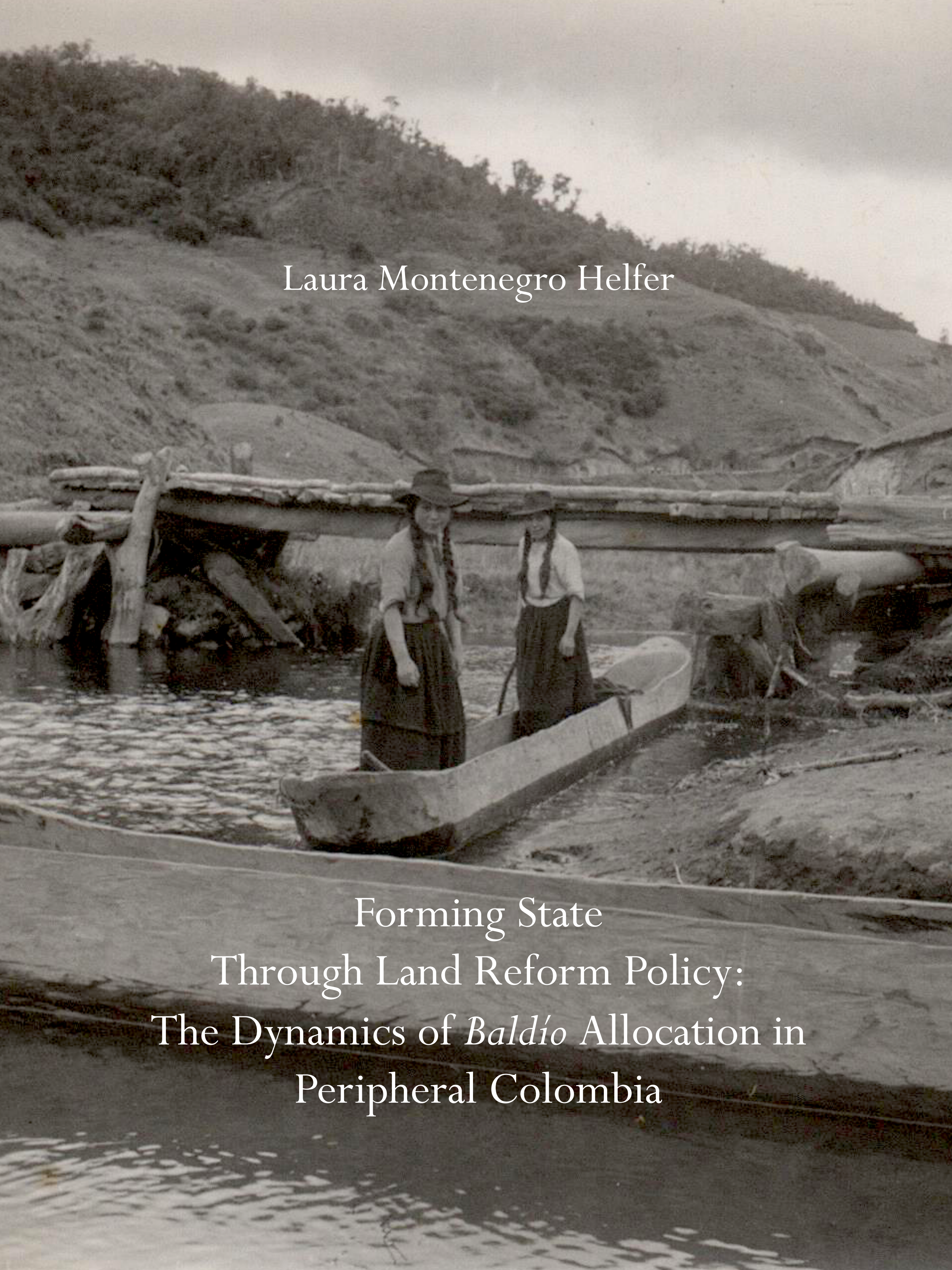

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Forming State Through Land Reform Policy: The Dynamics of *Baldío* Allocation in Peripheral Colombia

Forming State through Land Reform Policy: The Dynamics of *Baldío* Allocation in Peripheral Colombia

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Abstract

This paper analyses land policy when the state lacks the monopoly of legitimate violence (MLV) through a territory. I use historical data for Colombia to empirically assess the dynamics through which the central state allocates land in such a scenario. I argue that colonization processes directed towards peripheral areas with lack of MLV induces the state to attempt building capacity using land policy. Public goods nevertheless do not follow. I use an instrumental variable strategy in order to examine these hypotheses. Results show that rural migration towards the peripheral areas accounts for 42.01% of the total number and 68.55% of the total hectares of public land allocations. Allocations however account for only the 7.89% of the number policemen and the 6% of the number of policemen per inhabitant in these regions. Moreover, both their total and *per* hectare effect on police presence is much higher in the integrated zones than in the peripheral ones.

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†The pictures at the beginning and end of this document were taken by Erwin Helfer during the early 1950s in Southern Colombia. The cover picture portrays two peasants in the Río Bobo region wearing traditional *polleras*. The picture at the end depicts a woman grinding corn by hand. This millenary practice has survived the passing of the years and is still found in some regions of Colombia.

"I always think it is easier to herd cattle, not people, towards the far away zones of the country."
—Ricardo Uribe Escobar, *cited by Carlos Lleras Restrepo in Congress, 1961*

Introduction

State formation–or state building–has been theorized to emerge due to a variety of factors. The territorial cohesion around a sovereign center (Elias, 1990), the internal coordination of economic and political groups (Olson, 1987; Centeno, 1997; Robinson, 2015), the incidence of external war and violent domestic conflict (Tilly, 1992; Besley & Persson, 2010b, 2010a), and the symbolic dominance of the state as a bureaucratic actor (Bourdieu, 2002) have been argued to explain its genesis and development. The most prominent view on state formation however refers to the state's capacity to enforce the monopoly of legitimate violence (MLV) throughout the territory (Huntington, 1968). Without the ability of evenly providing security across a country, the state cannot build overall public good capacity on fiscal, administrative, or legal aspects (Olson, 1987; Binswanger et al., 1995; Acemoglu et al., 2016).

Although the literature amply discusses the importance of the MLV as a precursor for effective public good provision, many questions still remain unanswered. The strategies used by a central state that has been unsuccessful in providing the MLV across the territory have not yet been fully understood. This raises significant questions since the problems and potential solutions a state with low degrees of governance faces differ from those of a fully formed state: the former must deal with the existence of peripheral regions that it is unable to control due to the lack of the MLV. This paper's contribution is to provide evidence on one such strategy. I argue that the economic organization of agriculture is used as an attempt to satisfy the increasing demands for state capacity that result from accentuating migration towards these peripheral areas.

The nature and determinants of agrarian organization have been widely studied in the literature. In addition to the characteristics of the economic environment, both the definition and contestation of property rights trigger agrarian reform policies (Binswanger et al., 1995). Agrarian reforms have been used as instruments for forestalling conflict or revolution (Horowitz, 1993; Grossman, 1994) in the absence of markets for land leases and labor (Conning & Robinson, 2007), or employed as political tools in order to deal with opportunistic reelection concerns and electoral competition (Bardhan & Mookherjee, 2010). The present paper differs from these interpretations by arguing that the central state implements land reform policy in order to try to *form* state capacity in peripheral zones where it is unable to provide the MLV.

Implementing policies is nevertheless not equivalent to forging institutionality (Acemoglu, 2003). Policies are choices taken within a given social and political structure while institutions are this structure's long duration determinants (and thus constrain policies). Implementing centrally designed policies will therefore lead to irregular results when institutionality is incipient across a territory. Consequently, although land policy should in theory provide a framework for land sales by reducing asymmetric information and legitimating land rights (Binswanger et al., 1995), the lack or presence of state institutionality will determine whether these ends are or not met. Forming state capacity through land reform policy is therefore likely to fail in peripheral regions without the state's preexisting MLV.

I test these questions for the case of Colombia where economic opportunities and conflict around the distribution of land property rights have triggered peasant migration towards the peripheral areas of the country. In an attempt of meeting the new demand for state institutionality the central state has allocated *baldíos*–public owned lands–in these areas contingent on migration. Public goods such as police presence have nevertheless been unable to follow suit. Moreover, directing land policy towards peripheral regions has indirectly protected the concentrated land tenancy *status quo* located in the most productive and better provisioned lands of the country. This situation reflects the inability of the Colombian central state to forge strong and meaningful institutionality in regions where it is unable to provide the MLV.

I estimate two different models. The first one estimates the effect of migration on the allocation of *baldíos* at the municipal level; the second ones measures the effect of *baldío* allocation on the central state's municipal provision of policemen–which proxies the most fundamental public good, security. I measure migration with the national censuses for years 1973, 1993, and 2005 and build a set of *baldío* allocation variables using the Colombian Institute for Rural Development (INCODER in its Spanish acronym) database for years 1901 to 2013. I then use information on municipality police presence between 2002 and 2013 from the National Department of Planning (DNP in its Spanish acronym). I first estimate the models in fixed effects panel form. I later use an instrumental variable strategy in order to address persisting endogeneity problems.

