

WEALTH AND PROPERTY TAXATION IN THE UNITED STATES

Sacha Dray
World Bank

Camille Landais
LSE

Stefanie Stantcheva
Harvard



THE US GENERAL PROPERTY TAX

- **A US innovation at the turn of the 19th Century:**
 - Comprehensive tax on all property, not just on real estate
 - For over a century, US relied heavily on local taxation of all forms of property.
 - Tax administration left detailed paper trails.
- **New source of historical data on US property & wealth:**
 - We constructed wealth measures for the US, all US states, counties, and 300 largest cities from early 1800s to 1935 (depending on aggregation level). Based on many historical records.
 - While there are existing national wealth estimates, GPT offers coherent, high-frequency, long-run source.
 - No existing consistent & coherent subnational measures.

WE USE THIS NEW DATA TO ANSWER THREE QUESTIONS

- How did **aggregate wealth** evolve in this crucial period of US development?
- How was property distributed across space and how did **spatial inequality** change over time?
 - New, fine-grained local activity measure over a long time period.
 - Existing measures of historical local activity rely on lower-frequency and imputed measures of income.
- What factors shaped **local capital accumulation**?

OUTLINE

1. A Brief History of the US Property Tax
2. Data
3. Wealth in the US: Growth and Spatial Inequality
4. The Correlates of Capital Accumulation

OUTLINE

1. A Brief History of the US Property Tax
2. Data
3. Wealth in the US: Growth and Spatial Inequality
4. The Correlates of Capital Accumulation

A BRIEF HISTORY OF THE US PROPERTY TAX

	Active state governments financed by asset income	Active local governments financed by property tax	National government financed by income tax
		<p>1839-42: states in default; constitutions put limits on investment & debt</p> <p>1902: local revenues = all state & national revenues combined</p>	
1790	1810	1840	1930
<p>PT is the main state & local tax</p>	<ul style="list-style-type: none"> Decline in states' reliance on PT Increase in asset income: banks, canals, railroads, transportation 	<ul style="list-style-type: none"> State constitutions: uniformity & universality principles (already earlier on) PT is 50-80% of all state revenues State government activity declines Local governments take on water, sanitation, transportation, public works, schools PT is on average 65% of city revenue 	<ul style="list-style-type: none"> PT criticized as economy changes National govt. expanded (New Deal, SS) New sources of financing (income & sales tax) Increase in exemptions

THE PRINCIPLES OF THE GENERAL PROPERTY TAX

- **Universality**: all property should be taxed, including moveable and intangible property. Exemptions strictly defined and limited.
- **Ad valorem**: solely based on value; same tax schedule applies to all types of property. Makes the valuation of property essential.
- **Uniformity**: taxable property should be taxed at the same rate. Not aimed at progressivity.
- **Localism**: local taxes to fund local gvt & spending enforced by local elected officials.
 - Based on Jeffersonian/Jacksonian views of local democracy
 - Spending closely tied to revenues which made it politically sustainable.

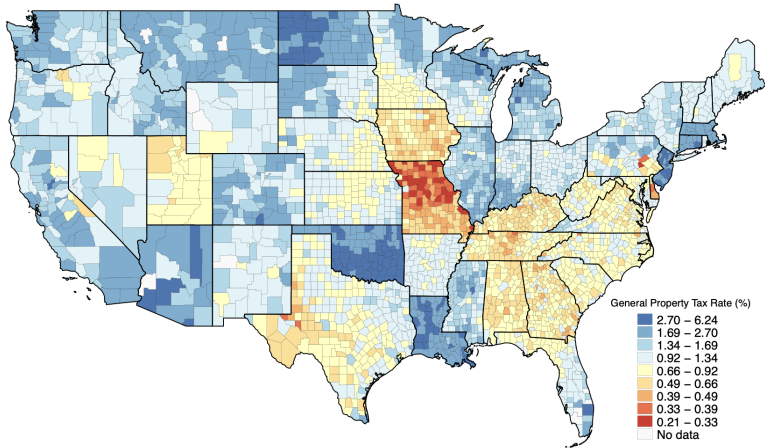
⇒ **The US implemented a comprehensive tax on all forms of property**

PROPERTY TAX: TAX BASE

- **Real Property:** Value of land, buildings & improvements
- **Personal Property:** Varies by state but includes most other forms of property:
 - Tangible property (furniture, livestock, merchandise, valuables).
 - Intangible property (money and bank deposits, mortgages, debts and credits, stocks, bonds). ▶ Example real and personal property : CT
- **Exemptions:** Vary by state but are limited. Typically public, religious property, hospitals, schools.
- **Double taxation** avoided through provisions on mortgages, loans, and debt.
- **Corporate property** taxed like individual property (classified as real or personal): no double taxation within state.
- **Enslaved people** assessed as property pre Civil-war. We will consider series with and without.

A LAYERED TAX TO SUPPORT LOCAL GOVERNMENT

Total Property Tax Rate - 1920 ▶ Tax Rates By Layer of Gvt

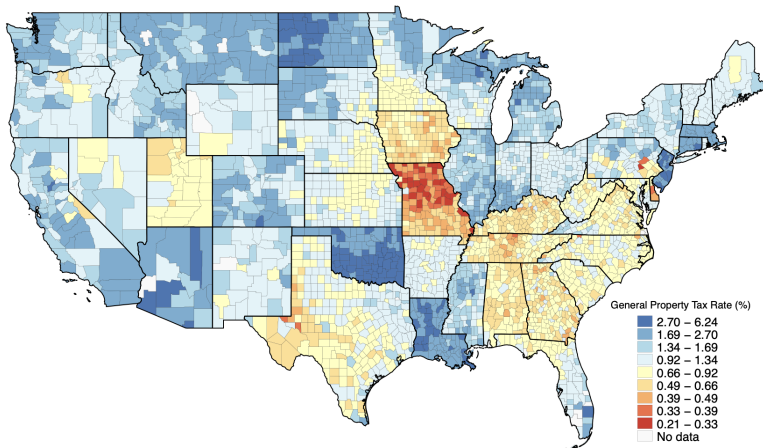


Layered tax on property: assessed once locally, then taxed by all residing jurisdictions (state, counties, cities, special districts (e.g., schools, roads)).

Average rate: 1.4%. Av. municipality: 0.97%. Av. state: 0.16%.

A LAYERED TAX TO SUPPORT LOCAL GOVERNMENT

Total Property Tax Rate - 1920 ▶ Tax Rates By Layer of Gvt



Represented $\approx 6\%$ of GDP, varied substantially across space.

OUTLINE

1. A Brief History of the US Property Tax
2. Data
3. Wealth in the US: Growth and Spatial Inequality
4. The Correlates of Capital Accumulation

NEW DATA ON WEALTH

Collected and digitized many new primary sources from scratch & built a catalog. Harmonized many different sources.

Extracted data on tax rates, assessed property, and assessment ratios.

State-level

- Annual State reports (Auditor's, Treasurer's, Comptroller's, etc); State Tax Commissions and Board of Equalization reports.
- Census *Financial Statistics of States* (1915-1939)
- Covers all 50 States (+DC and Puerto Rico) **annually** typically since after statehood until 1930s , N = 4,583
 - ▶ Coverage (State level)
 - ▶ Coverage (Overall population)

County-level

- Census' *Wealth, Debt, Taxation*
- Covers all counties every decade for 1850-1930, N = 18,242

City-level

- Census' *Annual Financial Statistics* (1899-1938)
- Covers 327 large U.S. cities (> 30k 1899-1930, > 100k 1931-1938), N=7,026.
- + 259 small cities in 1903 (8,000 - 25,000 population)

FROM REPORTED STATISTICS TO MEASURES OF PRIVATE PROPERTY AND WEALTH

- Wealth is always difficult to measure, even today.

Historical GTP directly assessed wealth.

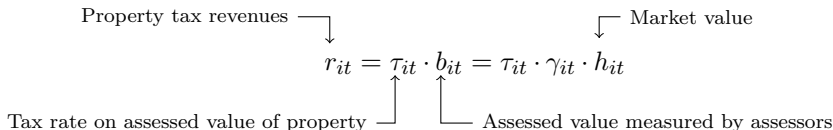
Substantial and serious efforts were put into carefully valuing property, in hands-on manner.

Provides us with new measure of local economic activity over long time period

- Two key measurement issues to discuss:
 1. From assessed value to market value.
 2. Wealth vs. property

FROM ASSESSED TO MARKET VALUE

We want to measure market value \neq assessed value



- “**Assessment ratio**” : $\gamma = \frac{b}{h} = \frac{\text{Assessed val.}}{\text{Market val.}}$
- In practice, $\gamma < 1$. But we have a solution!

Rich information on assessment practices & assessment ratios that we compile from several sources: [► Maps](#) [► Validation](#)

- *Wealth, Debt, and Taxation* series (decennial 1850 to 1920), State reports (esp. Boards of Equalization and Tax Commissions), secondary sources, *Financial Statistics of States* (annually 1915-1930; self-reported).

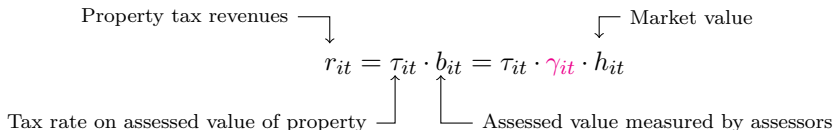
[► Ohio Property Series](#)

[► Kansas Property Series](#)

[► Indiana Property Series](#)

FROM ASSESSED TO MARKET VALUE

We want to measure market value \neq assessed value



- **“Assessment ratio”**: $\gamma = \frac{b}{h} = \frac{\text{Assessed val.}}{\text{Market val.}}$
- In practice, $\gamma < 1$. But we have a solution!

Rich information on assessment practices & assessment ratios that we compile from several sources: [► Maps](#) [► Validation](#)

- *Wealth, Debt, and Taxation* series (decennial 1850 to 1920), State reports (esp. Boards of Equalization and Tax Commissions), secondary sources, *Financial Statistics of States* (annually 1915-1930; self-reported).

[► Ohio Property Series](#)

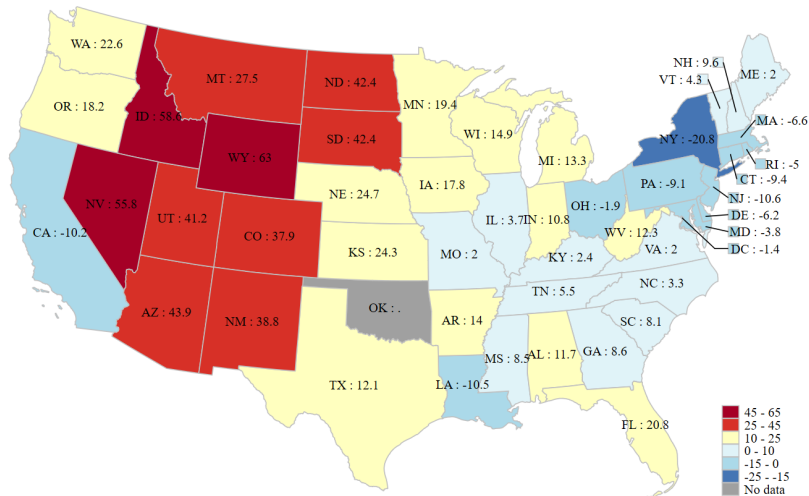
[► Kansas Property Series](#)

[► Indiana Property Series](#)

ASSIGNING “WEALTH” TO THE RIGHT PLACE

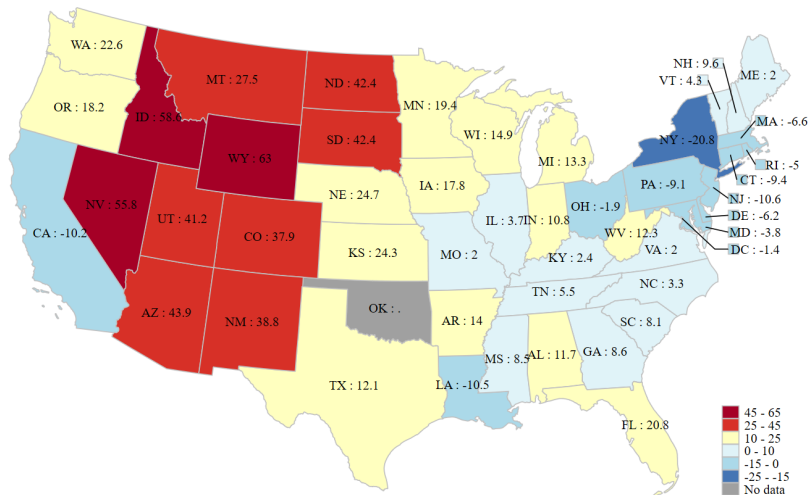
- Location of property and location of owner may be different.
 - Real estate and real assets taxed at location, which may be different than residence of owner.
- At city, county, and state levels, we measure **property** rather than wealth.
 - Property is valuable measure of local activity, even if \neq wealth.
 - At local level, private property $<$ wealth if residents own real property elsewhere and vice-versa.
 - Gap between property & wealth smaller at higher levels of aggregation.
 - At national level, we measure wealth, modulo net foreign assets.

NET ASSET POSITIONS OF STATES IN 1880



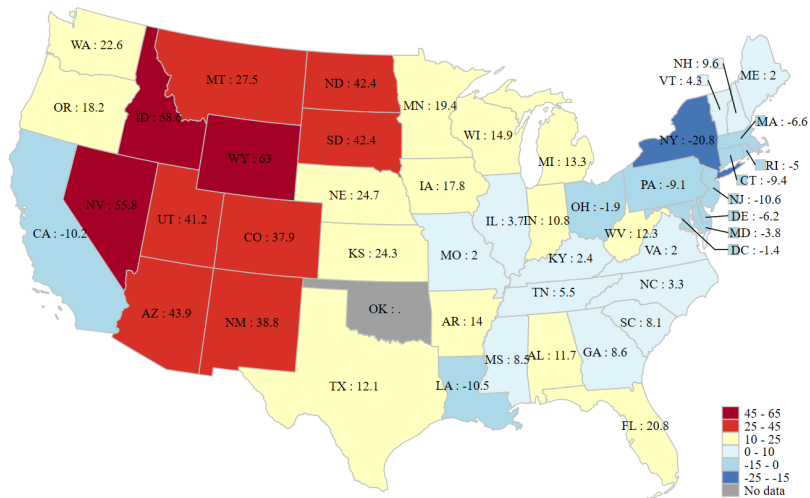
Info from Census.

