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The Paradox of Land Reform, Inequality and Development in Colombia[1]

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Abstract

Over two centuries, Colombia transferred vast quantities of land, equivalent to the entire UK landmass, mainly to landless peasants. And yet Colombia retains one of the highest concentrations of land ownership in the world. Why? We show that land reform's effects are highly bimodal. Most of Colombia's 1100+ municipalities lack a landed elite. Here, rural properties grew larger, land inequality and dispersion fell, and development indicators improved. But in municipalities where such an elite does exist and landholding is highly concentrated, such positive effects are counteracted, resulting in smaller rural properties, greater dispersion, and lower levels of development. We show that all of these effects – positive and negative – flow through local policy, which elites distort to benefit themselves. Our evidence implies that land reform's second-order effects, on the distribution of local power, are more important than its first-order effects on the distribution of land.

Keywords: Land reform, inequality, development, *latifundia*, poverty, Colombia

1. Introduction

Land is a key asset and factor of production, and has been so since pre-historic times. Even in the twenty-first century, land retains primary importance as a factor of production, store of wealth, and source of status. This is especially true in rural areas of developing countries. Influential studies have argued that land inequality leads to low agricultural productivity, low growth, high rates of poverty, oppressive social relations, and social unrest and violence (Binswanger, Deininger and Feder 1995, Mason 1998). Because of this, land reform has been promoted widely and for decades as a remedy for high levels of inequality, and a tool for modernization and social development more broadly (Kaufman1975, Lipton 2009). And yet despite the large number of land reforms implemented across the world, and the many studies conducted, evidence for land reform's effects on not just development but, more surprisingly, land inequality is decidedly mixed.

This is especially notable as theory supports expansive views of land reform's potential to affect not just rural incomes and output, but much broader economic, social and political relations. Land reform thus provides not just a set of interesting questions in itself, but a useful empirical setting in which to re-examine broader debates about some key factors thought to explain comparative development. Recent years have seen a powerful resurgence in the political economy literature on development. Ideas about, for example, the role of institutions vs. factor endowments vs. education in driving development have been advanced forcefully, and have been tested in a variety of contexts. But in our view this literature, rich and provocative as it is, has reached empirical limits in terms of its ability to identify and distinguish amongst complex, multi-dimensional factors. Even if the institutional intuition is correct, "institutions" are too high a level of aggregation to produce empirical evidence that is clear and convincing, and then compare with alterative theses. And the cross-country studies on which most of this literature (e.g. Acemoglu, Johnson and Robinson, 2001 & 2002) is based are heroic in both timescale and geographic scope. This leads to broad-brush assumptions that obscure the many fundamental ways in which countries differ, for which we have no good data and hence no credible statistical controls. And they produce empirical findings that are similarly heroic, lacking in nuance, unable to distinguish between different aspects of the 'institutions' they study.

What is needed, instead, is an empirical approach that: (1) unpacks "institutions" into analytically distinct components that can be measured quantitatively, and (2) empirically tests the effects of these components on development with high-quality, detailed data, (3) in an empirical setting that is adequately identified. Once good way to achieve this is via 'one-country, large-N analysis' (Faguet 2012; Kroth et al. 2016), using panel data from hundreds of observations across decades. When these units are subnational, the researcher can control for historical, macro-institutional, geographic, cultural, and other factors that are treated as exogenous in cross-country studies, and bedevil identification. The empirical quality and specificity of such an approach facilitates analysis that is rigorous and detailed, marked at its best by nuance and depth of understanding.

This paper analyses one remarkable case of significant, sustained land reform: Colombia. Since independence in 1821, Colombia has implemented a nationwide land reform program based not on breaking up large farms, but rather transferring vacant and colonized state land to rural producers, including settlers and landless and poor peasants (Albertus 2015). Since 1901, Colombia granted 23 million hectares of land, equivalent to the total landmass of the United Kingdom, twice Greece, or six times Switzerland. And yet Colombia retains one of the highest levels of land inequality in the world, alongside striking disparities in regional and municipal development indicators. How can we explain this paradox? Focusing on the period 1961-2010[5], we investigate land reform in Colombia both to answer these questions for their own sake, and as a tool to begin to prise open the black box of institutions and institutional change.

A first dimension of institutions examined here is the important issue of land rights and their distribution. Using an original panel database comprising 1100+ municipalities over 50 years, we distinguish between pre-existing distributions vs. land reform-induced allocations, and investigate the effects of the latter on plot sizes, land inequality, and indicators of development. We then explore the channels through which such effects might occur, disaggregating our development indicator into its individual components,

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[5] Data availability constrains us to this period. Most of Colombia's land reform followed Law 135 of 1961.

and focusing on public sector policies and investments. To our knowledge, this is the first quantitative study of land reform's effects on local inequality and development in Colombia.

Our analysis is predicated on the notion that land reform is not a simple policy instrument the main effects of which are first-order and mainly uni-dimensional (linear). The main effects of building more roads or hiring more teachers, for example, are principally to increase the efficiency and/or reach of transportation or education services. Knock-on effects on the nation's politics and society may well obtain, but will be comparatively less important. Land reform, by contrast, is a complex instrument that sets in motion important changes across many dimensions of a country's economics, politics and society. It can be expected to have significant effects on not just agricultural productivity and output, but also on factors further afield such as the distribution of status and power in society, the types and quantities of public services provided locally, political party competition, and amongst others.

These effects, furthermore, will not impact municipalities symmetrically, but will rather vary across them as much as municipalities are themselves different from one another. This is because in each relevant dimension under study, the effects of land reform depend on a municipality's characteristics. Distributing land in a sparsely populated, flat, lowland region on the frontier that lacks large landowners is not the same as doing so in the mountainous central highlands where landed elites are well established. Vastly different initial conditions will lead to different outcomes, and different long-term development implications. Colombia's descriptive statistics bear this out, as we shall see below.

The main heterogeneity we focus on is the extent of concentrated landholdings in a municipality. We capture this through our measure of *latifundia* – large farms of 500 hectares or more – as a proportion of a municipality's total rural cadastre, normalized in per capita terms. We expect land reform to have different effects in municipalities with high land concentration vs. those where land is more evenly distributed. In practice, this proves strikingly true, and explains mixed results from 200 years of land reform in Colombia.

Table 1 provides simple descriptive statistics for Unsatisfied Basic Needs (UBN), the Gini coefficient of land ownership, the amount of land allocated by hectares, and potential land reform – a

normalized proxy for allocable land that we explain in detail below – broken down into terciles by the degree of land concentration as measured by *latifundia*. The first tercile contains municipalities with the lowest levels of land concentration, and the third tercile contains the highest. We see that both UBN and the land Gini rise as we move up terciles, even as the amounts of land allocated or available for allocation rise significantly. The implication is that more land reform leads to lower municipal development – a surprising result – in a context of simultaneously increasing land concentration.

Table 1: Unsatisfied Basic Needs, Gini, and Land Reform Summarized by *Latifundia* Terciles

Variable	Obs	Mean	Std. Dev.	Min	Max
1st Tercile Latifundia					
UBN	282	38.285	16.989	7.122	100.000
Gini 2010	249	0.543	0.129	0.243	0.879
Allocated land ha pc	282	1.592	6.665	0.000	71.441
Potential land reform ha pc	282	1.772	4.201	0.015	60.831
2nd Tercile Latifundia					
UBN	247	40.180	17.655	9.429	87.169
Gini 2010	227	0.632	0.100	0.339	0.876
Allocated land ha pc	247	3.915	12.747	0.000	145.668
Potential land reform ha pc	247	2.220	3.675	0.097	53.814
3rd Tercile Latifundia					
UBN	263	46.756	18.601	8.689	100.000
Gini 2010	248	0.638	0.108	0.169	0.875
Allocated land ha pc	263	10.704	29.799	0.000	273.484
Potential land reform ha pc	263	5.548	15.132	0.085	215.998

Source: Authors' calculations.

Put another way, descriptive evidence suggests that Colombia contains *both* of the Iversen-Soskice types within its borders: highly unequal polities that redistribute little, and far more egalitarian polities that redistribute a great deal (Iversen and Soskice 2009). In such a context, can land reform have the expected positive effects on poverty and inequality in egalitarian municipalities, and at the same time negative effects where pre-existing land concentration is high? These are important, complex questions that cannot be answered with descriptive statistics, but require instead more rigorous econometrics. We return to them below. But table 1 does suggest something interesting to investigate. More generally, heterogeneity along these lines may also explain contradictory evidence for land reform's effects across other countries.

2. Land Reform, Institutions and Development

Our subject sits at the intersection of three large, interrelated literatures: land reform, inequality, and

institutions, and the effects of each of these on development. These are big, rich literatures that we cannot pretend to summarize comprehensively here. In particular, we omit the many studies of land reform's effects on agricultural investment, productivity, and yields as not directly germane to this paper. The following focuses on land reform's effects on inequality and institutions, including a short section of Colombia studies.

