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

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1. Introduction

Brazil is a country that historically faces issues of both land and income inequality. Estimates from USAID in 2016

However, land inequality in Brazil is something that can be found in the past.

This paper tries to answer how much of Brazil's present-day inequality can be traced to colonial institutions. Specifically, this paper uses Portuguese land grants called *sesmarias*, to identify the historical persistence of colonial activity in Brazil to present-day inequality.

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

2. Historical Background

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 (1937) - "the ones that don't possess sesmarias or can't own land are disowned by the own society they live in"

3. Data

The main source of data comes from the *Sesmarias of the Luso-Brazilian Empire Database*[1]. 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. The sesmarias are then georeferenced based on the geographical information present in the text, allowing us to trace them back to Brazilian municipalities.[2]

Data for current land tenure in 2021 in Brazil is obtained from Sparovek et al. (2019).[3]

Land usage from 1985-2010 is obtained from Mapbiomas.Souza et al. (2020)[4]

Census data for 1872 is obtained from the Nucleus of Research in Economic and Geographic History from the Federal University of Minas Gerais.[5] The 1872 Imperial Census contains demographic data at the municipality level and was the last census taken before the abolition of slavery in Brazil. Other census data

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[1]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.

[2]A more in-depth description on how the sources of the letters and how the sesmarias were georeferenced is available in Appendix A

[3]Available at https://atlasagropecuario.imaflora.org/

[4]Available at https://brasil.mapbiomas.org/en/

[5]Available at http://www.nphed.cedeplar.ufmg.br/

is obtained from the IBGE ().[6]

4.   Descriptive

5.   Identification Strategy

5.1.   Coastal Ban on Livestock

In 1701, the Portuguese Crown enacted a ban on livestock from 80km of the coast (Fausto et al., 2014, p .40). The effect was the expansion of cattle ranches towards the west of Brazil, especially in the Northeastern states. 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.[7]

Given the nature of this ban, I exploit the cutoff of 80 km to use a regression discontinuity design to measure the effects between the two types of economies in the region.

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.

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.

Historically livestock-raising areas were [...]

(Oliveira Andrade, 1980, p. 142)

5.2.   Treaty of Tordesillas

5.3.   Instrumental Variable

6.   Robustness

6.1.   Donut RDD

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[6]Microcensus data downloaded through the R package *censobr* from Pereira et al. (2023)

[7]An example of this would be the d'Avila family which owned a large estate in the state of Bahia [...]

References

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Sparovek, Gerd et al. (Sept. 2019). "Who owns Brazilian lands?" en. In: *Land use policy* 87.104062, p. 104062.

7. Figures

7.1. Maps

Figure 1: 1872 Municipalities and Proximity to the Coast

80 km away of the coast: 0 1
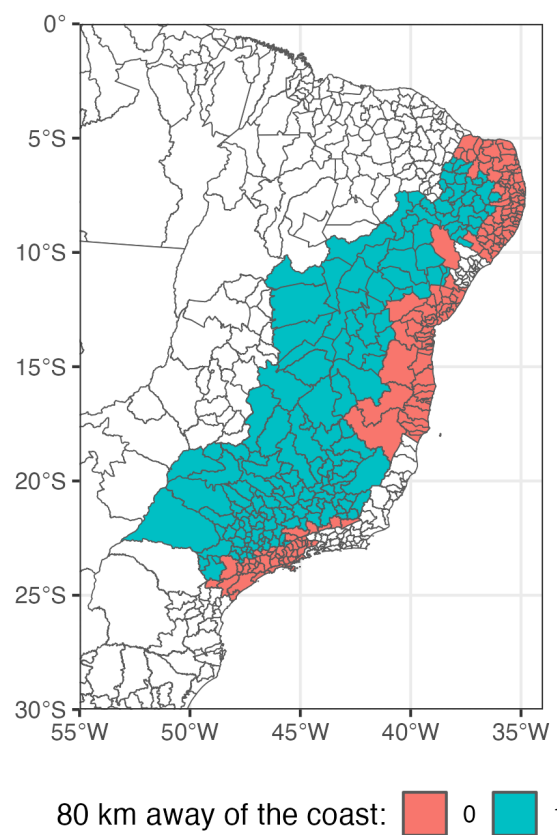
Notes: This figure considers whether or not any part of the municipality was within 80km of the coast.

