

# ONLINE APPENDIX

## for “Wealth and Property Taxation in the United States”

by Sacha Dray, Camille Landais, and Stefanie Stantcheva

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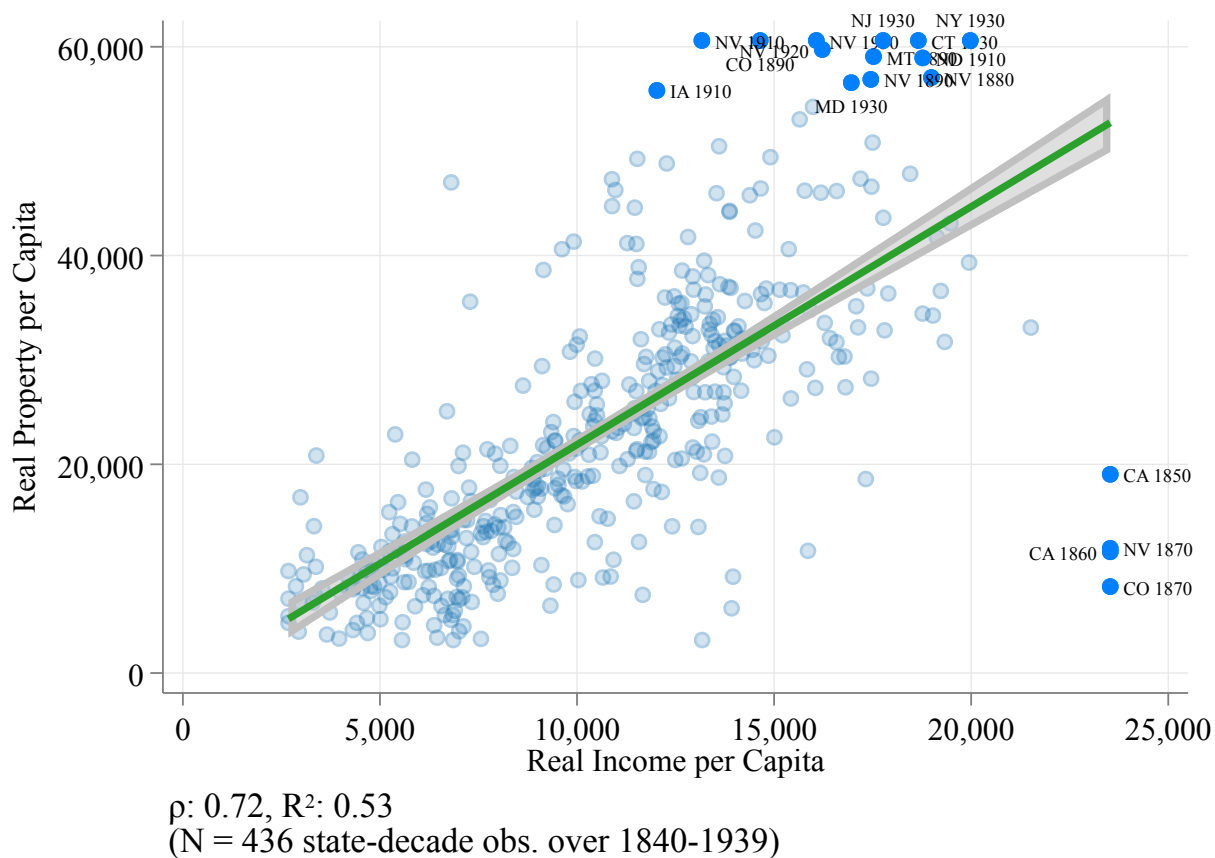
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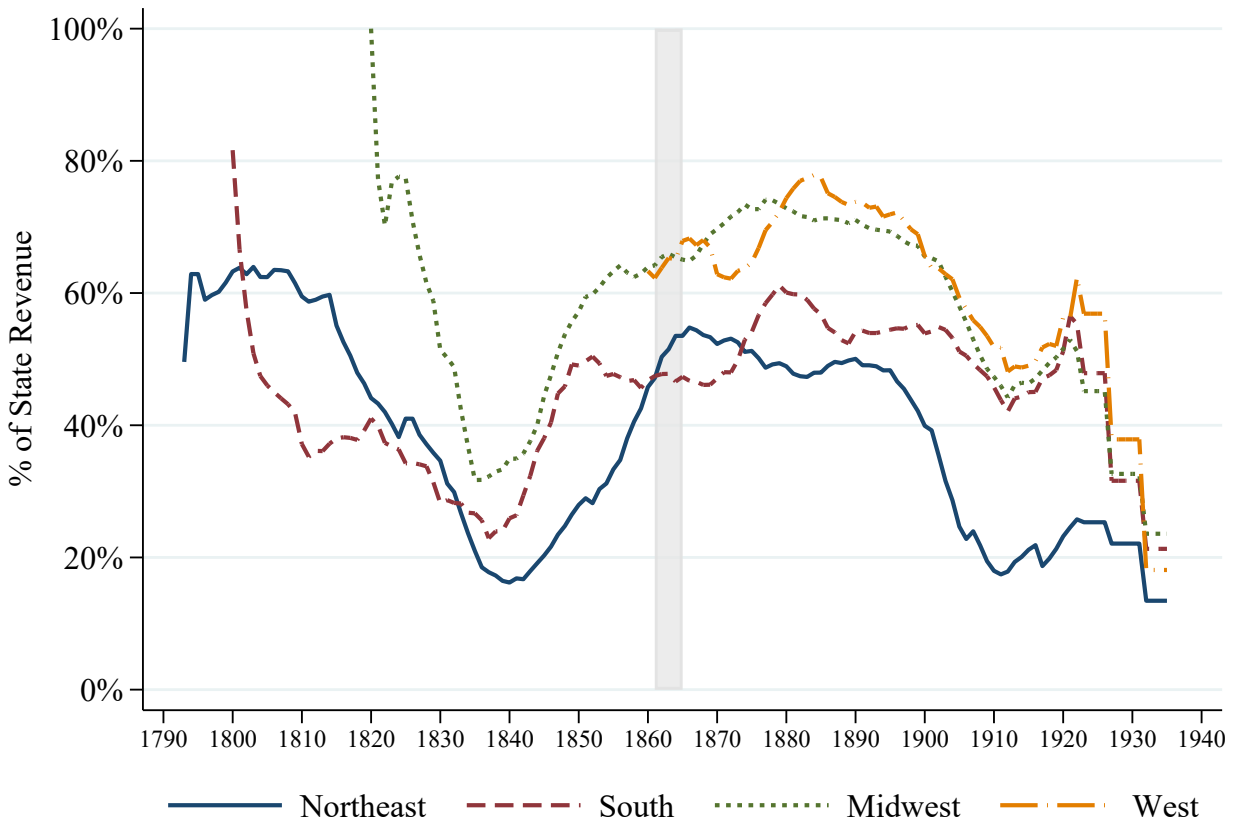
# I. Additional Tables and Figures

Figure A1: Property and Income Per Capita



*Notes:* This graph plots the relationship between real property per capita and real income per capita between 1840 and 1939 at the state level. The values are winsorized at 1% and 99%.

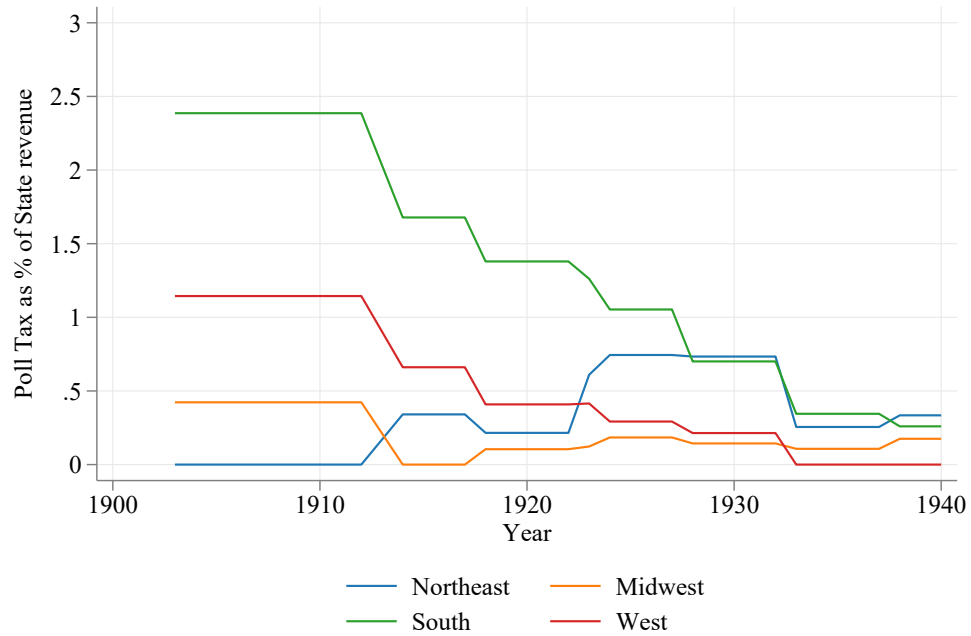
Figure A2: Property Tax Revenue as a Share of State Revenue



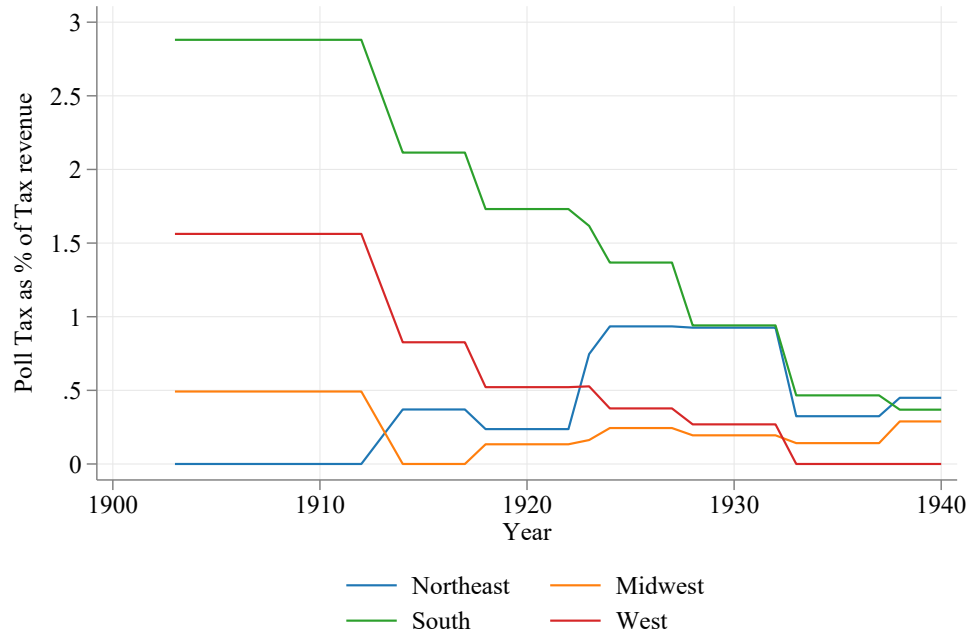
*Notes:* This figure shows the average share of state revenue (both tax and non-tax revenues) from property tax in four US regions. The values represent ten-year moving averages. For Southern states, we show series including and excluding enslaved wealth.

Figure A3: Revenue from the Poll Tax

A. As a Share of Total State Revenue

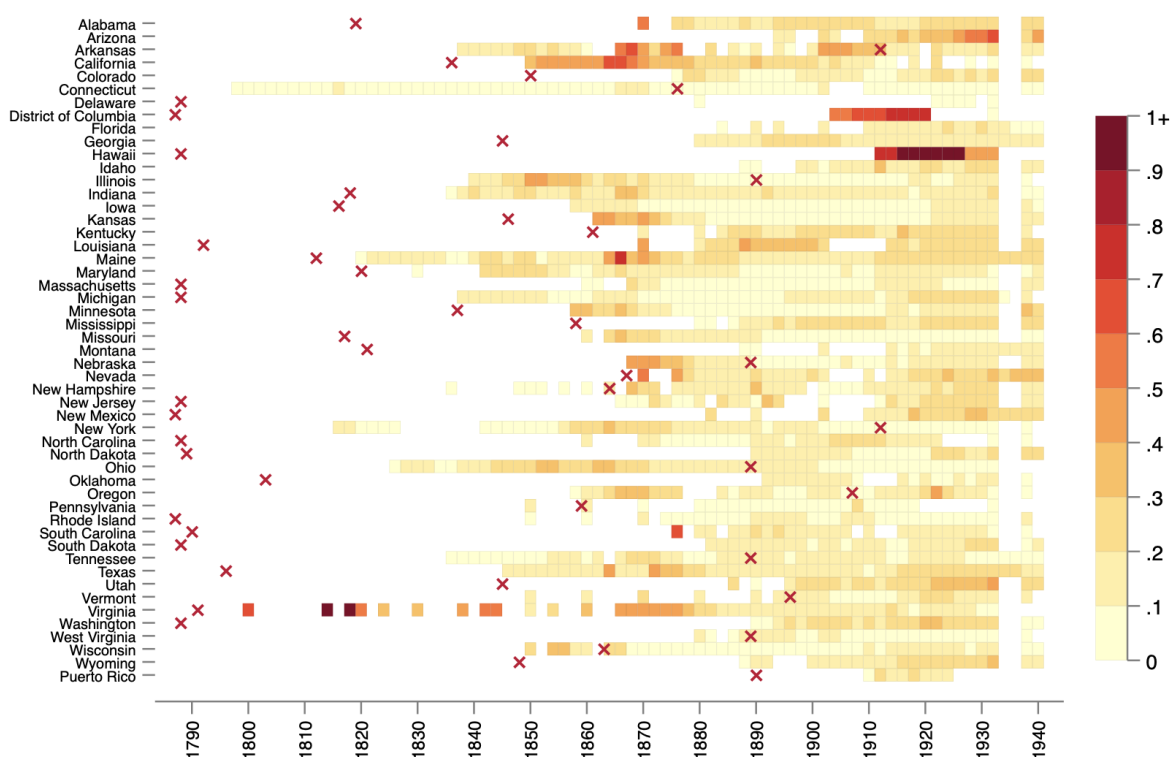


B. As a Share of State Tax Revenue



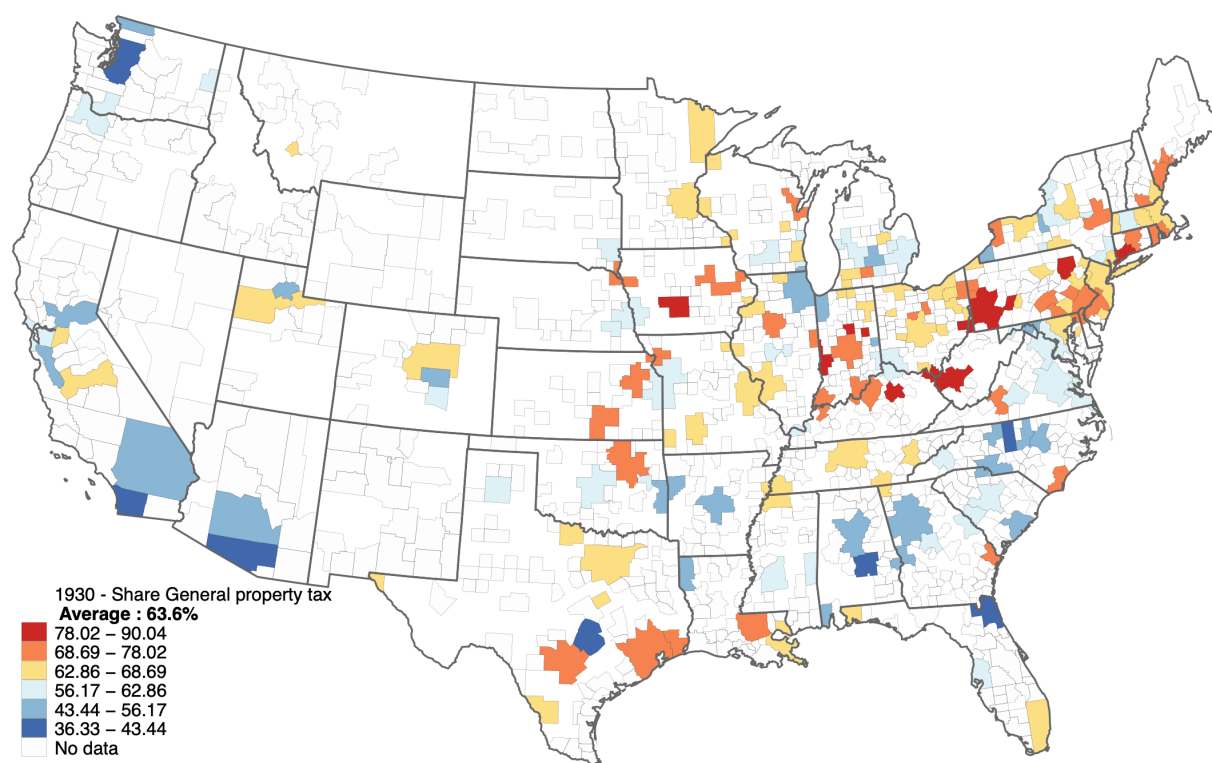
Notes: Panel A shows the average share of state revenue from the poll tax for the four US regions. Panel B shows the average share of state tax revenue from the poll tax by region. The values depicted are 10-year moving averages (because poll tax revenues is not reported every year in most states).

Figure A4: State Rate of Property Tax



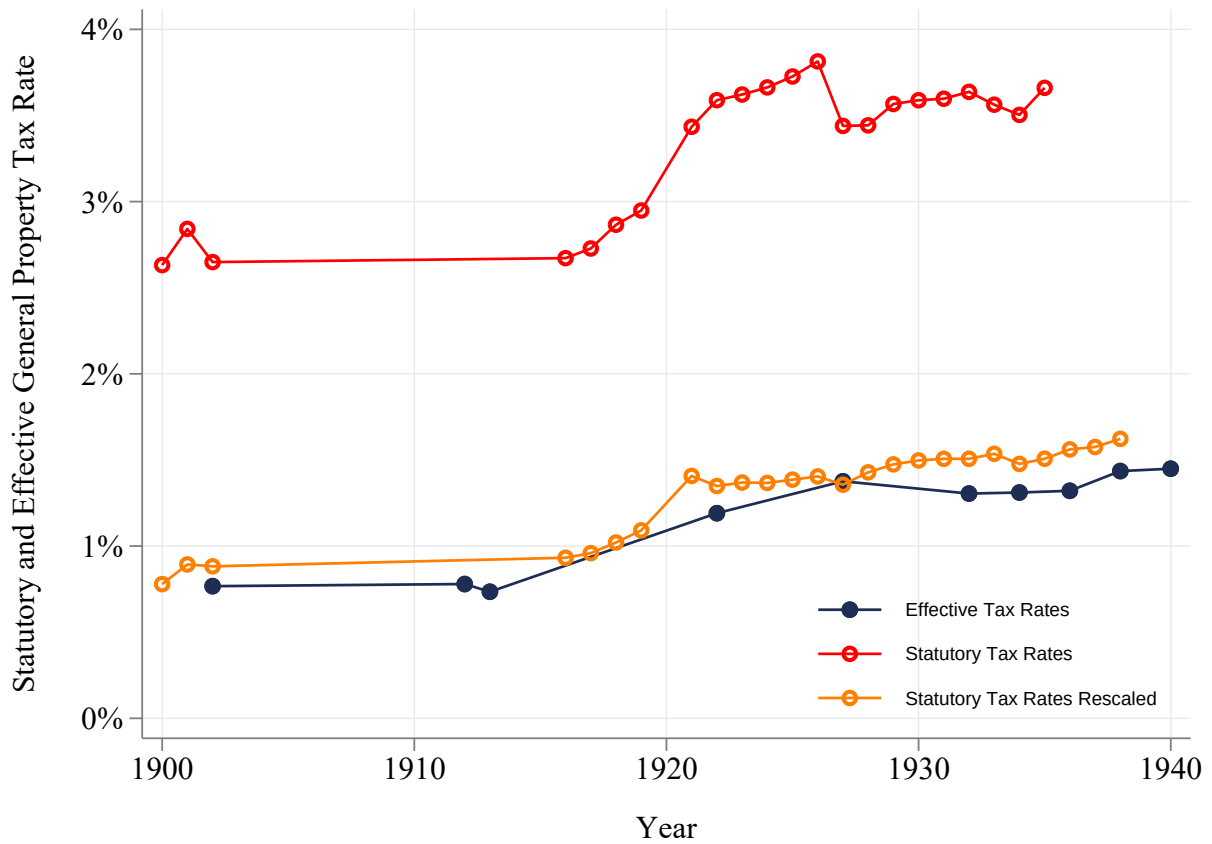
*Notes:* This figure shows the values of property tax for all 50 states, the District of Columbia and Puerto Rico. Values are interpolated every year at the state level and winsorized for 5th and 95th percentile. . Red crosses indicate the year of the admission of the state to the Union.

Figure A5: The Property Tax as Backbone of City Revenue



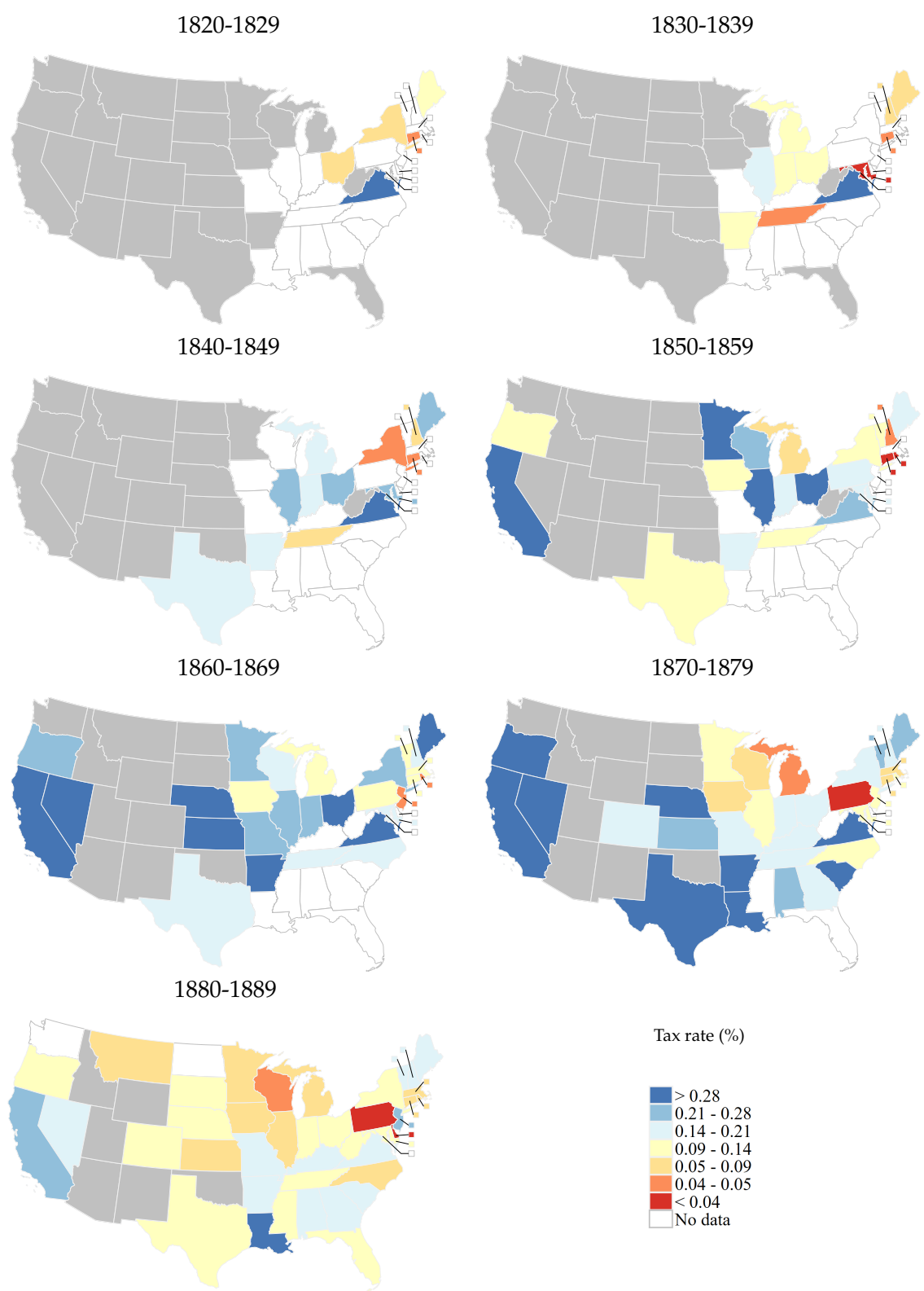
*Notes:* This figure shows the share of municipal revenue derived from the general property in 1930. The sample of cities are those with a population above 30,000 population. The shares are averaged and displayed on core-based statistical areas for readability.

Figure A6: Statutory and Effective Tax Rates (%)



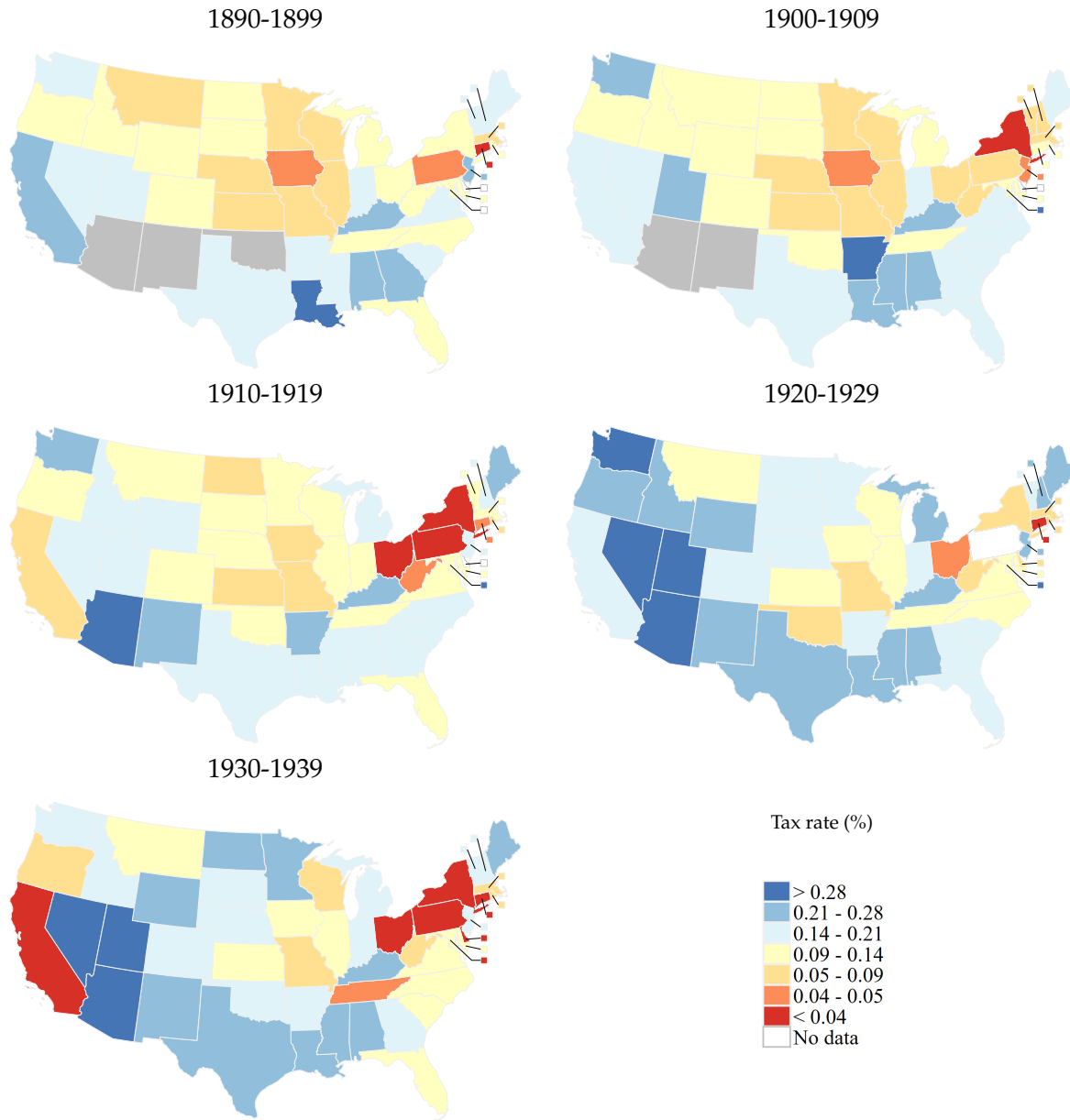
*Notes:* This graph plots the statutory tax rates on the general property tax, the effective tax rate computed using the tax levies and the true value of property as well as the statutory tax rates rescaled, taking into account the assessment ratios. For the data sources and construction, see Appendix III.10.

Figure A7: State Effective Property Tax Rate: 1820-1940 (%)



Continued to the next page

Figure A7: State Property Tax Rate: 1820-1940 (%)



*Notes:* This figure displays the average state effective property tax rate by state between 1820-1940. Values are averaged for every decade. The state property tax rate does not include property tax rates from other jurisdictions, such as city and county. The cutoffs for the legend represent the minimum, 5th, 10th, 25th, 50th, 75th, 90th percentile and maximum values across all years. The average tax rate is generally lower than 0.3%.



Figure A8: Private Property as Share of GDP (%)

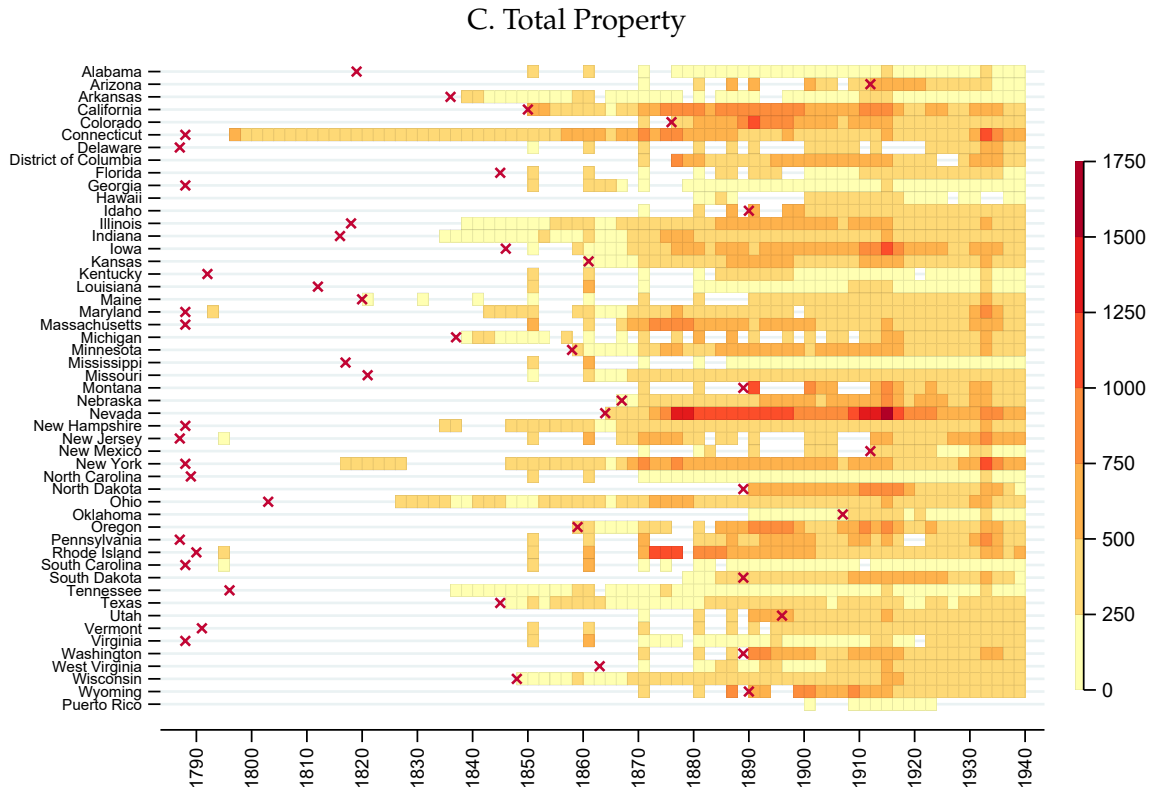
A. Real Property



B. Personal Property



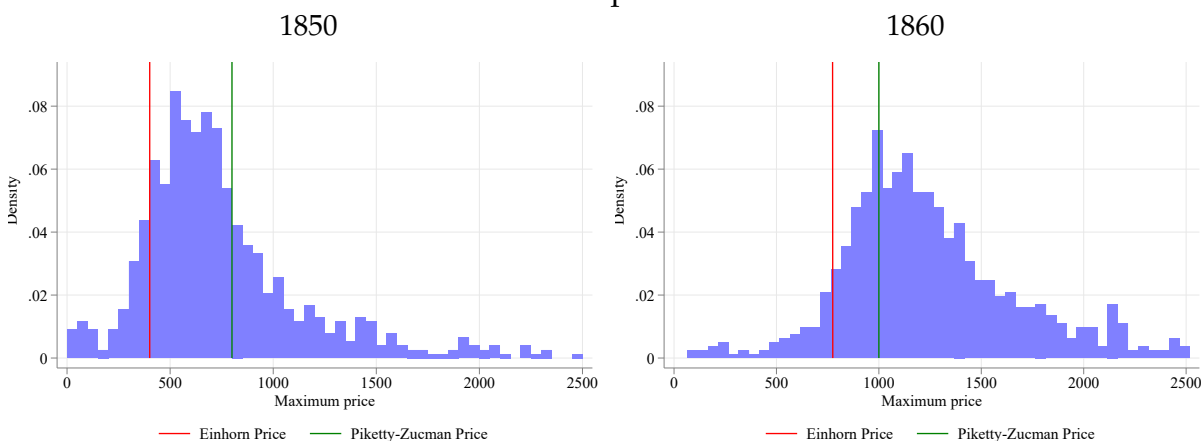
Notes: This Figure shows the coverage and trends in property share for all 50 states, the District of Columbia and Puerto Rico. Panel A displays Real property shares, and Panel B displays Personal property shares. Property shares are measured as the ratio of private property per capita in the state over national GDP per capita. Property values are linearly interpolated for missing years. Red crosses indicate the year of the admission of the state to the Union.