Following Besley, Burchardi and Ghatak (2012), we argue that land reform's first-order effects concern agricultural output, productivity, profits, and tax revenues. These may tend to be positive, but will depend for their magnitude and even sign on a number of contextual and complementary policy variables. But land reform has a number of second-order effects too, and these are potentially more important. They operate via the changes land reform generates in underlying political and institutional relations, which in turn can more powerfully affect opportunity, the distribution of income, and economic growth than building more school or roads. In the short run, first-order effects are likely to dominate the balance of any particular land reform. But in the long run, such as the half-century we analyze for Colombia, second-order effects should be far more powerful and should easily dominate. The remainder of this paper, therefore, focuses on this indirect but more potent channel.

2.1 Inequality

Land reform's second-order effects operate through the consequences of different distributions of land for political power and control of public institutions. The key concept is inequality, and a large literature has grown up analysing its origins and multifaceted effects. Its impacts, this literature argues, go far beyond conflicts over land or other asset classes, to economic growth and development more broadly. Galor et al. (2003, 2009) show why, beginning from first principles.

Capital and skills are complementary in a way that land and skills are not. Rising human capital increases output, productivity and profits in firms, as workers' efforts are multiplied by greater capital intensity and more advanced technologies. This is good not only for workers, who are more productive and whose wages accordingly rise, but also for firm owners and managers, as profits increase. The same relationship does not hold for large landowners, however. The nature of the agricultural economy is that

increasing human capital raises the wages of agricultural workers faster than their productivity, and is thus a profit-decreasing strategy for large landowners. Small landowners may support human capital investments that increase their off-farm income opportunities, as Gerbash and Siemers show (2010). But large landowners will tend to oppose them. This is especially true in *latifundista*-dominated polities, where the benefits of investments in public education and healthcare would be enjoyed by many but the costs borne by few. In such places the few will oppose such investments, and will have the power to impose their will.

Based on this logic, Galor et al. (2003) predict that public expenditure on education will fall as land inequality rises, and find empirical support in cross-state data from the early-20th century US. They also analyse the dramatic case of Korea, where major land reform was followed by a massive increase in public expenditure on education. Between 1949 and 1950 family farms increased more than five-fold, from 349,000 to 1.8 million, while tenant farm households fell from 1.1 million to virtually nothing. During the years that followed, government education expenditure soared from 8% to 15% of the total public budget. Because of the complementarities between capital and human capital, capitalists were the prime beneficiaries of rising human capital amongst the masses. In contrast to Marx, the authors conclude that workers and capitalists are natural economic allies, and landlords the principle opponents of human capital investments, economic development, and social mobility in society. A country's industrial elite would rather relinquish power to the masses before permitting a landed elite to block development by blocking human capital investment.

Nugent and Robinson (2010) use the cases of Colombia, Costa Rica, El Salvador and Guatemala to, in effect, test these ideas. All four countries displayed very similar initial conditions at independence: levels of development, colonial history, language, religion, climate, topography, factor endowments, technologies, and dominant export crops. But as they entered an export-led phase of rapid economic growth in the second half of the 19th-century, based largely on coffee (another shared feature), they adopted very different landholding structures. In Colombia and Costa Rica, coffee production was dominated by smallholder farms. In Guatemala and El Salvador, large coffee plantations became the rule. This difference was mostly driven by different laws. Colombia and Costa Rica both passed laws similar to the US 1862 Homestead act,

protecting smallholders and allowing them to gain title to land. In Guatemala and El Salvador, by contrast, powerful elites passed legislation at the onset of the coffee boom that facilitated mass land grabs. Elites wrested lands from freeholders and indigenous populations, and converted them into large coffee plantations that used extreme labor repression. Coffee production requires significant investments, the authors point out, for which secure private property is essential. Both sets of countries achieved this, but in completely different ways.

Different legal reforms were promulgated by very different kinds of elites. From the mid-19th century onwards, dominant elites in Colombia and Costa Rica were mainly commercial in origin, with interests in manufacturing, trade, banking, and the urban economy more generally. In El Salvador and Guatemala, by contrast, dominant elites were large landowners heavily invested in the agricultural economy and rural society. These different interests generated different priorities that affected much more than property rights. For example, Colombia introduced universal male suffrage in the 1850s; approximately 46% of adult males voted in the 1856 election, a figure high by any international standard of the time. The ultimate result a century later is per capita GDP in Colombia and Costa Rica roughly twice that of Guatemala and El Salvador, levels of human development that are much higher, and institutions and practices of democracy that are far more robust.

The micro-dynamics of land inequality blocking democratization are explored in much greater detail by Ziblatt (2008), who investigates the failed 1912 attempt to reform Prussia's notoriously unequal 3-tier voting system. This system divided the electorate by tax contribution, grossly over-representing the richest fifteen percent of the population compared to the bottom 85 percent, in a way designed to ensure Conservative majorities. Legislation to adopt the one-man-one-vote standard used elsewhere in Germany was debated but defeated in Prussia's legislature, largely by representatives from constituencies with high land inequality, who were more likely to vote against – even controlling for income inequality. Ziblatt's results echo Tocqueville's (1835) analysis of the importance of small landholders to American democracy, and similar arguments cast in terms of the middle class and income equality by Moore (1966) and Boix

(2003). Gerschenkron (1946) argues, further, that the unequal distribution of immobile assets, such as land, is a major impediment to democracy. This effect is analytically distinct from, and more powerful than, inequality of wealth.

The logic behind this is a combination of the Meltzer-Richard (1981) model and the "special asset" idea. The former holds that democratization is an indirect fight over redistribution. By involving a larger share of the population in the exercise of power, democratization increases the chances that a rich elite will be expropriated. Hence the rich oppose reform. Their control over the special asset, land, permits them to get their way. This is because land is both fixed and highly visible. Unlike income inequality, land inequality underpins a particularly pernicious form of social power (Ziblatt 2008) that invests landowners with status and power in rural communities, giving them undue influence over public decision-making, and over the lives and – in extreme cases – the ideas and preferences of peasants. Mobilizing peasants to support democratization in such circumstances can appear to the peasants themselves as a threat to their interests. Hence the unequal distribution of land dampens public investment in education and other forms of human capital, undermines economic growth and development, sustains oligarchic rule, and represses democratization.

2.2 Institutions

New institutionalist theories of development, such as the seminal works of Engerman and Sokoloff (1997, 2002), Sokoloff and Engerman (2000), and Acemoglu, Johnson and Robinson (2001, 2002), are well known and so summarized briefly here before moving on to more recent contributions. Engerman and Sokoloff (henceforth ES) argue that the roots of comparative development of countries in the Americas lie in their factor endowments. Areas with soils and climates suitable for high-value crops, such as sugar, developed highly unequal political and legal systems that supported plantation agriculture based on slave labor, for several centuries the most efficient means of sugar production. These societies displayed severe levels of inequality in income and wealth, and systematic political exclusion of the masses. A similar story holds for mining areas, also based on slavery and forced labor. A third category of areas was sparsely

populated, lacked minerals, and were not suitable for plantation agriculture. These were settled by Europeans, who engaged in smallholder, family-based farming. They developed far more participative political institutions and legal systems based on equality, and far more equal distributions of income and wealth. The path dependency of institutions means that patterns set early in the colonial experience explain economic and social outcomes to this day.

Acemoglu, Johnson and Robinson (henceforth AJR) construct a similar argument, but from a different starting point. Because colonial lands had very different disease burdens, European considering emigration faced significantly different death rates. They settled in large numbers, with their families, in areas where chances of survival were high. These colonies developed politico-legal institutions based on equality and participation, as above, and relatively equal distributions of wealth. Where the chances of death were high, by contrast, few Europeans settled, constituting a tiny elite that exploited mineral wealth and plantation agriculture via slavery and forced labor. The institutions that developed in these colonies were exclusive, exploitative, and highly unequal. Once again, institutional path dependency explains economic and social outcomes today. Interestingly, this evolution involves a reversal of fortune in which the richest economies around 1750, based on sugar and mineral exploitation, are the poorest today, while poor economies founded on less-productive smallholder farms are today the richest.

These papers reinvigorated a historical-institutionalist debate that has proved extraordinarily fruitful. Looking to explain Europe's rise over the Islamic world and China during the early modern period, Stasavage (2014) examines the role of a distinctively European phenomenon: autonomous city-states. Autonomous city-states were controlled by merchant guilds, who provided greater political stability, more secure property rights, more training, and who more easily solved collective action problems, compared to princely rule. This, in turn, better supported long-term economic growth. Over time, however, strong property rights and high barriers to entry strangled innovation, and city-state economies stagnated. Examining a similar period, AJR (2005) explain Europe's sustained growth from 1500 onwards via the Atlantic Ocean trade, which promoted the emergence of political institutions that provided secure property

rights to a broader segment of society, and allowed free entry into profitable businesses. Such changes occurred in European countries with access to Atlantic trade, especially the Netherlands and Britain, but not elsewhere in Europe – including other trading states without access to the Atlantic. Their evidence shows that profits from the Atlantic trade were insufficient to drive sustained growth in the countries that benefited, but were big enough to change the distribution of power in society. We echo this argument in our analysis of land and development in Colombia below.

