

Land Concentration and Long-Run Development in the Frontier United States

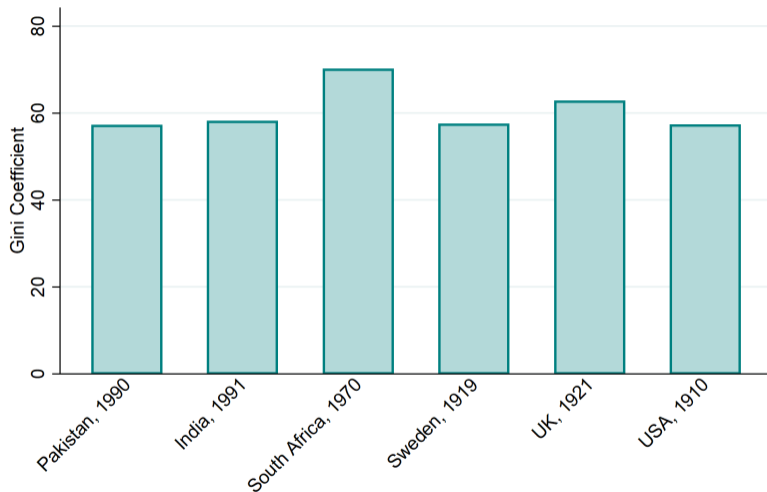
Cory Smith*

University of Maryland

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Wheatfield in California (colorized), 1903 — Hart Merriam



- ▶ Top 10% landowners hold \approx 55-75% of land value
(Bauluz, Govind, Novokmet 2020)
- ▶ Small-scale owner operators
- ▶ Large-scale landlords
- ▶ Tenants: cash, share tenancy / sharecropping

“It seldom happens, however, that a great proprietor is a great improver”

“It could never... be the interest [of sharecroppers] to lay out, in the further improvement of the land, any part of the little stock which they might save from their own share of the produce because the lord... was to get one half of whatever it produced.”

— Adam Smith, *Wealth of Nations* (1776)

“In conditions of... low security of tenure... a market in land arises in which concentration of ownership trumps improvement of yields as the easiest source of income for land owners.”

— Joseph Studwell, *How Asia Works* (2013)

- ▶ Three perspectives
 - Moral hazard/incentive issues between landlord and tenants
 - Depends on contract?
 - Economies of scale are good
 - “Coasian” World: irrelevant with good markets
- ▶ Standard theory/evidence: short-run returns to “effort” (Marshall 1890)
 - What about Smith’s “improvements” over the long term?
- ▶ Identification is hard
- ▶ Today:
 - Quasi-random variation in initial allocations from US land policy
 - Concentration increased in alternate square miles of land (“checkerboard”)
 - Study effects then & ≈ 150 years later

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- ▶ **Land Concentration** →
 - Low investment (historically)
 - Low land values (today)
 - Both persistence & convergence
- ▶ **Mechanisms** [briefly]
 - Tenancy & share tenancy (static)
 - Coasian convergence: steady but slow (dynamic)
- ▶ Overall: support for Smith's views over a long period
 - (In this setting)

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- ▶ Share tenancy's (constrained-)efficiency? (Marshall 1890; Cheung 1969; Stiglitz 1974; Braverman and Stiglitz 1982; Alston and Higgs 1982; Lichtenberg 2007; Naidu 2010; Burchardi et al. 2018)
- ▶ Land distribution and tenancy reform (Shaban 1987; Allen 1988; Besley and Burgess 2000; Jeon and Kim 2000; Banerjee et al. 2002; Engerman and Sokoloff 2002; Ghatak and Roy 2007; Dell 2010; Montero 2022; Adamopolous and Restuccia 2019)
- ▶ US frontier/rural history (Hornbeck and Naidu 2014; Olmstead and Rhode 2001; Kuncce et al. 2002; Bleakley and Ferrie 2014; Bazzi et al. 2017; Alston and Smith 2020; Hagerty 2023)
- ▶ Contributions
 - Quasi-random variation in initial concentration
 - Long-run effects (investments, markets)
 - Important US policies, governed $\approx 25\%$ land

Historical Background

- ▶ Federal lands / 1862 Homestead Act, ≈ 270 million acres
 - Goal: land to “ordinary” people, working their own farms
 - 160 acres max, close to national average (134 ac. in 1880)
 - (Nearly) free if you lived on it
 - → Less concentrated land
- ▶ Railroad lands (1850-1871), ≈ 170 million acres
 - In-kind payments to RR companies
 - Political controversy: land to the affluent
 - Large-scale sales at market price
 - → More concentrated land

