

Portuguese Colonial Land Grants in Brazil: Long-term Effects on Inequality and Economic Development

Vinicius Okada da Silva

May 10th, 2024

Motivation

- Inequality in access to land is a key political and economic issue in Brazil
 - “**Brazil has one of the highest levels of inequality of land distribution in the world [...] An estimated 1% of the population owns 45% of all land in Brazil.**” ([USAID, 2016](#))

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- Large plots of land are often associated with low utilization ([Oliveira Andrade, 1980](#), p. 1)
 - Brazilian Agrarian Reform Agency in 2010, reported that “72% of all land occupied by large holdings was considered unproductive”.
- Broad economic ramifications
 - Land monopolies lead to the depression of rural wages alongside the stagnation of the consumer market ([Oliveira Andrade, 1980](#), p. 1).

Motivation

- Land inequality is not a recent issue ([Alston et al., 2010](#))

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TABLE 2. Gini Coefficient of Landownership Distribution in Brazil

Region	1960	1970	1975	1980	1985
Brazil	0.842	0.844	0.850	0.853	0.854
North	0.944	0.839	0.865	0.830	0.795
Northeast	0.846	0.855	0.858	0.858	0.865
Southeast	0.771	0.761	0.754	0.763	0.766
South	0.727	0.727	0.725	0.735	0.744
Center-West	0.845	0.856	0.851	0.840	0.836

Source: Hoffman 1982 and C. C. Mueller 1987.

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- A report to the Minister of Agriculture in 1873 states that “The major part of the land in our province is divided into great properties, remains of the ancient [land grants], of which few have been subdivided” ([T. L. Smith, 1972, p. 325](#))

Research Question

- How much of present-day land inequality can be traced to historical land grants in Brazil?

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Identification:

1. **1-1 Propensity Score Matching**
2. **Treaty of Tordesillas**: Assignment of Portuguese and Spanish Brazil until 1750.
3. **Colonial Policy Variation**: Coastal Ban on Livestock within 80km in 1701
4. **Instrumental Variable in the Southeast**: Explorer Routes in the Southeast.

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 4. **Instrumental Variable in the Southeast**: Explorer Routes in the Southeast.
- ⇒ **Main Takeaway**: All methods point toward a significant increase in 1995 land concentration in municipalities that had a grant.

Contribution

- Novel dataset on the distribution of colonial grants in Brazil.
- First to study and document the long-term effects of colonial land distribution on the present in Brazil.
 - Americas: [Wigton-Jones, 2020](#) (JEG), [Sellars et al., 2018](#) (JDE), [C. Smith, 2023](#) (WP)
 - India and Africa: [Banerjee et al., 2005](#) (AER)
- Understand the persistent effects of colonial Brazil's economic structure on the present.
 - Institutional and Natural Endowments: [Acemoglu et al., 2001](#) (AER), [Sokoloff et al., 2000](#) (JEP).
 - [Naritomi et al., 2012](#) (JEH), [Musacchio et al., 2014](#) (JEH), **Laudares2022-vy** (WP).

Outline

Background

Data

Identification Strategies

Challenges to Identification

Results

Results - Matching

Results - Tordesillas Treaty

Results - Coastal Ban on Livestock

Results - Instrumental Variable

Heterogeneity

Channels

Robustness

Conclusion

Background

Law Origins

- Originally, the *sesmarias* (land grants) were used as a land distribution policy created in Portugal to deal with the allocation of land post-Black Death.
- Granted small holdings to help repopulate and drive economic growth in affected regions.

Background

In Brazil

- Goal was to encourage Portuguese settlement in Brazil.
 - Reason on why they were much larger than in Portugal.
- One of the few ways to have access to land in colonial Brazil and given to people who could afford to develop the land ([T. L. Smith, 1944](#); [Dean, 1971](#)).
- People without direct access to it were often marginalized ([Simonsen, 2005](#)).
- Lasted until 1822.

Background

Procedure

- Petitioner submits a letter for an unoccupied land detailing their qualifications (captain, governor, etc.)
- Governor reads it, and if accepted returns back a letter with the requirements for the petitioner to satisfy.
- Five years to develop the land
- If successful, upon an inspection, the land was legally transferred from the government to the petitioner.
- Able to sell, pass down as inheritance, etc.

Background

Persistence

- In 1850, the Land Law was passed, dictating how land was to be distributed in post-independence Brazil.
 - Decided by large landowners, consolidated the land access in their hands.
- Historical and anecdotal evidence of the land grants having permanent effects in Brazilian economic structure:
 - Early studies argued it led to the development of the “**economic aristocracy of the colonial society**” and the “**principal cause of the [large estates]**” in Brazil ([Lima, 1954](#), p. 36; [Costa Porto, 1979](#), p. 48).

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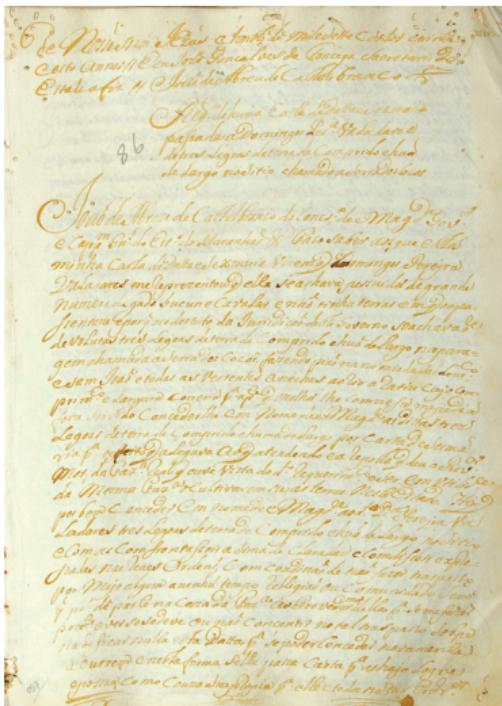
Data

- Land Grant Locations:
 - Information on the land grants from the [Sesmarias of the Luso-Brazilian Empire Database](#) and my own archival work [**Novel Data**]

Land Grant Dataset

Three main types of documents used:

1. Manuscript Only (Northeast)



PA 0001

Registro de uma carta de data e sesmaria passada a Domingos Pereira Valadares de 3 léguas de terra de comprimento e uma de largura, no sítio chamado a Serra dos Cocos.

Jodo de Abreu Castelo Branco, do Conselho de Sua Majestade, governador e capitão-general do estado do Maranhão, etc. Faco saber, aos que esta minha carta de de assentos e sementes viu, que Domingos da Cunha, o qual requerer que se de em que apacientas e quanto no diauto da justiça desde quando em governo se achavam devolutas 3 leguas de terra de comprido e uma de largo, na paragem chamada a Serra dos Coqueiros, fazendo pão na nomeada São Lourenço e São João, e todas as vertentes anexas ao Rio Aratu, cujo comprimento e largura correia para a parte que nascem das cossas de São José, que se componem em nomeada São José, São Pedro, São Paulo, etc, para o caso de semearia, para efeito que alegrava, o que atendendo, e a resposta que deu o provedor-mor da Fazenda Real, que houve vista do dito requerimento, e ser em utilidade da mesma Fazenda e das terras nele contidas. Eis o resultado, em que consta que o Marquês de São João, no dito Povoado Valadaro, é de 3 leguas de comprido e a de largo, no sitio e com as confrontações acima ditas e condições expressadas nas Reais Ordens, com condição de não fazer trespasse, por meio algum, em nenhum tempo, religião ou comandado, sem que primeiramente da parte da Casa da Fazenda o provedor-mor deles, para se me fazer presente e ver se deve ou não consentir no tal trespasso, sob pena de ficar nula esta data para se poder conceder concessão de alvará de posse, e que o dito Marquês de São João, seja sempre considerado como cosa sua própria, para todos e os seus herdeiros, ascendentes e descendentes, sem pena, nem tributo algum mais que o dizemos a Dízimo. Nossa Senhor dos frutos que nelas tiver, a qual concessão fico não prejulgando a terreno nem a sua extensão, e que o dito Marquês de São João, e os seus herdeiros, e os que derem os pais ou netos, que houverem posse e encomendações, com declaração que mandaria confirmar, esta data por Sua Majestade dentro de 3 anos prazo seguintes, e cultivaria as ditas terras de maneira que dí fruto, e dará caminhos públicos e particulares aonde for necessário para portas, fontes, brancas e veredas, como é estilo e o dito senhor ordena. E, outrossim, que o dito Marquês de São João, e os seus herdeiros, e descendentes, e os que acocerteando, possal-los sejam o ensorgo de pagar das dízimos a Deus como se fossem possuidas por seculares, e fallando a qualquer destas cláusulas, se haverão por devolutas e se darão a quem as denunciar. Pelas quais, que fano, provedor-mor da Fazenda Real, e capitão-mor e mestre e padres a quem referir, detençam e tirem a este o dito Marquês de São João, e os que derem os pais ou netos, que houverem herdeiros, ascendentes e descendentes, como cosa sua própria, e guardem esta data de carta e de semearia só intertemente como nela se contém, e que se registrará no dia e se passou por duas vias. Data na cidade de São Luís do Maranhão, aos 19 dias

Land Grant Dataset

Three main types of documents used:

2. Digitized Manuscript (Sao Paulo):

— 46 —

Carta de data de terras de
sesmaria que dá o capitão-mor
Thomaz da Costa Barbosa ao
capitão Luiz Soares Ferreira
morador em a villa de São
Paulo.

Diz o capitão Luiz Soares Ferreira morador
nesta villa de São Paulo que elle supplicante não
tem terras para lavrar e fazer seus mantimentos,
pede a vossa mercé em nome do senhor Marquez
de Cascaes donatario perpetuo desta capitania
e pelos poderes que vossa mercé tem como pro-
curador bastante e sesmeiro loco-lente do dito
senhor de lhe dar quatrocentas braças de terra
que poderá ter das confrontações pouco mais
ou menos e de serão poderá ter quinhentas
pouco mais ou menos tudo pelas confrontações,
quer tenha a quantidade que diz ou mais ou
menos valendo as confrontações que estão devolu-
tas e ha bem de annos no termo desta villa
bairro de Jaraguá, a saber começando da borda
de um brejo que fica junto ao rio do Tieté aci-
ma de um poco chamado Curahapué de testa-
tida correndo ao longo do dito rio por elle abai-
xo até a Cachoeira Grande e dahi correndo ao
serão até entestar com os vallos de Ignez Pe-
droso e da outra banda da borda do rio de onde
começou até entestar com o ribeirão do Moinho
Velho que lhe chamam Guassacibí e da cachoeira
até Ignez Pedroso sempre ao longo do
todas as pontas e enseadas e charcos que tiver

Land Grant Dataset

Three main types of documents used:

3. Inventory (Minas Gerais):

SESMEIRO	LOCAL, FREGUESIA, DISTRITO, TERMO, COMARCA	DATA	CÓDICE	PÁGINA
MADEYRA, João Damaceno	Cabeceiras. F. Congonhas. C.S.	04ago.1759	SC.125	78v.
MADEYRA, Manoel Lopes	Par. da Lagoa Verde. T. V.S. João del-Rei. C.R.M.	09nov.1756	SC.112	130v.
MADEIREIRA, Antonio da Costa	Sít. das Palmeiras	12maio1747	SC. 90	49v.
MADEIREIRA, João Borges de	Par. de Sta. Ana e S. Joaquim.	23set.1745	SC. 85	33v.
MAFRA, Antonio Freire	Guaiaçu do Sul. F. Sumidouro. D. Mariana	11ago.1753	SC.106	90v.
MAFRA, ^{ES} , Anna Mendes de	Rib. de S. Bartolomeu, margem do Rio Doce. T. Mariana	16ago.1825	SP. 36	58v.
MAFRA, ^{ES} , Antonino Mendes de	Rib. de S. Bartolomeu, margem do Rio Doce. T. Mariana	16ago.1825	SP. 36	58v.
MAFRA, ^{ES} , Antonio José de Souza	Rib. Magalhães	16nov.1819	SC.384	23
MAFRA, ^{ES} , Antonio Miz. de, cap.	Rio Pinho, ao pé da Cachoeira de S. Domingos	28jul.1783	SC.234	29v.
MAFRA, ^{ES} , Antonio Mendes de	Rib. de S. Bartolomeu, margem do Rio Doce. T. Mariana	16ago.1825	SP. 36	58v.
MAFRA, ^{ES} , Antonio Pinto de, cap.	Sít. à margens do Rio das Velhas, na Barra do Piçarrão	05fev.1711	SC. 07	62v.
MAFRA, ^{ES} , Antonio Pinto de, cap.	Sít. nos Raposos	05fev.1711	SC. 07	63
MAFRA, ^{ES} , Antonio Pinto de	Sete Lagos	03nov.1718	SC. 12	10v.
MAFRA, ^{ES} , Fernando Luis Machado de, cel	Barra do Rio Corrente ao entrar no Rio Doce	29jul.1825	SC. 36	45
MAFRA, ^{ES} , Fernando Luis Machado de ...	Margem esquerda do Rio Corrente. T. V. Príncipe	16ago.1825	SP. 36	57v.
MAFRA, ^{ES} , João Baptista, sac.	Faz. Morrinhos, no Sert. da Ribeira do Urucuia	22nov.1760	SC.129	88
MAFRA, ^{ES} , João Baptista de, sac.	Faz. Morrinhos, no Sert. da Ribeira do Urucuia	25abr.1761	SC.129	113
MAFRA, ^{ES} , João Ignacio de	Rib. de S. Bartolomeu, margem do Rio Doce. T. Mariana	16ago.1825	SP. 36	58v.
MAFRA, ^{ES} , José Mendes de	Rib. de S. Bartolomeu, margem do Rio Doce. T. Mariana	16ago.1825	SP. 36	58v.
MAFRA, ^{ES} , Lourenço da Silva, sac.	Matos junto do Sít. das Furnas da Prata	20maio1724	SC. 21	180v.
MAFRA, ^{ES} , Manoel Coelho de	Entre as sesmarias do Palmital, a de Dom ^{os} Pinto Monteiro, a de João da Costa de Araujo Dantas e a do Quilombo	13abril.1785	SC.234	101v.