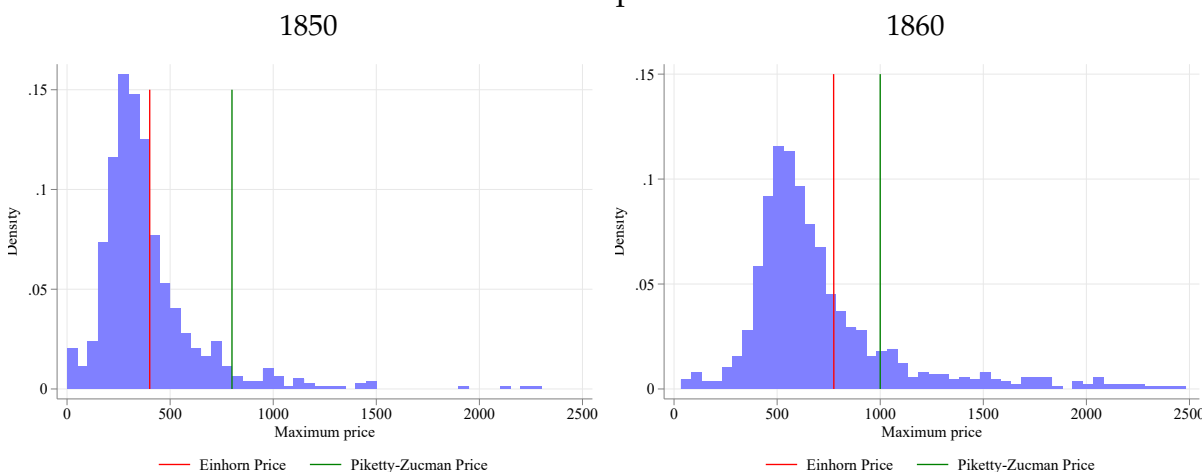
*Notes:* This Panel shows the coverage and trends in property share for all 50 states, the District of Columbia and Puerto Rico. Property shares are measured as the ratio of private property per capita in the state over national GDP per capita. Red crosses indicate the year of the admission of the state to the Union. For coverage with linear interpolation, see Figure 4.

Figure A9: Distribution of the Upper Bounds on Prices of Enslaved People

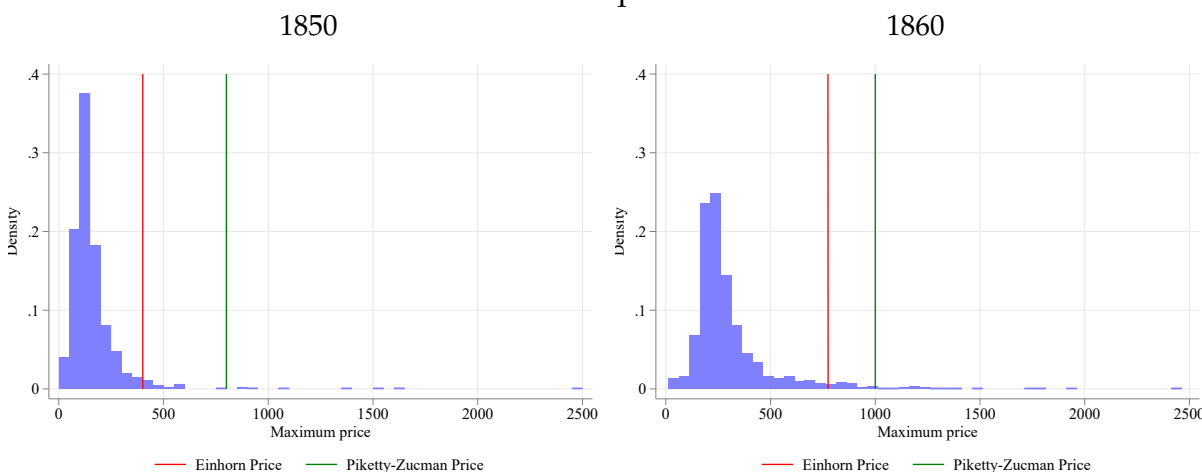
A - Wealth from Enslaved People = 100% of Personal Wealth



B - Wealth from Enslaved People = 50% of Personal Wealth

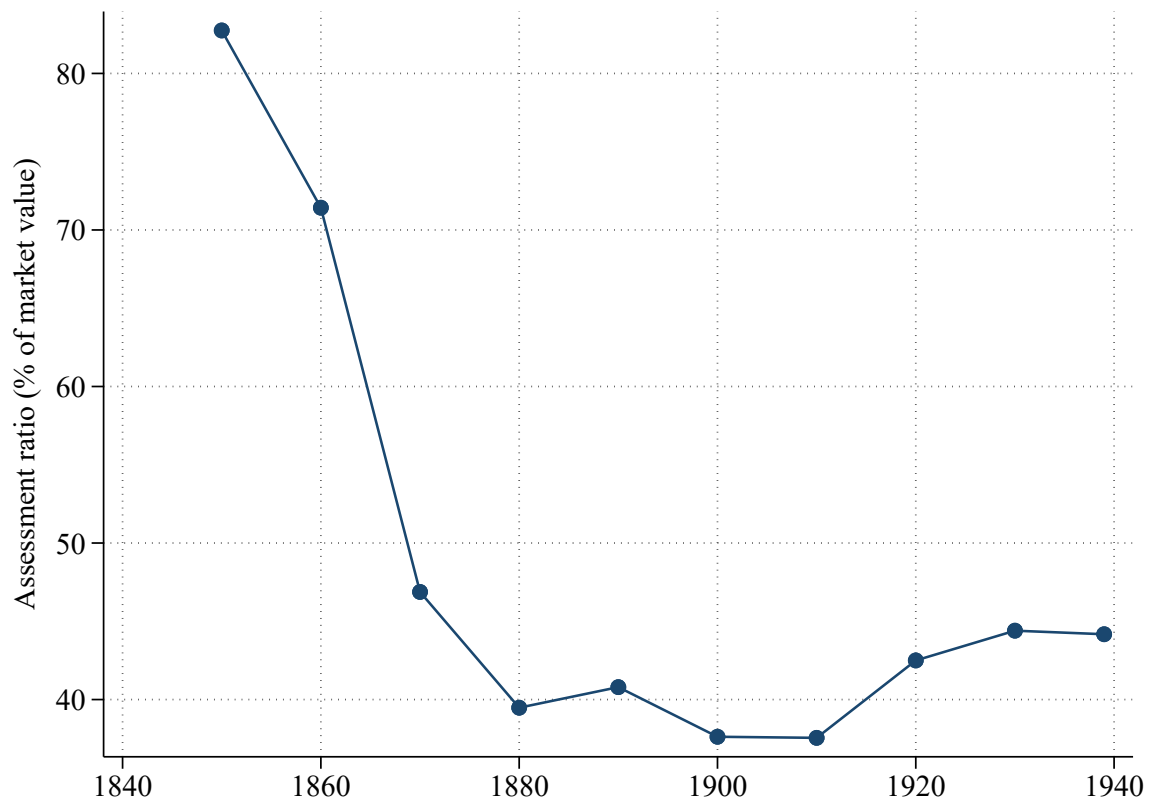


C - Wealth from Enslaved People = 20% of Personal Wealth



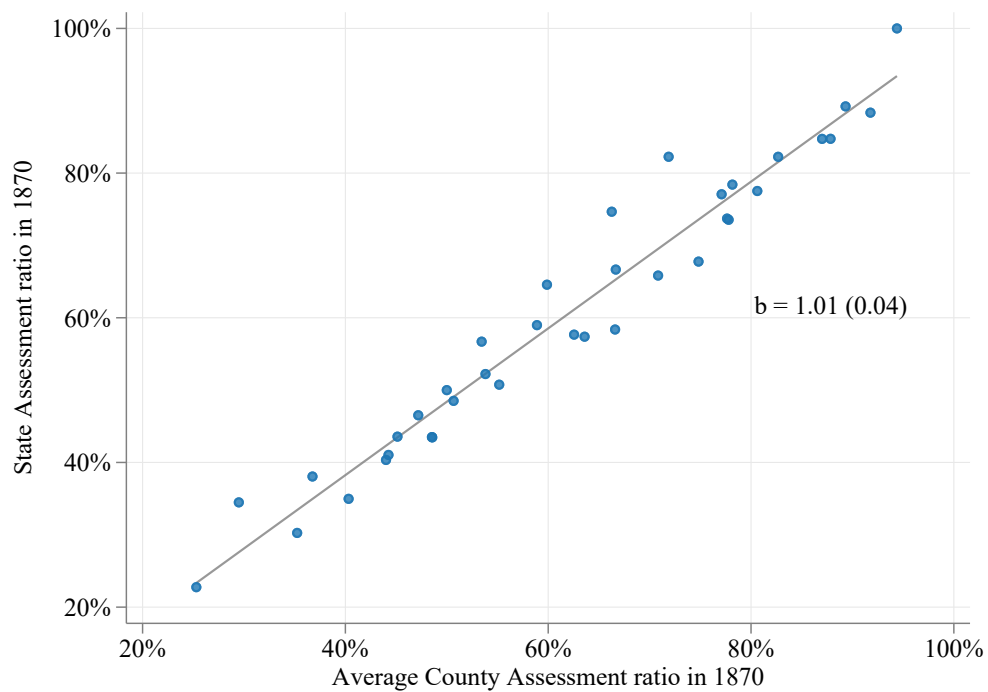
*Notes:* The figure represents the distribution of the upper bounds on prices of enslaved people by county. The prices are obtained by assuming that wealth from enslaved people represents a share  $X$  of Personal Wealth in Southern states in 1850 and 1860 and dividing by the number of enslaved people in the county. Panel A assumes the share  $X$  is 100%; Panels B assumes it is 50%; and Panels C assumes it is 20%. The vertical lines are prices from [Einhorn \(2008\)](#) and [Piketty and Zucman \(2014\)](#).

Figure A10: Assessment Ratio



*Notes:* The figure shows the average effective ratio of assessed to true value of all property used for state property taxation. Decline in 1850-1880 happens as intangible property gained in importance during the industrialization (share of personal property in tax base is stable), increase from 1910 is due to adoption of state tax commissions and increased enforcement (average year of adoption: 1908).

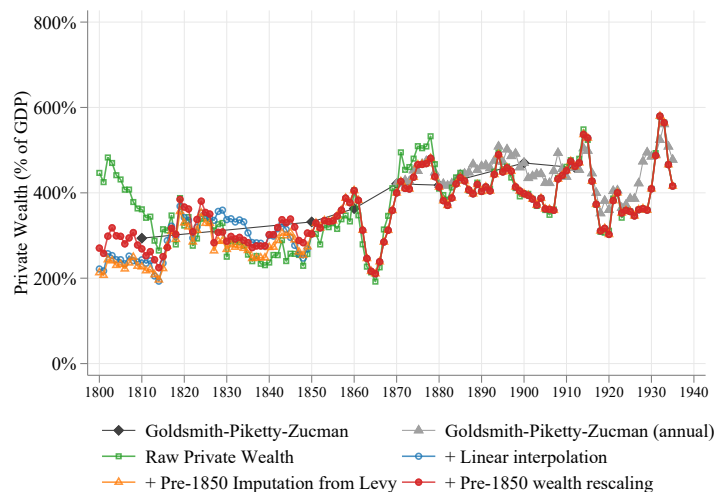
Figure A11: Comparison of State and Counties Assessment Ratios in 1870



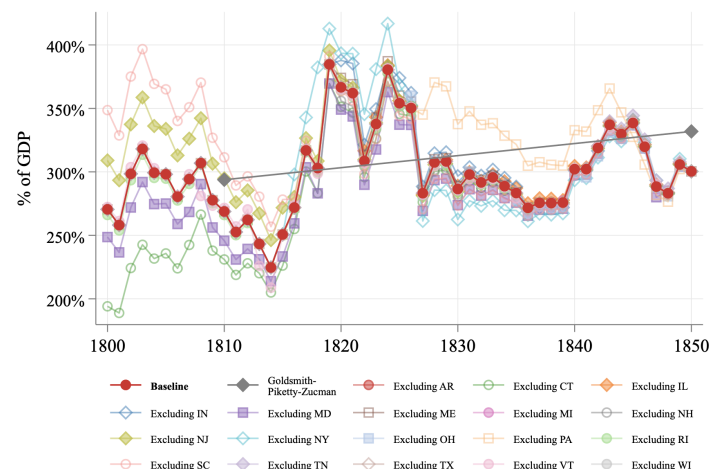
*Notes:* This figure displays the average assessment ratio of assessed to true value of all property at the state-level in 1870. Each dot plots the ratio in the state compared to the average ratio of each county in that state weighted by county population.

Figure A12: Sensitivity of National Wealth Estimates to Various Assumptions

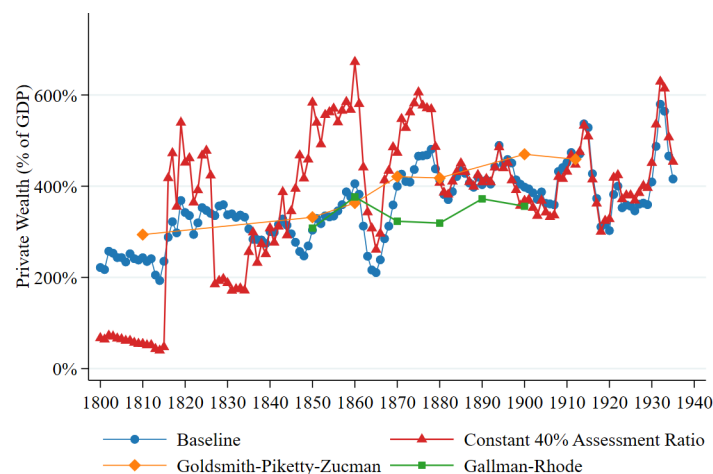
A. Comparison of Private Wealth Estimates



B. Robustness of US Wealth Estimates



C. Sensitivity to Assessment Ratio



Notes: Panel A compares the different Wealth estimates. Panel B compares different Wealth estimates excluding certain states. Baseline is Pre-1850 rescaling and imputation from Levy. Panel C compares the different Wealth Estimates with those of [Goldsmith \(1951\)](#) and [Piketty and Zucman \(2014\)](#).

Figure A13: Private Wealth at the State Level 1850-1870 based on IPUMS USA Full Count

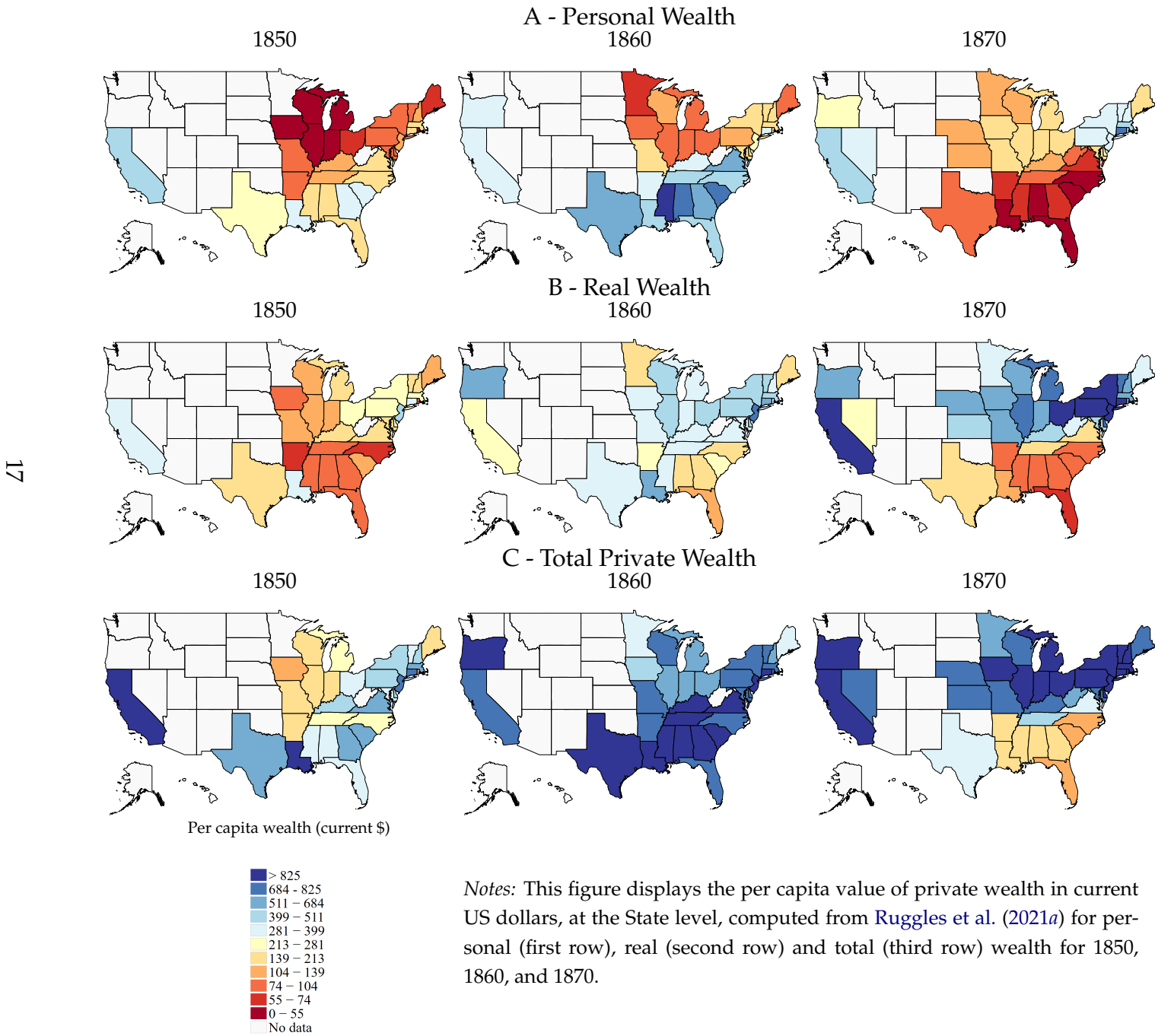


Figure A14: Private Wealth at the County Level 1850-1870 based on IPUMS USA Full Count

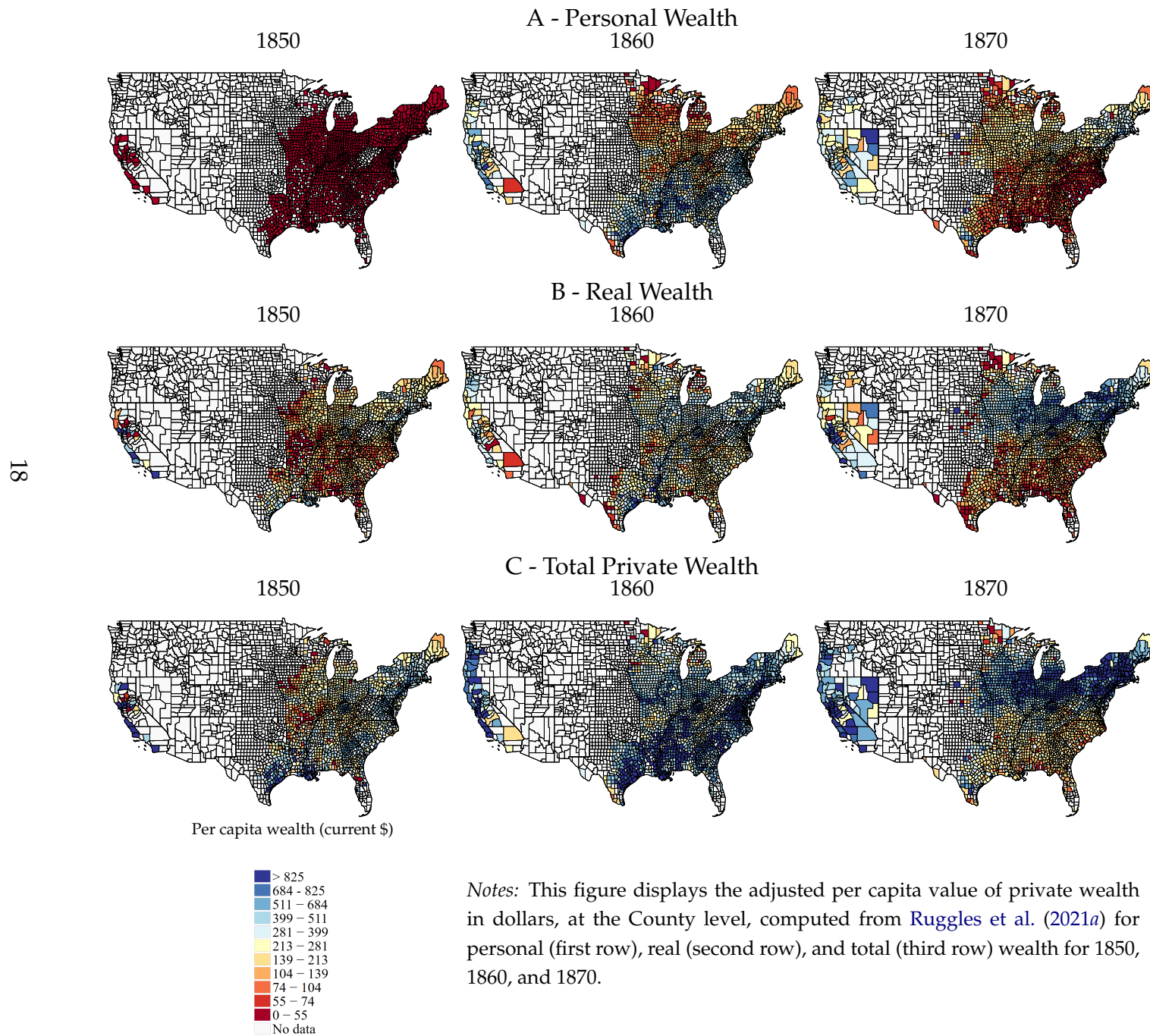
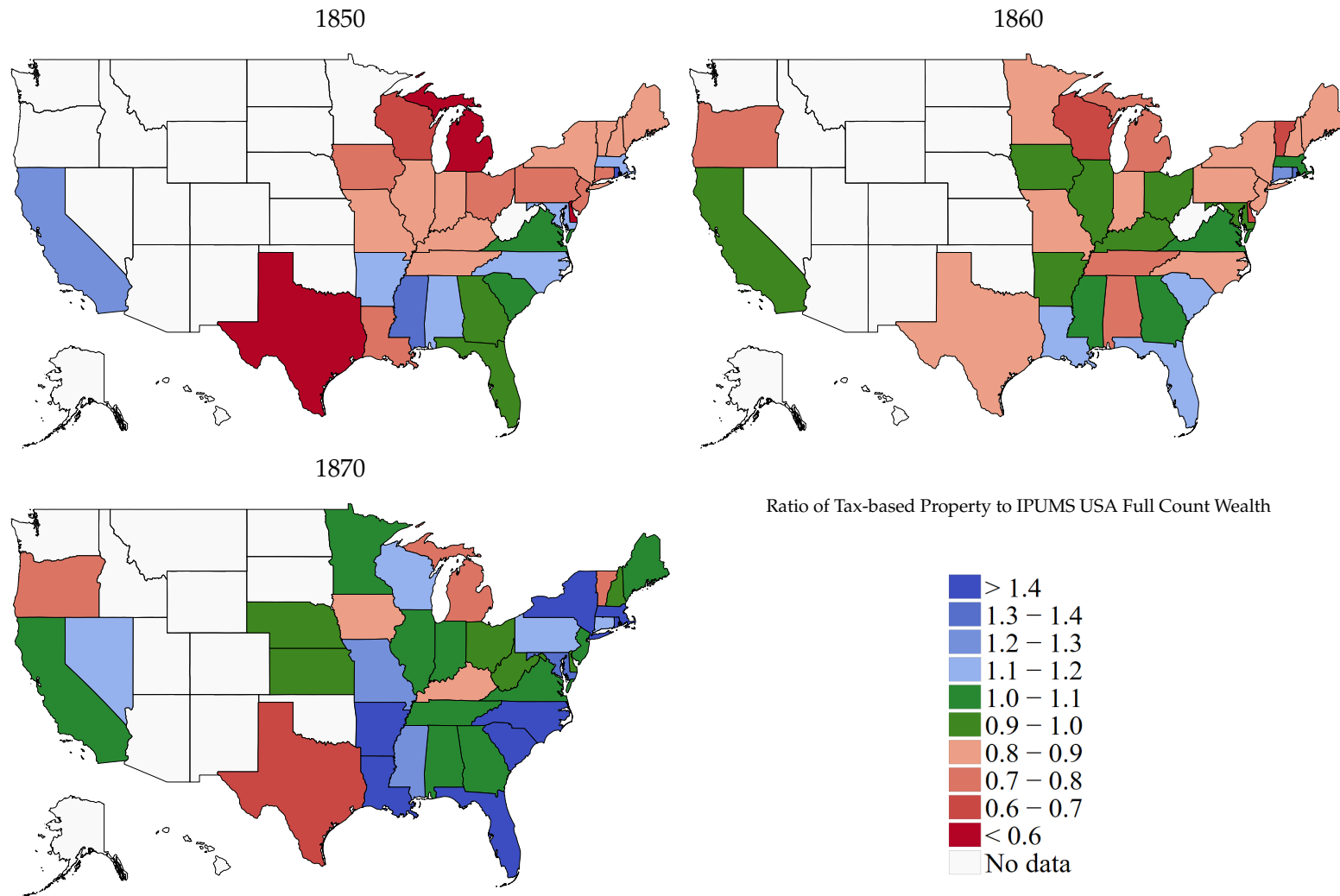


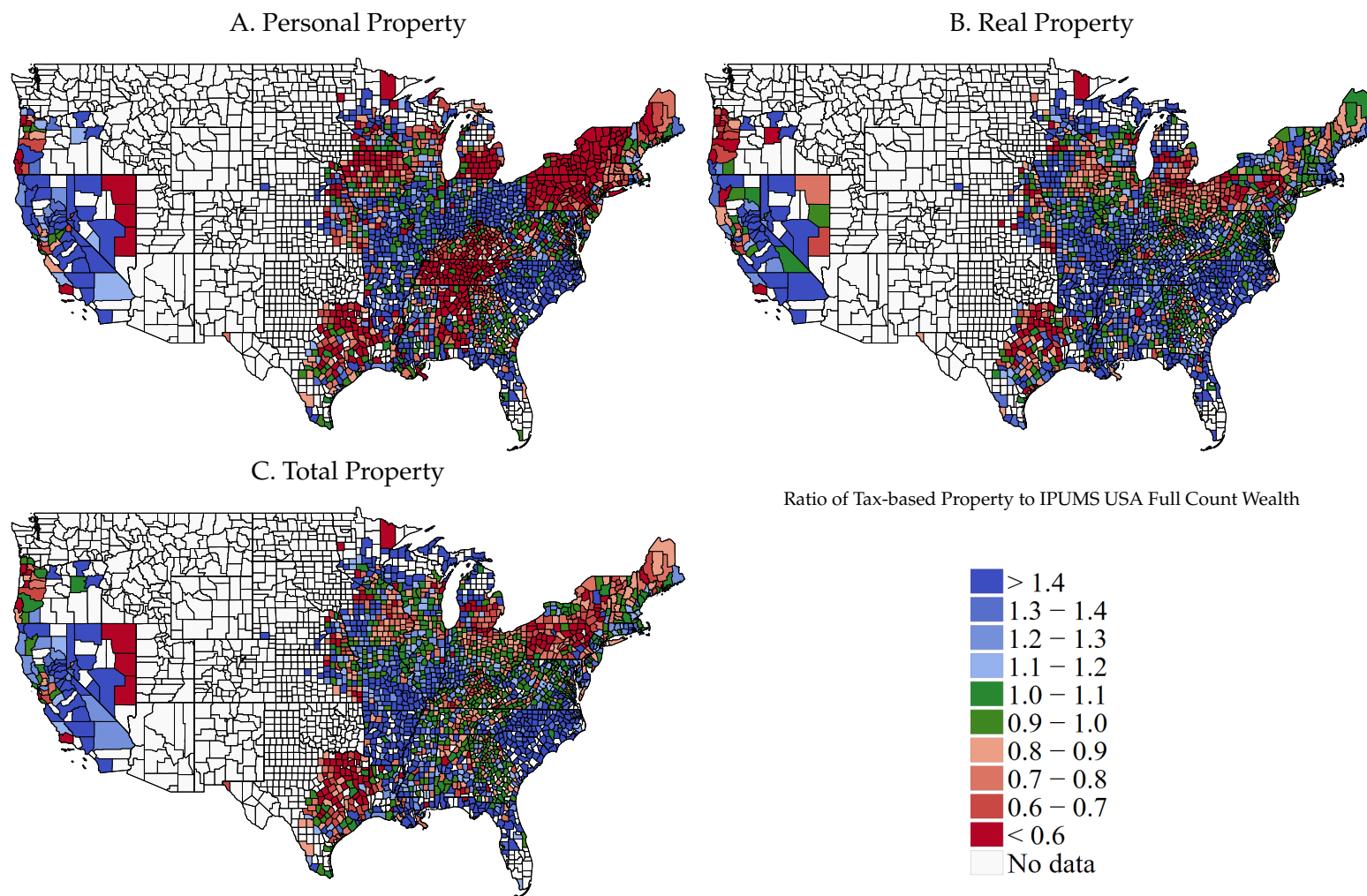


Figure A15: Ratio of Tax-based Property and IPUMS USA Full Count Wealth Measures at the State Level 1850-1870



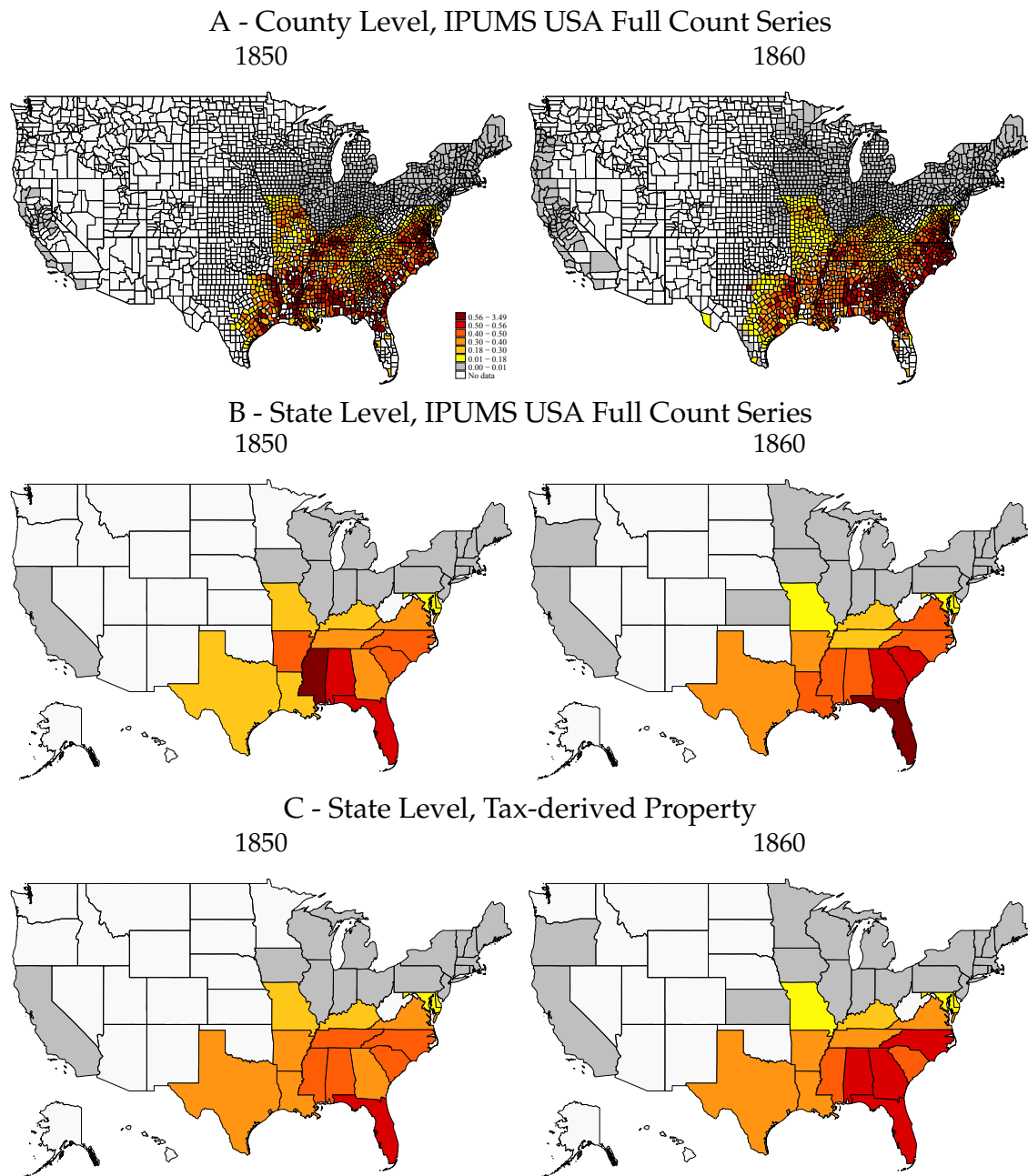
Notes: The figure shows the ratio of the tax-based property measure to the IPUMS USA Full Count wealth measure at the state level, for 1850, 1860, and 1870. Data for states in US territories prior to admission in the Union are not displayed.