Naritomi et al. (2012) also show institutional path dependency, with detailed subnational data from Brazil. In colonial sugar plantations, polarization between landlord and slaves defined social, economic and political structures; in gold mining settlements, the state established rentier institutions detached from the local population and unresponsive to local demands, focused on taxing extraction. These patterns determine current development outcomes: municipalities with origins in the sugar boom have more land inequality today, while those with origins in the gold boom have worse governance practices and less access to justice. Both suffer lower provision of public goods. Bruhn and Gallego (2012) also explore colonial activities with subnational data, in their case from across the Latin American region. They divide the colonial economy into "Good" activities, characterized by low economies of scale and low population density prior to colonization; "Bad" activities, with high economies of scale and the heavy exploitation of labor, e.g. mining and sugar production; and "Ugly" activities, where large native populations were exploited in large operations that lacked economies of scale, relying on forced labor. Centuries later, areas with bad colonial activities have lower economic development, and areas with ugly activities lower GDP/capita, than areas with good or no activities.

These are just a few of the many studies probing the long-term institutional determinants of both countries' and subnational regions' comparative development. They give a flavour of the recent outpouring of research in support of the idea that (a) institutional characteristics were set at a particular point in time – by factor endowments, the disease environment, or colonial powers – after which (b) these institutions determine levels and type of development. But the literature is not unanimous in its agreement. A number of

influential studies have begun to pick apart the institutional thesis, and some reject it outright. Coatsworth (2008) points out that ES' reliance on natural resource endowments to explain differences in wealth between Latin America and North America has not held up well to scrutiny. This is true both at the macro level: inequalities in resource endowments and wealth vary as much within as between the two regions, and at the micro level: grain estates in central Mexico historically produced similar mixes of crops and animals as farms in, for example, Pennsylvania.

And the ways in which AJR and ES characterize inequality of wealth, rights, and political power in Latin America, Coatsworth points out, is simply wrong. Spanish and Portuguese colonial societies were less unequal, and settler elites far less powerful, than AJR and ES claim. Creole settler elites did not control indigenous peasants' access to land, for example. Surrounded and outnumbered by indigenous people and/or slaves, comparatively small elites had little choice but to trade loyalty to the Crown for protection. In the vast expanses of Spanish and Portuguese America, the authority of weak and distant monarchs depended as much on keeping settler elites insecure in their rights and properties as on suppressing discontent from below. The institutions of early colonial society were more determined by this double imperative than by factors or diseases. To take one important example, the New World's legal system acted as a brake on growth not because it led to inequality, but because the law failed to define and extend property rights in a clear and coherent way, because the judicial process was very costly, slow, and thoroughly corrupt, and because it constrained the mobility of labor and capital by imposing a caste system (Coatsworth and Tortella 2002).

Economic growth, when it began late in the 19th century, required not inclusive institutions, but rather the exclusion of majorities from political power. This consolidated the dominance of desperately precarious elites, so promoting investment by those elites and by foreigners. As immigration kept wages low, growth greatly increased the returns to physical and human capital. And so the end of the 19th century – when Latin America was finally growing, investing, and developing vigorously – committed the sins that both AJR and ES attribute to the colonial era: increasing inequality; government dominated by narrow elites; the exclusion of competing interests from power; poor property rights; and poor human rights protections.

Far from impeding growth, Coatsworth (2008) argues, these institutional features accompanied and abetted growth and development.

Exploring how Latin American income per capita fell so far behind the US, Przeworski and Curvale (2008) also reject the inequality/inclusivity theses. In 1700, and perhaps as late as 1800, Latin American income levels were similar to the US. By 2000 US income levels were five times greater. What happened? Focusing on the periods when Latin America first fell behind, and then resumed growth at levels similar to the US, Przeworski and Curvale identify as the key causal mechanism not inclusive or egalitarian institutions, but rather institutions that establish clear rule of the game that resolve conflict. Economies grow when political power protects economic power – hence the importance of property rights – if conflict is efficiently dealt with. Political inequality can thus be consistent with healthy growth in the short term. But it is inefficient in the long term when exclusion leads to political crisis, undermining the rules of the game and hence growth. Interestingly, they also point out that land inequality does not lead to economic inequality, or at least not in the same degree, where land is abundant and therefore cheap, as it was in the new world. But inequality persists even when the assets that gave rise to it change, implying that an initially benign inequality can, with time, become pernicious.

2.3 Colombia

A rich literature on land, inequality, institutions and development in Colombia has also emerged in recent years, mirroring key aspects of the debates outlined above. Its findings are similarly mixed. Evidence on the economic effects of Colombian land reform is scarce. Assessing the land reform act of 1961, Balcázar et al. (2001) find that agricultural productivity increased but household income of beneficiary families fell – a troubling result that the authors cannot explain. Heshusius (2005), by contrast, finds positive income effects from improved access to credit and work training in households associated with reform. We know of no studies assessing the effects of reform on land concentration in Colombia.

Acemoglu et al. (2008) find a positive relationship between land inequality in the 19th century and current levels of economic development across municipalities in the Colombian department of

Cundinamarca. Their result contradicts the negative relationship ES (and arguably AJR) imply. Likewise, Galán (2011) shows that municipalities in Cundinamarca with more unequal landholdings in the 19th and 20th centuries have higher education levels, lower poverty, and more public goods provision today. These findings are echoed by Dell (2008), studying modern development outcomes amongst districts in Peru and Bolivia that did vs. did not suffer the *mita* forced labor system under colonial rule. *Mita* districts have lower household consumption, lower levels of education, and less-developed road systems than those that did not.

All three studies suggest that politics played an important intermediating role. The colonial government restricted the formation of Spanish *latifundias* in *mita* districts. Because *latifundistas* typically lobbied for more provision of public goods, *mita* districts lacked prominent advocates, and so were exploited in the short term and languished in the long term. And in Cundinamarca, the large majority of national and local politicians were large landowners. Hence municipalities with more large landowners had more powerful voices to demand, and more interested politicians to provide, public investments that stimulated long-term development there. The role of such advocates is especially important because the Colombian government routinely provided very few public goods before the 1930s. The state maintained a very uneven presence throughout Colombia's territory, with order at the center and a more arbitrary, primitive sort of power punctuated by chaos and violence across much of the periphery (O'Donnell 1993, Gutiérrez 2014).[6]

To a greater degree than in Europe or North America, localities abandoned by the state in Colombia and many other developing countries defined a stark "internal frontier" (Fajardo 2002, Machado 2013), creating wide disparities in long-term development across space (Boone 2012, LeGrand 1986). Might land reform be part of a solution? Viewed from the perspective of its second-order effects, can land reform catalyze a shift from a patrimonial to a liberal local order (Kohli 2004), or from closed to open-access institutions and organizations (North, Wallis and Weingast 2009), by empowering peasants who lack land,

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[6] Boone (2012) argues that the uneven reach of the state in Latin America and Africa is often intentional, serving specific political purposes, rather than being evidence of state failure.

and hence voice and rights? By endowing the poor with this "special asset", could land reform alter the distribution of local political power so as to help peasants claim not only higher incomes, but greater voice and more rights?

3. Land Tenure and Land Reform in Colombia

Land is distributed highly unequally in Colombia, with a concentration of ownership amongst the highest in the world. For two centuries, land inequality has been closely linked to rural poverty and the economic exclusion of the rural population (Acemoglu et al. 2008, Gutiérrez 2014). This largely explains Colombia's long-standing program of land reform. But high concentrations of landholding and large estates – *latifundia* – have nonetheless endured to the present.

The distribution of land in Colombia is deeply rooted in its colonial experience and the 19th century expansion of the agrarian frontier. During the colonial period, large properties emerged from the system of *encomiendas* established by the Spanish Crown. *Encomiendas* were royal grants that allowed the (Spanish) holder, the *encomendero,* to extract tribute and labour from indigenous people living in a particular area, in exchange for protecting and Christianizing them. Technically the *encomienda* did not assign ownership, but rather an inheritable right to use a piece of land. In practice, however, *encomiendas* were treated as private property, and were eventually transformed into *latifundia* – great estates – when landlords formalized their titles. At the same time, other Spanish and *criollo* farmers received smaller plots from the crown, creating an unequal, two-tiered initial distribution of land. Over time, the latter category grew steadily as Spanish-indigenous *mestizos* grew from a negligible share of the population to become the majority. Initially outsiders, their clamour for inclusion in the country's legal and economic life was assuaged through the sale of public land by the crown. As colonial *encomiendas* gave birth to *latifundia,* colonial indigenous reservations, *resguardos*, gave rise to small estates, *minifundios*, in particular regions, when communal lands were privatized to surviving indigenous populations[7] (Ankersen and Rupert 2006, Colmenares 1997). As the

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[7] The relationship between proportion of *latifundia* in a particular municipality in 1961 and the structure of

indigenous population declined, many mestizos invaded *resguardos* and seized their land.

