

THE PERVERSION OF LAND REFORM BY LANDED ELITES Power, Inequality and Development in Colombia¹

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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 across 1100+ municipalities are highly bimodal. Where small and medium-sized farms dominate, land reform increased average farm size, decreased land inequality, and accelerated local development. But where land was concentrated in the hands of a rural elite, distributed land was diverted to bigger farms, resulting in fewer small and more large farms, greater land dispersion, and lower levels of development. These effects – both positive and negative – flow through voter turnout, political competition, and public expenditures. Landed elites use patron-client ties to distort local and national politics to their benefit. Land reform's secondary effects, on the distribution of power, outweigh its primary effects on the distribution of land.

Keywords: Land reform, inequality, development, *latifundia*, political competition, Colombia

Let me tell you about the very rich. They are different from you and me.

– F. Scott Fitzgerald

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, Boix 2003, 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 (Ansell and Samuels 2014, Lipton 2009, Moore 1966). And yet in many of the countries that have implemented land reform, land inequality, poverty and development have continued increasing (de Janvry 1981). How can we explain this paradox?

This paper analyses a 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, mainly 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. Why?

Focusing on the period 1961-2010⁵, we merge a huge database recording the details of each of 484,000 land grants, with data on political, economic, social, territorial, and other characteristics of

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

Colombia's 1100+ municipalities. Constructing this database was an immense amount of work, and is itself an empirical contribution. We use this data both to probe the paradox of Colombian land reform, and to shine a light on some of the underlying institutional dynamics at work in other countries that have attempted it.

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 political and fiscal channels through which such effects might occur, focusing on political participation, political competition, and public expenditure and service provision. To our knowledge, this is the first quantitative study of the effects of land reform and land concentration on 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. Like other complex institutional reforms (Faguet and Shami 2018), land reform is a complex instrument that sets in motion important changes across various dimensions of economics, politics and society. It can be expected to have significant effects on not just agricultural productivity and output, but also factors further afield such as the distribution of status and power in society, the types and quantities of public services provided locally, and political party competition, amongst others.

Furthermore, these effects may not impact municipalities symmetrically, but may instead vary 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 long 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 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 more land concentration and lower municipal development – a surprising result.

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 (2009) types within its borders: highly unequal polities that redistribute little, and far more egalitarian polities that redistribute a great deal. 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? Can heterogeneity along these lines explain mixed evidence for land reform's effects across other countries?

2. Land Inequality and Development

A large literature addresses the effects of land reform on agricultural productivity, investment, crop yields, farmer incomes, and related variables. These are land reform's first-order effects. We do not focus on those here. Instead, we follow Besley, Burchardi and Ghatak (2012) to argue that land reform's second-order effects are potentially more powerful. Those operate via changes in underlying political and institutional relations, which in turn can affect the distribution of income, opportunity, political participation, and economic growth. This is especially true given the relatively long, fifty-year time frame we analyze. The remainder of this section focuses on the effects of land inequality on political, economic and social development.

2.1 Democratic vs. oligarchic politics

The idea that large landowners are systematically antidemocratic has a large and well-established pedigree dating back at least to Gerschenkron (1946), and arguably Weber (1917) and Tocqueville (1835-40). Barrington Moore's (1966) is probably the most influential statement: large landowners employ agricultural technologies that exploit agricultural workers; these technologies rely on patterns of social hierarchy and domination that are incompatible with democracy. Rueschemeyer, Huber Stephens and Stephens' (1992) comprehensive review of political trajectories across Europe and the Americas finds strong evidence in favor. Albertus (2017), Ansell and Samuels (2014), Boix (2003), Paige (1993, 1997) and Ziblatt (2008) have tested and further refined the proposition with more modern methods, at both micro and macro levels, with results that broadly support the proposition.⁶

The underlying logic can be expressed as 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

⁶ While each supports the narrow proposition that large landowners repress democracy, the specific mechanisms they propose differ in non-trivial ways.

that a landed elite will be expropriated. The secret ballot and freedom of the press will likely undermine landlords' ability to press peasants to vote for landlords' preferred candidates. And the coercive methods landlords use to obtain cheap, docile labor are harder to deploy in a democracy (Albertus 2017, Ziblatt 2008). Hence large landowners tend to oppose democratization.

Why is land a 'special' asset class? For reasons both negative and positive. Land is fixed, highly visible, and comparatively easy to tax, making large landowners particularly vulnerable to expropriation. But land also gives owners the power to block reform. In large concentrations, this highly visible asset underpins a particularly pernicious form of social power (Paige 1993, Ziblatt 2008) that invests landowners with status and authority in rural communities. These give them disproportionate influence over public decision-making, and over the lives and – in extreme cases – the ideas and preferences of peasants. Mobilizing peasants to support democratization and extend public services in such circumstances can appear to the peasants themselves as a threat to their interests. Hence an unequal distribution of land tends to repress the development of democracy. Governments that are more oligarchic provide fewer public goods and less redistribution, resulting in lower levels of economic and social development.

Why exactly do large landowners oppose public goods? And how do they succeed? The next two sections examine the deep logic behind each claim.

2.2 Economic incentives of large landholders

Galor et al. (2003, 2009) plumb the deep interconnections between land inequality and economic development, 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. They 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 none. During the years that followed, government education expenditure soared from 8% to 15% of the total public budget. Because of the complementarities between physical and human capital, capitalists were the prime beneficiaries of rising human capital amongst the masses. The authors conclude that Marx was wrong: workers and capitalists are natural economic allies, and landlords are 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.

But Acemoglu et al. (2008) find contrary results much closer to home. Focusing on municipalities in the Colombian department of Cundinamarca, they find a positive relationship between land inequality in the 19th century and current levels of economic development. 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. This is echoed in the “good extraction” logic of Faguet, Sánchez and Matajira (2017), and implies that Colombia may not conform to the landowner oligarchy pattern of some other countries in the region.

One reason – and a characteristic that sets Colombia apart from many countries – is its stark “internal frontier” (Fajardo 2002, Machado 2013). This frontier distinguishes territory the state occupied and governed

from territory and localities that the central state abandoned. The result was 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), creating wide disparities in long-term development across space (Boone 2012, LeGrand 1986).⁷ This spatial heterogeneity will prove central to our analysis; we return to it below.

Nugent and Robinson (2010) further test these ideas with evidence from Colombia, Costa Rica, El Salvador and Guatemala. 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 legislation. 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 laws 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.

Nugent and Robinson (2010) and Paige (1993, 1997) show that different legal reforms were promulgated by very different kinds of elites. From the mid-19th century onwards, dominant elites in smallholder countries like Colombia and Costa Rica were mainly commercial in origin, with interests in manufacturing, trade, banking, and the urban economy more generally. In countries like El Salvador and Guatemala, by contrast, dominant elites were large landowners heavily invested in the agricultural economy

⁷ 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 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 international standards 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.

2.3 The political mechanism: Patron-client relations

Where does landholders' power come from? How do they exercise it? By what mechanism do landholders sway political decisions at the local and national levels? We turn to anthropology and sociology for answers, specifically to the study of patron-client relations.

It is important from the outset to distinguish between two varieties of clientelism that, although deeply related in terms of instruments and outcomes, are nonetheless distinct: machine politics vs. patron-client relations. The former is typical of cities with large immigrant populations where new voters who feel disoriented are susceptible to small material rewards (Scott 1969). Political machines are non-ideological organizations interested primarily in securing office for their leaders and distributing particularistic rewards to their supporters (Stokes 2009). They tend to thrive in areas experiencing rapid social change where political power is fragmented, ethnic cleavages are widespread, and much of the population is poor (Scott 1969). The classic political machines of Chicago and New York in the late 19th and early 20th centuries are two prominent examples.