NET ASSET POSITIONS OF STATES IN 1880



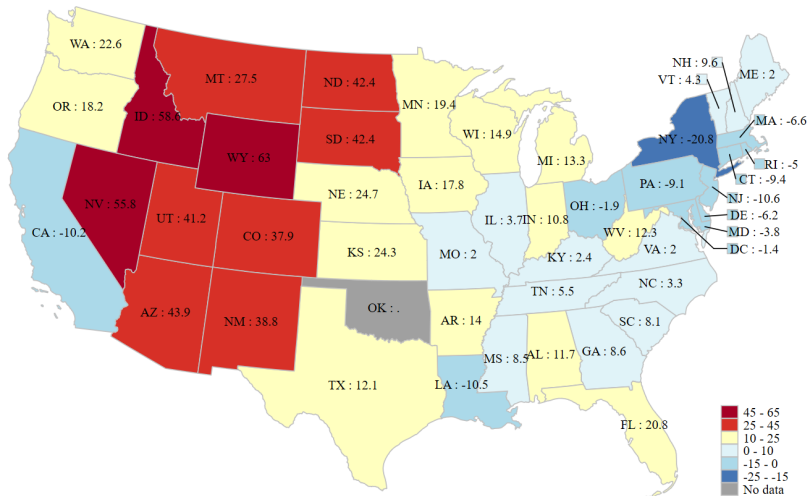
Bulk of states have net asset positions of -10% to +20%.

NET ASSET POSITIONS OF STATES IN 1880



Mountain & South West states (WY, ID, NV, AZ) have biggest disconnect between local property & wealth.

NET ASSET POSITIONS OF STATES IN 1880



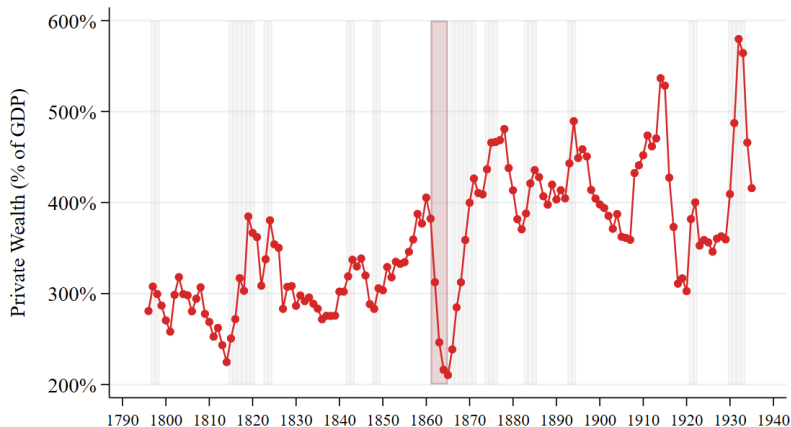
Again, local property is valuable measure of **local activity**, even if different from wealth.

OUTLINE

1. A Brief History of the US Property Tax
2. Data
3. Wealth in the US: Growth and Spatial Inequality
4. The Correlates of Capital Accumulation

THE GROWTH IN US WEALTH 1800-1935

US PRIVATE WEALTH-TO-GDP RATIO 1800-1935

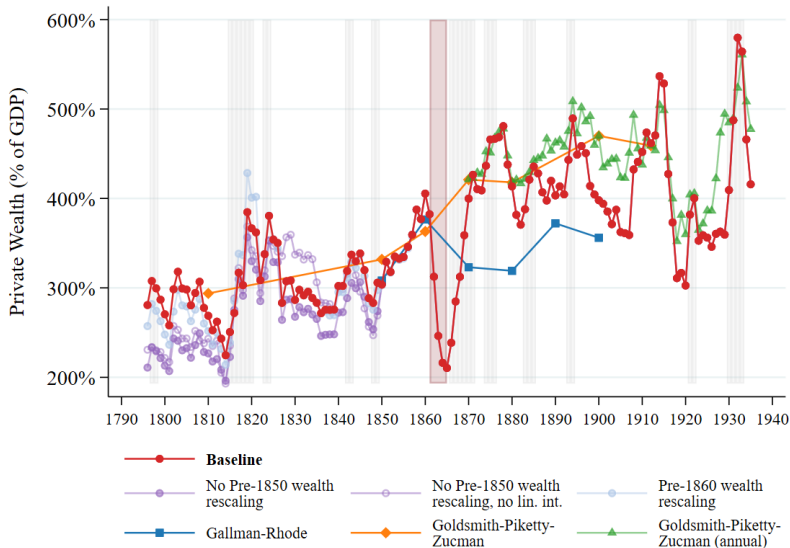


Private wealth per capita in 2012 USD:

In 1800 = \$ 5,000, in 1930 = \$ 40,000.

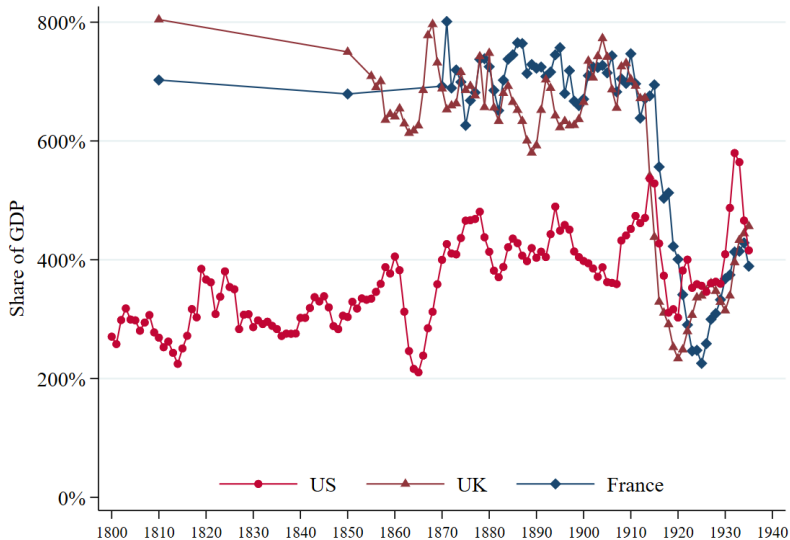
⇒ Private wealth $\approx \times 8$ in 130 years [► Levels](#)

COMPARISON WITH EXISTING WEALTH ESTIMATES



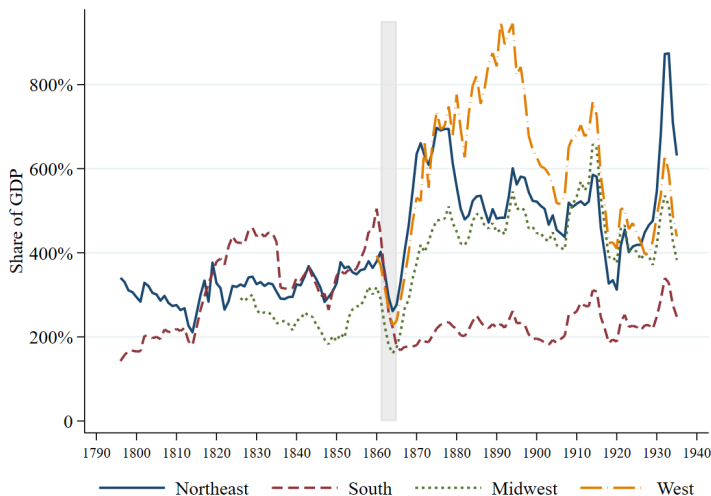
THE US OVERTOOK THE UK & FRANCE IN WWI

Wealth-to-GDP Ratios in the US vs. France and UK



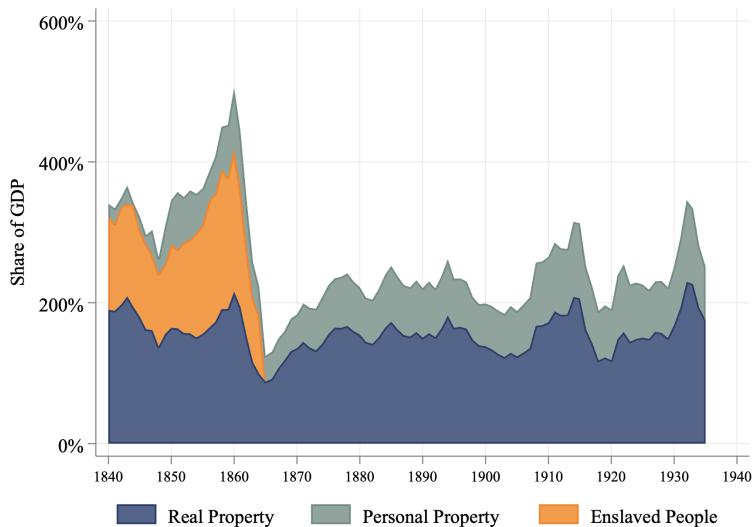
THE DECLINE OF THE RICH SOUTH AND THE GROWTH OF THE WEST?

WEALTH PER CAPITA AS % OF US GDP PER CAPITA BY REGION (1790-1935)



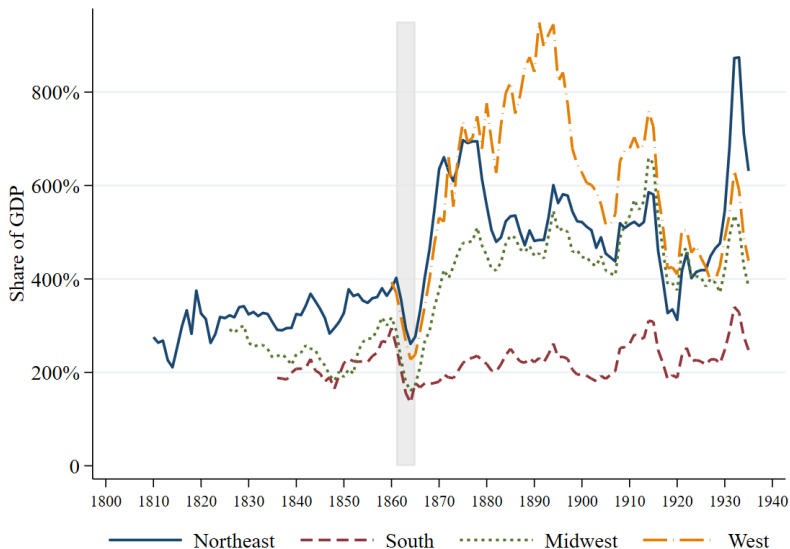
THE CIVIL WAR AND SOUTHERN WEALTH

COMPOSITION OF PROPERTY IN THE SOUTH 1840-1935



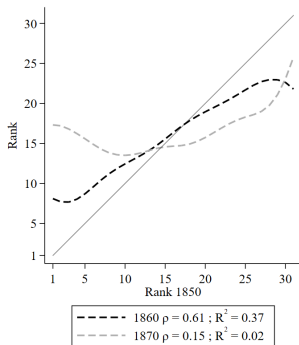
THE SOUTH HAS ALWAYS BEEN WEALTH POOR

WEALTH EXCLUDING ENSLAVED PEOPLE, PER CAPITA BY REGION (1810-1935)

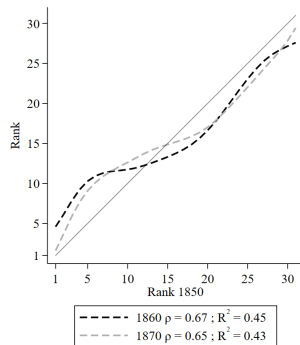


PERSISTENCE IN PROPERTY RANKING AROUND THE CIVIL WAR

Counting enslaved as property



Not counting enslaved as property

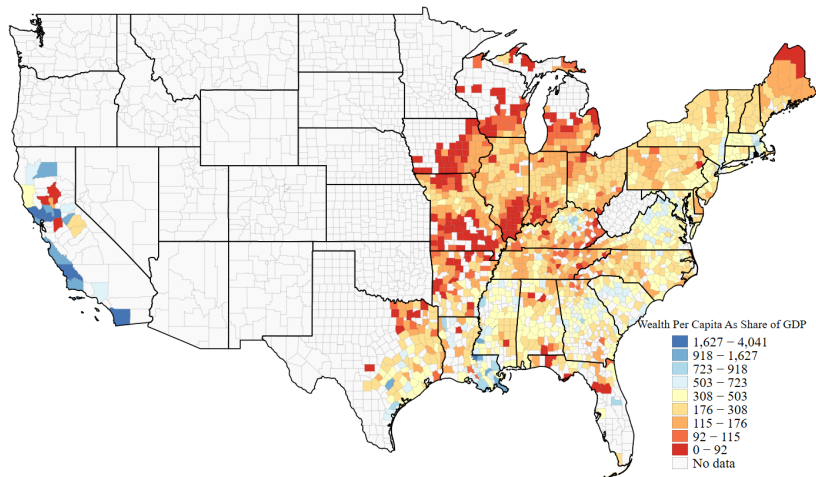


► Persistence maps

THE PERSISTENCE OF SPATIAL INEQUALITY 1870-1930

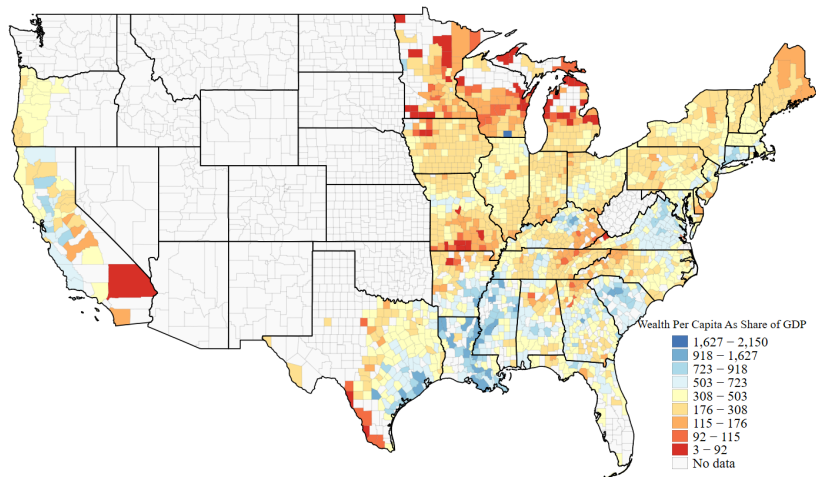
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1850



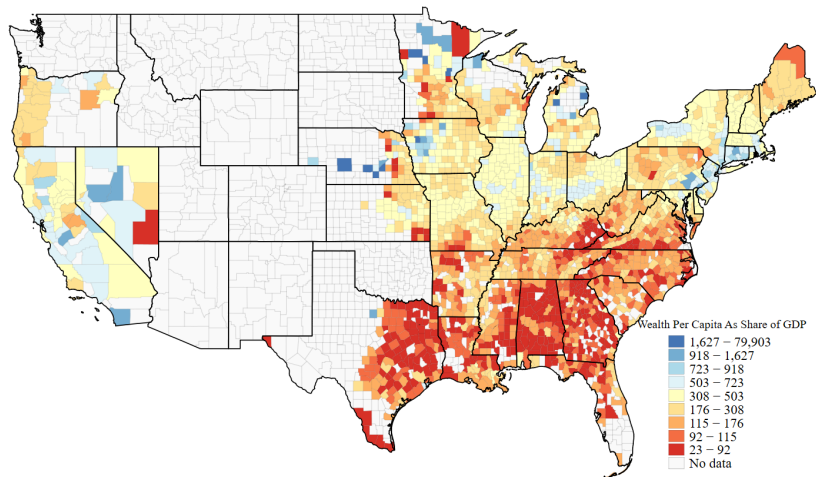
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1860