Colombia was born bankrupt. The government redeemed debts accumulated during the war of independence by transferring public lands to private bondholders, and so a sort of land reform began at independence in 1821. More broadly, the defining characteristic of Colombian land reform is the transfer of publicly held land to landless or poor agricultural workers able to demonstrate that they have been squatting on vacant public lands (*baldíos*) for some years. Unlike other cases, such as Mexico or Bolivia, less than one-half of one percent of total land distributed was confiscated or purchased from large landlords. Hence the large estates at the top of the land distribution remained mostly unchallenged through two centuries of land reform. But at the same time, vast quantities of land were distributed to peasants.

The total area of Colombia is 110 million ha. About 32 million ha are designated indigenous reservations, and 60 million hectares are registered as privately held property. Between 1901 and 2012, the state granted nearly 23 million ha of land to peasants and agricultural businesses in over 565,000 plots. This is equivalent to 20% of Colombia's total area, and one-third of all privately held land. To put this in perspective, over the past century Colombia has distributed an amount of land equal to the total area of the United Kingdom, Romania, or Ghana, about twice the area of Greece or South Korea, six times the size of Switzerland, and seven times the size of the Netherlands. As for any country, land reform in Colombia has idiosyncratic characteristics. But there is no denying that reform has happened, and on a huge scale.

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the colonial institutions can be established through the following equation:

$Latidundio/Mun\_Area_{1961} = 3.31 + 0.012 * \log(Indigenous)_{1560} - 0.2 * Encomienda - Influence + Geographical - Controls$. N=634, R2=0.16.

All variables are significant at the 1% level. The equation suggests that the formation *of latifundia* was affected by two forces: a positive one driven by the availability of labor, and a negative one driven by the larger availability of land away from 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*.

During the 19th century, land reform legislation focused on raising funds to pay off public debts and fomenting a land market. Towards the end of the century, more emphasis was placed on promoting agrarian development and enhancing the efficient use of land. During the 20th century, the focus shifted again towards resolving rural conflicts over land ownership and use. Law 200 of 1936 defined for the first time the social function of property, and weakened individual rights over land in order to strengthen squatters' rights. Subsequent land distributions increased modestly from the very low levels of the previous decades.

But it was not until seminal Law 135 of 1961 that land reform in Colombia went into high gear. Seeking to pacify and develop rural areas, improve domestic food supplies, and respond to foreign pressures such as the Alliance for Progress, distributions increased from about 90,000 to 600,000 ha per year; the number of beneficiaries more than sextupled. Land allocation slowed after 1973, and then increased again in the1990s as a result of institutional changes associated with the 1991 Constitution. Shifting gears again, Law 160 of 1994 promoted a market-oriented approach to land reform that sought to lower the cost of land for poor peasants, and provided publicly-subsidized loans.

Figure 1 provides time series data on yearly distributions in area and number of plots. Figure 2 shows the distribution of land grants in hectares between 1961-2012 by size. Interestingly, the largest two categories are the modest 20-200 ha range, and the larger >500 ha range. It is important to note that even a 200 ha farm, while not small, is not large by Colombian or Latin American standards; we define *latifundia*, or large landholdings, as properties of 500 ha or more. Also, none of the laws discussed above provided full property titles *per se*, but rather Administrative Resolutions of land allocation to a private party. Obtaining full title thereafter was a straightforward process, but entailed nontrivial costs that many beneficiaries preferred not to incur.

After over 100 years of land reform *a la colombiana*, two facts stand out: (1) the magnitude of reform has been significant, both in terms of the quantity of land distributed and the number of people benefiting; and (2) land inequality, and high levels of land concentration, have not decreased. As Helo and Ibañez (2011) point out, 42% of private land is concentrated in large properties of more than 200 ha, and the

Gini coefficient for land reached 0.863 in 2009. *Latifundia* remain a significant feature of the Colombian countryside, and have recently increased in size (Mora and Muñoz, 2008). One century and 23 million ha later, the broad structure of landholding inherited from the Spanish – a small number of large landowners and a large number of small landowners – remains.

Figure 1: Land Distributions in Area (Ha) and Plots, 1901-2012
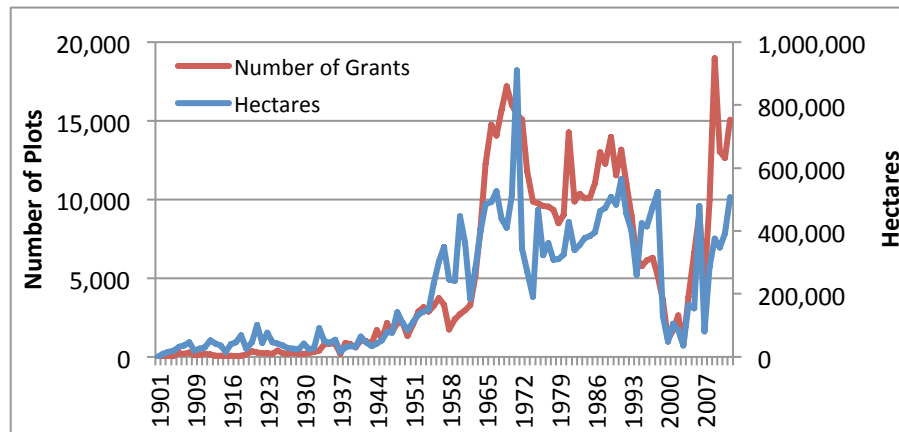
Source: Information System of Rural Development, SIDER-INCODER; Authors' calculations

Figure 2: Land Allocation (Ha) by Plot Size, 1961-2012
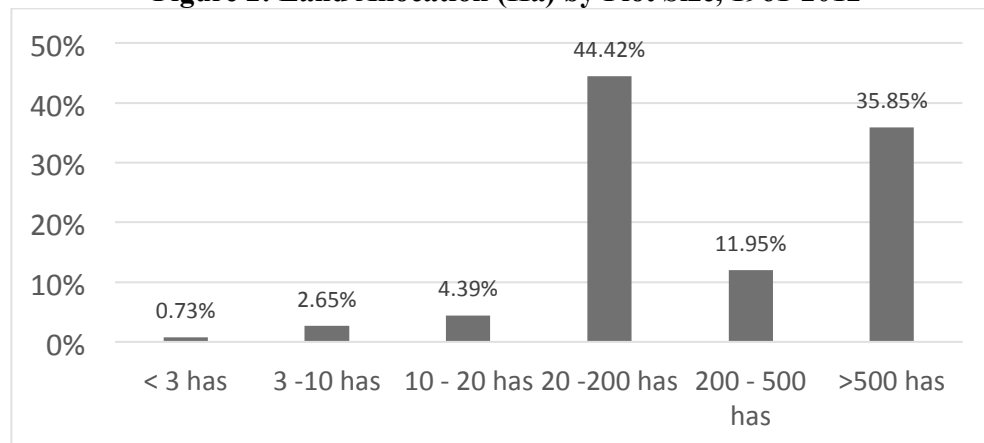
Source: Rural Development Information System SIDER-INCODERS.

4. Data and Methodology

We examine the effects of land reform on municipal-level development and land inequality, focusing on its differential effects in the presence vs. absence of *latifundia*. We then explore possible mechanisms by which the concentration of landownership might cause land reform's effects to vary. We focus on the period 1961-2010 for two reasons: (1) although we have very detailed data on land reform going back to 1901, data on our dependent variables is only available at municipal level from 1973 onwards; also (2) the pace of land

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reform increased significantly with Law 135 of 1961, as mentioned above, and so the latter half-century is where one would expect to find the most important effects.

4.1 Data

Our database combine historical data from several sources. Land reform data comes from the Colombian Institute of Rural Development (INCODER[8]), which provided individual-level data on plots and areas allocated in each municipality between 1961-2010. Data on UBN comes from the National Statistics Department, and varies between 0, when all basic needs are satisfied, and 100, when they are unsatisfied. Our land Gini coefficients of plot sizes and values are constructed for each municipality using rural cadastral data from the Augustín Codazzi Geographic Institute (IGAC) for 1985, 1993, 2005 and 2010. Average plot size and the coefficient of variation of plot sizes are constructed from the same data, as are distributional data on plots by various ranges of size. Lastly, variables for the extent of *latifundia* and its share of the total rural cadastre are calculated from IGAC data from 1960. *Latifundia* are defined as properties of 500 ha or more. All per capita values are calculated using lagged population data from the national census.[9]

Appendix 1 presents summary statistics of the variables used in our estimations. Land reform has taken place in almost all Colombian municipalities, and the average size of rural properties is 47 ha. Average land inequality is high, at 0.69, and in some municipalities reaches extremely high values of 0.98 for both plot size and value. Medium size properties account for about 40% of rural land, *latifundia* for 37%, and small properties for 33%. The average municipality in 1960 had 13,445 ha of *latifundia,* representing 14% of rural property. But dispersion is very high, with *latifundia* in 1960 ranging from 0 ha to as much as 1.45 million ha and 98.8% of all land in a municipality.