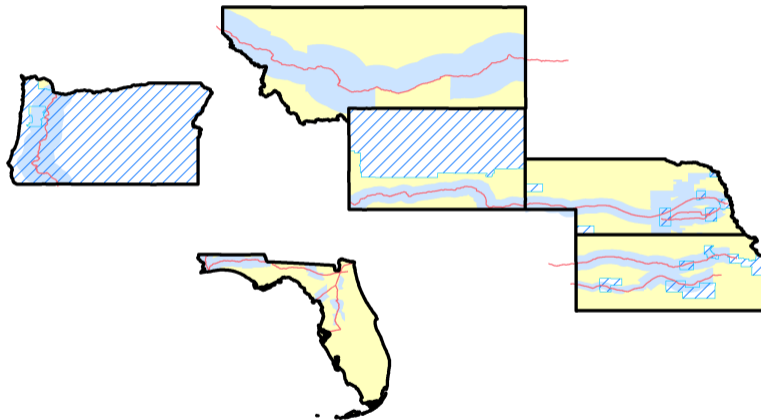
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The 1862 Homestead Act “seemed a godsend to penniless people who otherwise could not hope to buy land”

— Letter of Rachel Calof, 1894 (quoted in McCollum 1997)

“The land policies of the railroads encouraged... large-scale purchases with the result that millions of acres were turned into bonanza farms... or were rented or leased to incoming settlers who had expected to find free land”

— Gates 1936



Legend

- Land Grant RRs
- Grant Area
- ▨ No Property Data
- Property data



- ▶ Square grid survey
- ▶ “Township” = 6 miles \times 6 miles
- ▶ 36 “sections” = 1 mi² = 640 acres
- ▶ Railroads: only get odd sections 1, 3, 5...
 - Quasi-random
- ▶ Federal lands: 2, 4, 6...
 - Usually Homestead or similar

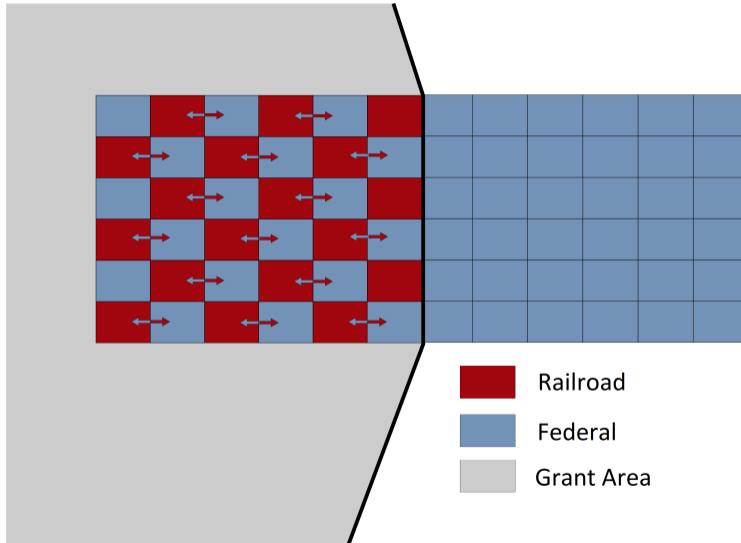
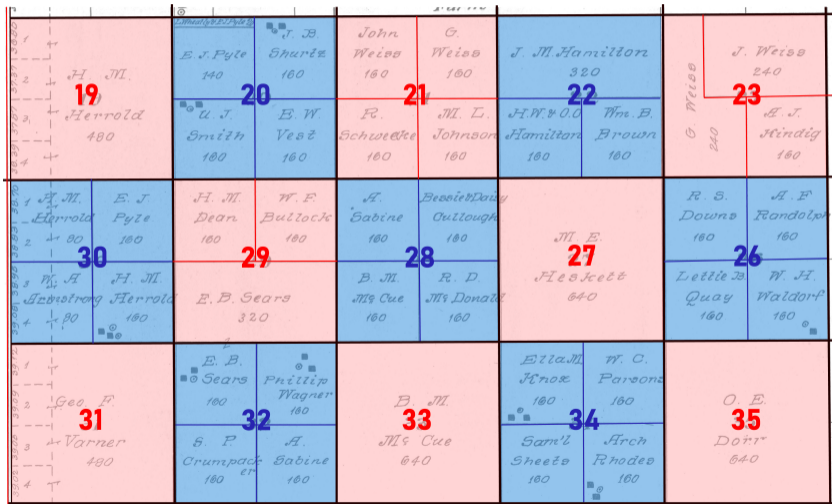