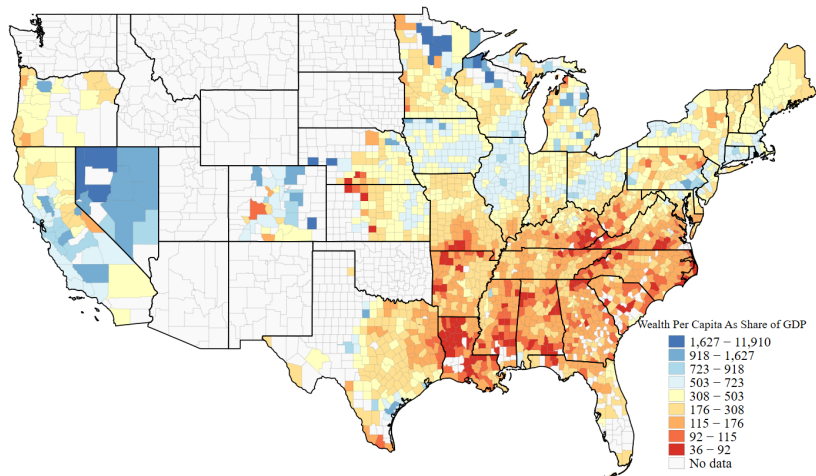
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1870



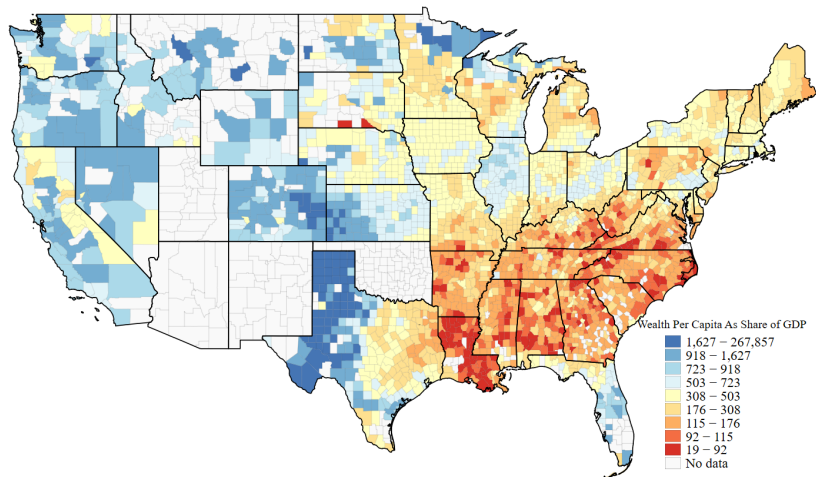
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1880



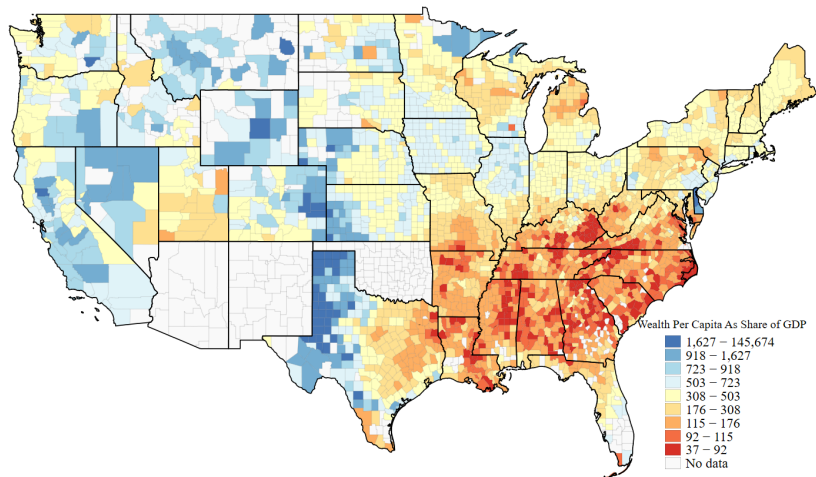
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1890



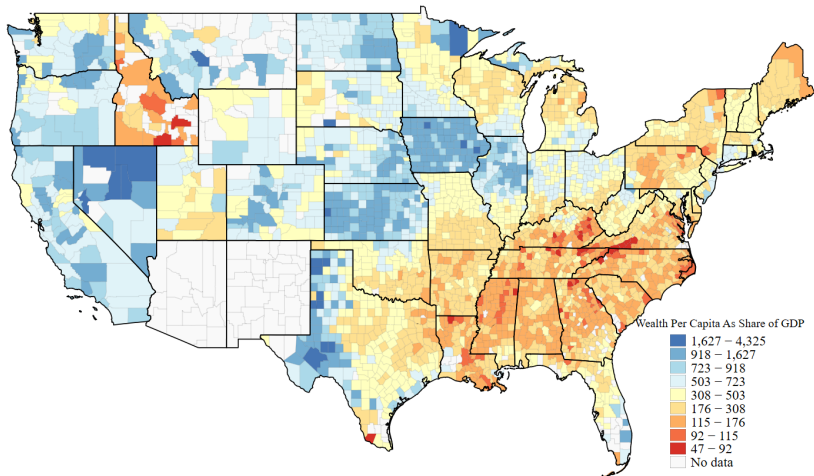
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1900



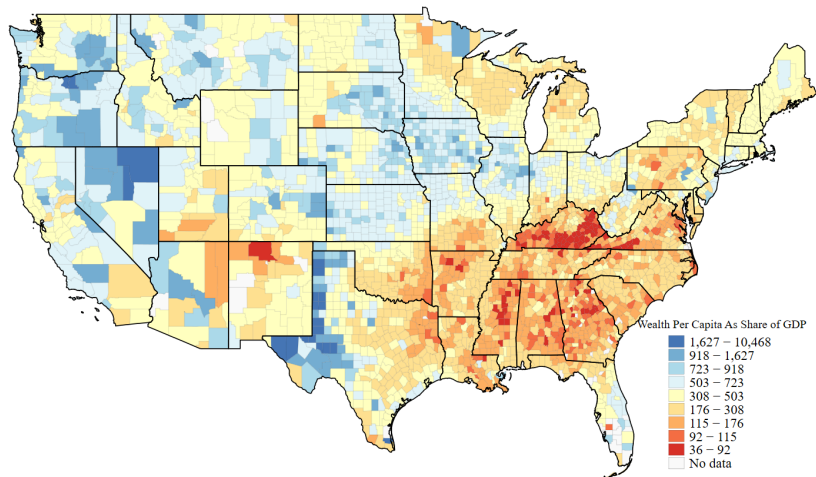
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1910



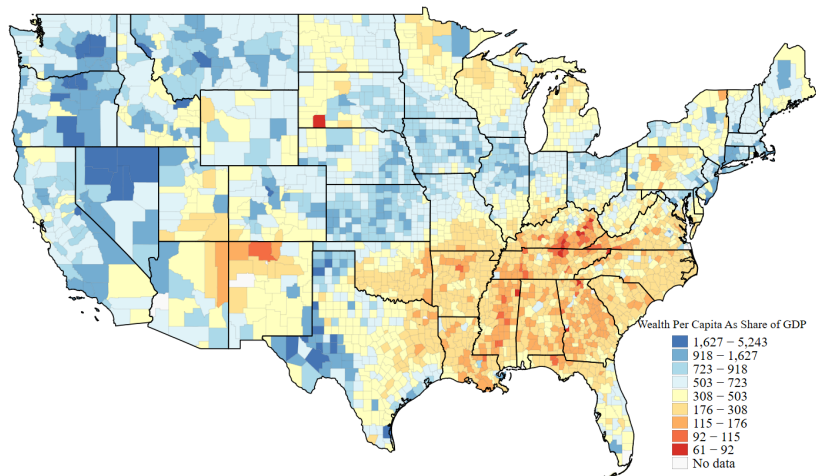
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1920



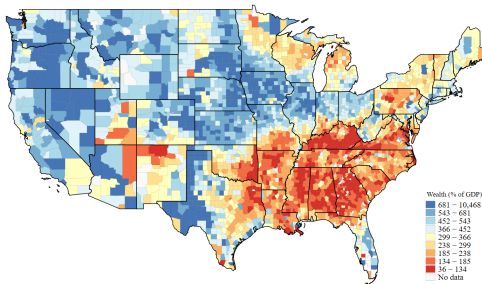
SPATIAL INEQUALITY IN THE US

PROPERTY PER CAPITA AS FRACTION OF US GDP PER CAPITA BY COUNTY 1930



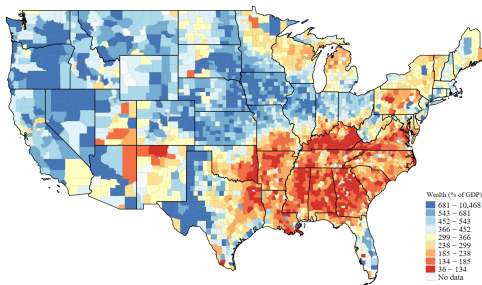
CORRELATION WITH GEOGRAPHY OF INCOME TODAY

PROPERTY IN 1920 VS OPPORTUNITY ATLAS INCOME

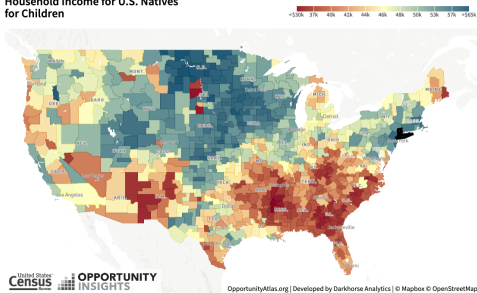


CORRELATION WITH GEOGRAPHY OF INCOME TODAY

PROPERTY IN 1920 VS OPPORTUNITY ATLAS INCOME (CORR = 0.6)

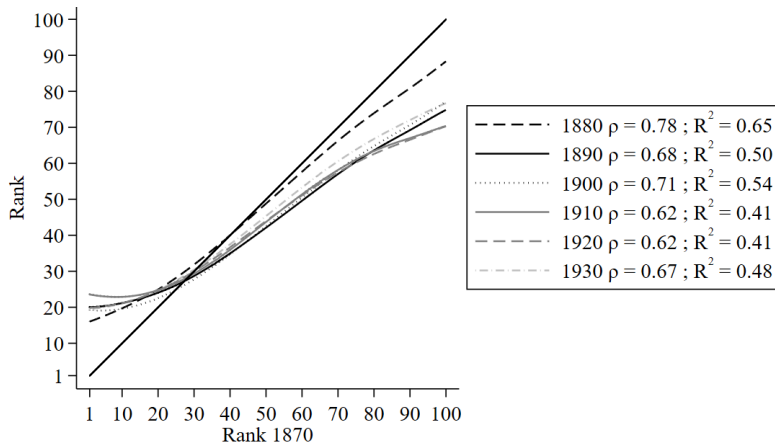


Household Income for U.S. Natives
for Children



SPATIAL INEQUALITY IS VERY PERSISTENT

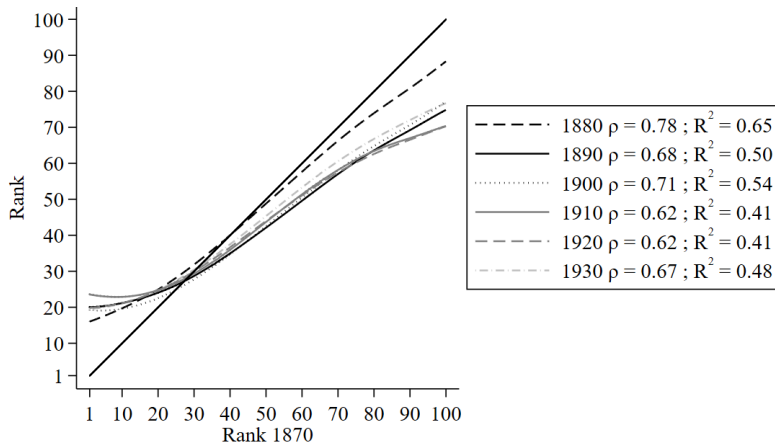
PROPERTY RANK PERSISTENCE FOR COUNTIES



► Persistence Across States

SPATIAL INEQUALITY IS VERY PERSISTENT

PROPERTY RANK PERSISTENCE FOR COUNTIES



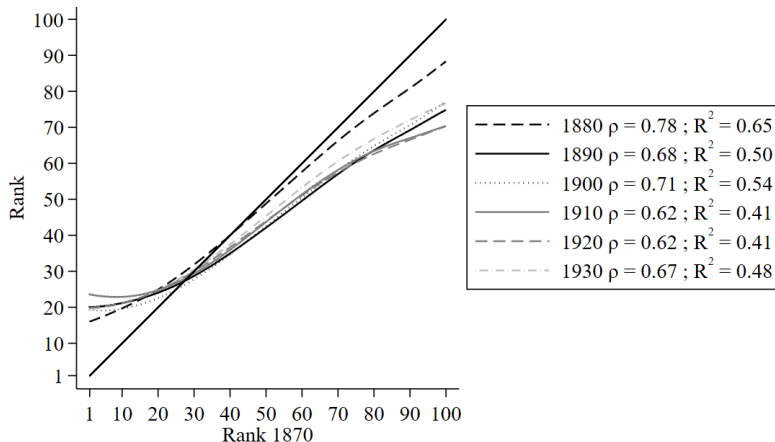
β -convergence (link between initial level and growth):

Small, $\approx 3X$ slower than income (Barro & Sala-i-Martin [2004])

Driven by Southern counties [► Details](#)

SPATIAL INEQUALITY IS VERY PERSISTENT

PROPERTY RANK PERSISTENCE FOR COUNTIES



σ -convergence: spatial variance in property per capita has not decreased. [► Details](#)

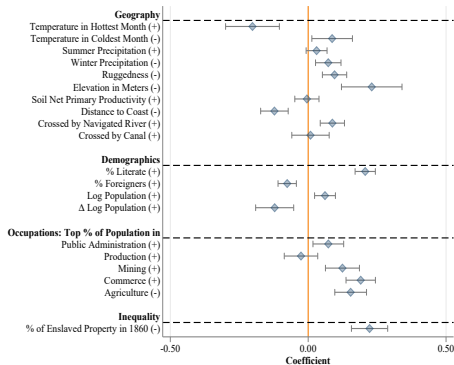
OUTLINE

1. A Brief History of the US Property Tax
2. Data
3. Wealth in the US: Growth and Spatial Inequality
4. The Correlates of Capital Accumulation