4.2 Methodology

To determine the effects of land reform on development and inequality, we would like to estimate

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[8] Acronyms of Colombian institutions are given in the Spanish original.

[9] Population growth might credibly be driven by the reality, or prospect, of land allocations in a municipality.

$$y_{it} = \delta_i + d_t + \gamma_1 \text{PLRpc}_{it} + \gamma_2 \text{PLRpc}_{it} * \text{L1960}_i + \gamma_3 \text{L1960}_i * d_t + \gamma_4 \textbf{\textit{Area}}_i * d_t + \varepsilon_{it} , \quad (1)$$

where dependent variable y represents development and inequality outcomes of interest. We use Unsatisfied

Basic Needs (UBN) as our key measure of development; as measures of land inequality we use the land Gini

coefficient of plot sizes and values, the average size of rural properties, and the coefficient of variation of

plot sizes. Variables δ and d are municipal and year fixed effects, respectively. L1960_i is per capita

latifundia (larger than 500 hectares) in 1960, previous to the land reform of 1961, capturing the relative size

of large landholdings in municipality i. This variable captures the prevalence of *latifundia,* and the relative

power of the landed elite in a municipality prior to land reform. The Area term is a scalar or vector of first

and second-degree polynomials of municipal area interacted with time fixed effect d, which permits a

reduced-form control for the direct effect of land availability on local development and land distribution.

And ε_{it} is the error term. All variables are subscripted by municipality i and year t.

Our key policy variable is land reform. But we cannot introduce simple indicators of land reform

(plots, ha, or per capita) as regressors in this equation because of the endogeneity bias that would result. As

land reform policies have aimed to reduce poverty, improve land inequality, and increase rural development,

it is likely that land reform actions at the local level have been largely driven by poverty and inequality.

Naïve OLS estimates would thus produce biased estimators. To correct for this, we construct an exogenous

measure of land reform called Potential Land Reform per capita, PLRpc. This variable distributes the total

land area allocated each year in Colombia in proportion to each municipality's area, correcting the latter for

previous years' distributions. To construct PLR, we first calculate Potential Land Allocable:

$$Potential\ Land\ Allocable_{it} = \frac{corrected\ area_i}{\sum_i corrected\ area\ of\ municipalities_{it}} * total\ hectares\ allocated_t$$

Corrected area captures the total area of the municipality corrected by previous land allocations. The

correction involves two steps: (i) for each municipality, an area is discounted equal to its proportional share

of national allocations (not real allocations there); and (ii) areas are corrected only in municipalities where

actual allocations took place between years t-1 and t. Our concept of land allocable for land reform is thus

based on national, and not local, trends. Corrected municipal area is defined as follows:

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

Potential Land Reform per capita is thus defined as municipality i's total allocable land summed between 1961 and year t, expressed in lagged per capita terms:

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

It can be interpreted as the intensity of the intent-to-treat, given national land reform trends and the quantity of land available in a particular municipality. Figure 3 shows correlations between actual and potential accumulated hectares of land reform for 1973 and 2010. We see that Potential Land Reform is a good, but not perfect, predictor of real land reform – a desirable characteristic for an exogenous proxy.

Figure 3: Potential and Actual Land Reform Allocations
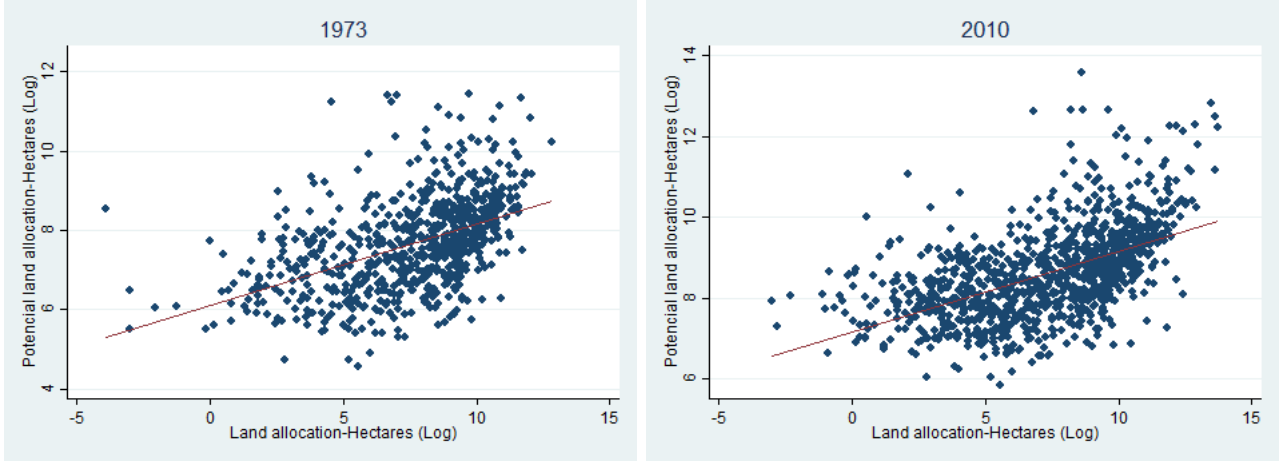
Source: Authors' calculations.

We expect the coefficients on PLRpc to be negative for estimates of poverty or land inequality, implying that land reform benefits poorer populations and improves the distribution of land – i.e. the first-order effects of land reform obtain. Land reform's second-order effects, operating through changes in political power and public institutions, should over time increase these trends. We test these ideas in a second set of estimations, explained below. We expect the coefficient on *latifundia* to be positive for both poverty and land inequality, in accordance with the literature reviewed above. This implies that where land is highly concentrated, elites are able to either capture land reform for their own benefit, or capture local

institutions in ways that benefit them at the expense of the poor. In such places, the positive effects of land reform will be undermined. Following the same logic, we expect the coefficient on the interaction of PLRpc and *latifundia* to be positive for both as well.

Our specification is parsimonious, with few controls. We omit other commonly-used controls, such as indicators of education, health, and tax revenues, or political and violence variables, due to probable endogeneity and/or multicollinearity. We estimate for 1100 municipalities over the period 1961-2010.

In order to investigate the deeper mechanisms by which any effects identified in equation (1) occur, we further estimate a variation of (1) substituting dependent variable p_{it} for y_{it}, where p_{it} denotes individual components of UBN, such as the proportion of people with inadequate housing or public utilities. We interpret these as indicators of poverty that are particularly susceptible to public policy. We also estimate

$$e_i = \zeta_i + \gamma_1 \text{PLRpc}_i + \gamma_2 \text{PLRpc}_i * \text{L1960}_i + \gamma_3 \text{L1960}_i * d_t + \gamma_4 \boldsymbol{Area}_i * d_t + \boldsymbol{Z_i} + \varepsilon_i , \qquad (2)$$

where *e* is different measures of local agricultural expenditure in municipality i, ζ are department and regional fixed effects, **Z** is a vector of standard geographic controls, and remaining variables are defined as above. Due to a lack of time-series data for local expenditure, we estimate this equation as a cross-sectional regression. The logic of both sets of regressions is to investigate how land reform and *latifundia* interact to affect the sorts of local policies that might accelerate local development and reduce poverty. In other words, how are rural elites are benefiting from land reform in areas where they predominate? Are local public policies systematically different in such municipalities, compared to those where land is not concentrated?

5. Results: Land Reform, *Latifundia,* Inequality and Development

Inequality

How did land reform affect inequality? Models 1 and 2 in Table 2 show that land reform decreases the Gini coefficient of plot sizes and plot values; both coefficients are significant at the one percent level. The land reform-*latifundia* interaction term is insignificant in both equations. Model 3 shows that land reform increases the average size of rural properties, a result significant at the one percent level. But the land reform-*latifundia* interaction term is negative and statistically significant also at the one percent level,

implying a countervailing effect. Model 4 shows that land reform decreases the coefficient of variation of plot sizes – a measure of the dispersion of overall landholdings. The land reform-*latifundia* interaction term is again statistically insignificant. Additional control variables for area, a simple *latifundia* term, and municipal fixed effects are included, all of which behave as expected.