Patron-client relations, by contrast, are characterized by oligarchic patterns of behavior and habits of deference and subordination on the part of voters towards established notables, who are recognized as natural leaders. They are typical of rural areas with stable populations where social relations follow long-established patterns. Scott (1972a) defines the patron-client relationship as

a special case of dyadic (two-person) ties involving a largely instrumental friendship in which an individual of higher socioeconomic status (patron) uses his own influence and resources to provide

protection or benefits, or both, for a person of lower status (client) who, for his part, reciprocates by offering general support and assistance, including personal services, to the patron. (p.92)

According to Scott, these elements “are most apparent in the ties between a high-status landlord and each of his tenants or sharecroppers in a traditional agrarian economy – a relationship that serves, in a sense, as the prototype of patron-client ties.” (p.93) Such relationships have very deep historical roots whose origins are probably impossible to trace; prominent Roman patrons cultivated clients in similar ways during the classical period.

Patron-client ties describe the micro mechanism by which landlords exert pernicious control over peasants’ lives and choices. The clientelistic exchange is defined by asymmetric reciprocity, in which each partner provides something the other values. This distinguishes patron-clientelism from pure coercion. Goods and services typically provided by patrons include: protection, security, employment, access to arable land, to education, and to food in bad times. Clients typically provide: political services such as canvassing, organizing, demonstrating, and voting in favor of the patron’s preferred candidates and causes; military or fighting duties, often in informal vigilante or bandit groups; labor services on the patron’s estate; and payment of rent, interest and other charges (Scott 1972a & 1972b). As in most exchange, the receiver is likely to value the gift more highly than the giver. For example, a client may value access to a plot of the patron’s land more highly than the patron does; a patron may value political and labor services his clients provide more highly than they value their own time. But beyond the instrumentality of their relationship, Scott (1972a) points out, there often lies “a durable bond of genuine mutual devotion that can survive severe testing” (p. 94).

The patron-client relationship is nonetheless deeply unequal and prone to the exploitation and oppression of clients. This is because the patron is far more important to the client than the client is to the patron. More precisely, the marginal benefit a patron receives from any particular client is low, whereas the benefits a client receives from his patron are high and may be critical to his family’s livelihood. The patron’s ‘gifts’, and hence her power, are often rooted in monopoly control over a resource or technology that is

valuable to the polity (Medina and Stokes 2007). Examples include land, a grain elevator, a mill, a school or a grocery store. In the case of infrastructure and services, the patron's control may be indirect, via ownership of the land on which the infrastructure sits, and not of the infrastructure itself, a phenomenon Shami (2012) refers to as control via 'interlinked markets'. The proffering of material goods by clients will often take the form of threats (implicit or explicit), for example of exclusion from a critical market or service, rather than inducements.

Monopoly power in the provision of critical needs allows patrons to make heavy demands of clients. Clients are typically poor and operate near the subsistence threshold. Slim margins mean they prefer to minimize their losses rather than maximize gains by taking risks that may plunge a family into hunger or worse (Scott 1972a). In an economy offering few options, their incentives are to sacrifice their independence and serve their patron (Escobar 2002). In turn, the patron's incentives are to provide clients with a subsistence livelihood and physical security above some minimum threshold such that her legitimacy is not undermined in the eyes of the community, and peasants do not defect or revolt. The precise balance of reciprocity will tend to shift back and forth over time. But it is structurally loaded in favour of patrons.

Beyond blocking progress towards democracy, what do landowners use their powers of patronage to achieve? They typically suppress rural wages and access to credit; prevent organization by landless or poor farmers, or intervene in such organizations when they form; constrain labor mobility and urbanization; monopolize access to higher quality land and other resources; and manipulate the rural vote (Albertus 2017). Their influence over their clients' votes gives them significant electoral power, which they use to elect themselves or allies to positions of power in local government, and – in league with larger associations of landowners – at the regional and national levels as well (Paige 1997). Miranda's classic study of clientelism in Colombia (1977) identifies just such a mechanism at work in Colombia. Landowners' hold on the rural vote can give them representation in national legislatures that is disproportionate to their numbers or economic weight. It can also invert political accountability, leaving voters (clients) accountable to parties (patrons) for their actions, rather than parties to voters (Stokes 2009).

Landowners use this power to repress public investment in public goods, like education and health, and other services and infrastructure likely to benefit their rural clients, which might raise their patronage-price or free them from their clientage altogether, for example by facilitating migration (Dávila and Leal 2010, Pizano 2001). In the aggregate, landlords' interest in the continuing poverty and dependence of peasants undercuts investment in public goods and slows economic development not just of their regions, but of the national economy. This is why patron-client relations are characteristic of disproportionately poor countries, both across the world and across time (Stokes 2009), and continued to define politics in much of rural Colombia through the end of the 20th century (Dávila 1999).

Patron-client ties are sustained by the persistence of large inequalities in wealth, status, and power; an absence of impersonal guarantees of physical security, status, and wealth; biased administration of justice; and the inability of the kinship group to overcome these failings (Scott 1972a). Conversely, such ties are undermined by economic growth and social development, which tend to raise clients' patronage price, and also diversify the economy in ways that loosen patrons' monopoly on key assets and opportunities. As clients become wealthier and better educated, their motivations tend to shift from material benefits to ideological or programmatic values (Scott 1969, Stokes 2009). Indeed, Kitschelt and Wilkinson (2007) theorize a Malthusian law of patron-client decline, in which the costs of retaining clients increases exponentially with economic development, but resources available for clientelistic exchange grow only linearly or asymptotically.

Throughout all of this discussion, the key factor has been control over large tracts of land. This is what confers upon landholders their patronage powers, which in turn allow them extraordinary scope to intervene in electoral competition, undermine democratization, and repress economic and social development. The opposition of large landholders to land reform will thus go far beyond their reluctance to give up an asset. Alienation from their land implies a direct loss of power, status, authority and prestige in society. It is something *latifundistas* will fight tooth and nail to block, or – once implemented – reverse.

2.4 Theoretical predictions

How should we expect patron-client relations to interact with land reform in Colombia? Where agricultural land is concerned, Colombia's municipalities can be divided into: (i) those with high *latifundia*, where land is highly concentrated; and (ii) those with low or no *latifundia*, characterized by a smallholder agricultural economy. These very different distributions of land, the 'special asset', will give rise to very different political and social environments. Between them lies a broad third group (iii) characterized by intermediate levels of *latifundia* and smallholder farming, with political and social characteristics that lie between the extremes.

Concentrated landholding grants elites disproportionate power in their local communities. Faced with attempts to transfer land to the landless, their most powerful strategy is to capture this land for themselves. Elites will use their varied levers of social and economic power in a number of ways, along the lines outlined above, to achieve this; we mostly lack adequate data to measure these means. One important channel for which we do have data is electoral turnout and political competition. Landed elites can repress local turnout so as to decrease political competition and increase political concentration, implying a one-party lock on local politics. This gives elites two distinct instruments for achieving their goals: (1) control over local governments, which can actively aid their land reconcentration efforts, or look the other way when abuses are committed in pursuit of the same; and (2) disproportionate influence in Congress, as national parties compensate elites' ability to deliver the local vote with an outsize say over land policy.

Where *latifundia* is low, we expect the distribution of land to previously landless peasants to increase the number of smallholder-farmers. This should, in turn, increase voter turnout, as beneficiaries' greater wealth and status will encourage them to vote, as will their increased stake in public affairs. Higher turnout should, in turn, lead to greater political competition, and hence smaller margins of victory and lower vote totals for winning parties in both local and national elections. Greater political competition should in turn lead to higher investment in public goods, as parties compete for smallholders' votes. By contrast where *latifundia* is high, we expect its incremental effect to be negative on turnout, on political competition, and on

political concentration. This should, in turn, lead to lower public investment, both as a result of lower political competition, and as an intentional strategy by elites to keep rural labor repressed.