Results show that migration towards the rural areas of the peripheral municipalities has a positive and significant effect on the state's allocation of *baldíos*: 42.01% of the total number and 68.55% of the total hectares of *baldío* allocations. Additionally, the allocation of *baldíos* has a positive and significant effect on the provision of police presence in peripheral areas; this effect is nevertheless small and highly inefficient[1]. These results suggest that the allocation of *baldíos* is not a good tool to increase central state capacity in the regions where it is scarce. This might come as a surprise when considering that *baldío* allocation has been the most frequently discussed and implemented rural policy in Colombia for the purposes of building state capacity (Fajardo Montaña, 1993; Montenegro Helfer, 2014).

1 Forming state through land reform policy and the problem of public good provision

The mechanisms that lead to the use of land reform as a state formation policy in peripheral areas can be explored through a simple model on the emergence and development of land property rights. When population density is high the competition for high quality and integrated lands–that are better irrigated, located near markets, and provided with public goods–leads to demands for ownership security and cultivation rights (Binswanger et al.,

[1]7.89% of the number policemen and 6% of the number of policemen per inhabitant.

1995). A bargaining process arises between landlords and peasants in order to secure access to good land and labor for agricultural production. The bargaining conditions are nevertheless seldom egalitarian: strong actors such as landlords try to access labor through different means by increasing the profitability of tenancy or usufructuary contracts relative to that of independent peasant cultivation[2].

A sufficiently powerful landowning elite may therefore offer high quality land for improving the utility of production under contract or induce the government to introduce economic distortions in order to tie rural workers to their land (Binswanger et al., 1995)[3]. Peasants will choose between (i) working for a landowner as tenants, usufructuaries, or under another contractual arrangement or (ii) engaging in independent farming. In order for them to choose the latter, the utility associated with independent cultivation must be equal to or larger than their reservation price as workers. However, if landlords concentrate the land with better access to public goods and markets, peasants will be forced to move towards the peripheral zones of the territory in order to remain independent (LeGrand, 1988; Binswanger et al., 1995).

Given that peripheral lands require higher investments than integrated ones to make cultivation productive[4], two channels might help boost migration towards these areas. First, exceptionably profitable economic opportunities–such as resource extraction, illegal mining, or novel or illegal crop cultivation (Molano, 1994; Binswanger et al., 1995). Second, a redistributive agrarian reform attempt inside the integrated lands–or equivalently, within the agrarian frontier. Although the policy should in theory transfer rents from landlords to tenants by changing land ownership distributions[5], if agrarian reform is gradually applied–as opposed to rapidly enforced–and landowners are able to anticipate expropriation, they

[2]Binswanger et al. (1995) argue that under simple technology owner-operated family farms are the economically most efficient form of production, assuming no economies of scale in farming. The argument behind this assumption is that family farms save on the supervision costs of labor as well as in moral hazard (incentive) problems associated with tenancy.

[3]Economic distortions might include restricting land use, confining agricultural public goods and services to some areas, imposing differential taxation on owners and workers, or limiting market access (Binswanger et al., 1995).

[4]Poor infrastructure, low access to markets, and low investment opportunities that arise from the lack of ownership security diminish the utility of cultivation in these areas (Binswanger et al., 1995).

[5]That are unequal due to economic distortions in land sales markets and inefficient property right titling.

might evict tenants beyond the limits of the frontier in order to reduce their exposure to expropriation (LeGrand, 1988; Conning & Robinson, 2007).

The instruments available to large landowners for protecting their access to land reflect the negative consequences of the state's incipient institutionality throughout the territory. First, the state does not have the tools to hold back the process of land concentration. Second, the state faces difficulties dismantling the economic distortions that tie workers to private land. Third, the central state is unable to avoid the eviction of peasants when it announces expropriation policies. Fourth, the influence of powerful rural actors might be strong enough to directly impact the central state's policy-making. Such an extensive influence of the elite has been widely reported in the case of Colombia (Guillén Martínez, 1979; Urrutia, 1991; Robinson, 2005; Acemoglu & Robinson, 2012; González, 2014; Montenegro Helfer, 2014; Robinson, 2015).

A second bargaining process therefore arises between the central state and the rural landowners. The central state wishes to build capacity in the peripheral areas that are strong migrant recipients; landowners seek to avoid land expropriation in the integrated areas of the country. Since (i) the integrated lands with access to markets and public good provision are unavailable for redistribution and (ii) the costs associated with production in marginal areas are inherently high, they agree on allocating public lands to small landowners in the peripheral areas (Montenegro Helfer, 2014). Land allocation outside the frontier has the potential to improve rural production by forging central state presence in the peripheral areas while making expropriation unnecessary in the integrated ones (LeGrand, 1988)[6].

However, although land allocation policy should in theory provide a land sales institutional framework by reducing asymmetric information problems and legitimizing land rights (Binswanger et al., 1995), land title allocation in peripheral regions that lack the state's provision of the MLV is unlikely to lead to the enforcement of land property rights. Given the incipient stage of state formation and institutionality in these areas, asymmetric information and risk are at their extreme levels. Private institutions–such as gunmen or

[6]For a thorough review on land policy in Colombia see Moncayo C. (1975).

informal economic actors–protect land property rights by their own means and challenge the enforcement of land titles allocated by the state (Binswanger et al., 1995). These land titles will therefore not be credible. Public land allocation in peripheral regions will not provide the means for building state capacity.

Quite on the contrary, the existence of peripheral areas has been argued to have a negative effect on economic and political development when a country's incipient political institutionality hampers their efficient allocation (García-Jimeno & Robinson, 2009). Furthermore, evidence suggests that from a long term point of view historical *baldío* allocation has enhanced forced displacement in the municipalities where it was most implemented (Salas, 2014) and has not always been profound enough so as to withhold guerrilla warfare (Albertus & Kaplan, 2012).

2 The model: A two-sided story on *baldío* allocation

The objective of this paper is to study two sides of the Colombian central state's *baldío* allocation policy. First, I analyze the effect of migration on the number and size of allocated *baldíos* at the municipality level. Rural migration reflects the lack of land in the integrated regions of the country as well as the emergence of novel economic opportunities in the peripheral ones. Second, I estimate the effect of *baldío* allocations on public good provision–measured as the municipality level police presence. The identification strategy for both outcomes exploits the panel nature of the data. I first estimate each model using municipality and year fixed effects–for year cuts 1973, 1993, and 2005 in the first case and years 2002 to 2013 in the second one. I then estimate both models using a two stage instrumental variable strategy in order to address prevailing endogeneity problems.

2.1 The data

I use four different data sources in this paper. The first one is a set of National Censuses covering the years 1973, 1993, and 2005[7]. The household questionnaires for all three

[7] I did not include the 1964 and 1985 censuses as part of the panel due to restrictions in the data.

censuses contain microdata on individuals that I use to build variables for both the total population and the migration streams at the municipality level. I additionally use municipality population information for 1964 in order to reduce endogeneity problems in the models[8]. The second data source is the CEDE's panel[9]. I use two of its information sets. First, I use geographical data that I merge with the census data in order to calculate the municipalities' population densities for each year cut. The geographical variables come from the National Administrative Department of Statistics[10].

Second, I use the CEDE's panel to include conflict controls for some of this paper's main estimations. This data is provided by the Ministry of Defense and the Integrated System for Illicit Crop Monitoring[11]. The third source I use is the Colombian Institute for Rural Development's *baldío* database (INCODER in its Spanish acronym). The data contains information regarding the central state's *baldío* allocation policy at the municipal level for years 1901 to 2013. Finally, the fourth and last data source I use is the National Department of Planning's (DNP in its Spanish acronym) information on national police presence. This is a proxy measure for the central state's provision of public goods. The data is available from 2002 to 2013 and offers information on the number of policemen per municipality in each of the sample years.

A technical note on the data is worth mentioning. All historical data at the municipality level used in this paper–such as *baldío* allocations, migration, and total population–was adjusted by standardizing it to its 2005 municipality political border equivalent. Accounting for these changes is essential since the 1119 municipalities that were registered in 2005 (the date for the last census in Colombia) have been subject to various border transformations in the past decades[12]. This means that a municipality that had information registered in 1973 may not exist as such in 2005. Without this political border adjustment the

[8]This variable was kindly provided by Fabio Sánchez.
[9]Center of Economic Development Studies, in its Spanish acronym
[10]DANE in its Spanish acronym.
[11]SIMCI in its Spanish acronym.
[12]I followed the methodology developed by Salas (2014) and further adjusted it with official data on borders–provided by Juan Felipe Riaño and Leopoldo Fergusson. This information is nevertheless not carved in stone. Ambiguity exists in the political definition of municipality borders across time probably due to precisely the phenomenon this paper attempts to study: the lax definition of land property rights. Further, some municipalities could not be rebuilt for all panel cuts.

information collected in different points of time would not be comparable. This paper is probably one of the first attempts of building a panel with such ample historical data for Colombia.

2.2 The identification strategy and some descriptive statistics

2.2.1 Model 1: The effect of migration on *baldío* allocations

The first model estimates the impact of migration on the number and size of *baldío* allocations at the municipality level. This model focuses on two variables that account for this paper's central argument: migration and population density–where the latter is used to proxy the peripheral municipalities. The purpose is to show that migration to the marginal areas of the country is followed by *baldío* allocation policy, while migration towards the integrated zones does not trigger such a policy response. This is to be expected since the peripheral areas are more likely to have available public lands for allocation than the integrated ones–given the interest of preserving the land *status quo*. Model (1) for this estimation can be written as follows:

$$\begin{aligned} BA_{it} = \beta_{0it} + \beta_1 M_{1it} + \beta_2 F_{2it} + \\ \alpha_i + \gamma_t + \beta_3 X_{1it} + ... + \beta_{(n+3)} X_{(n)it} + u_{it} \end{aligned} \tag{1}$$

where the dependent variable 'BA_{it}' is the sum of the (i) number or the (ii) size of *baldío* allocations in municipality i in the eight years after census t (where $t = 1973, 1993, 2005$)[13]. The variable of interest 'M_{1it}' is the sum of the total number of individuals who reported having migrated to municipality i in the five years prior to census t, the census year inclusive. This five year threshold is directly defined by the way the census question was asked–which remains constant for the three census years.

