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Land Reform, *Latifundia* and Social Development at Local Level in Colombia, 1961-2010*

Jean-Paul Faguet† **Fabio Sánchez**‡ **Marta-Juanita Villaveces**§

Abstract

The paper analyzes the effects of land reform on social development –poverty and land distribution- at the local level. Land reform in Colombia, understood as the allocation of public land to peasant, has granted 23 million hectares which comprises around 20% of Colombian territory and about 40% of usable productive land. Theoretically, the net impact of land reform on development is the combination of a poverty effect and a land distribution effect. Our findings suggest that land reform from 1961 onwards has slightly reduced poverty and mildly improved land distribution. Nonetheless, municipalities with strong presence of latifundia prior to 1961 have experienced both a slower drop in poverty and a weaker improvement of land distribution. This paper finds that prevalence of *latifundia* partially reduces the positive effect of land reform in promoting social development.

Keywords: Land reform, land distribution, *latifundia*, poverty, local economic development, Colombia

***JEL* classification:** Q15, N16, H27

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Reforma Agraria, Latifundio y Desarrollo Social en el Nivel Local en Colombia, 1961-2010

Resumen

El documento analiza los efectos de la reforma agraria en desarrollo social -pobreza y distribución de la tierra- a nivel local. La reforma agraria en Colombia entendida como la asignación de tierras públicas a campesinos, ha concedido 23 millones de hectáreas , que comprende alrededor de 20% del territorio colombiano y alrededor del 40 % de la tierra productiva. En teoría, el impacto neto de la reforma agraria en el desarrollo es la combinación de un efecto de la pobreza y un efecto de distribución de la tierra. Nuestros hallazgos sugieren que la reforma agraria a partir de 1961 ha reducido ligeramente la pobreza y mejorado tímidamente la distribución de la tierra. No obstante, los municipios con fuerte presencia de latifundios antes de 1961 han experimentado tanto una caída más lenta en la pobreza como una mejora más débil de la distribución de la tierra. En este trabajo se concluye que la prevalencia de los latifundios reduce parcialmente el efecto positivo de la reforma agraria en la promoción del desarrollo social.

Palabras claves: Reforma Agraria, distribución de la tierra, *latifundio*, pobreza, desarrollo económico local, Colombia

JEL classification: Q15, N16, H27

1. Introduction

Throughout the 20th century, land reform policies have been adopted as strategies to tackle land inequality and reduce poverty in rural areas. Despite the large number of land reform experiences across the world, results vary widely in terms of reduction of land inequality and poverty. Scholars suggest that the effect of land reform on development depends on the extent to which peasants have access to land and the degree of land transferability. It has been well established that unequal land distribution is negatively related to economic and social development and is associated with low rural productivity, lack of access to land for peasants and high poverty indicators (Binswanger and Deinninger, 1993). In this paper, we found for the Colombian case that the pre-existence of high land concentration in the form of *latifundia* is associated with the meager results of land reform in reducing poverty and improving land distribution.

In Colombia, numerous land reform efforts have been made since Independence in the early 19th century to the present. Land reform has been a continuous policy aiming at providing land access based on three fundamental goals: economic productivity, social development and peace. The central mechanism of land reform has been the transfer of state-owned land –the so-called *baldios*- to peasants for their private exploitation and giving them private ownership over the transferred land. Colombia's area equal 114 million hectares of which about 60 million comprises private terrains. From 1900 to 2012 the State has granted around 23 million hectares of *baldios*. Thus, close to 40% of the national productive private land has been granted to private individuals (Villaveces & Sanchez, 2014). In this regard, as a long-term policy of delivering property rights to peasants, land reform would be expected to improve development indicators. However, to our knowledge, there has not been a systematic analysis of the effect of land reform stemming from allocation of public lands on development.

Colombia´s land inequality has been historically high and currently is among the highest in Latin America (national land Gini coefficient was about 0.86 in 2010).[5] After Independence, a dual landholding structure developed in Colombia with *latifundia* (large landholdings)

[5] Colombia is, after Paraguay, the most unequal country in terms of land distribution in Latin America. According to IGAC, land concentration is very homogeneous in the entire country and land Gini coefficient by department ranges from about 0.68 to 0.91, revealing a startling level of inequality.

dependent on large numbers of peasants and rural laborers, and *minifundios* (smallholdings) that made up the peasant subsistence economy. Over time, *latifundia* have grown, and land ownership has become even more concentrated (UN-Habitat , 2005); (Reyes, 2009)(Fajardo, 2000) (IGAC, 2012).

Therefore, land reform policies are expected to be beneficial for economic development by reducing poverty and improving land distribution. Nonetheless, as land reform policy would be implemented under existing institutional arrangements the latter may positively or negatively affect its impact. Our research intends to show that if land reform occurs in places with high concentration of land –*latifundia*- its effects on poverty and inequality may be lower or even negative, which confirms the conclusions of some of the studies of land reform in Latin America. For instance, Lipton (2009) suggests that land reform has proven to be less effective in reducing poverty and creating employment in regions where great landlords own vast amounts of farmland, as is the case in Latin America.

In Colombia, the presence of previous *latifundia* and the extent of land reform display different patterns across municipalities and over time. For instance, not all municipalities with land reform show the same pattern of economic development and land structure. The data suggest an important interaction between former existence of *latifundia* and poverty in municipalities with land reform. The higher the prevalence of *latifundia,* the lower is the reduction of poverty over time.

Figure 1

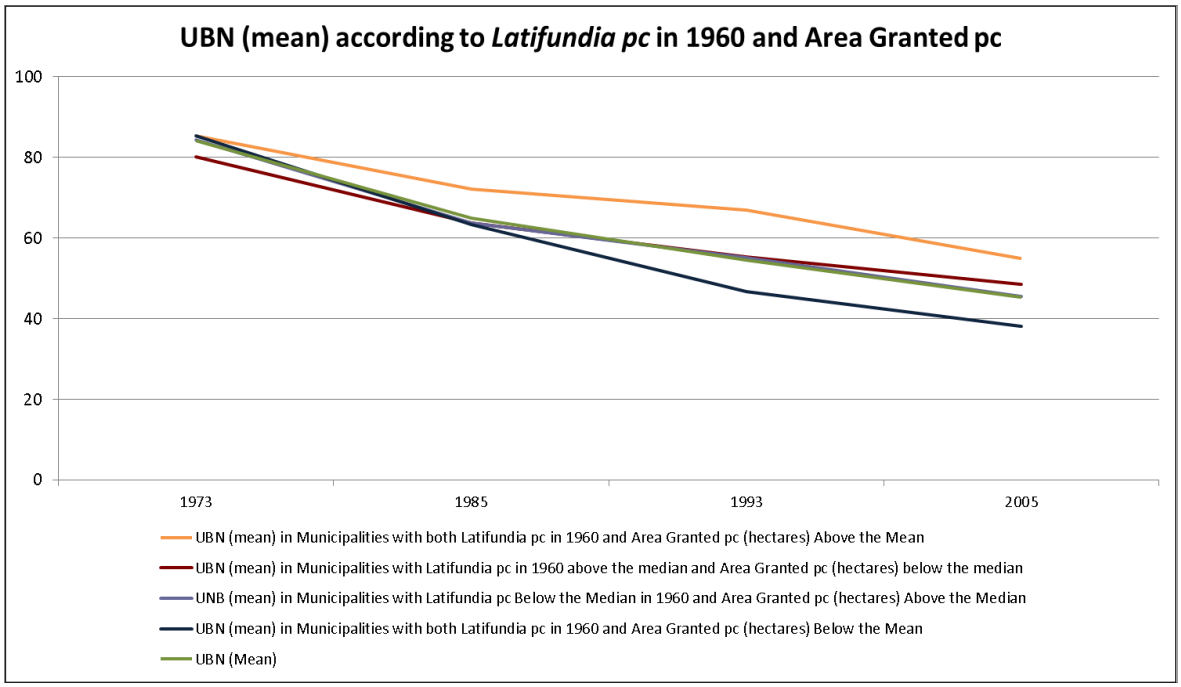
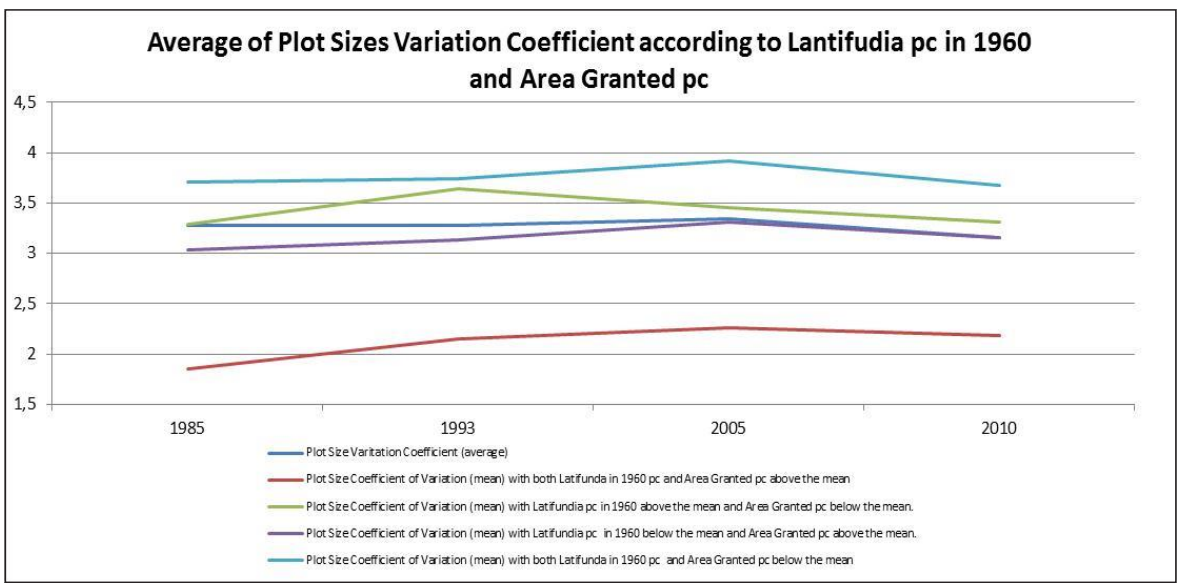


Figure 2.