Georeferencing Example

ambos lavrarem na banda dos campos de Ytacurubitiva no caminho que fez Gaspar Vaz que vai para Boigi mirim a saber partindo da barra dum rio que se chama Guayao por elle arriba até dar em outro rio que se chama dahí dará volta a demarcação pelas faldas do outeiro da banda do sudoeste e correrá avante até dar no rio grande de Anhemby e por o rio grande abaixo até dar digo até tornar aonde começou a partir e assim mais meia com dois capões que estão defronte da dita dada a saber um capão que se chama de Ytacurubitiva e outro ... assupeva para fazerem suas casas e trazerem suas criações e vista por mim sua petição puz ao pé della o despacho que se segue.

- Four geographical markers:
Campos de Ytacurubitiva (Fields of Ytacurubitiva), Boigi Mirim, Rio Grande de Anhemby, and Rio Guyao

Georeferencing Example

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- *Campos de Ytacurubitiva* (Fields of Ytacurubitiva) → Same as Itaquaquecetuba (Costa, 2021).

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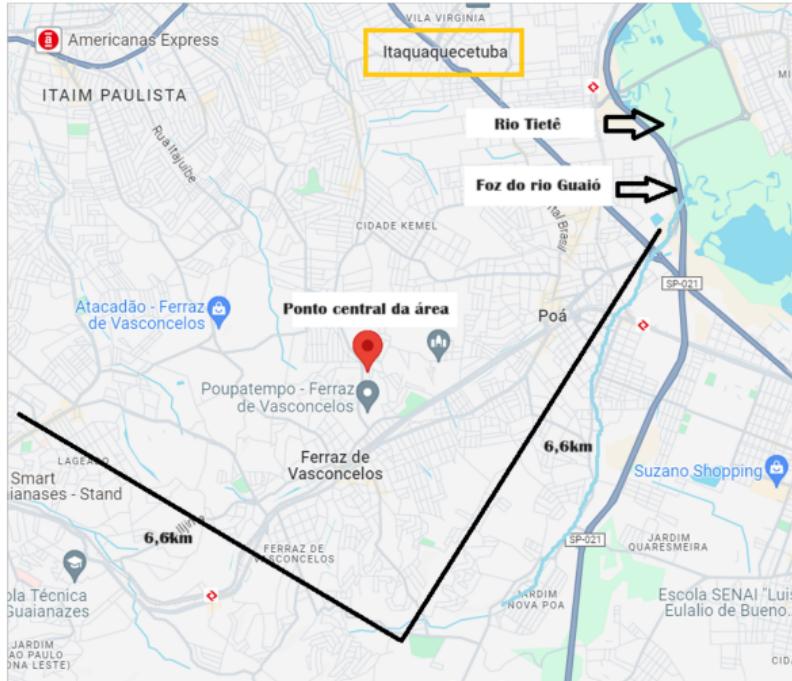
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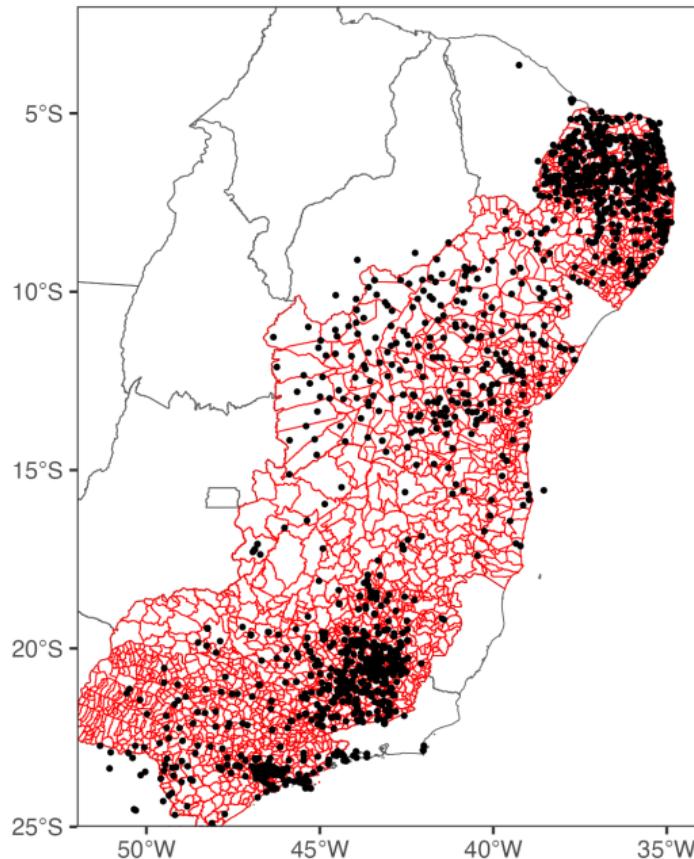
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- Boigi Mirim → Municipality of Mogi das Cruzes (Leme, 2014).
- Rio Grande de Anhemby → Tiete River (Vilardaga, 2020).
- Rio Guyao → Guaio River.

Georeferencing Example



Coordinates: -46.3, -23.5

Full Land Grant Dataset



Data Assumptions

1. Sample Selection:

- Data only contains land grants that were able to be georeferenced **and** saved in archives.
- Assume that the dataset is at least partially **representative** of all the grants

Data Assumptions

2. Geolocation Procedure:

- Treatment assignment could vary on how well the georeferencing is done.
- Described previously.
- Uses a variety of historical, and scholarly work.
- **Last resort:** pinpoint to the nearest municipality.

Data

- Land Grant Locations:
 - Information on the land grants from the [Sesmarias of the Luso-Brazilian Empire Database](#) and my own archival work **[Novel Data]** Grant by Decade Distribution
- Present-Day Effects on Land Inequality (1995 Municipalities)
 - 1995 Brazilian Agricultural Census
 - **Measure of inequality:** % of Total Agricultural Land in a Municipality that is in establishments of over 2,000 ha (20 km^2 or 4,912 acres).

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 - For reference the UIUC campus is 6,370 acres.

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Results - Matching

Results - Tordesillas Treaty

Results - Coastal Ban on Livestock

Results - Instrumental Variable

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Identification Strategy I

Matching

$$LandGrant_m = X_m + \mu_s + \epsilon_{m,s} \quad (1)$$

- Variables used to match: latitude, longitude, mean elevation, mean slope, soil quality for food crops ([Galor et al., 2016](#)), potential sugarcane output from the FAO, the distance to the coast, distance to the nearest river, and the presence of four types of soil.
 - All important geographical measures of settler presence.
- Estimate the coefficients on the $X_m \rightarrow$ predicts the propensity score that a municipality received a grant.
- 1-1 Nearest Neighbor Matching: an untreated municipality is assigned as a control for a treated municipality.
- Generates the **matched sample** of municipalities.

Identification Strategy I

Matching

For both the matched and unmatched samples:

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

- **Key Assumption:** Untreated municipalities are similar in both observables and unobservables as treated municipalities. Propensity Score Overlap
- Further exploit variation on 1698 law that limited grant size.

$$Y_{m,s} = \gamma_1 \cdot Pre1700Grant_m + \gamma_2 \cdot Post1700Grant_m + X_m + \mu_s + \epsilon_{m,s} \quad (3)$$

Identification Strategy II

Tordesillas Treaty

- Brazil was split between Portuguese and Spanish sides in 1494 (before the first Europeans arrived in Brazil).
- By law lasted until 1750.
- Generates variation in where the grants **could be assigned**, and the **exposure of two colonization types**.
 - Spanish side was not deeply settled, few cities, and some missionary activity ([Barsanetti, 2021](#)).
- Focused only on the Southeastern states of Sao Paulo and Minas Gerais - both have municipalities on either side of the treaty line.

Identification Strategy II

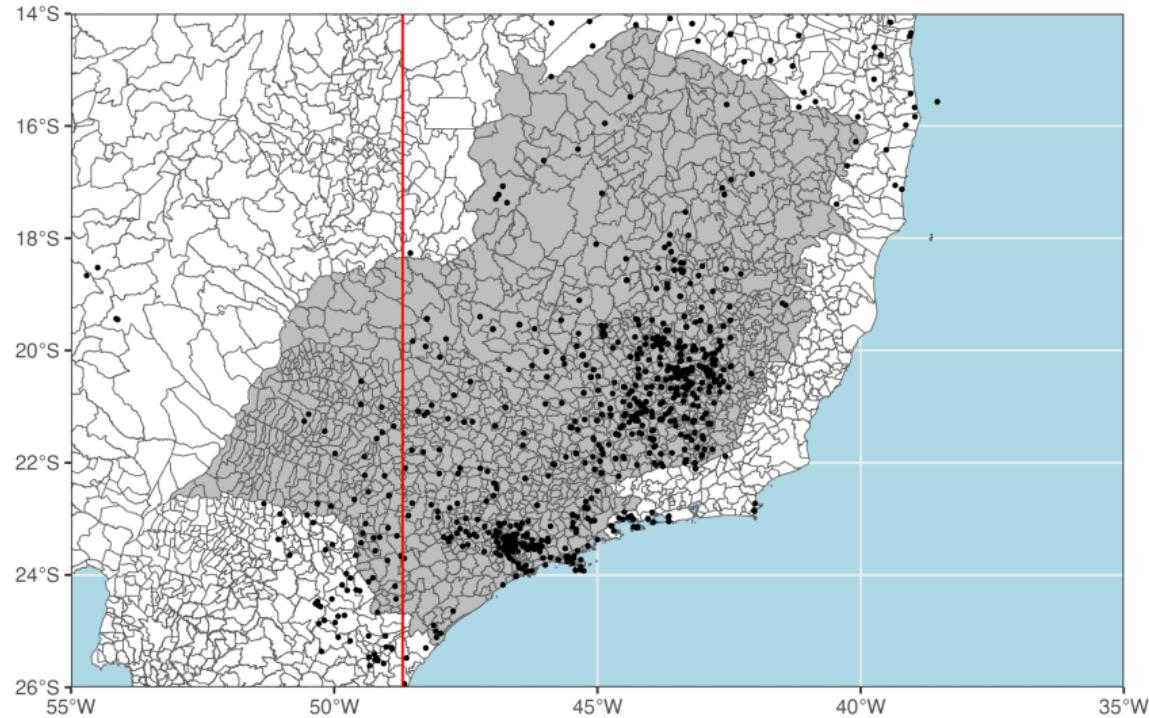
Tordesillas Treaty

$$Y_{m,s} = \beta_1 \cdot (\text{Grant}_m * \text{Portuguese}_m) + \beta_2 \cdot (\text{Grant}_m * \text{Spanish}_m) + \\ \delta \cdot \text{Portuguese}_m + X_m + \mu_s + \epsilon_{m,s}$$

- Follow **Laudares2022-vy** to define the Tordesillas Treaty at 48.7 W.
- Test historical predictions
- **Control Group:** Municipalities on the **Spanish Side** that **did not** receive a grant.
 - X_m same as previous specifications + **distance to the line**.
 - μ_s state fixed effects.

Identification Strategy II

Tordesillas Treaty



Identification Strategy II

Hypothesis and Predictions

$$Y_{m,s} = \beta_1 \cdot (\text{Grant}_m * \text{Portuguese}_m) + \beta_2 \cdot (\text{Grant}_m * \text{Spanish}_m) + \\ \delta \cdot \text{Portuguese}_m + X_m + \mu_s + \epsilon_{m,s}$$

Coefficients	If the Following is True	Predicted Sign
δ	Portuguese colonization led to increase in land inequality relatively to Spanish colonization.	+
β_1	The land grants led to land inequality.	+
β_2		+

Identification Strategy III

Coastal Ban on Livestock

- In 1701, a Royal Decree was established banning livestock raising within 80km of the coast ([Fausto, 2014](#), p .40; [Simonsen, 2005](#), p .198; [Bethell, 1984](#), p .460).
 - The main reason was that livestock was destroying the crops being planted on the coast.

Identification Strategy III

Coastal Ban on Livestock

- In 1701, a Royal Decree was established banning livestock raising within 80km of the coast ([Fausto, 2014](#), p .40; [Simonsen, 2005](#), p .198; [Bethell, 1984](#), p .460).
 - The main reason was that livestock was destroying the crops being planted on the coast.
- Generates variation on the **grant locations** and **possible economic activity**.
 - The law led to “a clear specialization between the two activities” ([Ribeiro, 2012](#)).
- Livestock grants are often associated with large estates, since cattle needed the area to roam ([Fausto, 2014](#), p .41).

