

# Land Grants in Colonial Brazil and Long-Term Effects on Development

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## Abstract

Land access in Brazil has been a key political issue for the past century. The concentration of land in large estates that are often unproductive is argued to be a factor in the low social mobility and inequality of the rural population. However, restricted land access in Brazil has its roots in colonial times. Large plots of land were granted from 1530-1822 through land grants called *sesmarias*. These land grants were often given to people with substantial financial means, restricting land access to most of the population. By collecting a novel dataset on the location of these land grants alongside a matching procedure, I study the long-term effects of land grants on Brazil's economic development. Preliminary results indicate that the land grants had persistent effects on land concentration, tenure, and usage until the 20th century.

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# 1. Introduction

Brazil has one of the highest levels of land inequality in the world, with “an estimated 1% of the population own[ing] 45% of all land” (USAID, 2016). This issue is compounded by the fact that large agricultural lands in Brazil are often unproductive, with the Brazilian agrarian reform agency indicating that in 2010 “72% of all land occupied by large holdings was considered unproductive” (Carlson, 2019). The combination of land concentration and low levels of utilization are spread through the economy as it depresses rural wages, keeping those people away from the consumer markets (Oliveira Andrade, 1980, p. 1). However, land inequality is something that has persisted in Brazil ever since its colonization.

This paper analyzes the historical colonial causes of land inequality in Brazil, by exploiting geographical and economic variation in the request for land grants, called *sesmarias*.

I exploit the geographical, time, and economic variation of the grants to study their persistent effect in the economic development of

I first describe how the grants themselves were distributed and describe the process of learning that ...

I use a matching algorithm to show that the land grants in Brazil are associated with... . These effects are seen in 1872 and have persisted up to ...

I then turn to understand what are the mechanisms that are driving the results.

Given the prominence of land grants in colonial Brazil and the variation on why the land was granted, this paper studies the long-term effects of the role of colonial land assignment in long-term development. The paper provides a novel georeferenced dataset of colonial grants in Brazil. First, there are no empirical papers studying the direct causes of colonial land distribution in Brazil. Previous literature has found negative long-term effects of colonial land usage in Africa and South America (Dell, 2010; Lowes et al., 2021). However, there exists evidence that not all land regimes led to negative effects and instead led to economic development, with examples in India and Indonesia (Banerjee et al., 2005; Dell and Olken, 2019; Ratnoo, 2023). Other studies have analyzed the effect of land grants in the United States (Akee et al., 2014; Allen, 2019; C. Smith, 2023)

This paper also contributes to the understanding of the historical economic development of Brazil by trying to explain the diverging paths in development in each region. The land regime and size in each region, as measured by the land grants could have differential impacts on development. Wigton-Jones (2020) studies the effects of 1920 agricultural census land inequality and how it still has persisted to the present. The literature has analyzed how different economic cycles and how immigration have led to differential educational outcomes in Brazil (Musacchio et al., 2014; Rocha et al., 2017). Related literature has also

analyzed the effect of the Spanish-Portuguese borders in South America, the role of sugarcane, and gold mining in Brazil (Laudares et al., 2022; Naritomi et al., 2012).

(Dell, 2010) (Sokoloff et al., 2000)

Ratnoo (2023) [Paper about land tenure in India]

Albertus et al. (2018)

## 2. Historical Background

### 2.1. Land Grant Implementation in Brazil

<https://www.taipu.rn.leg.br/a-cidade/>

Portuguese presence in Brazil began in 1500, when [...].

Something about the capitanias here [...]

Quote about how the captains had to give land grants.

Implementation in the following years.

Portugal tried to implement in Brazil a similar system of land distribution they had successfully done in the Azores and in Portugal.

Costa Porto (1979, p. 58-59) “Enquanto, no Portugal de D. Fernando, de D. João e de D. Duarte, a distribuição de terra de sesmaria gerou, em regra, a pequena propriedade, no Brasil foi a causa principal do latifúndio”

(Carlson, 2019) “For many Latin American scholars seeking to explain their region’s backwardness in the first half of the twentieth century, the prevalence of latifundio-dominated agrarian structures was key. The latifundio was seen as a fundamental impediment to economic development due to its feudal-like social relations, its tendency for monocropping, and its negative impact on the formation of domestic markets. However, it was these scholars’ emphasis on the labor regimes that were characteristic of the latifundio that prevented them from fully grasping the nature of the problem.”

(Carlson, 2019) “Going back to colonial times, land in Latin America has often been acquired outside of market mechanisms. This typically occurred through massive land grants from the crown such as the merced, or the sesmaria in Brazil, or, after independence, through free or low-cost land concessions from national or local governments (Furtado 2003, 68–80).”

(Carlson, 2019) “These findings are further supported by information from Brazil’s agrarian reform agency, which reported in 2010 that more than 50 percent of all large landholdings and 72 percent of all land occupied by large holdings was considered “unproductive” according to agency parameters (INCRA 2011).”

([Carlson, 2019](#)) “Not only do extensive activities predominate, but land use statistics reveal the low-investment and low-productivity nature of these types of production. On grazing land, for example, if we divide the total number of animals on large farms by total hectares of pasture, Brazil’s large farms have only 0.65 animals per hectare of grazing land, while in Peru it is an incredibly low 0.06 animals per hectare (IBGE 2012; INEI 2012).”

([Carlson, 2019](#)) “As Edelman (1992, 22) explains: “the important point is that the dynamics of accumulation are radically different than those of classical capitalist development. Rather than investing heavily in improved technologies, employing productive human labor, attempting to capture increased market shares, or developing linkages with other production processes, latifundistas could become wealthy from harvesting natural and quasi-natural products of the land.””