Figures 1 and 2 exhibit the central thesis of our paper. Figure 1 shows that unmet basic needs (UBN) have dropped in municipalities with land reform (measured as hectares granted in per capita). Nonetheless Figure 1 also shows that in municipalities with greater prevalence of *latifundia* prior to the land reform after 1960, poverty has decreased less than in municipalities with less prevalence of *latifundia*. In fact, municipalities with low and high levels of previous *latifundia* had about the same level of UBN (82%) in 1973, but subsequently UBN fell by about 40 points in municipalities with low *latifundia,* with a difference of 10 points compared to municipalities with large *latifundia*. Thus, the evidence suggests that land reform has had heterogeneous effects on poverty reduction. While land reform may have improved UBN over time, the stylized facts of Figure 1 are also consistent with numerous descriptive and non-empirically tested analyses that emphasize the negative effects of Colombian land reform in areas with substantial presence of large landholdings.

In addition, Figure 2 illustrates that the coefficient of variation of average size of land plots – and indicator of the size dispersion and land distribution- has experienced a minimal change since 1985 no matter the magnitude of land allocation and previous existence of *Latifundia*, suggesting that land reform has been unable to affect substantially land distribution. In fact, the coefficient of variation of land plot size has somehow increased in those municipalities with per capita allocation of *baldios* and 1961 per capita latifundia above the mean. In the other types of municipalities the coefficient of variation of land plot sizes has remained from 1985 to 2010 more or less constant. Such similar trends indicate that municipalities with more intense land reform activity after 1960 have not behaved differently in terms of land distribution than the less intense land reform municipalities. Hence, this paper will attempt to address such findings more systematically and with the adequate empirical strategies.

In short, we hypothesize that the effects of land reform on poverty and land distribution are affected by the persistence of previous structure of land ownership. We maintain that land structures persist over time and attempts to lower land concentration through land reform policies would be hindered for the previous institutional arrangements that characterized *latifundia*. The result is that land tends to concentrate in places with a presence of large landholdings whereas the opposite is likely to occur in regions where their incidence is lower. Thus, locations where the proportion of large landholdings prior to 1961 was relatively high land reform might have reinforced this pattern.

We explore this hypothesis using Colombia's experience where land reform has a long history that continues to the present. The results indicate in fact that land reform has contributed to poverty reduction measured in terms of unmet basic needs (UBN). Furthermore, public land allocations are associated with reduction of the indicators of land concentration –diminution of the Gini coefficient and of the coefficient of variation of plot sizes. However, we also found that the existence of *latifundia* prior to land reform curtails the effect of land reform on poverty reduction and land inequality. Hence, our findings match the literature on the negative impact of the concentration of wealth on development outcomes.

Our main contribution is to quantitatively assess the effects of land reform on poverty and on land distribution at the municipal level and to analyse the heterogeneous effect of land reform on poverty in municipalities according to pre-existing prevalence of *latifundia*. We empirically find that land reform reduces poverty yet somehow weakly when *latifundia* are present nonetheless we have not explored the channels whereby it occurs. The explanation of the channels will be part of our research agenda on land reform. in the area. To our knowledge, this is the first paper addressing the effects of land reform on development at the local level with panel data that takes into account 50 years of land reform. Furthermore, it is a genuine contribution to measuring the effect of land reform on poverty, and specifically to quantitatively determining the effects of prevalence of *latifundia* prior to the implementation of land reform of those indicators.

The rest of the paper is organized as follows: Section 2 provides a discussion on the related literature on land reform and *latifundia* and its economic effects. Section 3 presents a historical background on Colombian land distribution and land reform, and Section 4 presents the data and explains the identification strategy. Section 5 analyses the econometric results and discusses the relationships between land reform, *latifundia*, poverty and land inequality. Lastly, section 6 concludes.

2. Related Literature

The effects of land reform on productivity, inequality, poverty, conflict and local politics has been a significant matter for scholars in terms of its policy relevance (e.g, (Berry & Cline, 1979); (World Bank, 1993); (Binswanger, Deininger, & Gershon, 1995); (de Janvry, Saboulet, & Davis, 1996);(Besley, Leight, Pande, & Rao, 2013); (Besley& Burgess, 2000; among others). Still, more attention has been given to the effects of land reform on productivity and poverty reduction than on inequality. As some scholars highlight (Bardhan, Mookherjee, Luca, & Pino, 2014), the effectiveness of land reform in changing the distribution of land ownership has not been seriously studied. This might be because the effect on distribution is not clear-cut and will depend on the type of land reform and the transferability of the land granted. Since our paper deals with the effects of land reforms on poverty, land distribution and *latifundia* in the Colombian context we will present in this section the relevant literature about these aspects.

Land Reform and Economic Development. The analyses on the economic effects of land reform do not provide conclusive results. Literature has presented three main factors associated with the effects of land reform on poverty: the type of contracts, the extent of land granted and the agricultural activities involved. In addition, the reasons that are presented to explain the results on inequality are: population growth, type of contracts and the extent of the property rights given to peasants.

Gerbash & Siemers (2010) show that land reforms are means of inducing the transition from a society in a poverty trap to a developed economy where agriculture plays a minor role. Land reform operates by providing peasants additional income. Passed certain threshold, families will invest in education which leads not only to higher income but also to even higher human capital investment, both of which reduce poverty. In addition, the authors suggest that the optimal land reform is not a one-off land allocation, but a sequence of land transfers that may bring about short-term inequality yet long-term economic development. An example of the diverse results on poverty is the case of India´s land reform (Bardhan, Mookherjee, Luca, & Pino, 2014); (Besley, Leight, Pande, & Rao, 2013); (Besley& Burgess, 2000); among others). Besley and Burgess (2000) find positive effects of land reform on poverty reduction in India associated with changes in the terms of contracts and the increase of agricultural wages rather than on redistribution of land. In subsequent work, (Besley, Leight, Pande, & Rao, 2013) assess

the long-run effects of land reform in India after 30 years, finding evidence of lower inequality in more regulated areas but with important differences among caste groups. By contrast, (Bardhan, Mookherjee, Luca, & Pino, 2014), present the negative indirect effects of land reform and population growth on land inequality. They show that, even though the tenancy reform lowered inequality, the increase of inequality due to natural population growth quantitatively dominates this effect.

Banerjee, Gertler and Ghatak (2002) examine the particular case of the West Bengal tenure reform on efficiency and underline the positive results on agriculture when reform incorporates laws that regulate rents, sharecropper tenure and transferability. Their empirical results suggest a twofold effect. On one side, reform increases the bargain power of tenants by raising their share of landlord crops. On the other side, secure tenure may reduce efficiency if the landlord threatens eviction, and may increase efficiency if the tenant increases investment as a result of guaranteed tenure. In addition, they find empirical support of positive effects on productivity measured by differences with Bangladesh (without tenure reform and sharecropper registration). They find greater productivity in West Bengal where the share of Operation Barga in this improvement was 28 % compared to Bangladesh. In the same perspective, Bardhan and Mookherjee (2007) confirm the positive effects on agriculture; however their empirical analysis shows that direct effects on tenant farms are overshadowed by spill-over effects on non-tenant farms.

In the same line, Gauster and Isakson (2007) find that land reform in Guatemala has a marginal effect on land distribution, explained by three reasons: land reform was narrow in terms of the amount of land given to peasants, the quality of land was not good and access to land did not guarantee access to credit markets. Besides, Besteman (1994) suggests that land reform in Somalia benefits some groups; generally the less needy such as urban elites and civil servants instead of the poor; men rather than women and old people rather than the young population. Assunção (2006) finds for Brazil differentiated effects of land reforms according to household income. He concludes that the policy implemented during the 1980s increased land ownership of poor families and also increased land concentration across the group of landholding families. By contrast, the findings of Sabourin (2008) indicate that land reform programs during the 1990s -loan-oriented- have been insufficient to drive up household income, suggesting that beneficiaries still depend on income from off-farm occupations. As Souza (2012) states, at the

municipality level, even though the proportion of cultivated area increased significantly in the years coinciding with land allocation, this happened in the context of a much less promising crop output growth rate. He implemented a survey and concluded that from the peasant point of view, just owning a plot of land is not enough to enhance their standard of living.