Figure A16: Ratio of Tax-based Property and IPUMS USA Full Count Wealth Measures at the County Level in 1870

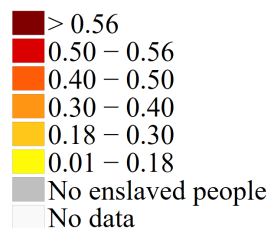


Notes: The panels shows the ratio of the tax-based to the IPUMS USA Full Count wealth measure at the county level in 1870.

Figure A17: Share of Wealth and Property from Enslaved People in Total Wealth

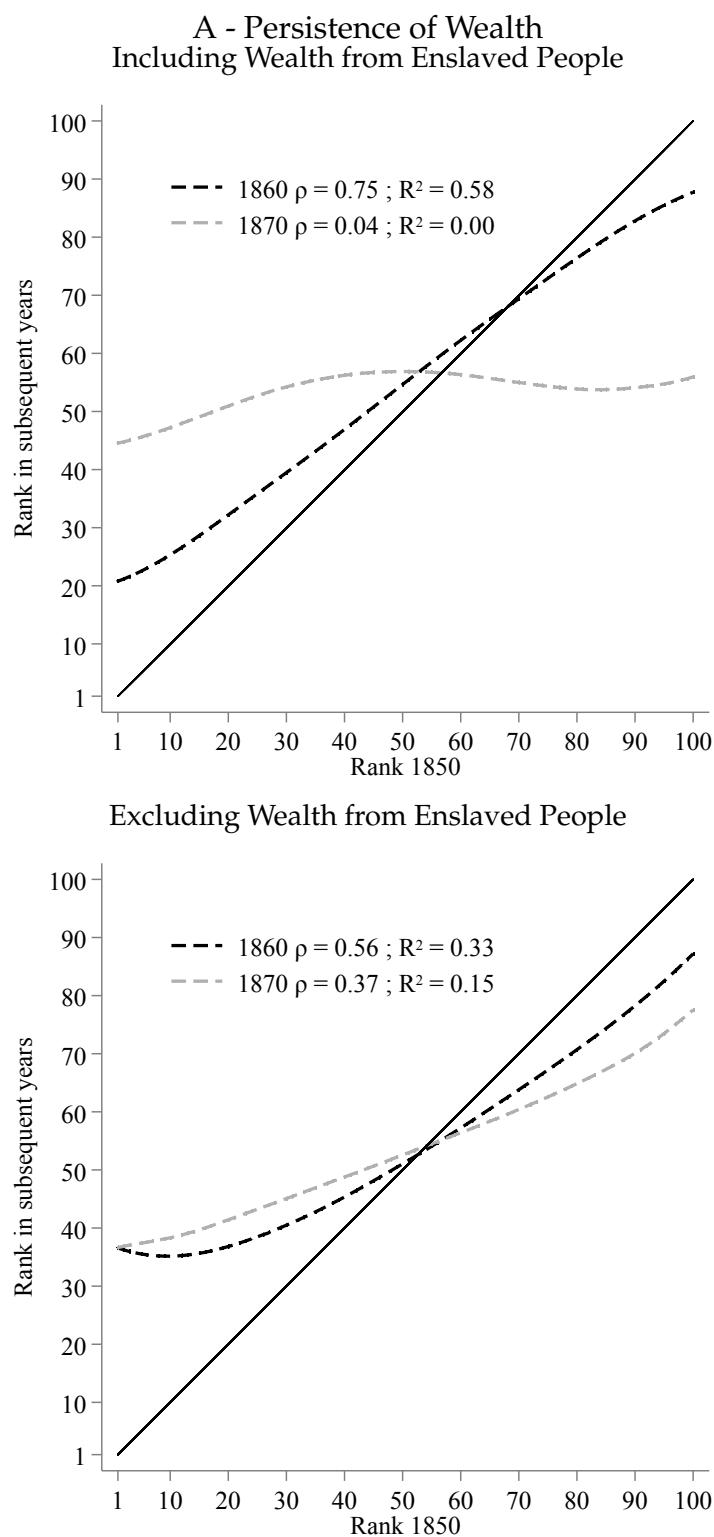


Share of Wealth from Enslaved People in Total Wealth



Notes: The figure shows the value of wealth and property from enslaved people at the county level (Panel A) and state level (Panels B and C) as a share of total private wealth/property in 1850 and 1860. Panels A and B use the IPUMS USA Full count wealth data. Panel C uses the property tax data. The construction of wealth from enslaved people is described in Section III.2. Data for states in US territories prior to admission in the Union are not displayed.

Figure A18: Effects of the War and Role of Enslaved Wealth at the County Level



*Notes:* Panel A shows the rank-rank correlation of county-level property per capita for different years ( $\rho$ ) and the  $R^2$  for each year  $t$  of a simple regression of county-level wealth per capita in year  $t$  on county-level wealth per capita in 1850, taking [Ruggles et al. \(2021a\)](#) series. We successively include or exclude wealth from enslaved people using [Einhorn \(2008\)](#) prices. Wealth is compared in current US dollars.

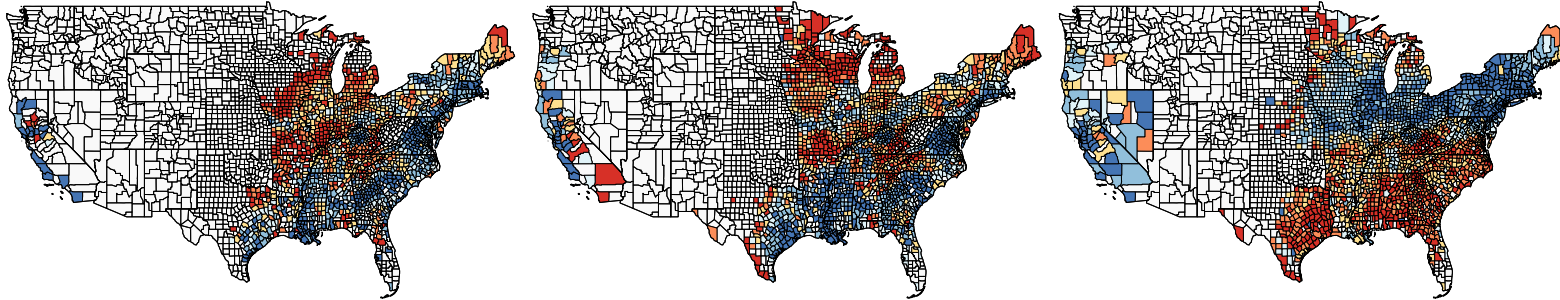
Figure A18: (continued)

B - Per Capita Total Wealth Including Wealth from Enslaved People

1850

1860

1870

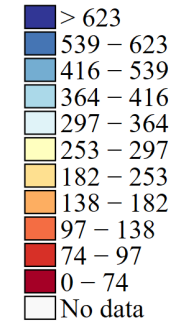
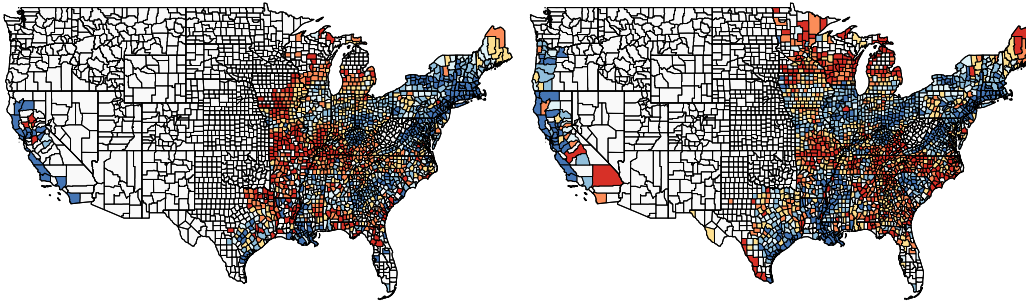


C - Per Capita Total Wealth Excluding Wealth from Enslaved People

1850

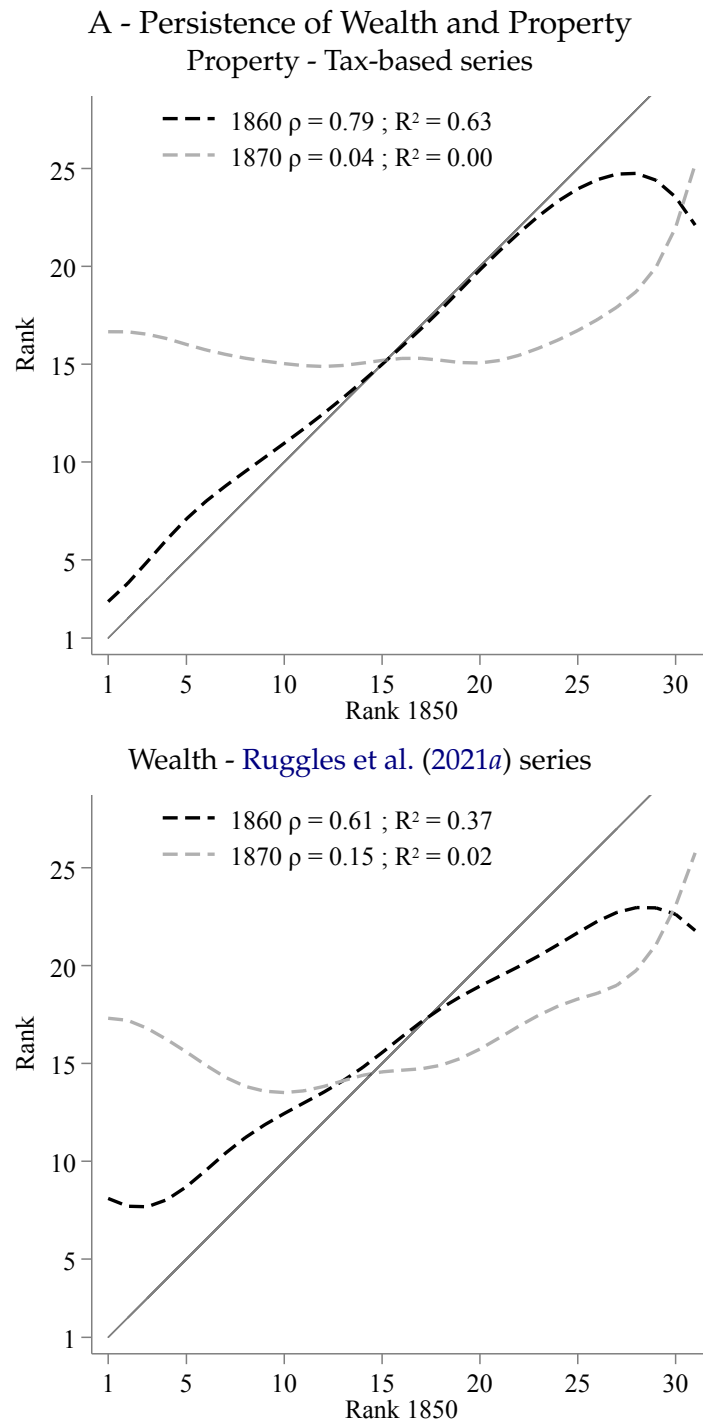
1860

Per capita wealth (current \$)



Notes: Panel B displays the value of wealth per capita at the county level from [Ruggles et al. \(2021a\)](#) series, including wealth from enslaved people, in current US dollars. Panel C displays the value of wealth per capita at the county level from [Ruggles et al. \(2021a\)](#) series, excluding wealth from enslaved people, with [Einhorn \(2008\)](#) prices. Panel C year 1870 would be identical to Panel B because there were no enslaved person in 1870. Wealth is compared in current US dollars. Data for counties in US territories prior to admission in the Union are not displayed.

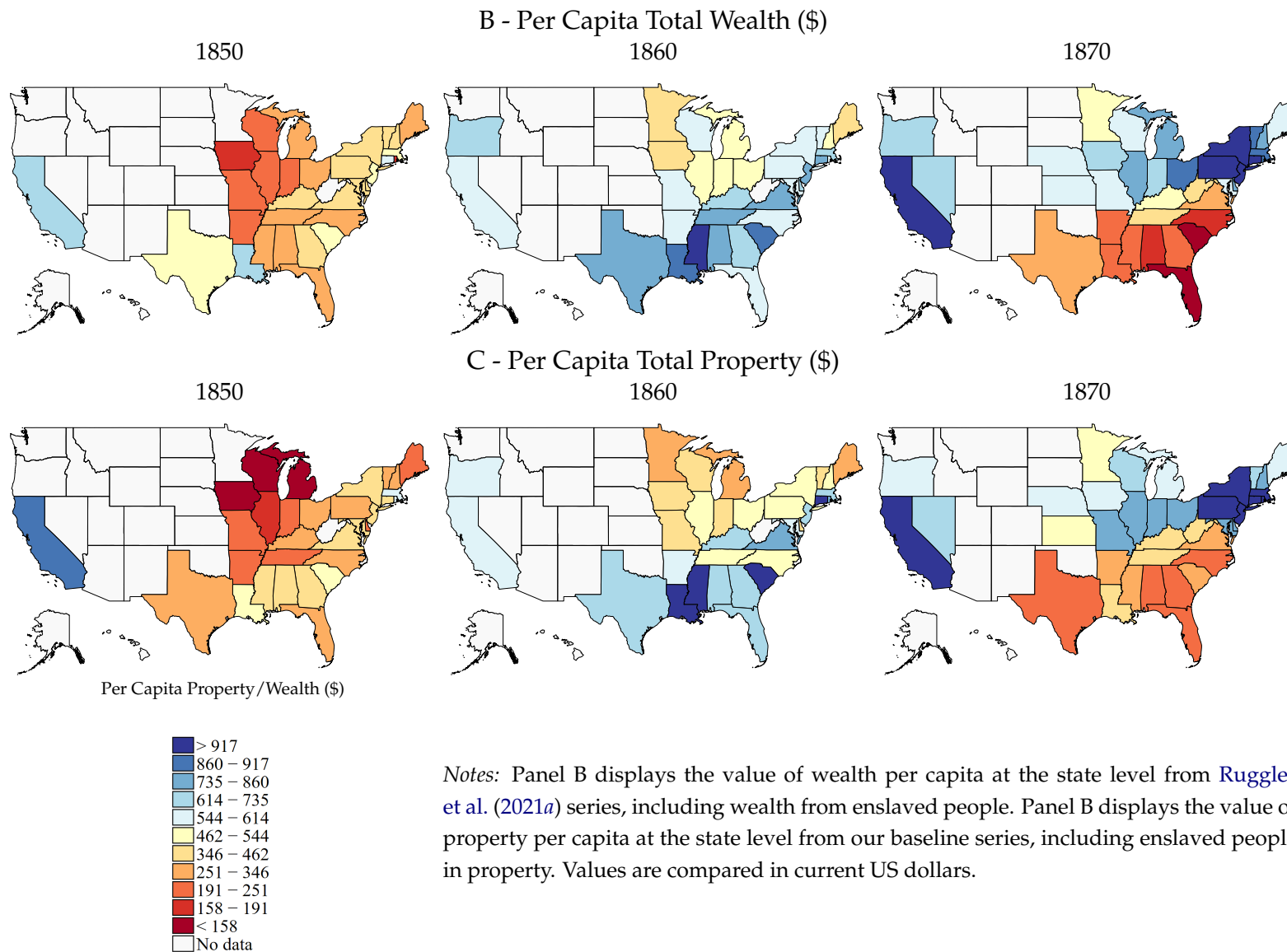
Figure A19: Effects of the War at the State Level : Property and Wealth



Notes: Panel A shows the rank-rank correlation of state-level property per capita for 1860 and 1870 ( $\rho$ ) and the  $R^2$  for each year  $t$  of a simple regression of state-level wealth per capita in year  $t$  on county-level wealth per capita in 1850, taking [Ruggles et al. \(2021a\)](#) series for the upper panel and our property data for the bottom panel.

*Continued to the next page*

Figure A19: Effects of the War at the State Level



*Notes:* Panel B displays the value of wealth per capita at the state level from [Ruggles et al. \(2021a\)](#) series, including wealth from enslaved people. Panel C displays the value of property per capita at the state level from our baseline series, including enslaved people in property. Values are compared in current US dollars.



Figure A20: Sensitivity Analysis: State-Level Property in 1850 and 1860 using Different Prices for Enslaved People

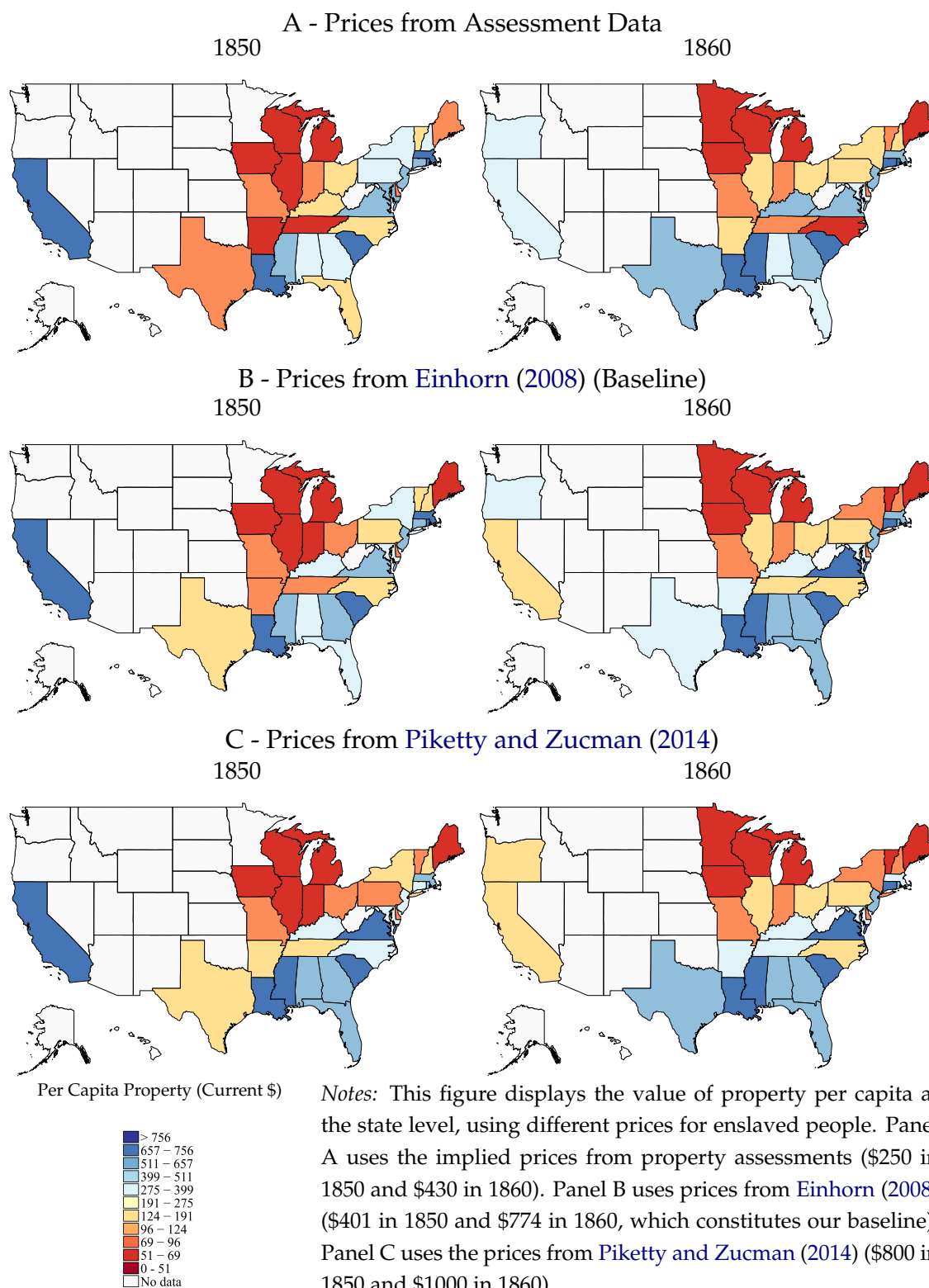
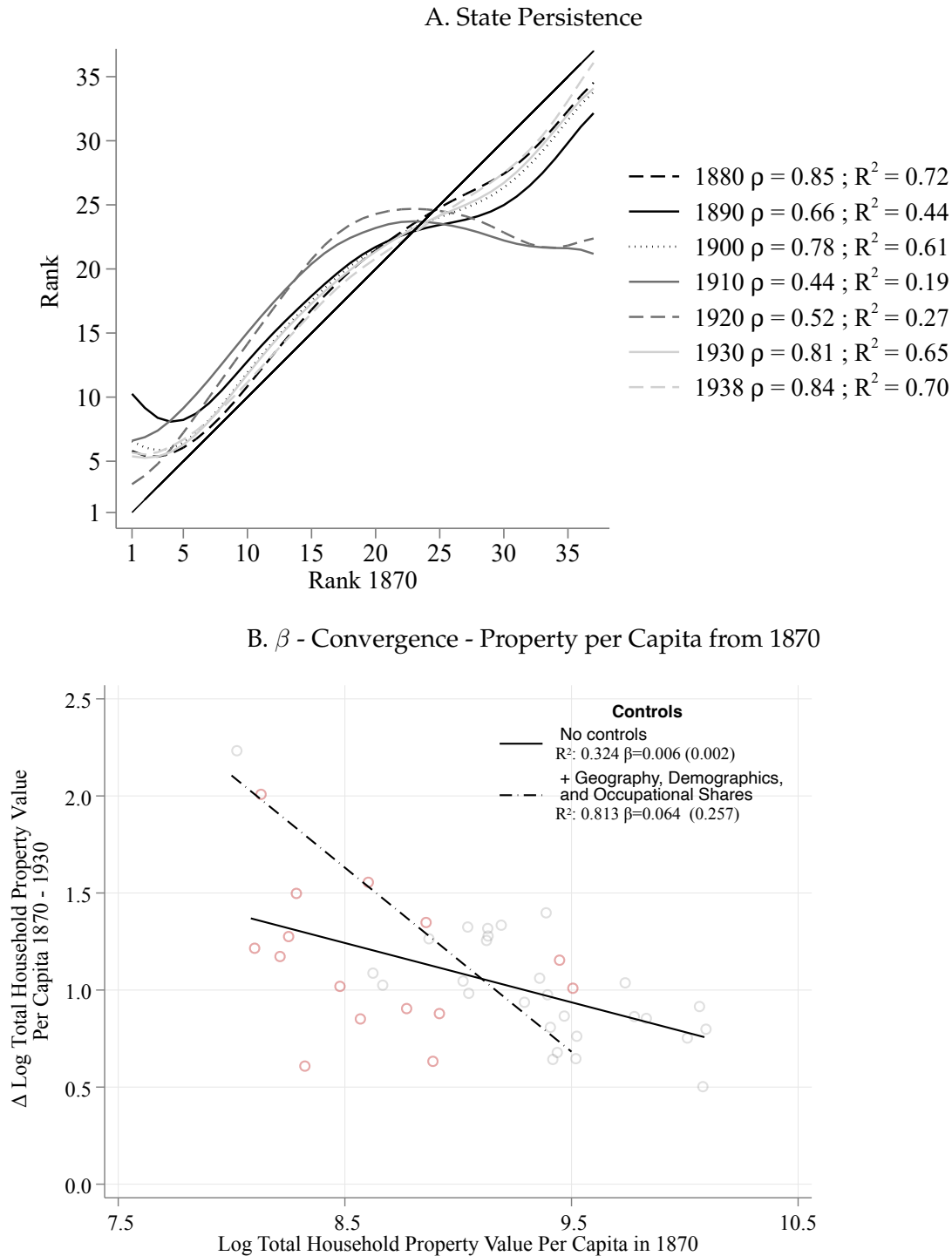


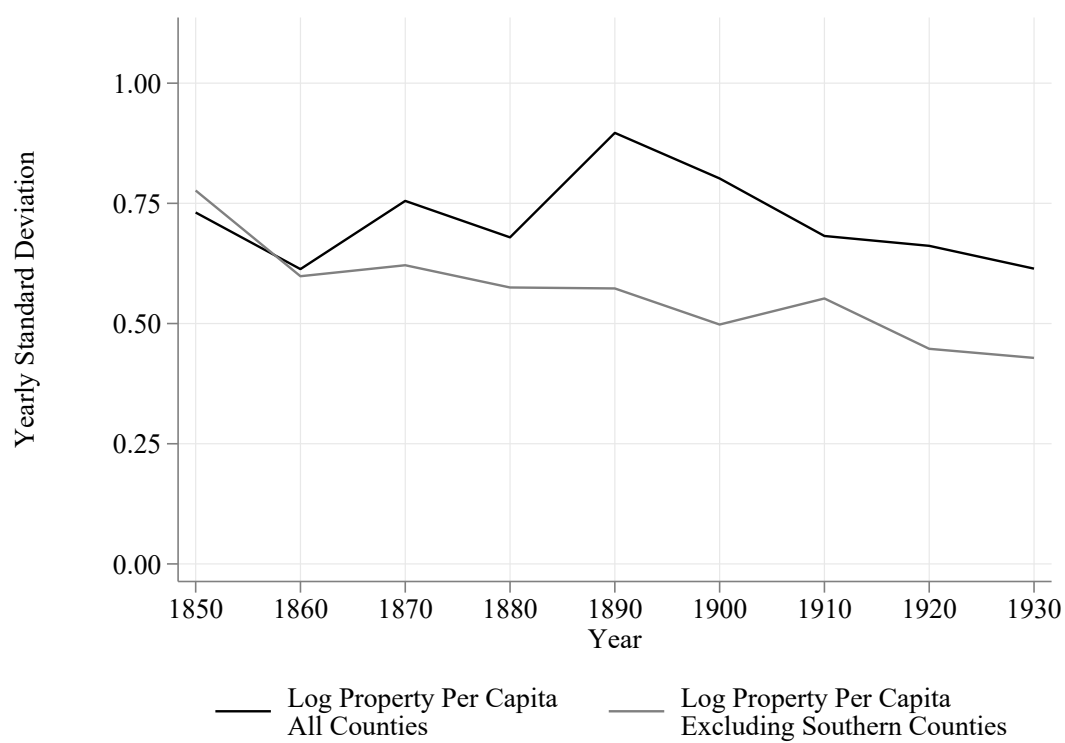


Figure A21: State Persistence and Convergence



Notes: Panel A shows the rank-rank correlation of state-level property per capita for different years ( $\rho$ ) and the  $R^2$  for each year  $t$  of a simple regression of state-level property per capita in year  $t$  on state level property per capita in 1870. Panel B shows the relationship between the growth rate of state level property per capita between 1870 and 1930 and initial property per capita in 1870, without controls (solid line) or adding controls for geography, demographics, and occupational shares (dashed line). Southern states are represented in red.

Figure A22: Dispersion in Property across Counties over Time



*Notes:* The figure displays the yearly standard deviation of property per capita across counties for all counties (solid black line) and excluding Southern counties (grey line).

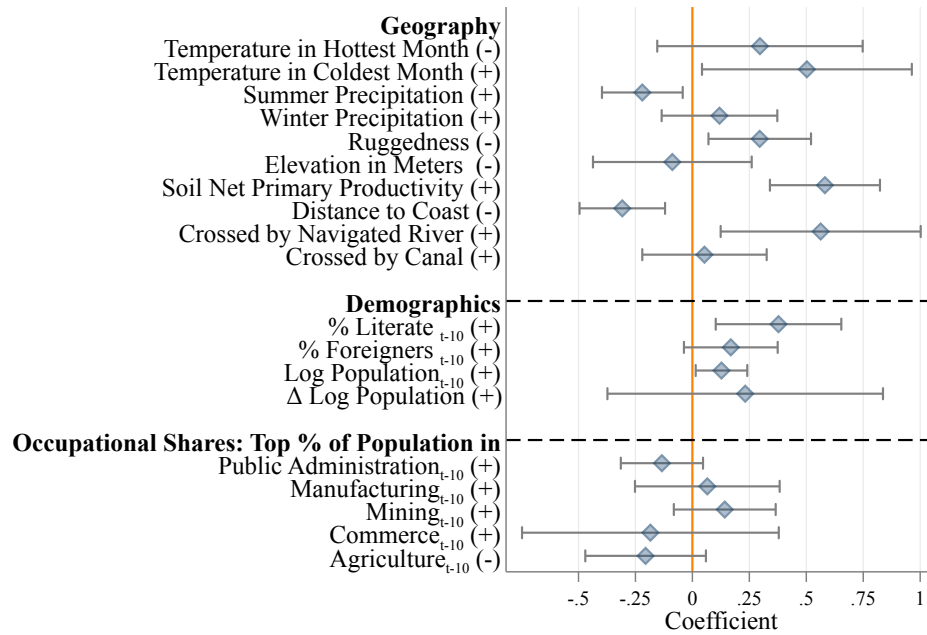
Figure A23: Evolution of Spatial Inequality across Counties Based on Share of National Property Owned by the Top 10%



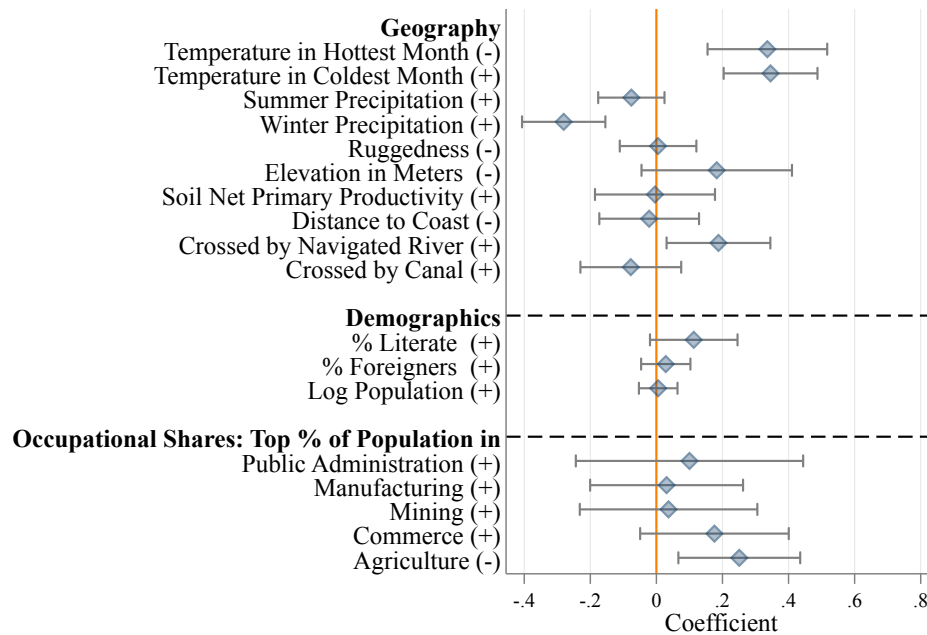
*Notes:* The figure displays the evolution of the share of national property owned by the top 10% wealthiest counties between 1860 and . The balanced panel only keeps counties for which we have values for all decades between 1860 and 1930. The unbalanced panel keeps all counties.