([Carlson, 2019](#)) “Extensive activities like cattle grazing continued to operate largely as before, as Bicalho and Hoefle (1990, 57) explain for northeast Brazil: “While the new system of cattle raising uses such technical innovations as planted pasture, pasture divisions with rotation of use, purchased animal feed, improved breeds and the greater use of vaccines, which together with the use of waged labour, satisfy the most demanding definitions of capitalized agriculture, the productivity per hectare has not increased significantly. Mere pseudo-modernisation has occurred. The ranches have all the trappings of being highly productive but the pastures only have one or two steers per hectare.””

[Diégues Júnior \(1959\)](#)

[T. L. Smith \(1944\)](#) “The only way to distribute the lands was by grants of large tracts as sesmarias”

[Dean \(1971\)](#) - “Anyone who claimed to have the means and desire to make use of the land was given a grant, customarily one to three leagues in extent (16.7 to 50.1 square miles).”

[Simonsen \(2005\)](#) - “the ones that don’t possess sesmarias or can’t own land are disowned by the own society they live in”

[Oliveira Andrade \(1980, p. 1\)](#) “The agrarian problem is one of the most serious the country has, because of the great concentration of land ownership and the low level of utilization by the large and medium property owners. A majority of the rural population receives very low wages, which practically puts them outside the consumer market”

[Oliveira Andrade \(1980, p. 34-35\)](#) argues that “one of the causes that most aggravate the problem [the considerable increase in population, without a corresponding increase in possibilities for employment, is much more a swelling than an orderly growth] is the system of land tenure, dominant since colonization. It tends to contribute to the concentration of property and the lack of guarantees, of written and respected contracts, that would give greater stability to the sharecroppers in the Agreste and the Sertao and to the agricultural workers in the Zona da Mata.”

Oliveira Andrade (1980, p. 36) “The concentration of landholdings in the Northeast is a consequence of the essentially commercial character of agriculture there. This character has manifested itself since the start of colonization. Even today, despite the perceptible growth of the middle class and the internal markets, it is predominant. Its control manifests itself in the protection bestowed by the government agencies on the large farms, and in the complete disdain for subsistence farming”

Oliveira Andrade (1980, p. 113) “Extensive cattle raising, with open grazing, did not require much attention or labor. For that reason, the number of slaves in the region was small”

Oliveira Andrade (1980, p. 119) “[The cotton] advantage was a stimulus to the large landowners of the region, since they could increase their profits without modifying their traditional economic activities, and without forsaking cattle raising. Even today one can see that in the Agreste and Sertao cattle raising is the economic activity most associated with the latifundia. The large landowners are always principally cattle raisers and only secondarily farmers. This pattern is broken in the wet areas where climatic conditions are less favorable to cattle raising and where land is almost always in small holdings”

This paper describes the history of land usage in Brazil and discusses the roles of the sesmarias in it (Reydon et al., 2015).

Oliveira Andrade (1980, p. 157) “Cattle raising is today, as in the past, the source of great wealth in the Sertao [...] The system of cattle raising on the large fazendas of the Sertao has changed little in recent years”

“The slaves in Brazil were at least partially integrated into society and possessed rights, quite a legal contrast to the plight of the slaves in the United States. Hence their transition from slave to freedman was facilitated. One paramount privilege the slaves enjoyed was their ability to purchase their own freedom. Blacks, taking advantage of the many Catholic holidays to work on their own, saved money for that purpose. They occasionally formed their own mutual aid societies to facilitate their purchase of freedom.”

## 2.2. End of the Land Grants and the 1850 Land Act

Between 1822 and 1850 there was no clear way on how to obtain lands in Brazil.

1850 Land Law allowed [...]

The first big land reform was in 1964 with the Land Act.

1985 National Agrarian Reform Plan was used.

Land grants were given until 1822, shortly before Brazil’s independence.

<https://atlas.fgv.br/marcos/caminhos-do-gado/mapas/o-nordeste-da-cana-e-do-gado-no-seculo-17> [IV?]

<https://atlas.fgv.br/marcos/movimentos-e-conflitos-sociais/mapas/o-sertao-dos-cangaceiros-1877-1940> [Something About Historical Conflict]

Dutch Brazil ? ”dois fatores contribuíram para a penetração do gado para o interior nordestino. O primeiro reside na necessidade de abastecer as áreas açucareiras do litoral com animais para o transporte e de carne para as populações urbanas. O segundo fator foi a presença dos holandeses no século XVII levando os criadores a sair do litoral em direção ao interior devido o temor de perder seus alimentos para os invasores que os requisitavam. Ao fazer isso, os criadores passaram a se estabelecerem em extensões de terra doadas em sesmarias. Um outro fator que também não podemos esquecer é que nesse momento a economia voltava-se para a expansão da empresa comercial canavieira a ponto de a “Carta Régia” de 1701 chegar a proibir a criação de gado até dez léguas da costa”

“Além deste fator, o autor explicita um condicionante geográfico para a existência desses mercados, pois, as maiores feiras de gado existentes na região se localizam nas cidades que estão exatamente no contato entre o litoral e o sertão.” ([Galdino Dantas, 2008](#))