The Mexican agrarian reform presents striking results. In Mexico half of the surface of the country was redistributed during the Revolution period as *Ejidos* or collective lands.[6] There is a great consensus on the negative effects of agrarian reform on long term economic development. While land reform was a positive policy in terms of bringing stability to regions with insurgent activity (Dell, 2012) the effect on economic development was negligible in the sense that GDP could have been 124% higher in 1995 without land reform (Magaloni, Weingast, & Díaz-Cayeros, 2008) and (Albertus, Díaz-Cayeros, Magaloni, & Weingast, 2014); and unimportant for industrialization by preventing the establishment of agro-industrial activities (Dell, 2012). The empirical analysis of Dell (2012) shows that municipalities with revolutionary insurgency had about 22 percent more of their municipal area redistributed through land reform. However, municipalities with more insurgency are around 30 percent poorer today than nearby municipalities that did not have a revolutionary insurgence; and about 20% more of the labour force is in agricultural activities and 10% less in industry.

Land Reform and Land Concentration. In this paper we are interested in the combined effects of land reform and *latifundia,* the latter denoting a situation of land concentration. There is a growing amount of literature addressing the economic effects of land concentration: while the effect of land inequality on economic performance is usually regarded as negative, there is no unique reason to explain how it operates. Whereas some argue that the effects are negative (Galor, Moav , & Vollrath, 2009) others show that the negative effects disappear in the long run and no longer explain differences in development performance (Summerhill, 2010); (Acemoglu, Bautista, Querubín, & Robinson, 2007).

The institutional and economic history literature has pointed out the relevance of land distribution to explain economic performance. For instance, (Galor, Moav , & Vollrath, 2009) claim that before the industrial revolution opposing interests of landlords and capitalists reveal

[6] Ejidos: farms comprised of individual and communal plots that were granted to groups of petitioners

different intentions toward education policies. Landlords were mainly interested in reducing rural labour mobility, whereas industrialists needed an educated workforce to boost industrial productivity. Moreover, they find evidence showing that in societies with high land concentration, inefficient education policies persist, delaying growth and industrialization. By contrast, in societies with land ownership distributed more equally, growth-enhancing education policies were implemented at earlier stages, positively affecting the process of development.

As said by (Sokoloff & Engerman, 2000) the highly skewed distribution of resources in Latin America led to slower growth by contributing to institutions that reduce the economic and market participation of the population. Over time this in turn shaped the further evolution of land policy, especially the preservation of land inequality and persistence of former *latifundia* structures. As a result, *latifundia* have been persistent over time because it is an institution that successfully preserves the elite's power. As Bulmer-Thomas (1994) indicates, the great political power of landed elites either coerced peasant to compel them to remain in elite's landholdings or force them to settle in frontier regions facing weak property and unstable land ownership.

Baland and Robinson (2008) and Conning and Robinson (2002) suggest that the presence of *latifundia* engender inefficient economic outcomes. Accordingly, "where land inequality is highest, there is a greater incentive to challenge property rights via the political system, and this makes landlords more likely to organize agriculture in a politically defensive manner, by limiting tenancy" (Baland and Robinson, 2008: 4). Martinelli (2012) assesses *latifundia* in the context of Italian post WWII land reform and states that negative effects of land concentration operate through market mechanisms rather than through political or cultural mechanisms. His empirical evidence shows that local *latifundia* in the context of barriers to factor mobility will give market power to landowners having an impact on the resulting market equilibrium. In a similar way, Conning (2003) theoretically find initial land inequality could lead to persistently inefficient allocations and slower growth. By modelling landlord market decisions he concludes the rent advantages of land inequality in the context of unsecure property rights.

Deininger and Squire (1998) carrying out a cross-country find that land inequality is negatively associated with long-term growth yet such negative effect affects mainly the income of the poor rather than the wealthy' s. In contrast, Summerhill (2010) finds that the Brazilian

colonial land institution called *aldeamento*[7] is positively correlated with current income per capita. In other words, historical land concentration is associated with better income per capita in the 20th century. In the same perspective, Acemoglu et al. (2007) observe that municipalities that had unequal land distribution in Cundinamarca (Colombia) in the 19th century are more developed today.

Land Reform in Colombia. Lastly, Colombian literature on land reform has mainly addressed the political and social unrest related with competing land interests and public land allocation (LeGrand, 1988); (Bejarano, 1987); (Palacios, 2009); (Machado, Ensayos para la historia de la política de tierras en Colombia. De la Colonia a la creación del Frente Nacional, 2009); (PNUD, 2011)(García A. , 1980) among others. The general claim is that land reform has not succeeded as a mechanism to stop violence. The persistence of social conflict in rural areas has been a consequence of the negative effects of land reform and its inability to foster economic development and reduce inequality.

Available studies dealing with the economic effects of land reform offer scarce data and scanty empirical evidence. Balcázar, López and Vega (2001) assess the social and economic effects of the 1961 Land Reform Act. They surveyed households that benefitted from land grants in 1962 in three departments of Colombia, finding that land reform did have an effect on productivity yet the household income of beneficiary families was lower than that of non-beneficiary families. This result suggests that land reform entails greater land productivity, but it is insufficient to raise household income and to improve quality of life similar to the levels of other families in the region. Heshusius (2005) finds positive effects on income, associated with access to credit and work training of at least one household member.

In addition, Colombia´s literature on land reform has placed special emphasis on the correlation between land allocation and conflict and inequality, in a circular reasoning where land reform is cause and effect of conflict and unequal distribution, but lacking empirical support for this statement. Nonetheless, most scholars indicate that land reform has been inefficient in reducing poverty and land inequality. The main reason is that the large landholder elite has the

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[7] *Aldeamentos* were settlements assigned by the Crown to Jesuits, including the existing native populations, in exchange of their work and taxes.

power to re-concentrate the lands the given to peasants by buying them or encroaching them. In addition, other scholars state that in Latin America land property rights were often granted to people politically well-connected but not necessarily productive farmers, which limits development (Bardhan and Mookherjee, 2007). In terms of land distribution, we do not find any work that assesses the effects of land reform on land concentration. Still, some studies do point out that land inequality has recently increased (from 2000 to 2009) and this pattern is stronger in regions recently settled and with weak state presence (Gáfaro, Ibáñez, & Zarruk, 2012); and (Gutiérrez, 2014) (Restrepo & Bernal, 2014).

Colombian land reform since 1961 constitutes an opportunity to determine the effects of land reform in a milieu of land concentration. Politically, land distribution was a highly controversial issue and a source of rural distress until the land reform implemented after 1961. Scholarly research reflects this controversy. Traditional historiography viewed the *latifundia* inherited from colonial times and from the 19th century in a very negative manner, describing it as inefficient in terms of productivity and labor mobility and highly associated with patronage behavior. Modern economic history offers a more positive assessment of the long term economic outcomes of *latifundia* compared to the traditional view in the sense that some current positive effects are found in regions where land was highly concentrated in the 19th century (Acemoglu, Bautista, Querubín, & Robinson, 2007); (García C. , 2005); (Galán, 2011).

Our paper is therefore related to the growing literature on the economic effects of land reform on local development (Besley& Burgess, 2000; Besley et al, 2013; Bardhan and Mookherjee, 2007; Bardhan et al. 2014, Magaloni, 2008; Dell, 2012). The literature focuses primarily on the motivation and extent of land reform and its linkage to poverty reduction, land distribution and economic activity enhancement at the local level, but empirical work on the long run economic effects of land reform is limited. Our paper is also related to recent literature on *latifundia* and economic outcomes (Conning, Martinelli, 2012; Galor*et al.*, 2009), which assesses the impact of *latifundia* and land inequality on economic performance. Lastly, this paper contributes to the political economy approach to the relationship between inequality, redistribution and development.

3. *Latifundia* and Land Reform in Colombia

3.1. Historical background of *latifundia*

Land distribution in Colombia is extremely unequal, with concentration of land ownership among the highest in the world and second highest in Latin America after Paraguay. Inequality in access to land is closely linked to rural poverty and the economic exclusion of the rural population. Attempts to reverse the concentration of land ownership have so far been unsuccessful, as large estates –*latifundia*- have never been affected (USAID, 2010)(USAID, 2010)

The highly concentrated Colombian land distribution is deeply rooted in the colonial and 19th century agrarian frontier expansion. During the colonial period, large properties emerged as a result of the system of *encomiendas* established by the Spanish Crown and later with the formation of the *haciendas*. *Encomiendas* were a grant from the Crown to produce, extract tributes and use the labour force of the indigenous peoples who lived in the area granted in exchange for protecting and Christianising them. Technically the *encomienda* did not assign ownership to the *encomendero* but an inheritable right to use the land. However, in practice *encomiendas* were treated as private property. The system of *hacienda* was the emergence of private properties as landlords expanded their land titles.