Figure A24: Correlates of Property Growth - State Level Estimates (1870-1939)

A. Log Total Household Property Value per Capita in 1870

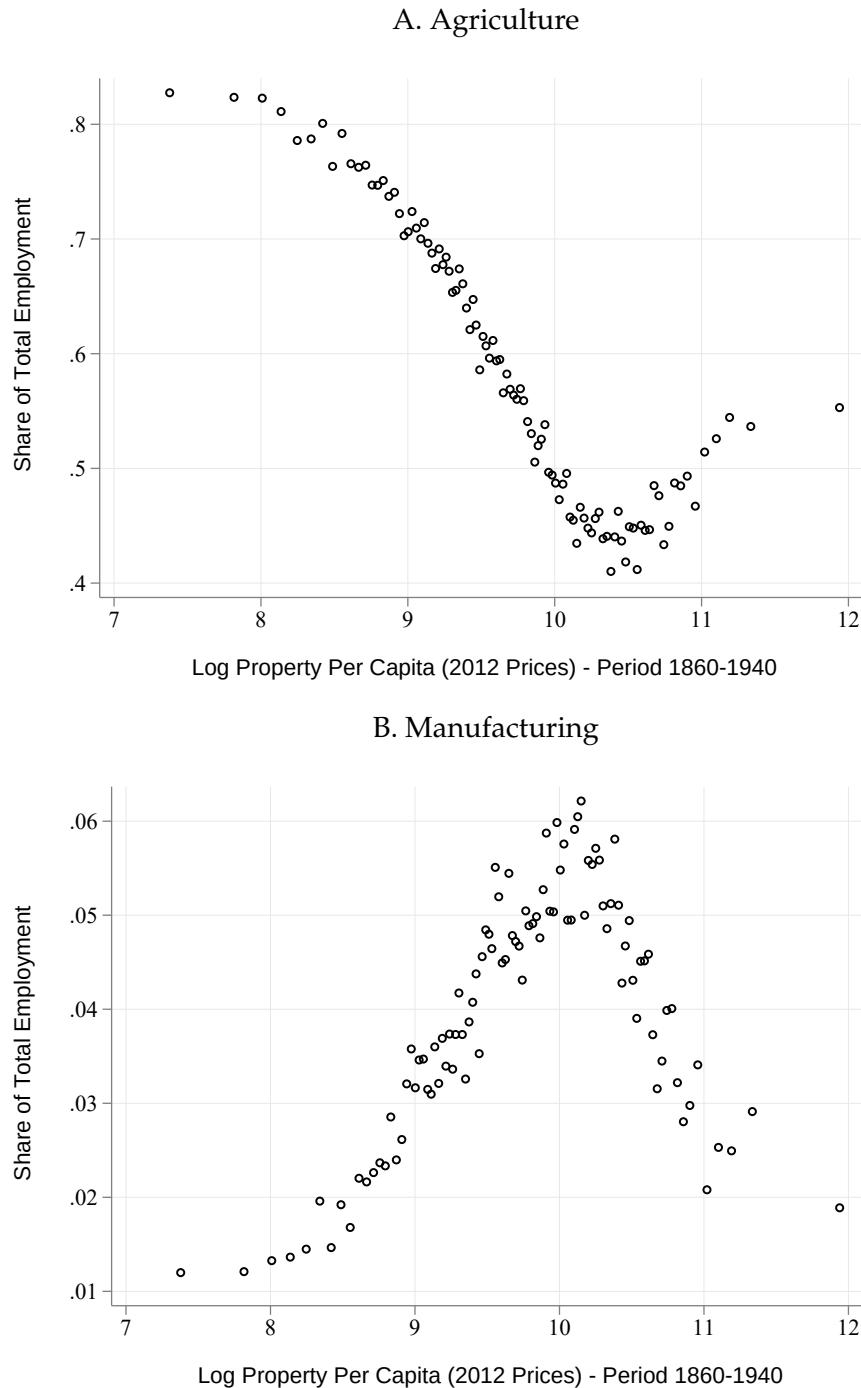


B. 1870-1930  $\Delta$  log Total Household Property Value per Capita



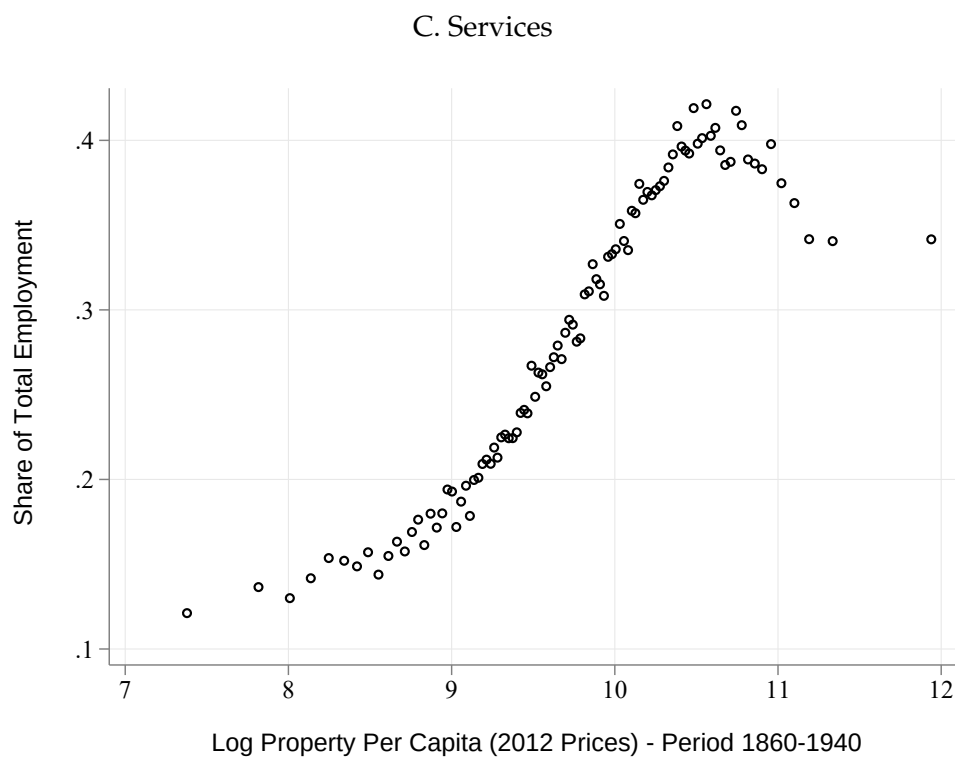
Notes: Panel A presents the set of coefficients coming from the regression of log property in 1870 on 1860's determinants from equation 3. Panel B presents the set of coefficients coming from the regression of the change in log property between 1870 and 1939 on 1870's property and controls from equation 2. Geography is time-constant and every coefficient is shown with its 90% confidence interval. Furthermore, the minus sign tells that the sign of the coefficient was switched for graphical purposes. Year fixed effects are included in this specification.

Figure A25: Structural Transformation of Economic Sectors with Structural Transformation Over the Course of Development: Occupational Shares in Total Employment and Log Property Per Capita by County



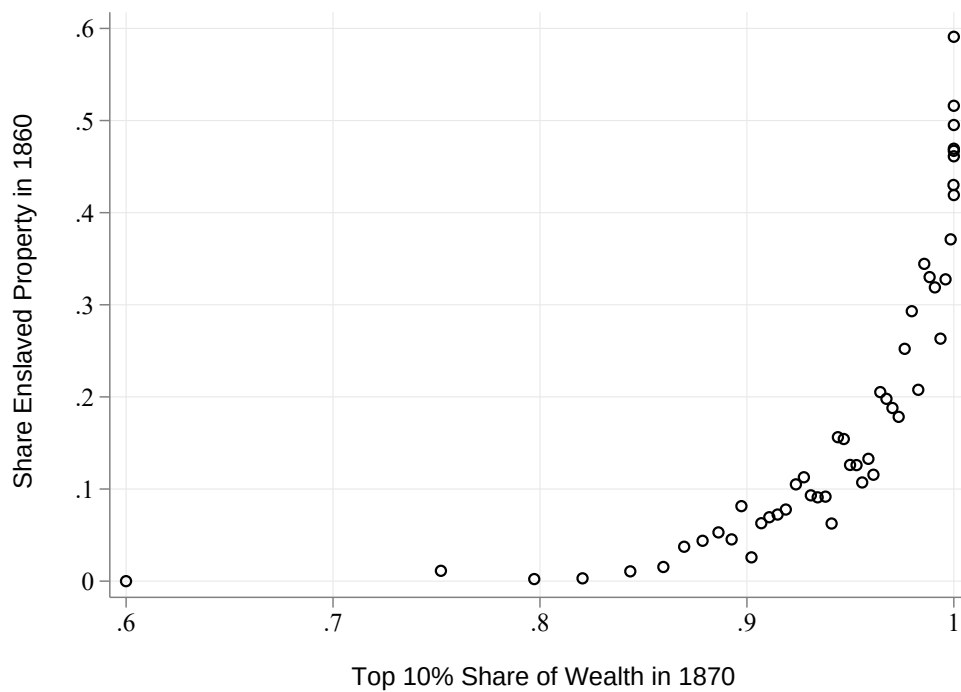
*Notes:* Panel A displays the relationship between the share of agriculture in the total employment in the county and the log of the county property per capita expressed in 2012 US dollars for the period between 1860 and 1940. Panel B displays the relationship between the share of manufacturing industry in the total employment in the county and the log of the county property per capita expressed in 2012 US dollars. Counties are ranked by this measure of log of property per capita in 100 bins pooling all years.

Figure A25: Structural Transformation Over the Course of Development: Occupational Shares in Total Employment and Log Property Per Capita by County



*Notes:* Panel C presents the relationship between the share of services in the total employment in the county and the log of the county property per capita expressed in 2012 US dollars for the period between 1860 and 1940. The service sector is built by adding the fraction of people working in business, retail, finance, transport and public administration sectors. Counties are ranked by this measure of log of property per capita in 100 bins pooling all years.

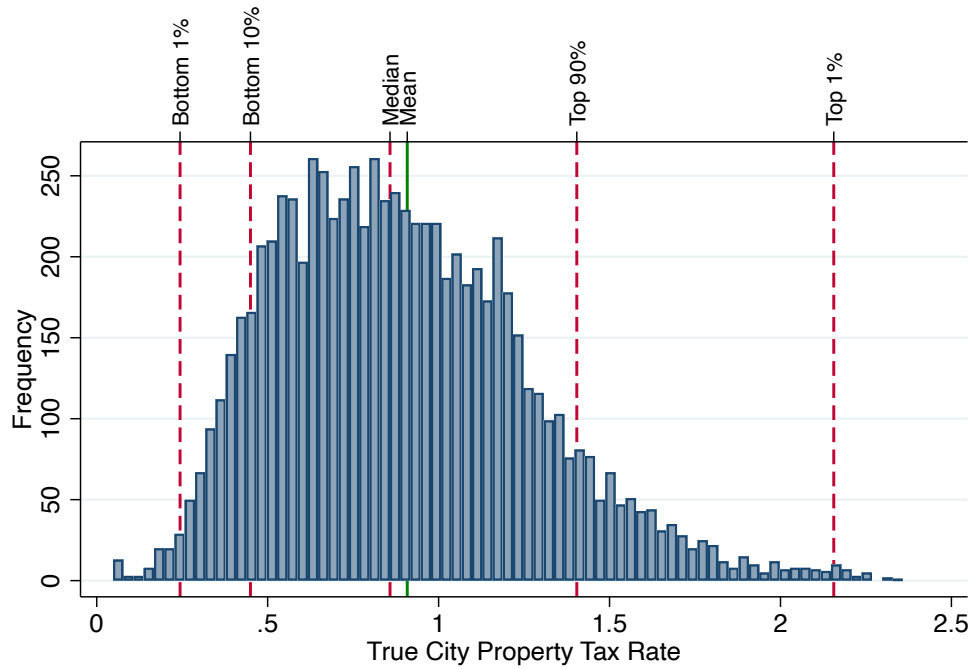
Figure A26: Correlation between Top 10% Wealth Share in 1870 and Share of Enslaved Property in 1860 at the County Level



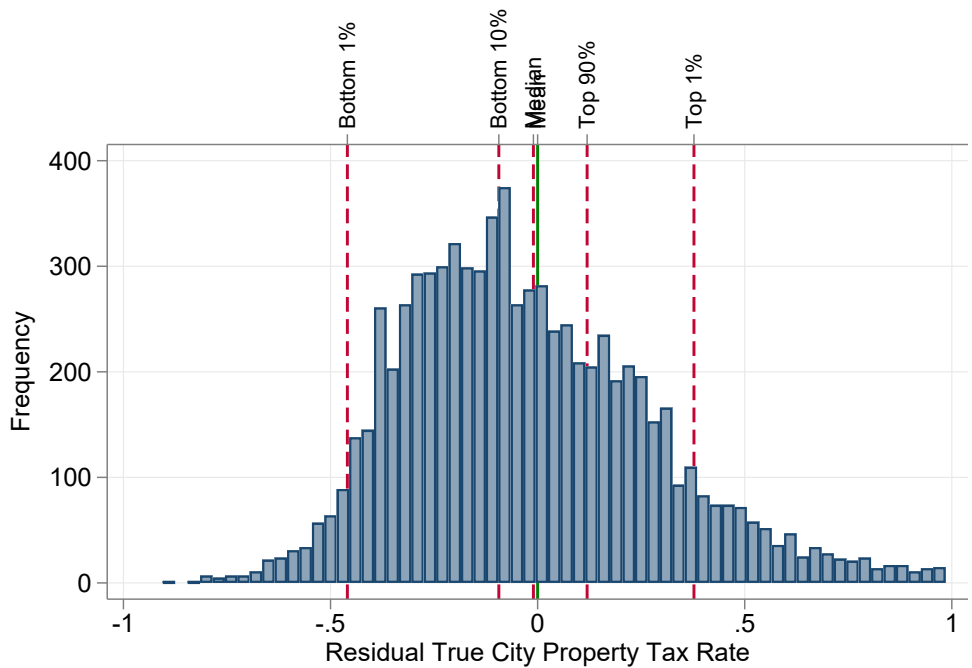
*Notes:* This figure displays the correlation between the share of enslaved property in 1860 and the top 10% share of total wealth in 1870. Top 10% wealth share measures the fraction of total wealth owned by the top 10% of wealthiest individuals in the county, measured in the Census data. Counties are ranked by share of the total wealth owned by the top 10% in 100 bins.

Figure A27: Distribution of Effective Tax Rates Across Municipalities

A. Histogram of Effective Tax Rates



B. Histogram of Residualized Tax Rates Changes



Notes: Panel A plots the distribution of the true city property tax rates. Panel B plots the residualized difference of the true city property tax rate in T and the true city property tax rate in T-1.



Figure A28: Serial Correlation of Residual Tax Rates Changes

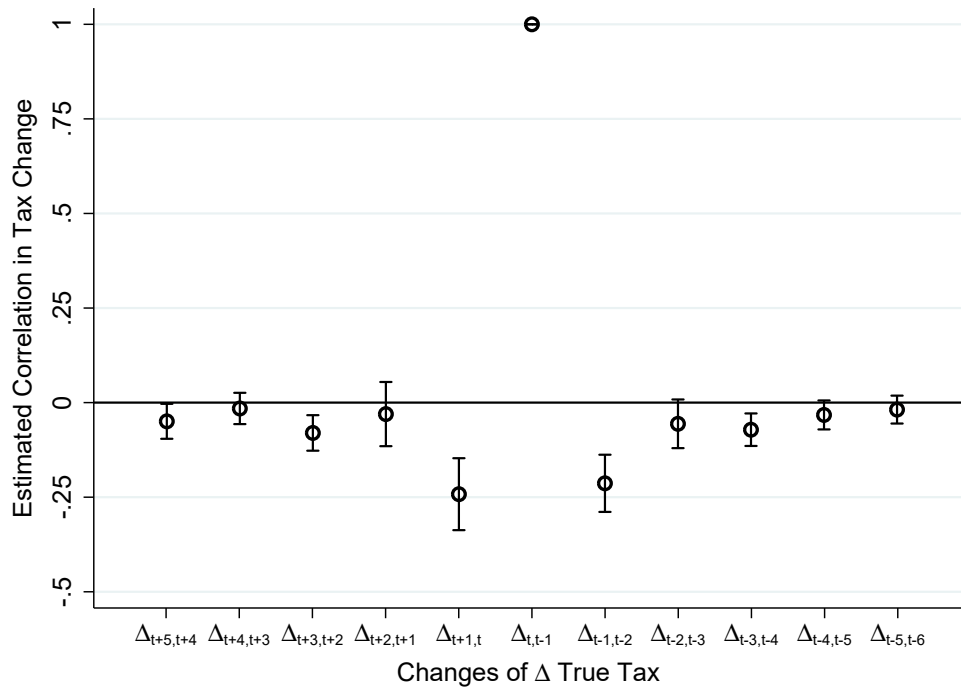


Figure A29: Estimates of Migration Elasticities in Literature

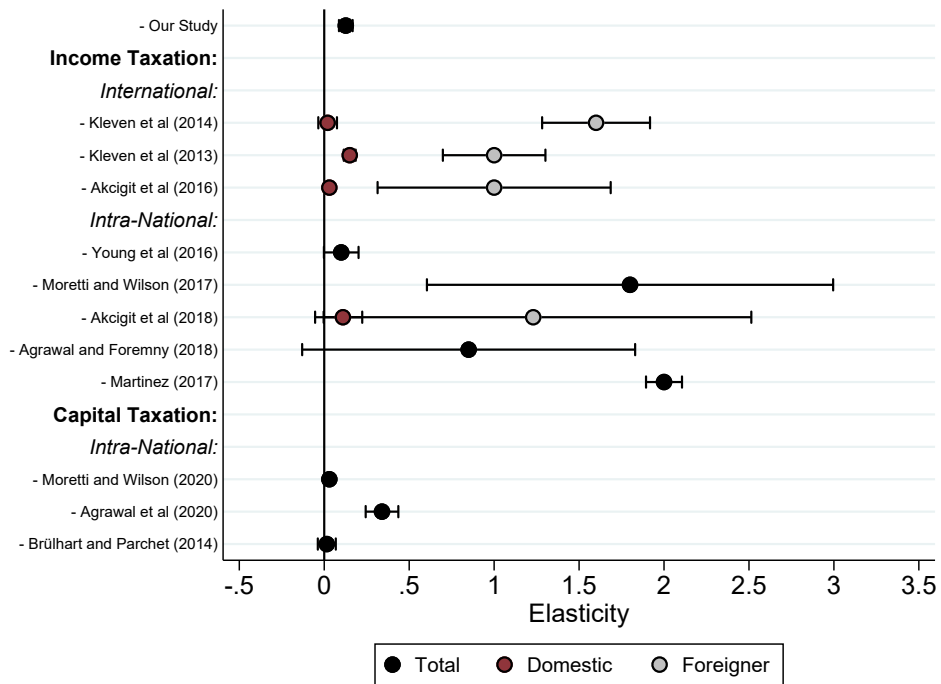


Figure A30: Capitalization Into Value of Real Property: Dynamic Impact of Tax Change on Value of Real Property Per Capita



Notes: The Figure shows the estimated cumulative effect of a tax change on the log of total real property value per capita. The horizontal axis plots the years since the tax change. We estimate equation (4) and plot the coefficients for each year  $t = j$ ,  $\alpha_j = \sum_{k=-j}^5 \hat{\gamma}_k$ . For the covariates definition see the notes to Figure 26.

Table A1: 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                                                           |                                                                     |                                                                   |
| 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                                                              |

*Notes:* This table shows for each state the date of first appearance of the general property tax principles of universality in the assessment of property and the use of a uniform rate of taxation for all property types. The data are given both as a first appearance of universality and uniformity requirements in state constitutions, as well as the first observed appearance of these practices in state reports. The practice of universal assessment of property refers to the assessment of real and personal property with limited exemptions. The practice of uniformity refers to using a single tax rate or apportionment system on the aggregate value of all property instead of different rates by type of property.

*Source:* [Jensen \(1931\)](#) and [Benson et al. \(1965\)](#) 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.

Table A2: Correlates of Property - County Level

|                                                        | Dependent variable: Log Total Household Property Value Per Capita |                      |                      |                      |                      |                      |
|--------------------------------------------------------|-------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                                                        | (1)                                                               | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|                                                        | 10-Year $\Delta$                                                  | 10-Year $\Delta$     | 10-Year $\Delta$     | 10-Year $\Delta$     | 60-Year $\Delta$     | in 1870              |
| Log Total Household Property Value Per Capita          | -0.261***<br>(0.008)                                              | -0.410***<br>(0.011) | -0.503***<br>(0.013) | -0.520***<br>(0.012) | -0.718***<br>(0.025) |                      |
| <b>A. Geography</b>                                    |                                                                   |                      |                      |                      |                      |                      |
| Temperature in Hottest Month                           |                                                                   | -0.062***<br>(0.017) | -0.032*<br>(0.017)   | -0.023<br>(0.017)    | 0.169***<br>(0.053)  | -0.315***<br>(0.060) |
| Temperature in Coldest Month                           |                                                                   | -0.001<br>(0.015)    | 0.038***<br>(0.014)  | 0.024*<br>(0.014)    | -0.007<br>(0.040)    | 0.061<br>(0.043)     |
| Summer Precipitation                                   |                                                                   | -0.107***<br>(0.007) | -0.063***<br>(0.008) | -0.070***<br>(0.007) | -0.022<br>(0.016)    | 0.028<br>(0.022)     |
| Winter Precipitation                                   |                                                                   | -0.081***<br>(0.012) | -0.094***<br>(0.012) | -0.087***<br>(0.012) | -0.051*<br>(0.027)   | -0.148***<br>(0.030) |
| Elevation in meters                                    |                                                                   | -0.003<br>(0.014)    | -0.030**<br>(0.013)  | -0.037***<br>(0.013) | 0.082<br>(0.056)     | -0.344***<br>(0.068) |
| Ruggedness                                             |                                                                   | -0.042***<br>(0.009) | -0.010<br>(0.009)    | -0.010<br>(0.009)    | -0.009<br>(0.028)    | -0.127***<br>(0.028) |
| Soil Net Primary Productivity                          |                                                                   | 0.061***<br>(0.009)  | 0.082***<br>(0.010)  | 0.074***<br>(0.010)  | 0.058**<br>(0.024)   | 0.031<br>(0.027)     |
| Distance to Coast                                      |                                                                   | 0.007<br>(0.009)     | 0.053***<br>(0.009)  | 0.058***<br>(0.008)  | -0.130***<br>(0.025) | 0.238***<br>(0.029)  |
| Crossed by Navigated River                             |                                                                   | 0.014<br>(0.010)     | -0.003<br>(0.010)    | -0.006<br>(0.010)    | -0.027<br>(0.021)    | 0.089***<br>(0.026)  |
| Crossed by Canal                                       |                                                                   | 0.069***<br>(0.018)  | 0.092***<br>(0.020)  | 0.090***<br>(0.020)  | 0.008<br>(0.030)     | 0.010<br>(0.038)     |
| <b>B. Demographics</b>                                 |                                                                   |                      |                      |                      |                      |                      |
| % Literate                                             |                                                                   |                      | 0.197***<br>(0.011)  | 0.177***<br>(0.011)  | 0.102***<br>(0.019)  | 0.377***<br>(0.038)  |
| % Foreigners                                           |                                                                   |                      | 0.061***<br>(0.008)  | 0.055***<br>(0.007)  | 0.023<br>(0.014)     | -0.069***<br>(0.018) |
| Log Population                                         |                                                                   |                      | -0.033***<br>(0.008) | -0.049***<br>(0.009) | 0.055***<br>(0.016)  | 0.082***<br>(0.024)  |
| $\Delta$ Log Population                                |                                                                   |                      | -0.093***<br>(0.022) | -0.093***<br>(0.021) |                      | -0.073<br>(0.055)    |
| % Males                                                |                                                                   |                      | 0.029***<br>(0.011)  | 0.023**<br>(0.009)   | 0.087***<br>(0.027)  | 0.087***<br>(0.033)  |
| % White                                                |                                                                   |                      | -0.097***<br>(0.008) | -0.094***<br>(0.008) | -0.048**<br>(0.019)  | -0.343***<br>(0.054) |
| <b>C. Occupational shares: Top % of Population in:</b> |                                                                   |                      |                      |                      |                      |                      |
| Public Administration                                  |                                                                   |                      |                      | 0.026***<br>(0.010)  | 0.071***<br>(0.025)  | -0.032<br>(0.033)    |
| Production                                             |                                                                   |                      |                      | 0.014<br>(0.011)     | -0.098***<br>(0.029) | 0.118***<br>(0.032)  |
| Mining                                                 |                                                                   |                      |                      | 0.008<br>(0.012)     | 0.024<br>(0.028)     | 0.097***<br>(0.031)  |
| Commerce                                               |                                                                   |                      |                      | 0.023**<br>(0.011)   | 0.034<br>(0.025)     | 0.092***<br>(0.031)  |
| Agriculture                                            |                                                                   |                      |                      | -0.092***<br>(0.011) | -0.185***<br>(0.028) | -0.040<br>(0.032)    |
| <b>D. Inequality</b>                                   |                                                                   |                      |                      |                      |                      |                      |
| Top 10% Property Share                                 |                                                                   |                      |                      |                      | -0.155***<br>(0.025) |                      |
| % of Enslaved Property in 1860                         |                                                                   |                      |                      |                      | -0.069**<br>(0.027)  | -0.257***<br>(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            | 1930                 | 1870                 |
| Adjusted $R^2$                                         | 0.37                                                              | 0.47                 | 0.52                 | 0.53                 | 0.57                 | 0.61                 |
| Implied Convergence                                    | 0.030                                                             | 0.053                | 0.070                | 0.073                | 0.021                |                      |

Notes: Columns 1-4 report the coefficients obtained by regressing the 10-year change in log property on lagged property, geography variables, demographics, occupational shares and inequality variables. Geography is taken as time-constant. Occupation shares are represented by indicator variables taking value 1 if the county is in the top quartile for such an occupation category. This specification includes year fixed effects. Column 5 reports the set of coefficients coming from the regression of the change in log property between 1870 and 1930 on 1870's property and controls. Geography is time-constant. Column 6 presents the set of coefficients coming from the regression of log property in 1870 on 1860's controls.

Table A3: Correlates of Property - County Level - State FEs

|                                                        | Dependent variable: Log Total Household Property Value Per Capita |                      |                      |                      |                      |                      |
|--------------------------------------------------------|-------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                                                        | (1)                                                               | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|                                                        | 10-Year $\Delta$                                                  | 10-Year $\Delta$     | 10-Year $\Delta$     | 10-Year $\Delta$     | 60-Year $\Delta$     | in 1870              |
| Log Total Household Property Value Per Capita          | -0.489***<br>(0.010)                                              | -0.523***<br>(0.011) | -0.573***<br>(0.013) | -0.589***<br>(0.012) | -0.728***<br>(0.026) |                      |
| <b>A. Geography</b>                                    |                                                                   |                      |                      |                      |                      |                      |
| Temperature in Hottest Month                           |                                                                   | 0.027<br>(0.022)     | 0.033<br>(0.024)     | 0.043*<br>(0.024)    | 0.060<br>(0.066)     | -0.046<br>(0.080)    |
| Temperature in Coldest Month                           |                                                                   | -0.018<br>(0.019)    | -0.009<br>(0.020)    | -0.023<br>(0.020)    | -0.037<br>(0.056)    | 0.085<br>(0.062)     |
| Summer Precipitation                                   |                                                                   | -0.005<br>(0.012)    | 0.005<br>(0.013)     | -0.003<br>(0.012)    | 0.001<br>(0.029)     | 0.014<br>(0.031)     |
| Winter Precipitation                                   |                                                                   | -0.073***<br>(0.011) | -0.102***<br>(0.013) | -0.101***<br>(0.013) | -0.070**<br>(0.032)  | -0.196***<br>(0.034) |
| Elevation in meters                                    |                                                                   | 0.084***<br>(0.019)  | 0.050**<br>(0.021)   | 0.047**<br>(0.021)   | 0.091<br>(0.060)     | -0.124*<br>(0.072)   |
| Ruggedness                                             |                                                                   | -0.052***<br>(0.009) | -0.017*<br>(0.009)   | -0.016*<br>(0.009)   | -0.020<br>(0.029)    | -0.084***<br>(0.028) |
| Soil Net Primary Productivity                          |                                                                   | 0.031***<br>(0.012)  | 0.052***<br>(0.013)  | 0.048***<br>(0.013)  | 0.034<br>(0.026)     | 0.028<br>(0.028)     |
| Distance to Coast                                      |                                                                   | -0.053***<br>(0.013) | -0.001<br>(0.014)    | 0.007<br>(0.014)     | -0.228***<br>(0.030) | 0.062<br>(0.039)     |
| Crossed by Navigated River                             |                                                                   | 0.024**<br>(0.010)   | -0.000<br>(0.010)    | -0.005<br>(0.010)    | -0.015<br>(0.019)    | 0.065***<br>(0.024)  |
| Crossed by Canal                                       |                                                                   | 0.101***<br>(0.021)  | 0.112***<br>(0.024)  | 0.106***<br>(0.024)  | 0.071*<br>(0.039)    | 0.017<br>(0.037)     |
| <b>B. Demographics</b>                                 |                                                                   |                      |                      |                      |                      |                      |
| % Literate                                             |                                                                   |                      | 0.125***<br>(0.011)  | 0.107***<br>(0.011)  | 0.055***<br>(0.018)  | 0.396***<br>(0.037)  |
| % Foreigners                                           |                                                                   |                      | 0.052***<br>(0.009)  | 0.045***<br>(0.009)  | 0.028*<br>(0.016)    | -0.052***<br>(0.017) |
| Log Population                                         |                                                                   |                      | -0.032***<br>(0.009) | -0.049***<br>(0.009) | 0.077***<br>(0.016)  | -0.012<br>(0.027)    |
| $\Delta$ Log Population                                |                                                                   |                      | -0.100***<br>(0.020) | -0.105***<br>(0.020) |                      | -0.144**<br>(0.057)  |
| % Males                                                |                                                                   |                      | 0.014<br>(0.012)     | 0.007<br>(0.010)     | 0.068**<br>(0.033)   | -0.009<br>(0.036)    |
| % White                                                |                                                                   |                      | -0.115***<br>(0.008) | -0.113***<br>(0.008) | -0.043**<br>(0.021)  | -0.198***<br>(0.069) |
| <b>C. Occupational shares: Top % of Population in:</b> |                                                                   |                      |                      |                      |                      |                      |
| Public Administration                                  |                                                                   |                      |                      | 0.016*<br>(0.010)    | 0.032<br>(0.024)     | 0.035<br>(0.030)     |
| Production                                             |                                                                   |                      |                      | 0.049***<br>(0.011)  | -0.054**<br>(0.027)  | 0.164***<br>(0.029)  |
| Mining                                                 |                                                                   |                      |                      | 0.003<br>(0.011)     | -0.011<br>(0.026)    | 0.081***<br>(0.027)  |
| Commerce                                               |                                                                   |                      |                      | 0.032***<br>(0.010)  | 0.033<br>(0.023)     | 0.086***<br>(0.028)  |
| Agriculture                                            |                                                                   |                      |                      | -0.073***<br>(0.011) | -0.153***<br>(0.026) | -0.057**<br>(0.027)  |
| <b>D. Inequality</b>                                   |                                                                   |                      |                      |                      |                      |                      |
| Top 10% Property Share                                 |                                                                   |                      |                      |                      | -0.103***<br>(0.024) |                      |
| % of Enslaved Property in 1860                         |                                                                   |                      |                      |                      | -0.061**<br>(0.029)  | -0.140***<br>(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                |                      |

Notes: Columns 1-4 report the coefficients obtained by regressing the 10-year change in log property on lagged property, geography variables, demographics, occupational shares and inequality variables. Geography is taken as time-constant. Occupation shares are represented by indicator variables taking value 1 if the county is in the top quartile for such an occupation category. This specification includes both state and year fixed effects. Column 5 reports the set of coefficients coming from the regression of the change in log property between 1870 and 1930 on 1870's property and controls. Geography is time-constant. Column 6 presents the set of coefficients coming from the regression of log property in 1870 on 1860's controls.