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 *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 populations⁸ (Ankersen and Rupert 2006, Colmenares 1997). As the

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:

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

Colombia was born bankrupt. The government redeemed debts incurred during the war against Spain by transferring public lands to private bondholders, and so a sort of land reform began at independence in 1821. Over the two centuries that followed, the defining characteristic of Colombian land reform has been the transfer of publicly held land to landless or poor farmers able to demonstrate that they have been squatting on vacant public lands (*baldíos*) for some years. Very little redistributive land reform occurred. 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 hectares, of which 60 million ha are registered private property. Between 1901 and 2012, the state granted nearly 23 million ha to peasants and agricultural businesses in over 565,000 plots, equivalent to 20% of Colombia's total area. To put this in perspective, over the past century Colombia has distributed 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 the structure of land tenure has been reformed, and on a huge scale.

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

$Latidundio/Mun_Area_{1961} = 3.31 + 0.012 * \log(Indigenous)_{1560} - 0.2 * Encomienda -$
 $Influence + Geographical - Controls$. 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 greater availability of land away from indigenous settlements.

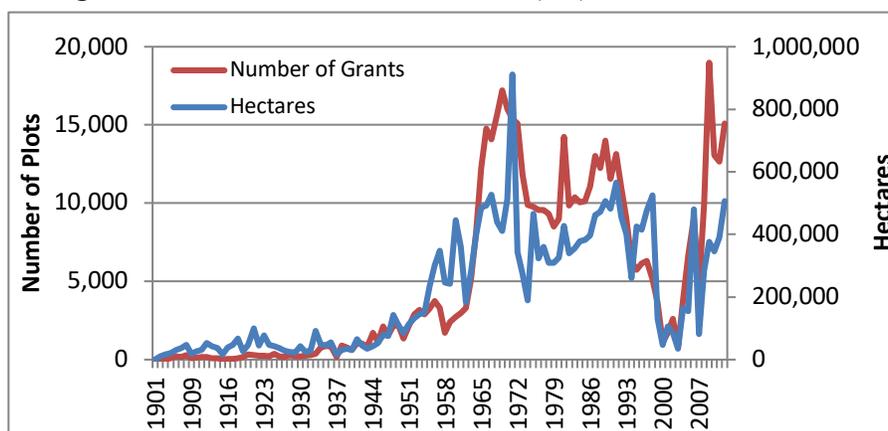
development and enhancing the efficient use of land. During the 20th century, the focus shifted again towards resolving rural conflicts and strengthening squatters' rights. But it was not until seminal Law 135 of 1961 that land reform in Colombia went into high gear. Seeking to develop rural areas, improve domestic food supplies, and respond to the Alliance for Progress, distributions increased from about 90,000 to 600,000 ha per year; the number of beneficiaries more than sextupled. It is notable that the 1961 law explicitly called for redistribution via the break-up of *latifundia*, and for a few years such redistribution did occur. But landed interests were able to defund the public agency charged with expropriation, and redistribution soon petered out (de Janvry 1981). Allocation of public lands slowed after 1973, and then increased again following the 1991 Constitution.

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 medium 20-200 ha range, and the large >500 ha range. It is important to note that even a 200 ha farm, while not small, is not yet 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 with modest costs that many beneficiaries did not pursue.

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 properties larger 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). Two centuries 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.

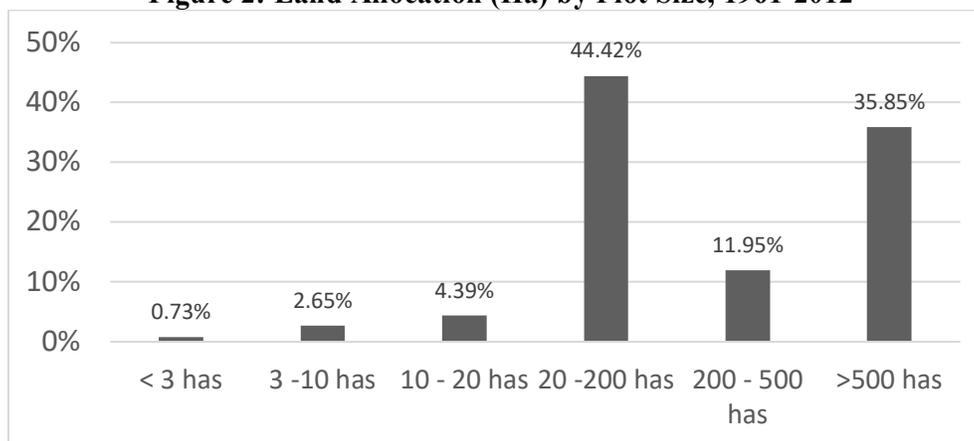
But their distribution is highly uneven. Largely for historical reasons, *latifundia* are concentrated in a minority of municipalities (the third tercile of Table 1). The Spanish never settled the majority of Colombia’s territory; Colombia’s internal frontier has deep roots. Though *latifundia* spread modestly beyond these initial areas over time, hundreds of municipalities never experienced any *latifundia*, and hundreds more did only at low levels. Only in the top tercile can we say that *latifundia* is an important characteristic of the structure of land tenure. This creates several ‘different Colombias’ that developed along different lines over long periods of time: areas dominated by *latifundistas*, where we expect politics to be characterized by patron-client relations; areas where *latifundia* is absent, where we expect patron-client ties to be weak and programmatic politics to be stronger; and one or more sets of areas in-between, characterized by intermediate levels of *latifundia* and patron-clientelism.

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 a plausible political mechanism 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 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 combines historical data from several sources. Land reform data comes from the Colombian Institute of Rural Development (INCODER⁹), which provided individual-level data on beneficiary, plot size, date, and municipality for each of nearly 484,000 land grants 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. 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. Lastly, electoral data are from the Colombian National Registry. All per capita values are calculated using lagged population data from the national census.¹⁰

⁹ Acronyms of Colombian institutions are given in the Spanish original.

¹⁰ Population growth might credibly be driven by the reality, or prospect, of land allocations in a municipality.

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

$$y_{it} = \delta_i + d_t + \gamma_1 \text{PLRpc}_{it} + \gamma_2 \text{PLRpc}_{it} * \text{L1960}_i + \gamma_3 \text{L1960}_i * d_t + \gamma_4 \text{Avg}_i + \gamma_5 \text{Area}_i * d_t + \gamma_6 \text{Ethn}_i * d_t + \varepsilon_{it}, \quad (1)$$

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. Avg is the average proportion of land allocated in municipalities that received land allocations in the previous period. The Area and Area squared terms interacted with time fixed effect d permit a reduced-form control for the direct effects of land availability on local development and land distribution over time. Ethn is a dummy equal to 1 when the proportion of indigenous and black people in a municipality exceeds the national average, using data from the 1912 census, interacted with time fixed effect d . It controls for the effects of ethnic diversity on development over time. 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); 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:

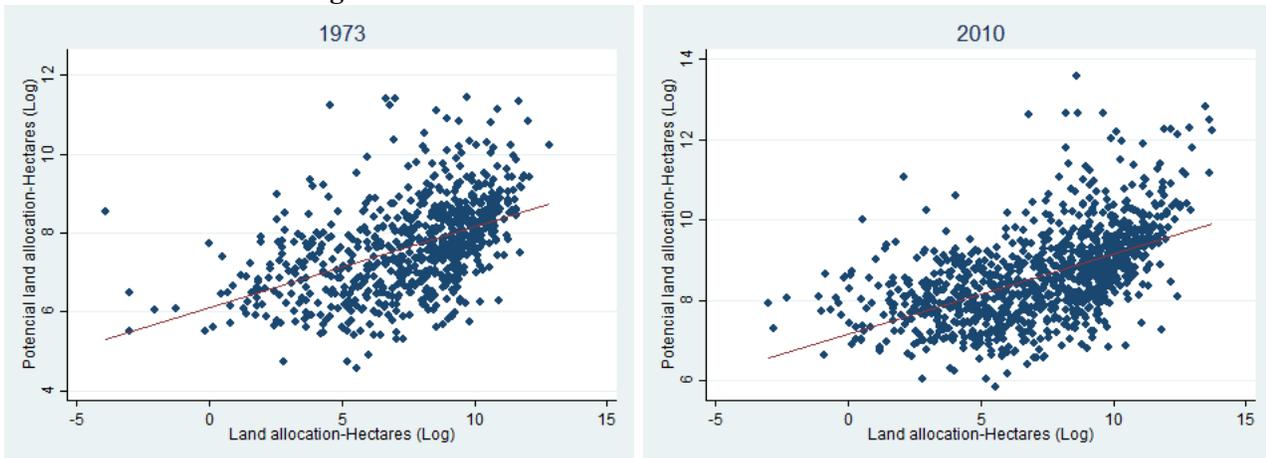
$$Corrected\ area_{i,t} = corrected\ area_{i,t-1} - (average\ proportion\ allocated_{t,t-1}) * corrected\ area_{i,t-1}$$

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 PLR_{pc} 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 PLR_{pc} 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 political 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 voter turnout, electoral margin of victory, and winning party's proportion of the vote in local and Congressional elections, for municipality i and year t . And to investigate the fiscal channels through which any political

effects then flow, we substitute f_{it} for y_{it} , where f_{it} is public investment per capita, public service expenditure per capita, and per capita tax revenues, for municipality i and year t .