These large landholdings coexisted with the formation of medium and small landholdings. Some elites managed to negotiate *haciendas* and some farmers received smaller plots of land as well. Changes in land structure were also affected by changes in the population and new demand for land by groups of outsiders (mainly mestizos). On one side, the reduction of the indigenous population reduced the size of the reservations as landless mestizos invaded them and, on the other side, the Crown responded to the demand for land by selling existing public lands to peasants and landlords.

As Colmenares (1997) suggested, colonial *encomiendas* gave birth to great estates –the *latifundia*[8]. And the colonial indigenous reservations –*Resguardos*- gave rise to small estates –

[8] The relationship between proportion *of latifundia* in a particular municipality in 1961 and the structure of the colonial institutions can be established through the following equation:

minifundios- in certain Colombian regions. According to Ankersen and Rupert (2006), the early land policy of the Crown inevitably led to the inequitable distribution of land in much of the New World. During the 19th century, land concentration persisted with the existing system of haciendas and the concentration of public land given to private parties to redeem government debt bonds. However, the demand for land arising from a growing population created a process of frontier settlement by squatters who enforced de facto ownership, giving rise to medium and small rural holdings, thereby accentuating unequal distribution.

In spite of the continuous land reform efforts in Colombia, land concentration persists. Some suggest that land policies have played in favour of large landholders, who not only benefited from specific subsidies and credits, but also by capturing small plots of land held by peasants. As a result, there has not been a significant change in land structure, and the *latifundia* remain and even have increased in size (Mora, 2007). Scholars suggest that land distribution and concentration reveals the inability of policies to affect land ownership and reduce unequal distribution (Machado, 1998); (PNUD, 2011); (Reyes, 2009); (Kalmanovitz and López, 2003), among others).

Overall, the area of Colombia is 114.2 million hectares, of which about 32 million hectares have been handed over and titled as indigenous reservations (28%); 5.2 million were granted to ethnic communities of African descent (about 4.5%); and 15 million hectares belong to the National Parks and Reserves (13%). According to cadastral data, about 60 million hectares are registered as private property (both individuals and state-owned, equivalent to around 52%). From 1901 to 2012, the State has granted nearly 23 million hectares (20%) of Colombian total area to peasants and agricultural businesses in over approximately 565,000 plots.

For us, these figures clearly demonstrate the magnitude of land reform in Colombia since the 20th century. Taking into account the allocation of collective land to ethnic communities (indigenous and afro) plus the allocation to peasants, 57% of the nation's land has been

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$Latidundio/Mun_Area_{1961} = 3.31 + 0.012 * \log(Indigenous)_{1560} - 0.2 * Encomienda - Influence + Geographical - Controls$ N=634 R2=0.16. All variables are significant at 1%.

The equation suggests that the formation *of latifundia* were affected by two forces: a positive one driven by the availability of labor force and a negative one driven by the larger availability of land away from the indigenous settlements. In the latter, it was observed the emergence of Resguardos and in the 19th century when they were dissolved it followed the propagation of *minifundia*.

transferred from the State to private owners. Nonetheless, leaving aside collective grants, land reform accounts for about one-third of the rural private cadastre in Colombia, meaning that a very large number of rural properties have been allocated through the mechanism of land reform. Therefore, it would be naïve to underestimate the effect of this enormous policy on economic, social, political and territorial matters. In addition, the persistence of land reform for over more than a century reveals the importance and magnitude of this state policy.

Despite the magnitude of the land reform policy, rural land distribution in Colombia has been characterized by a dualistic ownership structure –*few large landowners and many small landholders*- since colonial times. This high level of land inequality has actually increased in the last two decades. As Helo and Ibañez (2011) highlight, around 42% of land is concentrated in large properties of more than 200 hectares. About 40% of landholdings are mid-sized and 18% are properties of less than 20 hectares. In addition, the land Gini coefficient was 0.863 in 2009. In this sense, it is of interest to study the effects of land reform on land distribution.

In terms of development, rural areas have experienced important but insufficient changes in the past decades. Rural poverty has dropped in the past decade from 79% of the rural population to 49% in 2008; however, extreme poverty is still high and greater than urban extreme poverty. Furthermore, rural wealth is lower than urban wealth and extremely concentrated, thereby deepening income inequality (Castañeda & Escobar, 2011). In addition, rural jobs are highly concentrated in agrarian activities (about 61%) with a tendency to fall in the past 10 years but with a growth trend between 2007 and 2012, when about 820,000 new jobs were created. Most workers are self-employed (51%); followed by employees (17%) and the rest are day workers (Merchán, 2014). This leads us to assess the relative importance of land reform on rural development and land distribution.

3.2. Historical Trends of Colombian Land Reform

Land reform has been in the agenda since independence in 1821. According to Hirschman, Colombian land reform "is by no means and aspiration that arose abruptly in recent years as a result of a sudden yearning for social justice or in response to outside pressure. Rather, it has long been a developing reality" (Hirschman, 1963)

Land reform policy is not intended to produce a radical transformation of land ownership as in the Mexican or Bolivian cases, where property was transferred from large landlords to peasants. The singularity of Colombian land reform is the transfer of State ownership to peasants after a long-run process of previous squatter occupation of vacant lands (*baldíos*[9]), which is equivalent to a *land reform* in the sense that it delivers private land to landless peasants, it recognizes previous settlers on agrarian frontiers, and through the allocation of private properties, it attempts to foster economic development and reduce poverty and inequality.

In Colombia land reform legislation began in the 19th century as a mechanism to foster a land market and as a strategy to use public land to raise funds to pay off obligations with creditors. From legislation purely focused on the allocation of the vast area of public land it became a mechanism to promote agrarian development and efficient use of the land at the end of the century. Later, during the 20th century, land legislation focused increasingly on growing rural conflicts involving land ownership and uses. The seminal law in 1936 –Law 200- shows a liberal ideology aiming to "de-individualize" the concept of rights that national constitutions defended in order to guarantee squatters' rights.[10] It intended to change land use by promoting efficiency and defining for the first time the social function of property.

Even though the legislation was aimed at redistributing land, creating new conditions for access to land and promoting private ownership over land, it was not until the 1960s when large amounts of public lands were allocated. At that time, Law 135 of 1961 generated a growing process of public land allocation from about 90,000 hectares per year on average allocated before 1961 to around 600,000 hectares per year during the 1960s. Land reform pursued three main aims: the pacification of rural areas, to pursue economic and food supply development, and to alleviate foreign pressure from US-initiatives such as the Alliance for Progress.[11]

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[9] According to Colombian legislation, a *baldío* is real estate property owned by the Nation and located in rural areas. As a general rule it should be awarded to those who occupy it and meet the requirements set by law.

[10] Law 200 of 1936 gave ownership to those who were using it and who in good faith thought there were no previous owners (Alvear, 2013).

[11] Furthermore, the 1961 law was enacted in the context of the Alliance for Progress and the National Front in Colombia, when there was a strong consensus on the need to stop any insurgent movement mainly through economic development strategies.

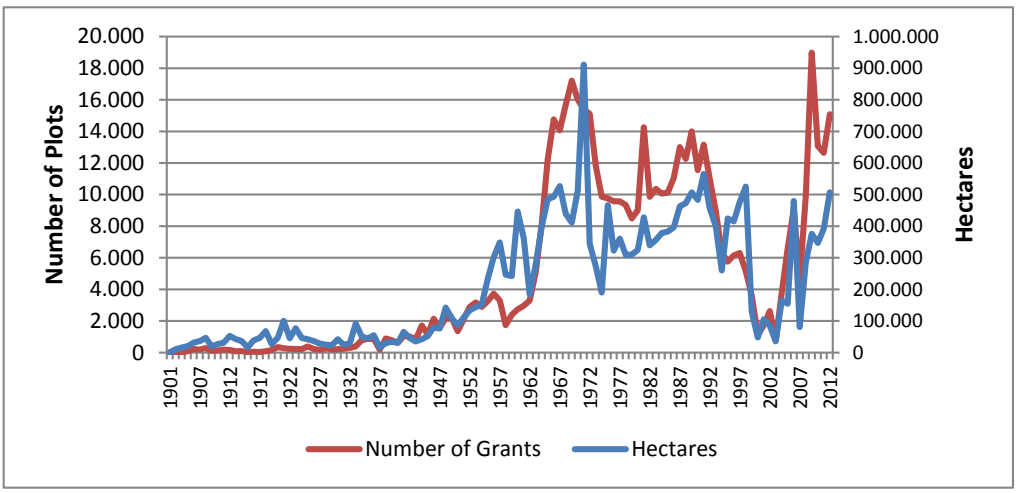
From 1973 to 1994, INCORA continued its task of allocating land, but at a slower rate.[12] After 1988 land allocations increased again, because at the time the government was committed to addressing the rural conflict, partly by providing incentives to allocate land in conflict-related zones. In 1994, as part of the institutional changes associated with the 1991 Constitution and in the context of a market economy, the government enacted Law 160 designing a loan-based market-oriented approach to land reform aimed at lowering the cost for poor landless peasants to obtain farmland.