Identification Strategy III

Coastal Ban on Livestock

$$Y_{m,s} = \beta_1 \cdot (\text{Pre1700Grant}_m * \text{More80km}_m) + \beta_2 \cdot (\text{Pre1700Grant}_m * \text{Less80km}_m) + \delta \cdot \text{More80km}_m + X_m + \mu_s + \epsilon_{m,s}$$

$$Y_{m,s} = \zeta_1 \cdot (\text{Post1700Grant}_m * \text{More80km}_m) + \zeta_2 \cdot (\text{Post1700Grant}_m * \text{Less80km}_m) + \delta \cdot \text{More80km}_m + X_m + \mu_s + \epsilon_{m,s}$$

- **Control Group:** Municipalities within 80km of the coast that **did not receive a grant**
- First test whether there is an increase in the **percentage of agricultural area used for livestock.**

Identification Strategy III

Coastal Ban on Livestock

$$Y_{m,s} = \beta_1 \cdot (\text{Pre1700Grant}_m * \text{More80km}_m) + \beta_2 \cdot (\text{Pre1700Grant}_m * \text{Less80km}_m) + \delta \cdot \text{More80km}_m + X_m + \mu_s + \epsilon_{m,s}$$

$$Y_{m,s} = \zeta_1 \cdot (\text{Post1700Grant}_m * \text{More80km}_m) + \zeta_2 \cdot (\text{Post1700Grant}_m * \text{Less80km}_m) + \delta \cdot \text{More80km}_m + X_m + \mu_s + \epsilon_{m,s}$$

Coefficients	If following is True	Effects on Livestock	Effects on Land Inequality
β_1	Expansion of cattle towards the West was driven by the grants and livestock required larger plots of land.	~	+ or 0
β_2		~	+ or 0

Identification Strategy III

Coastal Ban on Livestock

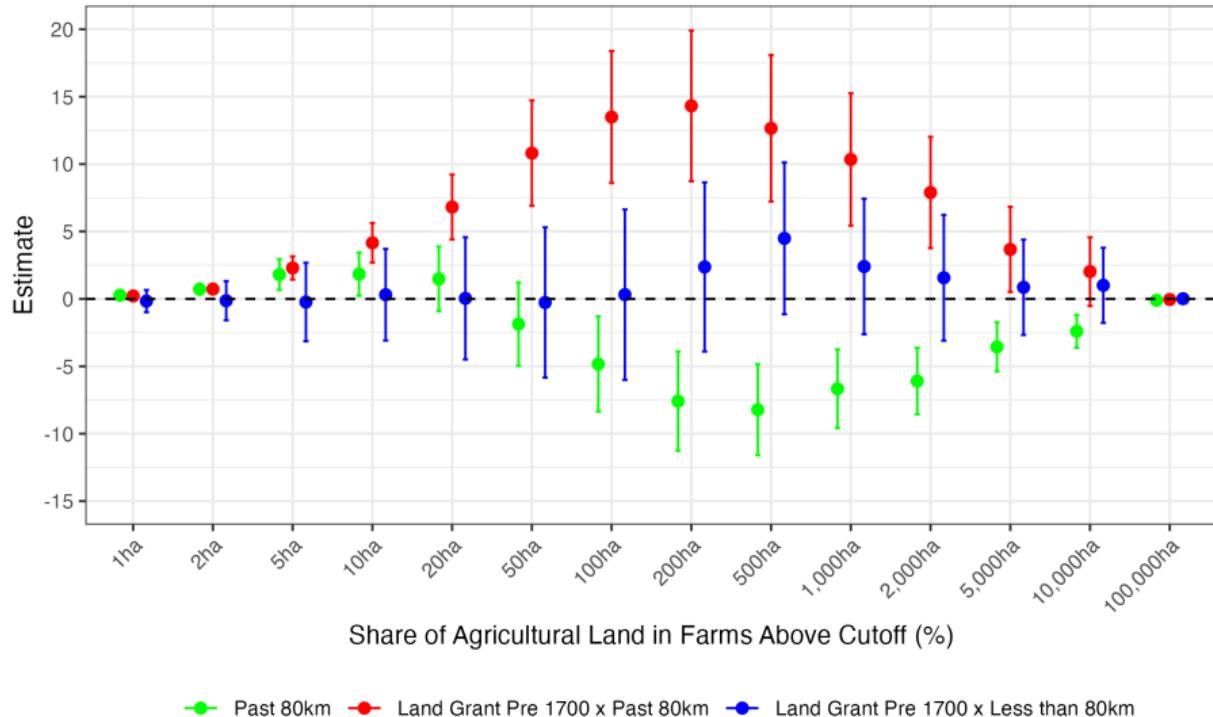
$$Y_{m,s} = \beta_1 \cdot (\text{Pre1700Grant}_m * \text{More80km}_m) + \beta_2 \cdot (\text{Pre1700Grant}_m * \text{Less80km}_m) + \delta \cdot \text{More80km}_m + X_m + \mu_s + \epsilon_{m,s}$$

$$Y_{m,s} = \zeta_1 \cdot (\text{Post1700Grant}_m * \text{More80km}_m) + \zeta_2 \cdot (\text{Post1700Grant}_m * \text{Less80km}_m) + \delta \cdot \text{More80km}_m + X_m + \mu_s + \epsilon_{m,s}$$

Coefficients	If following is True	Effects on Livestock	Effects on Land Inequality
ζ_1	Expansion of cattle towards the West was driven by the grants and livestock required larger plots of land.	+	+
ζ_2		- or 0	+ or 0