Table 2: Effects of Land Reform and *Latifundia* on Land Inequality

VARIABLES	(1) Gini Coefficient of Plot Sizes	(2) Coefficient of Plot Values	(3) Average Size of Rural Properties (Log)	(4) Coefficient of Variation of Plot Sizes
Potential Land Reform-Hectares pc (Log)	-0.0200***	-0.0182***	0.186***	-0.211***
	(-0.00674)	(-0.00619)	(-0.021)	(-0.0478)
Potential Land Reform-Hectares pc*Latifundia pc (Log)	0.00335	0.00694	-0.0555***	0.0451
	(-0.00551)	(-0.00506)	(-0.017)	(-0.0385)
Constant	-2,027	-2,577	16.54***	16.52
	(-4056)	(-3723)	(-6046)	(-13.75)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes
Second degree polynomial of area of municipalities	Yes	Yes	Yes	Yes
Average Proportion allocated	Yes	Yes	Yes	Yes
Observations	1628	1628	3164	3164
R-squared	0.02	0.021	0.365	0.082
Number of cod_mpio	814	814	814	814

Panel estimates with municipal and year fixed effects; Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

These results imply that land reform in Colombia decreased inequality in landholdings between 1961-2010. The estimated effect of a one-log-unit increase in land reform (in hectares per capita) is a reduction of 0.02 points of the land Gini. Keeping in mind that the Gini ranges between 0 and 1, this effect, though not very large, is significant. Put another way, an increase of one standard deviation in land reform decreases the Gini coefficient of plot sizes by 0.029 points (=1.46*0.02), equivalent to 27 percent of its standard deviation, or four percent of its mean. Interestingly, the presence of concentrated landholdings – and the rural elites they imply – do not seem to affect either measure of land inequality. Our indicator of dispersion shows a similar pattern. A one-standard-deviation increase in land reform decreases the coefficient of variation by 0.31 units, equivalent to nine percent of its mean or 22 percent of its standard deviation.

Land reform also affects the average size of landholdings, but here the effect is positive. An increase of one standard deviation in land reform increases average plot size by 0.27 log units, or 1.31 ha; this is

equivalent to nine percent of its mean, or 22 percent of its standard deviation. The presence of *latifundistas*, however, mostly counters this effect. Our results suggest that a one-standard-deviation increase in the interaction term decreases the average size of rural properties by 0.09 log units (=0.056*1.53), equivalent to 1.09 ha, three percent of its mean, or seven percent of its standard deviation. The concentration of landholding thus counteracts most of the beneficial effects of land reform on average plot size.

Table 3 probes the distributional effects of land reform further by estimating its effects on per capita landholdings across various size categories. We see that land reform increases landholdings in all of the size categories except the largest, corresponding to *latifundia*. The biggest coefficient is for the 20-200 ha range, followed by the 3-10 ha range. All of these coefficients are significant at the one percent level. But in standardized terms, we see larger effects in the smaller categories: an increase of one standard deviation in land reform increases the number of plots smaller than three ha by 0.219 log units, equivalent to 183 percent of its mean. Standardized effects for 3-10 and 10-20 ha/capita are 148 percent and 120 percent of their means, respectively.

Table 3: Effects of Land Reform and *Latifundia* on the Structure of Landholding

VARIABLES	(1) <3 ha/capita (log)	(2) 3-10 ha/capita (log)	(3) 10-20 ha/capita (log)	(4) 20-200 ha/capita (log)	(5) 200-500 ha/capita (log)	(6) >500 ha/capita (log)
Potential Land Reform-Hectares pc (Log)	0.150***	0.212***	0.164***	0.322***	0.0801***	0.0251
	(0.00597)	(0.00892)	(0.00843)	(0.0202)	(0.0125)	(0.0224)
Potential Land Reform-Hectares pc*	-0.0339***	-0.0185**	0.0174**	0.0810***	0.0922***	0.105***
Latifundia pc (Log)	(0.00487)	(0.00728)	(0.00688)	(0.0165)	(0.0102)	(0.0183)
Constant	6.090*	4.344	-1.540	-11.66	-2.668	11.47*
	(3.587)	(5.361)	(5.064)	(12.13)	(7.483)	(6.645)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes	Yes	Yes
Second degree polynomial of municipal area	Yes	Yes	Yes	Yes	Yes	Yes
Average Proportion allocated	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,627	1,627	1,627	1,627	1,627	1,627
R-squared	0.465	0.466	0.427	0.404	0.309	0.126
Number of cod_mpio	814	814	814	814	814	814

Panel estimates with municipal and year fixed effects; Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The *latifundia* interaction term is similarly significant at the five and one percent levels, but with signs that change in a way that is telling. The interaction term is positive for all four largest size categories – including *latifundia* – but negative for the two smallest size categories. These results imply that land reform

increased per capita landholdings across small, medium and large landholdings, but most strongly amongst medium-large properties of 20-200 ha. This effect is complemented by the *latifundia* effect above 10 ha/capita, but counteracted below that threshold. It is notable that the *latifundia* effect exceeds the pure land reform effect for the largest two categories, both as coefficients and in standardized terms.

Development

Table 4 examines the effects of land reform and *latifundia* on municipal-level development, measured by the relatively broad measure of Unsatisfied Basic Needs.[10] Equations 1-3 test alternative specifications of our basic model as a robustness check. Land reform is negative and statistically significant at the one percent level in all three. Once again the land reform-*latifundia* interaction term has the opposite sign, and is statistically significant at the one percent level. Other variables behave as expected.

Table 4: Effects of Land Reform and *Latifundia* on Local Development

VARIABLES	(1) UBN	(2) UBN	(3) UBN
Potential Land Reform-Hectares pc (Log)	-1.733***	-3.857***	-2.942***
	(0.467)	(0.559)	(0.546)
Potential Land Reform-Hectares pc*Latifundia (Log)		2.179***	1.404***
		(0.353)	(0.353)
Constant	-200.3	78.77***	226.8
	(130.8)	(0.773)	(177.7)
Average Proportion allocated	Yes	Yes	Yes
Interaction Latifundia*Year	No	Yes	Yes
Polynomial of area*year	No	No	Yes
Second degree polynomial of municipal area	No	No	Yes
Observations	3,260	3,260	3,260
R-squared	0.835	0.824	0.838
Number of cod_mpio	815	815	815

Panel estimates with municipal and year fixed effects; Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

By decreasing unsatisfied basic needs, land reform is associated with increasing local development. A one-log-unit-increase in land reform is associated with a 3.9 unit reduction in UBN. To put this in context, a one-standard-deviation increase in land reform would be expected to decrease UBN by 5.63 points, equivalent to nine percent of its mean or 37 percent of it standard deviation. But once again, these effects are largely undone by concentrated landholdings. A one-standard-deviation increase in the *latifundia* interaction

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[10] As compared, for example, to local measures of income per capita or tax receipts.

term drives UBN back up by 3.3 points, equivalent to five percent of its mean, or fifteen percent of its standard deviation.

Summary

Taken together, our results imply that the effects of land reform in Colombia are not symmetric across municipalities, but rather heterogeneous. As theory suggests, the effects of reform vary significantly with context. On its own, land reform decreases land inequality, increases average plot size, and decreases dispersion in the distribution of land ownership. It does so not by breaking up large farms – Colombia's reform did not work that way – but rather by increasing the lower and middle ranges of the distribution. In so doing, it alters that distribution from a bimodal one – with peaks at the extremes, a "missing middle", and a high degree of dispersion – towards a more normal, more even distribution. Land reform also improves local development. Impressively, our estimates imply that the magnitude of this effect in standardized terms rivals the effect on land inequality. Land reform reduces unsatisfied basic needs, a measure of development that naturally prioritizes poorer Colombians. This is a notable finding given that any reasonable chain of causality would link land reform more tightly to land inequality than to broader, multidimensional measures of development.

But the presence of *latifundia* – concentrated landholdings – undermines this, reducing land reform's effects on average plot size, number of plots in smaller categories, and development. These counter-effects are significant in size. Our results imply that *latifundia* counteracts 59 percent of the beneficial effects of land reform on development, and 83 percent of the effect on average plot size. It appears that large landowners are able to either prevent the benefits of reform from flowing to their intended beneficiaries, or – perhaps – capture these benefits for themselves.

These results are point estimates at average values for all municipalities. If our overarching finding is that pre-existing inequality strongly mediates the effects of land reform, then we need to know more. At what thresholds of inequality do land reform's effects switch from positive to negative for the variables we estimate? When does land reform improve inequality and development and when does it make things worse?

The graphs that follow answer these questions by calculating the incremental effects of land reform vs. land concentration separately on Colombian municipalities decile by decile. We recalculate our canonical equation using coefficients estimated above and decile averages to calculate estimated $\hat{y}$ values for each decile of Colombian municipalities ranked by *latifundia*. By alternately setting the land reform and the interaction terms to zero and subtracting $\hat{y}$ values, we can easily estimate incremental effects of land reform and *latifundia* on each dependent variable.