Table A4: Correlates of Property - State Level

|                                                       | Dependent variable: Log Total Household Property Value Per Capita |                       |                       |                       |                       |                     |
|-------------------------------------------------------|-------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------|
|                                                       | (1)                                                               | (2)                   | (3)                   | (4)                   | (5)                   | (6)                 |
|                                                       | 10-Year $\Delta$                                                  | 10-Year $\Delta$      | 10-Year $\Delta$      | 10-Year $\Delta$      | 69-Year $\Delta$      | in 1870             |
| Lagged Log total Household Property Value Per Capita  | -0.206***<br>(0.0380)                                             | -0.420***<br>(0.0309) | -0.523***<br>(0.0412) | -0.544***<br>(0.0410) | -0.902***<br>(0.207)  |                     |
| <b>A. Geography</b>                                   |                                                                   |                       |                       |                       |                       |                     |
| Temperature in Coldest Month                          |                                                                   | 0.0546<br>(0.0713)    | 0.0401<br>(0.0408)    | 0.0316<br>(0.0425)    | 0.245*<br>(0.125)     | 0.440*<br>(0.213)   |
| Temperature in Hottest Month                          |                                                                   | -0.0177<br>(0.0747)   | 0.0286<br>(0.0566)    | 0.0274<br>(0.0579)    | -0.174<br>(0.155)     | -0.249<br>(0.251)   |
| Soil Net Primary Productivity                         |                                                                   | 0.172***<br>(0.0384)  | 0.116**<br>(0.0441)   | 0.112**<br>(0.0464)   | 0.141<br>(0.131)      | 0.600***<br>(0.157) |
| Elevation in meters                                   |                                                                   | 0.110<br>(0.100)      | 0.0901<br>(0.0717)    | 0.0775<br>(0.0723)    | -0.157<br>(0.213)     | 0.135<br>(0.228)    |
| Ruggedness                                            |                                                                   | -0.0809**<br>(0.0346) | -0.0290<br>(0.0295)   | -0.0283<br>(0.0300)   | 0.0992<br>(0.0970)    | -0.300**<br>(0.138) |
| Winter Precipitation                                  |                                                                   | -0.00890<br>(0.0551)  | -0.0234<br>(0.0356)   | -0.0240<br>(0.0334)   | -0.275***<br>(0.0943) | 0.168<br>(0.123)    |
| Summer Precipitation                                  |                                                                   | -0.122***<br>(0.0298) | -0.0368*<br>(0.0198)  | -0.0414*<br>(0.0222)  | -0.209**<br>(0.0934)  | -0.246**<br>(0.111) |
| Distance to Coast                                     |                                                                   | -0.00932<br>(0.0425)  | 0.00875<br>(0.0336)   | 0.0110<br>(0.0333)    | 0.0365<br>(0.0981)    | 0.295**<br>(0.115)  |
| Crossed by Canal                                      |                                                                   | -0.0342<br>(0.0354)   | 0.00416<br>(0.0346)   | -0.00241<br>(0.0354)  | -0.0227<br>(0.111)    | 0.0713<br>(0.156)   |
| Crossed by Navigated River                            |                                                                   | 0.207***<br>(0.0719)  | 0.150**<br>(0.0600)   | 0.148**<br>(0.0607)   | 0.157<br>(0.169)      | 0.567*<br>(0.273)   |
| <b>B. Demographics</b>                                |                                                                   |                       |                       |                       |                       |                     |
| Lagged Log Population                                 |                                                                   |                       | 0.00348<br>(0.0147)   | -0.000305<br>(0.0143) | -0.00658<br>(0.0517)  | 0.129*<br>(0.0710)  |
| Lagged % Literate                                     |                                                                   |                       | 0.162***<br>(0.0409)  | 0.138***<br>(0.0427)  | 0.199*<br>(0.0971)    | 0.378**<br>(0.155)  |
| Lagged % Males                                        |                                                                   |                       | 0.00530<br>(0.0440)   | 0.0179<br>(0.0457)    | -0.153*<br>(0.0741)   | -0.0867<br>(0.0743) |
| Lagged % White                                        |                                                                   |                       | -0.0529<br>(0.0345)   | -0.0447<br>(0.0353)   | -0.107<br>(0.0955)    | -0.464*<br>(0.262)  |
| Lagged % Foreigners                                   |                                                                   |                       | 0.0967***<br>(0.0300) | 0.0861***<br>(0.0319) | -0.0515<br>(0.0532)   | 0.140<br>(0.106)    |
| $\Delta$ Log Population                               |                                                                   |                       | 0.0827<br>(0.0900)    | 0.0650<br>(0.0965)    |                       | 0.283<br>(0.321)    |
| <b>C. Occupational shares: Top % of Population in</b> |                                                                   |                       |                       |                       |                       |                     |
| Lagged Agriculture                                    |                                                                   |                       |                       | -0.0429<br>(0.0273)   | -0.150<br>(0.140)     | 0.194<br>(0.158)    |
| Lagged Mining                                         |                                                                   |                       |                       | -0.0284<br>(0.0454)   | -0.0334<br>(0.194)    | 0.112<br>(0.112)    |
| Lagged Production                                     |                                                                   |                       |                       | -0.0119<br>(0.0470)   | 0.0243<br>(0.192)     | -0.0722<br>(0.141)  |
| Lagged Commerce                                       |                                                                   |                       |                       | 0.0457<br>(0.0406)    | 0.306<br>(0.218)      | -0.0663<br>(0.214)  |
| Lagged Public Administration                          |                                                                   |                       |                       | 0.0144<br>(0.0389)    | 0.160<br>(0.219)      | -0.101<br>(0.103)   |
| Observations                                          | 2,722                                                             | 2,636                 | 2,509                 | 2,509                 | 44                    | 41                  |
| Number of units                                       | 52                                                                | 48                    | 48                    | 48                    | 44                    | 41                  |
| Period Dep. Variable                                  | 1826-1940                                                         | 1826-1940             | 1860-1940             | 1860-1940             | 1939                  | 1870                |
| Adjusted $R^2$                                        | 0.51                                                              | 0.61                  | 0.66                  | 0.66                  | 0.62                  | 0.80                |
| Implied Convergence                                   | 0.023                                                             | 0.055                 | 0.074                 | 0.078                 | 0.034                 |                     |

*Notes:* Columns 1-4 report the coefficients obtained by regressing the 10-year change in log property on lagged property, geography variables, demographics and occupational shares variables. Geography is taken as time-constant. Occupation shares are represented by indicator variables taking value 1 if the county is in the top quartile for such an occupation category. This specification includes year fixed effects. Column 5 reports the coefficients presents the set of coefficients coming from the regression of the change in log property between 1870 and 1939 on 1870's property and controls. Geography is time-constant. Column 6 presents the set of coefficients coming from the regression of log property in 1870 on 1860's controls.

Table A5: Effect of Enslaved Property in 1870 on 60-Year Property Growth

| <i>Dependent variable: 60-year Growth in Property per Capita</i> |                    |                    |                    |                                  |                    |
|------------------------------------------------------------------|--------------------|--------------------|--------------------|----------------------------------|--------------------|
|                                                                  | (1)                | (2)                | (3)                | (4)                              | (5)                |
|                                                                  | Baseline           | Geography          | Demographics       | <b>Occupations</b>               | Top 10% Share      |
| Enslaved Property ( $\Psi$ )                                     | -0.260<br>( 0.072) | -0.189<br>( 0.077) | -0.187<br>( 0.090) | <b>-0.188</b><br><b>( 0.089)</b> | -0.158<br>( 0.091) |
| Property in 1870                                                 | -0.515<br>( 0.023) | -0.570<br>( 0.025) | -0.639<br>( 0.028) | <b>-0.672</b><br><b>( 0.029)</b> | -0.669<br>( 0.029) |
| <b>Controls:</b>                                                 |                    |                    |                    |                                  |                    |
| Geography                                                        |                    | X                  | X                  | <b>X</b>                         | X                  |
| Demographics                                                     |                    |                    | X                  | <b>X</b>                         | X                  |
| Occupations                                                      |                    |                    |                    | <b>X</b>                         | X                  |
| Top 10% Share                                                    |                    |                    |                    |                                  | X                  |
| Observations                                                     | 862                | 862                | 862                | 862                              | 862                |

*Notes:* This table presents the regression of the 60-Year Property Growth per capita on the share of enslaved property in the county. Column 1 is the baseline specification adding only the initial log of property per capita in 1870 as a control. Column 2 is adding geography controls: the temperature in hottest month and in coldest month, the summer precipitation, the winter precipitation, the elevation, the ruggedness, the soil net primary productivity, the distance to coast and dummies if the county is crossed by a navigated river or by a canal. Column 3 is adding demographics controls including the % of literate, the % of foreigners, the log of the population of the county, the % of males and the % of whites in the county. Column 4 is the main specification adding the occupational shares controls as top % of population in public administration, production industry, mining, commerce and agriculture sectors. Column 5 is adding the share of the total property owned by the top 10% as a final control.

Table A6: Effect of Top 10% Share of Property in 1870 on 60-Year Property Growth

| <i>Dependent variable: 60-year Growth in Property per Capita</i> |                    |                    |                    |                                  |                    |
|------------------------------------------------------------------|--------------------|--------------------|--------------------|----------------------------------|--------------------|
|                                                                  | (1)                | (2)                | (3)                | (4)                              | (5)                |
|                                                                  | Baseline           | Geography          | Demographics       | <b>Occupations</b>               | Enslaved Property  |
| Top 10%<br>Wealth Share ( $\Lambda$ )                            | -2.539<br>( 0.166) | -1.793<br>( 0.185) | -1.619<br>( 0.196) | <b>-1.861</b><br><b>( 0.195)</b> | -1.934<br>( 0.253) |
| Property in<br>1870                                              | -0.508<br>( 0.014) | -0.659<br>( 0.016) | -0.755<br>( 0.017) | <b>-0.778</b><br><b>( 0.017)</b> | -0.735<br>( 0.020) |
| <i>Controls:</i>                                                 |                    |                    |                    |                                  |                    |
| Geography                                                        |                    | X                  | X                  | <b>X</b>                         | X                  |
| Demographics                                                     |                    |                    | X                  | <b>X</b>                         | X                  |
| Occupations                                                      |                    |                    |                    | <b>X</b>                         | X                  |
| Enslaved Property                                                |                    |                    |                    |                                  | X                  |
| Observations                                                     | 1797               | 1797               | 1797               | 1797                             | 1568               |

*Notes:* This table presents the regression of the 60-Year Property Growth per capita on the share of total property owned by the top 10% at the county level. Column 1 is the baseline specification adding only the initial log of property per capita in 1870 as a control. Column 2 is adding geography controls: the temperature in hottest month and in coldest month, the summer precipitation, the winter precipitation, the elevation, the ruggedness, the soil net primary productivity, the distance to coast and dummies if the county is crossed by a navigated river or by a canal. Column 3 is adding demographics controls including the % of literate, the % of foreigners, the log of the population of the county, the % of males and the % of whites in the county. Column 4 is the main specification adding the occupational shares controls as top % of population in public administration, production industry, mining, commerce and agriculture sectors. Column 5 is adding the share of enslaved property in the county as a final control.



Table A7: Mediation of the Effect of Top 10% Share of Property in 1870 on 60-Year Property Growth

| <i>Estimated <math>\Lambda</math> from specification (4): -1.861</i> |                                                                         |                                             |
|----------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------|
| Mediators                                                            | Change in Estimated $\Lambda$ when adding mediator to specification (4) | Fraction of $\Lambda$ explained by mediator |
| Average ETR                                                          | .029                                                                    | 1%                                          |
| <i>Demographics:</i>                                                 |                                                                         |                                             |
| $\Delta$ % Literate                                                  | .456                                                                    | 18%                                         |
| $\Delta$ % Foreigners                                                | .073                                                                    | 3%                                          |
| $\Delta$ Log(Population)                                             | .003                                                                    | 0%                                          |
| $\Delta$ Males                                                       | .007                                                                    | 0%                                          |
| $\Delta$ White                                                       | .005                                                                    | 0%                                          |
| <i><math>\Delta</math> Top 10% of Population in:</i>                 |                                                                         |                                             |
| Public Administration                                                | .017                                                                    | 1%                                          |
| Production                                                           | -.007                                                                   | 0%                                          |
| Mining                                                               | -.025                                                                   | -1%                                         |
| Commerce                                                             | -.005                                                                   | 0%                                          |
| Agriculture                                                          | .112                                                                    | 4%                                          |

*Notes:* This table presents the mediation analysis of the effect of Top 10% Share of Property on 60-Year property growth. We use the baseline specification (4) on the table above that include controls for geography, demographic and occupational shares, we determine the effect of adding several controls for differences in covariates. We sequentially add mediator variables from the vector of differences in covariates  $\mathbb{Z} = \{Z_1, Z_2, \dots, Z_n\}$ , and repeat this operation  $x$  times, taking a random sequence of the variables in the vector  $\mathbb{Z}$ . For each variable  $Z_j \in \mathbb{Z}$ , we measure the importance of its mediating effect of  $\Lambda$  by computing for each sequence the change in estimated  $\Lambda$  between the specification just before  $Z_j$  is introduced and the one in which  $Z_j$  is introduced, and we average this change in estimated  $\Lambda$  over all  $x$  sequences.

## II. Institutional and Historical Appendix

### II.1. History.

**Property taxes in history.** There is evidence on land taxation in Egypt by already 3000BC which were levied in kind (i.e., agricultural product) rather than in cash ([McGregor \(1956\)](#) p.265) and in Greece as early as around 600BC ([Seligman \(1890\)](#) and [Walker \(1984\)](#) p.265). The Roman Empire seems to have attempted a general property tax without much success, reverting to land taxes ([Walker \(1984\)](#) p.265). The Danegeld was the first system of land taxation since the fall of the Roman Empire. First levied by King Aethelred of England to pay off viking invaders, it had by 1014 become “a nationwide tax, collected on the systemic basis for the maintenance of a foreign fleet.” ([Cohen \(2018\)](#) p.20 ). In 18th and 19th century England, the Land Tax was a major financing tool for government.

**Principles.** [Jensen \(1931\)](#) pp. 101 writes that “The law may at one time provide that all persons shall pay taxes; at other times, that all property shall be taxed; frequently both provisions occur. It was evidently not always clear whether the general property tax was a tax on all persons according to the value of their property or a tax on all property, regardless of ownership. In fact, it is a combination of both.”

**The early 1800s** As a result of the 1842 recession, many states adopted constitutional provisions limiting or altogether prevent the use of public funds to invest in private corporations, and restricting public debt. See for instance the "Stop and Tax" policy in New York to ban state borrowing for internal improvement and preventing the state from investing in corporations following the economic collapse of 1837 ([Einhorn \(2008\)](#) p. 221. See [Fisher \(1996\)](#) pp. 51-56 for case studies of Ohio and Illinois after 1840. [Lamoreaux and Wallis \(2017\)](#) describe how this crisis in public finance led to the idea that laws should be general, contrary to the system of special laws prevailing until then.

**Criticisms of the property tax in the early 1900s.** Economists led the charge and were at the forefront of proposals for reforms to the GPT (see [Seligman \(1890\)](#); [McPherson \(1907\)](#) for a summary of criticism, and [Ely \(1888\)](#); [Jensen \(1931\)](#); [Bullock \(1916b\)](#); [Lutz \(1921\)](#) for reviews and reform proposals. Another popular proposal was a single tax on land championed by [George \(1882\)](#). Another criticism levied against the property tax was that the size of the administrative districts were small, which facilitated tax sheltering and rendered the valuation of property crossing jurisdictions (such as shares in the rail-

roads) difficult. In Boston, the inclusion of Roxbury and Dorchester in 1868 and 1870 led nonetheless to the migration of wealthy elites as tax rates were increased, and Boston was derided by contemporaries as “the heaviest taxed city in civilization.” See also the debate over classification in Boston between David A. Wells (in favor of taxing real estate only) and Thomas Hill, described in [Maggor \(2017\)](#), in particular pp. 74-95.

## II.2. Tax base.

Some states specifically required that both people and corporations were subject to the property tax (Illinois, Idaho, Nebraska, Utah, Washington). It was common for state constitutions to have a provision requiring that all property should be taxed (e.g. in New Hampshire, Arizona, Wyoming, California, Texas, Utah, Virginia, and Washington) or specifically require that corporate property be included in the tax base for property taxation (e.g. Arkansas, Colorado, Georgia, Louisiana, among others), see [Jensen \(1931\)](#) pp. 101-103).

Provisions for double taxation of corporate assets: No state required both the owner side and the corporate side to be taxed for the same asset. [Jensen \(1931\)](#) p. 122-124. For instance, Pennsylvania valued and taxed the capital stock owned by corporations, and exempted holders from paying taxes on their shares. On the contrary, Maryland required corporations to report resident shareholders and taxed them on the value of their bonds and stocks. ([Jensen \(1931\)](#) pp. 190-194). Commercial banks were often taxed separately and taxed on the value of the shares ([Jensen \(1931\)](#) p. 206).

Specific provisions allowed the deduction of debt and mortgages from the property tax base so that the assets they finance were not double counted. At least eighteen states allowed the deduction of debt from the taxpayer’s solvent credits in 1931 (Arizona, Arkansas, Colorado, Connecticut, Illinois, Indiana, Kansas, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New Mexico, North Carolina, South Carolina, Texas, Utah, and West Virginia), and all states exempted debts from securities of the federal government or a state’s own bonds. To prevent taxpayers from artificially declaring large debts, all states restricted the privilege of deduction to “debts owing in good faith”, and usually further restricted the category of deductible debts. For instance, West Virginia prevented the deduction of contingent liabilities ([Jensen \(1931\)](#) p. 116). The nature of mortgage deductions varied from state to state. In 13 states, the lender of a mortgage was liable to the property tax on the mortgage value while mortgagors could deduct its amount from the value of land. In other states, borrowers were liable to the property tax and lenders could deduct the value of the mortgage from personal property. See [U.S. Census Bureau \(1902\)](#)

pp. 622-623 for more details.

### **II.3. Tax administration.**

In [U.S. Census Bureau \(1902\)](#) (p. 617) it is stated that "In general, the state laws leave wide discretionary powers to the local governments as to matters relating to taxation, but in each state there are some statutory provisions of a general character intended to bring about uniformity in the levy and collection, even of local taxes, within the state." There were also local legislative bodies at the city or county level whose role was to adjust differences in individual assessments by local assessors, and hear appeals. It is unclear whether these bodies had any prerogative to adjust the definition of what counts as property or other parameters. These documents – such as city charters or ordinances– have never been reviewed by any of the sources we identified. Taxes were collected on a tax day. The property tax was levied at the place and at the value it has on a specific day of the year. Loss of value or changes in location during the year were not recognized until tax day of the next year. There were early exceptions to this rule for property subject to manipulation for tax avoidance or to avoid obvious inequities. For instance, merchants' and manufacturers' inventories were made on the basis of average values rather than on a specific day.

Wealth, debt, and taxation.(p. 617), "In general, the state laws leave wide discretionary powers to the local governments as to matters relating to taxation, but in each state there are some statutory provisions of a general character intended to bring about uniformity in the levy and collection, even of local taxes, within the state."

## **III. Data Appendix**

### **III.1. Census (IPUMS USA Full Count) Data at the County and State Level**

We construct wealth series at the county and state levels using the IPUMS USA Full Count data ([Ruggles et al., 2021a](#)) for 1850, 1860, and 1870. In these years the Census asked about real estate and Personal Wealth (only in 1860 and 1870) of households. In 1870, Marshalls were instructed to include "all bonds, stocks, mortgages, notes, live stock, plate, jewels, or furniture" in ersonal wealth, but exclude "wearing apparel". Real estate was supposed to be reported "without any deduction on account of mortgage or other incumbrance, whether within or without the Census subdivision or the county. The value meant is

the full market value, known or estimated.” In 1860, the instructions were similar for personal wealth: it was meant to include “all the property, possessions, or wealth of each individual which is not embraced in the column previous [real estate], consist of what it may; the value of bonds, mortgages, notes, slaves, live stock, plate, jewels, or furniture; in fine, the value of whatever constitutes the Personal Wealth of individuals.” In 1860 and 1870, the elicited measures of wealth are thus supposed to encompass most of real and Personal Wealth. In 1860, Personal Wealth also includes wealth from enslaved people (which is not reported as a separate category).

**Censoring and top-coding.** Personal wealth is censored from below at \$100 in 1870. There is no such bottom censoring in 1850 and 1860. In 1850, 1860, and 1870 there is top-coding at \$999997 for both personal and real wealth separately.

**Imputing personal wealth in 1850.** In 1850, only real wealth is reported. We thus need to impute Personal Wealth. We do this by assuming that the ratio between personal wealth and real wealth is constant between 1850 and 1860 at the county level. If  $c$  is a county and  $W_{c,1860}^{real}$  is the real wealth in the county in 1860,  $W_{c,1860}^{pers}$  is the personal wealth in the county in 1860, we consider the ratio between personal and real wealth:

$$\rho_{c,1860} = \frac{W_{c,1860}^{pers}}{W_{c,1860}^{real}}, \quad \rho_{c,1850} = \frac{W_{c,1850}^{pers}}{W_{c,1850}^{real}} \quad (1)$$

We consider that this ratio is constant over time :  $\rho_c = \rho_{c,1860} = \rho_{c,1850}$ . With available IPUMS USA full count data, we are able to compute  $\rho_c = \rho_{c,1860}$ , and then to retrieve:

$$W_{c,pers}^{1850} = \rho_{c,1850} * W_{c,real}^{1850} = \rho_c * W_{c,real}^{1850}$$

This allows us to impute personal wealth at the county level in 1850. To obtain state-level wealth, we simply aggregate county-level wealth up to the state level.

**Appending IPUMS USA Full count data data to the assessed property data at the county level.** The IPUMS USA Full count-derived wealth data at the county level for 1850 and 1860 is appended to our tax series which start in 1870 at the county level (see Section 3). We thus rescale these series in order to be consistent with the state-level tax derived data. If  $s$  is a state and  $c$  is a county in state  $s$ , we write  $w_{c,t}$  the total wealth in county  $c$  in year  $t$ , and  $W_{s,t}$  the total property in state  $s$ . We define the ratio

$$\rho_{s,t} = \frac{W_{s,t}}{\sum_{c \in s} w_{c,t}} \quad (2)$$

Which is the correction ratio. If it is greater than 1 it means that state level property is greater than the aggregation of its counties wealth, and that we have to correct our IPUMS USA Full Count county series upwards. We hence define

$$\widetilde{w}_{c,t} = \rho_{s,t} * w_{c,t} \quad (3)$$

The corrected wealth at the county level. Now if we add up  $\widetilde{w}_{c,t}$  for all counties in state  $s$ , we find  $W_{s,t}$  which makes the series consistent. We therefore consider our new series  $\widetilde{w}_{c,t}$  as our base series for 1850 and 1860.

Figure A13 shows private wealth from the IPUMS USA Full Count raw data series at the state level and Figure A14 shows private wealth at the county level between 1850 and 1870.

### III.2. Value of wealth from enslaved people

**Prices of enslaved people.** The literature provides a wide range of estimates for the market price of an enslaved person. [Piketty and Zucman \(2014\)](#) use prices of \$800 for 1850 and \$1000 for 1860. [Einhorn \(2008\)](#) estimates the prices to be \$401 in 1850 and \$774 in 1860, based on three-year moving average of the estimations of [Ransom and Sutch \(1988\)](#), p. 150, who give a close estimate of \$377 and \$778. [Philipps \(1966\)](#) estimates a higher price of \$958 in 1860. Our tax-derived data series which comes from [U.S. Census Bureau \(1870\)](#) gives an average price of \$250 for 1850 and \$420 for 1860. Those values were estimated by [Goldsmith \(1952\)](#), p. 317 and [U.S. Census Bureau \(1870\)](#) (Nota Bene p. 8). There are good reasons to believe that those prior estimations of wealth from enslaved people were under-estimated ([U.S. Census Bureau \(1870\)](#), p. 8, and [Piketty and Zucman \(2014\)](#), p. 63 of Appendix).

Table A8: Prices Estimates of Enslaved Persons 1810-1860

| Series | <a href="#">U.S. Census Bureau (1870)</a> | <a href="#">Piketty and Zucman (2014)</a> | <a href="#">Einhorn (2008)</a> | <a href="#">Ransom and Sutch (1988)</a> |
|--------|-------------------------------------------|-------------------------------------------|--------------------------------|-----------------------------------------|
| 1810   | -                                         | 500                                       | 265                            | 277                                     |
| 1850   | 250                                       | 800                                       | 401                            | 377                                     |
| 1860   | 420                                       | 1000                                      | 774                            | 778                                     |

Notes: Column 3 ([Einhorn, 2008](#)) corresponds to a 3-year average of [Ransom and Sutch \(1988\)](#).

States do not typically separately report their property from enslaved people in their annual state reports. The exceptions are Georgia (from 1860 to 1864) and Texas (from 1846 to 1861 and in 1864). Those property values imply an enslaved person price of \$306 and

\$584 in Texas in 1850 and 1860, and \$655 in Georgia in 1860. The figures are higher than the enslaved price estimates from [U.S. Census Bureau \(1870\)](#), but still somewhat lower than those in [Einhorn \(2008\)](#).

To get a sense of possible bounds on the price of enslaved people, Figure [A9](#) shows the distribution of the implied price per enslaved person in 1850 and 1860 under three hypothetical scenarios, namely that wealth from enslaved people represents i) 100%, ii) 50%, or iii) 20% of Personal Wealth measured in the Census for Southern states. The prices by [Einhorn \(2008\)](#) which we use seem reasonable given these distributions. The prices implied in the tax data of \$250 for 1850 and \$420 for 1860 appear indeed too low, given that wealth from enslaved people was a significant share of Personal Wealth in Southern states.

**Computing wealth from enslaved people.** We will generically use the number of enslaved people from [Haines et al. \(2010\)](#) and multiply it by a given price for each year (1850 and 1860). We call this variable *Val. Enslaved*. To obtain the series of private wealth excluding wealth from enslaved people, we do the following for years 1850 and 1860:

1. For the state IPUMS USA Full Count series: we subtract the value of enslaved people at the state level from reported private wealth.
2. For the state tax-based data: we first subtract an estimate of the value of enslaved people as given by tax assessors before adding back the value of enslaved people *Val. Enslaved*.
3. For the county IPUMS USA Full Count series (which are our only data for 1850 and 1860), we subtract *Val. Enslaved*.

In some counties, sometimes, total Personal Wealth is below value of enslaved wealth, if we use the Einhorn prices of enslaved people. In 1860, this occurs in 3.2% of counties, or 6.0% of counties that held enslaved persons. In a total of 4.9% of counties, wealth from enslaved people is more than 90% of Personal Wealth using the Einhorn prices. Those counties are mainly located along the Mississippi river and South Carolina. We cap *Val. Enslaved* at the total value of Personal Wealth in each county. Figure [A17](#) shows the share of wealth from enslaved people at the county and state levels obtained for each of the three series (1-3).



### III.3. State Level property data

#### III.3.1. General approach for the construction of assessment ratios and market value of wealth

**Assessed value of property.** For each state, we start from a harmonized series measuring the total assessed value of property compiled from State reports (mainly reports from the Auditor, the Board of Equalization, or the State Tax Commission), the Census *Wealth, Debt, Taxation* publications, and *Financial Statistics of States* series. Table A11 provides a list of the sources for the assessed property measures for each state. We reconstructed a measure of total assessed property value typically since around after statehood to 1930. When multiple sources were available, we prioritized assessed values reported in the Financial Statistics of States and State reports.

In very few cases (128 observations out of 3,409), when no other information was available, we estimated the assessed value of property using information on the tax rate and the revenue of the general property tax. More precisely, we use the identity:  $\tilde{W}_{it} = \frac{R_{it}}{\tilde{\tau}_{it}}$  where  $\tilde{W}_{it}$  indicates the assessed value of property in state  $i$  and year  $t$ ,  $R_{it}$  the property tax revenue, and  $\tilde{\tau}_{it}$  the tax rate on assessed property value. We excluded estimates of assessed value of property coming from this computation for the following States and years, as we could not cross-verify their accuracy and they were an order of magnitude different from valuations provided by either State reports or Census reports in neighboring years: Iowa (1919), Indiana (1904), Maryland (1841 - 1844, 1899), Missouri (1920), New Jersey (1891 - 1894), New Mexico (1913), New York (1842 - 1845), Rhode Island (1878-1879), Utah (1911), Virginia (1866). We also excluded the assessed value for Vermont in 1920 (from State reports, inconsistent with the series from the Financial Statistics of States for 1915 - 1939 ).

Next, we estimate the total value of private property by constructing an annual assessment ratio for each state. This assessment ratio is the ratio of assessed to market value of property. We systematically collected information on the assessment ratio using (i) the assessment ratio calculations done by the Census Bureau over the period 1850 - 1922 in the *Wealth, Debt, Taxation* reports; (ii) State reports; (iii) secondary sources (especially Jensen (1931)) and the proceedings of the National Tax Association conferences from 1907 to 1925).

**Assessment ratios.** Importantly, we collected information on assessment ratios given by state tax officials between 1915-1930, but given their self-reported nature and the Census characterization of these ratios as being “only approximately correct” (Census 1921, p.



21), we only use them in special cases to validate our estimates from other sources, as detailed for each state in Section III.3.2.

Our approach to construct annual assessment ratios for each state from this information is the following

1. Start from the Census ratios available about one year every decade from 1850 to 1920, and linearly interpolate in between them.<sup>1</sup>
2. Add information on assessment ratios used in practice provided by State reports, in the legislation, and secondary sources, which are due to changes in the assessment basis used by assessors. This information helps us better identify the timing of changes in assessment ratios. For instance, suppose that for state  $s$ , the Census provides an assessment ratio of value  $a_1^s$  in 1890 and of value  $a_2^s$  in 1900. We check the legislation and secondary sources for state  $s$  and find out that there was a legislation related to property tax enforcement in 1896. We will thus be able to infer that the value of the assessment ratio changed from  $a_1^s$  to  $a_2^s$  in 1896 (rather than assuming that this change happened in 1900, the first year in which we see the new assessment ratio). Many times, we can validate the timing by noting that there are sharp breaks in the assessed values of property exactly in the same year as the legislation.
3. If there are remaining breaks in the time series of assessed property per capita for which we cannot find any explanation in State reports, legislations and secondary sources used in (2), we adopt the following procedure. Suppose the assessment ratios constructed by the Census are different in  $t$  and  $t + 1$  (i.e., in the decadal publications) and equal to  $a_t = a_1$  and  $a_{t+10} = a_2$  respectively. If we see a break in the series of assessed property in  $t + x$  where  $x \leq 10$ , we assume that the change in assessment ratio from  $a_1$  to  $a_2$  happened in year  $t + x$ , so that we set  $a_n = a_1$  for  $t \leq n < t + x$  and  $a_n = a_2$  for  $t + x \leq n \leq t + 10$ .
4. For the remaining breaks in the assessed values, when we observe a break in the assessed property series, but find no other information, we apply state-by-state adjustments based on information from self-reported assessment ratios by tax assessors in the Census *Financial Statistics of States*. However, given the self-reported nature of

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<sup>1</sup>For 1880 and 1902, the Census did not construct an estimated true value of property from which we can obtain an implicit assessment ratio. Rather, they only provide a tax rate on the true property value. As this number is less precise, we only use it for states in 1880 and 1902 where we have no other information available. This is detailed for each state in Section III.3.2.

this information, we only use it to infer changes in assessment ratio trends, but do not trust the levels reported.