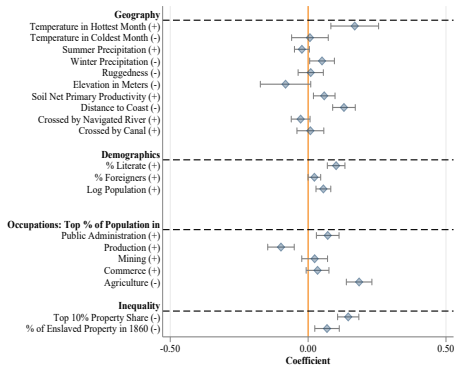
CORRELATES OF INITIAL PROPERTY AND GROWTH

CORRELATES OF PROPERTY PER CAPITA AT THE COUNTY LEVEL (1870-1930)

1870: initial property

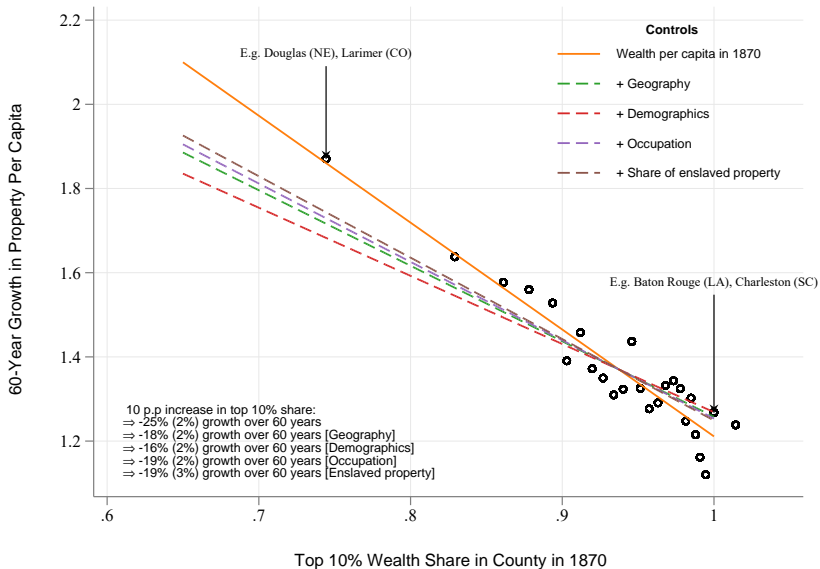


60-year growth



► Table

THE LEGACY OF INEQUALITY

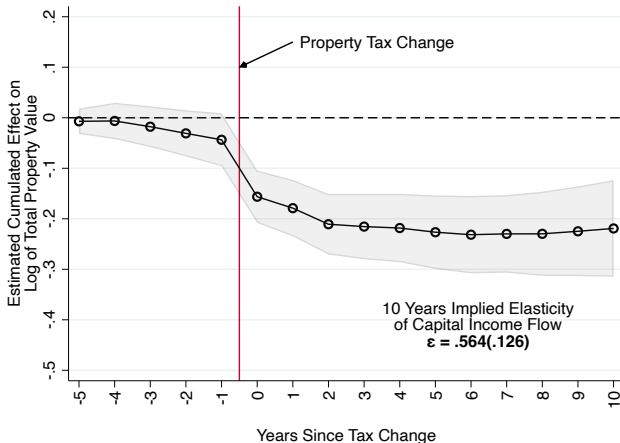


THE ROLE OF PUBLIC POLICIES AND TAXATION

PROPERTY TAXATION & CAPITAL ACCUMULATION

- How does property taxation affect capital accumulation?
- We leverage our city-level data for this question because it has:
 1. **Geographical depth** of data: large variation in property tax rates across 300+ municipalities ▶ City Effective Tax Rates
 2. **Historical depth**: annual frequency over long time period (40 years)
- **Local public finances matter**, explain 30% of variance in local property. ▶ Variance
- Large tax changes within city are common ▶ Tax Change Distribution
- Tax changes exhibit little serial correlation ▶ Serial Correlation
- Distributed leads and lags model: residualize on city i FE, state $s \times$ year t FE, + rich set of covariates \mathbf{X}_{ist} (including local public expenditures)

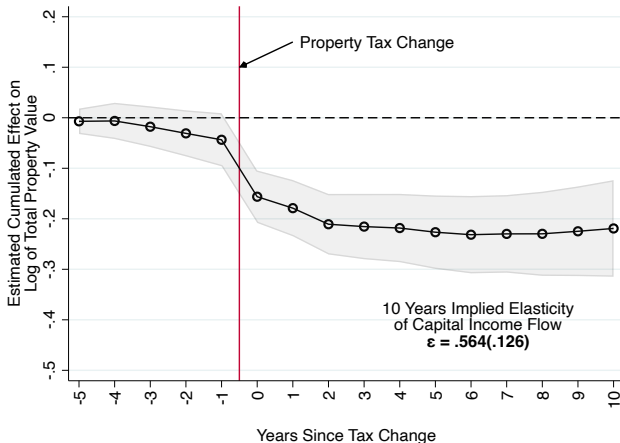
THE DYNAMIC IMPACT OF PROPERTY TAX CHANGES



Distributed Leads and Lags Model:

$$W_{ist} = \sum_{k=-10}^{k=5} \gamma_k \tau_{i,t+k} + \mathbf{X}'_{ist} \gamma + \eta_i + \zeta_{st}$$

THE DYNAMIC IMPACT OF PROPERTY TAX CHANGES



Elasticity of Implied Capital Income $r \cdot W$: $\frac{d \ln W}{d \ln(1-\tau/r)}$

We take $r = 2.5\%$, average for US Treasury bonds over period

INTENSIVE VS. EXTENSIVE MARGIN

	(1)	(2)	(3)
	<i>A. Log of Total Property Value</i>		
Estimated Elast. $\hat{\varepsilon}$	0.516*** (0.108)	0.776*** (0.123)	0.564*** (0.126)
	<i>B. Log of Population</i>		
Estimated Elast. $\hat{\varepsilon}$	-0.141 (0.088)	0.161** (0.074)	0.201*** (0.077)
	<i>C. Log of Total Property Value Per Capita</i>		
Estimated Elast. $\hat{\varepsilon}$	0.669*** (0.104)	0.615*** (0.119)	0.362*** (0.123)
5 Leads Net-of-Tax Rate	X	X	X
Year + City FE	X	X	X
Economic Covariates		X	X
Demographic Covariates		X	X
Assessment Ratio		X	X
Tax Enforcement		X	X
Expenditures		X	X
State-Year FE			X

$$Y_{ist} = \varepsilon \ln(1 - \bar{\tau}_{i,t,t-10}/r) + \mathbf{X}'_{ist}\gamma + \eta_i + \zeta_{st}$$

≈ 40% of elast. of K stock = extensive margin

► Comparison to migration literature

INTENSIVE VS. EXTENSIVE MARGIN

	(1)	(2)	(3)
	<i>A. Log of Total Property Value</i>		
Estimated Elast. $\hat{\varepsilon}$	0.516*** (0.108)	0.776*** (0.123)	0.564*** (0.126)
	<i>B. Log of Population</i>		
Estimated Elast. $\hat{\varepsilon}$	-0.141 (0.088)	0.161** (0.074)	0.201*** (0.077)
	<i>C. Log of Total Property Value Per Capita</i>		
Estimated Elast. $\hat{\varepsilon}$	0.669*** (0.104)	0.615*** (0.119)	0.362*** (0.123)
5 Leads Net-of-Tax Rate	X	X	X
Year + City FE	X	X	X
Economic Covariates		X	X
Demographic Covariates		X	X
Assessment Ratio		X	X
Tax Enforcement		X	X
Expenditures		X	X
State-Year FE			X

$$Y_{ist} = \varepsilon \ln(1 - \bar{\tau}_{i,t,t-10}/r) + \mathbf{X}'_{ist}\gamma + \eta_i + \zeta_{st}$$

≈ 60% of elast. of K stock = intensive margin

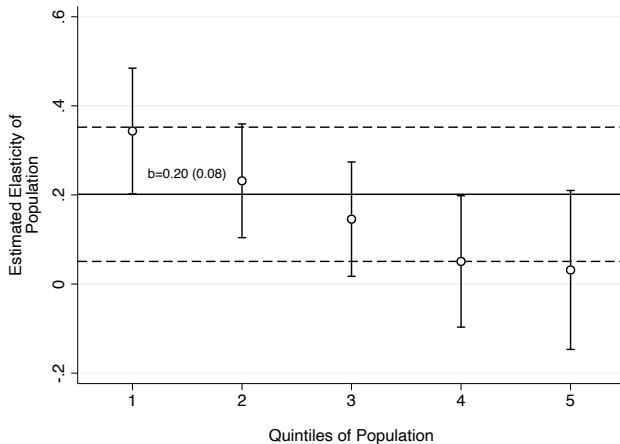
► Capitalization

INTENSIVE VS. EXTENSIVE MARGIN

	(1)	(2)	(3)
	<i>A. Log of Total Property Value</i>		
Estimated Elast. $\hat{\varepsilon}$	0.516*** (0.108)	0.776*** (0.123)	0.564*** (0.126)
	<i>B. Log of Population</i>		
Estimated Elast. $\hat{\varepsilon}$	-0.141 (0.088)	0.161** (0.074)	0.201*** (0.077)
	<i>C. Log of Total Property Value Per Capita</i>		
Estimated Elast. $\hat{\varepsilon}$	0.669*** (0.104)	0.615*** (0.119)	0.362*** (0.123)
5 Leads Net-of-Tax Rate	X	X	X
Year + City FE	X	X	X
Economic Covariates		X	X
Demographic Covariates		X	X
Assessment Ratio		X	X
Tax Enforcement		X	X
Expenditures		X	X
State-Year FE			X

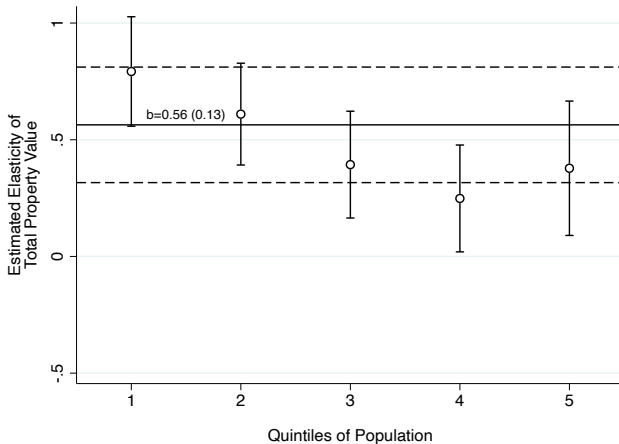
GPT financed valuable spending: Migration ε insignificant if do not control for this & other city characteristics. \Rightarrow Link with spending made GPT politically sustainable.

THE ROLE OF TAX COMPETITION



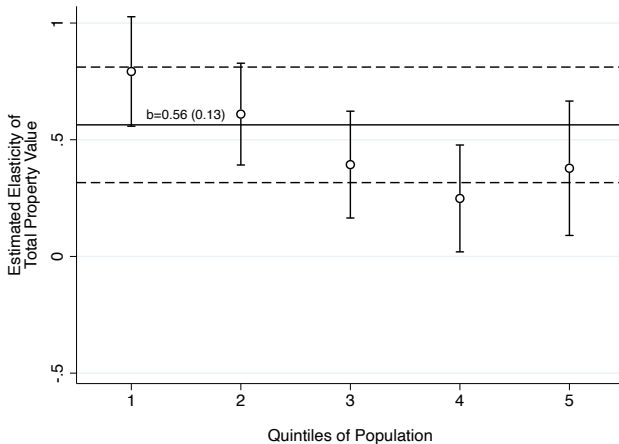
Migration response (extensive margin) strongly decreasing with municipality size

THE ROLE OF TAX COMPETITION



Elast. of K stock decreasing with municipality size

THE ROLE OF TAX COMPETITION



Additional evidence of tax competition:

- ▶ City's property negatively correlated with neighbors' net-of-tax rates
- ▶ City's tax rate change positively correlated with past changes of neighbors' tax rates

CONCLUSION

- New data on wealth and property over the long-run for the US, all US states, counties, and large cities.
- The US experienced very rapid wealth accumulation after the Civil war and until the Great Depression.
- Spatial inequality has been highly persistent, slow convergence.
- Strong effects of the GPT (a local “wealth tax”) on local K accumulation on intensive & extensive margins.

Evidence for tax competition.

Property tax paid for valuable services, which made it politically sustainable.

Paper here:



Thank you!