“A cana-de-açúcar foi plantada, de início, nas sesmarias e grandes propriedades doadas de 500 braças, até 50 e 200 léguas. Nos séculos XVI e XVII, com os altos preços alcançados pelo açúcar, verificou-se uma reação da pequena propriedade, de exploração agrícola limitada, que, entretanto, foi logo absorvida pelos latifúndios. Nos princípios do século XIX, o panorama da região açucareira apresenta-se diferente, com o regime da média propriedade, resultante do parcelamento dos latifúndios, doados pelo excesso de terras devolutas, pela escassez de colonizadores ou pela repartição entre os herdeiros. Foi a época em que os engenhos não possuíam mais do que légua e meia ou duas léguas .” ([Geografia, 1970](#), p. 118)

“Nos sertões da Bahia, Pernambuco, Paraíba, Rio Grande do Norte, Ceará, Piauí, as primeiras estradas foram os caminhos das boiadas. Assim é que numerosas povoações - núcleos de futuras vilas e cidades - estabeleceram-se às margens dos rios, nos lugares onde estes ofereciam passagem mais fácil aos animais, e à beira dos caminhos, nos pontos em que as boiadas paravam para descansar.” ([Geografia, 1970](#), p. 164) ([Panini, 1990](#))

Maybe can combine the Sao Paulo ones with the immigration that happened there and contrast.

### **2.3. Present Day System**

While the land grants themselves

### 3. Data

The main source of data comes from both a collaboration with the *Sesmarias of the Luso-Brazilian Empire Database* and my own work <sup>1</sup>. The database uses archival data from either state records or original manuscripts to obtain data on the concessions of sesmarias in Brazil. When available, information such as the year, the reason for the request, etc. are coded. For the states of Sao Paulo and Minas Gerais the information [...] The sesmarias are then georeferenced based on the geographical information present in the text, allowing us to trace them back to Brazilian municipalities.<sup>2</sup>

[Need to add the citations here.]

The sesmarias from Sao Paulo are obtained from three volumes from the *Sesmarias; documentos do Arquivo do Estado de São Paulo* (1921)

For Minas it is from [add citation]

For Ceara the land grants come from L. Pereira et al. (1971).

More information on the sources used for this project is available in Appendix C.

<sup>3</sup>

Data for current land tenure in 2021 in Brazil is obtained from Sparovek et al. (2019).<sup>4</sup>

Land usage from 1985-2010 is obtained from Mapbiomas (Souza et al., 2020)<sup>5</sup>.

Census data for 1872 is obtained from the Nucleus of Research in Economic and Geographic History from the Federal University of Minas Gerais.<sup>6</sup> The 1872 Imperial Census contains demographic data at the municipality and parish level and was the last census taken before the abolition of slavery in Brazil. <sup>7</sup>

Other census data is obtained from the IBGE ().<sup>8</sup>

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<sup>1</sup>Information on the content of the letters is available at <http://plataformasilb.cchla.ufrn.br/>. The georeferencing process was done in collaboration but as a separate project for this paper.

<sup>2</sup>A more in-depth description on how the sources of the letters and how the sesmarias were georeferenced is available in Appendix D

<sup>3</sup>More information on the description based on the 1872 census data is available on Appendix F

<sup>4</sup>Available at <https://atlasagropecuario.imaflora.org/>

<sup>5</sup>Available at <https://brasil.mapbiomas.org/en/>

<sup>6</sup>Available at <http://www.nphed.cedeplar.ufmg.br/>

<sup>7</sup>Distribution of the 1872 parishes alongside the municipality boundaries is available at Figure 1. For the sample used, I have 469 municipalities and 1,115 parishes.

<sup>8</sup>Microcensus is available through the IBGE but the data downloaded through the R package *censobr* from R. H. M. Pereira et al. (2023)

## 4. Descriptive

### 4.1. Summary Statistics

Following [Lowes et al. \(2021\)](#) I show balance on geographical characteristics at the 10 x 10km grid level in [reference to table here].

Summary statistics for the 1872 censuses are available in [Table 1](#). Overall, we can see that municipalities farther from the coast

### 4.2. OLS Descriptive

First I show descriptively through the 1872 census that the interior of Brazil was more likely to be [...] ([Laudares et al., 2022](#)).

$$Y_{p,s} = \beta_1 \cdot Morethan80km_{p,s} + \mu_s + \epsilon_{p,s} \quad (1)$$

Results can be found in ?? and ??. Descriptively, it indicates that parishes more than 80km from the coast had a lower proportion of slaves to the total population and lower amounts of freed black people as a total of the population.

Similarly, matching to the historical evidence, these places have a higher proportion of people who report ranching as the primary occupation, and were less likely to have jobs in the industry, liberal, or other professions.

## 5. Methodology

### 5.1. Matching

To study the effects of the land grants I use a propensity score matching procedure to select control municipalities that are similar in geographical characteristics to those that received at least one land grant. In the first step, I estimate the following:

$$LandGrant_m = X_{m,s} + \mu_s + \epsilon_{m,s} \quad (2)$$

The set of variables used to match are: latitude, longitude, mean elevation, mean slope, soil quality for



food crops<sup>9</sup>, potential sugarcane output from the FAO, and the distance to the coast.<sup>10</sup> These variables are selected because they are proxies for agricultural output, geographical location, market access, and the main export of Brazil during the colonial times which was sugarcane. For each treated municipality I select one untreated municipality to be its control, which generates the matched sample.

From the matched sample I then estimate the following equation:

$$Y_{m,s} = LandGrant_m + X_{m,s} + \mu_s + \epsilon_{m,s} \quad (3)$$

The assumption for the matched sample is that conditional on the set of controls, the municipalities that received a land grant are as good as random since the control municipalities had similar geographical characteristics.