Figure 4 shows the incremental effects of land reform and *latifundia*, as well as the net effect (blue line, discussed above), on the Gini coefficient of land ownership. Land reform decreases inequality throughout the distribution, but does so more strongly in the higher deciles of land concentration – where the underlying problem it seeks to remedy is greater – as we would expect. *Latifundia* has no effect in the lower deciles, again as we would expect since its value there is zero or very low. But above the 8th decile *latifundia* has a sharply increasing effect that raises the Gini coefficient by 0.011, countering fully half the beneficial effect of land reform in decile 10.

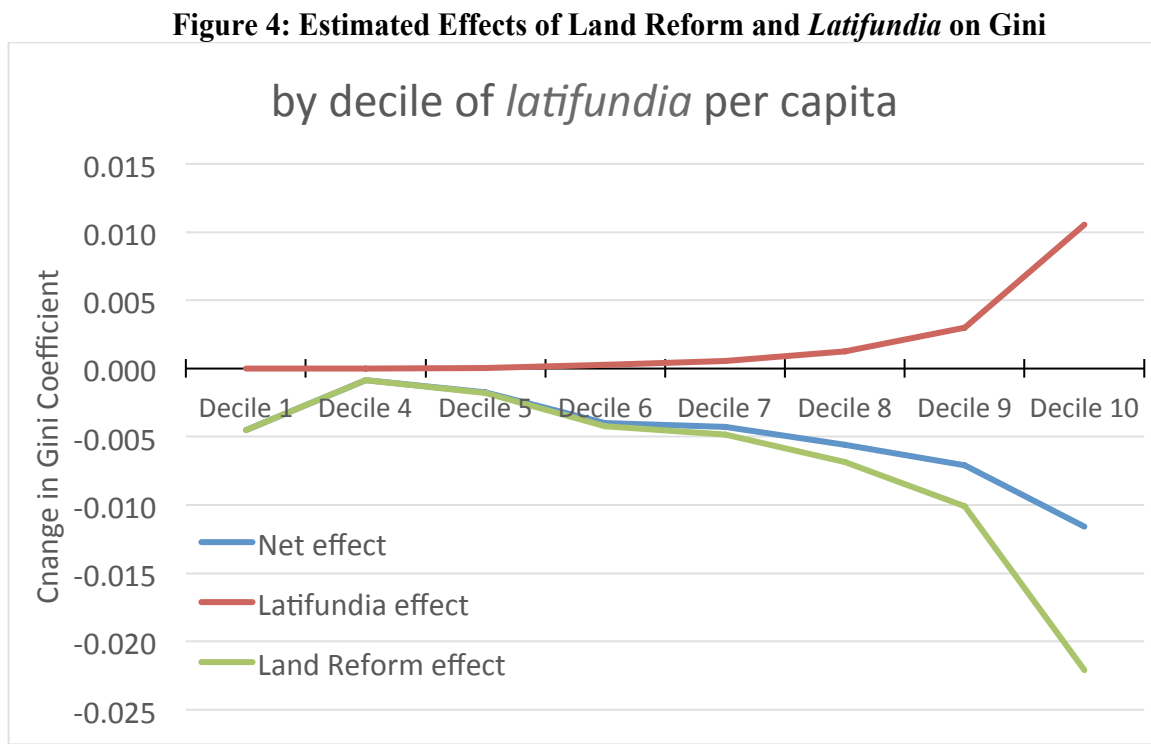**Figure 4: Estimated Effects of Land Reform and *Latifundia* on Gini**

Figure 5 shows the incremental effects of land reform and *latifundia* on different categories of plot

sizes. Land reform's strongest effects are on the smallest size category, <3 ha, quickly becoming negative thereafter. But, curiously, the effects of land reform rise above 200 ha, approaching zero again for plots above 500 ha. The effects of *latifundia*, by contrast, are negative and small for the smallest plot sizes, but become positive above 10 ha and large above 20 ha. The net effect is broadly U-shaped: land reform increases landholding in the smallest and largest categories, and reduces in in the middle categories.

Figure 5: Estimated Effects of Land Reform and *Latifundia* on the Structure of Landholding
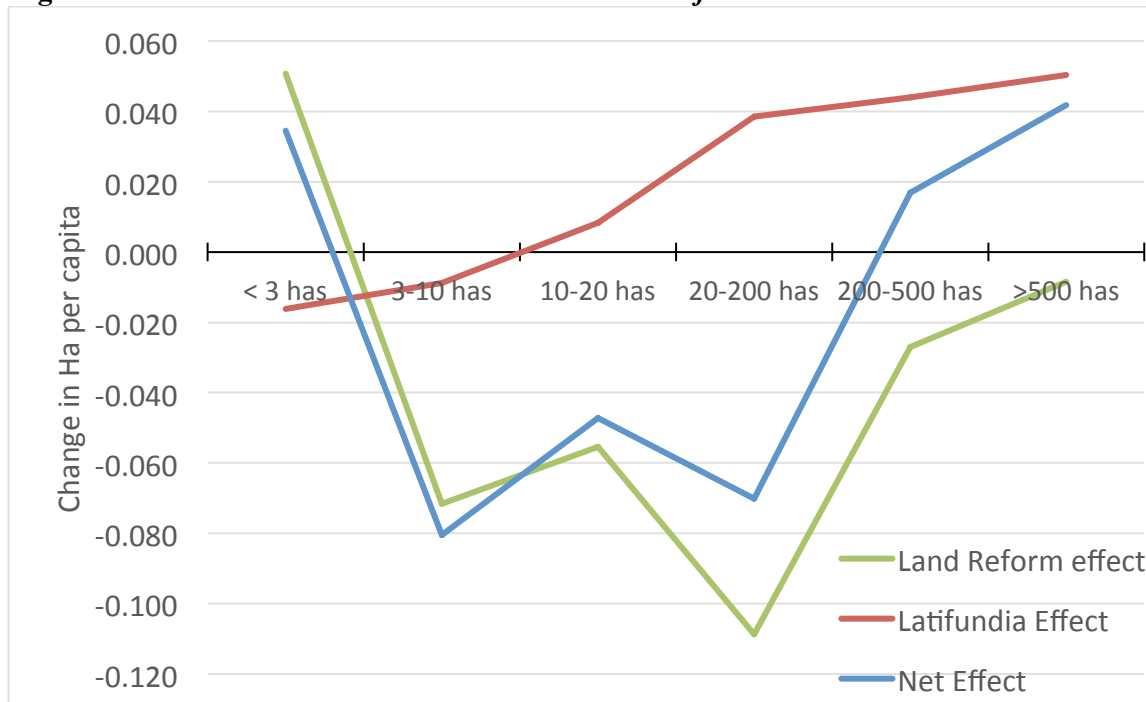

Figure 6 shows the incremental effects of land reform and *latifundia* on local development. Land reform decreases UBN throughout, thereby increasing development; it does so most strongly in the highest deciles, especially the 10th. *Latifundia* has an almost-mirror image opposite effect, initially zero, then rising slowly through decile 7, and accelerating thereafter; by decile 9 *latifundia* counters 85 percent of land reform's beneficial effect on local development; in decile 10 *latifundia* counters 136 percent of land reform's beneficial effect. In these municipalities, additional increments of land reform decrease inequality by only half as much as elsewhere, and actually worsen local development. It is no wonder that a century of land reform has done so little to reduce land inequality and poverty rates in Colombia.

How does land reform achieve these effects? And how does *latifundia* undo them? Does reform

affect development by changing the distribution of land assets, assuming the latter is its first-order effect? Or

is there an independent public sector channel, as theory suggests? A number of the components of the UBN

indicator – especially access to education, water, sanitation, health care, and electricity – imply that the

public sector must be involved. And does *latifundia* counteract the effects of land reform by intervening in

the distribution of land only, or by additionally altering public policy and the distribution of public

expenditure? Our evidence thus far permits only speculation. The next section investigates the channels of

land reform's effects in more detail.