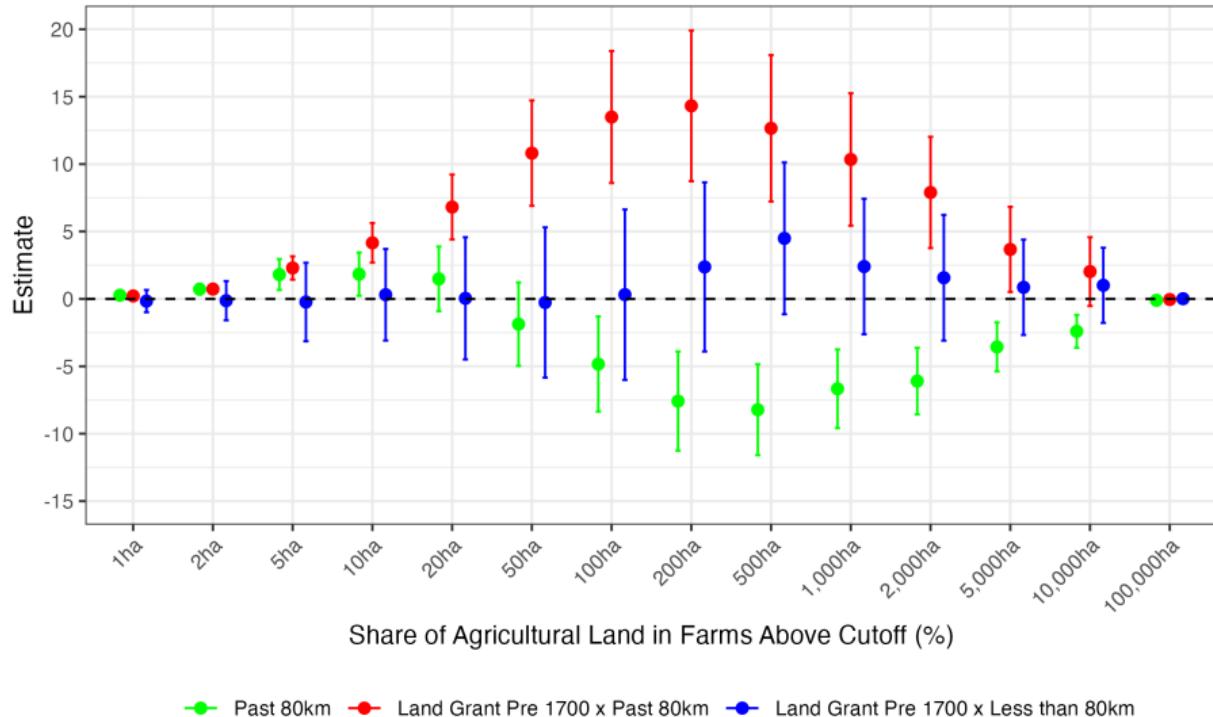
Pre-1700 Results

Land Distribution - Entire Sample



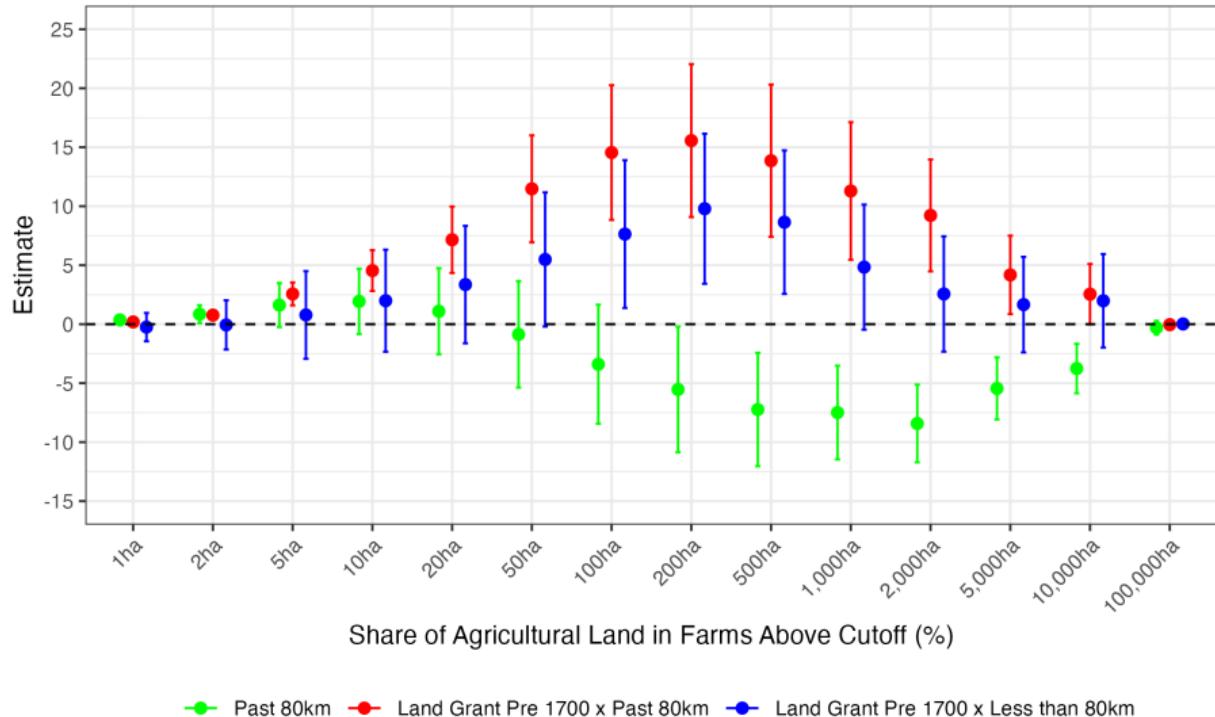
Pre-1700 Results

Land Distribution - Matched Sample



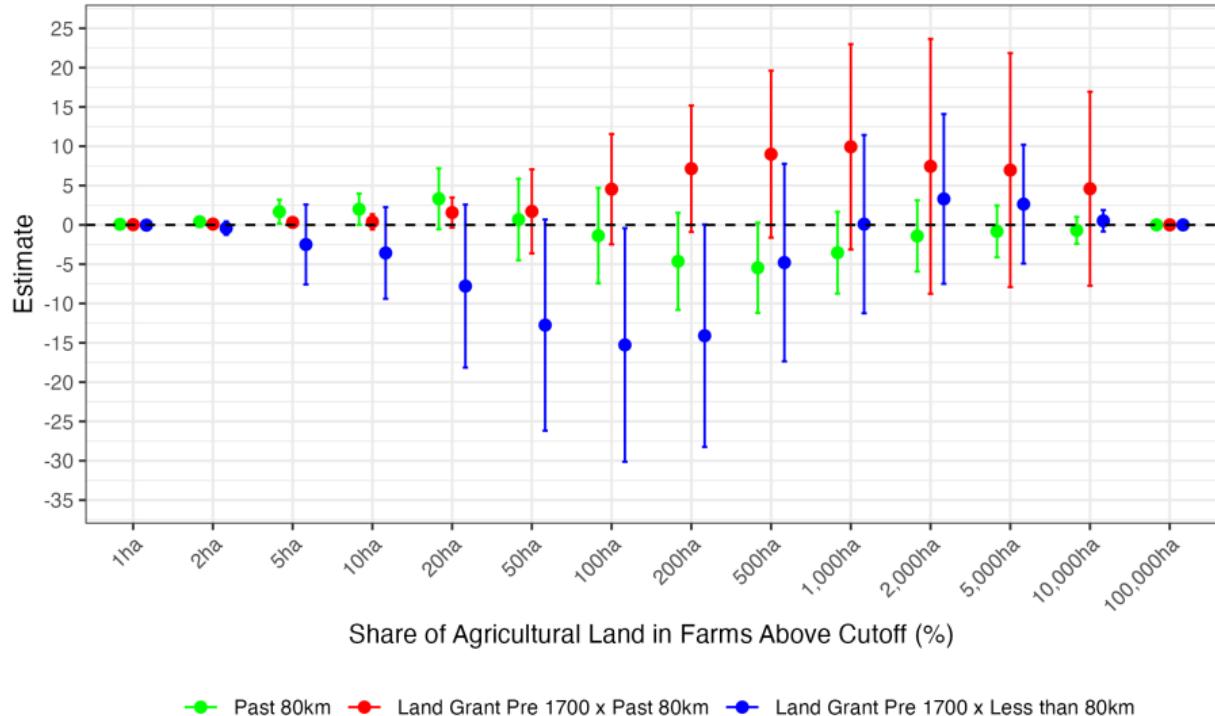
Pre-1700 Results

Land Distribution - Northeast



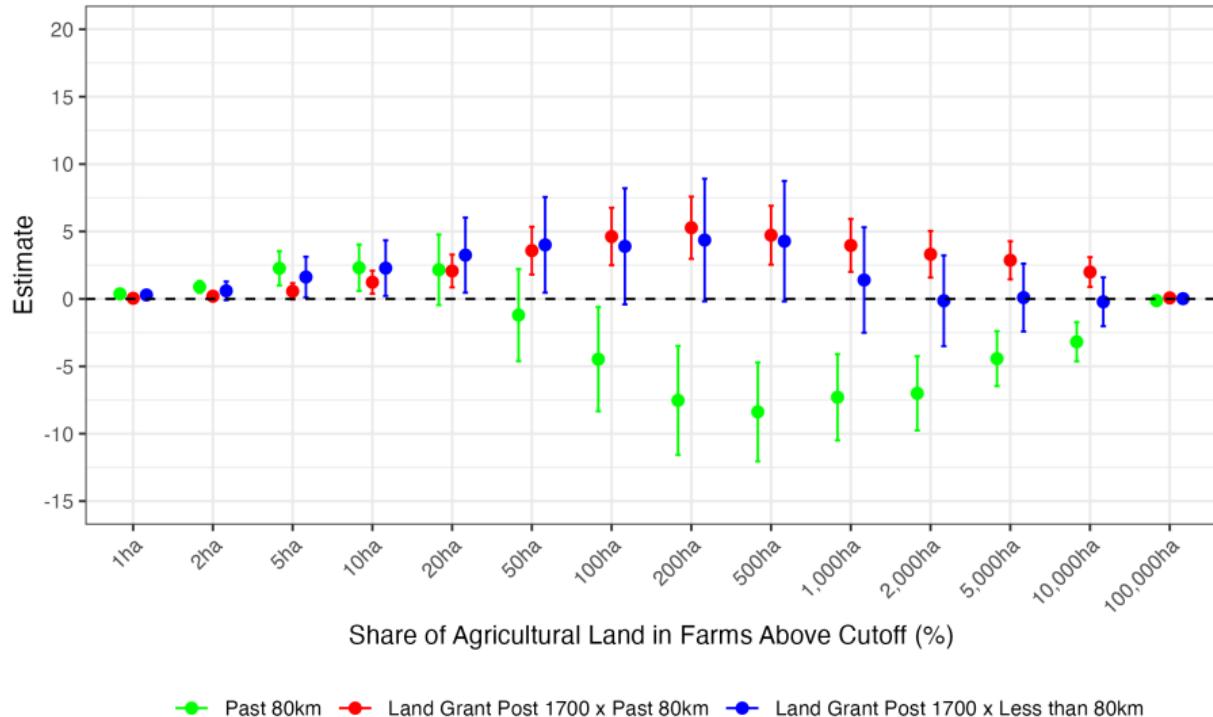
Pre-1700 Results

Land Distribution - Southeast



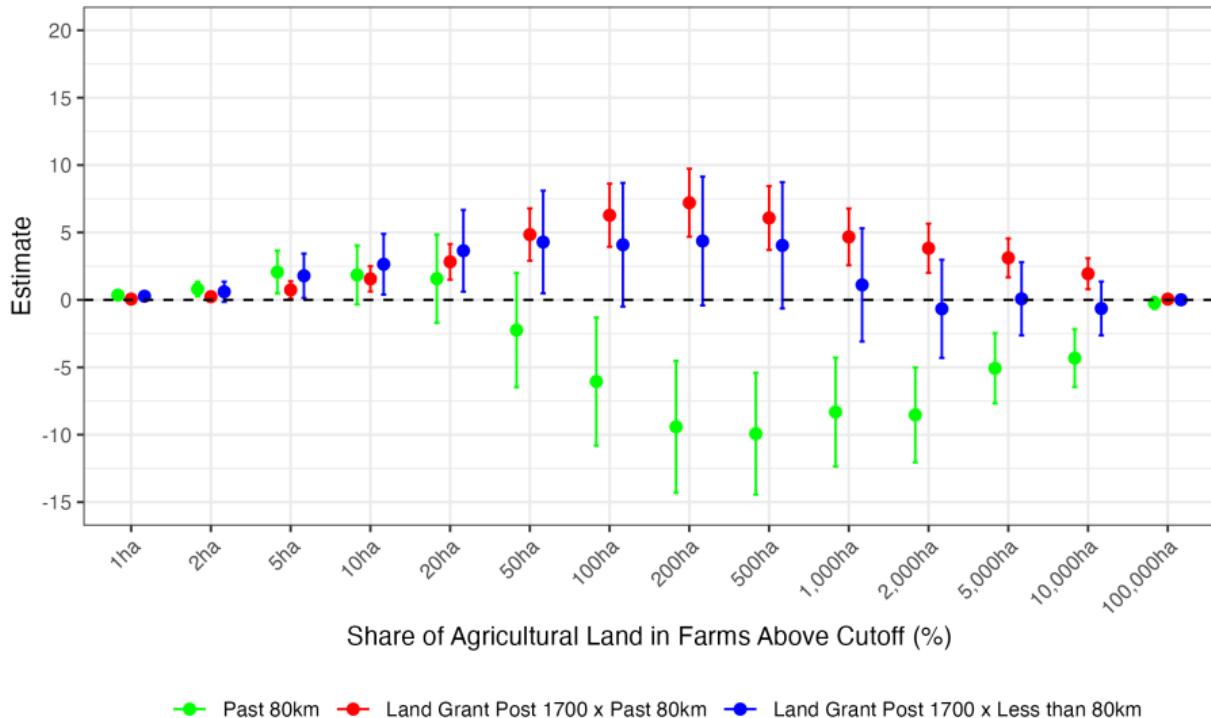
Post-1700 Results

Land Distribution - Entire Sample



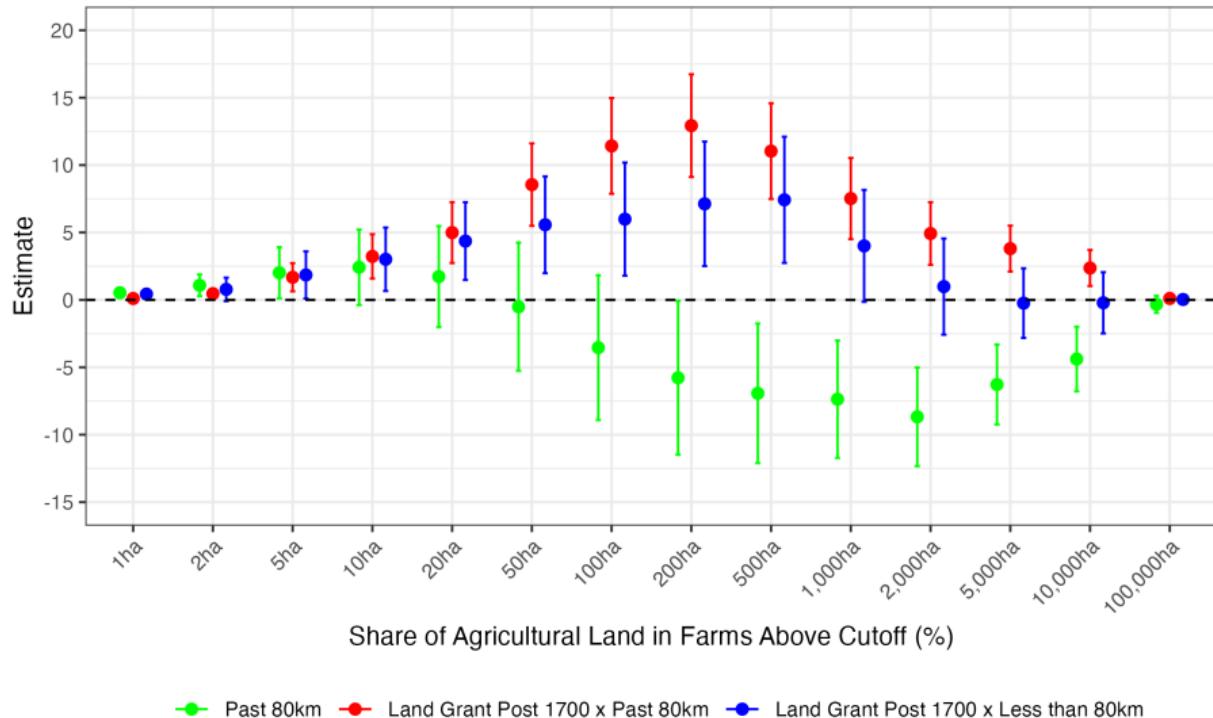
Post-1700 Results

Land Distribution - Matched Sample



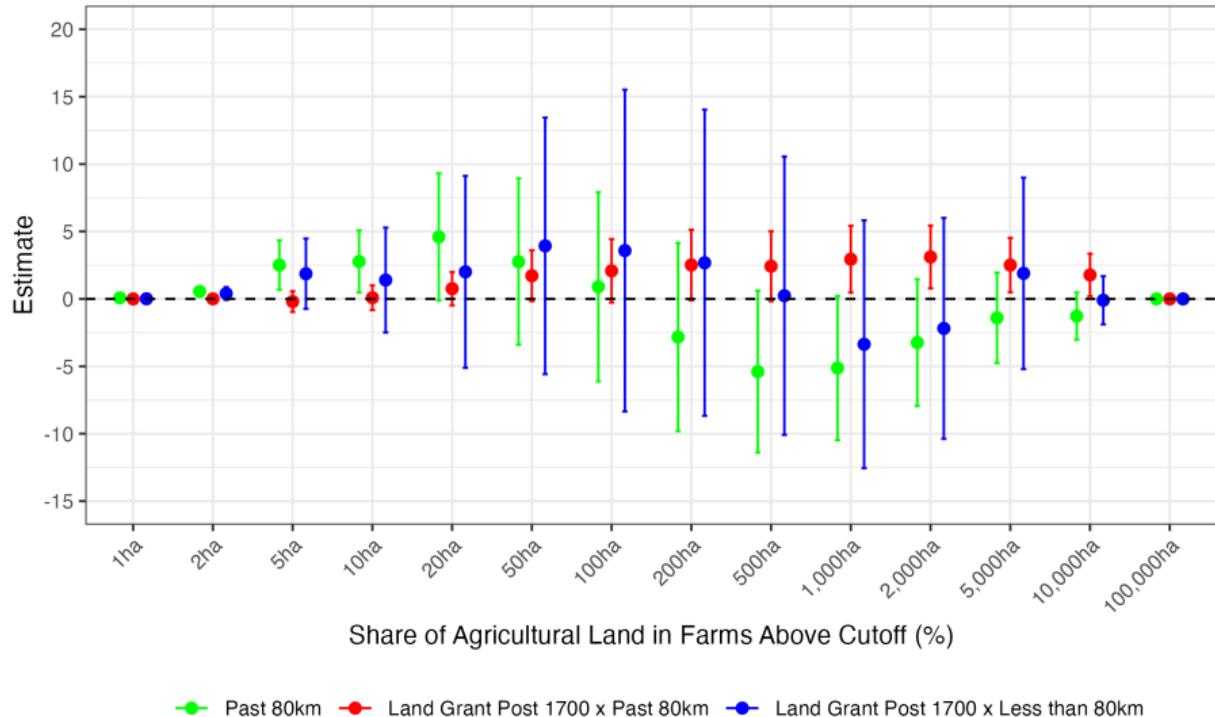
Post-1700 Results

Land Distribution - Northeast



Post-1700 Results

Land Distribution - Southeast



Identification Strategy IV

Instrumental Variable

- Middle seventeenth and eighteenth century, exploration from São Paulo led by people looking for gold, minerals, and indigenous slaves.
- “Owing in large measure to the intrepid Paulistas of the seventeenth century, the menace of Indian attacks from the interior was largely eliminated, and the lands themselves were appropriated in extremely large tracts for the purposes of cattle raising” ([T. L. Smith, 1972](#), p. 320).

Identification Strategy IV

Instrumental Variable

- Middle seventeenth and eighteenth century, exploration from Sao Paulo led by people looking for gold, minerals, and indigenous slaves.
- “Owing in large measure to the intrepid Paulistas of the seventeenth century, the menace of Indian attacks from the interior was largely eliminated, and the lands themselves were appropriated in extremely large tracts for the purposes of cattle raising” ([T. L. Smith, 1972](#), p. 320).
- **Instrument:** The proximity of a municipality to an explorer route. [Full Map](#)
- Focused only on the Southeastern states of Sao Paulo and Minas Gerais.

Identification Strategy IV

Instrumental Variable

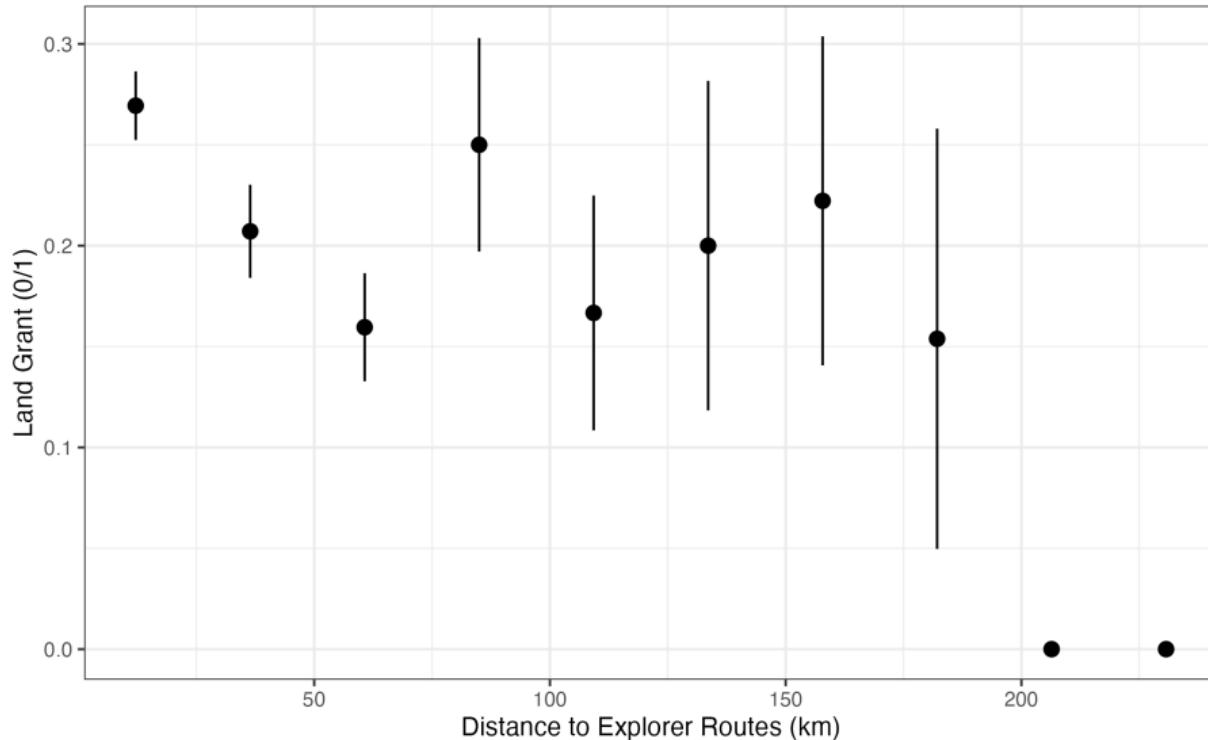
$$LandGrant_{m,s} = \delta \cdot BandeiraDist_{m,s} + X_{m,s} + \mu_s + \epsilon_{m,s} \quad (4)$$

$$Y_{m,s} = \beta \cdot \widehat{LandGrant}_{m,s} + X_{m,s} + \mu_s + \epsilon_{m,s} \quad (5)$$

- **Exclusion Restriction:** Conditional on the set of controls, the proximity to the explorer routes only affects land inequality through the increased presence of land grants.