Figure 1: Farm Properties 1910, Finney KS



Data & Balance

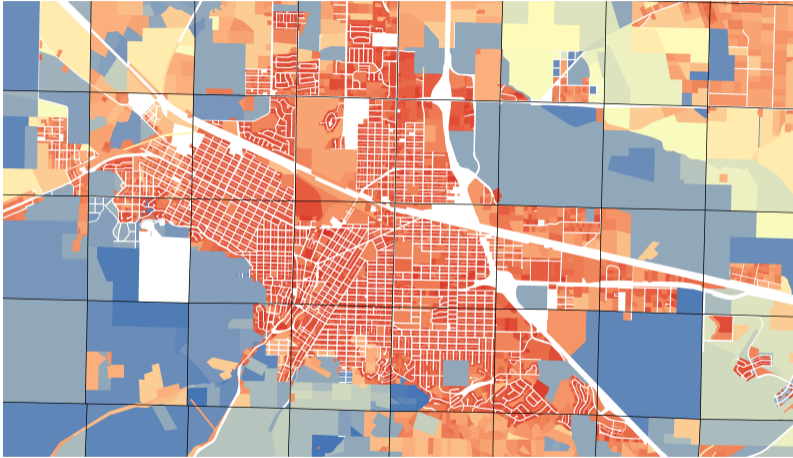
Within the grant boundary, just compare even & odd sections.

$$y_i = \alpha RR_i + \beta X_i + \varepsilon_i \quad (1)$$

- ▶ Unit i is a (non-education) section
- ▶ y an outcome
- ▶ RR_i is whether the section should have been granted to the railroad (odd-numbered)
- ▶ X controls
- ▶ Standard errors generally spatial
- ▶ Tend to use (asinh) for fat-tailed outcomes with 0s (land value)

Table 1: Balance on Geographic Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	Soil (z-score)	Slopes (z-score)	Streams (z-score)	Elevation (z-score)	log(Area)	log(RR Dist)
RR Effect	-0.00047 (0.00097)	-0.00027 (0.00035)	-0.0014 (0.0045)	-0.00049 (0.00028)	0.00011 (0.00049)	-0.0011 (0.00078)
Sample	All	All	All	All	All	All
Grant \times State FEs	Y	Y	Y	Y	Y	Y
County FEs	Y	Y	Y	Y	Y	Y
Township FEs	Y	Y	Y	Y	Y	Y
SEs / Clusters	Spatial	Spatial	Spatial	Spatial	Spatial	Spatial
N	132,463	132,463	132,463	132,463	132,463	132,463
$\mathbb{E}[y]$	-.046	1.2	.55	1.7	-.017	2.5



Helena, Montana

- ▶ 12 million properties
- ▶ 380,000+ mi² area
- ▶ \$600 billion ag. value
- ▶ Value, investments, usage

4 NAME OF OWNER AND MORTGAGEE	DESCRIPTION				Acres or Lots Improved		Acres or Lots Unimproved	
	Part of Section or Lot	Sec. or Lot	Twp. or Block	Range	Number	Actual Value	Number	Actual Value
Clark J Rice	NE 4	19	20	47	160	400		
Do	SE 4	19	20	47			160	320
Do	E 2 NW 4	19	20	47			160	320
Harry C. Conant	NE 4	20	20	47	160	600		

Nebraska Property Assessments, 1900

- ▶ Archival samples of data, ≈1900s
- ▶ 100 – 18,000 mi² area
- ▶ 1880 – 1965
- ▶ Assessments, ownership, population

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Figure 2: Land Improvement and Concentration (case study)