APPENDIX

UNIFORMITY & UNIVERSALITY PRACTICES

Dates of admission in the Union, Constitution requirement and actual practice of universality and uniformity

State	Admission to Union	First observed practice of universality in assessment of property	First observed practice of uniformity for taxation of property	First appearance of universality requirements in State Constitution	First appearance of uniformity requirements in State Constitution
Alabama	1819	1850	1870		
Alaska	1959	1906			
Arizona	1912	1870	1893		
Arkansas	1836	1838	1838	1868	1836
California	1850	1850	1850	1849	1849
Colorado	1876	1870	1876		
Connecticut	1788	1808	1795		
Delaware	1787	1776	1776		1897
District of Columbia	N/A	1850	1903		
Florida	1845	1850	1884	1868	1838
Georgia	1788	1755	1796		1868
Hawaii	1959	1881	1912		
Idaho	1890	1870	1887		
Illinois	1818	1839	1839		
Indiana	1816	1835	1835	1851	1851
Iowa	1846	1850	1858		
Kansas	1861	1860	1861	1858	1855
Kentucky	1792	1795	1795	1890	1890
Louisiana	1812	1850	1870		1845
Maine	1820	1820	1820		1819
Maryland	1788	1793	1793		
Massachusetts	1788	1792	1792		
Michigan	1837	1838	1838		
Minnesota	1858	1850	1858		1857
Mississippi	1817	1850	1880	1868	1868
Missouri	1821	1850	1860		1820
Montana	1889	1870	1888	1889	1868
Nebraska	1867	1860	1867		
Nevada	1864	1865	1869	1864	1864
New Hampshire	1788	1772	1793		

UNIFORMITY & UNIVERSALITY PRACTICES

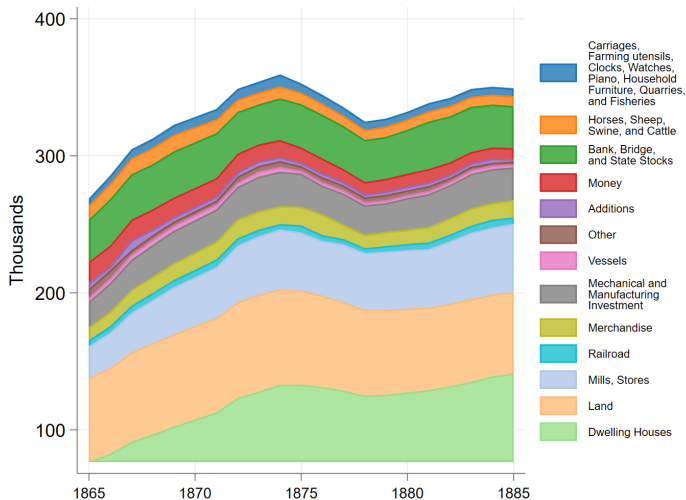
State	Admission to Union	First observed practice of universality in assessment of property	First observed practice of uniformity for taxation of property	First appearance of universality requirements in State Constitution	First appearance of uniformity requirements in State Constitution
New Jersey	1787	1794	1794		1844
New Mexico	1912	1850	1882		
New York	1788	1788	1788		
North Carolina	1789	1868	1868	1868	1868
North Dakota	1889	1890	1890	1889	1868
Ohio	1803	1826	1826	1851	1851
Oklahoma	1907	1890	1891		
Oregon	1859	1850	1858	1857	1857
Pennsylvania	1787	1788	1788		
Puerto Rico	N/A	1901	1909		
Rhode Island	1790	1796	1769		
South Carolina	1788	1794	1794	1868	1868
South Dakota	1889	1879	1881	1889	1868
Tennessee	1796	1836	1836		1834
Texas	1845	1846	1846	1845	1845
Utah	1896	1850	1886	1895	1895
Vermont	1791	1796	1796		
Virginia	1788	1793	1793	1850	1850
Washington	1889	1860	1890	1889	1868
West Virginia	1863	1870	1880	1863	1863
Wisconsin	1848	1848	1850		1848
Wyoming	1890	1870	1887	1889	1868

Source: Jensen (1931) and Benson (1965) for the first appearance in State constitutions ; State reports for the first observed practices (see Appendix table on State coverages and Sources); Wolcott (1796) and Rabushka (2008) for additional information on practice of assessment and uniformity prior to 1800 in the Thirteen Colonies , Kentucky, Tennessee and Vermont.

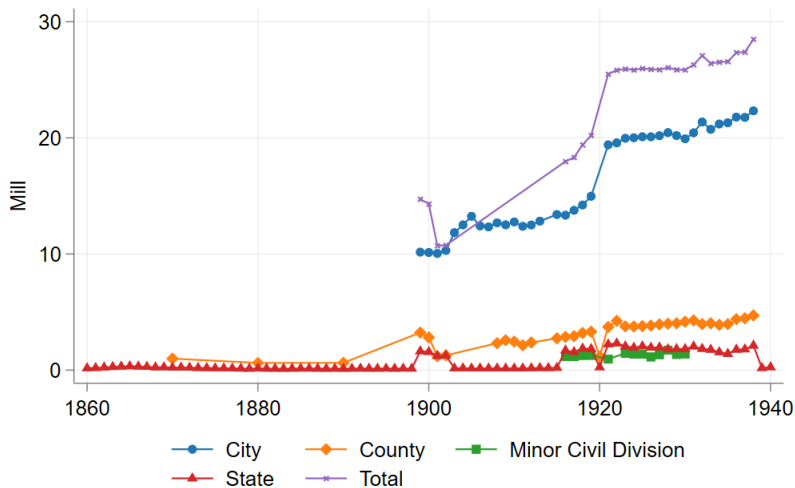
► Back

EXAMPLE OF PRIVATE PROPERTY: CONNECTICUT

CATEGORIES OF PERSONAL WEALTH



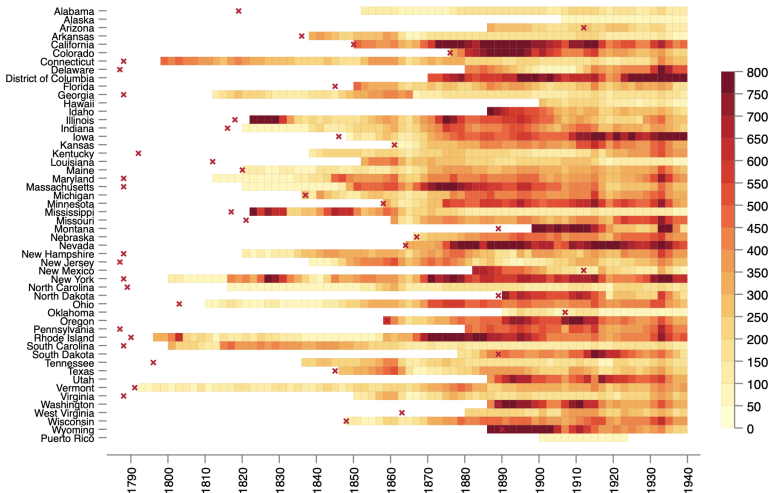
AVERAGE EFFECTIVE RATES OF TAXATION



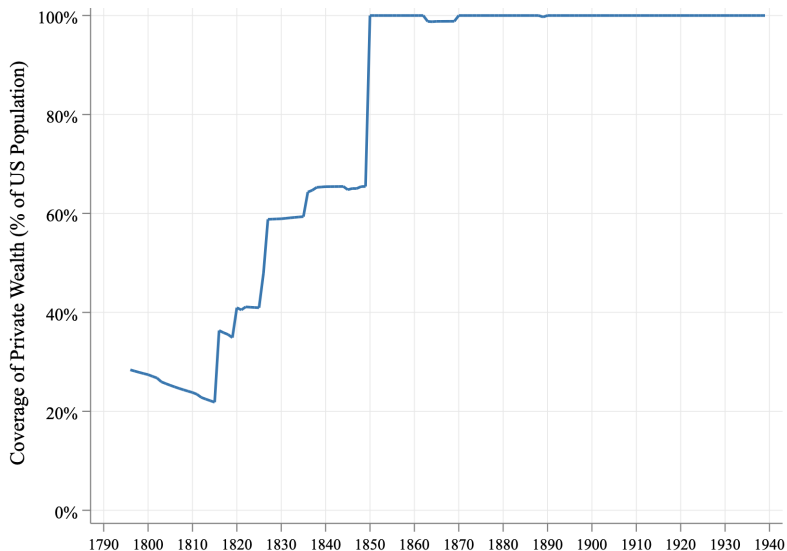
► [Back to Tax Rates](#)

► [Back to City Events](#)