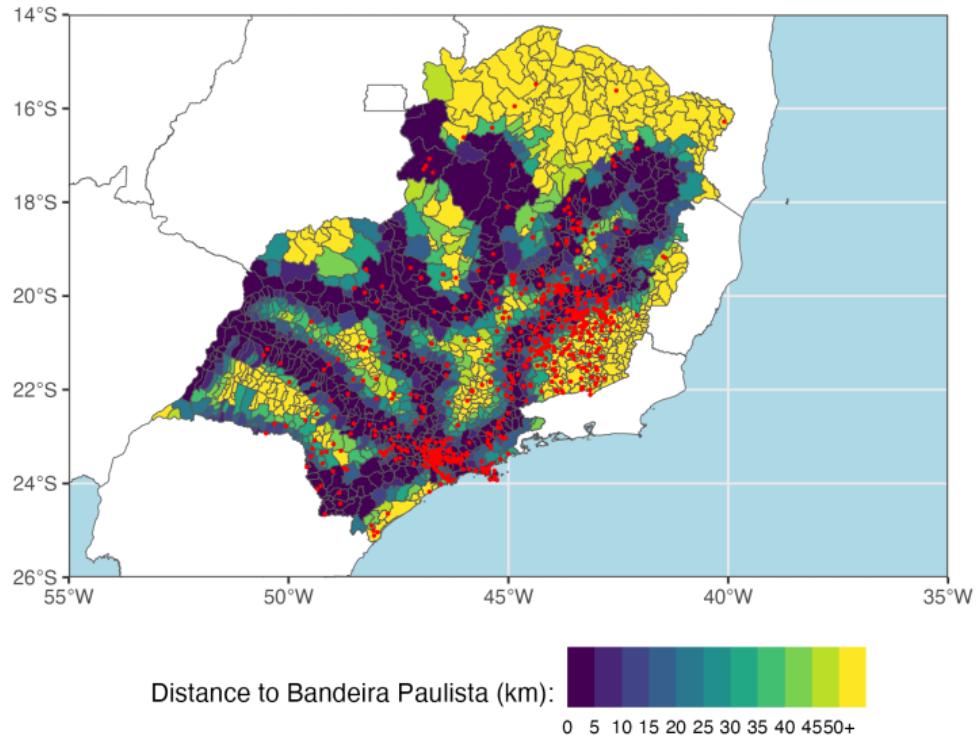
Visualization

First Stage Graph



Visualization

First Stage Map



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Results - Coastal Ban on Livestock

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Challenges to Identification

1. Endogeneity of the grants

- Grantees would choose the best suitable places to get the grants
- Control for possible geographical characteristics that likely would have mattered for settlers
- Matching estimators
- Historical variation on the location of the grants
- Instrumental Variable for the Southeast

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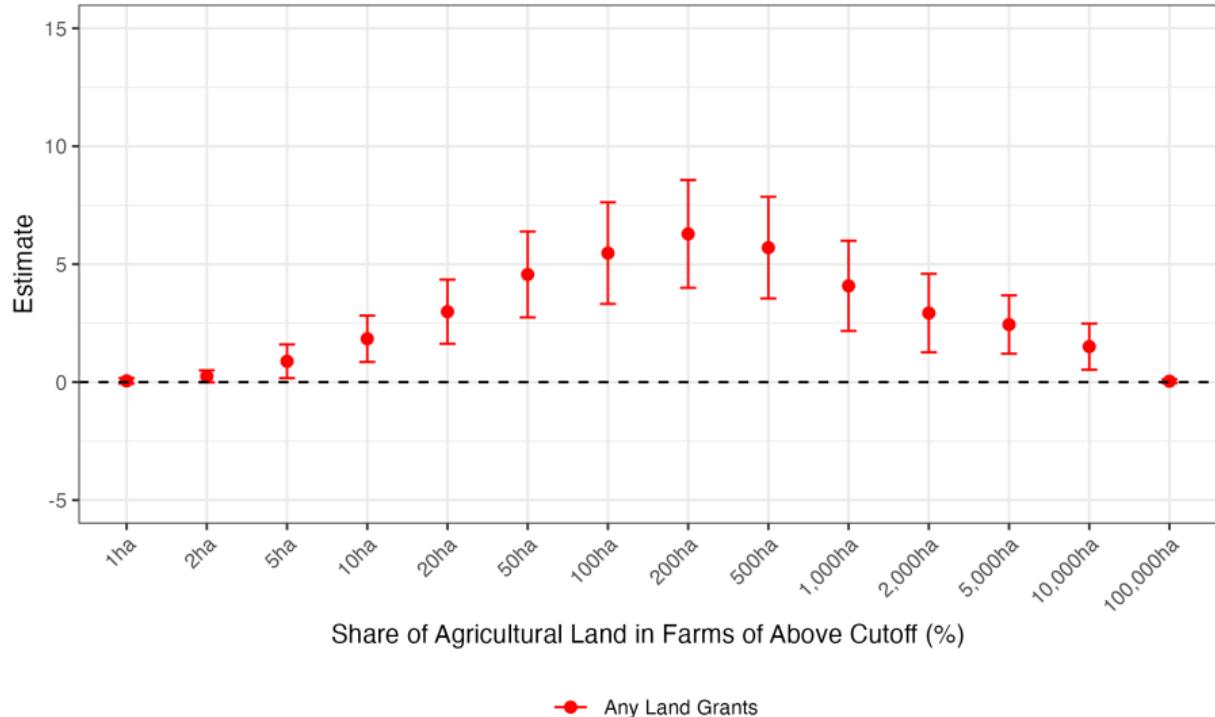
Channels

Robustness

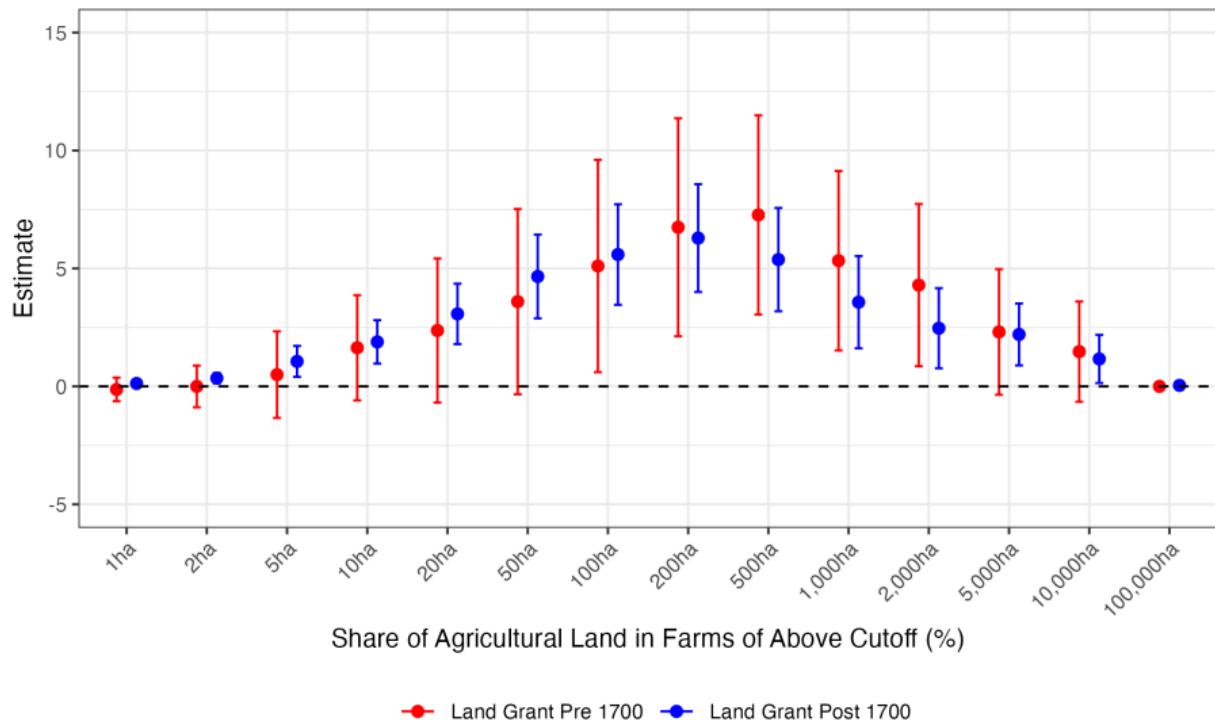
Conclusion

Matching Results

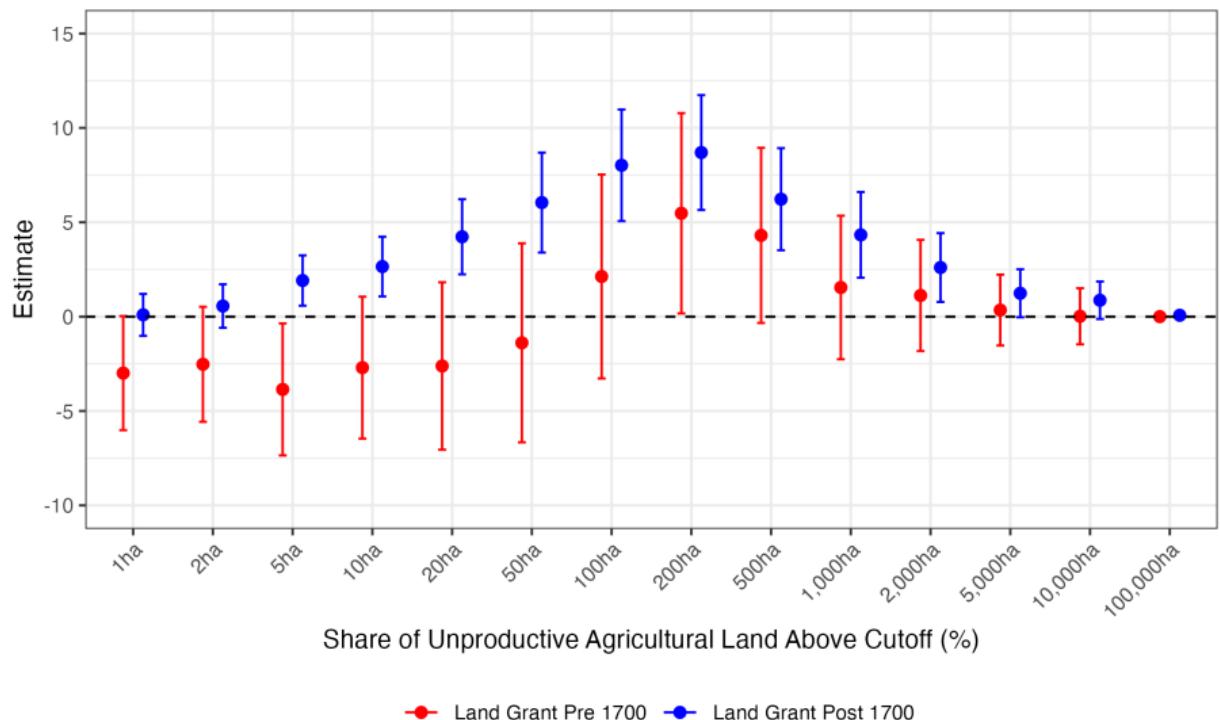
Any Grants - Land Size



Matching Results



Effects on Productivity



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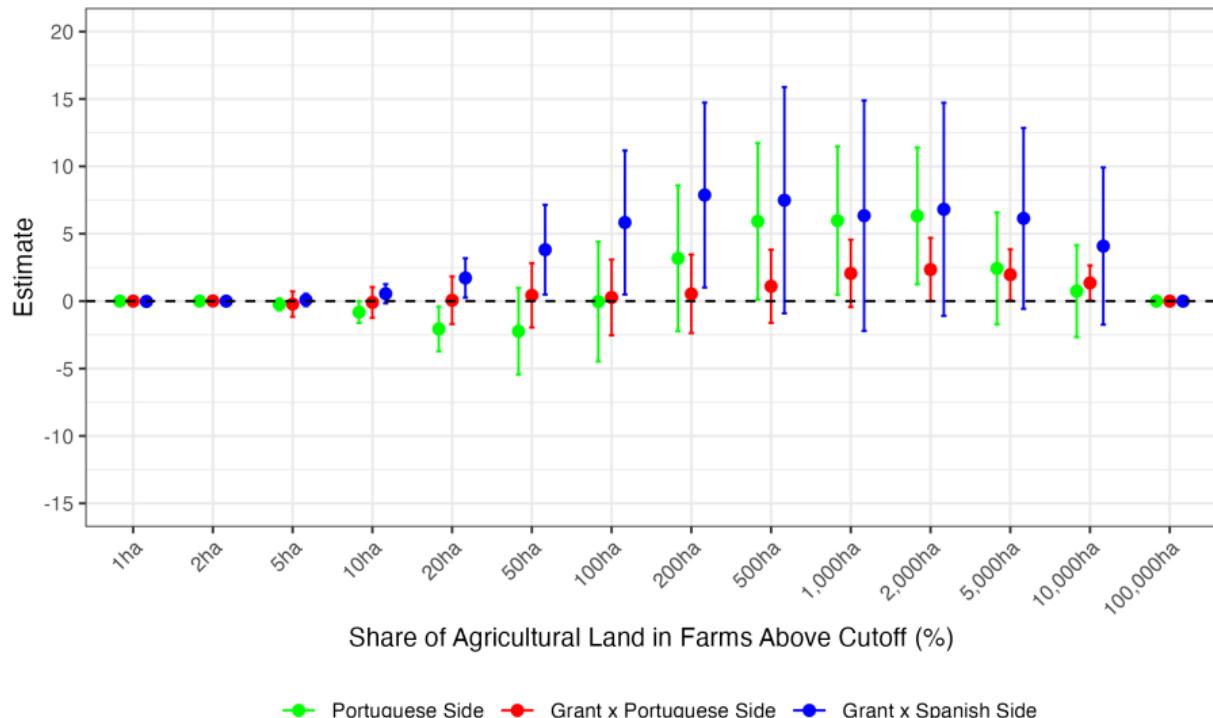
Results

Table 1: Differential Effect of the Grants on 1995 Land Inequality - Tordesillas Treaty