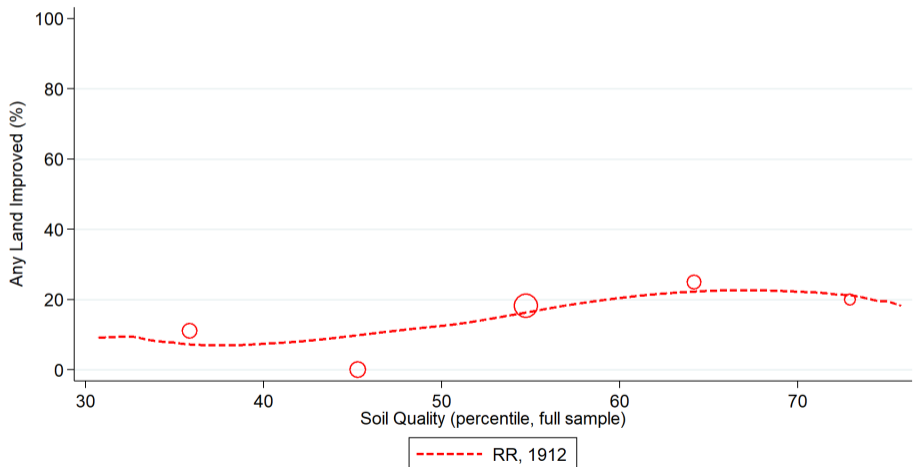


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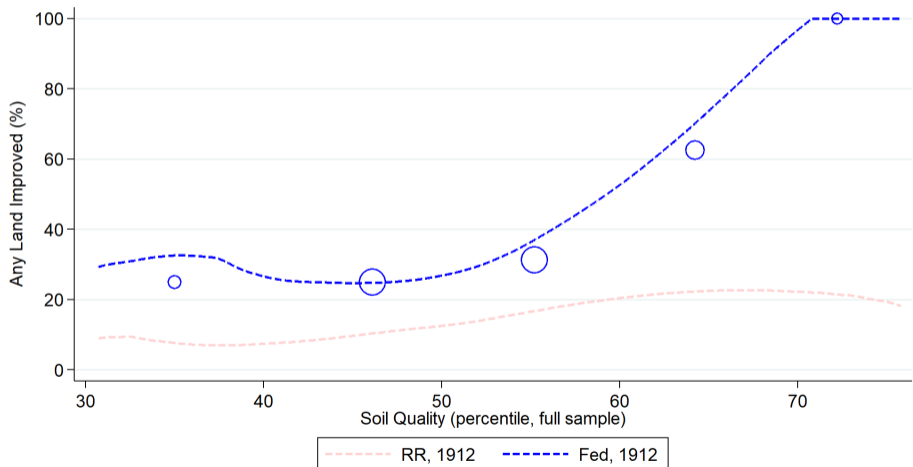


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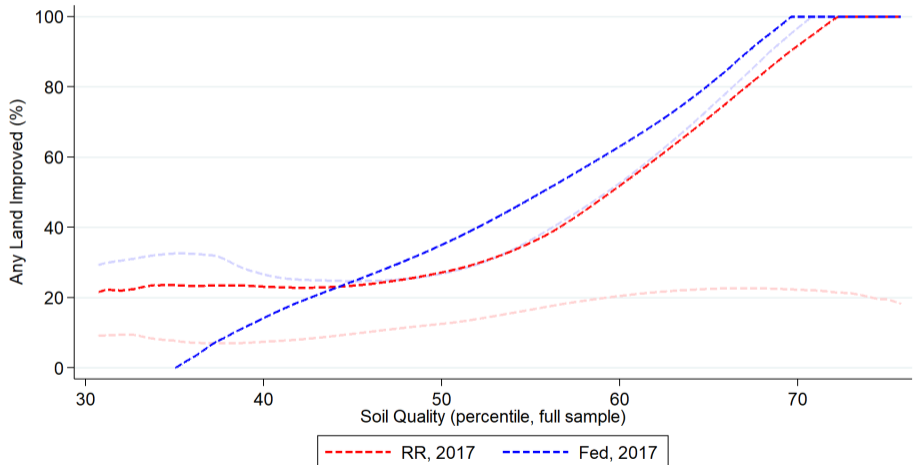