'F_{2it}' is a dummy variable that determines whether municipality i is or not peripheral based on the calculation of its population density. I build two different thresholds for this variable. The first one is equal to one when the municipality i has less than 10 inhabitants

[13] For the sake of symmetry, *baldío* allocations were aggregated in groups of eight year periods since the data is available up to 2013, that is eight years after 2005 which is the newest census in Colombia.

per square kilometer and the second one is equal to one when the municipality has less than 50. I include these dummies in the paper's set of estimations in a variety of ways. I first introduce them in the regressions as dummy variables. I subsequently use them to divide the total sample into four different subsamples (playing with $F_{2it} = 1$ and $F_{2it} = 0$): (i) one sample that only includes municipalities with less than 10 inhabitants per km^2, (ii) another one only with municipalities with less than 50, (iii) one only with municipalities with more than 10, and (iv) one only with those with more than 50.

Two points on this. First, the municipality peripherality measure is *lagged*: to determine whether in 1973 a municipality is peripheral I calculate its population density in 1964–the previous census–and do the same for the other year cuts. I do this to reduce endogeneity problems in the estimation. Second, I chose to report results for the 10 and 50 inhabitants per km^2 thresholds somehow arbitrarily. The average municipality population density in the sample is of 51.27 inhabitants per km^2 in 1964, 74.5 in 1973, 112.51 in 1993, and 138.8 in 2005. The 10 and 50 thresholds are therefore low. However, the percentage of municipalities that comes under these thresholds–and those in their proximity–represents a significant portion of the total sample. This is why I chose to estimate the models using these population density limits.

Table 1 specifies the number and percentage of municipalities in each population density group for all year cuts. The number of municipalities with less than 10 and 50 inhabitants per km^2 diminishes as time passes, which is expected when population has a tendency to increase (Table 4). Municipalities with less than 10 inhabitants per km^2 account for roughly 17% of the lagged years that are included in the regressions (1964, 1973, and 1993); the ones with less than 50 do so for approximately 60%. It is important to note that the main results of this paper are not affected by changes in these thresholds. When estimating regressions with 5, 20, 30, 40, 60, 70, and 80 inhabitants per km^2 thresholds no significant differences arise in the results or do so in a fashion that is consistent with the theory's main predictions.

Table 2 shows the average municipality number and size of *baldío* allocations in the eight years after each census for the different lagged population density groups. The table shows that the number and size of allocated *baldíos* is higher in the most peripheral municipalities–those with less than 10 inhabitants per km^2 followed by those with less than 50. The highest number of *baldío* allocations is after 1973; the lower is in 1993. The data therefore shows significant variation in *baldío* allocations throughout time.

Table 3 shows the average number of municipality migrants for each lagged population density group in the three panel years. The censuses allow migration data to be further separated into (i) migration to the urban areas from (ii) migration to the rural areas of the municipalities[14]. Migration in 1973 was the highest relative to the population (see Table 4). This might come as a surprise given Colombia's overall population increase in the last forty years: although population has significantly increased migration has sharply decreased. In 1973 average immigrants per municipality were 16.54% of the population, compared to 12.98% in 1993, and 6.5% in 2005.

Migration towards the rural areas was higher in 1973 than in 1993 or 2005. Further, rural migration in 1973 is higher than migration to the urban areas for municipalities with less than 50 inhabitants per km^2. In contrast, for all the rest of the categories migration towards the urban areas always exceeds migration to the rural areas of the municipalities. These descriptive statistics show how the importance of the rural areas has been in decline. The evidence for Colombia is congruent with the observed worldwide trend of people migrating towards the urban centers.

The terms 'α_i' and 'γ_t' are the model's municipality and year fixed effects. The municipality fixed effect 'α_i' captures all the time invariant municipality level unobservables that would otherwise be included in the idiosyncratic error term 'u_{it}' were the model estimated as a pooled OLS. Including 'α_i' in the model therefore allows me to control for factors that might affect 'BA_{it}' such as the municipality's geography, its long run political culture, or persistent economic characteristics. The time fixed effect 'γ_t' controls for unobservables that change each year for *all* municipalities. These might include macroeconomic cycles or changes in national-level politics.

[14]Urban areas are defined as the municipalities' capital (*cabeceras municipales* in Spanish). Rural areas refer to small populated centers or zones where households are sparsely scattered.

Although both types of fixed effects control for a variety of unobservables, endogeneity problems persist. Unobservable variables that change in time *and* across municipalities lead to inconsistent '$\hat{\beta}_1$' and '$\hat{\beta}_2$'. In order to deal with this problem I first include 'X_{1it}' to '$X_{(n)it}$' which are covariates at the municipality level that change for each year cut t. These are (i) the total municipality population and (ii) the historical cumulative allocation of *baldíos* between 1901 and the year before census year t (see Table 5). The first covariate controls for population size and is expected to negatively affect *baldío* allocation (population levels might hamper land policy after a certain threshold); the second one controls for past cumulative *baldío* allocations that might negatively influence future allocations. The latter effect means that the peripheral municipalities attain at some point their full available *baldío* capacity forcing the state to allocate land in farther municipalities.

Conflict may also influence *baldío* allocation. Evidence suggests that *baldío* allocation has been used in order to appease violent outbreaks in regions with no state control– although with limited success (Fajardo Montaña, 1993). These highly mutable conflict related covariates might therefore positively affect *baldío* allocations in different points of time. Controlling for these factors is nevertheless not possible in the case of Model 1. Systematic conflict information is to my knowledge non existent for the seventies in Colombia. In order to cope with prevalent endogeneity problems I therefore build an instrument and estimate a 2SLS model. I build an exogenous variable that measures the municipality potential of migration. The instrument is defined as the interaction between the national migration trend in year t, the population, and a migration cost index. I write 'PM_{it}' as follows:

$$PM_{it} = national\ migration\ trend_t \cdot population_i \cdot migration\ costs_i \tag{2}$$

where

$$national\ migration\ trend_t = \frac{\sum_{i=1} migration_{it}}{\sum_{i=1} population_{it}} \tag{3}$$

and

$$migration\ costs_i = \sum_{j=1} distance_{ij} \tag{4}$$

The variable '*national migration trend*$_t$' defined in equation (3) measures the ratio of country level migrants to total population in year t (where $t = 1973, 1993, 2005$). This ratio captures migration trends at the national level not the municipality one (that might be affected by local dynamics). The variable *migration costs*$_{it}$ defined in (4) is an index that measures municipality i's distance from the rest of municipalities j in the country. I built this variable by aggregating all the distances from municipality i to all municipalities j. The higher the index, the more costly it is to migrate to municipality i relative to the other municipalities j in the territory. 'PM_{it}' defined in (2) is the interaction between these two variables and the population of the municipality. It captures the fraction of the municipality population that potentially migrated and the migration costs.

2.2.2 Model 2: The effect of *baldío* allocations on public good provision

Model 2 explores whether the number and size of *baldío* allocations is followed by the central state's provision of public goods–measured as the number of policemen per municipality. As in the case of Model 1, this model focuses on two different variables: *baldío* allocations and lagged population density–where the latter is once again used to determine whether a municipality is or not peripheral. *Baldío* allocations are expected to have a positive and significant effect on the number of policemen per municipality. The magnitude of this effect is nevertheless anticipated to vary depending on how peripheral the municipality is. The more integrated the region the more likely it is for the central state's public good provision to follow *baldío* allocations. Peripheral municipalities will be less likely to benefit from this policy. Model 2 can be written as follows:

$$\begin{aligned} P_{i(t+1)} = {} & \beta_{0it} + \beta_1 BA_{1it} + \beta_2 F_{2it} + \\ & \alpha_i + \gamma_t + \beta_3 X_{1it} + ... + \beta_{(n+3)} X_{(n)it} + u_{it} \end{aligned} \tag{5}$$

where the dependent variable '$P_{i(t+1)}$' measures police presence for years 2002 to 2013. I define this variable in two different ways: (i) the total number of policemen in municipality i and (ii) the number of policemen per inhabitant in municipality i–measured according to the 2005 census information. I include these different police presence measures in order to highlight the diverse policy angles a central state might focus on when allocating public goods: its provision in terms of absolute value and of value per inhabitant. Making these distinctions is particularly relevant for estimating Model 2. The state does not only differentially allocate *baldíos* throughout the territory. It also provides public goods differently depending on whether regions are integrated or peripheral.

Figure 1 contains two graph panels that show the municipalities' number of policemen and number of policemen per inhabitant for each population density group. The panels show considerable heterogeneity. Panel 1 depicts the increase in the number of policemen per municipality between 2002 and 2013. With an average of 43.68 policemen per municipality in 2002 and an average of 84.25 in 2013, large differences arise when the data is disaggregated by population density groups. Panel 1 clearly shows an inverse relationship between the number of policemen per municipality and the municipality's population density. Municipalities with less than 50 inhabitants per km^2 have 20.63 policemen on average between 2002 and 2013 while those with more than 50 inhabitants per km^2 have 131.61. Interestingly, municipalities with less than 10 inhabitants per km^2 have an average of 24.65 policemen (see Table 6).