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 marginally significant 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, ethnic minorities, and municipal fixed effects all behave as expected.

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

VARIABLES	(1)	(2)	(3)	(4)
	Gini Coefficient of Plot Sizes	Gini Coefficient of Plot Values	Average Size of Rural Properties (Log)	Coefficient of Variation of Plot Sizes
Potencial Land Reform - Hectares pc (Log)	-0.020*** (0.006)	-0.017*** (0.006)	0.188*** (0.021)	-0.203*** (0.049)
Potencial Land Reform - Hectares pc* <i>Latifundia</i> pc (Log)	0.009* (0.005)	0.009* (0.005)	-0.054*** (0.017)	0.047 (0.039)
Constant	-0.409 (3.656)	-2.245 (3.594)	15.977*** (6.080)	14.694 (13.840)
Average Proportion allocated	Yes	Yes	Yes	Yes
<i>Latifundia</i> *Year	Yes	Yes	Yes	Yes
Area*year	Yes	Yes	Yes	Yes
Area squared*year	Yes	Yes	Yes	Yes
Ethnicity*Year	Yes	Yes	Yes	Yes
Observations	1,628	1,628	3,164	3,164
R-squared	0.212	0.096	0.368	0.084
Number of municipalities	814	814	814	814

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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 is a significant effect. Put another way, an increase of one standard deviation in the quantity of land reformed 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. By comparison, 0.029 points represents the difference in income Ginis between Denmark and Sao Tomé & Príncipe, or between Sweden and Pakistan.¹¹ The presence of concentrated landholdings – and the rural elites they imply – decreases each measure of land inequality, though our evidence for this is weak. The indicator of dispersion shows a similar pattern. A one-standard-deviation increase in land reform decreases the coefficient of variation by 0.30 units, equivalent to nine percent of its mean or 21 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 1.32 ha. 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 0.08 log units ($=0.056*1.53$), equivalent to 1.09 ha. 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*, where the effect is statistically nil. The biggest coefficient is for the 20-200 ha/capita range, followed by the 3-10 ha/capita 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 0.218 log units, equivalent to 181 percent of its mean. Standardized effects for 3-10, 10-20 and

¹¹ World Bank data; <https://data.worldbank.org/>

20-200 ha/capita are 146 percent, 119 percent and 75 percent of their means, respectively.

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

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<3 ha/capita (log)	3-10 ha/capita (log)	10-20 ha/capita (log)	20-200 ha/capita (log)	200-500 ha/capita (log)	>500 ha/capita (log)
Potencial Land Reform - Hectares pc (Log)	0.149*** (0.006)	0.210*** (0.009)	0.163*** (0.008)	0.323*** (0.019)	0.082*** (0.012)	0.024 (0.022)
Potencial Land Reform - Hectares pc* Latifundia pc (Log)	-0.032*** (0.005)	-0.013* (0.007)	0.022*** (0.007)	0.097*** (0.015)	0.100*** (0.009)	0.112*** (0.018)
Constant	6.668* (3.602)	5.477 (5.249)	-0.552 (4.905)	-8.545 (11.149)	-0.921 (6.961)	7.546 (13.382)
Average Proportion allocated	Yes	Yes	Yes	Yes	Yes	Yes
Latifundia*Year	Yes	Yes	Yes	Yes	Yes	Yes
Area*year	Yes	Yes	Yes	Yes	Yes	Yes
Area squared*year	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity*Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,630	1,630	1,630	1,630	1,630	1,630
R-squared	0.467	0.495	0.468	0.501	0.406	0.143
Number of municipalities	815	815	815	815	815	815

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** p<0.01, ** p<0.05, * p<0.1

The *latifundia* interaction term is similarly significant (mostly) at the one percent level, but with signs that change in a way that is telling. The interaction term is positive for all four largest size categories, including the largest. But it is 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 below 10 ha, *latifundia* has the opposite effect, decreasing the number of small farms. This is worth underlining: the incremental effect of *latifundia* on a program to give small plots of land to poor farmers is *fewer* small farms. Also notable is 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.¹² Equations 1-3 test alternative

¹² As compared, for example, to local income per capita or tax receipts.

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
Potencial Land Reform - Hectares pc (Log)	-1.733*** (0.467)	-3.857*** (0.559)	-1.799*** (0.537)
Potencial Land Reform - Hectares pc*Latifundia pc (Log)		2.179*** (0.353)	1.340*** (0.342)
Constant	-200.275 (130.806)	78.772*** (0.773)	257.053 (171.988)
Average Proportion allocated	Yes	Yes	Yes
Latifundia*Year	No	Yes	Yes
Area*year	No	No	Yes
Area squared*year	No	No	Yes
Ethnicity*Year	No	No	Yes
Observations	3,260	3,260	3,260
R-squared	0.835	0.824	0.849
Number of municipalities	815	815	815

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis
 *** 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 reductions in UBN of between 1.7 and 3.9 units. To put this in context, a one-standard-deviation increase in land reform would decrease UBN by as much as 5.6 points, equivalent to nine percent of its mean or 37 percent of its standard deviation. But once again, these effects are mostly undone by concentrated landholdings. Using model (3), a one-standard-deviation increase in land reform decreases UBN by 2.6 points; a one-standard-deviation increase in *latifundia* drives UBN back up by 2.1 points, effectively undoing 80 percent of the positive effect of land reform on development.

Summary

Taken together, our results imply that the effects of land reform in Colombia are not symmetric across municipalities, but highly heterogeneous. And theory provides strong reasons why we should expect the effects of reform to 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 right-skewed 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 between 59-80 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 prevent the benefits of reform from flowing to the poorest farmers, instead capturing this land 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 both 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 (green

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 lowest 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 completely counteracts, and then exceeds, the beneficial effect of land reform. By the tenth decile, the *latifundia* effect is 133 percent of the land reform effect, producing a net increase in inequality of 0.007 Gini points. In other words, transferring land to landless and poor farmers in the presence of high *latifundia* not only does not decrease land inequality, but makes it worse.