	Over 2,000 ha	Over 5,000 ha	Over 10,000 ha
Portuguese Side	6.324** (2.588)	2.425 (2.117)	0.744 (1.740)
Any Grants x Portuguese Side	2.343* (1.196)	1.963** (0.963)	1.350** (0.664)
Any Grants x Spanish Side	6.812* (4.029)	6.138* (3.419)	4.084 (2.972)
N	1365	1365	1365
Geographical Controls	✓	✓	✓
Control Mean	11.21	3.68	1.54

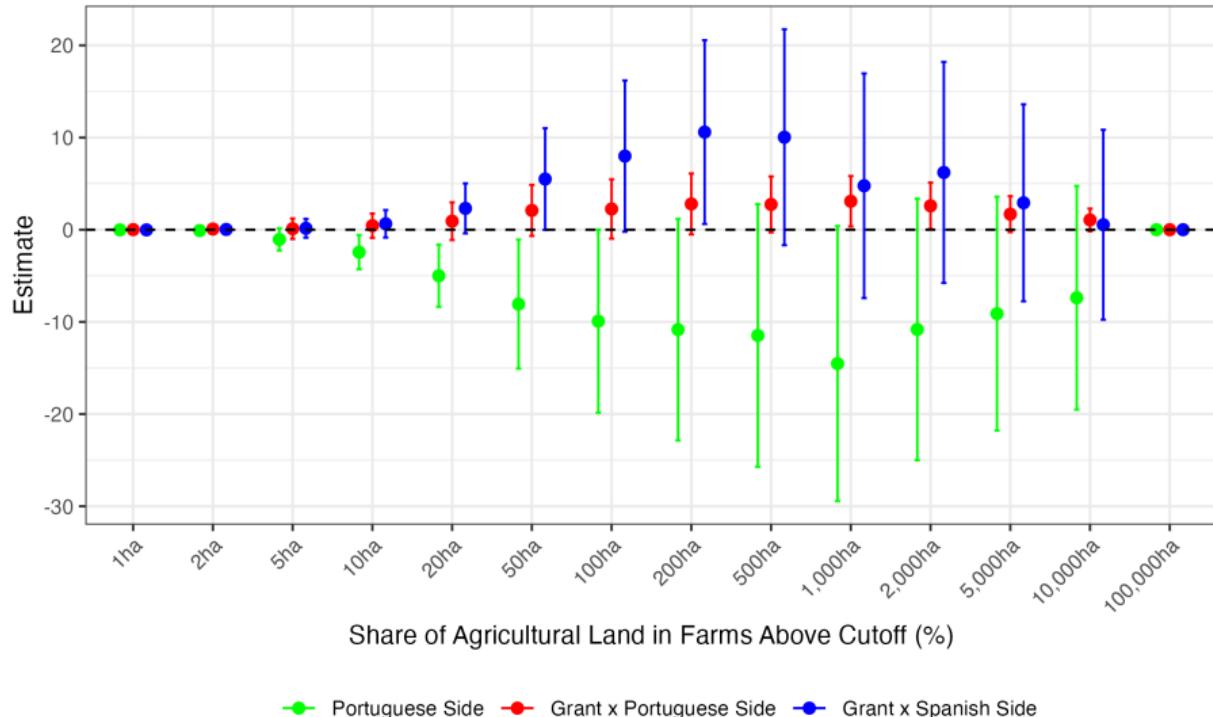
* p < 0.1, ** p < 0.05, *** p < 0.01

Distribution Results



Distribution Results

Matched Sample



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Table 2: Effects of Land Grants in Livestock and Pastures - 1995

	Area used for Livestock (%)	Area used as Natural Pasture (%)	Area used as Artificial Pasture (%)
More than 80 km from the Coast	-5.459*** (1.994)	4.027*** (1.443)	-1.567 (2.770)
Grants Pre-1700 x More than 80 km from the Coast	6.631** (3.025)	1.216 (1.771)	-2.396 (2.265)
Grants Pre-1700 x Less than 80 km from the Coast	-4.176 (3.618)	3.429 (7.311)	-1.685 (2.482)
Geographical Controls	✓	✓	✓
N	2372	2372	2372
Control Mean	43.4	17.2	13.8

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

Identification III

Coastal Ban on Livestock

Table 3: Effects of Land Grants in Livestock and Pastures - 1995

	Area used for Livestock (%)	Area used as Natural Pasture (%)	Area used as Artificial Pasture (%)
More than 80 km from the Coast	-3.929* (2.349)	5.156*** (1.767)	-1.877 (2.914)
Grants Post-1700 x More than 80 km from the Coast	4.363*** (1.235)	1.464** (0.705)	1.693 (2.860)
Grants Post-1700 x Less than 80 km from the Coast	7.121 (5.646)	6.789 (5.033)	0.835 (4.751)
Geographical Controls	✓	✓	✓
N	2372	2372	2372
Control Mean	40.3	15.7	13.7

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

Identification III

Coastal Ban on Livestock

Table 4: Effects of Pre-1700 Land Grants in Land Inequality - (%) of Farms over Size Cutoff 1995

	Over 2,000 ha (%)	Over 5,000 ha (%)	Over 10,000 ha (%)
More than 80 km from the Coast	-6.100*** (1.261)	-3.563*** (0.926)	-2.407*** (0.621)
Grants Pre-1700 x More than 80 km from the Coast	7.894*** (2.104)	3.671** (1.612)	2.027 (1.299)
Grants Pre-1700 x Less than 80 km from the Coast	1.568 (2.377)	0.859 (1.802)	1.007 (1.422)
Geographical Controls	✓	✓	✓
N	2372	2372	2372
Control Mean	9.6	3.6	2

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

Identification III

Coastal Ban on Livestock

Table 5: Effects of Post-1700 Land Grants in Land Inequality - (%) of Farms over Size Cutoff 1995

	Over 2,000 ha (%)	Over 5,000 ha (%)	Over 10,000 ha (%)
More than 80 km from the Coast	-7.005*** (1.403)	-4.433*** (1.040)	-3.185*** (0.740)
Grants Post-1700 x More than 80 km from the Coast	3.310*** (0.881)	2.865*** (0.721)	1.992*** (0.563)
Grants Post-1700 x Less than 80 km from the Coast	-0.138 (1.716)	0.098 (1.285)	-0.217 (0.922)
Geographical Controls	✓	✓	✓
N	2372	2372	2372
Control Mean	9.4	3.5	2

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

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Instrument Validity

- Exploration in the Southeast was prominent during the middle to late 17th century and 18th century.
- **Placebo Test:** Check first-stage using pre-1700 grants
 - First-stage should only exist for later grants.

Instrument Validity

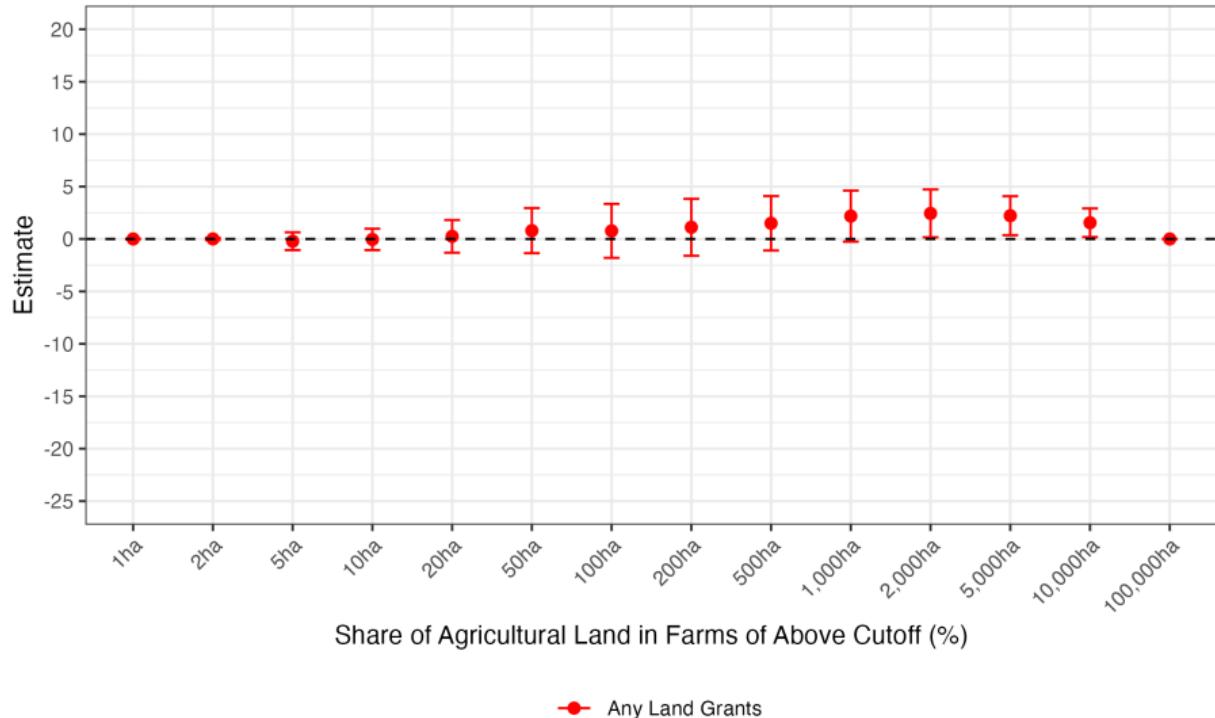
- Exploration in the Southeast was prominent during the middle to late 17th century and 18th century.
- **Placebo Test:** Check first-stage using pre-1700 grants
 - First-stage should only exist for later grants.

	Grant Presence Pre-1700s	Grant Presence Post-1700s
Distance to Bandeira (10km)	0.001 (0.001)	-0.012*** (0.003)
Geographical Controls	✓	✓
Dependent Variable Mean	0.03	0.21
N	1365	1365
F-stat	1.94	16.52

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

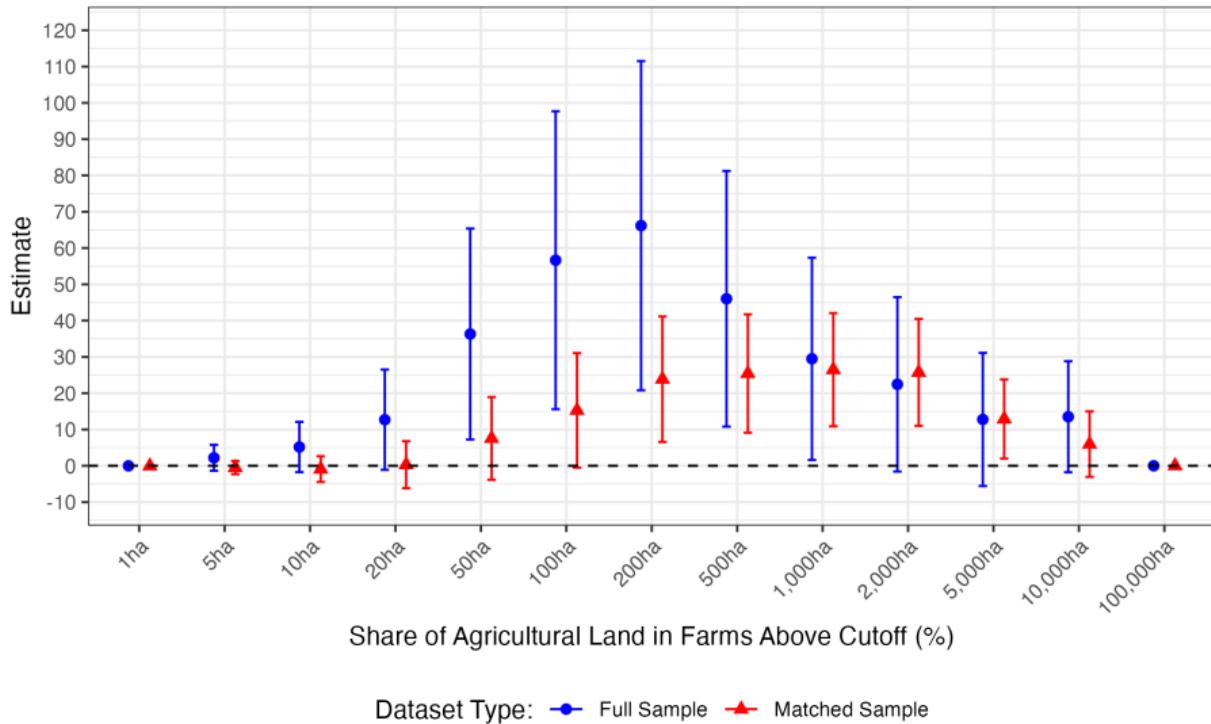
Matching

Southeast Results



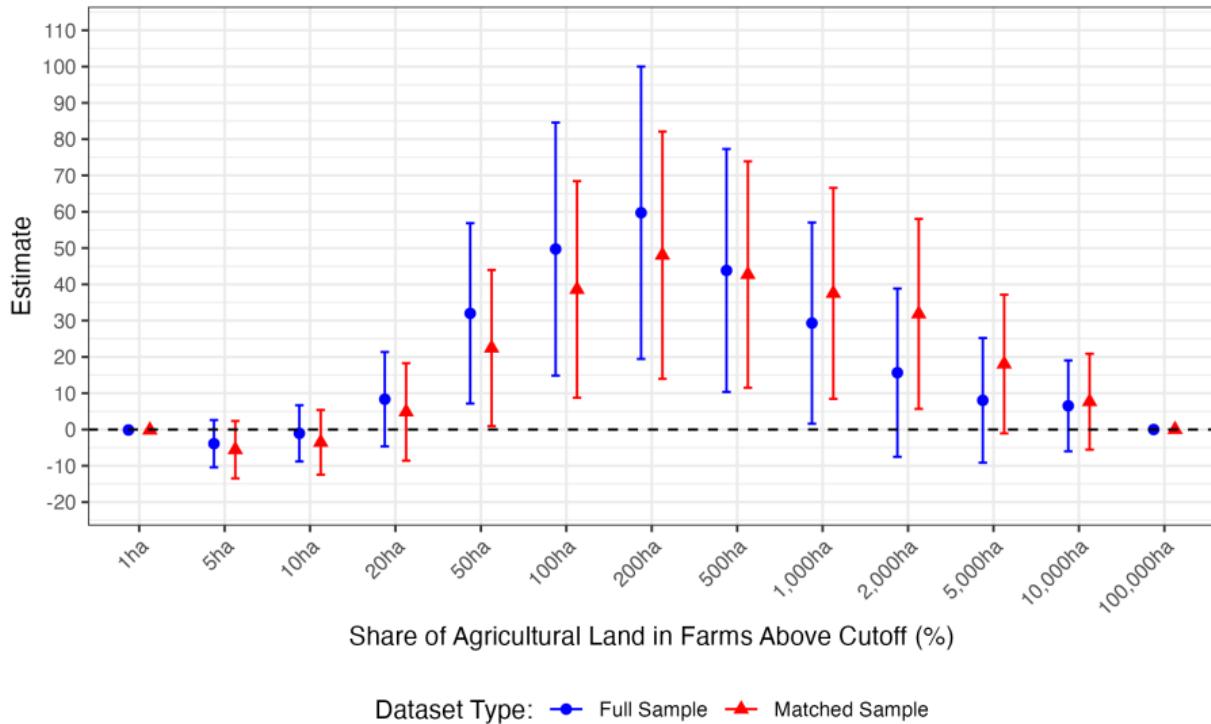
IV Results

Land Distribution - 1995



IV Results

Land Distribution - 1995



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Regional Effects

Northeast vs. Southeast

- Northeastern Brazil was colonized first and was the main economic hub.
- Southeast only became of economic importance later into the eighteenth and nineteenth centuries.
- Could colonial land grants explain the economic backwardness of the Northeastern states?
 - Or is the grant overall impact pervasive in both regions?