Changes in the number of policemen per municipality between 2002 and 2013 also vary greatly across population density groups. In municipalities with less than 50 inhabitants per km^2 the number of policemen increased from 11.54 policemen in 2002 to 26.64 in 2013 (a 130.85% increment); in those with more than 50 the number of policemen was 100.21 in 2002 and 185.82 in 2013 (a 85% increase). The change was of 196.58% for municipalities below the 10 inhabitant threshold (with 9.93 policemen in 2002 and 29.45 in 2013) and of 89.24% for those above it (50.75 policemen in 2002 and 96.04 in 2013). Although the rates are higher for the less populated municipalities, the increase for the more densely populated ones represents a considerably higher number of policemen.

Panel 2 of Figure 1 shows the opposite trend. The number of per capita policemen is higher the more marginal the municipality. All population density groups have roughly the same number of policemen per inhabitant in 2002 (0.001 policemen on average). By 2013 levels vary considerably. The number of per capita policemen increases in 300.92%

in municipalities with less than 10 inhabitants per km^2 during the period (from 0.001 in 2002 to 0.004 in 2013, reaching a maximum point of 0.00607 in 2007). Municipalities with less than 50 inhabitants per km^2 increase their number of policemen per capita in 136.97% (from 0.001 to 0.003), those with more than 10 do so in 92.52% (from 0.001 to 0.002), and those with more than 50 in 98.84% (from 0.0009 to 0.0017) (see Table 6).

The variable 'BA_{1it}' is a measure for the historical allocations of *baldíos* at the municipality level. I calculate this variable by adding the total size and hectares of *baldío* allocations from the year 1901 to the year previous to each panel cut (i.e. 1901-2001,...,1901-2012, where the upper bound is equal to $t-1$). The purpose of this variable is to weight the long term importance of public land allocations in a given municipality i[15].

The variables 'X_{1it}' through '$X_{(n)it}$' are a set of covariates at the municipality level that measure conflict for each panel year t. These are the total hectares of cultivated coca, total homicides, and total kidnappings per municipality (see Table 6). I include these variables in Model 2 since conflict strongly predicts the increases in the number of policemen and number of policemen per inhabitant. 'F_{2it}' is defined in the same way (and with the same logic) as it was in Model 1. In the results section I comment the estimations when the definition for peripheral municipalities is changed to 5, 20, 30, 40, 60, 70, or 80 thresholds. The terms 'α_i' and 'γ_t' refer to once again to the model's municipality and year fixed effects–'α_i' captures all the time invariant unobservables and 'γ_t' captures time variant municipality unobservables.

I first estimate a fixed effects strategy and then a 2SLS model. For the latter, I build a variation of Faguet et al.'s (2015) instrument for hectares of *baldío* allocations (I only instrument the size of allocations not the number). This exogenous measure for public land allocations may be described as the *potential intensity* of land reform in municipality i. It captures national allocation trends and evenly redistributes them across municipalities depending on their available area for land policy. I first build the measure for every year in

[15] I also built a measure for *baldío* allocations in the five years prior to each panel cut in the form of a moving average (i.e. 1997-2001,...,2008- 2012, where the upper bound is in $t-1$). I nevertheless do not report these results in this paper. Results are similar to the ones obtained with the historical measure for 'BA_{1it}' and equally support this paper's main arguments.

the *baldío* allocations sample–which goes from 1902 to 2013[16]. I then create the historical *baldío* allocation variable in the same way as I did with 'BA_{1it}': I add the hectares of allocated *baldíos* from 1902 to the year previous to the panel (i.e. 1902-2001,...,1902-2012). I define the "potential allocation of hectares" ('PAH_{it}') in the following way:

$$PAH_{it} = \left(\frac{corrected\ area_{it}}{\sum_{i=1} corrected\ area_{it}}\right) TAH_t \tag{6}$$

where

$$corrected\ area_{it} = corrected\ area_{i(t-1)}\left(1 - APA_{it}\right) \tag{7}$$

and

$$APA_t = \frac{\sum_{i=1} allocations_{it}}{\sum_{i=1} area\ where\ allocations\ took\ place_{it}} \tag{8}$$

The term 'APA_{it}' in equation (8) is the "Average Proportion Allocated" in year t. I calculate this figure by adding the total hectares of *baldío* allocations in year t and dividing them by the sum of the area of the municipalities in which these allocations took place. This measure only includes information on the municipalities that received allocations during t. The term '$corrected\ area_{it}$' defined in equation (7) is equal to municipality i's available surface after chipping off 'APA_{it}' to its available area in the previous period $t-1$ (available area is only reduced if i was recipient of allocations in t; it otherwise remains the same during the period). This measure therefore only takes into account the national *baldío* allocation trends not the local ones. Finally, 'PAH_{it}' defined in equation (6) distributes the total allocated hectares ('TAH_{it}') in year t across the corrected area of all municipalities.

2.3 Results

2.3.1 Model 1: The effect of immigration on *baldío* allocations

Table 7 shows results for the fixed effects panel version of Model 1. The table is divided into two sets of regressions in which the dependent variable is (i) the number or (ii) the

[16] The year 1901 is lost when building the instrumental variable.

size–in hectares–of *baldío* allocations. Table 6 further discerns between two measures for migration: (i) total municipality migration and (ii) migration to both the municipalities' urban and rural areas. All regressions are estimated for each lagged population density group. Column (1) includes the whole sample. Columns (2) and (3) include a dummy that is equal to 1 when a municipality has less than 10 and 50 inhabitants per km^2 and is zero otherwise. Columns (4) and (5) only include the sample of municipalities with less than 10 and 50 inhabitants per km^2. Finally, columns (6) and (7) include municipalities with more than 10 and 50 inhabitants per km^2.

Estimations for the correlation between total migration and the number of *baldío* allocations (NBA) are not significant. They are nevertheless significant for urban and rural migration in municipalities with less than 10 inhabitants per km^2. The coefficient that accompanies urban migration is negative–which is why this result must be dealt for with carefully–and positive for rural migration. If the migration coefficient is scaled by the population density group's total migration for the three census years, the total estimated effect corresponds to -12.98% and 39.54% of all NBA during the period[17]. The fact that the coefficient for urban migration is negative shows that the panel version of Model 1 is being biased by unobservables. There is no economic interpretation for this result.

The estimations for the hectares of *baldío* allocations (HBA) are significant in different cases. First, estimations for total migration have significant and positive coefficients for the peripheral regions of the country (column (5)). If the migration coefficient is scaled up, the total estimated effect corresponds to 35.72% of all HBA during the period in municipalities with less than 50 inhabitants per km^2. It is noticeable that this correlation is driven by rural migration. When migration is split between rural and urban, coefficients accompanying rural migration are positive and significant for almost all population density

[17] I calculate the migration coefficient's scaled effect as follows:

$$Effect_k = \frac{\hat{\beta}_{it} \cdot migrants_k}{HBA_k}$$

Where '$\hat{\beta}_{it}$' is the estimated migration coefficient in population density group 'k', '$migrants_k$' is the total municipality number of migrants in the five years before 1973, 1993, and 2005 in population density group 'k', and 'HBA_k' is the total municipality HBA or NBA in the eight years after 1973, 1993, and 2005 in 'k'.

groups. The largest coefficients are for the peripheral areas of the country. These findings suggest that the more densely populated the municipality the smaller the correlation between migration and the HBA is–as expected from theory.

It is noticeable that the coefficient in (6) (which eliminates municipalities with less than 10 inhabitants per km^2) is not significant. Accounting for the peripherality of municipalities is thus important for the correlation between rural migration and HBA to be significant. The migration coefficients' scaled effect accounts for 64.41% of total HBA in column (1), 70.23% in column (2), 72.24% in column (3), 20.38% in column (4), 79.63% in column (5), and 56.02% in column (7). Magnitudes for municipalities with less than 50 inhabitants per km^2 are especially high. This shows that although the correlation between rural migration and HBA is higher *per* migrant for the most marginal municipalities in (4), when the relationship is measured in terms of total rural migration and total HBA the effect is much bigger for municipalities with less than 50 inhabitants per km^2.

Total hectares of land allocated by the state in municipalities with less than 50 inhabitants per km^2 are therefore more correlated with migration than hectares allocated in those with less than 10. This suggests that when municipalities are *too* marginal the total number of HBA is mostly related to other factors other than migration. These findings are interesting since they show that the logic behind the dynamics of *baldío* allocations does seem depend on how peripheral a region is. In order to understand this in more depth I instrument migration and estimate a 2sls version of Model 1. Table 8 shows the first stage results. Coefficients are low–which is consistent with the instrumental variable's large values–and are extremely significant in all seven cases. The F tests are much higher than 10 in every column–reporting the lowest value in column (4)–except in column (7) for rural migration.

Table 9 presents the second stage results. This version of Model 1 shows a causal relationship between migration and public land allocation. It is noteworthy that the effect of migration on the NBA is now only significant for rural migration. This means that the estimators in the fixed effects version of Model 1 were being biased by omitted variables of the form 'μ_{it}'. Coefficients are significant and positive for the total sample as well as for regressions that account for peripheral areas–columns (2), (3), and (5)–except for municipalities with less than 10 inhabitants per km^2. Total rural migration accounts for 38.67%, 43.01%, and 42.37% of the total NBA in regressions (1) to (3), and 42.01% in regression (5). These effects do not change much when the dummies are defined with other population density cuts in columns (1) to (3)[18].