After 1994, access to land did not depend on living and cultivating it, but on standard of living eligibility conditions such as being rural workers in conditions of poverty and claiming that their income is derived mainly from rural activities. Once these conditions are fulfilled, a peasant is entitled to receiving a loan equal to 30% of the price of the land, and INCODER subsidizes the remaining 70%. Therefore, land reform is a subsidized transaction that allows peasants to access land even if they have not formerly lived on it. Nevertheless, as previous land reform laws, Law 160 of 1994 does not provide a property title as such, but only an Administrative Resolution of allocation to a private party.

Graph 1 offers a complete picture of land reform trends –total area and number of plots allocated, from 1901 to 2012.

[12] The momentum of the 1961 land reform was sharply interrupted in 1973 as a result of a political pact named "*Pacto de Chicoral*", through which large landowners and the conservative government of President Misael Pastrana agreed to reorient land policy and curtail land distributions to peasants.

Graph 1. Number of Plots and Area (hectares) Allocated - 1901-2012



Source: author's calculation – Information System of Rural Development - SIDER-INCODER

During the early 20th century the amount of land allocated and the number of awards remained at a low level. An upward trend is observed in the late 1930s, following the enactment of Law 200 of 1936, which established a land reform. Contrary to widespread belief, this land reform was very modest, and a substantial increase in the allocation of public lands did not occur until after the enactment of Law 100 of 1944, which reversed some of the reforms of Law 200.

The major upturn in land allocation took place in the 1960s as a result of the 1961 land reform act. The magnitude of this reform is notorious, not only in terms of the area allocated, but also in the number of plots, and therefore of beneficiary families. Here again, there is a downward trend after 1973. Later, in the 1990s the change in the land reform mechanisms once again produced a downturn in land allocation, suggesting that the market-led land reform actually reduced land access for peasants (Mondragón, 2001)

In this paper, we document that the differential changes in poverty as a result of land reform policy are greatly accounted for by the land reform after 1961. Throughout the document, the term land reform refers to the allocation of public land to peasants as defined in Law 135 of 1961, which aims to deliver property rights to landless peasants in order to foster economic development, reduce local poverty, improve land distribution and prevent social unrest over land. The term Potential Land Reform refers to the amount of land potentially

available to be granted to landless peasants based on the area of the municipality as presented in the following section.

4. Land Reform and *Latifundia* in Colombia: Data and Empirical Strategy

The central hypothesis of this paper, that previous latifundia adversely affected the results of land reform on development, is examined empirically by means of changes in unmet basic needs (UBN), land Gini coefficient and size of rural properties across municipalities and over time in Colombia during the land reform period of 1961 to 2010.

4.1. Data

The historical data we use in this paper is gathered from several sources. Land reform data is from INCODER, which gathers information on the number and area of plots allocated in all municipalities from 1961 to 2012. This data specifies the number of hectares awarded in a single plot by year and municipality. To calculate the area allocated per capita we use lagged population, given that population is endogenous to land reform. We extrapolate population from National Census data in order to have the initial population in 1961 (which did not match the census). Therefore, the information takes into account the t-1 population data of each cumulative period.

The information of Unmet Basic Needs (UBN) came from the National Statistics Department of Colombia (DANE) and includes information from 1973 to date. The UBN takes values between 0 and 1, where 1 is a situation of complete UBN and 0 is the situation where all basic needs are fulfilled.

The level of land inequality is captured by constructing a Gini coefficient for land distribution within each municipality using rural cadastral data from the Colombian Geographic Institute (IGAC) for years 1985, 1993, 2005 and 2010. As can be seen from table 1, land inequality at the local level is high, with a Gini coefficient of about 0.69 when including all municipalities and 0.86 when only measuring municipalities with land distribution information. In addition, we calculate the Gini coefficient of rural land values within each municipality using land value data from IGAC for years 1985, 1993, 2005 and 2010.

The average size of rural plots and the coefficient of variation of the average size of plots are constructed with cadastral information from IGAC. The average size is the area of rural plots divided by the total number of rural plots in municipality *i* in year *t*. The coefficient of variation is calculated using the same information and takes into account the average size and its standard deviation.

To measure rural property size we calculate the per capita proportion of plots in five ranges of plot sizes: less than 3 hectares, from 3 to 5 hectares, from 5 to 10 hectares, from 10 to 50 and from 50 to 500 hectares and greater than 500 hectares. These ranges of plot sizes are used by the IGAC to categorize properties. We use lagged population to calculate per capita proportion of property according to size.

In addition to measuring existing *latifundia* in 1960, we use cadastral information from IGAC in 1960 to calculate the proportion of *latifundia* (plots of 1000 hectares and greater) over the total rural cadastre. Then we divide it by municipal population in order to capture the per capita proportion of *latifundia* one year before the land reform.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Years
NBI	4484	62,17016	22,95579	5,360615	100	1973-2005
Gini Coefficient of Plot Sizes	2030	0,6907051	0,1096375	0,01842	0,98155	2005-2010
Gini Coefficient of Plot Values	1907	0,6672029	0,0950144	0,1820413	0,97627	2005-2010
Average Size of Rural Properties	3937	47,12584	81,23982	1,5	1000	1985-2010
Average Size of Rural Properties (Log)	3937	3,103426	1,219117	0,4054651	6,907755	1985-2010
Coefficient of Variation of Plot Sizes	3516	3,27247	1,395649	0,1440372	9,814722	1985-2010
Plots by Size Ranges Less than 3 has	3530	1077,505	1391,488	0	14070,32	1985-2010
Plots by Size Ranges 3-10 has	3530	5275,738	7566,801	0	102317,8	1985-2010
Plots by Size Ranges 10-20 has	3530	2918,747	3404,457	0	130542,7	1985-2010
Plots by Size Ranges 20-200 has	3530	16522,45	24125,36	0	384411,7	1985-2010
Plots by Size Ranges More than 200 has	3530	15643,19	66598,32	0	1455682	1985-2010
Plots by Size Ranges Less than 3 has per capita	3526	0,1102632	0,1575853	0	1,441306	1985-2010
Plots by Size Ranges 3-10 has per capita	3526	0,519521	0,8786615	0	26,65516	1985-2010
Plots by Size Ranges 10-20 has per capita	3526	0,2693952	0,5719247	0	25,95799	1985-2010
Plots by Size Ranges 20-200 has per capita	3526	1,34449	2,377221	0	78,68728	1985-2010
Plots by Size Ranges More than 200 has per capita	3526	1,458635	7,678689	0	210,3293	1985-2010
Plots by Size Ranges Less than 3 has per capita (log)	3526	0,0963765	0,1223105	0	0,8925333	1985-2010
Plots by Size Ranges 3-10 has per capita (log)	3526	0,3401989	0,3498383	0	3,319812	1985-2010
Plots by Size Ranges 10-20 has per capita (log)	3526	0,2157487	0,1783343	0	3,29428	1985-2010
Plots by Size Ranges 20-200 has per capita (log)	3526	0,677073	0,5254659	0	4,37811	1985-2010
Plots by Size Ranges More than 200 has per capita (log)	3526	0,4294373	0,637757	0	5,353417	1985-2010
Allocated land hectares pc	5542	1,398928	6,901582	0	223,5763	1973-2010
Allocated land hectares pc (log)	5542	0,3813797	0,6843213	0	5,414216	1973-2010
Potential land reform hect pc	5479	4,09658	39,46959	0,0014716	1166,222	1973-2010
Potencial Land Reform-Hectares pc (Log)	5479	-0,9864552	1,455105	-6,521434	7,061525	1973-2010
Latifundia in 1960 hectares	4125	13444,68	71114,39	0	1450956	1961
Latifundia in 1960 hectares pc	4075	6,418938	71,84517	0	1804,153	1961
Latifundia in 1960 hectares pc (log)	4075	0,5644357	0,9107407	0	7,498401	1961
Proportion of *Latifundia* 1960 over rural cadastral (hectares)	3960	0,1411364	0,1846243	0	0,988	1961

Table 1 presents descriptive statistics of all the variables used in our empirical approach. As can be seen, land reform has taken place in almost all municipalities in Colombia, allocating on average one hectare per capita over a potential of land reform of 4.09 hectares per capita. The average size of rural properties is about 47 hectares and the coefficient of variation is positive meaning that in average, plots are more unequal in size. A vast proportion of rural area corresponds to medium size properties and *latifundia,* about 40% is medium size properties and 37% *latifundia*. Small properties account for 33%, where properties less than 3 hectares are about 2.6%; properties in the range of 3 to 10 hectares are about 12.7% and properties in the range of 10 to 20 hectares around 7%. In addition, UBN is about 62.17 and land Gini coefficient 0.69, where some municipalities display a tremendous land concentration of 0.98 and others very low land concentration of about 0.0189. On average, municipalities had about 13.500 hectares of latifundia in 1960 representing 14% of rural properties area but with municipalities where about 98% of rural properties were *latifundia*.