**Computing wealth from enslaved people and correcting for the under-valuation of wealth from enslaved people at the state level.** There is evidence that the assessments of wealth from enslaved people for property tax purposes were under-estimate( [U.S. Census Bureau \(1870\)](#), p. 8, and [Piketty and Zucman \(2014\)](#), p. 63 of Appendix.). Therefore, we want to correct these assessed values using actual market prices. We use the prices from [Einhorn \(2008\)](#) which are \$401 in 1850, \$774 in 1860. We multiply these by the number of enslaved people at the county level from ([Haines et al., 2010](#)) and at the state level from ([Gibson and Jung, 2002](#)). Section [III.1](#) describes these constructions in more detail.

We also need to first subtract the (underestimated) value of wealth from enslaved people from the tax-assessed wealth. To do so, we use an estimate of the implicit price per enslaved person at the Federal level. More precisely, we use the total federal values of enslaved person derived from [Goldsmith \(1952\)](#), p. 317 for 1850 and [U.S. Census Bureau \(1870\)](#), p. 8 for 1860. [Goldsmith \(1952\)](#) provides an estimate of wealth from enslaved people of \$0.8 billion in 1850, which implies an averages price of \$250 per enslaved person, using enslaved people counts from ([Gibson and Jung, 2002](#)). For 1860, the implied price is \$420 in [U.S. Census Bureau \(1870\)](#).

This approach assumes that the price of enslaved people was the same across states in a given year. This is not the case in practice. For Georgia in 1860 and Texas in 1850 and 1860, the tax data contains the wealth from enslaved people separately. If we use the actual number of enslaved people in these two states from the Census, we obtain an implicit price used by tax of \$306 and \$584 in Texas in 1850 and 1860, and \$655 in Georgia in 1860, which is lower than the estimates from Einhorn. Yet, it seems important to correct for the undervaluation of wealth from enslaved people in the tax assessment data.

We also have alternative sources of prices, as described in Appendix Section [III.2](#), especially on Table [A8](#) which we can use for robustness instead of the prices in [Einhorn \(2008\)](#). Figure [A20](#) shows the state-level wealth using these alternative prices. The picture remains similar in terms of the spatial distribution and time trends.

### **III.3.2. State-by-state information on assessment ratios**

This section describes in more detail the construction of assessment ratios for each state. We also depict the time series of assessed wealth, assessment ratios, and the market value of property in each state.

## **Alabama**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, and 1904 - 1912
- Use 1880 Census ratio for 1871 - 1886
- Use 1890 Census ratio for 1887 - 1893
- Use 1900 Census ratio for 1894 - 1900
- Use 1912 Census ratio for 1912 - 1919
- Use 1922 Census ratio for years 1920 and later

## **Alaska**

- Use 60% assessment ratio indicator in State records (Survey of Taxation 1938, page 31)

## **Arizona**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, and 1890 - 1900
- Use 1900 Census ratio for 1900
- Use average of 1900 and 1904 Census ratio for 1901 - 1903
- Use 1904 Census ratio for 1904
- Use 25% assessment ratio for 1905 - 1911
- Use 1912 Census ratio for 1912
- Use 1922 Census ratio for 1913 - 1922
- Use 1922 Census ratio for years post 1922

## Arkansas

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, and 1904 - 1912
- Use 1912 Census ratio for 1912 - 1921
- Use 1922 Census ratio for years 1922 and later

## California

- Use 1860 Census ratio for years 1860 and earlier.<sup>2</sup>
- Linearly interpolate between Census ratios for 1860 - 1870, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1870 Census ratio for 1870 - 1871
- Use higher assessment basis from the 1860 Census ratio in 1872 to account for changes in assessment methods following the creation of the Board of Equalization as noted in the reports of the Board of Equalization in 1873 (pp. 4-5) and 1880 (p. 10).
- Linearly interpolate between 1872 and 1880 Census ratio
- Use 1922 Census ratio for years 1922 and later

## Colorado

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios between 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1902 - 1904, and 1904 - 1912
- Use 1900 Census ratio for 1900 - 1901
- Use 1922 Census ratio for 1913 - 1922
- Use 1922 Census ratio for years 1922 and later

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<sup>2</sup>We rely on the 1860 Census ratios instead of 1850 as the wealths estimates of 1850 underestimated the value of wealth in California compared to the assessed valuation.

## Connecticut

- Use 6% assessment ratio used in 1808 to report full assessed values in the tax list<sup>3</sup> for year 1790 - 1820.
- Use 4.4% assessment ratio for 1821 - 1827, Use 4% for 1828 - 1844, and 3.6% for 1845<sup>4</sup>
- Use 1850 Census ratio for 1850 and linearly interpolate assessment ratio between 1846 and 1850
- Linearly interpolate between 1850 and 1861 using 1850 and 1860 Census ratios, and following the same trend for 1861
- Use 1870 census ratio for 1862 - 1870, following change to the legal basis of assessment (reporting of full value of property in the grand list in 1862)
- Linearly interpolate between Census ratios for 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for years 1922 and later

## Delaware

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1904 - 1912<sup>5</sup>, and 1912 - 1922
- Use 1904 Census ratio for 1901 - 1911
- Use 1922 Census ratio for years 1922 and later

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<sup>3</sup>Connecticut had a particular system whereby assessors were asked to estimate property at its full cash value, but report a percentage of this value into a grand list to be used as tax base. The 1808 Statutes of Connecticut, Title 102, Chapter 1, Section 14, reports that 6% of the full cash value of intangible were to be reported in the grand list (as quoted in the State Tax Commission of 1922, p. 54).

<sup>4</sup>We chose these ratios to account for (i) discontinuous drops in aggregate valuation of property in the grand list at these threshold years, (ii) the decline in assessment ratios between 1808 (6% as indicated by State records) and 1850 (3% as estimated in Census reports).

<sup>5</sup>We ignore the 1902 Census ratio as it is inferred from tax rates therefore less precisely estimated, and its value is widely different from the 1904 Census ratio

## **District of Columbia**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1904, and 1904 - 1912
- Use 1912 Census ratio for 1912 - 1921
- Use 1922 Census ratio for years 1922 and later

## **Florida**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1904 - 1912, and 1912 - 1922
- Use 1900 Census ratio for 1900 - 1901, 1902 Census ratio for 1902, and 1904 Census ratio for 1903 - 1904
- Use 1922 Census ratio for years 1922 and later

## **Georgia**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1860 Census ratio for 1860 - 1864
- Use 1870 Census ratio for 1865 - 1874
- Use 1880 Census ratio for 1875 - 1880
- Use 1921 ratio in the Financial Statistics of States for 1921
- Use 1922 Census ratio for years 1922 and later

## **Hawaii**

- Use 1930 ratio in the Financial Statistics of States throughout (the Census Wealth, Debt, Taxation reports did not estimate the property of Hawaii)

## **Iowa**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 - 1932, and 40% ratio for years 1933 - 1940

## **Idaho**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, and 1912 - 1922
- Use 1890 Census ratio for 1890 - 1898
- Use 1900 Census ratio for 1899 - 1900
- Use 1904 Census ratio for 1901 - 1906
- Use 30% assessment ratio for 1907 - 1910
- Use 1912 Census ratio for 1911 and 1912
- Use 1922 Census ratio for years 1922 and later

## **Illinois**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1880 - 1890, 1890 - 1900, 1900 - 1902, and 1902 - 1904
- Use 1870 Census ratio for 1870 - 1872
- Use 50% assessment ratio in 1873 and a linear interpolation with the 1880 Census ratio for 1874 - 1880 (to match the sudden jump in assessed valuation in 1873)
- Use 1904 Census ratio for 1904 - 1908
- Use 1912 Census ratio for 1909 - 1919
- Use 22% assessment ratio for 1920 - 1921

- Use 1922 Census ratio for 1922 - 1927
- Use 40 % assessment ratio for 1928 - 1921, and 33% for 1932 - 1940

## Indiana

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1900 - 1902, 1902 - 1904, and 1904 - 1912
- Use 1900 Census ratio for 1891 - 1900
- Use 1912 Census ratio for 1912
- Use 25% ratio in 1918 based on State reports<sup>6</sup> and linear interpolation between 1912 and 1918
- Use 1922 census ratio for 1919 - 1922
- Use 1922 Census ratio for years 1922 and later

## Kansas

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, and 1890 - 1900
- Use 1900 Census ratio for 1900, 1902 Census ratio for 1901 - 1902, and 1904 Census ratio for 1903 - 1904
- Use 16.5% ratio for 1905 - 1907<sup>7</sup> and 80% assessment ratio for 1908<sup>8</sup>
- Use 1922 Census ratio for 1922 - 1932, and 40% ratio for years 1933 - 1940

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<sup>6</sup>The State Tax Commission of 1918 estimated that the assessment of property varied across the State, but gave plausible estimates ranging from 10%, 25%, and 40% for real property. We use the middle range estimate of 25%. See for reference the discussion pp. 122-123.

<sup>7</sup>cf Proceedings of 1908 National Tax Association conference reported in its digest, p. 225.

<sup>8</sup>Reform of the basis of assessment in 1908 cf Jensen (1931) p. 473, the Wealth Debt Taxation 1912 estimated the new assessment ratio to be around 80% (see p. 20)



## **Kentucky**

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1904 - 1912
- Use 1880 Census ratio for 1880 - 1886
- Use 1890 Census ratio for 1887 - 1899
- Use 1900 Census ratio for 1900 -1901, 1902 Census ratio for 1902, and 1904 Census ratio for 1903 - 1904
- Use 1912 Census ratio for 1912 - 1914, 55% for 1915 - 1917, and 66% for 1918
- Use 1922 Census ratio for 1912 - 1922 and later years

## **Louisiana**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- Use 1912 Census ratio for 1912 - 1919
- use 50% ratio for 1920 - 1921 (in line with Financial Statistics of States)
- Use 1922 Census ratio for 1922 and later years

## **Maine**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 and later years

## **Maryland**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 and later years

## **Massachusetts**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 and later years

## **Michigan**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- Use 1850 Census ratio for 1850 - 1852
- Use 1860 Census ratio for 1853 - 1860
- Use 1912 Census ratio for 1912 - 1916
- Use 1922 Census ratio for 1917 - 1922
- Use 1922 Census ratio for 1922 and later years

## **Minnesota**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1860 - 1870, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- Continue 1860 - 1870 trend in assessment ratio for years 1870-1872

- Use 1890 Census ratio for 1874 - 1890
- Use 1900 Census ratio for 1900 -1901
- Use 1912 Census ratio for 1912 - 1920
- Use 1922 Census ratio for 1921 and later years

### **Mississippi**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 25% assessment ratio for 1915 - 1916 (Financial Statistics ratio for 1915)
- Linearly interpolate between 1912 - 1915
- Use 1922 Census ratio for 1917 - 1922
- Use 1922 Census ratio for 1922 and later years

### **Missouri**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- Use 1870 Census ratio for 1861 - 1870
- Use 1912 Census ratio for 1912 - 1920, 33.6% ratio for 1921 (Financial Statistics 1918), and 1922 Census ratio for 1922
- Use 1922 Census ratio for 1922 and later years

### **Montana**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1912
- Use 1922 Census ratio for 1920 - 1922
- Use 1922 Census ratio for 1922 and later years

## **Nebraska**

- Use 1860 Census ratio for 1860 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1904 - 1912
- Use 1900 Census ratio for 1900 - 1903
- use 1912 census ratio for 1912 - 1919
- Use 16% ratio in 1920
- Use 1922 Census ratio for 1921 and later years

## **Nevada**

- Use 1870 Census ratio for 1870 and earlier years
- Linearly interpolate between Census ratios for 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1921 - 1922
- Use 1922 Census ratio for 1922 and later years

## **New Hampshire**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, and 1912 - 1922
- Use 1904 Census ratio for 1901 - 1911
- Use 1922 Census ratio for 1922 and later years

## **New Jersey**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 and later years

## **New Mexico**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1890 - 1900, 1904 - 1912
- Use 1880 Census ratio for 1880
- Use 1870 Census ratio for 1870 - 1879 and 1881 - 1882
- Use 1890 Census ratio for 1883 - 1890
- Use 1904 Census ratio for 1901 - 1904
- Use 1912 Census ratio for 1912 - 1915 and 55% for 1916 - 1921
- Use 1922 Census ratio for 1922 and later years

## **New York**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1904 - 1912, and 1912 - 1922
- Use 1902 Census ratio for 1902 - 1902
- Use 1922 Census ratio for 1922 and later years

## **North Carolina**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902
- Use 1904 Census ratio for 1903 - 1904
- Linearly interpolate between 1904 - 1912, and continue trend until 1919, use 80% ratio in 1920 instead of full value basis in State reports.
- Use 1922 Census ratio for 1920 - 1922
- Use 1922 Census ratio for 1922 and later years

## North Dakota

- Use 1890 Census ratio for 1890 or earlier years
- Linearly interpolate between Census ratios for 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- Use 1912 Census ratio for 1912 - 1919
- Use 1922 Census ratio for 1920 - 1922
- Use 50 % ratio for 1923 or later years (ratio estimated by the Board of Equalization in 1932, page 95)

## Ohio

- Use 1850 Census ratio for 1847 - 1849, and 33% ratio for 1846 or earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1902 - 1904, 1904 - 1910<sup>9</sup>, and 1912 - 1922
- Use 1900 Census ratio for 1901
- Use 1912 Census ratio for 1911
- Use 1922 Census ratio for 1922 and later years

## Oklahoma

- Use 1890 Census ratio for 1890 and earlier years
- Linearly interpolate between Census ratios for 1890 - 1900, 1900 - 1904
- Continue trend of decline in assessment between 1890 - 1900 during 1905 - 1907: 17% in 1905, 14.5% in 1906, 11% in 1907
- Continue trend of decline in assessment between 1890 - 1900 during 1908 - 1912 after reform towards use full cash basis for assessment: 51.5% in 1908, 49% in 1909, 46.5% in 1910, 44% in 1911
- Use 1912 Census ratio for 1912 - 1918
- Use 1922 Census ratio for 1919 and later years

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<sup>9</sup>One-third valuation basis cf WDT 1912 Assessed Valuation 1860 - 1912.pdf p. 28.

## **Oregon**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1904, and 1912 - 1922
- Use 40% ratio for 1905 - 1908
- Use 1912 Census ratio for 1909 - 1912
- Use 1922 Census ratio for 1922 and later years

## **Pennsylvania**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 and later years

## **Puerto Rico**

- No information on assessment ratio: use conservative estimate of full assessment ratio.

## **Rhode Island**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1880 - 1890, 1890 - 1900, 1900 - 1904, and 1912 - 1922
- Use 1880 Census ratio for 1871 - 1880
- Use 1912 Census ratio for 1909 - 1912 and 60% ratio for 1905 - 1908
- Use 1922 Census ratio for 1922 and later years

## **South Carolina**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1922 Census ratio for 1922 and later years

## **South Dakota**

- Use 1890 Census ratio for 1890 and earlier years
- Linearly interpolate between Census ratios for 1890 - 1900, 1900 - 1904, 1904 - 1912
- Use 75% ratio for 1913 - 1918 (Financial Statistics ratio for 1915), and 80% ratio for 1919 - 1920 (Financial Statistics ratio for 1918)
- Use 1922 Census ratio for 1921 and later years

## **Tennessee**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- uUse 1860 Census ratio for 1860 - 1864
- Use 1870 Census ratio for 1865 - 1870
- Extrapolate declining trend 1904 - 1912 for 1913 - 1919
- Use 60% ratio in 1920 - 1921 (Tax Commission 1922, p. 28 about Legislation of 1919)
- Use 1922 Census ratio for 1922 and later years

## **Texas**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, 1890 - 1900, 1900 - 1902, 1902 - 1904



- Use 1904 Census ratio for 1904 - 1907
- Use 1912 Census ratio for 1908 - 1921
- Use 1922 Census ratio for 1922 and later years

## **Utah**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1900 - 1904, and 1904 - 1912
- Use 1880 Census ratio for 1880 - 1886
- Use 1890 Census ratio for 1887 - 1893
- Use 1900 Census ratio for 1894 - 1900
- Extrapolate trend 1904 - 1912 during 1913 - 1915
- Use 50% assessment ratio for 1916 - 1920 (Financial Statistics 1915)
- Use 1922 Census ratio for 1921 and later years

## **Vermont**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912, and 1912 - 1922
- Use 1870 Census ratio for 1870 - 1889
- Use 1890 Census ratio for 1890
- Use 1922 Census ratio for 1922 and later years

## **Virginia**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1880 - 1890, 1890 - 1900, 1904 - 1912, and 1912 - 1922
- Use 1870 Census ratio for 1870 - 1877
- Use 1880 Census ratio for 1878 - 1880
- Use average of 1900 and 1904 Census ratios for 1901 - 1903
- Use 1912 Census ratio for 1912 - 1921
- Use 1922 Census ratio for 1922 and later years

## **Washington**

- Use 1860 Census ratio for 1860 and earlier years
- Linearly interpolate between Census ratios for 1860 - 1870, 1870 - 1880, 1880 - 1890, 1900 - 1902, 1902 - 1904, and 1912 - 1922
- Use 1900 Census ratio for 1891 - 1900
- Use 1904 Census ratio for 1904 - 1905
- Use 1912 Census ratio for 1906 - 1912
- Use 1922 Census ratio for 1922 and later years

## **West Virginia**

- Use 1870 Census ratio for 1870 and earlier years
- Linearly interpolate between Census ratios for 1870 - 1880, 1890 - 1900, and 1900 - 1904.
- Use 1880 Census ratio for 1880 - 1884
- Use 1890 Census ratio for 1885 - 1890
- Extrapolate 1900 -1904 trend for 1905

- Linearly interpolate between 1905 (60% following creation of a Tax Commission<sup>10</sup>) and 1912 Census ratio
- Use 1912 Census ratio for 1912 - 1917
- Use 1922 Census ratio for 1918 and later years

## **Wisconsin**

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1850 - 1860, 1860 - 1870, 1870 - 1880, 1880 - 1890, and 1890 - 1900, 1900 - 1902, 1902 - 1904, 1904 - 1912
- Use 55% ratio for 1913-1921 and 1922 Census ratio for 1916 - 1922
- Use 1922 Census ratio for 1922 and later years

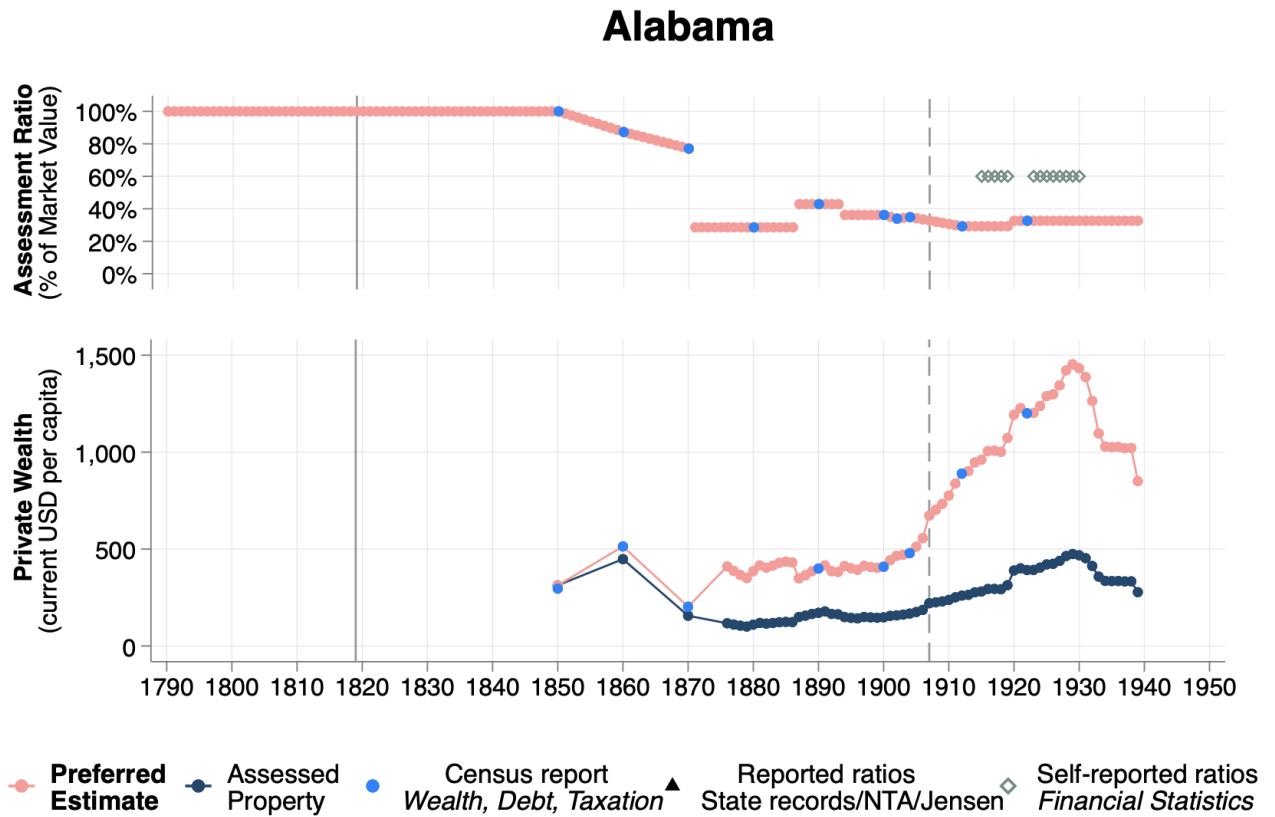
## **Wyoming**

- Use 1870 Census ratio for 1870 and earlier years
- Linearly interpolate between Census ratios for 1890 - 1900
- Use 1870 Census ratio for 1870 - 1880
- Use 1890 Census ratio for 1881 - 1890
- Use 1900 Census ratio for 1900 - 1904
- Use 1904 Census ratio for 1905 - 1908
- Use 1912 Census ratio for 1909 - 1913
- Use 1922 Census ratio for 1914 - 1919 and 1922
- Use 60% ratio for 1920 - 1921 and 70% ratio for 1923 - 1940 (Financial Statistics of States for 1921 and 1923 - 1930 respectively)

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<sup>10</sup>Digest NTA p. 17

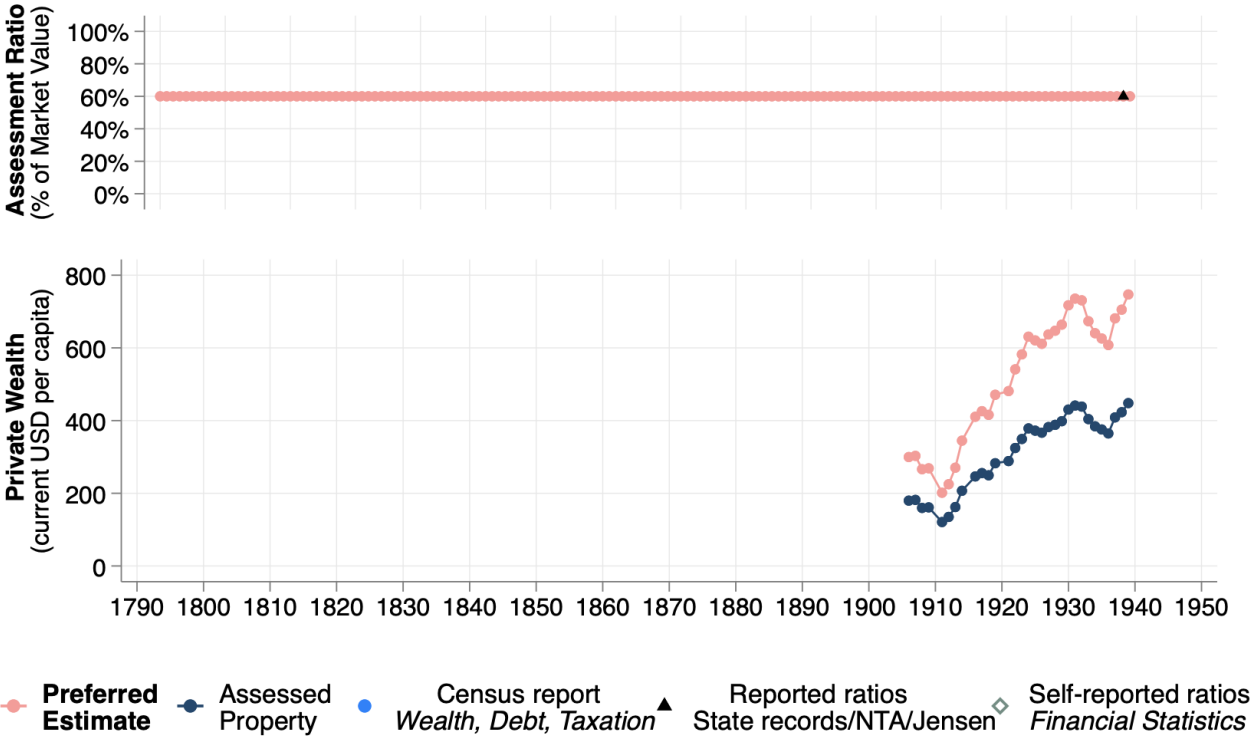
## Assessed Property Value, Assessment Ratio and Private Wealth Alabama



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

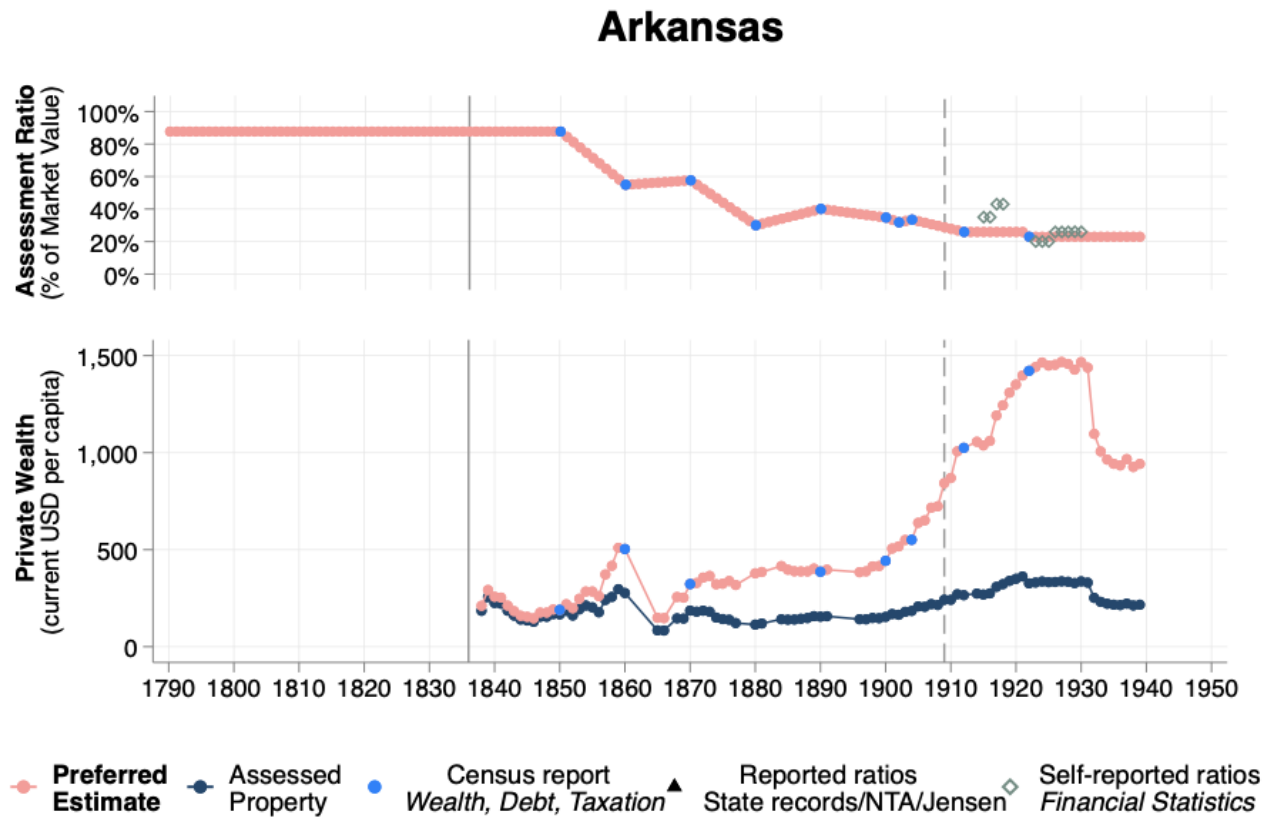
Alaska

Alaska



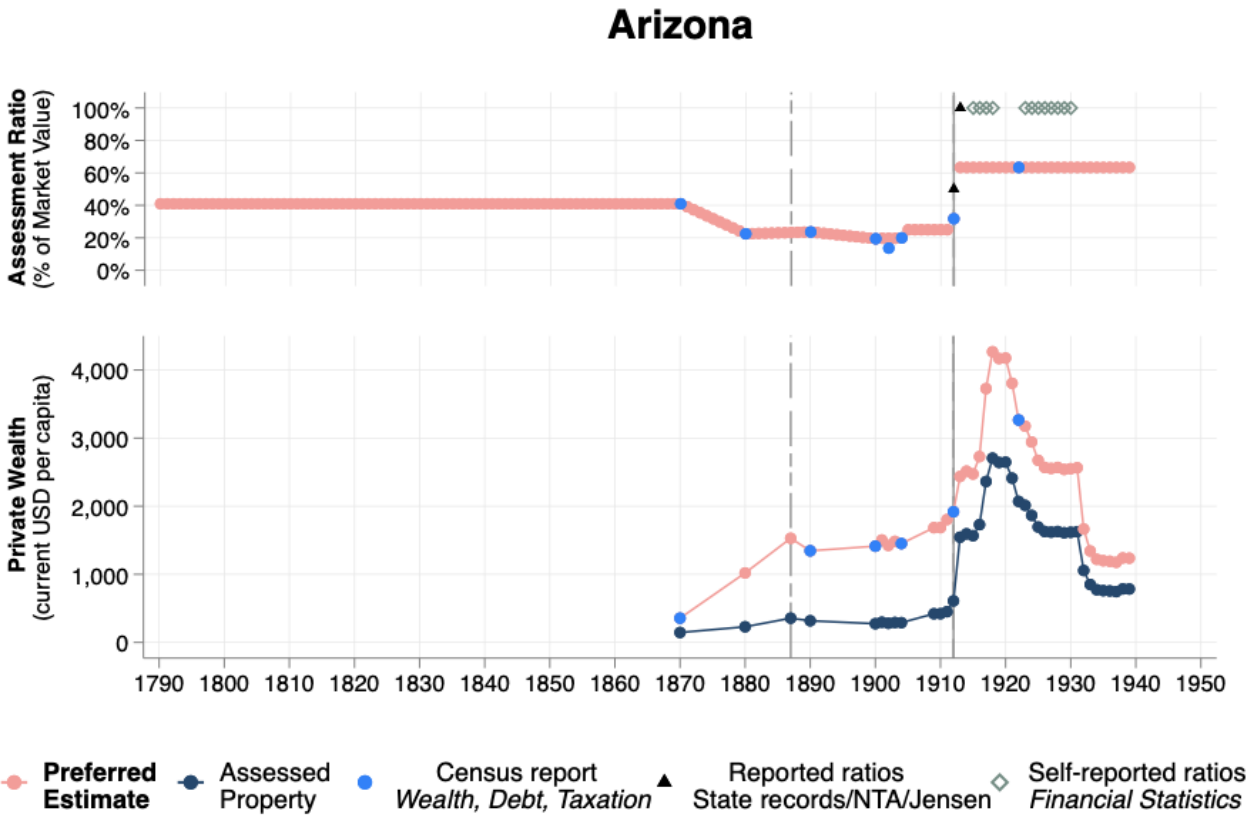
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