It is worth noting that once again estimations in columns (6) and (7) are not significant. This suggests that migration only has an impact on *baldío* allocation in certain peripheral regions. When estimated with other population density thresholds column (5) is only significant for municipalities with less than 40 inhabitants per km^2. For this coefficient to be significant, municipalities must be therefore peripheral but not *too* peripheral. It is very interesting to note that although the NBA is the highest in the *most* peripheral areas of the country (i.e. less than 10 inhabitants per km^2 in), they don't seem to be very related to rural migration in these very peripheral areas. Factors other than migration must be determining public land allocations in the most peripheral regions of the country.

The effect of total migration on HBA is only significant for column (5). The coefficient is large and shows the expected positive sign. This result is robust to different thresholds. The coefficient accounts for 55.60% of the total HBA. Estimations in which rural and urban migration are separated have coefficients with the expected statistical significance, magnitudes, and signs–and is largest for column (5). Rural migration accounts for the 41.83%, 37.56%, 39.19% of the total HBA in columns (1) to (3), and 68.55% in column (5). The effect of migration on total HBA is notoriously high in municipalities with less than 50 inhabitants per km^2. This coefficient is only not significant for municipalities with less than 10 inhabitants per km^2: it is high and significant for those with less than 5, and then smoothly diminishes until reaching a significant 2.586 for municipalities with less than 80.

2.3.2 Model 2: The effect of *baldío* allocation on the number of policemen

Table 10 shows the fixed effect panel version of Model 2. It includes five different regressions for each population density group–the total sample, municipalities with less than 10

[18] A reminder: as a robustness check I estimate these models for groups of municipalities with less than 5, 20, 30, 40, 60, 70, and 80 inhabitants per km^2.

inhabitants per km^2, municipalities with less than 50, with more than 10, and with more than 50. The dependent variables are (i) the number of policemen (NP) or (ii) the number of policemen per inhabitant (NPI). The interest variables are the NBA and the HBA. The table first shows a positive and significant correlation between the historical NBA and the NP in columns (2) and (3). One allocation increase is thus correlated with an increment of 0.0389 and 0.0244 policemen in the peripheral municipalities between 2002 and 2013. When estimated with other population density thresholds, coefficients are significant and equal to 0.0307 in municipalities with less than 20 inhabitants per km^2 and go down to 0.0209 in those with less than 70.

If the NBA coefficient is scaled by the total NBA increase between 2002 and 2013, the calculated effect corresponds to 23.01% and 11.68% of the total NP increase in this period[19]. These results show an apparently strong correlation between land allocation and public good provision in these regions–as opposed to an insignificant and low correlation in the integrated areas.

Results for the correlation between the HBA and the NP tell a slightly different story. Although the correlation is significant for both columns (2) and (3), municipalities with less than 50 inhabitants per km^2 show the largest coefficient. The correlation therefore increases the less peripheral the municipalities. This means that one hectare allocated in less peripheral municipalities is more highly correlated with the state's public good response than one hectare allocated in the peripheral areas. This makes sense given that for land allocation to have a positive effect (correlation) on public goods the state must be able to offer property rights security–which is more likely to happen in the integrated areas of the territory. Nevertheless, when the HBA coefficient is scaled by the total HBA increase the effect corresponds to the 8.88% of the total increase of NP in municipalities

[19]I calculate the scaled effect similarly as before:

$$Effect_k = \frac{\hat{\beta}_{it} \cdot \Delta HBA_{2002-2013}}{\Delta NP_{2002-2013}}$$

Where '$\hat{\beta}_{it}$' is the estimated allocation coefficient in population density group 'k', '$HBA_{2002-2013}$' is the NBA or HBA change (increase) between 2002 and 2013 in 'k', and '$NP_{2002-2013}$' is the NP or NPI change (increase) in the same time span in 'k'.

with less than 10 inhabitants per km^2 and the 3.94% in those with less than 50. This is the consequence of particularly high HBA between 2002 and 2013–which were 68,532.19 in municipalities with less than 10 inhabitants per km^2 and 28,044.53 in those with less than 50[20].

The results are also consistent with this paper's main hypotheses when these regressions are estimated for other population density cuts. The effect is positive and significant for column (2) starting in municipalities with less than 10 inhabitants per km^2 after which the coefficient gradually grows until arriving at a significant 0.000211 for municipalities with less than 80. This means that the more integrated the municipality the more correlated one allocated hectare is with the NP.

Regressions for the NPI are considerably different. The NBA do not have significant coefficients for any column. Additionally, signs are in some cases negative (which is not expected from the theory). The HBA do have significant coefficients for columns (1) and (3), where the higher values are the ones for municipalities with less than 50 inhabitants per km^2. The scaled measure corresponds to 2.97% and 4.49% of the total NPI increase, respectively.

Several things are worth mentioning. First, these effects seem rather small. Second, both the coefficients and the scaled effect are higher for the peripheral municipalities than for the total sample. Third, the coefficients are not at all significant for the most peripheral municipalities and integrated regions. These observations seem to indicate that the HBA are not correlated with the NPI in the most peripheral areas, which might seem strange given that these municipalities have the higher NPI levels in the sample (see Figure 1). However, If I estimate these regressions with other population density cuts, although significant coefficients do not arise in the *most* peripheral municipalities they do appear in the *intermediate* peripheral ones, starting at municipalities with less than 20[21].

I then estimate a 2sls model. Table 11 shows the first stage results. The potential hectares of *baldío* allocations (PBHA) have a positive and significant effect on both the

[20] Due to space restrictions these results are not reported in this paper.

[21] Significant coefficients arise in municipalities with less than 20 inhabitants per km^2 (equal to 2.36e-08) up to those with less than 80 (2.68e-08-08).

NP and the NPI. The F test is larger than 10 in all columns. Table 12 shows the second stage results. Predicted HBA has a positive and significant effect on the NP for columns (2) to (5). The coefficient is larger in municipalities with more than 50 inhabitants per km^2, followed by those with more than 10, those with less than 50, and with less than 10. The effect of one allocated hectare on the NP is therefore higher in the most integrated areas of the country than in the peripheral ones. If the potential HBA coefficient is scaled, the HBA account for the 7.89% of the increase of policemen in municipalities in column (2), 8.65% in column (3), 91.67% in column (4), and a 341.82% in column (5). This last coefficient does not have any economic interpretation[22].

This result is different to the fixed effects' one, which means that the coefficients for the FE model were being biased by unobservables. Although municipalities in columns (2) and (3) were recipient of more predicted HBA than integrated municipalities (an average of 43,168.42 and 19,621.02, respectively, see Table 6), both the predicted HBA coefficient and its scaled effect on the total increase of the NP are considerably smaller than those for other integrated zones. This means that although these regions receive a considerable amount of allocations, the intensity of this land policy does not compensate for the reduced effect that *one* hectare has on the increases in the NP. This is an indicator of the inefficiency of this policy. Results are similar for other population density cuts[23].

The case for the NPI varies. The effect of the predicted HBA on the NPI is positive and significant for columns (1) to (5). The largest significant coefficient is the one for municipalities with more than 50 inhabitants km^2 followed by the total sample, municipalities with more than 10, less than 50, and less than 10. Allocating land to increase the NPI in the peripheral areas (columns (2) and (3)) is therefore more inefficient as doing so in the integrated ones (column (4) and (5)). The scaled effect of the potential HBA on the NP increase is 15.38% for column (1), 6.00% for column (2), 7.79% for (3), 22.05% for (4), and 56.96% for (5). The scaled affect is therefore higher the most integrated the zones.

[22] This last column is not at all a good model: note the negative R.

[23] Coefficients are significant and positive in municipalities with less than 5 inhabitants per km^2 (equal to 0.000349) and smoothly grow until reaching those with less than 80 (equal to 0.000792). Similarly, coefficients for municipalities with more than 5 are positive and significant (0.00956) and grow the more integrated the region (reaching 0.510 in those with more than 80).

This model's results seem to explain these dynamics more accurately than the NP one.

Finally, if the model is estimated for other population cuts, significant coefficients show two consistent trends. First, positive and significant coefficients arise for municipalities with less than 5 inhabitants per km^2 (with 4.66e-08) up to those with less than 80 (7.24e-08). Second, they go up from municipalities with more than 5 inhabitants per km^2 (with 5.80e-08) reaching a coefficient of 5.80e-07 in those with more than 80. This means that the more integrated the municipality the larger will the *per* hectare and total hectare effect be on the increase of the NPI.

Concluding remarks

This paper analyzes land policy when the central state lacks the MLV throughout a territory. I argue that the state uses land reform in order to attempt building capacity in peripheral zones. Public goods do not follow. When testing these hypotheses for the case of Colombia results show that rural migration to the peripheral areas does in fact trigger more public land (*baldío*) allocations than rural migration to the integrated ones. Both the impact *per* migrant and the effect of total migration on *baldío* allocations are higher in these regions. The effect is nevertheless not overall significant in extremely peripheral municipalities–which suggests that other unknown factors come into play in these zones.