Figure 3: Historical vs. Modern Investment Effects

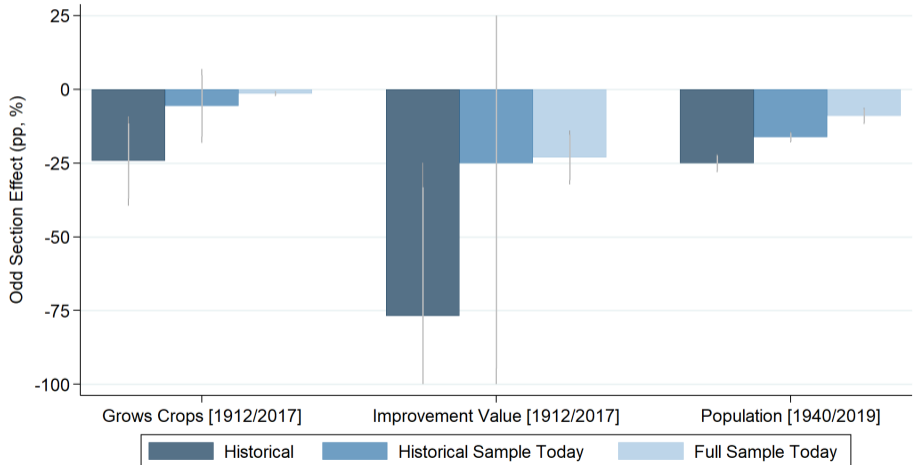
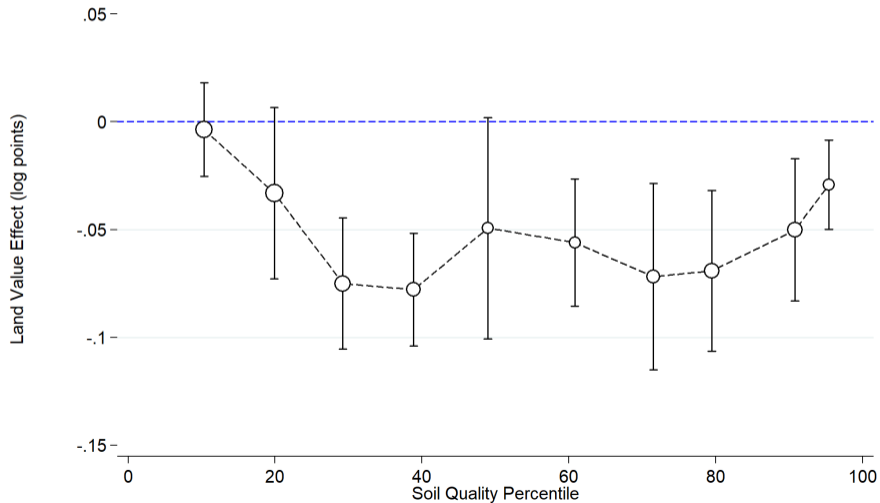
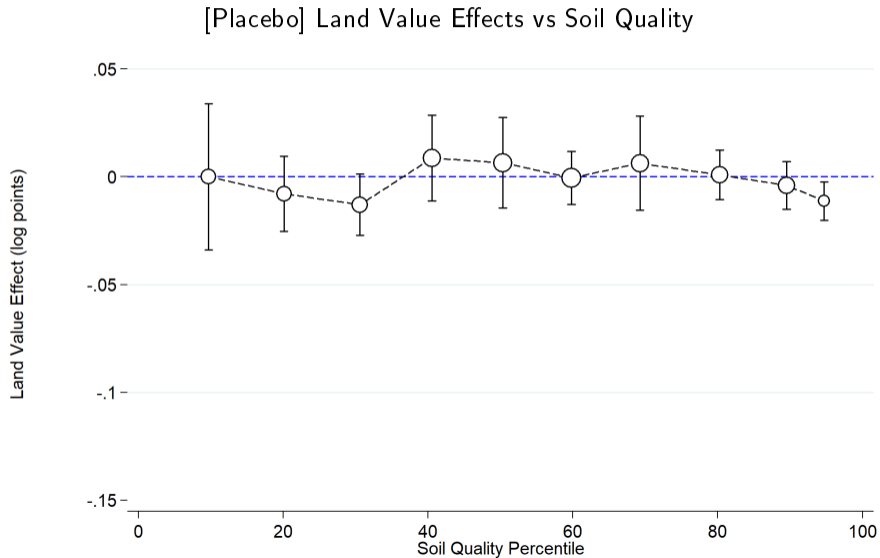


Figure 4: Land Value Effects vs Soil Quality





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Figure 5: Effects on Property Values by Fraction Share Tenant