Figure 4: Estimated Effects of Land Reform and *Latifundia* on Gini (by decile of *latifundia* per capita)

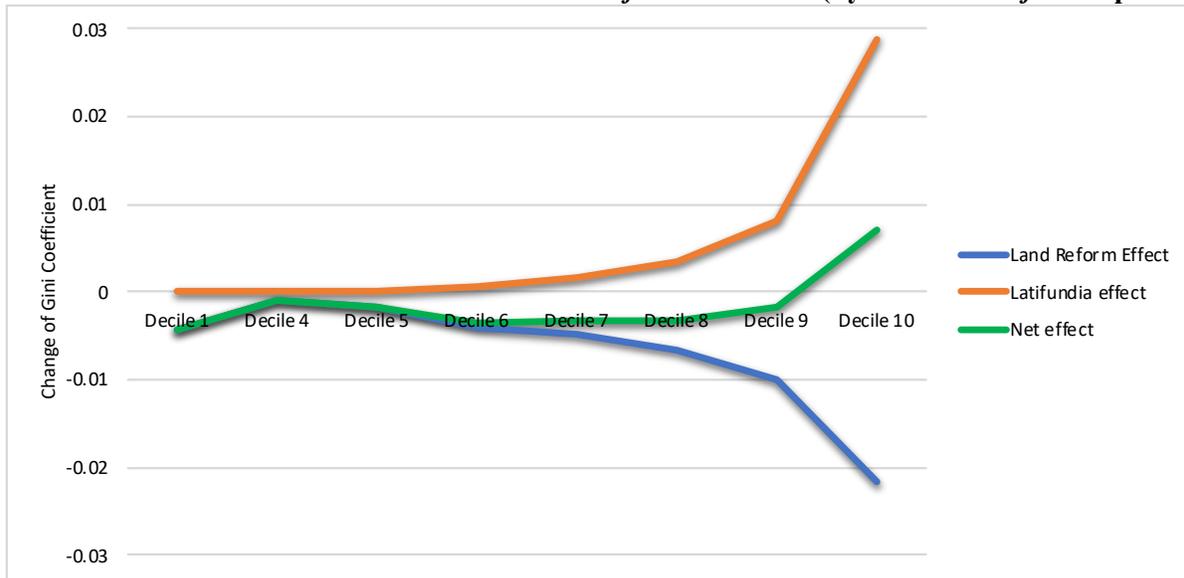


Figure 5 shows the incremental effects of land reform and *latifundia* on different categories of plot sizes. Land reform’s strongest effects are to increase landholdings in the intermediate 20-200 ha/capita category, followed by the smaller 3-10 ha/capita category, and then the 10-20 and <3 ha/capita categories. Land reform’s smallest effects are on the 200-500 and >500 ha/capita categories, as we would expect, though these are still positive. The effects of *latifundia*, by contrast, are negative for farms smaller than 3 and 10 ha/capita, but then rise consistently to peak in the largest two categories of farms above 200 and 500 ha/capita. The net effect of land reform on landholdings is positive across all categories, with a broadly secular rise (given by *latifundia*) from smallest to largest farms, and a large upward spike at 20-200

ha/capita. In sum, giving land to landless and poor farmers increases landholdings, but does so much more for medium and large farms than for small ones.

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

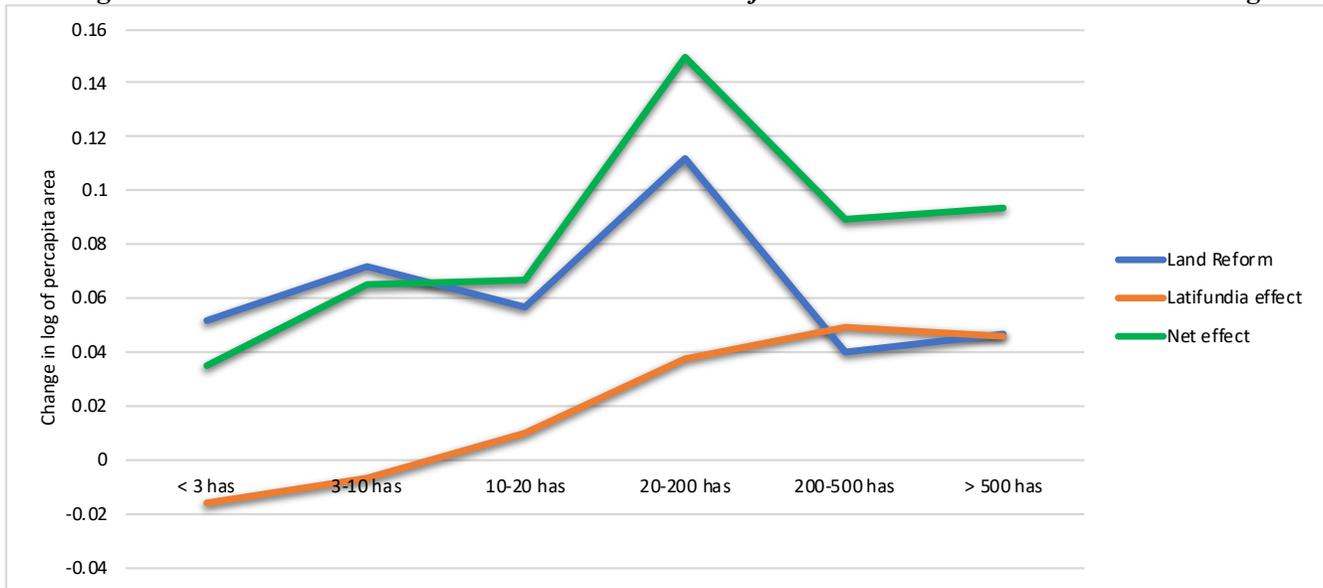
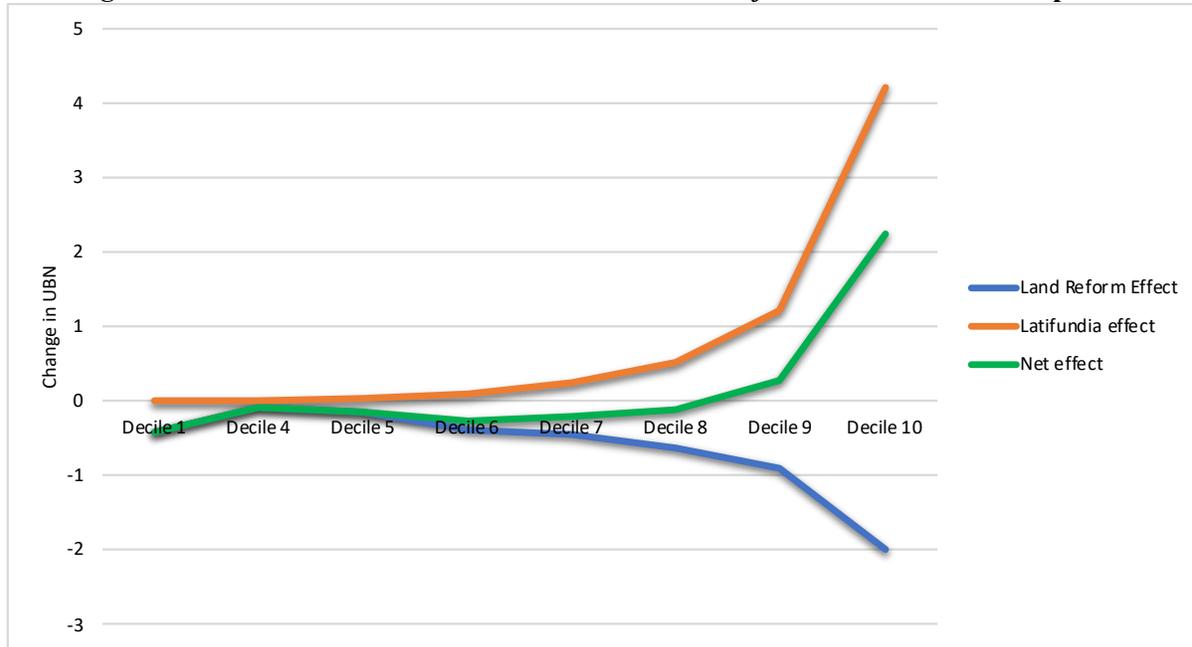


Figure 6 shows the incremental effects of land reform and *latifundia* on local development. Land reform decreases UBN throughout, thereby increasing development; it does so most strongly in the highest deciles, especially the 9th and 10th, where land inequality is greatest. *Latifundia* has a roughly mirror-image, opposite effect that counters this land reform effect. In the lower deciles, *latifundia*'s influence is small. But it then grows rapidly, countering 53 percent of the land reform effect in decile 7, and 82 percent in decile 8. By decile 9 *latifundia* completely undoes land reform's boost to development and then some, with an incremental effect that is -132 percent as large. In decile 10 the *latifundia* effect is -212 percent of land reform's beneficial effect. As a result, in both deciles the net effect of land reform in the presence of concentrated landholdings is strongly negative. In these municipalities, additional increments of land reform 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.