Baldío allocations do not lead to efficient or steep increases in these regions' police presence. The effect of one allocated hectare on the increase of the number of policemen is much smaller in peripheral areas than in integrated ones. So is the effect of total *baldío* allocations on the number of policemen. Further, the same goes for the effect of one hectare and total hectares on the increase in the number of policemen per inhabitant in peripheral areas. This evidence suggests that *baldío* allocation is an inefficient policy for building capacity in the regions where it is scarce. Far from being conclusive, this paper's results intend to encourage further research to deepen the understanding of policy dynamics in peripheral areas.

These results might however serve as a motivation to rethink the policy intended for the peripheral areas of a country. The challenges faced by a central state without the MLV are different from those encountered by a central state that is able to provide it. The policy response to political and economic phenomena should therefore also differ. Since the evidence shows that the allocation of public land is not enough to forge meaningful institutionality in the areas where it is scarce, it might be useful to think about new and more self-asserting public policy strategies for the purposes of intervening in the most isolated areas of a territory. Policy should not *follow* migration. It should *anticipate* it. Modern societies should not delegate the conquering of the land to individuals with limited resources.

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Appendices

Table 1: **Number and Percentage of Municipalities in Population Density Groups**

Year	**Total Sample**	**<10**	**<50**	**>10**	**>50**
		Model 1			
Municipalities (#)					
1964	998	254	734	744	264
1973	998	166	639	832	359
1993	997	124	598	873	395
2005	1,088	121	614	967	474
Municipalities (%)					
1964	100%	25.45%	73.55%	74.55%	26.45%
1973	100%	16.63%	64.03%	83.37 %	35.97%
1993	100%	12.44%	60.22%	87.56 %	39.78%
2005	100%	11.12 %	56.43 %	88.88 %	43.57%
		Model 2			
Municipalities (# and %)					
2005	1113	142	638	971	475
	100%	12.75%	57.32 %	87.24%	42.68%

Source: DANE, Author's calculations.

Table 2: **Average Municipality *Baldío* Allocations by Population Density Group**

Year	**Total Sample**	**<10**	**<50**	**>10**	**>50**
		Number of Allocations			
1973	64.56	117.46	79.67	46.5	22.55
	(161.87)	(182.79)	(182.46)	(149.99)	(64.26)
1993	30.93	53.03	36.45	26.61	21.11
	(78.77)	(114.69)	(86.81)	(68.9)	(60.87)
2005	50.16	91.28	58.62	42.96	36
	(114.16)	(159.62)	(118.49)	(102.63)	(105.16)
All periods	48.6	92	59.26	38.57	27.36
	(123.54)	(161.62)	(138.55)	(110.56)	(82.2)
		Hectares of Allocations			
1973	2,111.44	5,608.12	2,785.61	917.68	237.04
	(7,753.16)	(12,197.75)	(8,910.22)	(4,938.76)	(1,344.83)
1993	1,496.77	7,566.72	2,290.83	310.43	85.59
	(14,677.14)	(35,611.49)	(18,301.07)	(1,523.1)	(500.18)
2005	1,416.23	7,984.33	2,212.83	267.17	83.35
	(10,254.66)	(25,560.37)	(12,895.43)	(991.27)	(423.95)
All periods	1,667.32	6,824.35	2,441.85	474.86	123.52
	(11,235.91)	(24,570.97)	(13,693.24)	(2,908.41)	(790.35)

Source: INCODER, Author's calculations.

Table 3: **Average Municipality Migration by Lagged Population Density Group**

Year	**Total Sample**	**<10**	**<50**	**>10**	**>50**
		Total Migration			
1973	3,084.4	1,720.92	1,525.88	3,549.89	7,417.56
	(18,534.57)	(3,261.75)	(2,822.16)	(21,365.71)	(35,418.3)
1993	3,810.03	1,723.11	1,659.41	4,217.91	7,632.04
	(21,314.82)	(2,436.6)	(3,760.73)	(23,260.46)	(34,870.07)
2005	2,440.87	727.81	833.88	2,740.57	5,129.73
	(12,397.79)	(694.01)	(1,239.29)	(13,414.05)	(19,934.13)
All periods	3,091.96	1,443.67	1,337.83	3,473.09	6,588.29
	(17,677.05)	(2,579.62)	(2,805.98)	(19,556.34)	(30,030.64)
		Rural Migration			
1973	795.95	874.19	734.39	769.24	967.09
	(998.51)	(1,049.75)	(865.65)	(979.7)	(1,284.95)
1993	578.54	611.73	536.99	572.05	652.38
	(662.67)	(793.12)	(659.73)	(634.4)	(662.37)
2005	499.87	327.48	381.11	530.03	698.59
	(666.74)	(313.04)	(438.71)	(706.56)	(896.99)
All periods	621.16	647.34	555.86	615.1	751.3
	(798.06)	(858.84)	(698.72)	(783.39)	(953.19)
		Urban Migration			
1973	2,288.45	846.73	791.48	2,780.65	6,450.48
	(18,354.9)	(2,619.11)	(2,332.33)	(21,184.57)	(35,190.21)
1993	3,231.49	1,111.38	1,122.41	3,645.86	6,979.66
	(21,221.66)	(2,181.73)	(3,528.56)	(23,162.63)	(34,767.58)
2005	1,941	400.34	452.77	2,135.36	4,431.14
	(12,234.96)	(517.7)	(1,008.84)	(13,242.95)	(19,726.8)
All periods	2,432.57	796.34	781.97	2857.99	5,836.99
	(17,539.07)	(2,117.65)	(2,493.49)	(19,415.05)	(29,865.22)

Source: DANE, Author's calculations.

Table 4: **Average Municipality Population by Lagged Population Density Group**

Year	**Total Sample**	**<10**	**<50**	**>10**	**>50**
		Total Population			
1973	18,723.03	9,759.29	10,803	21,783.24	40,743.12
	(95,658.25)	(14,795.31)	(14,495.6)	(110,305.4)	(182,868.75)
1993	29,360.48	12,281.5	14,036.71	32,698.46	56,593.26
	(178,858.4)	(14,937.09)	(25,889.94)	(195,290.85)	(294,357.24)
2005	37,572.9	12,210.4	15,270.53	42,009.97	74,889.64
	(232,994.29)	(10,337.15)	(20,716.05)	(252,275.29)	(377,351.21)
All periods	28,815.21	11,155.14	13,289.85	32,898.75	59,760.43
	(180,291.11)	(13,771.05)	(20,713.23)	(199,728.25)	(308,320.77)
		Rural Population			
1973	6,920.79	5,871.49	6,618.89	7,279.02	7,760.15
	(5,714.19)	(4,850.82)	(5,706.1)	(5,941.12)	(5,663.19)
1993	6,564.43	5,808.37	6,423.86	6,712.19	6,814.24
	(6,464.6)	(6,010.28)	(6,645.07)	(6,542.92)	(6,131.92)
2005	8,886.51	6,782.09	8,024.8	9,254.67	10,328.34
	(9,181.89)	(5,944.23)	(7,655.45)	(9,592.23)	(11,145.92)
All periods	7,499.25	6,108.5	7,024.63	7,820.84	8445.27
	(7,407.63)	(5,517.58)	(6,727.73)	(7,745.02)	(8,529.15)
		Urban Population			
1973	11,802.24	3,887.8	4,184.11	14,504.22	32,982.98
	(94,695.92)	(12,119.38)	(11,056.76)	(109,334.91)	(181,771.7)
1993	22,796.06	6,473.14	7,612.85	25,986.27	49,779.02
	(178,163.6)	(11,396.35)	(22,935.07)	(194,591.77)	(293,656.24)
2005	28,686.39	5,428.31	7,245.74	32,755.3	64,561.3
	(231,324.81)	(7,372.92)	(16,437.01)	(250,523.61)	(375,171.71)
All periods	21,315.96	5,046.65	6,265.21	25,077.91	51,315.17
	(179,111.99)	(10,818.48)	(17,289.47)	(198,493.76)	(306,820.06)

Source: DANE, Author's calculations.

Table 5: **Complementary Descriptive Statistics for Model 1 (Average for 1973, 1993, and 2005)**

Variable	**Total Sample**	**<10**	**<50**	**>10**	**>50**
Other Controls					
Previous *Baldío* Allocations (Municipality Average)					
Number	323.05	519.63	395.29	277.6	179.06
	(600.52)	(642.81)	(660.59)	(581.05)	(422.78)
Hectares	14,034.47	43,463.51	19,153.34	8,241.75	3,831.52
	(43,196.14)	(93,761.88)	(51251.4)	(21,273.71)	(13,931.12)
Instrumental Variables					
Potential total	1,412,699,617	707,817,476.8	761,804,299.3	1,575,754,654	2,709,434,754
migration	(7,288,271,520)	(1,043,393,014)	(1,469,294,451)	(8,063,394,337)	(12,337,584,542)
Potential rural	287,361,713.3	272,748,969.8	285,794,582.9	290,741,968.4	290,483,802.3
migration	(314,667,303.8)	(259,975,407.2)	(317,265,774.6)	(325,967,262.1)	(309,554,735)
Potential urban	1,126,411,798	370,651,538.7	411,117,079.9	1,301,236,084	2,551,445,546
migration	(7,971,502,885)	(976,314,085.7)	(1,379,520,665)	(8,824,235,278)	(13,543,184,188)
Predicted Variables (First Stage)					
Potential total	3,092.83	2,522.23	2,318.8	3,224.82	4,634.87
migration	(9,664.79)	(1,712.01)	(2,393.98)	(10,688.98)	(16,269.04)
Potential rural	621.29	681.67	615.12	607.32	633.58
migration	(414.53)	(403.91)	(422.82)	(415.78)	(397.41)
Potential urban	2,471.54	1,685.45	1,538.78	2,653.38	4,329.82
migration	(11,212.18)	(1,649.46)	(2,283.89)	(12,409.69)	(18,995.21)

Source: INCODER, DNP, CEDE Panel, Author's calculations.