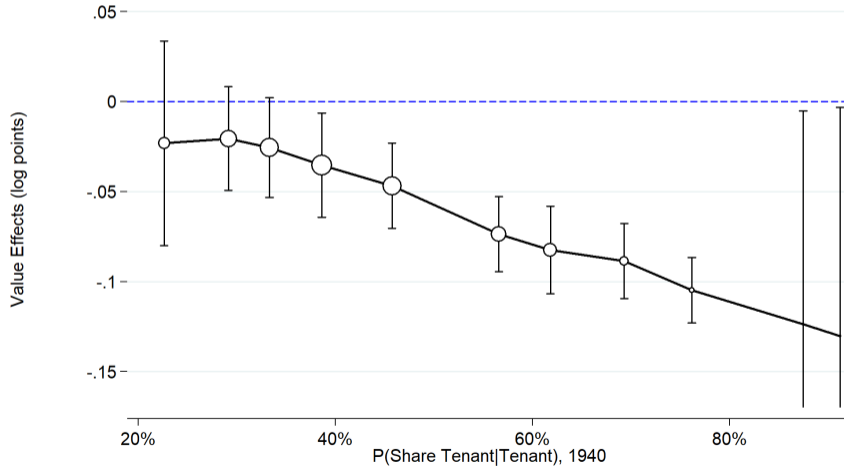
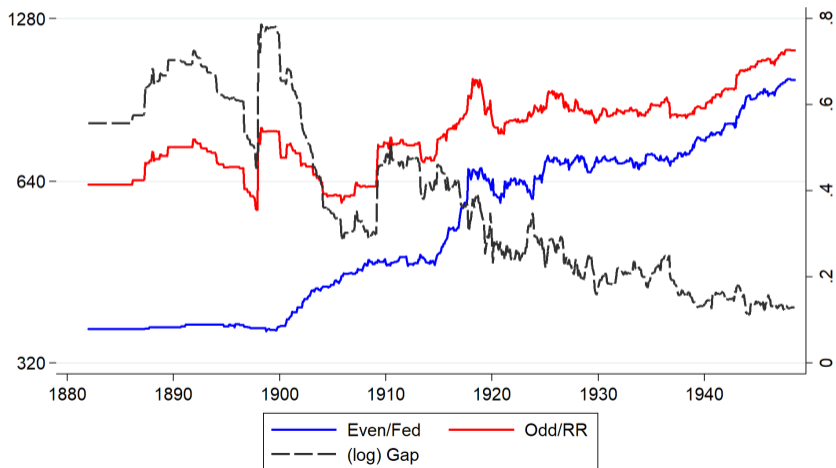
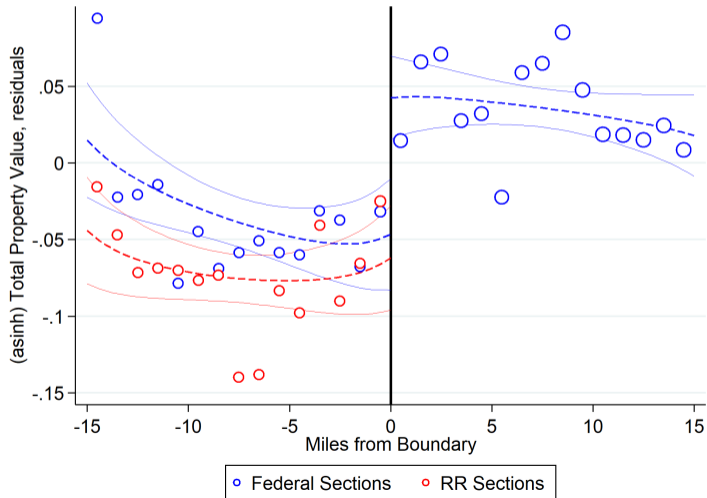


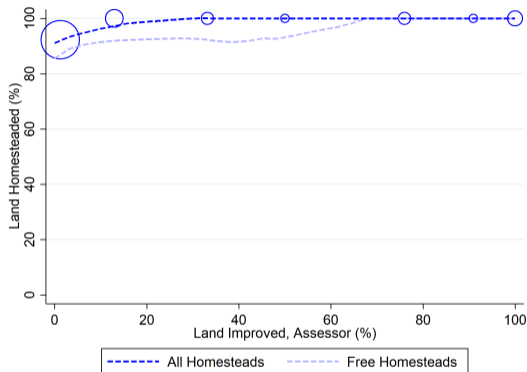
Figure 6: Land Concentration Over Time (case study)



- ▶ Land concentration → low, long-term land investment
 - Quasi-experimental support for Adam Smith's contention
 - Share tenancy as driver
- ▶ More in the paper!
 - More evidence on share tenancy, credit constraints
 - Reject alternative mechanisms
- ▶ View of the American frontier
 - More “mixed,” less equal distribution of land

Figure 7: (asinh) Total Value at Policy Boundary





Assessed Improvements vs. Completed Homesteads (Case Study County, 1912)

“Stock-raising and dairy production are so akin to agricultural pursuits that in grazing countries proof of settlement and use of the land for such purposes is satisfactory compliance with the homestead law.”

—Department of the Interior, October 13, 1880 (Luning Decision)

Table 2: Impact on Political and Public Good Outcomes

	(1)	(2)	(3)	(4)	(5)
	Schools	Churches	Community Halls	Road Distance	Owner Seeks Office (%)
RR Effect	-0.014 (0.0100)	-0.00022 (0.00078)	-0.0010*** (0.00035)	0.0021*** (0.00076)	-3.61 (5.05)
Sample	NE & KS 1940	NE & KS 1940	NE & KS 1940	All 2015	Morrill 1912
Grant \times State FEs	Y	Y	Y	Y	Y
County FEs	Y	Y	Y	Y	Y
Township FEs	Y	Y	Y	Y	Y
Geo Controls	Y	Y	Y	Y	Y
N	18,622	18,622	18,622	132,463	82
$\mathbb{E}[y]$.096	.013	.0025	1.1 mi	5.5%