4.2. Empirical Strategy

The model. In order to determine the impact of land reform in a particular municipality we estimate the following equation:

$$y_{it} = f(\mathrm{LRpc}_{it}, \mathrm{LRpc}_{it} * GL1960_{i}, Controls_{i,t'}, \delta_t, \delta_i) \qquad (1)$$

Where y_{it} is the dependent variable in municipality *i* in year *t* (here *t* indicates the years 1973, 1985, 1993, 2005, and 2010 respectively); dependent variables are development variables (UBN, land Gini of property (plots) sizes, land Gini of property values, average size of rural properties and coefficient of variation of property size). The variable $LRpc_{it}$ ***Land Reform per capita*** is the independent variable in year t, δ_i are municipality fixed effects and δ_t are year fixed effect. Land reform per capita is accumulated number of hectares granted in each municipality from 1961 to year t. For instance $LRpc_{i,1973}$ is the per capita hectares granted between 1960 and 1973 in municipality ***i.*** Likewise $LRpc_{i,1985}$ is the per capita hectares granted between 1960 and 1985 in municipality ***i***

GL1960$_i$ is per capita *latifundia* (plots greater > 500 hectares) in 1960 -previous to the land reform of 1961- capturing the per capita size of large landholdings in municipality ***i***. This variable

would indicate the prevalence of *latifundia* and the relative power of the landed elite prior to land reform.

In equation (1) we expect the coefficient associated to the effect of land reform LRpc_{it} on poverty or on the land distribution to be negative while to be positive the coefficient related to the prevalence of *latifundia* in 1960 as.–according to the reviewed literature – presence of large landholding and hence of landed elites may curtail the effects of land reform. Equation (1) only include as control variables municipal and time fixed effects given that any possible economic or social control variable would be endogenous to our variables of interest. For instance, social variables such as education enrolment, health access and local tax revenues may have been the result of land reform. By the same token, political and conflict variables are also associated with the performance and intensity of land reform, as described in the previous section.

Equation (1) cannot be estimated using a OLS panel model as it would beis plagued with endogeneity and omitted variables problems which would surely bias the coefficients obtained. In fact, land reform at the municipal level is far from being a random event. Quite the contrary because -in fact - land reform policies established among its objectives the reduction of the unequal concentration of land, the improvement of the living standards of peasant population, the increase of productive employment in rural areas and the mitigation of rural unrest. In consequence, land reform at local level was to large extent the consequence of poverty and land inequality. Thus, as said simple OLS estimation of poverty and land inequality on land reform indicators would produce bias estimators.

In order to correct the likely bias of the OLS coefficients in equation (1) we construct an exogenous measure of land reform called "**Potential of Land Reform**". As explained below this variable might be interpret as the *potential intensity of land reform* as it entails the accumulated hectares could have been "*potentially*" granted in a particular municipality ***i*** until year t given the country's trends of land grants and the land availability at municipal level. The potential land reform is highly correlated with the actual hectares of land granted yet does not exhibit the endogeneity and omitted variable predicaments of the latter.

Identification Strategy: Potential of Land Reform. In order to avoid the likely bias of the OLS coefficients in equation (1) we construct an exogenous variable that captures the

potential per capita of land reform in each municipality. This variable distributes the total hectares of land allocated each year in the country as a whole proportionately to the area of each municipality, correcting by the area granted in previous years in municipality ***i***. Thus, the per capita potential allocation will be computed for each year between 1961 and 2010 as follows:

$$Potential\ Allocation\ of\ Hectares_{\ it}$$

$$= \frac{corrected\ area_i}{\sum_i corrected\ area\ of\ municipalities_{it}} * total\ hectares\ allocated_t \quad \textbf{(2)}$$

Where *corrected area$_i$* captures the total area of the municipality corrected by previous land allocation. The correction of the municipality's area involves two steps: i) the proportion of area discounted to each municipality in which actual land reform took place equals the average proportion of the area allocated in the whole country; ii) the area is corrected only in municipalities with actual allocation took place between t-1 and t. Thus, the area discounted in each municipality used to determine land availability for land reform takes only into accounted the national trends and not the local ones. Thus, the corrected area of the municipality is expressed as follows:

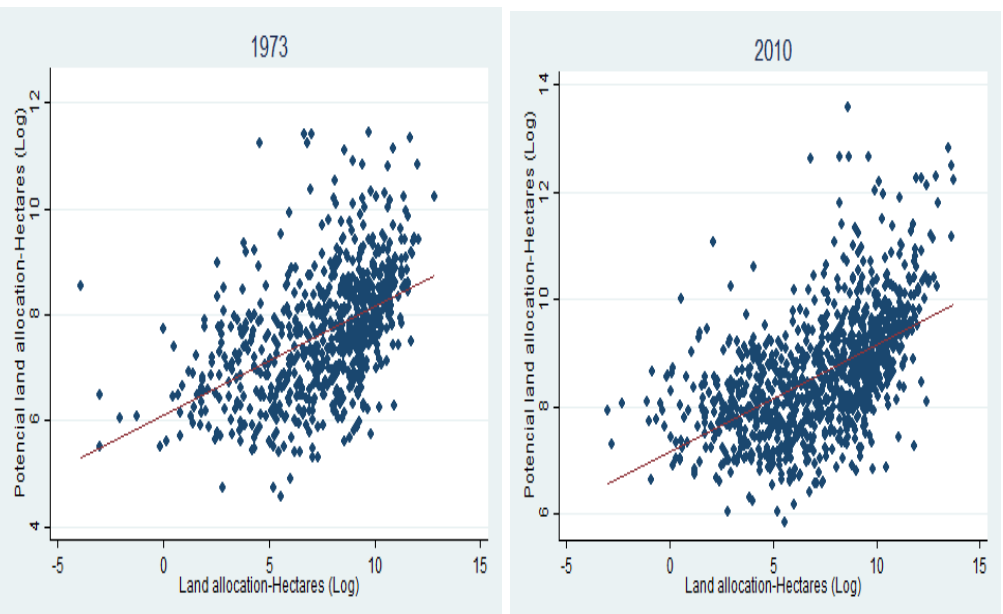
$$corrected\ area_{i,t} = corrected\ area_{i,t-1} - \left(average\ proportion\ allocated_{t,t-1}\right) * corrected\ area_{i,t-1}$$

Where *i* indicates the municipality and *t* indicates the years 1973, 1985, 1993, 2005 and 2010. The variable $area_i$ indicates the total area of municipality *i* while $corrected\ area_{i,t}$ measures the area that is potentially available for land reform. The variable $average\ proportion\ allocated_{t,t-1}$ denotes the country's proportion of land allocated in land reform calculated only with the municipalities in which land reform actually took place. After calculating the flow of potential hectares allocated in each municipality each year we proceed to accumulate over time the hectares granted through land reform in each municipality *i* from 1961 to *t*. Thus, the potential accumulated hectares of land reform namely **potential land reform** in per capita terms can be defined as follows:

$$PLRpc_{i,t} = \left(\sum_{1961}^{t} Potential\ Allocation\ of\ Hectares_{i,t}\right) / population_{i,t-1}.$$

Where $PLRpc_{i,t}$ denotes the potential of land reform in municipality $\boldsymbol{i}$ in year $\boldsymbol{t}$ in per capita terms. Graph 2 present the correlation between the actual and the potential accumulated hectares of land reform for 1973 and 2010 which shows that latter is a good predictor of the former. In this regard, the notional allocation of hectares through land reform –both from 1961 to 1973 and from 1961 to 2010 -based land availability is clearly a good proxy of the actual hectares granted.

Graph 2. Potential and Actual Land Allocations through Land Reform



Thus, equation (1) will be substituted by the following equation (2)

$$y_{it} = d_t + \gamma_1 \text{PLRpc}_{it} + \gamma_2 \text{PLRpc}_{it} * GL1960_i + \gamma_3 * GL1960_i * d_t + \delta_i + \varepsilon_{it}$$

(2)

Where PLRpci,t represents the potential for land reform as defined above while γ1 will be the coefficient associated to the impact of land reform on the social and land inequality indicators of municipalities. PLRpci,t *GL1960i stands for the interaction between potential land reform and the per capita latifundia in 1960. It is expected a negative sign for γ1 and a positive one for γ2.