Table 6: **Descriptive Statistics for Model 2 (2002-2013 Average)**

Variable	**Total Sample**	**<10**	**<50**	**>10**	**>50**
		Dependent Variables			
Number of Policemen (NP)	60.8	24.65	20.63	68.65	131.61
	(632.73)	(24.64)	(27.55)	(694.82)	(1044.8)
Number of Policemen per Inhabitant (NPI)	0.00227	0.00415	0.00264	0.00183	0.0014
	(0.00629)	(0.00904)	(0.00587)	(0.0034)	(0.00144)
		Interest Variables			
Number of *baldíos* (NBA)	436.93	804.95	565.04	385.21	250.94
	(731.07)	(870.2)	(823.72)	(693.56)	(507.83)
Hectares of *baldíos* (HBA)	19,197.49	68,532.19	28,044.53	11,011.4	5,364.65
	(60,187.47)	(134,598.78)	(74,292.7)	(26,176.12)	(17,867.78)
		Conflict Controls			
Number of coca plantations	74.35	317.22	110.86	27.25	2.56
	(450.94)	(905.34)	(539.04)	(248.62)	(34.09)
Homicides	13.14	8.12	6.9	14.41	24.48
	(75.88)	(15.95)	(17.14)	(83.03)	(123.02)
Kidnappings	0.53	0.44	0.38	0.55	0.74
	(3.2)	(1.5)	(1.45)	(3.39)	(4.61)
		Instrumental Variables			
Potential hectares of *baldío* allocations	19,197.49	52,242.2	19,783.16	7,302.92	4,277.47
	(63,840.24)	(93,562.57)	(49,864.96)	(8,959.15)	(5,744.94)
		Predicted Variable (First Stage)			
Predicted hectares of *baldío* allocations	19,197.49	43,168.42	19,621.02	10,565.75	8,369.04
	(46,336.5)	(67,908.29)	(36,190.51)	(6,510.09)	(4,187.38)

Source: INCODER, DNP, CEDE Panel, Author's calculations.

Table 7: **Model 1. Fixed Effects Panel Regression**

	(1) Total Sample	(2) D. 10	(3) D. 50	(4) <10	(5) <50	(6) >10	(7) >50
				Number of *Baldío* Allocations			
Migration	0.000123	0.000116	9.93e-05	0.00918	0.00163	-0.000340	-0.000327
	(0.000506)	(0.000504)	(0.000498)	(0.0139)	(0.00406)	(0.000737)	(0.000289)
R-squared	0.330	0.347	0.347	0.219	0.448	0.368	0.056
U. Migration	2.17e-05	1.14e-05	2.44e-08	-0.0150**	-0.000351	-0.000312	-0.000323
	(0.000473)	(0.000473)	(0.000466)	(0.00730)	(0.00474)	(0.000729)	(0.000284)
R. Migration	0.00740	0.00820	0.00758	0.0562**	0.0109	-0.00586	0.00529
	(0.00874)	(0.00874)	(0.00890)	(0.0279)	(0.0161)	(0.00850)	(0.00538)
R-squared	0.331	0.349	0.349	0.278	0.449	0.369	0.059
NBA	48.6	48.6	48.6	92	59.26	38.57	27.36
(mean & sd)	(123.54)	(123.54)	(123.54)	(161.62)	(138.55)	(110.56)	(82.2)
				Hectares of *Baldío* Allocations			
Migration	0.00559	0.00572	0.00800	2.097	0.652**	0.00570	-0.00125
	(0.0191)	(0.0198)	(0.0206)	(1.992)	(0.266)	(0.00651)	(0.00142)
R-squared	0.004	0.013	0.012	0.059	0.021	0.643	0.754
U. Migration	-0.0178	-0.0179	-0.0170	1.078	-0.00731	0.00535	-0.00125
	(0.0179)	(0.0186)	(0.0187)	(1.860)	(0.248)	(0.00641)	(0.00138)
R. Migration	1.729***	1.885***	1.939***	7.735***	3.498***	0.0739	0.0921***
	(0.500)	(0.477)	(0.480)	(2.264)	(0.823)	(0.0630)	(0.0324)
R-squared	0.014	0.026	0.026	0.086	0.039	0.643	0.760
HBA	1,667.32	1,667.32	1,667.32	6,824.35	2,441.85	474.86	123.52
(mean & sd)	(11,235.91)	(11,235.91)	(11,235.91)	(24,570.97)	(13,693.24)	(2,908.41)	(790.35)
Controls	YES	YES	YES	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
First stage	NO	NO	NO	NO	NO	NO	NO
Observations	3,205	3,083	3,083	579	2,053	2,504	1,030

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: **Model 1. First Stage Regression**

	(1) Total Sample	(2) D. 10	(3) D. 50	(4) <10	(5) <50	(6) >10	(7) >50
				Total Migration			
Potential M.	2.13e-06***	2.14e-06***	2.14e-06***	2.35e-06***	2.15e-06***	2.12e-06***	2.11e-06***
	(14.18)	(14.15)	(14.14)	(5.471)	(10.60)	(13.56)	(13.05)
F test	70.05	60.37	55.95	60.82	71.47	61.11	55.98
R-squared	0.866	0.868	0.868	0.732	0.759	0.872	0.887
Migration	3,091.96	3,091.96	3,091.96	1,443.67	1,337.83	3,473.09	6,588.29
mean & sd	(17,677.05)	(17,677.05)	(17,677.05)	(2,579.62)	(2,805.98)	(19,556.34)	(30,030.64)
				Urban Migration			
Potential U.M.	1.96e-06***	1.95e-06***	1.95e-06***	2.19e-06***	2.02e-06***	1.95e-06***	1.93e-06***
	(14.47)	(14.55)	(14.54)	(4.885)	(17.40)	(13.82)	(13.34)
Potential R.M.	5.48e-07**	5.42e-07*	5.61e-07*	5.61e-07	4.54e-07*	5.76e-07	2.17e-07
	(2.275)	(1.811)	(1.845)	(0.816)	(1.834)	(1.551)	(0.221)
F test	65.29	55.35	56.05	37.30	92.11	56.04	46.50
R-squared	0.883	0.884	0.884	0.844	0.868	0.884	0.894
U. Migration	2,432.57	2,432.57	2,432.57	796.34	781.97	2857.99	5,836.99
mean & sd	(17,539.07)	(17,539.07)	(17,539.07)	(2,117.65)	(2,493.49)	(19,415.05)	(29,865.22)
				Rural Migration			
Potential U.M.	-3.67e-10	7.09e-10	8.65e-10	1.65e-07	9.56e-08	-3.32e-09	-1.83e-09
	(-0.0497)	(0.0985)	(0.119)	(1.247)	(1.173)	(-0.567)	(-0.321)
Potential R.M.	1.12e-06***	1.40e-06***	1.41e-06***	1.99e-06***	1.34e-06***	1.29e-06***	1.87e-06***
	(5.025)	(10.66)	(10.62)	(4.924)	(8.004)	(8.572)	(5.388)
F test	40.43	37.94	37.14	11.51	41.06	27.80	9.266
R-squared	0.249	0.291	0.284	0.397	0.325	0.235	0.289
R. Migration	621.16	621.16	621.16	647.34	555.86	615.1	751.3
mean & sd	(798.06)	(798.06)	(798.06)	(858.84)	(698.72)	(783.39)	(953.19)
Controls	YES	YES	YES	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Observations	3,203	3,203	3,203	473	1,962	2,730	1,241

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: **Model 1. 2SLS Regression**

	(1) Total Sample	(2) D. 10	(3) D. 50	(4) <10	(5) <50	(6) >10	(7) >50
				Number of *Baldío* Allocations			
Predicted M.	0.000254	0.000246	0.000248	0.0120	0.00486	-0.000380	-0.000301
	(0.000745)	(0.000741)	(0.000737)	(0.0194)	(0.00684)	(0.000687)	(0.000318)
R-squared	0.330	0.347	0.347	0.219	0.447	0.368	0.055
Predicted U.M.	0.000214	0.000203	0.000203	-0.00144	0.00211	-0.000292	-0.000284
	(0.000749)	(0.000746)	(0.000742)	(0.0157)	(0.00697)	(0.000694)	(0.000333)
Predicted R.M.	0.0303**	0.0337**	0.0332**	0.0790	0.0403*	-0.00371	-0.00674
	(0.0143)	(0.0148)	(0.0148)	(0.0485)	(0.0243)	(0.0197)	(0.0109)
R-squared	0.318	0.333	0.332	0.266	0.436	0.368	0.043
NBA	48.6	48.6	48.6	92	59.26	38.57	27.36
(mean & sd)	(123.54)	(123.54)	(123.54)	(161.62)	(138.55)	(110.56)	(82.2)
				Hectares of *Baldío* Allocations			
Migration	-0.00672	-0.00758	-0.00683	3.599	0.696**	0.00312	-0.00187
	(0.0190)	(0.0196)	(0.0199)	(3.824)	(0.344)	(0.00662)	(0.00156)
R-squared	0.004	0.013	0.012	0.056	0.021	0.643	0.754
U. Migration	-0.0138	-0.0144	-0.0141	2.065	0.378	0.00328	-0.00169
	(0.0178)	(0.0185)	(0.0187)	(3.370)	(0.316)	(0.00659)	(0.00158)
R. Migration	1.252**	1.124*	1.173*	10.50	3.235***	-0.0998	0.0468
	(0.609)	(0.683)	(0.673)	(7.796)	(1.149)	(0.144)	(0.0530)
R-squared	0.014	0.024	0.023	0.074	0.038	0.641	0.759
HBA	1,667.32	1,667.32	1,667.32	6,824.35	2,441.85	474.86	123.52
(mean & sd)	(11,235.91)	(11,235.91)	(11,235.91)	(24,570.97)	(13,693.24)	(2,908.41)	(790.35)
Controls	YES	YES	YES	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
First stage	YES	YES	YES	YES	YES	YES	YES
Observations	3,184	2,985	2,985	410	1,848	2,371	910