8. Tables

8.1. Coastal RDD - 1872

Table 1: Effects on Proportion of Slaves to Total Population (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	5.168**	5.698*	6.397**	5.666	4.842
	(2.270)	(3.414)	(3.202)	(3.550)	(3.961)
Polynomial Order	1	2	1	1	1
N	239	239	123	105	91
R^2	0.05	0.05	0.07	0.08	0.08

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

[a] Mean of the dependent variable is 14.2%

Table 2: Effects on Proportion of Slaves Working in Farming (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	−8.993	−6.887	−8.619	−7.263	−5.337
	(6.356)	(9.516)	(6.314)	(6.936)	(7.237)
Polynomial Order	1	2	1	1	1
N	122	122	123	105	91
R^2	0.05	0.06	0.05	0.07	0.08

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

[a] Mean of the dependent variable is 40.7%

Table 3: Effects on Proportion of Male Slaves Working in Farming (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	−11.232*	−4.727	−8.586	−7.334	−5.358
	(6.792)	(10.085)	(6.871)	(7.529)	(7.887)
Polynomial Order	1	2	1	1	1
N	182	182	123	105	91
R^2	0.02	0.03	0.03	0.04	0.05

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

[a] Mean of the dependent variable is 50.1%

Table 4: Effects on Proportion of Female Slaves Working in Farming (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	−9.622	−12.641	−10.360	−9.083	−6.989
	(6.936)	(10.367)	(6.575)	(7.161)	(7.495)
Polynomial Order	1	2	1	1	1
N	114	114	123	105	91
R^2	0.08	0.11	0.09	0.10	0.12

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

[a] Mean of the dependent variable is 30.1%

Table 5: Effects on Proportion of Slaves in Domestic Work (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	9.806***	2.745	9.608**	6.669	5.629
	(3.727)	(5.484)	(3.828)	(4.213)	(4.518)
Polynomial Order	1	2	1	1	1
N	130	130	123	105	91
R^2	0.10	0.12	0.10	0.14	0.14

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

[a] Mean of the dependent variable is 18.6%

Table 6: Effects on Proportion of Male Slaves in Domestic Work (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	5.855*	−0.333	5.723	3.001	2.371
	(3.346)	(4.923)	(3.548)	(3.655)	(4.074)
Polynomial Order	1	2	1	1	1
N	137	137	123	105	91
R^2	0.09	0.11	0.10	0.14	0.13

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

[a] Mean of the dependent variable is 10.7%

Table 7: Effects on Proportion of Female Slaves in Domestic Work (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	15.722***	11.082	14.964***	11.980*	10.429
	(5.155)	(7.625)	(5.548)	(6.271)	(6.510)
Polynomial Order	1	2	1	1	1
N	184	184	123	105	91
R^2	0.05	0.07	0.09	0.11	0.13

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

[a] Mean of the dependent variable is 27.3%

Table 8: Effects on Proportion of Farmers (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	−4.491	−7.025	−4.159	−3.052	−3.602
	(4.714)	(7.028)	(4.687)	(5.119)	(5.173)
Polynomial Order	1	2	1	1	1
N	122	122	123	105	91
R^2	0.03	0.05	0.03	0.05	0.05

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

[a] Mean of the dependent variable is 31.4%

Table 9: Effects on Literacy Rate (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	1.228	2.119	1.303	−2.724	−0.990
	(4.063)	(5.994)	(4.868)	(5.330)	(5.699)
Polynomial Order	1	2	1	1	1
N	205	205	123	105	91
R^2	0.01	0.01	0.00	0.02	0.02

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

[a] Mean of the dependent variable is 26.3%

8.2. Coastal RDD - 1970

Table 10: Effects on Proportion of People Sharecropping (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	1.430***	1.385**	1.464***	1.478**	1.430**
	(0.450)	(0.691)	(0.551)	(0.601)	(0.670)
Polynomial Order	1	2	1	1	1
N	1202	1202	848	714	608
R^2	0.13	0.13	0.08	0.07	0.07

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

[a] Mean of the dependent variable is 3.33%

Table 11: Effects on Proportion of People Working with Livestock (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	1.397	2.691	1.241	1.650	1.921
	(1.493)	(2.337)	(1.125)	(1.250)	(1.394)
Polynomial Order	1	2	1	1	1
N	557	557	848	714	608
R^2	0.01	0.01	0.00	0.01	0.01

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

[a] Mean of the dependent variable is 18.9%

Table 12: Effects on Proportion of People Working with Sugarcane (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	−0.011	0.277	0.095	−0.116	0.047
	(0.572)	(0.883)	(0.569)	(0.551)	(0.574)
Polynomial Order	1	2	1	1	1
N	612	612	848	714	608
R^2	0.08	0.08	0.10	0.08	0.08

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

[a] Mean of the dependent variable is 1.4%

Table 13: Effects on Literacy Rate (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	1.862	0.320	3.077	2.468	0.413
	(2.499)	(3.852)	(2.155)	(2.399)	(2.656)
Polynomial Order	1	2	1	1	1
N	670	670	848	714	608
R^2	0.07	0.07	0.08	0.07	0.07

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

[a] Mean of the dependent variable is 43.1%

Table 14: Effects on Proportion of People Working with Farming (%)

	Optimal Bandwidth		[10, 150]	[20, 140]	[30, 130]
	(1)	(2)	(3)	(4)	(5)
Estimate	1.074	2.021	0.848	1.216	1.506
	(1.472)	(2.306)	(1.107)	(1.229)	(1.374)
Polynomial Order	1	2	1	1	1
N	557	557	848	714	608
R^2	0.01	0.01	0.00	0.00	0.01

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

[a] Mean of the dependent variable is 19.5%

A. Description of Letters and Georeferencing