## Arkansas



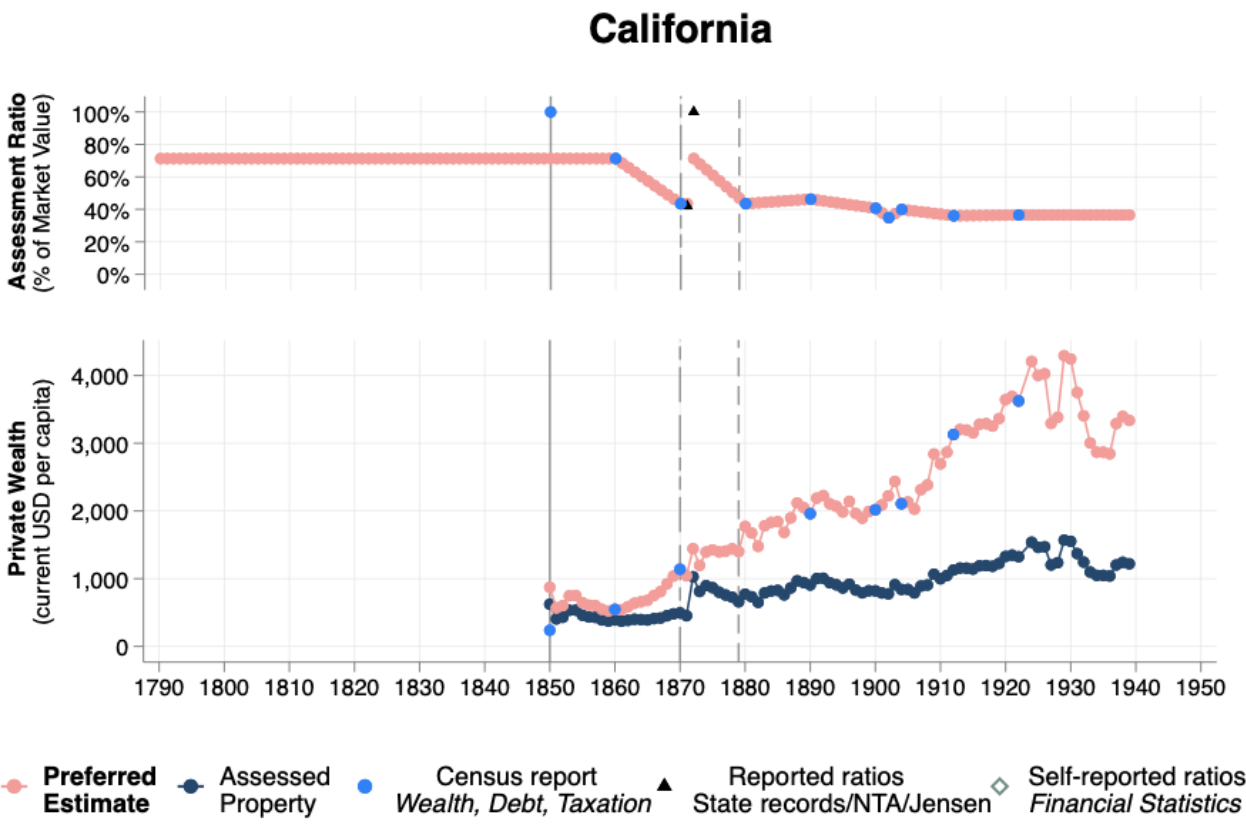
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

Arizona



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

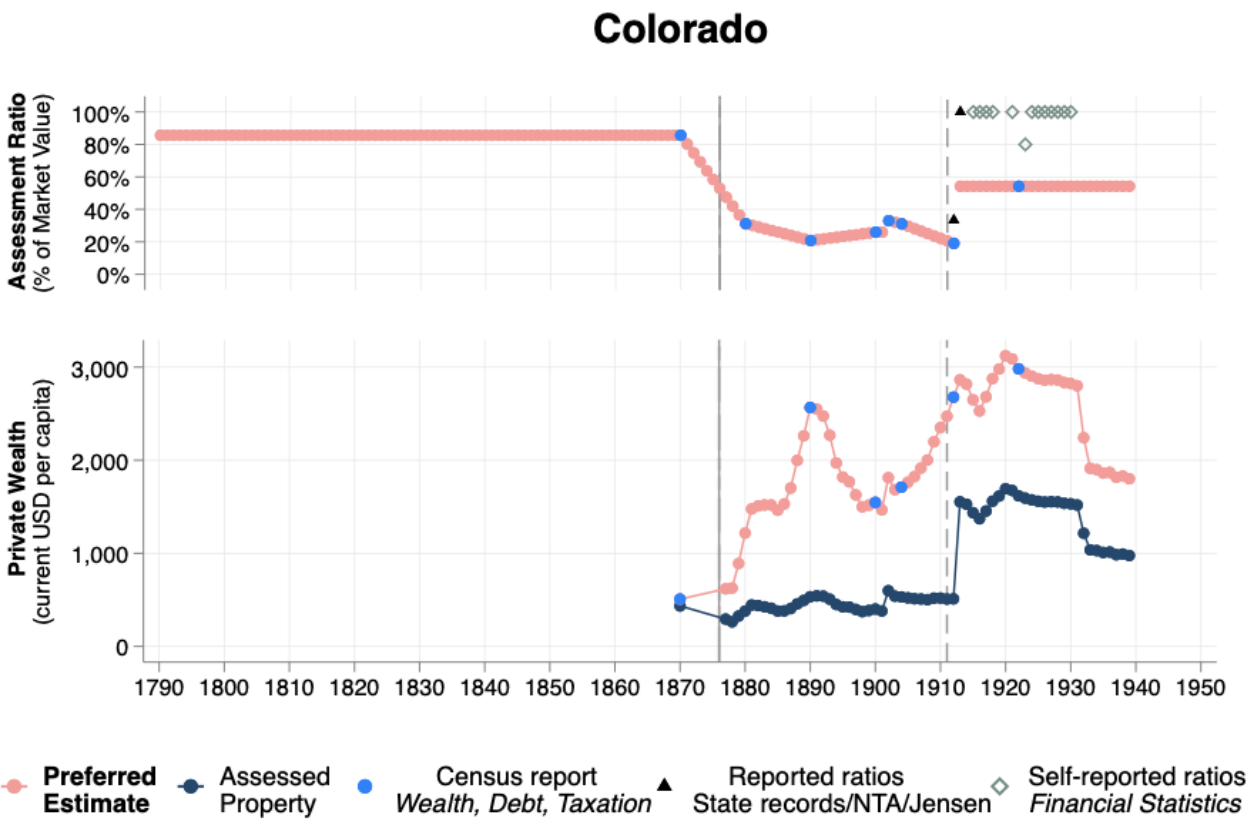
California



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

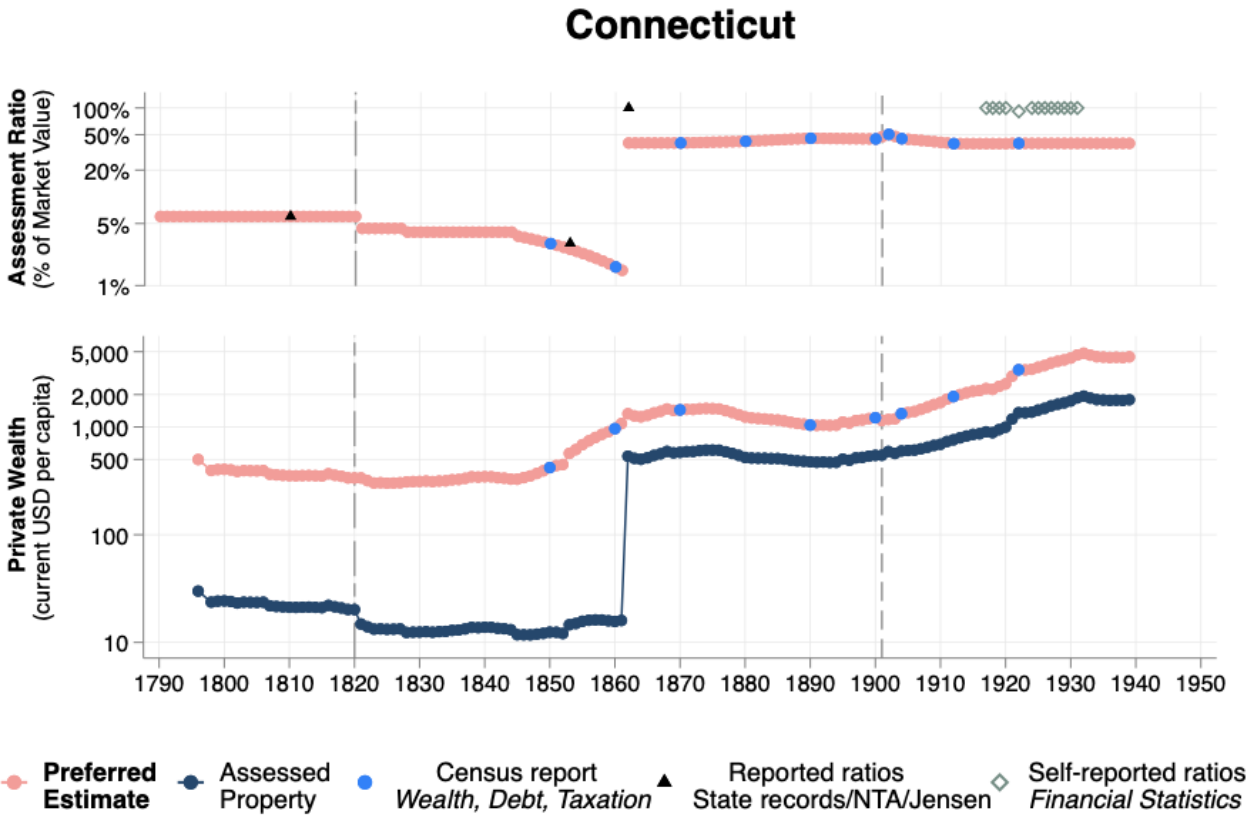


Colorado



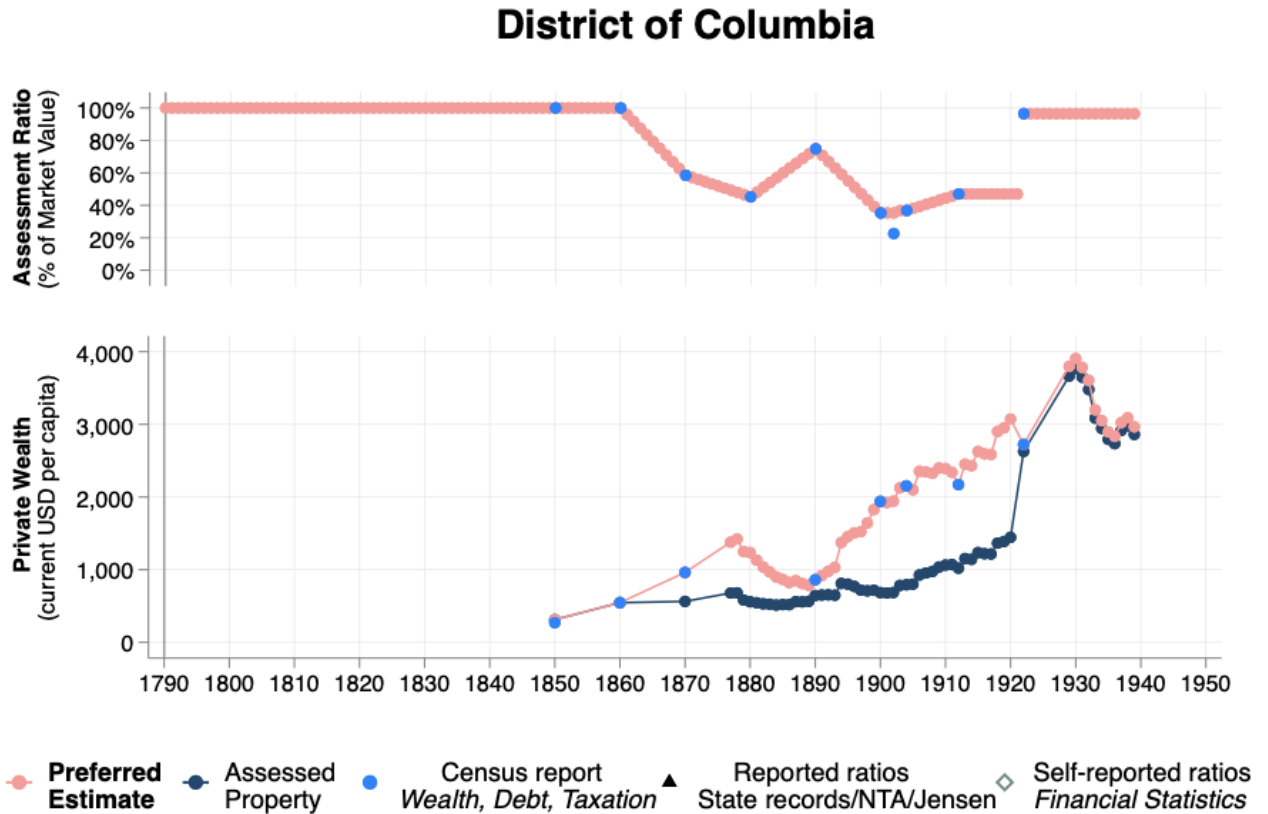
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

Connecticut



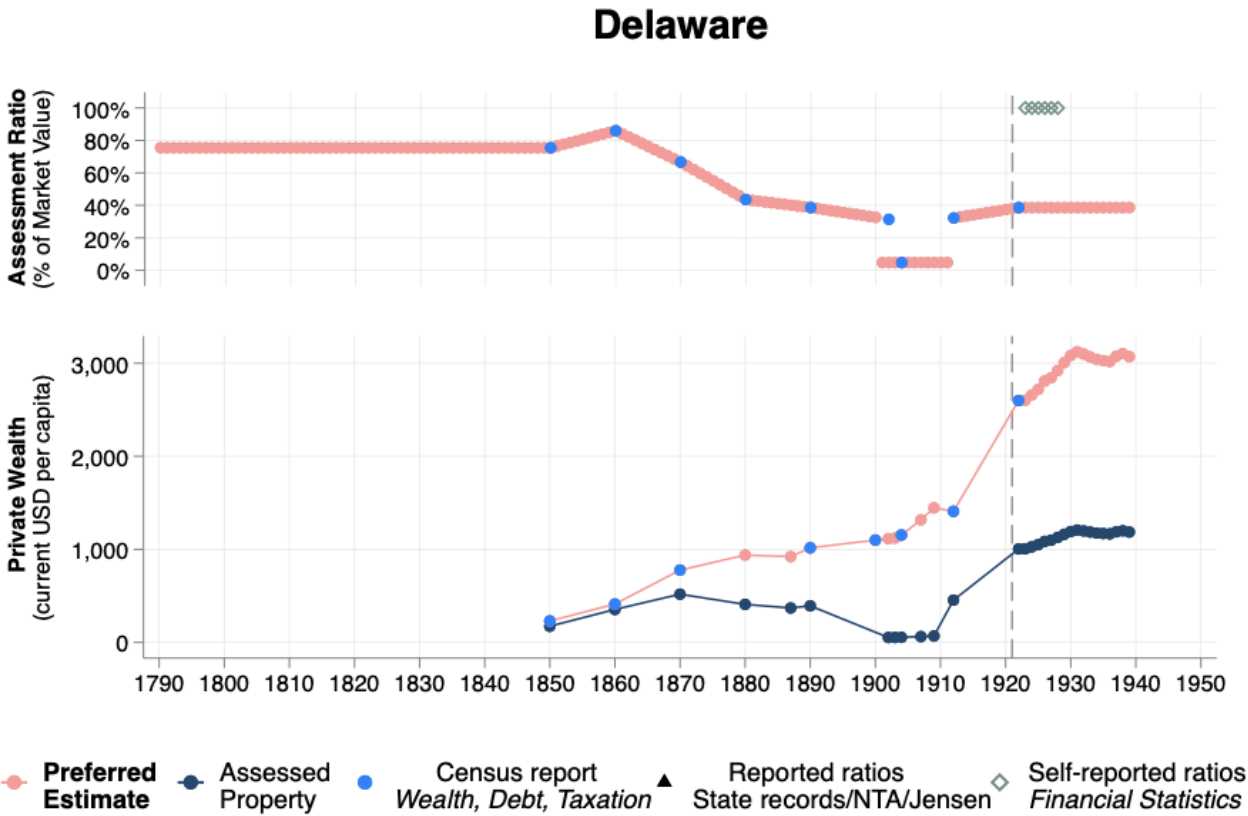
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## District of Columbia

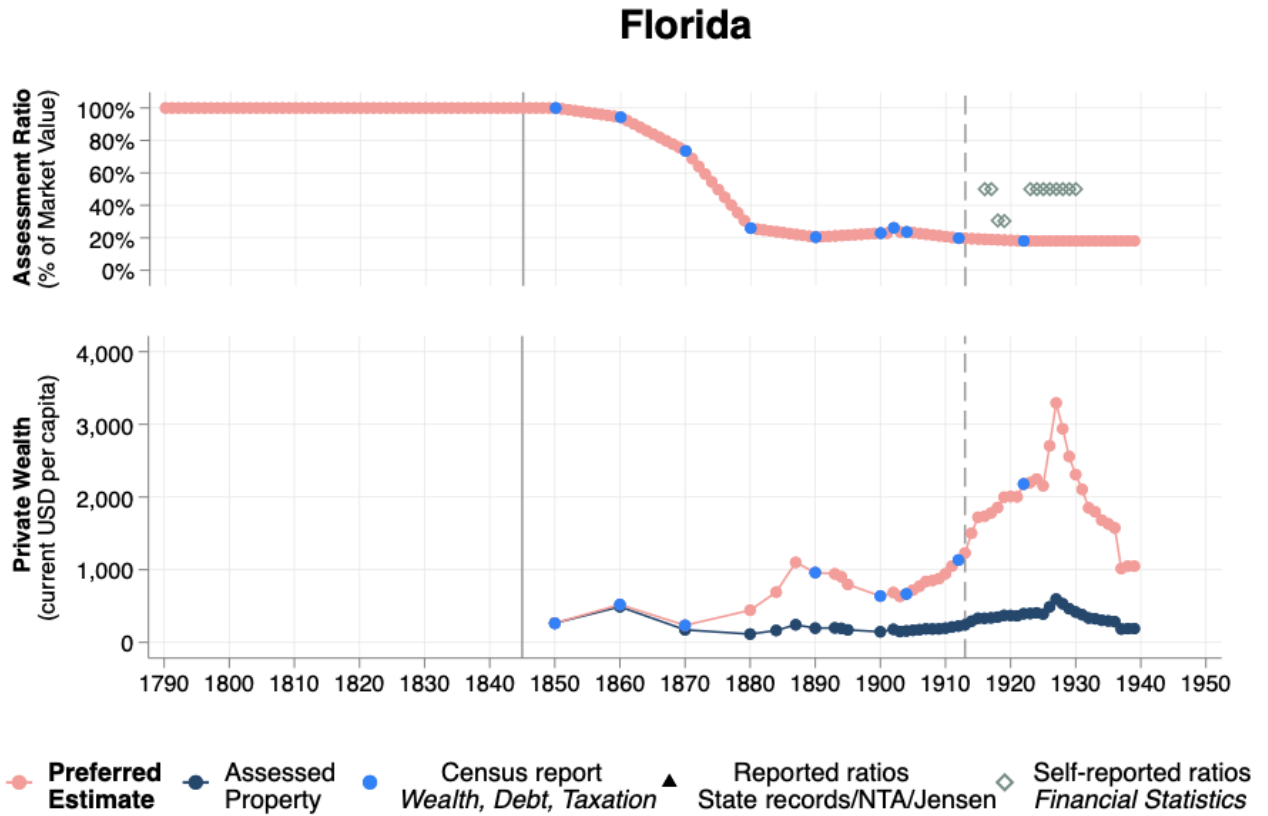


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

Delaware

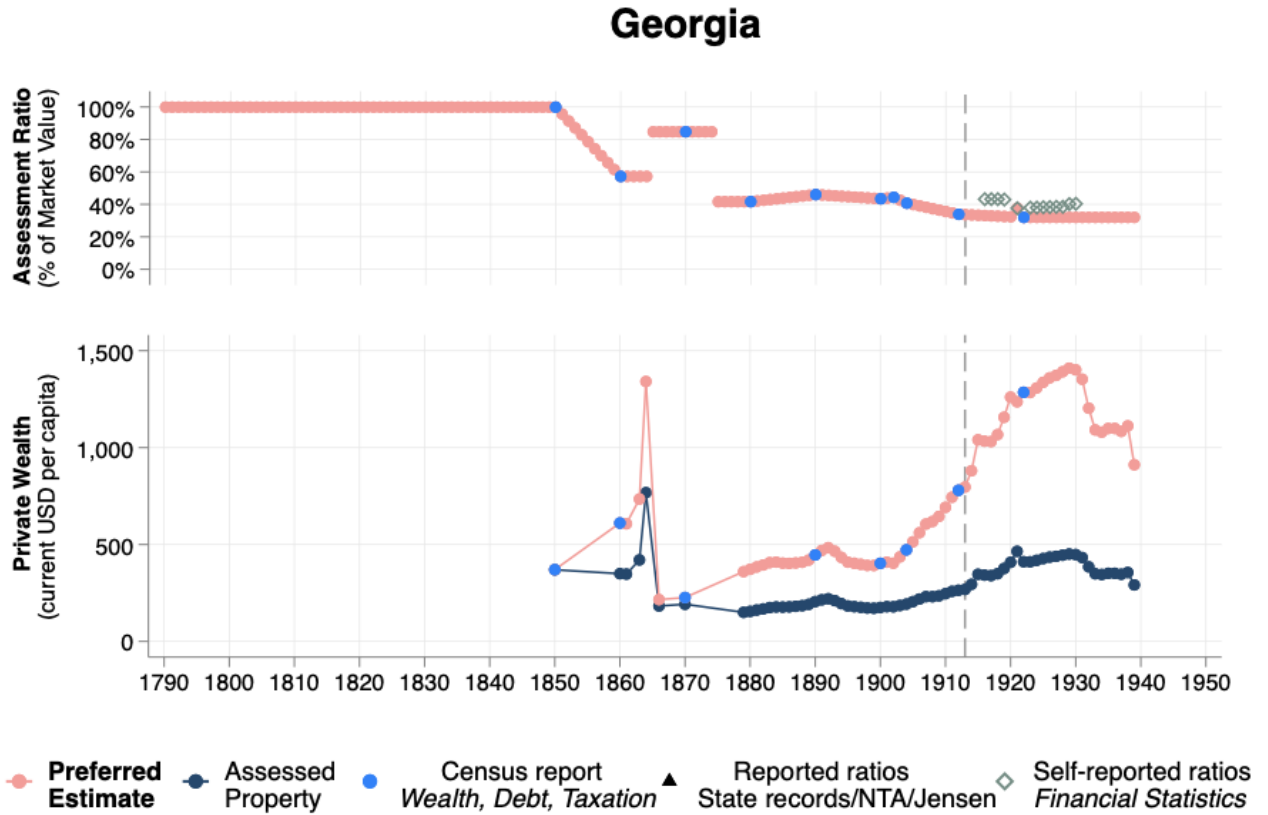


# Florida



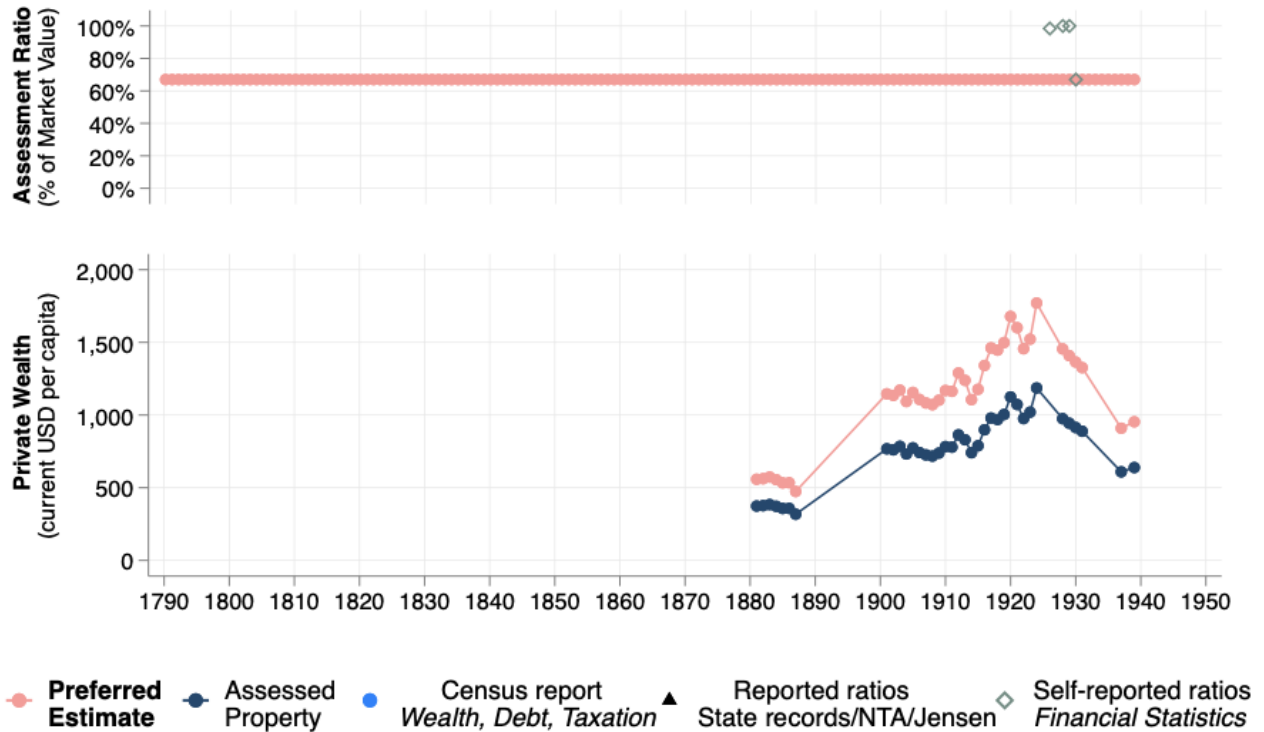
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## Georgia

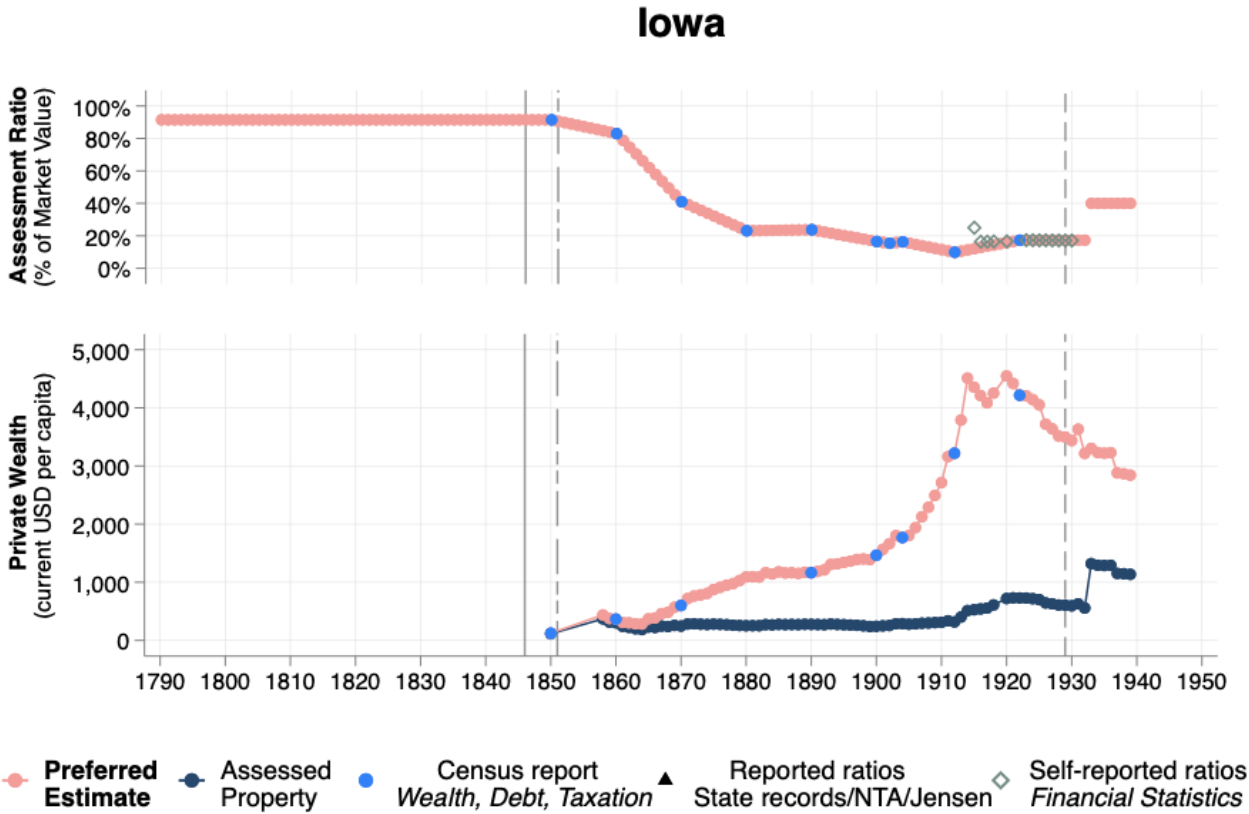


# Hawaii

## Hawaii



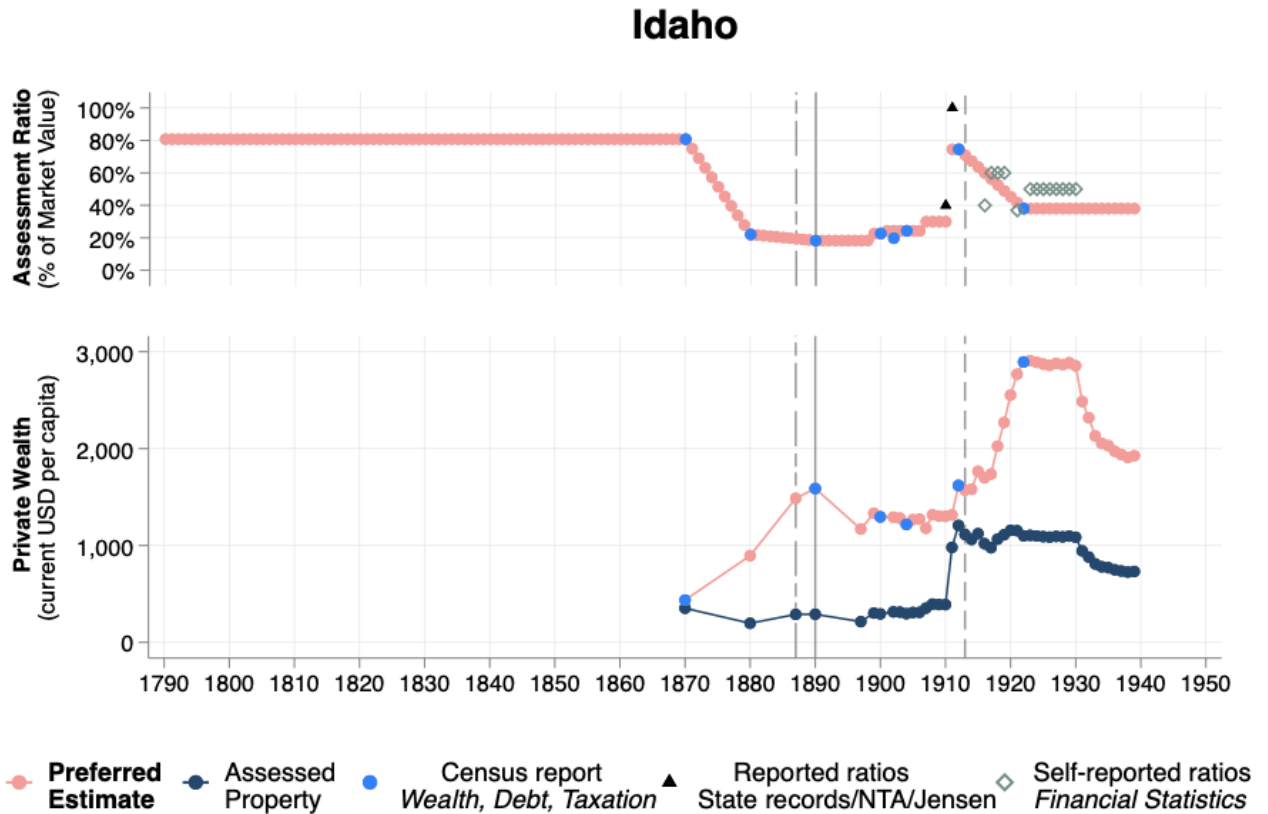
Iowa



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.