The results are found in tables X, Y, and Z. In each Panel, I consider whether the given municipality had any land grants, a land grant pre-1700 and a land grant only post-1700. The 1700 cutoff is chosen due to two historical factors: First, in 1698 it was imposed a limit on the size of the grants to be 3x1 leagues maximum [add citation here]. Additionally, in 1701 there was a ban on livestock grazing within 80km of the coast. The 1700 cutoff, therefore, chooses the combination of the two. Ideally, we would expect that the effects on land usage would change in favor to [add here] and [blah blah blah]

## 5.2. Dutch Brazil

## 5.3. Coastal Ban on Livestock

In 1701, the Portuguese Crown enacted a ban on cattle ranching from 80km of the coast (10 leagues) (Fausto et al., 2014, p .40; Simonsen, 2005, p .198; Bethell, 1984, p .460). The law went into effect after complaints from local farmers that cattle grazing was destroying the sugar plantations in the area. In effect that led to reserving the coast to be primarily an agricultural area and allowing the expansion of cattle towards the interiors of Brazil (Júnior, 1967, p. 216). That led to “a clear specialization between the two activities” (Ribeiro, 2012).<sup>11</sup>

Historically, the size of landholdings in the interior of Brazil at this time was extensive. As Fausto et al. (2014, p .41) indicates, the need for large lands to allow cattle to roam free led to the creation of large estates in the area, even bigger than those compared to the coast.<sup>12</sup> Even with restrictions on the sizes of the land

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<sup>9</sup>Proxied by the measures of Galor et al. (2016).

<sup>10</sup>In Appendix ? I show that the results are robust to a different set of control variable.

<sup>11</sup>An example of the effect can be seen in the Municipality of Ruy Barbosa and the state of Bahia and Caico in the state of Rio Grande do Norte. Both are described as being created by the cattle expansion that happened because of the 1701 Royal Decree. (IBGE 2024)

<sup>12</sup>An example of this would be the d’Avila family which owned a large estate in the state of Bahia [...]

grants taking into effect in 1698, due to the lack of government oversight the “sesmarias on which cattle ranches were established sometimes exceeded hundreds of thousands of acres” (Bethell, 1984).

(Boxer, 1962, p .)

“Cattle farming was to supply dry beef, leather, and carrying animals to the sugar mills and, later, to the villas that emerged around mining, but was not to mix itself geographically with these other two important export activities from the colonial period, nor with the coffee estates that emerged during the nineteenth century, when Brazil was already independent from Portugal.” (Ribeiro, 2012).

“It was there that farms measuring thousands of hectares emerged, where cattle found favourable environmental conditions for the multiplication of herds.”(Ribeiro, 2012).

Given the nature of this ban, I exploit the cutoff of 80 km to use a regression discontinuity design to measure the economic effects of this ban.

First, I provide evidence that [...] In the first-stage I check whether post-1701 we see an increasing number of land grants dedicated to livestock in municipalities farther than 80 km from the coast.

[Have to think this as an ITT, same with part of the land grants.]

Secondly, using the 1872 I analyze whether or not there were any effects of the coastal livestock ban on the demographics and economic activities at that time.

13

[Move this to the appendix]

Historically livestock-raising areas were [...]

$$Y_{m,s} = \beta \cdot CoastDist_{m,s} + f(D_{m,s}) + \mu_s + X_{m,s} + \epsilon_{m,s} \quad (4)$$

For the 1970-2010 census, given that I have information at the individual level I estimate:

$$Y_{i,m,s} = \beta \cdot CoastDist_m + f(D_m) + \mu_s + X_{i,m,s} + \epsilon_{i,m,s} \quad (5)$$

With the standard errors being clustered at the municipality level.

Provision of Public goods is the cause for the effects on literacy in 1970 and onwards (?).

Other links:

[http://historialuso.an.gov.br/index.php?option=com\\_content&view=article&id=6191:escravos-de-ganho&catid=2073&Itemid=121](http://historialuso.an.gov.br/index.php?option=com_content&view=article&id=6191:escravos-de-ganho&catid=2073&Itemid=121)

<https://www.nexojornal.com.br/especial/2017/07/07/censo-de-1872-o-retrato-do-brasil-da-escravidao>

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<sup>13</sup>While this setting would be ideal for a Regression Discontinuity Design, the lack of sample, especially for the early 1872 census results in noisier estimates. Estimations based on it can be found in Appendix ???

“Quando o senhor não tinha uma função para o escravo, ele deixava o escravo ao ganho”, explica o historiador Diego Bissigo. “Ele ia para cidade buscar emprego e o senhor ficava com o salário que o escravo recebesse. É uma forma de uso para o escravo. Assim, ou alugando para outro senhor também.”

”O termo jornaleiro, refere-se geralmente, a um trabalhador que trabalha à ”jorna”. Isto é, era contratado para trabalhos de pequena duração temporal, geralmente agrícolas, (vindimas, colheitas, poda...) e como tal, pago ao dia (jornada?).”

”Criado de servir era um termo mais aplicado aos empregados que trabalhavam na Casa ou em serviços mais ligados à Casa (Jardim, cavalos, recados, etc.) .”

([Oliveira Andrade, 1980](#), p. 142)

#### **5.4. Treaty of Tordesillas**

#### **5.5. Other**

#### **5.6. Instrumental Variable - Distance to Salvador and Olinda**

The main ports in the region were...

The radiation points for cattle were also...

First-stage indicates that ...

### **6. Results**

#### **6.1. Matching**

### **7. Heterogeneity**

#### **7.1. Regional Variation**

The effects between the Northeast and Southeast of Brazil [...]

In Table [...] I show that for the 1985 Agricultural census in the Northeast municipalities, the presence of a land grant is associated with an increase in [...]