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



Patron and Clients in Action

How did *latifundistas* manage to counteract the effects of land reform in the municipalities they dominated? As patrons in a patron-client setting, they had a range of tools at their disposal, including their wealth, status, control over land, manipulation of interlinked markets, and mobilization of the rural vote, as described above. Unfortunately, data capturing most of these forms of power do not exist at the municipal level for Colombia. But we do have detailed electoral data for all of Colombia's municipalities, permitting us to probe the relationships between land reform, latifundia and a key vector of power: political competition.

There are solid theoretical reasons to think that greater competition in a political system leads to more responsive government, more and higher quality public goods, and pro-growth economic policies (Besley, Persson and Sturm 2010, Faguet 2012, Kosec et al 2018, Stasavage 2005). While there is no one commonly accepted measure of political competition, many of the variables scholars have used combine measures of turnout with the closeness of electoral results. The logic is that an election is more competitive when larger portions of the electorate votes and more than one party has a realistic chance of winning.¹³

¹³ Some scholars distinguish between the effects of participation vs. competition on policy. While an

Hence we investigate the effects of per capita land distributions on local political competition, specifically electoral turnout and political concentration, given different levels of *latifundia*. We expect *latifundia* to repress turnout and increase political concentration, implying lower levels of political competition. We then turn to policy outputs, examining land reform and *latifundia*'s effects on public investment and expenditure at the municipal level.

Table 5 examines the effects of land reform and *latifundia* on electoral turnout in municipal election in 1972, 1984, 1992, 2003, and 2007, and for congressional elections in 1970, 1982, 1990, 2002, and 2010, the latter separated by lower and upper house. Here and in the results that follow, *latifundia* proxies for patron-client relations. We see that land reform is associated with higher voter turnout across the board, implying an increase in political competition. All our coefficients are positive, significant at the one percent level, and vary within a relatively narrow range regardless of specification or elected body. By contrast, the *latifundia* term is associated with decreasing voter turnout in municipal elections. Our results for *latifundia* in congressional elections are too weak to reject the null hypothesis. Other variables behave as expected. In standardized terms, *latifundia* counteracts 25 percent $((-0.011*1.53)/(0.046*1.46))$ of the positive land reform effect in municipal elections. This implies that in municipalities with no or low *latifundia*, land reform increased the level of political competition. But in municipalities with highly concentrated landholding, land reform *decreased* political competition.

interesting distinction in many ways, it is too fine-grained for our purposes here. It is also somewhat problematic: an election result in which two parties received one vote each and all other voters abstained would be maximally competitive but democratically meaningless.

Table 5: Effects of Land Reform and *Latifundia* on Electoral Turnout

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Voter	Voter	Voter	Voter	Voter	Voter	Voter	Voter	Voter
	Turnout in	Turnout in	Turnout in	Turnout in	Turnout in	Turnout in	Turnout in	Turnout in	Turnout in
	Municipal	Municipal	Municipal	Lower	Lower	Lower	Upper	Upper	Upper
	Councils	Councils	Councils	House	House	House	House	House	House
VARIABLES	Elections	Elections	Elections	Elections	Elections	Elections	Elections	Elections	Elections
Potencial Land Reform - Hectares pc (Log)	0.030*** (0.003)	0.046*** (0.004)	0.036*** (0.004)	0.041*** (0.003)	0.041*** (0.004)	0.039*** (0.004)	0.038*** (0.003)	0.043*** (0.004)	0.040*** (0.004)
Potencial Land Reform - Hectares pc* Latifundia pc (Log)		-0.011*** (0.002)	-0.004* (0.003)		0.002 (0.003)	0.006** (0.003)		-0.003 (0.002)	0.001 (0.003)
Constant	1.594* (0.819)	0.253*** (0.006)	-4.356*** (1.286)	-0.189 (0.852)	0.293*** (0.006)	-3.273** (1.365)	-0.252 (0.830)	0.294*** (0.006)	-3.873*** (1.332)
Average Proportion allocated	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Latifundia*Year	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Area*year	No	No	Yes	No	No	Yes	No	No	Yes
Area squared*year	No	No	Yes	No	No	Yes	No	No	Yes
Ethnicity*Year	No	No	Yes	No	No	Yes	No	No	Yes
Observations	3,999	3,999	3,999	3,997	3,997	3,997	3,998	3,998	3,998
R-squared	815	815	815	815	815	815	815	815	815
Number of municipalities	0.557	0.543	0.575	0.021	0.008	0.031	0.054	0.040	0.064

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** p<0.01, ** p<0.05, * p<0.1

Table 6 examines the effects of land reform and *latifundia* on political concentration. As measures of concentration we use the winning party's margin of victory and its overall level of support. Where parties win with bigger margins and higher overall levels of support, concentration is higher and hence the system is less competitive. We see that land reform reduces both electoral victory margins and winning party vote totals across lower house, upper house, and municipal elections, regardless of specification, with high statistical significance. By contrast, *latifundia* increases victory margins and winning parties' level of support, across lower and upper house elections, although with more variable statistical significance. This effect does not hold for municipal elections. This implies that land reform increased political competition in both local and national elections in Colombia. But in municipalities where concentrated landholding sustained patron-client ties, land reform *decreased* political competition.

Table 6: Effects of Land Reform and *Latifundia* on Political Concentration

LOWER HOUSE ELECTIONS						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Electoral margin of victory	Electoral margin of victory	Electoral margin of victory	Winning Party Support	Winning Party Support	Winning Party Support
Potencial Land Reform - Hectares pc (Log)	-0.055*** (0.010)	-0.078*** (0.012)	-0.066*** (0.012)	-0.017*** (0.006)	-0.025*** (0.007)	-0.022*** (0.007)
Potencial Land Reform - Hectares pc* Latifundia pc (Log)		0.020*** (0.008)	0.018** (0.008)		0.008* (0.005)	0.009** (0.005)
Constant	-1.242 (2.558)	0.432*** (0.017)	-3.498 (4.087)	0.913 (1.541)	0.736*** (0.010)	-1.916 (2.472)
Average Proportion allocated	Yes	Yes	Yes	Yes	Yes	Yes
Latifundia*Year	No	Yes	Yes	No	Yes	Yes
Area*year	No	No	Yes	No	No	Yes
Area squared*year	No	No	Yes	No	No	Yes
Ethnicity*Year	No	No	Yes	No	No	Yes
Observations	4,000	4,000	4,000	4,000	4,000	4,000
R-squared	815	815	815	815	815	815
Number of municipalities	0.113	0.121	0.127	0.438	0.439	0.442

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** p<0.01, ** p<0.05, * p<0.1

UPPER HOUSE ELECTIONS						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Electoral margin of victory	Electoral margin of victory	Electoral margin of victory	Winning Party Support	Winning Party Support	Winning Party Support
Potencial Land Reform - Hectares pc (Log)	-0.063*** (0.010)	-0.087*** (0.012)	-0.072*** (0.012)	-0.015** (0.006)	-0.023*** (0.007)	-0.018** (0.007)
Potencial Land Reform - Hectares pc* Latifundia pc (Log)		0.023*** (0.008)	0.015* (0.008)		0.010** (0.004)	0.006 (0.005)
Constant	-3.932 (2.578)	0.412*** (0.017)	-0.468 (4.111)	-2.365 (1.512)	0.734*** (0.010)	-1.822 (2.426)
Average Proportion allocated	Yes	Yes	Yes	Yes	Yes	Yes
Latifundia*Year	No	Yes	Yes	No	Yes	Yes
Area*year	No	No	Yes	No	No	Yes
Area squared*year	No	No	Yes	No	No	Yes
Ethnicity*Year	No	No	Yes	No	No	Yes
Observations	4,003	4,003	4,003	4,003	4,003	4,003
R-squared	815	815	815	815	815	815
Number of municipalities	0.136	0.143	0.151	0.499	0.500	0.502

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** p<0.01, ** p<0.05, * p<0.1