PRIVATE WEALTH AS SHARE OF GDP (%) IN ALL STATES

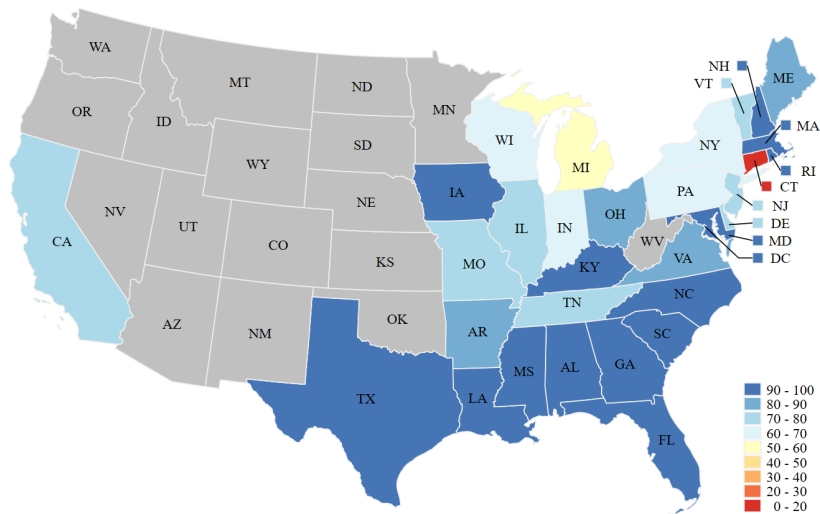


DATA COVERAGE OF OVERALL POPULATION OF PRIVATE WEALTH DATA



ASSESSMENT RATIOS IN 1850

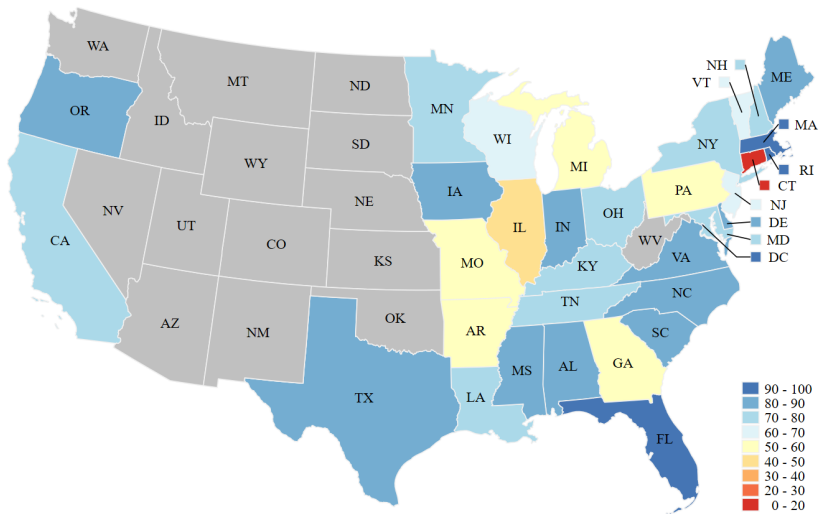
NATIONAL AVERAGE : 82%



► Back

ASSESSMENT RATIOS IN 1860

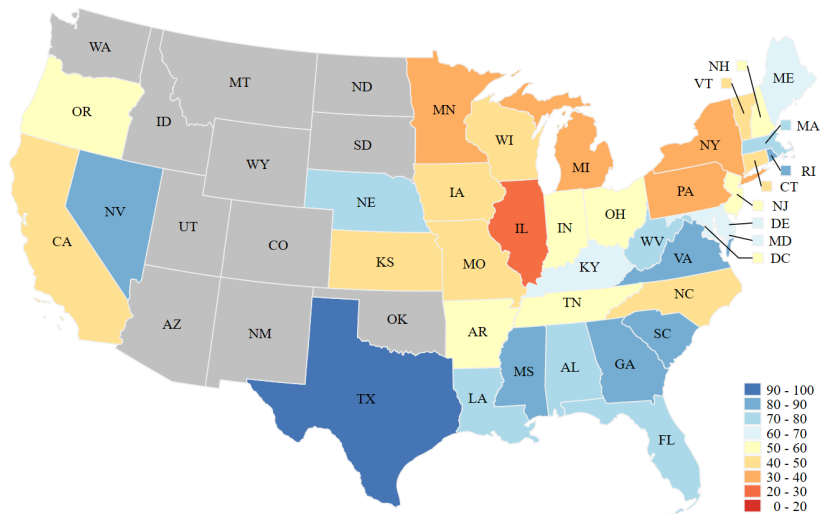
NATIONAL AVERAGE : 71%



► Back

ASSESSMENT RATIOS IN 1870

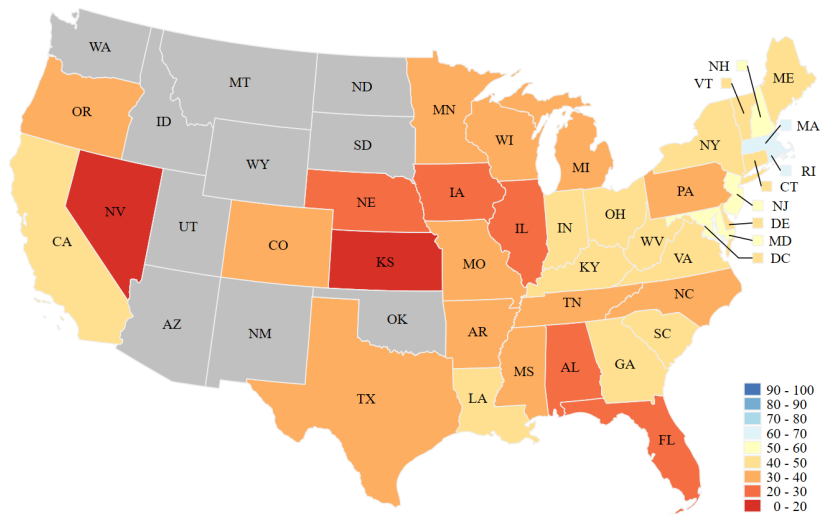
NATIONAL AVERAGE : 47%



► Back

ASSESSMENT RATIOS IN 1880

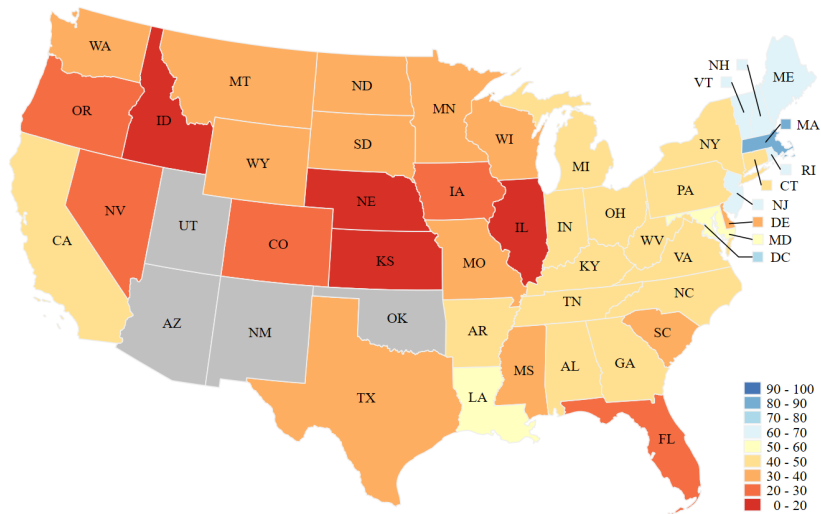
NATIONAL AVERAGE : 39%



► Back

ASSESSMENT RATIOS IN 1890

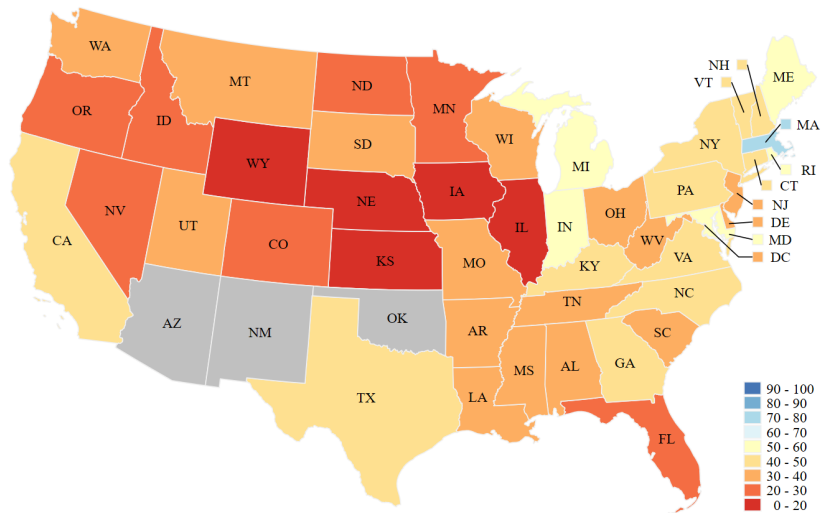
NATIONAL AVERAGE : 41%



► Back

ASSESSMENT RATIOS IN 1900

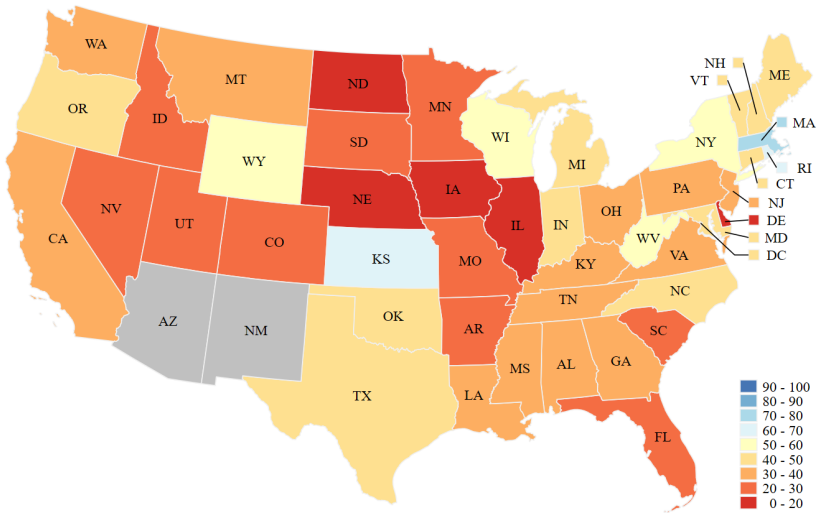
NATIONAL AVERAGE : 38%



► Back

ASSESSMENT RATIOS IN 1910

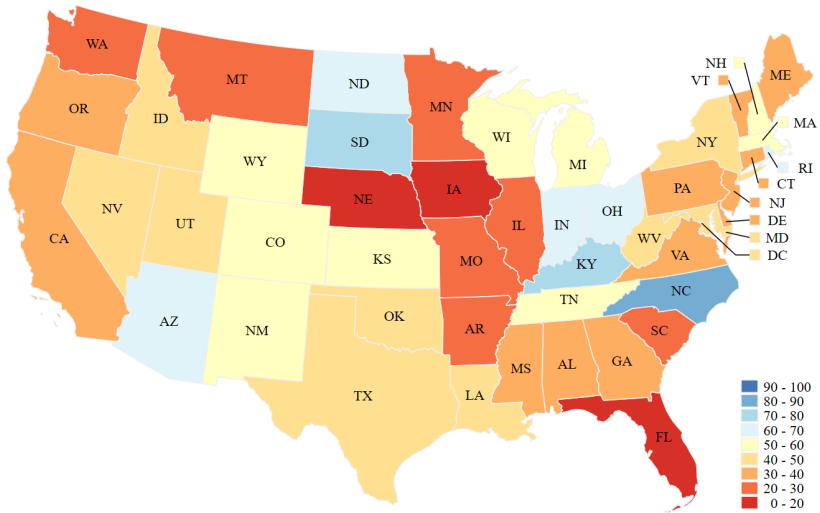
NATIONAL AVERAGE : 39%



► [Back](#)

ASSESSMENT RATIOS IN 1920

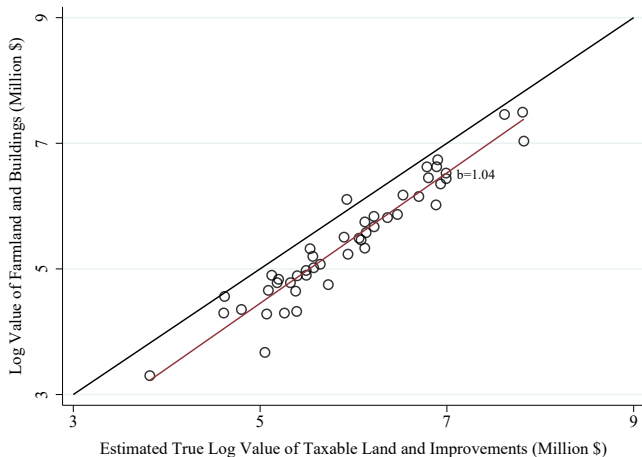
NATIONAL AVERAGE : 43%



► Back

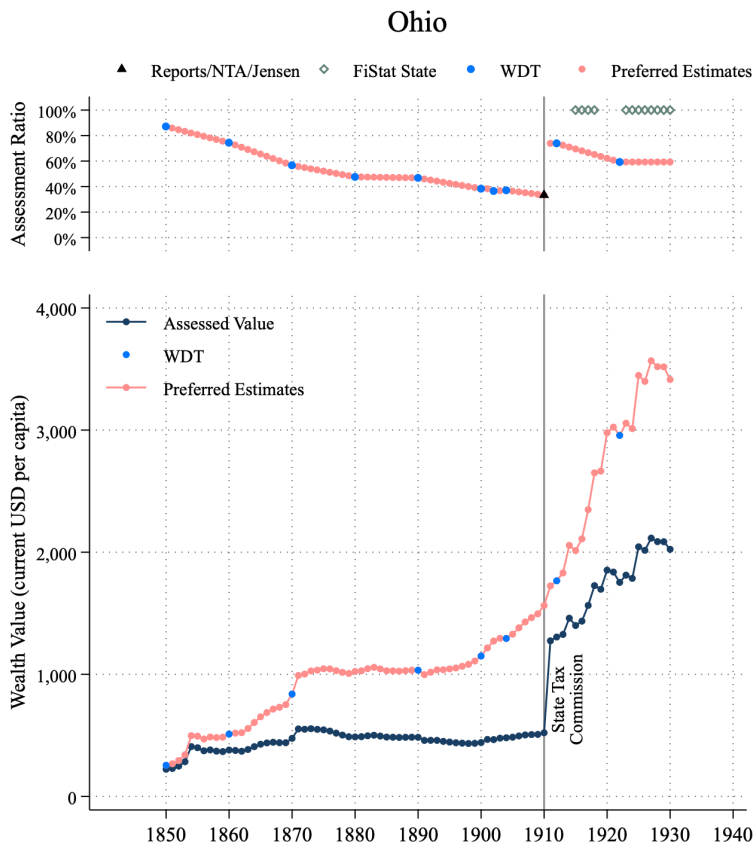
VALIDATION USING DATA ON MARKET VALUES

ESTIMATED VALUE OF TAXABLE LAND VS CENSUS OF AGRICULTURE VALUE OF LAND (STATE-YEAR LEVEL)



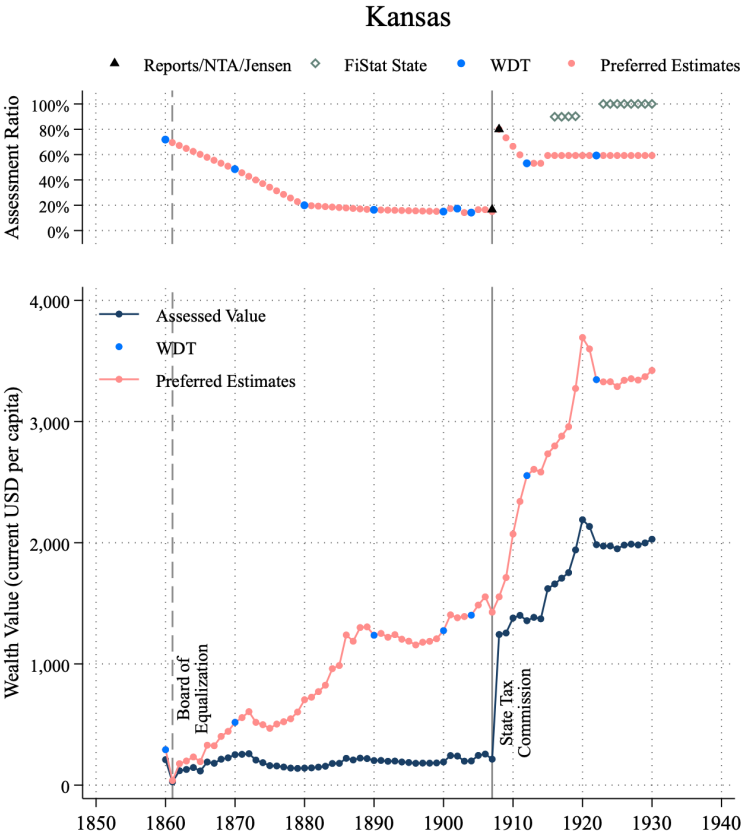
► Back

Wealth Series: Ohio



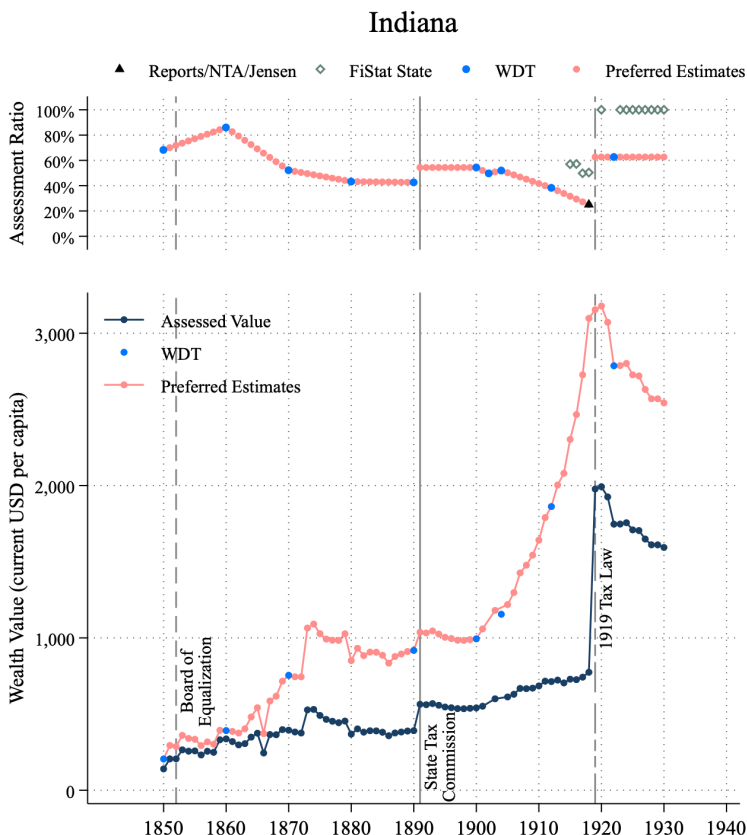
”Under the direction of the newly created tax com mission, [assessment] differed materially from former assessments, property being listed for taxation at its true value instead of about one-third of such value, as in previous years.” (Census 1912, p28)

WEALTH SERIES: KANSAS



Before 1908, "spirit of non-observance of the assessment-at-money-value" by assessors, and assessment "slightly in excess of 16.5%." (Howe 1908, pp443-444)

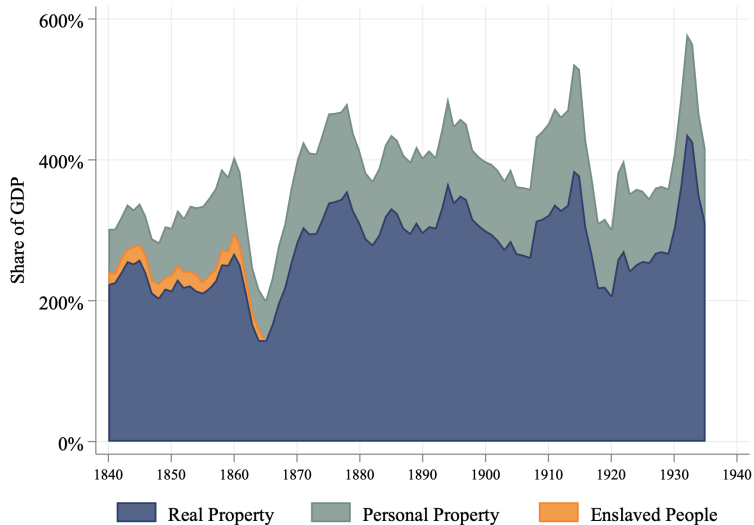
WEALTH SERIES: INDIANA



1891: Newly created State Board of Tax Commissioners revised in the basis of assessments, served subpoenas, and ordered increases to corporations and individuals (STC1919).