Figure 6: Estimated Effects of Land Reform and *Latifundia* on Local Development

by decile of *latifundia* per capita
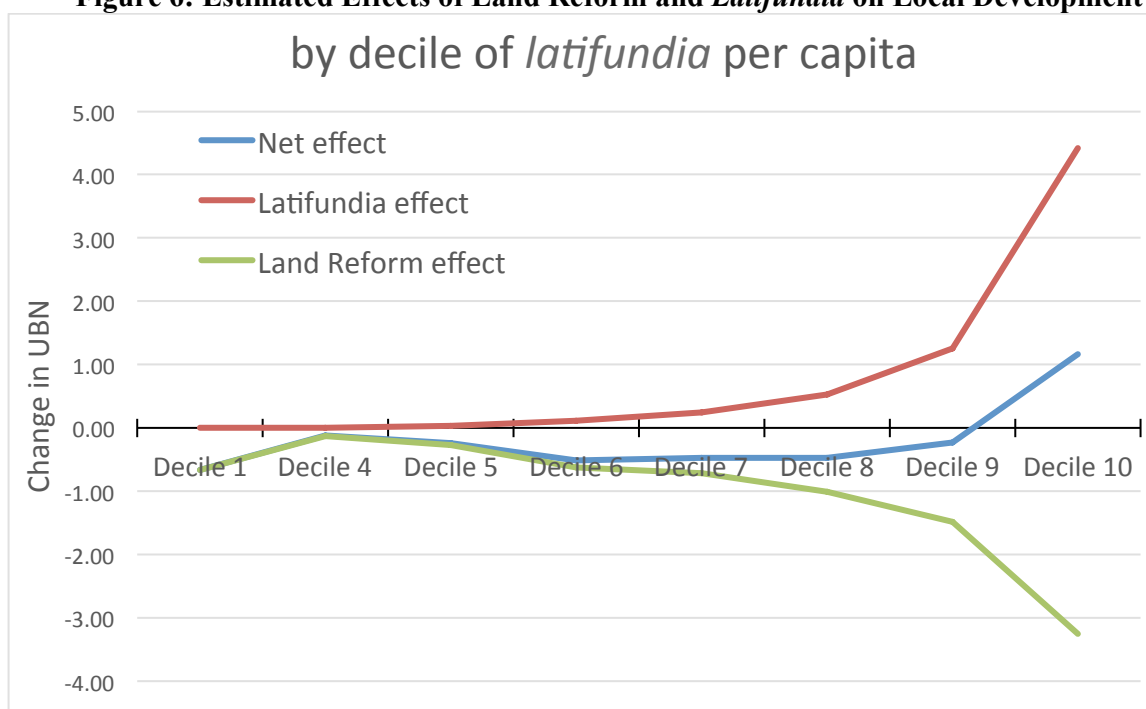
Mechanisms

Table 5 explores the effects of land reform and *latifundia* on municipal-level agriculture expenditure.

The vast majority of Colombian municipalities are rural, economically dominated by agricultural activities.

This is true today, and more true the further back in time we go. Hence agricultural policy is quite important

for promoting economic and social development; one good way to measure this is via local agricultural

expenditure. Ideally we would look at other areas of expenditure too, but for other sectors data is available

for too few municipalities to make this feasible. In addition, a lack of time-series data obliges us to estimate

these as cross-sectional regressions. Hence we present two measures of agricultural expenditure, each estimated with two sets of controls, as robustness checks. Our results are consistent across these specifications. In our view, equation 4 is our best model of agricultural expenditure.

Agriculture expenditure increases with land reform as a proportion of both total expenditure and total investment. All our estimates are significant at the one percent level. Hence land reform increases agricultural investment measured as a share of the budget. But the presence of concentrated landholdings in the form of *latifundia* once again counters this effect. In all four models, the *latifundia* interaction term is negative and statistically significant at the one and five percent levels, with coefficients an order of magnitude smaller than those for land reform. Once more, therefore, the *latifundia* effect reduces that of land reform, decreasing agriculture investment where large landholders predominate. Other control variables behave as expected.

Table 5: Effects of Land Reform and *Latifundia* on Local Agricultural Expenditure

VARIABLES	(1) Agriculture expenditure/ Total expenditure	(2) Agriculture expenditure /Total investment	(3) Agriculture expenditure/ Total expenditure	(4) Agriculture expenditure/ Total investment
Potencial Land Reform-Hectares pc (Log)	0.00174***	0.00198***	0.00160***	0.00180***
	(0.000333)	(0.000390)	(0.000353)	(0.000415)
Potencial Land Reform-Hectares pc*Latifundia pc (Log)	-0.000488**	-0.000572**	-0.000489***	-0.000569**
	(0.000189)	(0.000222)	(0.000189)	(0.000222)
Constant	0.0806***	0.0948***	0.0790***	0.0923***
	(0.0151)	(0.0177)	(0.0155)	(0.0182)
Latifundia (log)	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Average area allocated	Yes	Yes	Yes	Yes
Polynomial of area	Yes	Yes	Yes	Yes
Geographic controls	No	No	Yes	Yes
Observations	752	752	743	743
R-squared	0.182	0.191	0.199	0.208

Cross-sectional OLS; Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

How exactly does land reform affect development? Table 6 investigates the effects of land reform on disaggregated components of the UBN index. These can be thought of as separating development into private vs. public goods elements. The results show that land reform decreases the proportion of people living in overcrowded conditions. Reform also decreases the number of households living in structures built

with inadequate materials. Reform decreases the population with inadequate water, sanitation and electricity services ("public utilities"). And reform decreases the proportion of the population that did not attend school. These results are mostly significant at the one and five percent levels.

As before, the presence of *latifundia* reduces these effects in six of the eight models estimated. *Latifundia* increases the population with inadequate housing, inadequate access to water, sanitation and electricity services, and increases the rate of educational non-attendance. Two of these coefficients are significant at the one, two at the five, and two at the ten percent levels; *latifundia* is insignificant for overcrowding. Hence land reform on average promotes development across both its private and public dimensions, improving housing conditions and access to basic services. But the presence of concentrated landholdings counters these beneficial effects for the quality of housing materials, access to primary services, and educational non-attendance. Our results are robust to changes in specification from varying control variables.

Table 6: Effects of Land Reform and *Latifundia* on Independent UBN Components

VARIABLES	(1) Population overcrowded (percent)	(2) Population overcrowded (percent)	(3) Population with inadequate housing (percent)	(4) Population with inadequate housing (percent)	(5) Population with inadequate public utilities (percent) +	(6) Population with inadequate public utilities (percent)	(7) School non-attendance (percent)	(8) School non-attendance (percent)
Potential land reform ha pc (log)	-1.205**	-1.041*	-2.841***	-2.037**	-6.631***	-4.878***	-1.503***	-0.964**
	(0.554)	(0.555)	(0.866)	(0.861)	(0.984)	(1.046)	(0.379)	(0.397)
Potential land reform ha pc*	-0.0735	0.185	1.814***	1.071*	2.394***	1.622**	0.479*	0.601**
Latifundia pc (log)	(0.376)	(0.394)	(0.589)	(0.613)	(0.700)	(0.742)	(0.270)	(0.281)
Constant	60.98***	306.9	43.49***	729.7**	46.64***	606.1***	8.820***	49.37
	(0.791)	(212.2)	(1.234)	(329.3)	(1.387)	(166.5)	(0.534)	(63.11)
Interaction Latifundia*Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average area allocated	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Polynomial of area*year	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3,090	3,090	3,113	3,113	3,113	3,113	3,113	3,113
R-squared	0.884	0.887	0.640	0.654	0.632	0.638	0.285	0.319
Number of cod_mpio	806	806	806	806	806	806	806	806

Panel estimates with municipal and year fixed effects; Standard errors in parentheses
"Public utilities" is a composite of water, sanitation and electricity services
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

6. Conclusion

Colombia has pursued land reform since Independence, distributing vast quantities of land mainly to landless and poor peasants. What effects did this have on inequality and development? These questions are

interesting not just for their own sake, but because they shed light on larger questions concerning the effects of specific institutional features, such as inequality, on development. Our evidence shows that land reform had heterogeneous effects in Colombia. On average, land reform increased the size of rural properties, decreased land inequality, decreased dispersion in the distribution of landholdings, and reduced poverty. But the presence of *latifundia* – concentrated landholdings – in some municipalities significantly counters these beneficial effects, resulting in smaller rural properties, more dispersed landholdings, and lower levels of development.

By what mechanism did these effects came about? One channel is public policy. Land reform increased public investment in important areas such as agriculture, which promotes economic growth and well-being. This led to improvements in households' consumption of private goods such as housing, and publicly-provided primary services such as education, health, water and sanitation and electricity. But the presence of concentrated land ownership counteracted these effects once again, decreasing agriculture expenditure, and worsening outcomes in housing and primary services.

Land reform in Colombia had the intended first-order effects of reducing land inequality and dispersion, and placing more land in the hands of poorer farmers. Such changes to a key factor of production and the distribution of wealth are important in a developing country with a large agricultural sector like Colombia. But it is land reform's secondary effects – changes in the distribution of power, probably by increasing the wealth and status of beneficiaries – that are ultimately more important. In many Colombian municipalities, these took the form of long-term changes in decision-making and patterns of governance; public institutions reacted as one would expect in a democracy, providing more public goods to a wider share of the population, so spurring development.

Such benign effects followed land reform in municipalities where the initial distribution of land – and hence we assume wealth and status – was not highly skewed from the start. But in municipalities where land ownership *was* skewed, elites seem to have succeeded in twisting the public policy process such that the benefits of land reform – beginning with the land itself – flowed to a smaller, and not larger, share of the

population. Inequality and dispersion in the distribution of land increased as a result, average plot size fell, and large landholdings increased further in number. Municipalities of this type invested less in rural public and private goods, leading to worsening indicators of local development. In such places, it is important to note, land was also distributed. But it was given out in patterns, leading to broader outcomes, that were very different indeed.

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