MUNICIPAL COUNCILS ELECTIONS						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Electoral margin of victory	Electoral margin of victory	Electoral margin of victory	Winning Party Support	Winning Party Support	Winning Party Support
Potencial Land Reform - Hectares pc (Log)	-0.062*** (0.010)	-0.069*** (0.012)	-0.062*** (0.012)	-0.016** (0.006)	-0.016** (0.007)	-0.013* (0.007)
Potencial Land Reform - Hectares pc* Latifundia pc (Log)		-0.001 (0.007)	-0.005 (0.008)		-0.003 (0.005)	-0.007 (0.005)
Constant	3.033 (2.490)	0.293*** (0.017)	1.382 (3.931)	1.182 (1.548)	0.617*** (0.010)	0.873 (2.453)
Average Proportion allocated	Yes	Yes	Yes	Yes	Yes	Yes
Latifundia*Year	No	Yes	Yes	No	Yes	Yes
Area*year	No	No	Yes	No	No	Yes
Area squared*year	No	No	Yes	No	No	Yes
Ethnicity*Year	No	No	Yes	No	No	Yes
Observations	4,005	4,005	4,005	4,005	4,005	4,005
R-squared	815	815	815	815	815	815
Number of municipalities	0.273	0.281	0.294	0.547	0.552	0.557

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** p<0.01, ** p<0.05, * p<0.1

The patron-clientelism literature suggests, and the political competition literature predicts, that greater competition will lead to higher levels of public investment and public service provision, and greater tax effort (see above). Does this hold for Colombia? Table 7 examines the relationship between land reform and *latifundia* on public investment per capita, public service expenditure per capita, and tax revenues per capita. In separate results (omitted for the sake of brevity), we disaggregate tax revenues into property and non-property revenues. Our results indicate that public investment per capita, public service expenditure per capita, and tax revenues per capita all increase with land reform. These relationships are robust to different specifications and are all significant at the one percent level. By contrast, *latifundia* decreases public investment per capita, and there is some evidence that it decreases per capita public service expenditure as well. Tax revenues are unaffected by *latifundia* in all specifications. Disaggregating tax revenues by property/non-property sources produces identical results. These results imply that land reform promoted greater political competition, which in turn increased public investment and public service provision in affected municipalities, leading them to exert greater tax effort. But in municipalities with high levels of patron-clientelism, land reform is associated with lower political competition, causing public investment to

decline, and perhaps public service expenditures to decline too.

Table 7: Effects of Land Reform and *Latifundia* on Public Investment, Service Provision, and Tax Effort

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Public investment per capita (Log)	Public investment per capita (Log)	General public services expenditure per capita (Log)	General public services expenditure per capita (Log)	Tax revenues per capita (Log)	Tax revenues per capita (Log)
Potencial Land Reform - Hectares pc (Log)	0.853*** (0.052)	0.875*** (0.051)	0.784*** (0.026)	0.710*** (0.025)	0.483*** (0.040)	0.571*** (0.040)
Potencial Land Reform - Hectares pc* Latifundia pc (Log)	-0.169*** (0.045)	-0.113** (0.044)	-0.081*** (0.022)	-0.010 (0.022)	0.003 (0.034)	0.026 (0.035)
Constant	-0.013 (0.010)	-0.013 (0.009)	-0.000 (0.005)	-0.000 (0.005)	0.001 (0.007)	0.000 (0.007)
Average Proportion allocated Latifundia*Year	Yes	Yes	Yes	Yes	Yes	Yes
Area*year	No	Yes	No	Yes	No	Yes
Area squared*year	No	Yes	No	Yes	No	Yes
Ethnicity*Year	No	Yes	No	Yes	No	Yes
Observations	2,947	2,947	2,947	2,947	2,947	2,947
R-squared	0.904	0.913	0.702	0.738	0.814	0.824

Panel estimates with municipal and year fixed effects; Standard errors in parenthesis

*** 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 more complex questions of how elements of the institutional environment, such as the distribution of land, affect reforms aimed at boosting 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 in some municipalities the prevalence of *latifundia* – highly concentrated landholdings – significantly counters these beneficial effects, resulting in smaller rural properties, more dispersed landholdings, and lower levels of development. It is notable that in such places, a reform to distribute land to the landless and poor produced an increase in medium and large farms and greater land inequality.

Evidently, the benefits of a reform intended for the poor were captured by the rich in some municipalities, but reached the poor in others. By what mechanisms did these divergent results come about? Where *latifundia* was low or absent, land reform directly improved the wealth, income and well-being of the poor by transferring productive assets to them. But land reform's indirect effect is more interesting and potentially more powerful. Peasants who received land saw their social status rise. This, in turn, led them to participate more in local and national politics, raising electoral turnout and also the competitiveness of local and national elections. And increasing participation and competition led to more investment and expenditures in public services. Having taken on greater expenditure demands, such municipalities also increased their tax effort. Lastly, the combination of productive assets for the poor with greater public investment and service provision decreased poverty and increased development in these municipalities.

By contrast, municipalities with a high concentration of landholding (in the 9th and 10th deciles of *latifundia*) present opposite results. Here the beneficial effects of land reform were counteracted – often at levels above 100 percent – by a pernicious *latifundia* effect. In such municipalities, large landholders used patron-client power to capture land intended for the poor. This, in turn, allowed them to strengthen their grip on local politics. In such places, land inequality increased, which led in turn to falling voter participation and lower levels of political competition. Lower participation and competition led to decreasing public investment, and perhaps lower service provision too. The combination of greater land inequality and fewer small farms with lower public investment and service provision increased poverty and decreased development in these municipalities.

Additional evidence (see annex) suggests that land reform increased the share of agricultural expenditure in local public budgets. It 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 also, decreasing agriculture expenditure and worsening outcomes in housing and primary services.

Our evidence suggests that land reform in Colombia could have achieved far more. Landowning

elites' grip on local power allowed them to counter land reform in municipalities where they dominated, and even divert its benefits to themselves. Their ability to articulate this local power with congressional politics further allowed them to end redistribution nationally, in favour of a "Colombian model of land reform" via the distribution of vacant public lands. Where landed elites were absent, this model was good for the poor and good for development. But where landed elites were dominant, the lot of the poor worsened. Hence we can say that in purely analytical terms, it was a mistake not to redistribute *latifundia*. Doing so would likely have accelerated Colombia's development. Directly extracting land from the top of the distribution and redistributing it amongst the bottom could have powerfully reduced inequality. More potently, the countervailing power of elites would have been undermined. Distortion and capture in local politics would have been stymied. And Colombians today would be more equal, less poor, and more free.

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Appendix 1: Summary Statistics of Variables Used