1919 Tax law: broadened the powers and duties of all taxing officials, particularly the State Board of Tax Commissioners, with the object of strengthening the administration of tax laws" and respect of the full assessment of property (STC1919 p122)

COMPOSITION OF PROPERTY IN THE UNITED STATES 1840-1935

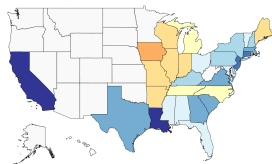


PERSISTENCE IN PROPERTY IN SOUTHERN STATES AROUND THE CIVIL WAR

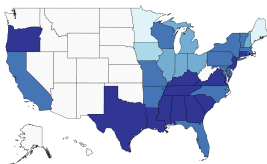
PER CAPITA WEALTH BY STATE (CURRENT \$)

Including Wealth from Enslaved People

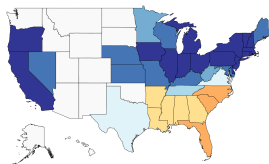
1850



1860

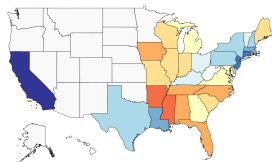


1870

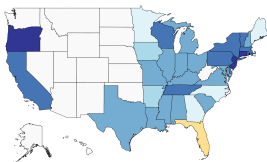


Excluding Wealth from Enslaved People

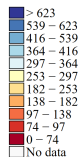
1850



1860

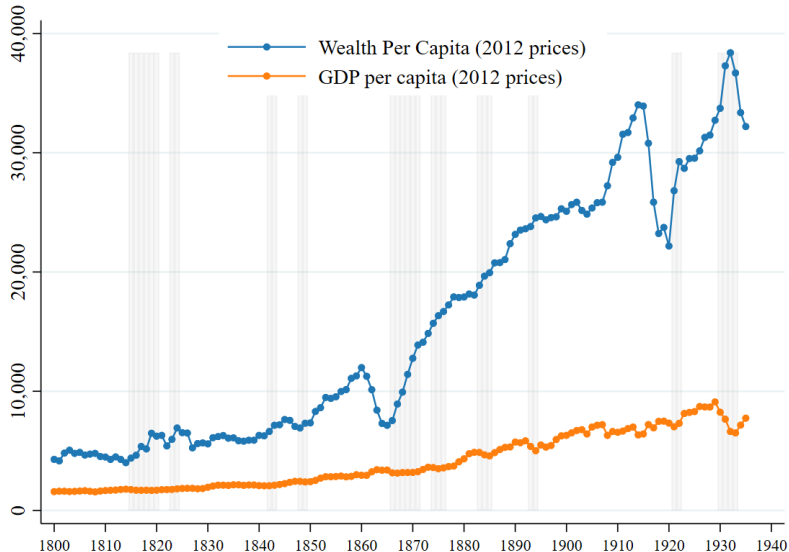


Per capita wealth (\$)



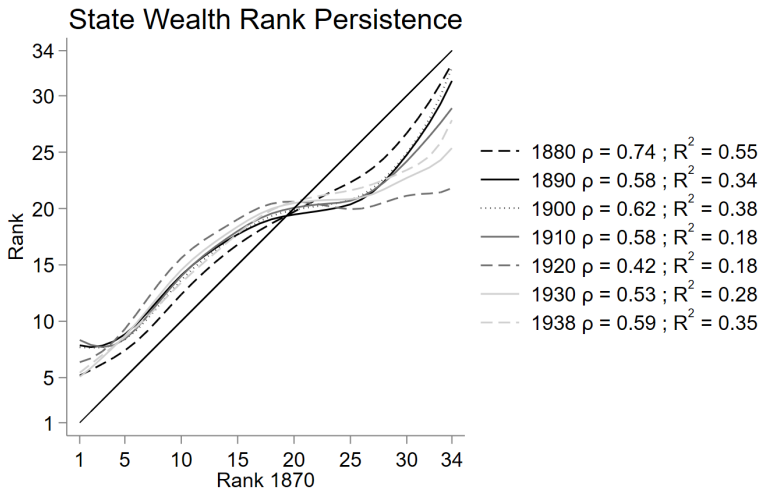
► Back

PRIVATE WEALTH PER CAPITA AND GDP PER CAPITA 1800-1935



SPATIAL INEQUALITY IS VERY PERSISTENT

PROPERTY RANK PERSISTENCE FOR STATES

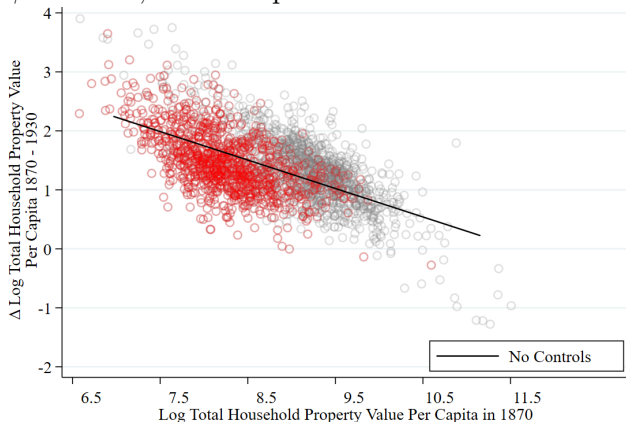


β -CONVERGENCE

INITIAL WEALTH VS GROWTH RATE OF WEALTH BY COUNTY

$$\log\left(\frac{W_{i,1930}}{W_{i,1870}}\right) = \alpha - (1 - \exp(-\beta)) \cdot \log(W_{i,1870}) + \gamma \mathbb{X}_{i,1870} + u_i$$

$\beta = 0.011$, slow compared to Barro & Sala-i-Martin (2004).



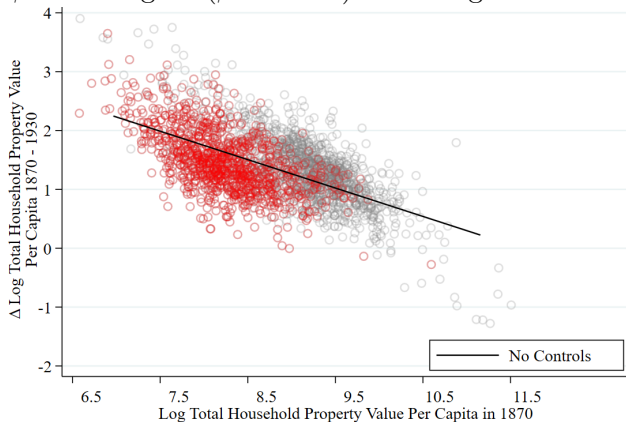
► Back

β -CONVERGENCE

INITIAL WEALTH VS GROWTH RATE OF WEALTH BY COUNTY

Slow convergence driven by Southern counties.

β twice higher ($\beta = 0.028$) excluding South.

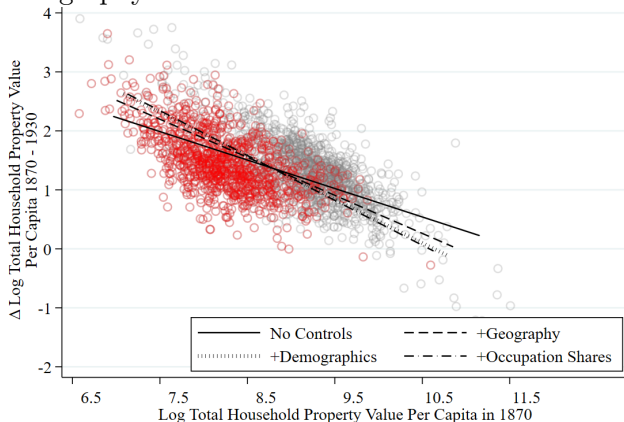


► Back

β -CONVERGENCE

INITIAL WEALTH VS GROWTH RATE OF WEALTH BY COUNTY

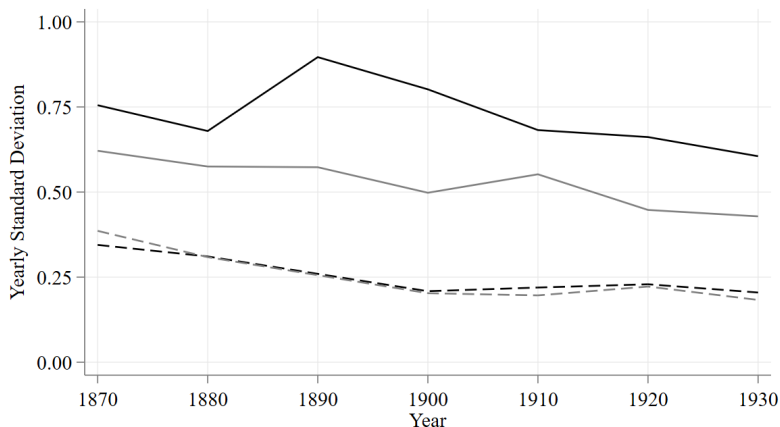
Including geography controls, β triples to 0.025.
Geography matters.



► Back

σ -CONVERGENCE

EVOLUTION OF US COUNTIES' WEALTH AND INCOME DISPERSION



34 States

— Log Wealth Per Capita
All Counties
— Log Wealth Per Capita
Excluding Southern Counties

- - - Log Income per Capita
All Counties
- - - Log Income per Capita
Excluding Southern Counties

► Back

COUNTY DETERMINANTS

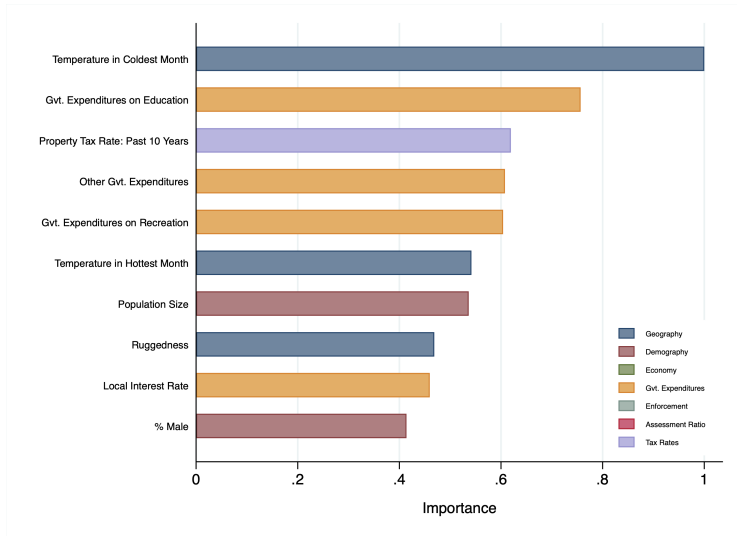
	Dependent variable: Log Total Household Property Value Per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
	10-Year Δ	10-Year Δ	10-Year Δ	10-Year Δ	00-Year Δ	in 1870
Log Total Household Property Value Per Capita	-0.281*** (0.008)	-0.449*** (0.011)	-0.503*** (0.013)	-0.519*** (0.012)	-0.719*** (0.025)	
A. Geography						
Temperature in Hottest Month		-0.062*** (0.017)	-0.032* (0.017)	-0.023 (0.017)	0.168*** (0.053)	-0.315*** (0.060)
Temperature in Coldest Month		-0.001 (0.015)	0.038*** (0.014)	0.024* (0.014)	-0.005 (0.040)	0.061 (0.043)
Summer Precipitation		-0.107*** (0.007)	-0.063*** (0.008)	-0.070*** (0.007)	-0.022 (0.016)	0.028 (0.022)
Winter Precipitation		-0.061*** (0.012)	-0.094*** (0.012)	-0.087*** (0.012)	-0.051* (0.027)	-0.148*** (0.030)
Elevation		-0.003 (0.014)	-0.036*** (0.013)	-0.038*** (0.013)	0.082 (0.056)	-0.344*** (0.068)
Ruggedness		-0.042*** (0.009)	-0.010 (0.009)	-0.010 (0.009)	-0.010 (0.028)	-0.127*** (0.028)
Soil Net Primary Productivity		0.061*** (0.009)	0.082*** (0.010)	0.074*** (0.010)	0.056** (0.024)	0.031 (0.027)
Distance to Coast		0.006 (0.009)	0.053*** (0.009)	0.058*** (0.008)	-0.128*** (0.025)	0.238*** (0.029)
Crossed by Navigated River		0.014 (0.010)	-0.003 (0.010)	-0.006 (0.010)	-0.025 (0.021)	0.089*** (0.026)
Crossed by Canal		0.077*** (0.019)	0.098*** (0.022)	0.090*** (0.025)	0.074** (0.036)	0.007 (0.039)
B. Demographics						
% Litestate			0.197*** (0.011)	0.179*** (0.011)	0.103*** (0.019)	0.377*** (0.038)
% Foreignborn			0.061*** (0.008)	0.054*** (0.007)	0.023* (0.014)	-0.060*** (0.018)
Log Population			-0.033*** (0.008)	-0.048*** (0.009)	0.053*** (0.016)	0.082*** (0.024)
Δ Log Population			-0.092*** (0.022)	-0.092*** (0.021)		-0.072 (0.055)
% Male			0.029*** (0.011)	0.023** (0.009)	0.088*** (0.027)	0.087*** (0.033)
% White			-0.097*** (0.008)	-0.094*** (0.008)	-0.059*** (0.019)	-0.343*** (0.054)
C. Occupations: Top % of Population in:						
Public Administration				0.020*** (0.010)	0.068*** (0.025)	-0.032 (0.033)
Production					0.015 (0.011)	0.118*** (0.033)
Mining					0.009 (0.012)	0.097*** (0.031)
Commerce					0.024** (0.011)	0.092*** (0.031)
Agriculture					-0.092*** (0.011)	-0.040 (0.032)
D. Inequality						
Fraction of the Total Property of the County Owned by the Top 10%					-0.147*** (0.023)	
% of Enslaved Property in 1860					-0.068** (0.027)	-0.257*** (0.034)
Observations	18,128	15,033	12,742	12,730	1,568	1,583
Number of units	3,080	2,519	2,518	2,518	1,568	1,583
Period Dep. Variable	1870-1930	1870-1930	1870-1930	1870-1930	1870	1870
Adjusted R ²	0.37	0.47	0.52	0.52	0.57	0.61
Implied Convergence	0.030	0.053	0.070	0.073	0.021	