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: **Model 2. Fixed Effects Panel Regression**

	(1) Total Sample	(2) <10	(3) <50	(4) >10	(5) >50
			Number of Policemen		
NBA	0.0540	0.0389*	0.0244*	0.0681	0.160
	(0.0415)	(0.0232)	(0.0126)	0.0618	(0.135)
R-squared	0.115	0.227	0.083	0.120	0.142
HBA	5.52e-05	0.000171**	0.000212**	0.00114	0.0379
	(9.58e-05)	(7.68e-05)	(8.20e-05)	(0.00220)	(0.0420)
R-squared	0.114	0.208	0.082	0.118	0.141
NP	60.8	24.65	20.63	68.65	131.61
(Mean & sd)	(632.73)	(24.64)	(27.55)	(694.82)	(678.97)
Observations	13,356	1,944	8,184	11,124	4,884
			Number of Policemen per Inhabitant		
NBA	-7.89e-08	-2.56e-07	8.15e-07	3.27e-07	-1.22e-07
	(6.76e-07)	(1.05e-06)	(7.00e-07)	(5.71e-07)	(3.57e-07)
R-squared	0.023	0.088	0.045	0.038	0.076
HBA	2.30e-08*	1.80e-08	2.61e-08*	2.35e-08	1.13e-08
	(1.34e-08)	(1.28e-08)	(1.35e-08)	(1.81e-08)	(6.09e-08)
R-squared	0.024	0.090	0.047	0.037	0.076
NPI	0.00227	0.00415	0.00264	0.00183	0.0014
(mean & sd)	(0.00629)	(0.00904)	(0.00587)	(0.0034)	(0.00144)
Observations	13,356	1,944	8,172	11,112	4,884
Controls	YES	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
First stage	NO	NO	NO	NO	NO

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: **Model 2. First Stage Regression**

	(1) Total Sample	(2) <10	(3) <50	(4) >10	(5) >50
	Hectares of *Baldío* Allocations				
Potential HBA	0.726***	1.686***	1.750***	0.604***	0.418***
	(7.045)	(4.477)	(5.136)	(9.559)	(8.352)
F test	18.46	14.86	20.73	52.70	15.17
R-squared	0.132	0.265	0.254	0.188	0.185
HBA	19,197.49	68,532.19	28,044.53	11,011.4	5,364.65
(mean & sd)	(60,187.47)	(134,598.78)	(74,292.7)	(26,176.12)	(17,867.78)
Observations	13,356	1,944	8,184	11,124	4,884
	Hectares of *Baldío* Allocations				
Potential HBA	0.726***	1.686***	1.750***	0.604***	0.418***
	(6.893)	(4.477)	(5.135)	(9.556)	(8.352)
F test	18.56	14.86	20.73	52.65	15.17
R-squared	0.137	0.265	0.254	0.188	0.185
HBA	19,197.49	68,532.19	28,044.53	11,011.4	5,364.65
(mean & sd)	(60,187.47)	(134,598.78)	(74,292.7)	(26,176.12)	(17,867.78)
Observations	13,356	1,944	8,172	11,112	4,884
Controls	YES	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

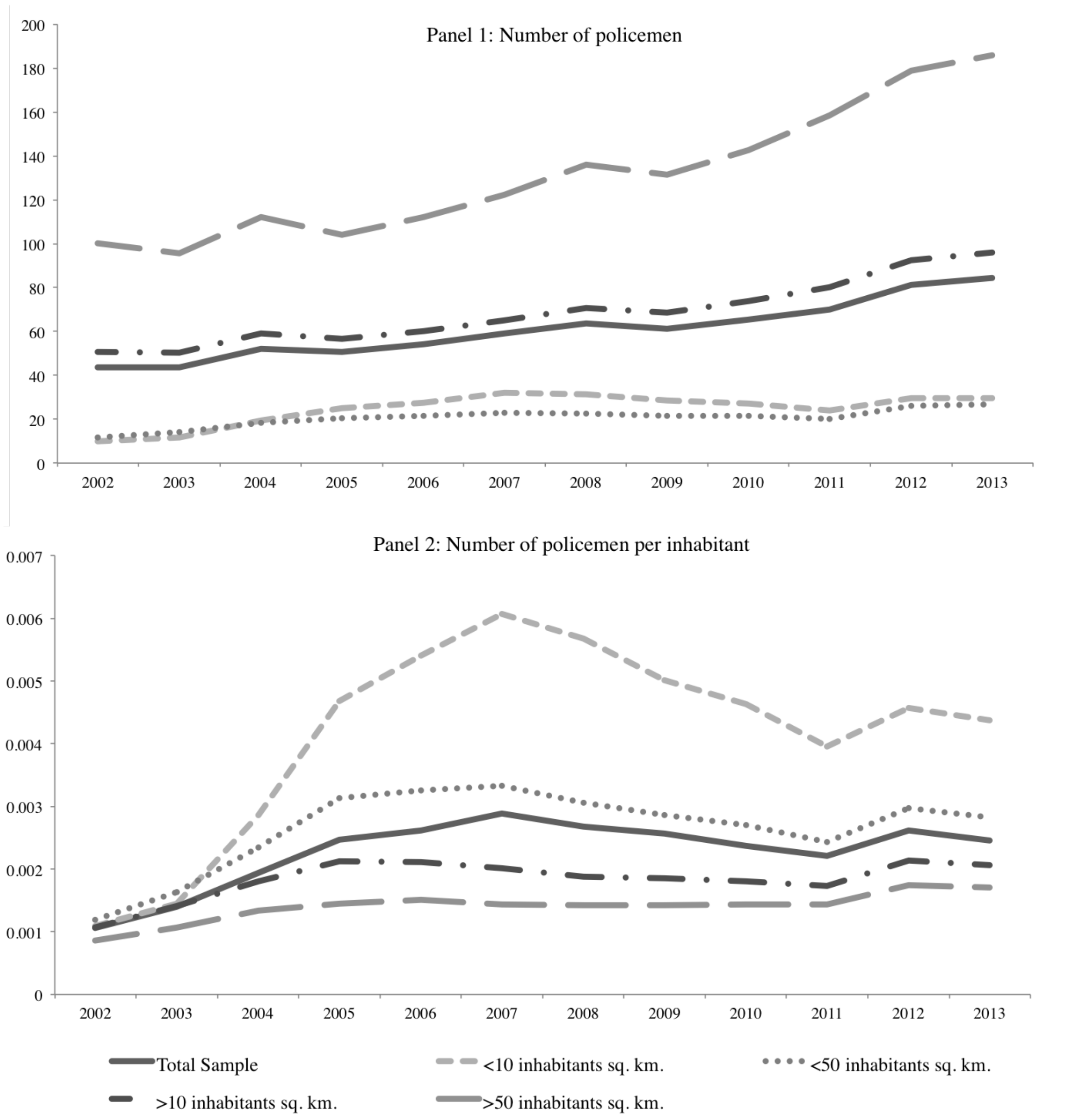
Table 12: **Model 2. 2SLS Regression**

	(1) Total Sample	(2) <10	(3) <50	(4) >10	(5) >50
	Number of Policemen				
Predicted HBA	3.27e-05	0.000389***	0.000725***	0.0428***	0.382***
	(0.000172)	(9.36e-05)	(0.000144)	(0.0108)	(0.0792)
R-squared	0.114	0.183	0.046	0.074	-0.088
NP	60.8	24.65	20.63	68.65	131.61
(Mean & sd)	(632.73)	(24.64)	(27.55)	(694.82)	(678.97)
Observations	13,428	1,944	8,184	11,124	4,884
	Number of Policemen per Inhabitant				
Predicted HBA	1.19e-07***	4.97e-08***	7.05e-08***	2.25e-07***	6.32e-07***
	(3.24e-08)	(1.83e-08)	(1.73e-08)	(6.75e-08)	(1.56e-07)
R-squared	0.008	0.084	0.039	0.034	0.053
NPI	0.00227	0.00415	0.00264	0.00183	0.0014
(mean & sd)	(0.00629)	(0.00904)	(0.00587)	(0.0034)	(0.00144)
Observations	13,356	1,944	8,172	11,112	4,884
Controls	YES	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
First Stage	YES	YES	YES	YES	YES

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: Police Presence (2002-2013)



Source: National Department of Planning.