Heterogeneity - Regional Effects

Results

Table 6: Effects of Land Grants in Land Inequality - (%) of Farms over 2000 ha 1995

	Northeast			Southeast		
	OLS	OLS	Matching	OLS	OLS	Matching
Any Grants	6.017*** (1.142)	4.489*** (1.026)	4.742*** (1.067)	0.405 (1.149)	2.442** (1.162)	3.089** (1.266)
Geographical Controls		✓	✓		✓	✓
N	1007	1007	842	1365	1365	630
Control Mean	7	7	7.4	10.5	10.5	7.5

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

Heterogeneity - Regional Effects

Results

Table 7: Effects of Land Grants in Land Inequality - (%) of Farms over 2000 ha 1995

	Northeast			Southeast		
	OLS	OLS	Matching	OLS	OLS	Matching
Grants Pre-1700	4.180** (1.735)	5.015*** (1.773)	5.332*** (1.833)	-0.055 (4.151)	4.178 (4.540)	2.811 (4.691)
Grants Post-1700	5.133*** (1.291)	3.153*** (1.101)	3.269*** (1.110)	0.815 (1.162)	2.378** (1.153)	3.306*** (1.247)
Geographical Controls		✓	✓		✓	✓
N	1007	1007	842	1365	1365	630
Control Mean	7	7	7.4	10.5	10.5	7.5

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

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Channels

1. Urbanization, Land Security, and Land Productivity.
2. Rural Land Conflict.
3. Slavery in 1872.

Channels

Land Usage: Urbanization, Land Security, and Productivity

- Did the grants lead to economic development?
- Are they associated with land security or productivity, as they are often claimed to be?
 - Economic Development: measured as % of municipality considered urban through LandSat data in 1995
 - Land Security: measured as the % of total agricultural area that the owner does not own, nor pays rent (land squatting).
 - Productivity: measured as the total % of agricultural land that is not being used.

Channels

Land Usage: Urbanization, Land Security, and Productivity

Table 8: OLS and Matching Estimates on 1995 Agricultural Census and 1995 LandSat Data on Land Usage

	Urban Area (%)			Occupied Land (%)			Productive Land Not Used (%)		
	OLS	OLS	Matching	OLS	OLS	Matching	OLS	OLS	Matching
Any Grants	1.093*** (0.285)	0.496** (0.250)	0.385 (0.282)	-1.231 (2.629)	-0.666 (2.746)	-1.962 (3.025)	-1.328 (1.840)	-0.967 (2.027)	1.618 (1.809)
Geographical Controls		✓	✓		✓	✓		✓	✓
Control Mean	1.1	1.1	1.4	9.6	9.6	9.3	8.7	8.7	5.8
N	2372	2372	1472	2372	2372	1472	2372	2372	1472

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

Channels

Land Usage: Urbanization, Land Security, and Productivity

Table 9: OLS and Matching Estimates on 1995 Agricultural Census and 1995 LandSat Data on Land Usage

	Urban Area (%)			Occupied Land (%)			Productive Land Not Used (%)		
	OLS	OLS	Matching	OLS	OLS	Matching	OLS	OLS	Matching
Grants Pre-1700	3.217*** (0.906)	2.482*** (0.819)	2.358*** (0.830)	-4.532*** (1.468)	-3.931** (1.551)	-0.996 (1.544)	-2.963** (1.348)	-1.630 (1.367)	-0.996 (1.544)
Grants Post-1700	0.363 (0.240)	-0.107 (0.232)	-0.213 (0.257)	-0.269 (2.876)	0.126 (2.980)	2.129 (2.075)	-0.548 (1.969)	-0.507 (2.199)	2.129 (2.075)
Geographical Controls		✓	✓		✓	✓		✓	✓
Control Mean	1.1	1.1	1.4	9.6	9.6	9.3	8.7	8.7	5.8
N	2372	2372	1472	2372	2372	1472	2372	2372	1472

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

Mechanisms

Slavery - 1872

- Large land plots were often associated with higher usage of slavery back in colonial Brazil.
 - 1872 Brazilian Census [**Novel Data at a Finer Geographical Level**] Parishes
 - No 1-1 matching, since 51% of parishes had a land grant.

Mechanisms

Slavery - 1872

Table 10: OLS Estimates on Slavery - 1872 Census

	Percentage of Slaves (%)		Percentage of Slaves Working in Agriculture (%)	
	OLS	OLS	OLS	OLS
Any Grants	-0.679 (0.663)	-0.996 (0.658)	2.418** (1.156)	1.541 (1.175)
Geographical Controls		✓		✓
Control Mean	16.1	16.1	37.8	37.8
N	813	813	813	813

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

Mechanisms

Slavery - 1872

Table 11: OLS Estimates on Slavery - 1872 Census

	Percentage of Slaves (%)		Percentage of Slaves Working in Agriculture (%)	
	OLS	OLS	OLS	OLS
Grants Pre-1700	-1.722** (0.691)	-2.029*** (0.751)	-0.396 (2.106)	-1.409 (2.112)
Grants Post-1700	0.175 (0.664)	0.108 (0.668)	2.669** (1.138)	1.902 (1.191)
Geographical Controls		✓		✓
Control Mean	16.1	16.1	37.8	37.8
N	813	813	813	813

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

Mechanisms

Land Conflict

- Land concentration is a key driver in land conflict in Brazil.
- In 2022, over 2,000 rural conflicts were reported in Brazil, affecting close to one million families.
- Often, poor families are victimized and removed by large landowners.
- Use data from the Pastoral Commission of Land to measure land conflicts between 2015-2022. [Land Conflict Map](#)

Mechanisms

Land Conflict

Table 12: Effects of Land Grants in Land Conflict 2015-2022

	(OLS)	(Matching)
Any Land Grants	0.062*** (0.018)	0.069*** (0.019)
Geographical Controls	✓	✓
N	2372	1472
Control Mean	0.2	0.2

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

Mechanisms

Land Conflict

Table 13: Effects of Land Grants in Land Conflict 2015-2022

	(OLS)	(Matching)
Grants Pre-1700	0.091** (0.039)	0.087** (0.040)
Grants Post-1700	0.060*** (0.019)	0.070*** (0.020)
Geographical Controls	✓	✓
N	2372	1472
Control Mean	0.2	0.2

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

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Robustness

- I estimate effects excluding outliers (municipalities that have a large share of agricultural land in farms over 2,000 ha) Removing Outliers
- I test whether the IV results change when making treatment be grants post-1700. Post-1700 only IV
- I test whether the IV is robust to different standard error bounds. IV for Different Standard Errors

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Conclusion

- Consistent association between land grants and modern land concentration in Brazil.
 - Different identification strategies tell the same story.
 - Effects range between an increase in the percentage of land in farms of over 2,000 ha of 1.3% to 22.0% depending on the method/region.
- Increase of 8% on whether a municipality reports a present-day land conflict.
 - No broad effects on land tenure, productivity, or slavery.

Thank You!

Next Steps

1. Study what other economic effects could the grants have.
2. Right-tail effect of distribution, or is it a general effect.
3. Still a lot of work to do this summer!

References I

-  Acemoglu, D, S Johnson, and J A Robinson (2001). "The colonial origins of comparative development: An empirical investigation". In: *Am. Econ. Rev.*
-  Alston, Lee J, Gary D Libecap, and Bernardo Mueller (May 2010). *Titles, conflict, and land use: The development of property rights and land reform on the Brazilian Amazon frontier*. en. *Economics, Cognition, and Society*. Ann Arbor, MI: University of Michigan Press.
-  Banerjee, Abhijit and Lakshmi Iyer (Aug. 2005). "History, institutions, and economic performance: The legacy of colonial land tenure systems in India". In: *Am. Econ. Rev.* 95.4, pp. 1190–1213.
-  Barsanetti, Bruno (Mar. 2021). "Cities on pre-Columbian paths". en. In: *J. Urban Econ.* 122.103317, p. 103317.
-  Bethell, Leslie (1984). *The Cambridge history of Latin America*. eng. Cambridge, England ; Cambridge University Press.
-  Costa Porto, José da (1979). *O sistema sesmarial no Brasil*. pt-BR. Editora Universidade de Brasília.
-  Dean, Werren (Nov. 1971). "Latifundia and land policy in nineteenth-century Brazil". en. In: *Hisp. Am. Hist. Rev.* 51.4, pp. 606–625.

References II

-  Fausto, Boris (Aug. 2014). *Cambridge concise histories: A concise history of Brazil*. en. 2nd ed. Cambridge, England: Cambridge University Press.
-  Galor, Oded and Ömer Özak (Oct. 2016). "The agricultural origins of time preference". en. In: *Am. Econ. Rev.* 106.10, pp. 3064–3103.
-  Lima, Ruy Cirne (1954). *Pequena história territorial do Brasil; sesmarias e terras devolutas*. por. 2. ed. Estante "Revista jurídica," 3. Pôrto Alegre: Livraria Sulina.
-  Musacchio, Aldo, André Martínez Fritscher, and Martina Viarengo (Sept. 2014). "Colonial institutions, trade shocks, and the diffusion of elementary education in Brazil, 1889–1930". en. In: *J. Econ. Hist.* 74.3, pp. 730–766.
-  Naritomi, Joana, Rodrigo R Soares, and Juliano J Assunção (May 2012). "Institutional development and colonial heritage within Brazil". en. In: *J. Econ. Hist.* 72.2, pp. 393–422.
-  Oliveira Andrade, Manuel Correia de (1980). *The Land and People of Northeast Brazil*. en. University of New Mexico Press.
-  Ribeiro, Ricardo Ferreira (Dec. 2012). "The ox from the Four Corners of the world: The historic origins of the Brazilian beef industry". en. In: *Agrar. S. J. Polit. Econ.* 1.3, pp. 315–340.

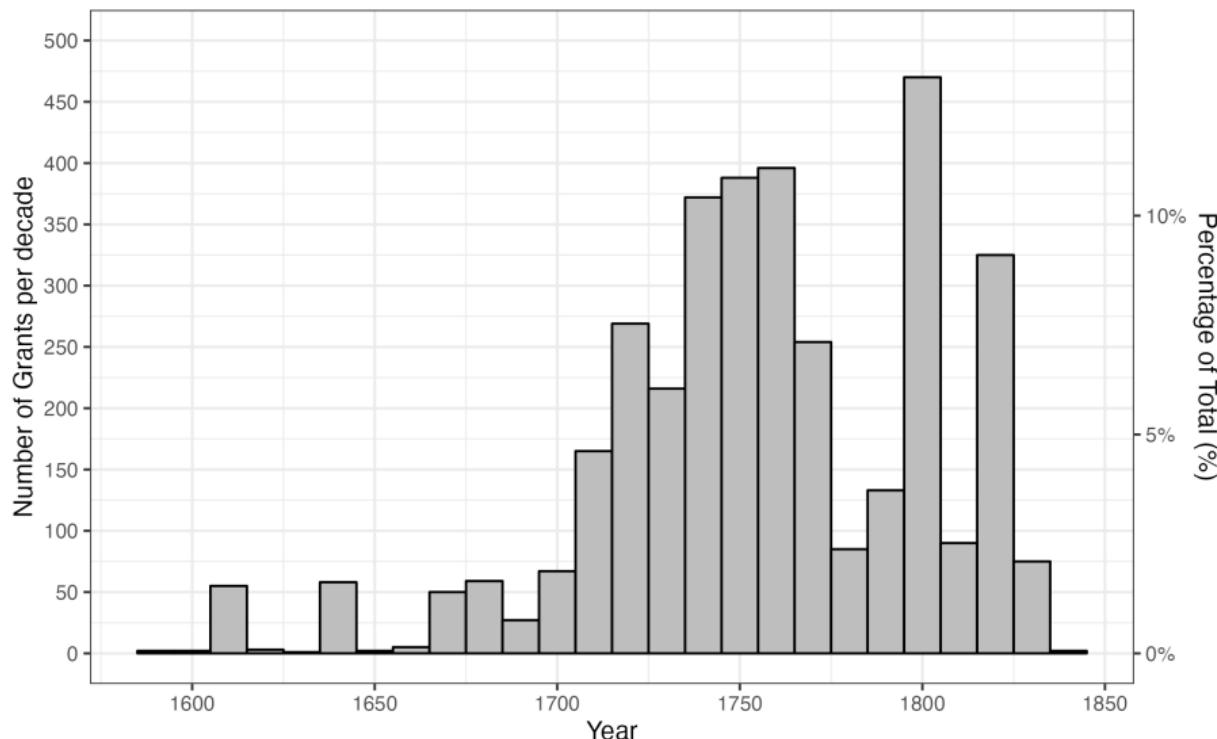
References III

-  Sellars, Emily A and Jennifer Alix-Garcia (Nov. 2018). "Labor scarcity, land tenure, and historical legacy: Evidence from Mexico". en. In: *J. Dev. Econ.* 135, pp. 504–516.
-  Simonsen, Roberto Cochrane (2005). *História econômica do Brasil : 1500-1820*. Edições do Senado Federal ; v. 34. Brasília : Senado Federal, Conselho Editorial.
-  Smith, Cory (2023). "Land concentration and Long-run development in the frontier United States". In.
-  Smith, T Lynn (1972). *Brazil; people and institutions*. eng. 4th ed. Baton Rouge: Louisiana State University Press.
-  — (1944). "Land Tenure in Brazil". In: *The Journal of Land & Public Utility Economics* 20.3, pp. 194–201.
-  Sokoloff, Kenneth L and Stanley L Engerman (Aug. 2000). "History lessons: Institutions, factor endowments, and paths of development in the New World". en. In: *J. Econ. Perspect.* 14.3, pp. 217–232.
-  USAID (2016). *USAID COUNTRY PROFILE: PROPERTY RIGHTS AND RESOURCE GOVERNANCE - Brazil*. Tech. rep. USAID.
-  Wigton-Jones, Evan (Dec. 2020). "Legacies of inequality: the case of Brazil". en. In: *J. Econ. Growth (Boston)* 25.4, pp. 455–501.