In Table [...] the effects for the Southeastern states of Sao Paulo and Minas Gerais are [...]

([Mueller, 1995](#))

## 7.2. Economic Activity

## 8. Robustness

In this section explore the heterogeneity of the economic activity.

### 8.1. Coefficient Bounds

I use the methodology from to estimate how much unobservables could be impacting the main estimates [Masten et al. \(2022\)](#).

### 8.2. Randomization Inference

## 9. Conclusion

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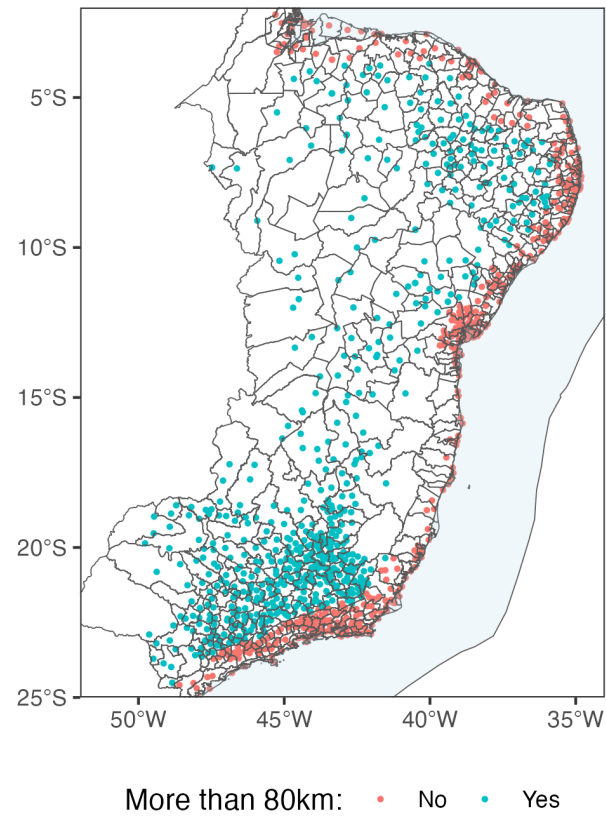
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## Figures

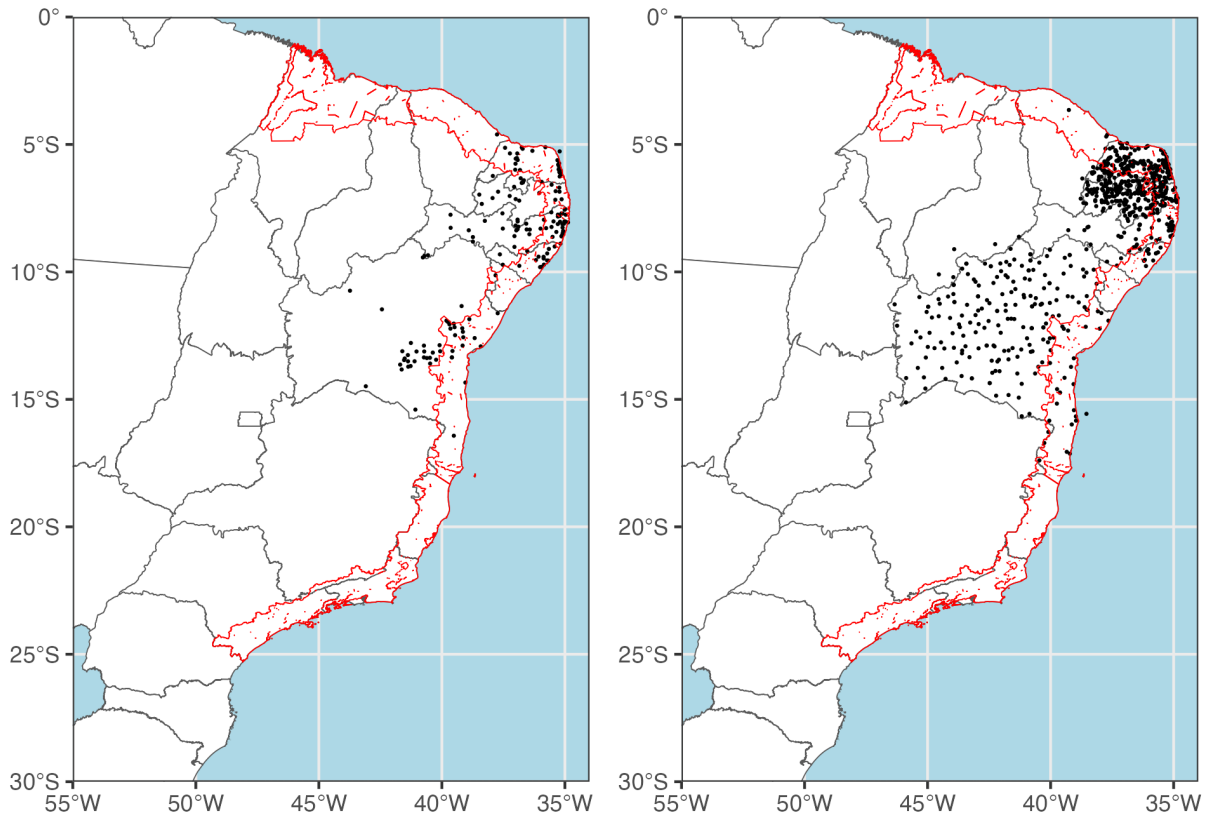
Figure 1: 1872 Municipalities and Parish Locations



*Notes:* Geographical distribution of 1872 parishes alongside 1872 municipality boundaries.