Variable	Obs	Mean	Std. Dev.	Min	Max	Years
UBN	4484	62.17	22.96	5.36	100.00	1973-2005
Gini Coefficient of Plot Sizes	2155	0.69	0.11	0.02	0.98	2005-2010
Gini Coefficient of Plot Values	2127	0.67	0.09	0.18	0.98	2005-2010
Average Size of Rural Properties	3937	47.13	81.24	1.50	1000.00	1985-2010
Average Size of Rural Properties (Log)	3937	3.10	1.22	0.41	6.91	1985-2010
Coefficient of Variation of Plot Sizes	3937	3.26	1.40	0.00	10.24	1985-2010
Plots by Size Ranges Less than 3 has	2139	1425.03	1658.75	0.00	14070.32	1985-2010
Plots by Size Ranges 3-10 has	2139	2851.30	2629.76	0.00	20336.30	1985-2010
Plots by Size Ranges 10-20has	2139	2786.41	2644.75	0.00	27272.94	1985-2010
Plots by Size Ranges 20-200 has	2139	16087.78	22947.71	0.00	377095.60	1985-2010
Plots by Size Ranges 200-500 has	2139	5074.73	10335.81	0.00	111403.50	1985-2010
Plots by Size Ranges more than 500 has	2139	10812.07	67348.33	0.00	1403169.00	1985-2010
Plots by Size Ranges Less than 3 has percapita	2129	0.14	0.19	0.00	1.44	1985-2010
Plots by Size Ranges 3-10 has percapita	2129	0.27	0.35	0.00	7.38	1985-2010
Plots by Size Ranges 10-20has percapita	2129	0.24	0.44	0.00	16.99	1985-2010
Plots by Size Ranges 20-200 has percapita	2129	1.19	2.22	0.00	78.69	1985-2010
Plots by Size Ranges 200-500 has percapita	2129	0.38	0.90	0.00	11.76	1985-2010
Plots by Size Ranges more than 500 has percapita	2129	0.84	5.56	0.00	95.15	1985-2010
Plots by Size Ranges Less than 3 has percapita (Log)	2129	0.12	0.14	0.00	0.89	1985-2010
Plots by Size Ranges 3-10 has percapita (Log)	2129	0.21	0.20	0.00	2.13	1985-2010
Plots by Size Ranges 10-20has percapita (Log)	2129	0.20	0.18	0.00	2.89	1985-2010
Plots by Size Ranges 20-200 has percapita (Log)	2129	0.63	0.51	0.00	4.38	1985-2010
Plots by Size Ranges 200-500 has percapita (Log)	2129	0.23	0.35	0.00	2.55	1985-2010
Plots by Size Ranges more than 500 has percapita (Log)	2129	0.22	0.52	0.00	4.57	1985-2010
Allocated land hectares pc (Log)	5542	1.40	6.90	0.00	223.58	1973-2010
Allocated land hectares pc	5542	0.38	0.68	0.00	5.41	1973-2010
Potencial Land Reform-Hectares pc	5479	4.10	39.47	0.00	1166.22	1973-2010
Potencial Land Reform-Hectares pc (Log)	5479	-0.99	1.46	-6.52	7.06	1973-2010
Latifundia in 1961 hectares	4125	13444.68	71114.39	0.00	1450956.00	1961
Latifundia in 1961 hectares pc	4075	6.42	71.85	0.00	1804.15	1961
Latifundia in 1961 hectares pc (Log)	4075	0.56	0.91	0.00	7.50	1961
Proportion of Latifundia 1961 over rural cadastral (hectares)	3960	0.14	0.18	0.00	0.99	1961
Average Proportion allocated	5605	0.13	0.13	0.00	0.54	1973-2010
Lower ninety five percent of owners	1767	0.34	0.08	0.02	0.66	2005-2011
Lower fifty percent of owners	1769	0.07	0.04	0.00	0.63	2005-2012
Highest ten percent of owners	1767	0.59	0.11	0.18	0.98	2005-2013
Voter Turnout in Municipal Councils Elections	5078	0.27	0.12	0	0.97	1973-2010
Voter Turnout in Lower House Elections	5139	0.26	0.1	0	0.96	1973-2010
Voter Turnout in Upper House Elections	5144	0.26	0.1	0	0.97	1973-2010
Electoral margin of victory in Municipal Councils Elections	5097	0.29	0.27	0	1	1973-2010
Electoral margin of victory in Lower House Elections	5174	0.4	0.29	0	1	1973-2010
Electoral margin of victory in Upper House Elections	5179	0.39	0.29	0	1	1973-2010
Winning Party Support in Municipal Councils Elections	5097	0.54	0.21	0.11	1	1973-2010
Winning Party Support in Lower House Elections	5174	0.64	0.2	0.18	1	1973-2010
Winning Party Support in Upper House Elections	5179	0.62	0.21	0.17	1	1973-2010
Percentage of afro and indigenous population	5414	19.49	18.16	0	94.06	1912
Dummy of afro & indigenous population > national mean	5655	0.34	0.47	0	1	1912
Public investment (millon COP, 2008 prices)	4114	10018.65	116792.53	0.59	6071488	1985-2010
General public services (millon COP, 2008 prices)	4145	3256.09	32227.71	31.79	1299666.63	1985-2010
Tax revenues (millon COP, 2008 prices)	4145	4213.73	73025.53	0.39	3813365.5	1985-2010
Property tax (millon COP, 2008 prices)	4128	1191.68	16333.21	0.02	709649.56	1985-2010
Public investment per capita	4110	0.3	0.57	0	23.64	1985-2010
General public services per capita	4140	0.09	0.11	0.01	3.92	1985-2010
Tax revenues per capita	4140	0.04	0.08	0	1.12	1985-2010
Property tax per capita	4123	0.02	0.03	0	0.94	1985-2010
Public investment per capita (Log)	4110	-2.23	1.73	-9.21	3.16	1985-2010
General public services per capita (Log)	4140	-2.67	0.62	-4.77	1.37	1985-2010
Tax revenues per capita (Log)	4140	-3.93	1.32	-10.05	0.12	1985-2010
Property tax per capita (Log)	4123	-4.88	1.29	-12.94	-0.06	1985-2010

Appendix 2: Effects of Land Reform on Agricultural Expenditure, and on Consumption of Public and Private Goods (Internet Only)

The results that follow investigate the effects of land reform and *latifundia* on perhaps the most important component of public expenditure for the rural economy, agriculture. We estimate

$$e_i = \zeta_i + \gamma_1 \text{PLRpc}_i + \gamma_2 \text{PLRpc}_i * \text{L1960}_i + \gamma_3 \text{L1960}_i * d_t + \gamma_4 \text{Area}_i * d_t + \mathbf{Z}_i + \varepsilon_i, \quad (\text{A.1})$$

where e is different measures of local agricultural expenditure in municipality i , ζ are department and regional fixed effects, \mathbf{Z} is a vector of standard geographic controls, and remaining variables are defined as above. We then disaggregate the UBN index and investigate the effects of land reform and *latifundia* on the different aspects of public and private consumption that make it up. We interpret these as indicators of poverty that are particularly susceptible to public policy. The logic of both sets of regressions is to probe more deeply the micro mechanisms by which land reform and *latifundia* affect municipal development.

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.

Table A2.1 shows that 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, the *latifundia* effect reduces that of land

reform, decreasing agriculture investment where large landholders predominate. Other control variables behave as expected.

Table A2.1: Effects of Land Reform and *Latifundia* on Local Agricultural Expenditure

VARIABLES	(1)	(2)	(3)	(4)
	Agriculture expenditure/ Total expenditure	Agriculture expenditure /Total investment	Agriculture expenditure/ Total expenditure	Agriculture expenditure/ Total investment
Potencial Land Reform-Hectares pc (Log)	0.00174*** (0.000333)	0.00198*** (0.000390)	0.00160*** (0.000353)	0.00180*** (0.000415)
Potencial Land Reform-Hectares pc*Latifundia pc (Log)	-0.000488** (0.000189)	-0.000572** (0.000222)	-0.000489*** (0.000189)	-0.000569** (0.000222)
Constant	0.0806*** (0.0151)	0.0948*** (0.0177)	0.0790*** (0.0155)	0.0923*** (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 A2.2 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.

Table A2.2: Effects of Land Reform and *Latifundia* on Independent UBN Components

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Population overcrowded (percent)	Population overcrowded (percent)	Population with inadequate housing (percent)	Population with inadequate housing (percent)	Population with inadequate public utilities (percent) +	Population with inadequate public utilities (percent)	School non-attendance (percent)	School non-attendance (percent)
Potential land reform ha pc (log)	-1.205** (0.554)	-1.041* (0.555)	-2.841*** (0.866)	-2.037** (0.861)	-6.631*** (0.984)	-4.878*** (1.046)	-1.503*** (0.379)	-0.964** (0.397)
Potential land reform ha pc* Latifundia pc (log)	-0.0735 (0.376)	0.185 (0.394)	1.814*** (0.589)	1.071* (0.613)	2.394*** (0.700)	1.622** (0.742)	0.479* (0.270)	0.601** (0.281)
Constant	60.98*** (0.791)	306.9 (212.2)	43.49*** (1.234)	729.7** (329.3)	46.64*** (1.387)	606.1*** (166.5)	8.820*** (0.534)	49.37 (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