Year Distribution

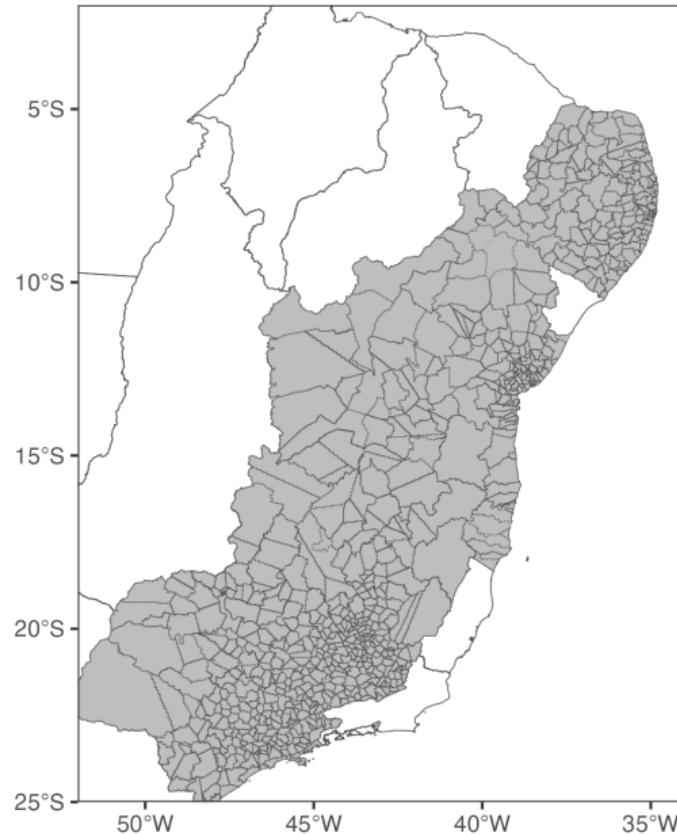
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Figure 1: Number of Land Grants per Decade 1590-1840



1872 Parish Level Information

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Matching Results

Land Size - Northeast

Table 14: Effects of Land Grants in Land Inequality - (%) of Farms over 2,000 ha 1995

	OLS	OLS	Matching
Grants Pre-1700	4.180** (1.735)	5.015*** (1.773)	5.332*** (1.833)
Grants Post-1700	5.133*** (1.291)	3.153*** (1.101)	3.269*** (1.110)
N	1007	1007	842
Geographical Controls		✓	✓
Control Mean	7	7	7.4

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

Matching Results

Land Size - Southeast

Table 15: Effects of Land Grants in Land Inequality - (%) of Farms over 2,000 ha 1995

	OLS	OLS	Matching
Grants Pre-1700	-0.055 (4.151)	4.178 (4.540)	2.811 (4.691)
Grants Post-1700	0.815 (1.162)	2.378** (1.153)	3.306*** (1.247)
N	1365	1365	630
Geographical Controls		✓	✓
Control Mean	10.5	10.5	7.5

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

Matching Results

Land Size - Different Cutoffs

Table 16: OLS and Matching Estimates on 1995 Agricultural Census - Varying Land Sizes

	Over 2,000ha (%)		Over 5,000ha (%)		Over 10,000ha (%)	
	OLS	Matching	OLS	Matching	OLS	Matching
Grants Pre-1700	4.210** (1.674)	4.128** (1.753)	1.961 (1.288)	2.156 (1.362)	1.415 (1.024)	1.394 (1.100)
Grants Post-1700	2.101** (0.825)	2.367*** (0.862)	1.984*** (0.656)	2.151*** (0.668)	1.304** (0.515)	1.130** (0.527)
N	2372	1472	2372	1472	2372	1472
Geographical Controls	✓	✓	✓	✓	✓	✓
Control Mean	9.2	8.2	3.7	3.1	1.7	1.6

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

^a All regressions include state fixed effects. Geographical controls, which are also used for the matching, include latitude, longitude, average slope, average elevation, distance to the nearest navigable river, distance to the coast, maximum caloric output from pre-Columbian and post-Columbian crops, and whether or not the municipality contains four different types of soils.

IV - Different Cutoffs

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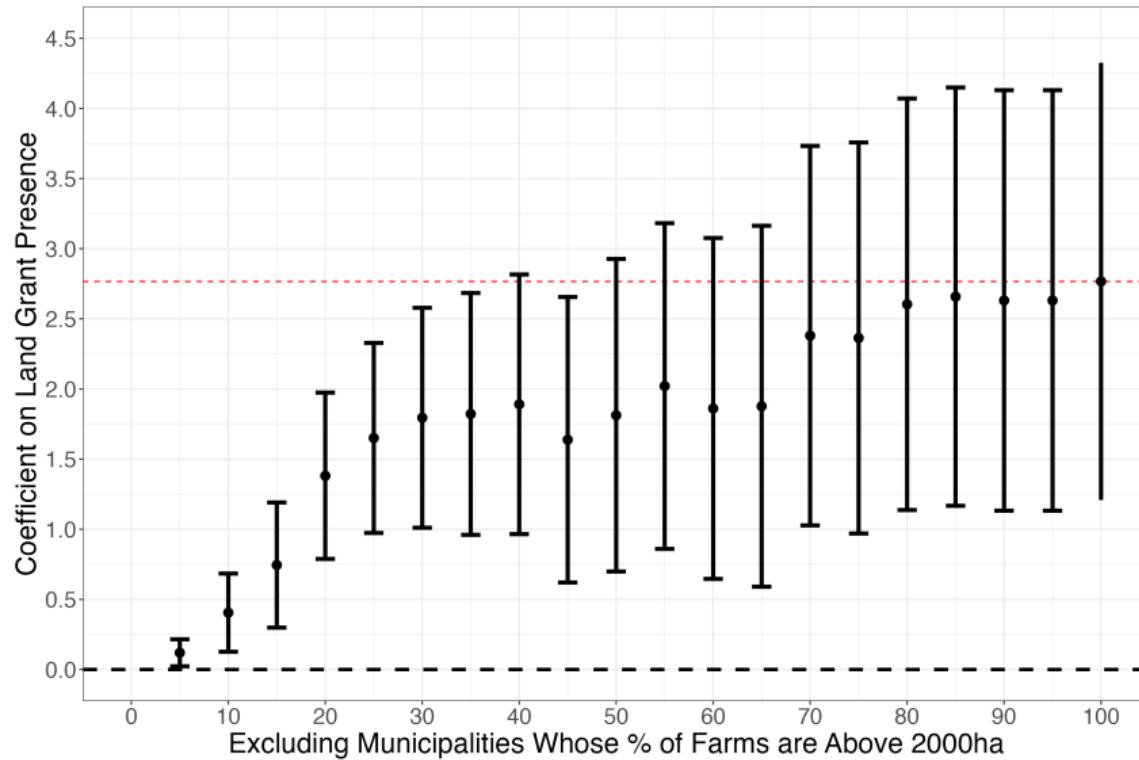
Table 17: IV and Matching Estimates on Agricultural Land Size - 1995 Agricultural Census

	Over 2,000ha (%)		Over 5,000ha (%)		Over 10,000ha (%)	
	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Any Land Grants	22.454*		12.774		13.512*	
	(12.246)		(9.354)		(7.796)	
Grants post-1700		20.782*		11.823		12.505*
		(11.176)		(8.594)		(7.097)
N	1365	1365	1365	1365	1365	1365
Geographical Controls	✓	✓	✓	✓	✓	✓
Control Mean	10.5	10.4	4.3	4.2	1.9	1.9

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

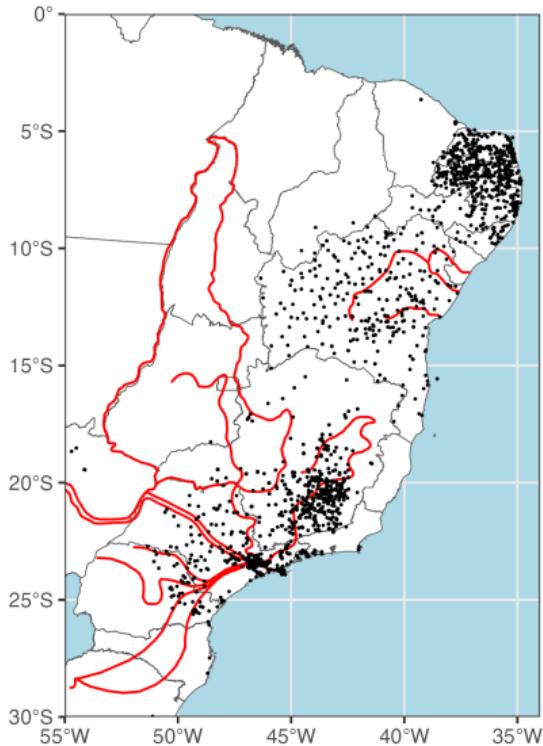
Effects Excluding Outliers

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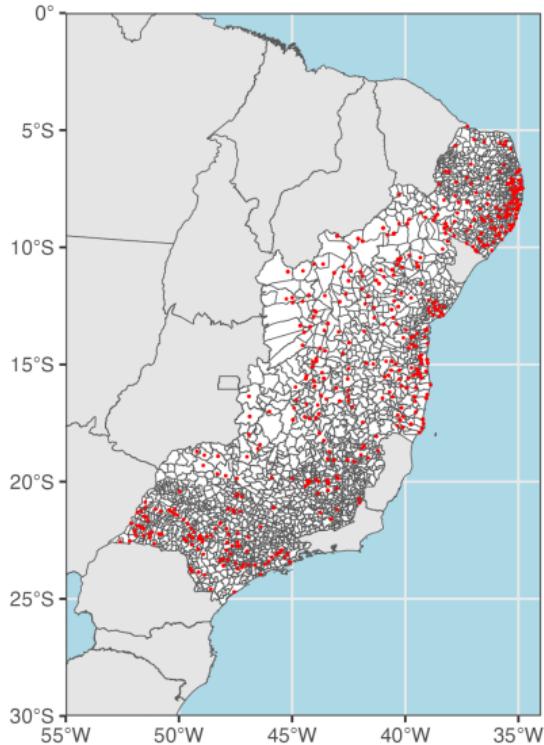
Explorer Routes

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Land Conflict

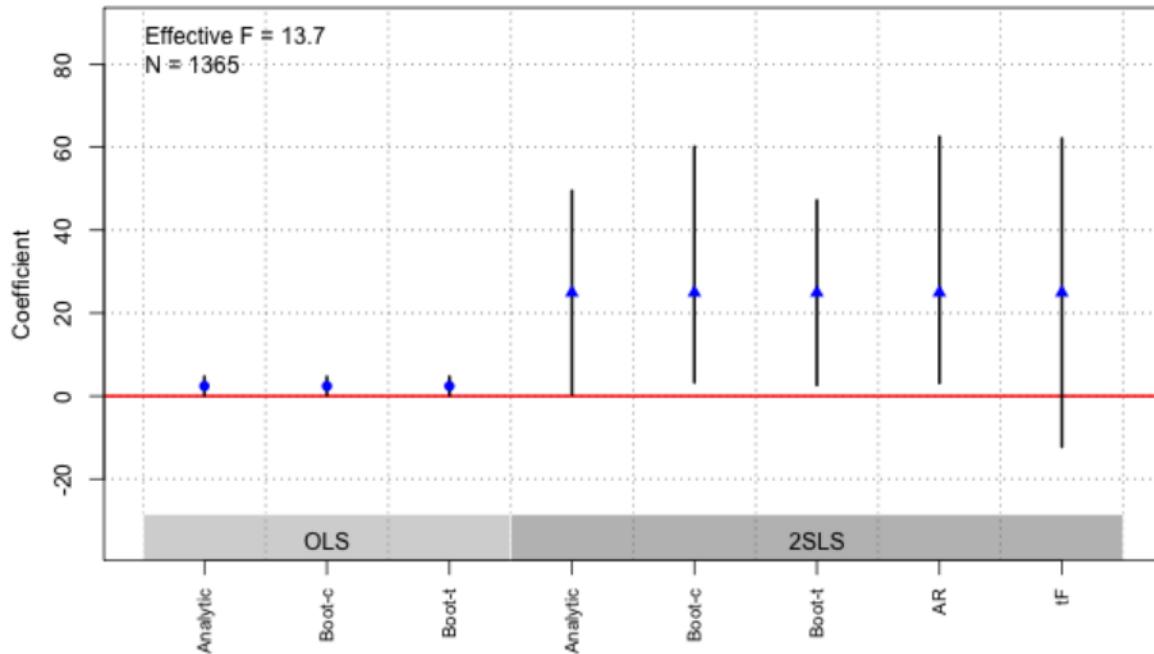
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IV Robustness

Different Methods

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Propensity Score Match Overlap

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Distribution of Propensity Scores