Table 3: Effects on Town Formation

	(1)	(2)	(3)	(4)	(5)	(6)
	# Towns CDPs	# Towns Schmidt (2018)	Pop ≥ 1 (%)	Pop ≥ 10 (%)	Pop ≥ 100 (%)	Pop ≥ 1000 (%)
RR Effect	0.00029 (0.00024)	0.0010 (0.00059)	-3.63*** (0.66)	-1.02*** (0.30)	-0.046 (0.054)	0.0085 (0.019)
Sample	All	All	All	All	All	All
Grant \times State FEs	Y	Y	Y	Y	Y	Y
County FEs	Y	Y	Y	Y	Y	Y
Township FEs	Y	Y	Y	Y	Y	Y
Geo Controls	Y	Y	Y	Y	Y	Y
N	132,463	132,463	132,463	132,463	132,463	132,463
$\mathbb{E}[y]$.024	.0039	33%	11%	3%	.58%

Figure 8: (log) Parcel Size by State, Soil Quality

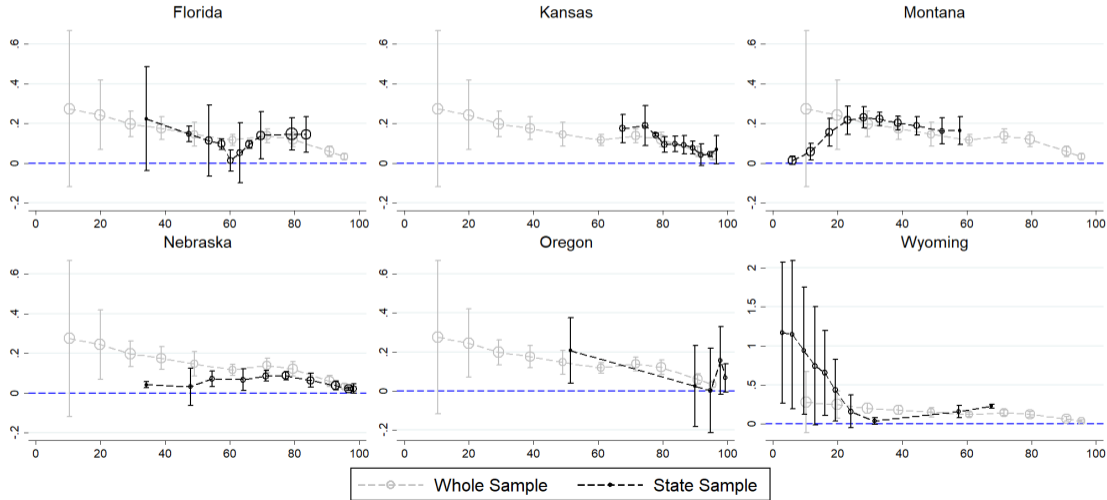


Figure 9: Effects on (asinh) Land Value

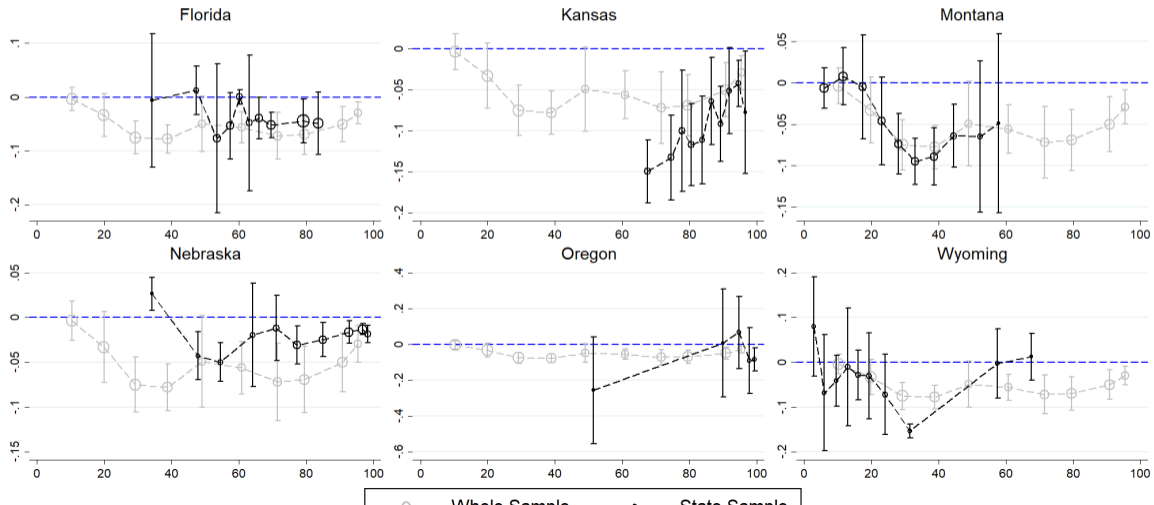


Figure 10: Land Value Effects by Soil Quality

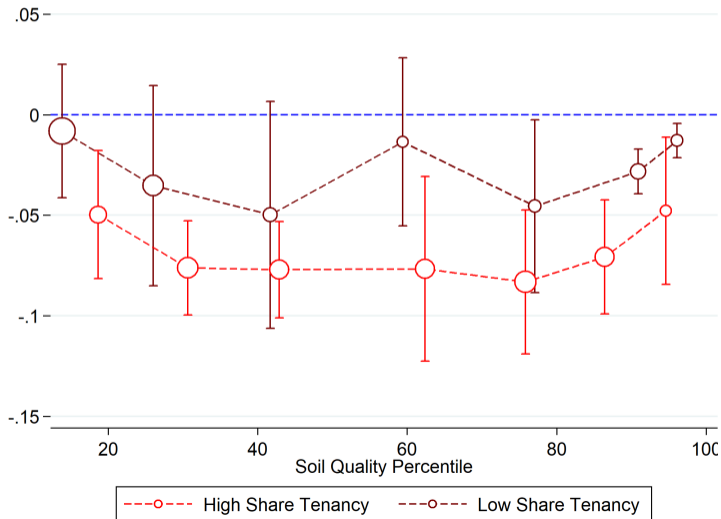


Figure 11: Effects by Year of County Settlement

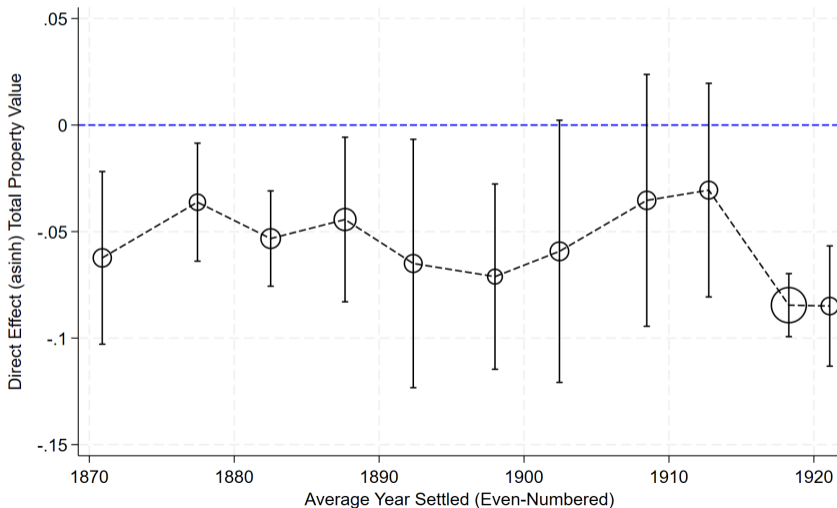


Figure 12: Acres Per Parcel, 2017 (all data)

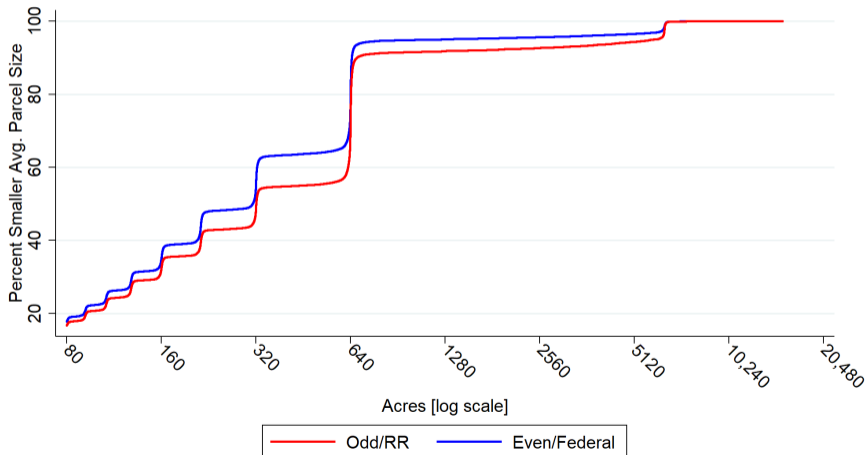


Figure 13: Probability 1+, 3+, 5+ Cumulative Sales (case study)