COUNTY DETERMINANTS

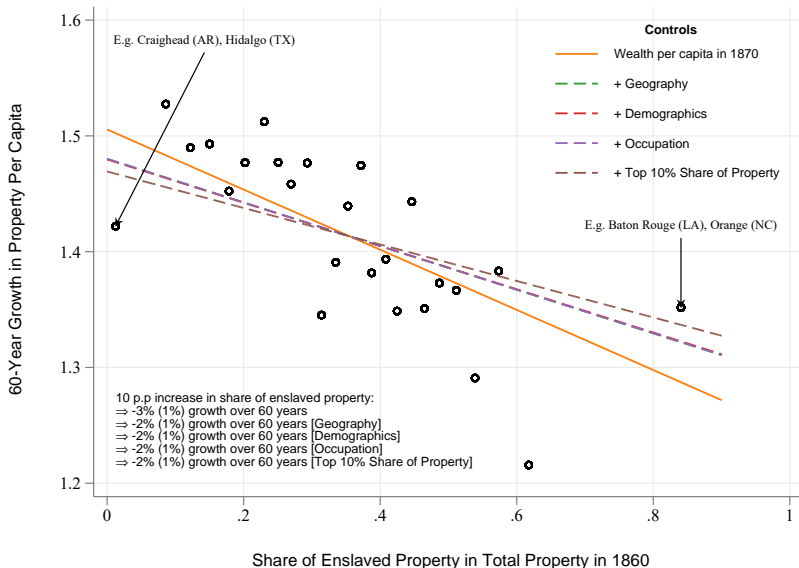
	Dependent variable: Log Total Household Property Value Per Capita					
	(1) 10-Year Δ	(2) 10-Year Δ	(3) 10-Year Δ	(4) 10-Year Δ	(5) 10-Year Δ	(6) in 1870
Log Total Household Property Value Per Capita	-0.489*** (0.010)	-0.523*** (0.011)	-0.523*** (0.013)	-0.589*** (0.012)	-0.728*** (0.026)	
A. Geography						
Temperature in Hottest Month	0.027 (0.022)	0.033 (0.024)	0.033 (0.024)	0.043* (0.024)	0.009 (0.066)	-0.046 (0.080)
Temperature in Coldest Month	-0.018 (0.019)	-0.009 (0.020)	-0.023 (0.020)	-0.037 (0.020)	-0.037 (0.056)	0.085 (0.062)
Summer Precipitation	-0.005 (0.012)	0.005 (0.013)	-0.003 (0.012)	0.001 (0.029)	0.001 (0.029)	0.014 (0.031)
Winter Precipitation	-0.073*** (0.011)	-0.502*** (0.013)	-0.104*** (0.013)	-0.079*** (0.032)	-0.196*** (0.034)	
Elevation	0.084*** (0.019)	0.050** (0.021)	0.047*** (0.021)	0.001 (0.000)	-0.124* (0.072)	
Ruggedness	-0.052*** (0.007)	-0.017* (0.009)	-0.016* (0.009)	-0.020 (0.029)	-0.084*** (0.026)	
Soil Net Primary Productivity	0.021*** (0.012)	0.052*** (0.013)	0.048*** (0.013)	0.034 (0.026)	0.026 (0.026)	
Distance to Coast	-0.053*** (0.013)	-0.001 (0.014)	0.007 (0.014)	-0.228*** (0.030)	0.062 (0.030)	
Crossed by Navigated River	0.024** (0.010)	-0.000 (0.010)	-0.005 (0.010)	-0.015 (0.019)	0.005*** (0.024)	
Crossed by Canal	0.101*** (0.021)	0.112*** (0.024)	0.196*** (0.024)	0.071* (0.039)	0.017 (0.037)	
B. Demographics						
% Latinate	0.125*** (0.011)	0.107*** (0.011)	0.055*** (0.018)	0.390*** (0.037)		
% Foreignborn	0.052*** (0.009)	0.045*** (0.009)	0.028* (0.016)	-0.052*** (0.017)		
Log Population	-0.032*** (0.009)	-0.049*** (0.009)	0.077*** (0.016)	-0.012 (0.027)		
Δ Log Population	-0.389*** (0.020)	-0.109*** (0.020)	-0.144*** (0.057)			
% Male	0.014 (0.012)	0.007 (0.010)	0.068** (0.033)	-0.009 (0.030)		
% White	-0.115*** (0.008)	-0.113*** (0.008)	-0.043*** (0.021)	-0.198*** (0.069)		
C. Occupations: Top % of Population in:						
Public Administration			0.010* (0.010)	0.032 (0.024)	0.035 (0.030)	
Production			0.049*** (0.011)	-0.054** (0.027)	0.164*** (0.020)	
Mining			0.003 (0.011)	-0.011 (0.026)	0.081*** (0.027)	
Commerce			0.032*** (0.010)	0.033 (0.023)	0.089*** (0.026)	
Agriculture			-0.073*** (0.011)	-0.133*** (0.026)	-0.037** (0.027)	
D. Inequality						
Fraction of the Total Property of the County Owned by the Top 10%				-0.007*** (0.022)		
% of Endowed Property in 1860				-0.061** (0.029)	-0.140*** (0.031)	
Observations	18,128	15,033	12,742	12,730	1,568	1,583
Number of units	3,080	2,519	2,518	2,518	1,568	1,583
Period	1870-1930	1870-1930	1870-1930	1870-1930	1930	1870
Adjusted R ²	0.53	0.55	0.59	0.59	0.67	0.71
Implied Convergence	0.067	0.074	0.085	0.089	0.022	

VARIABLE IMPORTANCE - RANDOM FOREST MODEL

10 MOST IMPORTANT VARIABLES FOR MUNICIPAL WEALTH VARIANCE

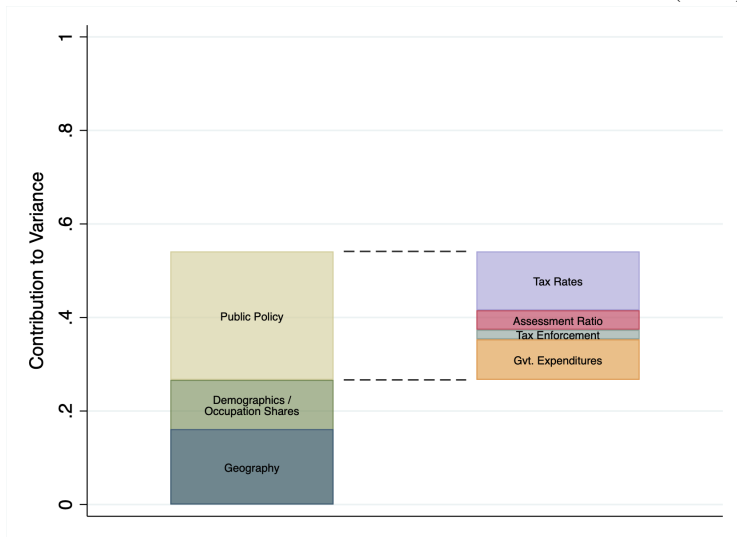


THE LEGACY OF INEQUALITY



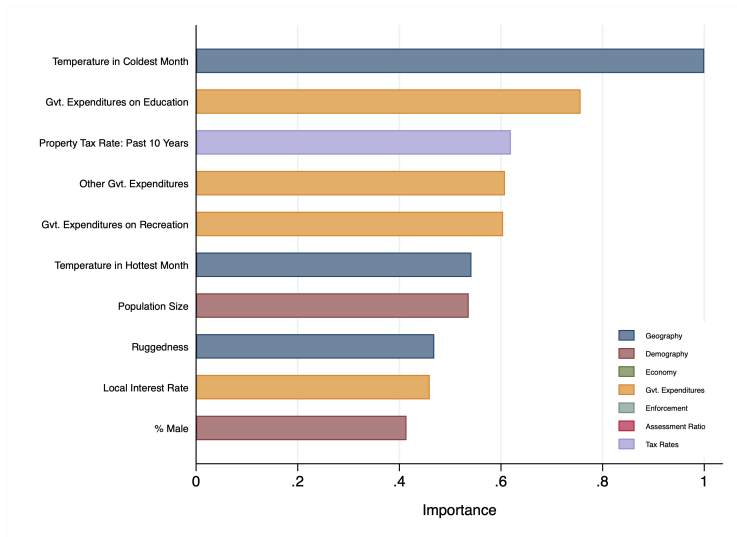
LOCAL PUBLIC FINANCES MATTER

VARIANCE DECOMPOSITION OF PROPERTY AT THE MUNICIPAL LEVEL (1930)

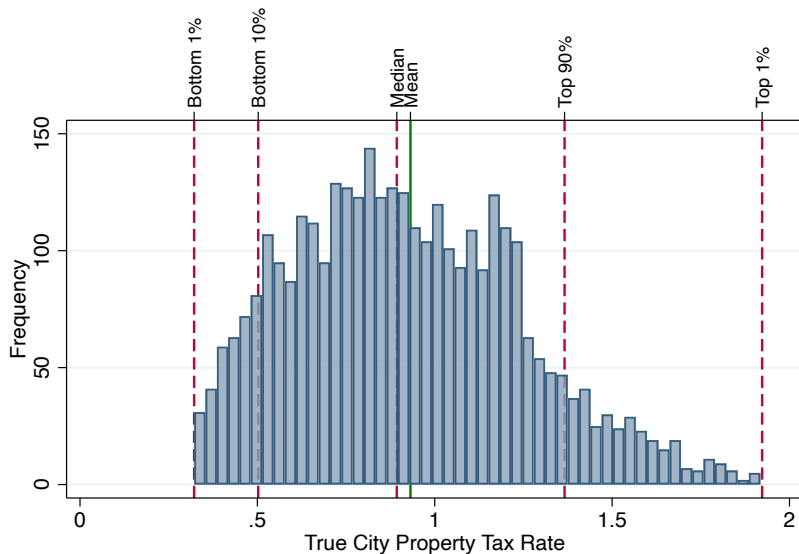


VARIANCE DECOMPOSITION USING RANDOM FOREST

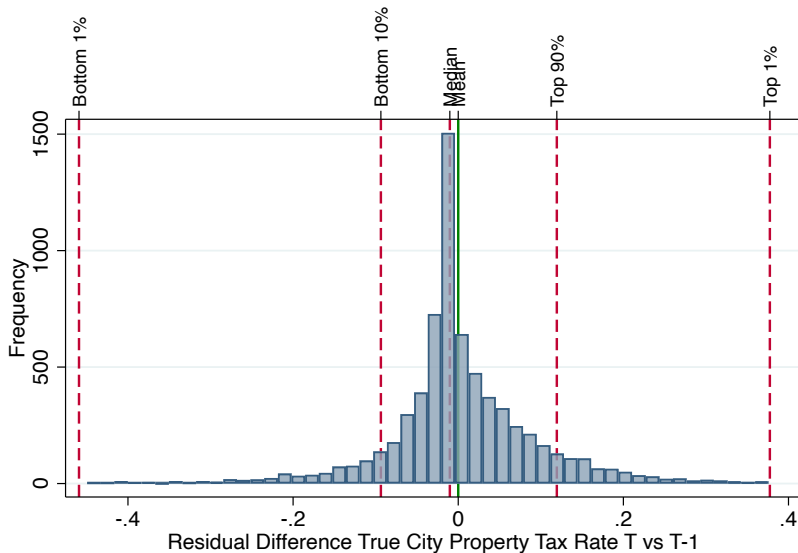
VARIABLE IMPORTANCE PLOT FOR PREDICTION OF PROPERTY PER CAPITA (1930)



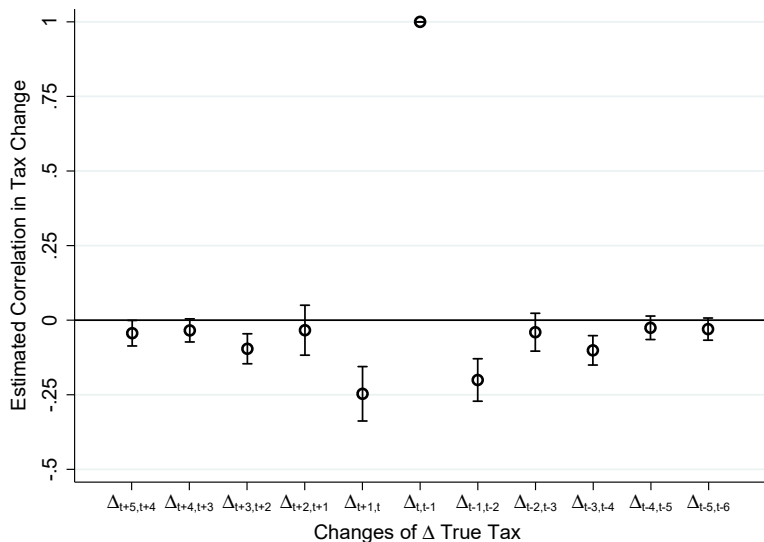
DISTRIBUTION OF EFFECTIVE TAX RATES



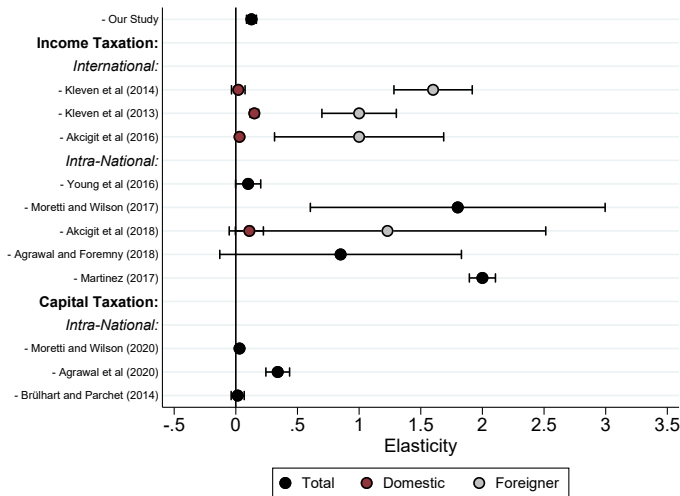
DISTRIBUTION OF RESIDUAL TAX RATES CHANGES



TAX RATES CHANGES EXHIBIT LITTLE SERIAL CORRELATION



ESTIMATES OF MIGRATION ELASTICITIES IN LITERATURE



CAPITALIZATION INTO REAL ESTATE VALUES



Strong evidence of immediate response of real estate values

► Back

SPILLOVERS AND TAX COMPETITION

City's property positively correlated with own net-of-tax rate,
negatively with neighbors' net-of-tax rates

<i>Dependent variable: Log Total Property Value</i>			
	(1)	(2)	(3)
$Log(1 - \frac{\tau}{r})$	0.496** (0.203)	0.620*** (0.184)	0.461*** (0.136)
$Neighbors' Log(1 - \frac{\tau}{r})$	-0.226 (0.172)	-0.093 (0.152)	-0.064 (0.144)
Observations	5596	4995	4234
Number of cities	252	250	244
Adjusted R^2	0.967	0.967	0.977
Year fixed effects	X	X	X
City fixed effects	X	X	X
Public Policy Covariates	X	X	X
Economic Covariates		X	X
Demographic Covariates			X

Notes: Standard errors clustered at the city level. Sample restricted to small cities (8-25K)

SPILLOVERS AND TAX COMPETITION

Especially so for smaller cities

<i>Dependent variable: Log Total Property Value</i>			
	(1)	(2)	(3)
$\text{Log}(1 - \frac{\tau}{r})$	0.739* (0.428)	0.998** (0.398)	0.976*** (0.356)
Neighbors' $\text{Log}(1 - \frac{\tau}{r})$	-0.861* (0.437)	-0.851* (0.442)	-0.521* (0.312)
Observations	1047	1019	1019
Number of cities	76	76	76
Adjusted R^2	0.895	0.887	0.900
Year fixed effects	X	X	X
City fixed effects	X	X	X
Public Policy Covariates	X	X	X
Economic Covariates		X	X
Demographic Covariates			X

Notes: Standard errors clustered at the city level. Sample restricted to small cities (8-25K)

SPILLOVERS AND TAX COMPETITION

City's tax rate positively correlated with neighbors' tax rates

Dependent variable: Average log of eff. net of tax rate from $t+1$ to $t+5$

	(1)	(2)	(3)	(4)
$\text{Log}(1 - \frac{\tau}{r})$	0.581*** (0.145)	0.323*** (0.111)	0.103 (0.146)	0.064 (0.183)
$\text{Neighbors}' \text{Log}(1 - \frac{\tau}{r})$	0.321** (0.143)	0.354** (0.163)	0.459** (0.190)	0.537** (0.213)
Observations	6573	5985	4290	3670
Number of cities	273	272	263	220
Adjusted R^2	0.710	0.710	0.715	0.725
Year Fixed Effects	X	X	X	X
City Fixed Effects	X	X	X	X
Public Policy Covariates	X	X	X	X
Economic Covariates		X	X	X
Demographic Covariates			X	X
Assessment Ratio				X
Own and Close Expenditures				X

Notes: Standard errors clustered at the city level.

Expenditures cover the average over the past 10 years of all real government cost payments.