These two coefficients can be interpreted as reduce form estimation for the instrumental variable strategy that would regress Hectares allocated through Land Reform against Potential for Land Reform with an interaction term. Nevertheless we will not use an IV approach because land availability could also affect poverty or land distribution directly which would invalidate the exclusion restriction of the instrument. Moreover, using our reduced form approach we can control for the direct effect of land availability on local development indicators by introducing as regressor in equation (2) a polynomial of the area of the municipality interacted with the time fixed effects δ as follows:

$$y_{it} = d_t + \gamma_1 \text{PLRpc}_{it} + \gamma_2 \text{PLRpc}_{it} * GL1960_i + \gamma_3 * GL1960_i * d_t + \delta_i +$$

$$h(Area_i * d_t) + \varepsilon_{it}$$

where the expression $\text{h(Area}_\text{i} * \text{d}_\text{t})$ in equation (3) represents a polynomial of the municipal area and will pick up the direct effects of land availability on the indicators of poverty and land distribution. The following section explains the result of the estimations.

5. Results: The Effects of Land Reform Amidst *Latifundia*

Poverty. Table 4 presents the results of the impact of Potential for Land Reform in per capita terms PLRpc_{it} on poverty indicators according to three model specifications. Column (1)

displays the results of the latter variables using a model with fixed effects by municipality and year. According to Table 4 PLRpc_{it} negatively impact the Unmet Basic Needs index suggesting that the larger the number of hectares allocated through land reform (in relation to the population in t-1) the greater the reduction of poverty in the municipality ***i***. Column (2) introduces the interaction of PLRpc_{it} with *latifundia* per capita in 1960 which exhibit a negative coefficient. This result suggests that poverty reduction effects that land reform may have would be hindered by the presence of large landholdings yet we cannot establish the channels through which it may occur. As stated in the literature review large landowner would curb the poverty effects of land reform if: i) they capture for themselves the land allocated through land reform either buying or despoiling the terrains granted to peasants; and/or ii) they oppose to the increase of public goods and social services which are more greatly demanded as a consequence of the stronger land property rights of peasants.

Table 3: Panel Data, municipal fixed effects - Variable: UBN

Variables	(1) UBN	(2) UBN	(3) UBN
Potential Land Reform-Hectares pc (Log)	-3.497***	-3.306***	-1.545***
	(0.425)	(0.483)	(0.483)
Potential Land Reform-Hectares pc * Latifundia pc (Log)		1.184***	0.793**
		(0.355)	(0.347)
Constant	80.75***	81.12***	83.29***
	(0.616)	(0.670)	(0.665)
Interaction Latifundia*Year	No	Yes	Yes
Polinomial of area*year	No	No	Yes
Second degree polinomial of area of municipalities	No	No	Yes
Observations	3.260	3.260	3.260
R-squared	0,819	0,821	0,836
Number of municipalities	815	815	815

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
All regression includes year fixed effect. Regressions includes years: 1985, 1993, 2005 and 2010

Column (3) reports the estimation of equation (3) which adds a second degree polynomial of municipality area interacted with the time dummies. This polynomial would pick up the direct effect of land availability on poverty indicators. Although the magnitude of the coefficients is smaller they remain significant. According to the model of column (2) an increase in one standard deviation of PLRpc_{it} in logs (=1.15) lowers the UNB index by 0.15 standard deviations (-3.03*1.15/24). In contrast, a rise of one standard deviation of $\mathrm{PLRpc}_{it} * GL1960_{i}$

(=0.78) augments the UBN index by 0.038 standard deviations. Hence, *latifundia* presence in fact curtails the effects of land reform on poverty.

Land Distribution. Table 4 displays the effect of land reform (potential) on different measures of land distribution under the same 3 specification. Colum (1), (5) and (9) indicate that land reform through allocations of hectares has a negative impact on the Gini coefficient of land areas. This result suggests that the municipalities where more land grants (potential) have been distributed among peasants would exhibit more equal land distribution. It should notice that the coefficient of PLRpc_{it} has the same magnitude regardless the model specification. Column (5) introduces the interaction term $\mathrm{PLRpc}_{it} * GL1960_{\ i}$ being the coefficient of the latter non-significantly different from zero. Thus, the prevalence of *latifundia* in 1960 does not seem to hinder the improvement of land distribution brought about by land reform. The result maintains in column (9) which introduces in the model the second degree polynomial of municipality area interacted with the time dummies. According to column (5) an increase of one standard deviation of PLRpc_{it} decreases in 0.12 (=1.06*-0.0124/.11) standard deviations the Gini coefficient of land areas. Thus, land reform has helped to lower Colombian high concentration of land although its magnitude seems somehow modest. Columns (2), (6) and (10) displays the same econometric exercises yet using as dependent variable the Gini coefficient of the land plot values. The results obtained are similar to the previous ones.

Table 4: Panel Data with municipal fixed effects. Dependent Variable: Gini Coefficient of Plot Sizes, Gini Coefficient of Plot Values, Average Size of Plots and Coefficient of Variation of Plot Sizes.

Panel A: Potential Reform

Variables	(1) Gini Coefficient of Plot Sizes	(2) Gini Coefficient of Plot Values	(3) Average Size of Rural Properties (Log)	(4) Coefficient of Variation of Plot Sizes
Potential Land Reform-Hectares pc (Log)	-0.0149***	-0.0139***	0.123***	-0.218***
	(0.00561)	(0.00514)	(0.0171)	(0.0388)
Constant	0.686***	0.660***	3.135***	3.125***
	(0.00612)	(0.00560)	(0.0218)	(0.0494)
Interaction Latifundia*Year	No	No	No	No
Second degree polynomial of area of municipalities	No	No	No	No
Observations	1,628	1,628	3,164	3,164
R-squared	0.009	0.016	0.338	0.047
Number of cod_mpio	814	814	814	814

Panel B: Interaction: Potential Land Reform and 1960 Latifundia

Variables	(5) Gini Coefficient of Plot Sizes	(6) Gini Coefficient of Plot Values	(7) Average Size of Rural Properties (Log)	(8) Coefficient of Variation of Plot Sizes
Potential Land Reform-Hectares pc (Log)	-0.0124**	-0.0142***	0.157***	-0.265***
	(0.00591)	(0.00541)	(0.0185)	(0.0421)
Potential Land Reform-Hectares pc * Latifundia pc (Log)	-0.00875	0.00232	-0.0949***	0.193***
	(0.00737)	(0.00675)	(0.0212)	(0.0480)
Constant	0.688***	0.660***	3.062***	3.239***
	(0.00636)	(0.00582)	(0.0210)	(0.0476)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes
Second degree polynomial of area of municipalities	No	No	No	No
Observations	1,628	1,628	3,164	3,164
R-squared	0.012	0.016	0.345	0.056
Number of cod_mpio	814	814	814	814

Panel C: Interaction: Potential Land Reform and 1960 Latifundia adding a Polyomial of Area of Municipality

Variables	(9) Gini Coefficient of Plot Sizes	(10) Gini Coefficient of Plot Values	(11) Average Size of Rural Properties (Log)	(12) Coefficient of Variation of Plot Sizes
Potential Land Reform-Hectares pc (Log)	-0.0152**	-0.0142**	0.190***	-0.231***
	(0.00601)	(0.00552)	(0.0190)	(0.0430)
Potential Land Reform-Hectares pc * Latifundia pc (Log)	-0.00816	0.00278	-0.0942***	0.126***
	(0.00739)	(0.00679)	(0.0212)	(0.0481)
Constant	0.685***	0.660***	2.764***	4.801***
	(0.00646)	(0.00594)	(0.381)	(0.862)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes
Second degree polynomial of area of municipalities	Yes	Yes	Yes	Yes
Observations	1,628	1,628	3,164	3,164
R-squared	0.020	0.017	0.362	0.085
Number of cod_mpio	814	814	814	814

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
All regression includes year fixed effect
Regressions for Gini Coefficient of Plot Sizes and Gini Coefficient of Plot Values includes years 2005 and 2010.
Regressions for Average Size of Rural Properties (log) and Coefficient of Variation of Plot Sizes includes years 1985, 1993, 2005 and 2010.

Columns (3), (7) and (11) in Table 4 present the econometric results for the average size of land properties in the municipality. The coefficient for PLRpc_{it} indicates that allocation land

plots to peasants through land reform seem to augment the average size of plots. In fact, an increase of 1% of potential land reform (in per capita hectares) augments by 0.15% the average size of properties (in logs). This result suggests that the plots allocated through land reform (mostly *baldios*) seem to be of larger area than the existing plots. Nonetheless, the positive effects of land reform on average area of the plots appear to be lower in places with greater prevalence of *latifundia* in 1960. Thus, it seems that in places with higher prevalence of 1960 *latifundia* the land reforms plots may have been of smaller size.

The results remained basically unaltered when we add to the regression –column (11) - the second degree polynomial of area of the municipality interacted with the time dummies. In magnitude, an increase of one standard deviation of (potential) hectares granted through land reform increase by 0.17 standard deviations the average size (in logs) of municipal properties (0.15*1.45/1.22). Such effects get reduced by 0.06 standard deviations if the interaction of land reform and 1960 *latifundia* augments by one standard deviation (0.79).

Columns (4), (8) and (12) of Table 4 present the regression of the coefficient of variation of plot sizes at municipal level on land reform. The three specifications point out that the dispersion of plot sizes at municipal level tends to be smaller if the (potential) land reform has been larger. Thus, although the sizes of existing plots are larger in the presence of land reform - as shown in columns (3), (7) and (11) - their dispersion seems to be lower.