Figure 2: Distribution of Land Grants pre- and post- 1701



*Notes:* This figure considers whether or not any part of the municipality was within 80km of the coast.

# Tables

## 9.1. Summary Statistics

Table 1: Summary Statistics for variables in 1872

	Less than 80 km from the Coast (N=504)		More than 80 km from the Coast (N=611)		Diff. in Means	Std. Error
	Mean	Std. Dev.	Mean	Std. Dev.		
<b>Education</b>						
Literacy Rate (%)	25.1	17.0	18.1	10.7	-7.0**	0.9
Men Literacy Rate (%)	31.1	18.5	23.4	12.3	-7.7**	1.0
Women Literacy Rate (%)	19.1	16.9	12.7	10.4	-6.4**	0.9
<b>Demographics</b>						
Total Population	7839.9	5591.2	7089.6	4374.3	-750.4**	305.5
Proportion White (%)	43.3	18.9	47.4	16.8	4.1**	1.1
Proportion Black (%)	13.1	10.3	11.5	6.9	-1.7**	0.5
Proportion Pardo (%)	39.3	17.3	37.9	15.3	-1.5	1.0
Proportion Caboclo (%)	4.2	6.6	3.3	4.4	-1.0**	0.3
Proportion Slaves (%)	19.0	14.1	15.2	9.7	-3.8**	0.7
<b>Labor</b>						
Proportion in Agriculture (%)	33.1	15.0	28.4	11.6	-4.7**	0.8
Proportion in Raising Livestock (%)	0.6	1.6	1.0	2.7	0.4**	0.1
Proportion in Industry (%)	1.7	1.7	0.9	0.7	-0.8**	0.1
Proportion in Manual Work (%)	7.5	5.2	10.6	5.9	3.1**	0.3
Proportion in Liberal Professions (%)	0.9	1.2	0.4	0.6	-0.5**	0.1
Proportion in Other Jobs (%)	20.5	13.7	22.2	10.1	1.7**	0.7
<b>Free Labor</b>						
Proportion Free in Agriculture (%)	30.8	14.7	26.9	11.7	-3.8**	0.8
Proportion Free in Industry (%)	2.2	2.2	1.0	0.8	-1.1**	0.1
Proportion Free in Manual Work (%)	8.2	5.9	11.3	6.4	3.1**	0.4
Proportion Free in Liberal Professions (%)	1.1	1.4	0.5	0.7	-0.6**	0.1
Proportion Free in Other Jobs (%)	19.6	12.1	21.7	10.2	2.1**	0.7
Proportion Owners of Land (%)	0.4	0.9	0.5	0.9	0.0	0.1
Proportion Free Wage Earners (%)	4.7	5.3	7.2	6.0	2.4**	0.3
<b>Enslaved Labor</b>						
Proportion Enslaved in Agriculture (%)	41.5	22.7	35.7	17.0	-5.8**	1.2
Proportion Enslaved in Manual Work (%)	5.2	5.1	7.2	6.3	2.0**	0.3
Proportion Enslaved in Other Jobs (%)	25.2	20.9	26.0	14.1	0.8	1.1
Proportion Enslaved Domestic Work (%)	16.2	12.7	20.3	12.1	4.0**	0.7
Proportion Enslaved Wage Earners (%)	8.5	15.6	5.6	8.0	-2.9**	0.8

Table 2: Summary Statistics for variables in 1872 - Within 40 to 120km of the coast

	Less than 80 km from the Coast (N=139)		More than 80 km from the Coast (N=90)		Diff. in Means	Std. Error
	Mean	Std. Dev.	Mean	Std. Dev.		
<b>Education</b>						
Literacy Rate (%)	22.9	13.1	20.9	10.9	-2.1	1.6
Men Literacy Rate (%)	29.1	15.7	26.2	12.1	-2.9	1.8
Women Literacy Rate (%)	16.2	11.5	15.5	12.3	-0.8	1.6
<b>Demographics</b>						
Total Population	8909.7	6462.4	6503.7	4424.7	-2406.0**	719.7
Proportion White (%)	49.1	18.4	51.8	15.9	2.7	2.3
Proportion Black (%)	11.8	9.9	10.2	6.8	-1.5	1.1
Proportion Pardo (%)	35.0	16.9	33.9	14.2	-1.1	2.1
Proportion Caboclo (%)	4.1	4.0	4.1	7.0	0.0	0.8
Proportion Slaves (%)	19.5	16.3	19.5	13.0	0.0	1.9
<b>Labor</b>						
Proportion in Agriculture (%)	36.2	13.5	30.0	12.6	-6.2**	1.8
Proportion in Raising Livestock (%)	0.7	1.5	0.9	3.1	0.2	0.4
Proportion in Industry (%)	1.2	1.0	0.9	0.6	-0.3**	0.1
Proportion in Manual Work (%)	6.5	4.5	8.2	4.9	1.7**	0.6
Proportion in Liberal Professions (%)	0.5	0.5	0.5	0.5	-0.1	0.1
Proportion in Other Jobs (%)	18.6	12.6	21.1	10.7	2.6***	1.5
<b>Free Labor</b>						
Proportion Free in Agriculture (%)	33.1	13.0	27.8	12.8	-5.3**	1.7
Proportion Free in Industry (%)	1.6	1.4	1.2	0.8	-0.4**	0.1
Proportion Free in Manual Work (%)	7.0	4.9	9.0	5.3	2.0**	0.7
Proportion Free in Liberal Professions (%)	0.7	0.6	0.6	0.6	-0.1	0.1
Proportion Free in Other Jobs (%)	18.6	11.8	20.9	10.7	2.3	1.5
Proportion Owners of Land (%)	0.3	0.5	0.4	1.0	0.1	0.1
Proportion Free Wage Earners (%)	4.7	5.7	7.1	6.7	2.4**	0.9
<b>Enslaved Labor</b>						
Proportion Enslaved in Agriculture (%)	46.7	21.3	39.6	18.1	-7.1**	2.6
Proportion Enslaved in Manual Work (%)	4.9	4.9	5.7	6.7	0.9	0.8
Proportion Enslaved in Other Jobs (%)	20.1	15.9	23.9	16.2	3.8***	2.2
Proportion Enslaved Domestic Work (%)	14.3	11.1	17.7	12.4	3.4**	1.6
Proportion Enslaved Wage Earners (%)	5.6	11.3	6.1	10.1	0.4	1.4

## 9.2. Matching

	Area Used for Livestock (%)		Farms over 2000ha (%)		Occupied Land (%)		Leased Land (%)	
	OLS	Matching	OLS	Matching	OLS	Matching	OLS	Matching
<i>Panel A (Any Grants)</i>								
Any Land Grants	6.963** (3.047)	6.769** (2.960)	4.746*** (1.060)	4.582*** (1.122)	-0.251 (2.598)	0.355 (2.522)	4.285 (6.147)	1.814 (6.227)
N	1007	842	1007	842	1007	842	1007	842
$R^2$	0.05	0.05	0.15	0.14	0.01	0.00	0.01	0.01
Control Mean	45.3	43.4	7.9	7	6.2	6.9	13.3	10.6
<i>Panel B (Pre 1700 Grants)</i>								
Grants Pre-1700	-2.355 (3.031)	1.247 (3.019)	4.610*** (1.776)	4.988** (2.217)	-3.167** (1.318)	-1.226* (0.735)	13.980 (11.359)	22.846** (11.154)
N	1007	220	1007	220	1007	220	1007	220
$R^2$	0.05	0.33	0.14	0.17	0.01	0.20	0.01	0.03
Control Mean	41	47	7.4	9	5.2	7.2	2.7	9.9
<i>Panel C (Post 1700 Grants)</i>								
Grants Post-1700	8.400** (3.482)	9.674*** (3.022)	4.134*** (1.124)	4.480*** (1.224)	0.770 (2.968)	0.974 (3.089)	4.190 (6.416)	1.356 (6.233)
N	1007	716	1007	716	1007	716	1007	716
$R^2$	0.05	0.09	0.14	0.16	0.01	0.00	0.01	0.02
Control Mean	43.5	43.5	8.2	7.5	6.4	6.5	11.8	11.1

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

	Sugarcane Workers (%)		Livestock Workers (%)		Sharecroppers (%)	
	OLS	Matching	OLS	Matching	OLS	Matching
<i>Panel A (Any Grants)</i>						
Any Land Grants	1.118*** (0.305)	1.054*** (0.290)	-1.503*** (0.481)	-1.511*** (0.488)	-0.296 (0.251)	-0.315 (0.260)
N	915	820	915	820	915	820
$R^2$	0.24	0.21	0.22	0.22	0.42	0.42
Control Mean	1.3	1.9	23.4	23.1	2.9	2.6
<i>Panel B (Pre 1700 Grants)</i>						
Grants Pre-1700	1.411*** (0.545)	1.066 (0.680)	-2.097*** (0.777)	-2.555** (1.012)	-0.387 (0.326)	-0.550 (0.403)
N	915	228	915	228	915	228
$R^2$	0.23	0.30	0.22	0.25	0.42	0.40
Control Mean	2.3	1.6	22.4	23.1	2.7	3.1
<i>Panel C (Post 1700 Grants)</i>						
Grants Post-1700	1.040*** (0.305)	0.858*** (0.272)	-1.559*** (0.504)	-1.297** (0.523)	-0.657** (0.274)	-0.715** (0.295)
N	915	694	915	694	915	694
$R^2$	0.23	0.20	0.22	0.24	0.42	0.42
Control Mean	1.1	2	23.3	22.9	3.5	2.6

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

	Sugarcane Area (%)		Pasture Area (%)		Urban Area (%)	
	OLS	Matching	OLS	Matching	OLS	Matching
<i>Panel A (Any Grants)</i>						
Any Land Grants	1.099*** (0.295)	1.004*** (0.289)	0.597 (0.981)	0.632 (1.178)	0.612*** (0.183)	0.648*** (0.164)
N	6747	1334	6747	1334	6747	1334
$R^2$	0.22	0.29	0.34	0.20	0.03	0.05
Control Mean	0.9	0.7	30.1	28.6	0.2	0.2
<i>Panel B (Pre 1700 Grants)</i>						
Grants Pre-1700	2.739*** (0.883)	1.927* (1.145)	-6.423*** (2.367)	-9.338*** (3.034)	2.370*** (0.762)	2.324*** (0.793)
N	6747	258	6747	258	6747	258
$R^2$	0.22	0.34	0.34	0.26	0.05	0.13
Control Mean	3.1	0.8	40.6	28.7	0.5	0.3
<i>Panel C (Post 1700 Grants)</i>						
Grants Post-1700	0.775*** (0.291)	0.577* (0.301)	1.705* (1.024)	2.778** (1.243)	0.236** (0.108)	0.345*** (0.130)
N	6747	1122	6747	1122	6747	1122
$R^2$	0.22	0.35	0.34	0.23	0.03	0.04
Control Mean	1.2	0.8	28	28.7	0.3	0.3

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

## A. Figures

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## B. Matching Descriptives

## C. Data Source Appendix

Below I describe the sources to which the land grants were compiled from. The states with a \* indicate that the works was done by the researchers at SILB.