Hence, land reform improves distribution by increasing the sizes of properties near the upper end of distribution rather than by decreasing the sizes of the largest ones. Based on column (8), an increase of one standard deviation of (potential) hectares granted through land reform lowers the coefficient of variation of plot sizes by 0.23 standard deviations – by no means a negligible effect. Nonetheless, the reduction of size dispersion is of smaller magnitude in municipalities with greater prevalence of 1960 *latifundia* as revealed by the result of columns (8) and (12). In fact, the effects of land reforms on plot dispersion get reduced by 0.12 standard deviations if the interaction of land reform and 1960 *latifundia* augments by one standard deviation. Hence, it seems that *Latifundia* presence hinders the improvement of land distribution as such presence is associated with the allocation of land reform plots of smaller sizes.

Structure of Plot Sizes. As mentioned above land reform has affected land distribution by reducing both the Gini coefficient of the plot areas and plots values and the coefficient of variation of plot sizes. In addition we found that that in the municipalities with greater incidence of *latifundia* in 1960 the effect of reform on land distribution indicators was smaller. Table 5 presents the effects of land reform on the amount of per capita hectares in each range of plot sizes. The reported coefficients can be interpreted as the elasticity of each range of plot size (in per capita hectares) with respect to the hectares granted through land reform and with respect to the latter variable interacted with 1960 per capita *latifundia*.

Table 5: Panel Data with municipal fixed effects.
Dependent Variable: Plots by Size Ranges (Has. per capita)

Panel A: Potential Reform

Variables	(1) Less than 3 has per capita (log)	(2) 3-10 has per capita (log)	(3) 10-20 has per capita (log)	(4) 20-200 has per capita (log)	(5) More than 200 has per capita (latifundia) (log)
Potential Land Reform-Hectares pc (Log)	0.123***	0.0841***	0.137***	0.335***	0.186***
	(0.00541)	(0.0180)	(0.00464)	(0.0123)	(0.0134)
Constant	0.212***	0.619***	0.395***	1.088***	0.653***
	(0.00693)	(0.0230)	(0.00591)	(0.0157)	(0.0171)
Interaction Latifundia*Year	No	No	No	No	No
Second degree polynomial of area*year	No	No	No	No	No
Observations	3,173	3,180	3,177	3,177	3,177
R-squared	0.396	0.283	0.287	0.303	0.196
Number of cod_mpio	814	814	814	814	814

Panel B: Interaction: Land Reform and Latifundia

Variables	(6) Less than 3 has per capita (log)	(7) 3-10 has per capita (log)	(8) 10-20 has per capita (log)	(9) 20-200 has per capita (log)	(10) More than 200 has per capita (latifundia) (log)
Potential Land Reform-Hectares pc (Log)	0.122***	0.0889***	0.124***	0.299***	0.171***
	(0.00574)	(0.0191)	(0.00492)	(0.0132)	(0.0141)
Potential Land Reform-Hectares pc * Latifundia pc (Log)	-0.0215***	0.0788***	0.0562***	0.120***	-0.0294*
	(0.00659)	(0.0218)	(0.00561)	(0.0151)	(0.0162)
Constant	0.285***	0.288***	0.334***	0.935***	0.571***
	(0.00656)	(0.0217)	(0.00559)	(0.0150)	(0.0161)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes	Yes
Second degree polynomial of area*year	No	No	No	No	No
Observations	3,173	3,180	3,177	3,177	3,177
R-squared	0.425	0.325	0.324	0.325	0.242
Number of cod_mpio	814	814	814	814	814

Panel C: Interaction between potential land reform and latifundia, and polynomial

Variables	(11) Less than 3 has per capita (log)	(12) 3-10 has per capita (log)	(13) 10-20 has per capita (log)	(14) 20-200 has per capita (log)	(15) More than 200 has per capita (latifundia) (log)
Potential Land Reform-Hectares pc (Log)	0.110***	0.144***	0.136***	0.320***	0.166***
	(0.00561)	(0.0187)	(0.00502)	(0.0135)	(0.0143)
Potential Land Reform-Hectares pc * Latifundia pc (Log)	-0.00809	0.0407*	0.0567***	0.125***	-0.00805
	(0.00631)	(0.0209)	(0.00560)	(0.0151)	(0.0161)
Constant	0.984***	-1.216***	0.441***	1.896***	3.050***
	(0.119)	(0.386)	(0.100)	(0.279)	(0.297)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes	Yes
Second degree polynomial of area*year	Yes	Yes	Yes	Yes	Yes
Observations	3,173	3,180	3,177	3,177	3,177
R-squared	0.489	0.398	0.350	0.347	0.276
Number of cod_mpio	814	814	814	814	814

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
All regression includes year fixed effect for years 1985, 1993, 2005 y 2010

Columns (1), (6) and (11) indicate that the elasticity of the (per capita) amount of land in plots of less than three hectares is around 0.1. Columns (6) and (11) it is also observe that the prevalence of 1960 *latifundia* has a negative effect on this range of plot size however non statistically significant when the second degree polynomial of the municipality area are used as control variables. In columns (2), (7) and (12) we present the same econometric exercise for the

per capita municipal areas in plots between 3 and 10 hectares. The elasticity of land reform –measured as potential of per capita hectares granted- obtained for this type of properties is around 0.14%. The effect of the interaction between potential land reform and 1960 *latifundia* on the per capita hectares in the said range of properties is positive but only marginally significant. A similar elasticity of land reform is found for the per capita terrains in plots between 10 and 20 hectares yet in this case the interaction between potential land reform and 1960 *latifundia* is positive and highly significant (see column (3), (8) and (13)).

The highest elasticity of land reform is obtained for the per capita terrains between 20 and 200 hectares which reaches 0.32 (see columns (4), (9) and (14)). By the same token, the coefficient of the interaction of land reform and 1960 *latifundia* for this type of size range is also the greatest reaching 0.12. Finally, the elasticity of per capita latifundia –plots of more than 200 hectares- to potential land reform is around 0.17. Nonetheless in the estimation that includes as controls the polynomial of the area of municipality the interaction between potential land reform and 1960 *latifundia* exhibits a coefficient non-statistically significant (see columns (5), (10) and (15)).

Summing up the results, the estimations of the effect on per capita (potential) land reform on the (per capita area) of different ranges of plot sizes indicate that it increases the areas of all types of plot sizes particularly those between 20 and 200 hectares. In addition, plots both between 10 and 20 hectares and 20 and 200 present an additional expansion as a consequence of land reform in municipalities with prevalence of 1960 *latifundia*. Thus, the reduction of the unequal land distribution as a consequence of land reform –presented in Table 4- occurs not for the contraction of the *latifundia* plots but as a result of a somehow larger expansion of the plots between 10 and 200 hectares.

6. Conclusions

The main objective of this paper was to determine the effect of land reform carried out by the granting of public land to peasants on indicators of poverty, land distribution and plot sizes. For this end we collected historical information of land grants from 1900 to 2010 and

merged it with census and cadastral data. In order to properly identify the effect of land reforms on the mentioned variables we undertook a reduced form approach using as the explanatory variable the **potential land reform** calculated as explain in section 4. **Potential land reform** can be interpreted as the intensity of the intent-to-treat that is highly correlated with the actual land reform but does not exhibit the likely biases stemming from the endogeneity and omitted variable issues of the actual land reform.

In this paper we explored the hypothesis that the effects of land reform on poverty and land distribution are affected by the persistence of previous structure of land ownership, in particular the prevalence of *latifundia*. We suggest that attempts to widen land access through land reform policy may be hindered as a result of the institutional arrangements that characterized the presence of latifundia. We empirically found that land reform from 1961 onwards has slightly reduced poverty and mildly improved land distribution. Nonetheless, municipalities with strong presence of latifundia prior to 1961 have experienced both a slower drop in poverty and a weaker improvement of land distribution.

We found that previous presence of large landownership –*latinfundia*- curtails the effect of land reform on poverty reduction and land inequality. As of land inequality we found the average sizes of existing plots are larger in the presence of land reform their dispersion seems to be lower. Hence, land reform improves distribution by increasing the sizes of properties near the upper end of distribution rather than by decreasing the sizes of the largest ones. Nonetheless, the reduction of size dispersion is of smaller magnitude in municipalities with greater prevalence of 1960 *latifundia*. Hence, it seems that *Latifundia* presence hamper the improvement of land distribution as such presence is associated with the allocation of land reform plots of larger sizes.

Our findings match the literature on the negative impact of concentration of wealth on development outcomes. Therefore, if there should be a successful land reform policy there should be also deep changes in the structure of land tenancy before the implementation of the former.

Our future agenda is to analyze and find evidence of the channels through land reform affect poverty and land distribution. The intuition suggests that some policies associated with land reform, like access to credit, registration of titles, technical assistance, among others, might

affect the positive impact on development. A greater understanding of those channels will be a significant contribution to the literature to comprehend long term development policy in Colombia.

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