### **Pernambuco\***

- Documentação Histórica Pernambucana. Recife: Imprensa Oficial, 1954. Vol. 1-2
- Documentação Histórica Pernambucana: sesmarias. Recife: Secretaria de Educação e Cultura. Biblioteca Pública, 1959. Vol. 1-4
- Coleção Documentos Históricos Biblioteca Nacional do Rio de Janeiro. Vol. 20-22
- Arquivo Nacional do Rio de Janeiro. Códice 427
- Arquivo Nacional do Rio de Janeiro. Códice 155
- Livro do Tombo do Mosteiro de São Bento de Olinda, Imprensa Oficial - Recife, 1948
- Livros do Tombo de São Bento. Book 1-3
- Revista do Instituto Arqueológico, Histórico e Geográfico Pernambucano, 1896.
- Revista do Instituto Histórico de Goiana, 1871.

### **Rio Grande do Norte\***

- O Treslado do auto e mais diligências que se fizeram sobre as datas de terras da capitania do Rio Grande, que se tinham dado. Fortaleza: Revista do Instituto do Ceará, 1909, Ano XXIII.
- IHGRN - Fundo Sesmarias - Books 1-9
- Documentos Históricos da Biblioteca Nacional do Rio de Janeiro..Vol. 23
- Documentos Históricos da Biblioteca Nacional do Rio de Janeiro..Vol. 24 Arquivo Nacional Rio de Janeiro, Códice 427

### **Bahia\***

- a

### **Paraíba\***

- A

## Sao Paulo

- *Sesmarias; documentos do Archivo do Estado de São Paulo* (1921) Vols. 1-3

## Minas Gerais

- c

## D. Description of Letters and Georeferencing

## E. Coastal RDD - Results

## F. Data Appendix - 1872

Below are the definitions of the variables measured for the 1872 census and how they were constructed. Some of the variables are already defined in the census:

### F.1. Base Variables, available by gender and free vs. enslaved:

1. Number of Literate People
2. Number of People 6-15 Attending/Not Attending/No Information on Schooling
3. Demographic Information on Race
  - (a) Number of Enslaved People
  - (b) Number of Pardos
  - (c) Number of Whites
  - (d) Number of Blacks
  - (e) Number of Caboclos
4. Number of People not born in the state based on origin: Within Brazil or from another country.
5. Number of people on types of jobs: Liberal/Manual/Agricultural/Industry/Other Jobs/No Jobs
  - (a) Liberal: Religious men/women, judges, lawyers, notaries, attorneys, justice officials, medics, surgeons, pharmacists, midwives, teachers, public officials, and artists.
  - (b) Manual or Mechanical:
  - (c) Agricultural: Farmers and livestock breeders.
  - (d) Industry: Manufacturers and merchants.
  - (e) Other: Military officers, mariners, fishermen, capitalists/owners, *jornaleiros* (workers that are paid based on a working day), domestic workers, and no information
6. Number of people by age group.

### F.2. Constructed Variables:

1. Number of Free People Above the Age of 15

$$\sum \# \text{ Of Free People Above 15}$$

2. Literacy Rates, following [Rocha et al. \(2017\)](#):

$$100 \times \frac{\# \text{ of Literate Free People}}{\# \text{ of Free People Above the Age of 15}}$$

3. Men Literacy Rates:

$$100 \times \frac{\# \text{ of Literate Free Men}}{\# \text{ of Free Men Above the Age of 15}}$$

4. Women Literacy Rates:

$$100 \times \frac{\# \text{ of Literate Free Women}}{\# \text{ of Free Women Above the Age of 15}}$$

5. Total number of children between 6-15

$$\begin{aligned} & \# \text{ of Free People between the ages 6-15 who attend school} + \\ & \# \text{ of Free People between the ages 6-15 who do not attend school} + \\ & \# \text{ of Free People between the ages 6-15 with no information on schooling} \end{aligned}$$

6. Percentage of Children between age 6-15 who are attending school:

$$100 \times \frac{\# \text{ of Free People between the ages 6-15 who attend school}}{\text{Total } \# \text{ of Free Children between 6-15}}$$

7. Percentage of Boys between age 6-15 who are attending school:

$$100 \times \frac{\# \text{ of Free Boys between the ages 6-15 who attend school}}{\text{Total } \# \text{ of Free Boys between 6-15}}$$

8. Percentage of Girls between age 6-15 who are attending school:

$$100 \times \frac{\# \text{ of Free Girls between the ages 6-15 who attend school}}{\text{Total } \# \text{ of Free Girls between 6-15}}$$

9. Proportion of Slaves to Free Population:

$$100 \times \frac{\# \text{ of Enslaved People}}{\# \text{ of Free People}}$$

10. Proportion of White/Caboclo/Black/Pardo:

$$100 \times \frac{\# \text{ of Free People of Certain Race}}{\# \text{ of Free People}}$$

11. Proportion of Internal/Foreign Immigrants:

$$100 \times \frac{\# \text{ of Free People of Certain Immigration Category}}{\# \text{ of Free People}}$$

12. Proportion of Teachers per 10,000:

$$10000 \times \frac{\# \text{ of Free People working as Teacher}}{\# \text{ of Free People}}$$

13. Proportion of Workers by Labor Market characteristics (as described in the data above):

$$100 \times \frac{\# \text{ of Total People in Certain Job}}{\# \text{ of Total People}}$$