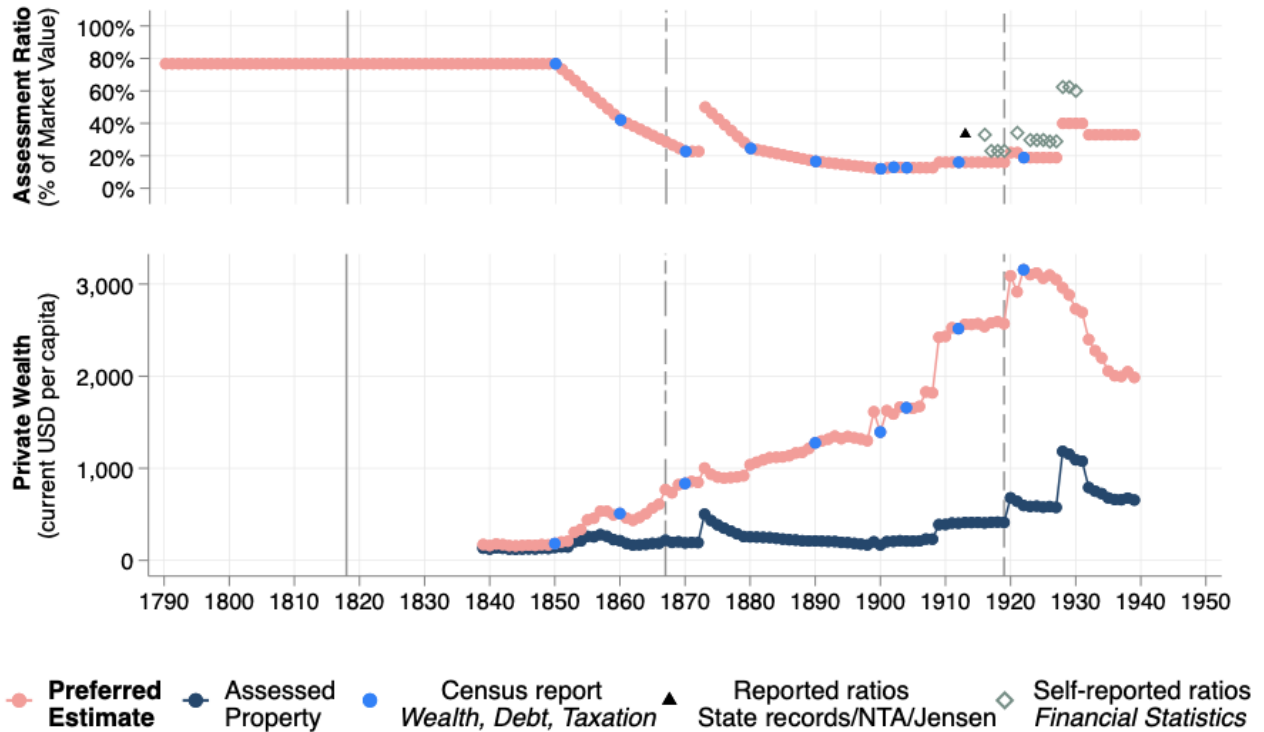
## Idaho



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

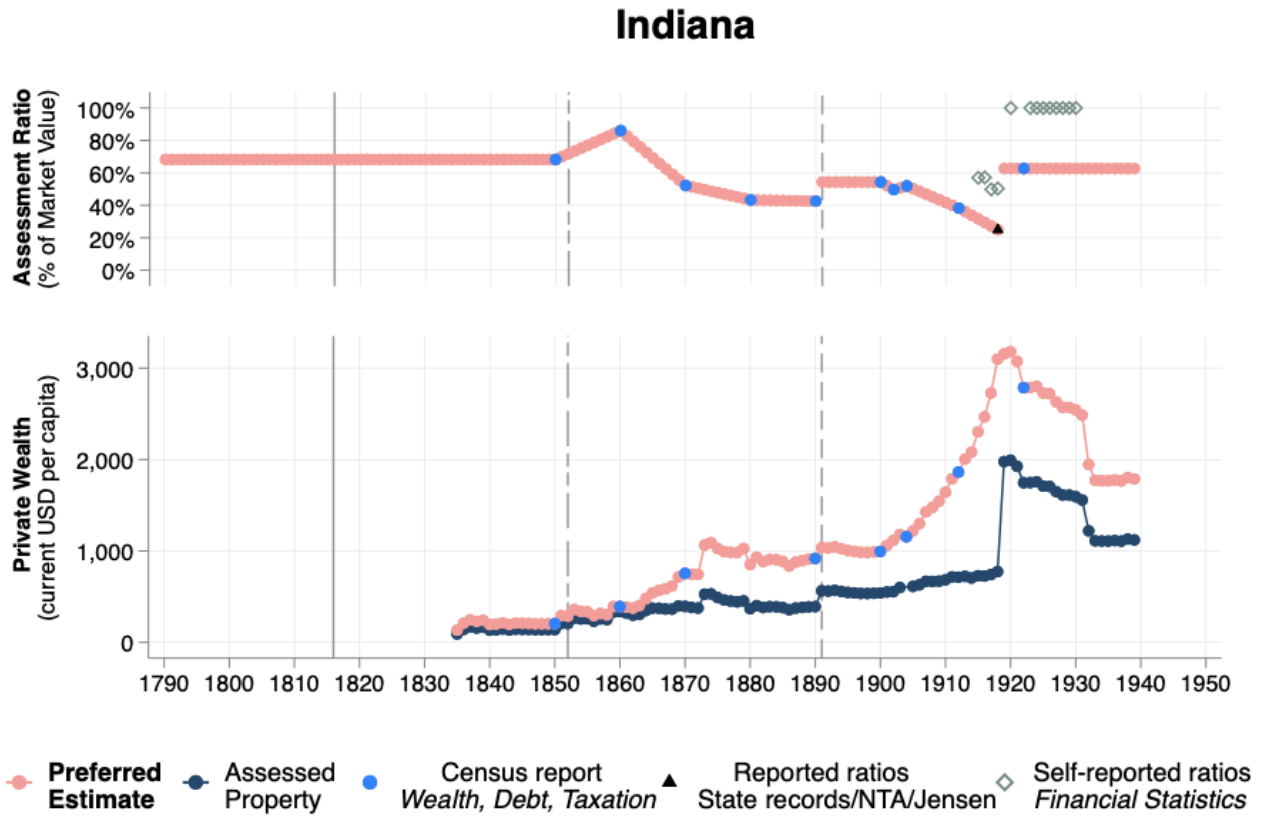
# Illinois

## Illinois



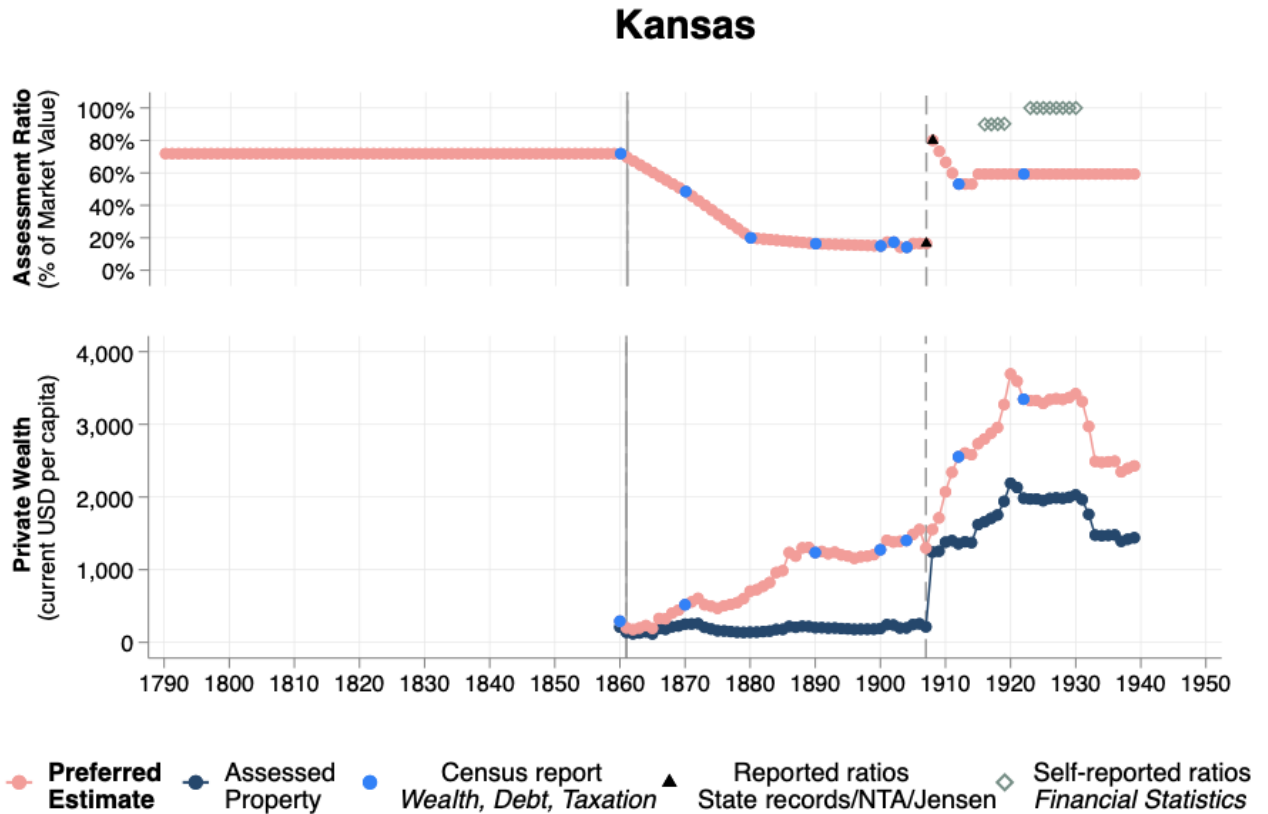
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

## Indiana



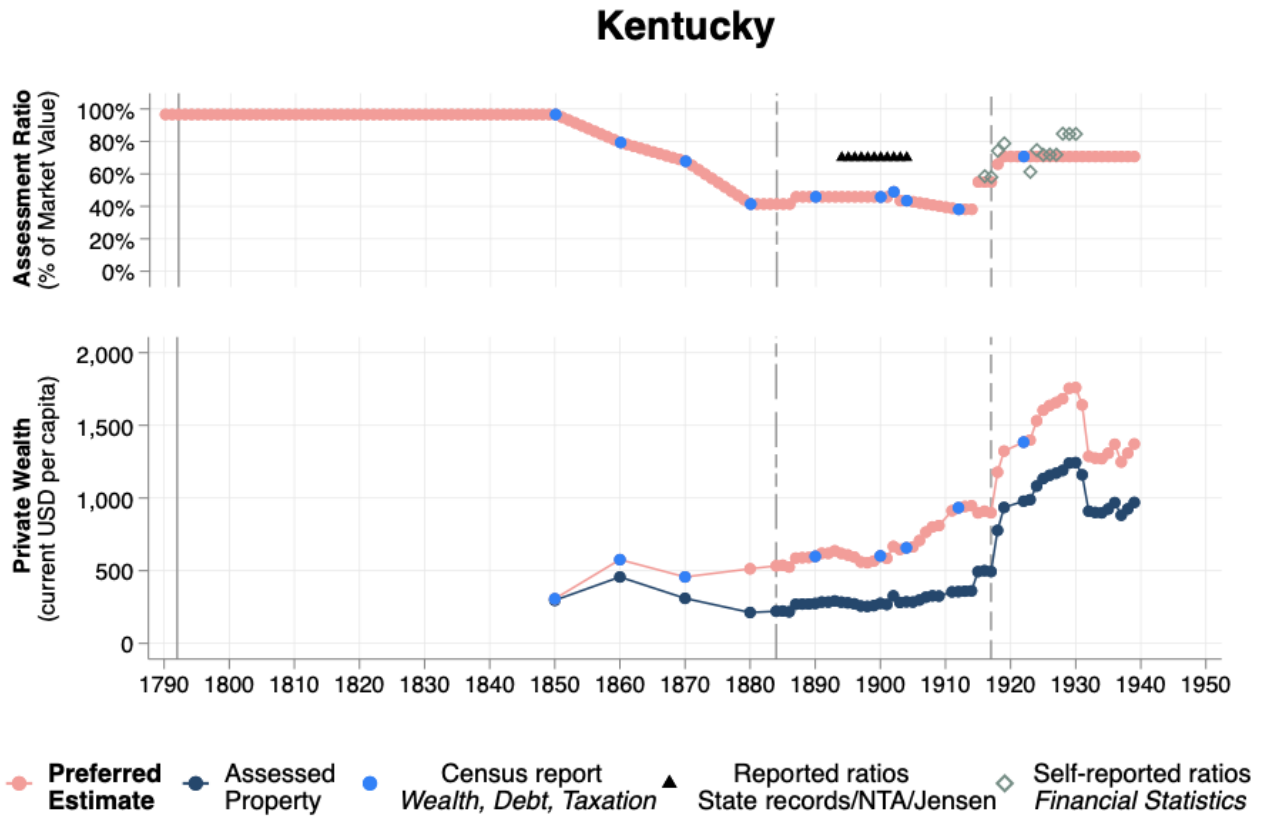
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

## Kansas



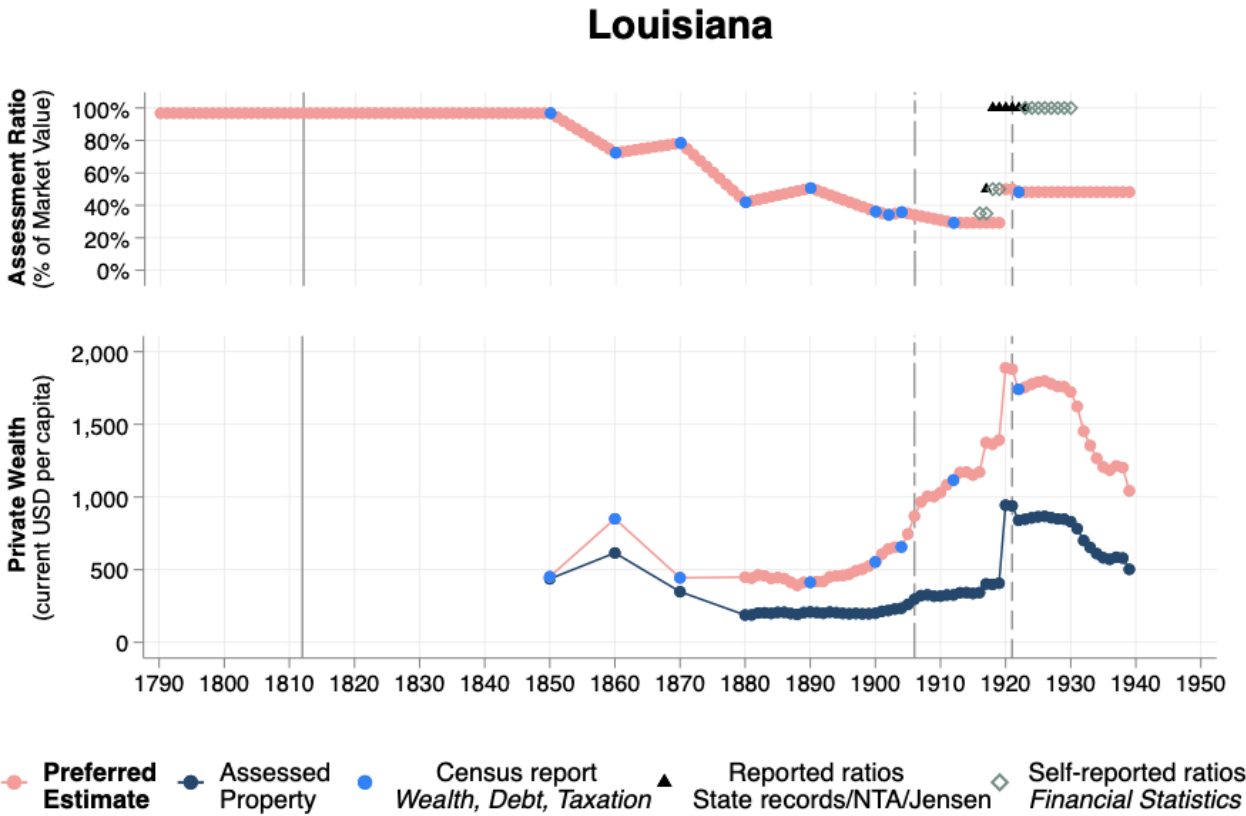
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

# Kentucky



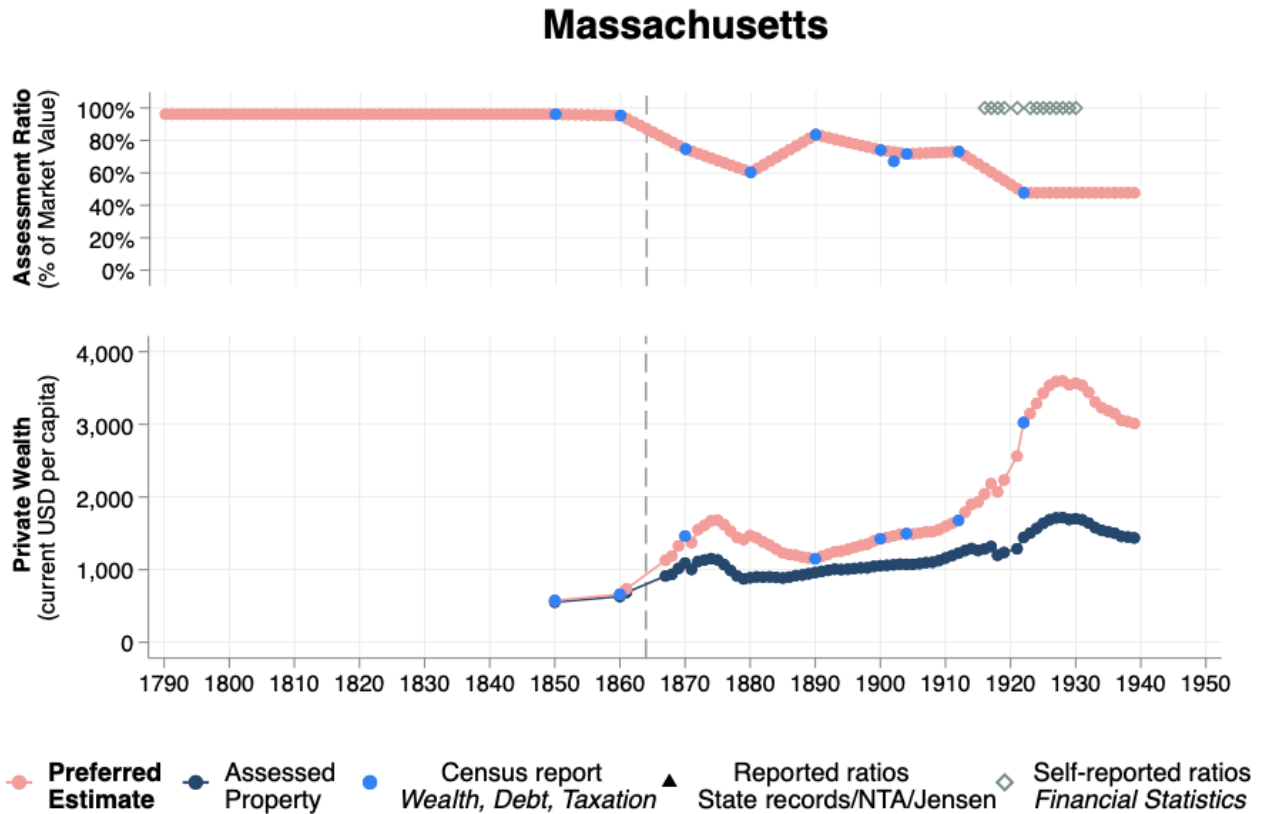
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

Louisiana



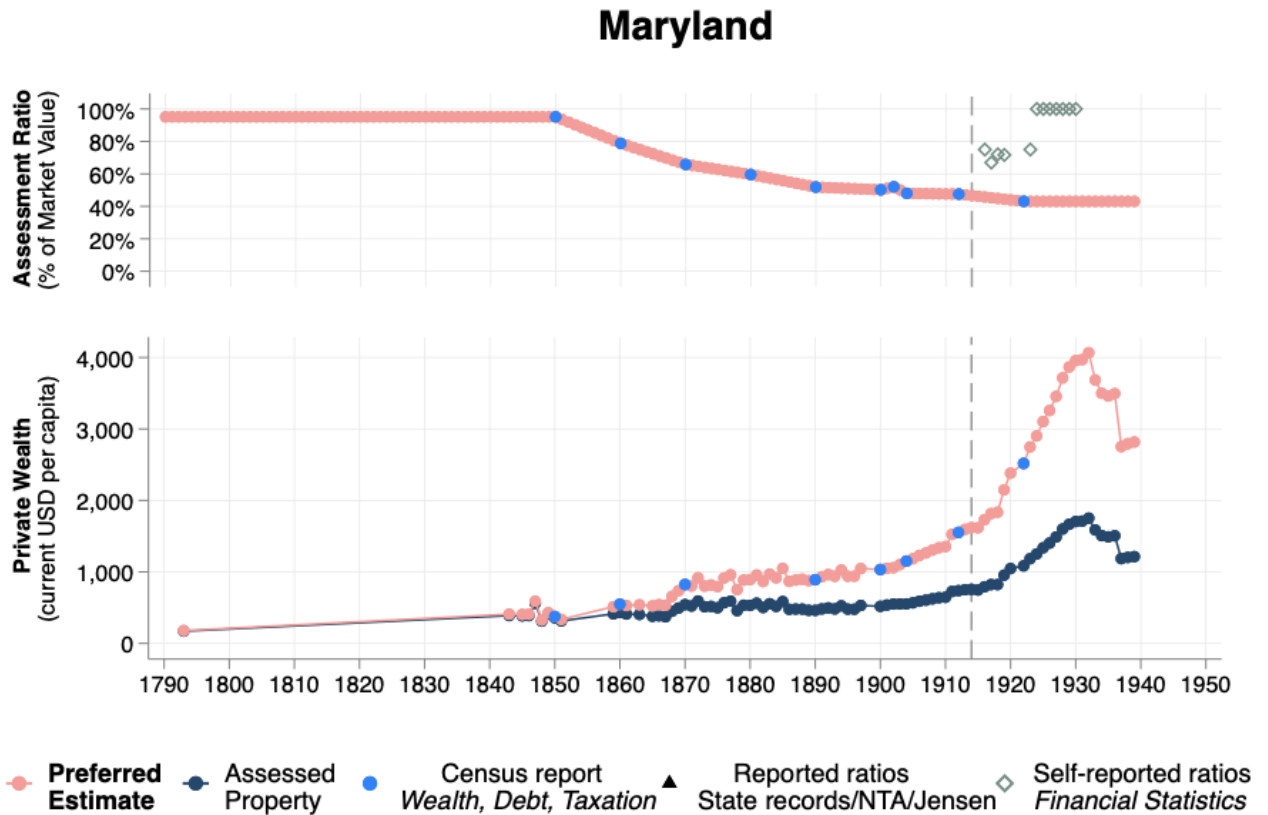
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

# Massachusetts



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

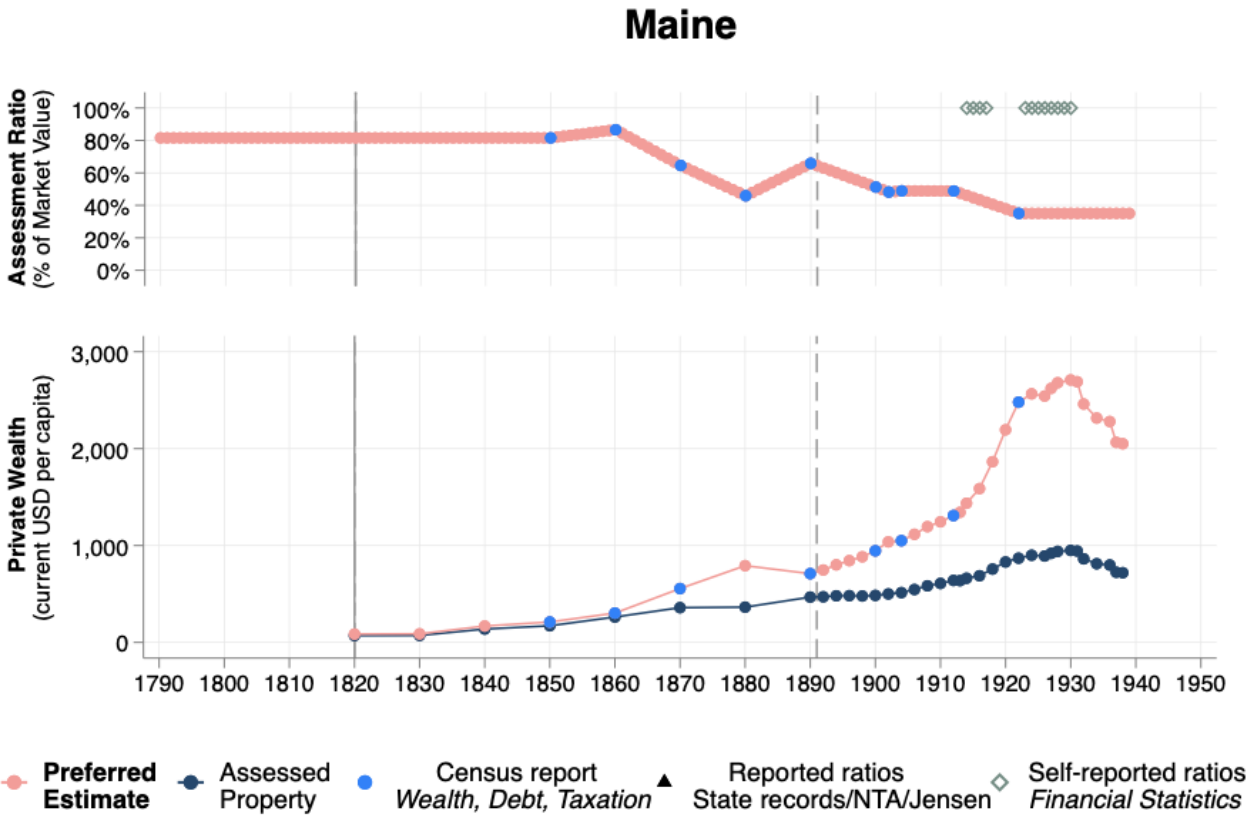
# Maryland



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.



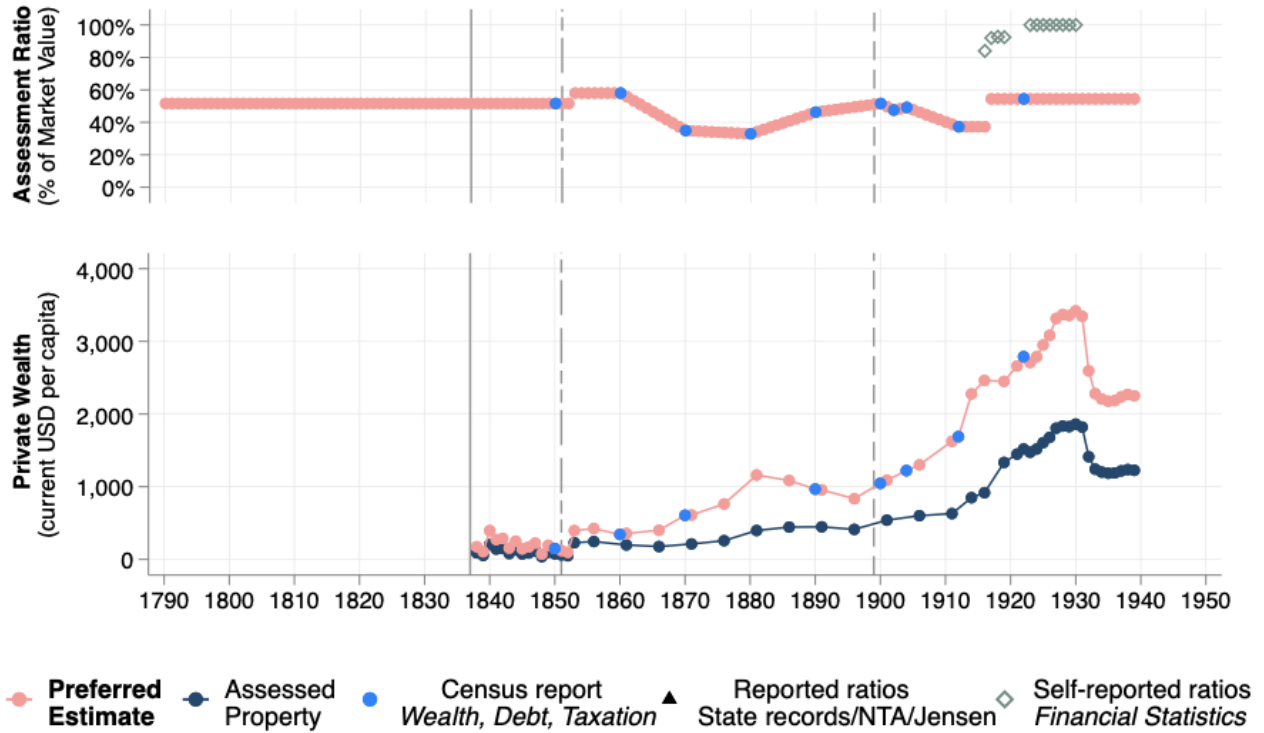
Maine



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

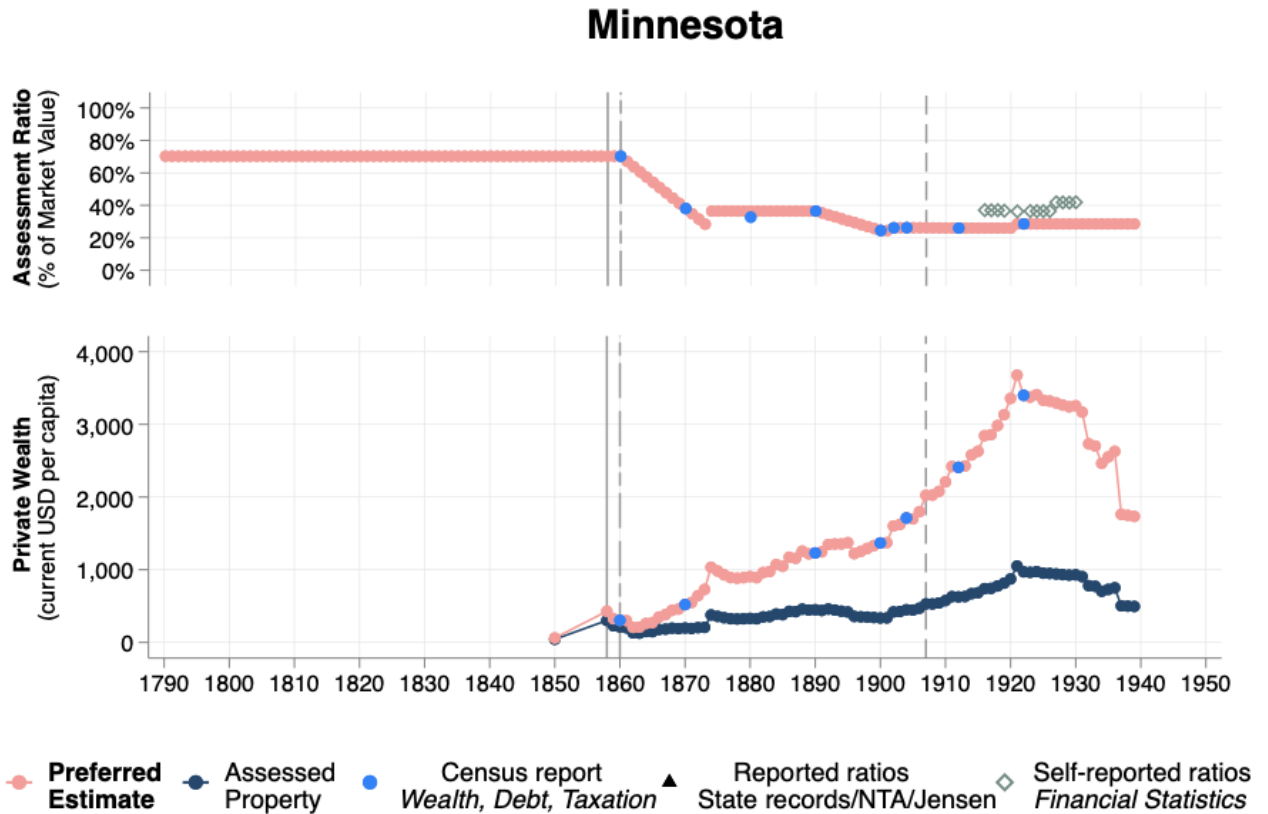
# Michigan

## Michigan



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

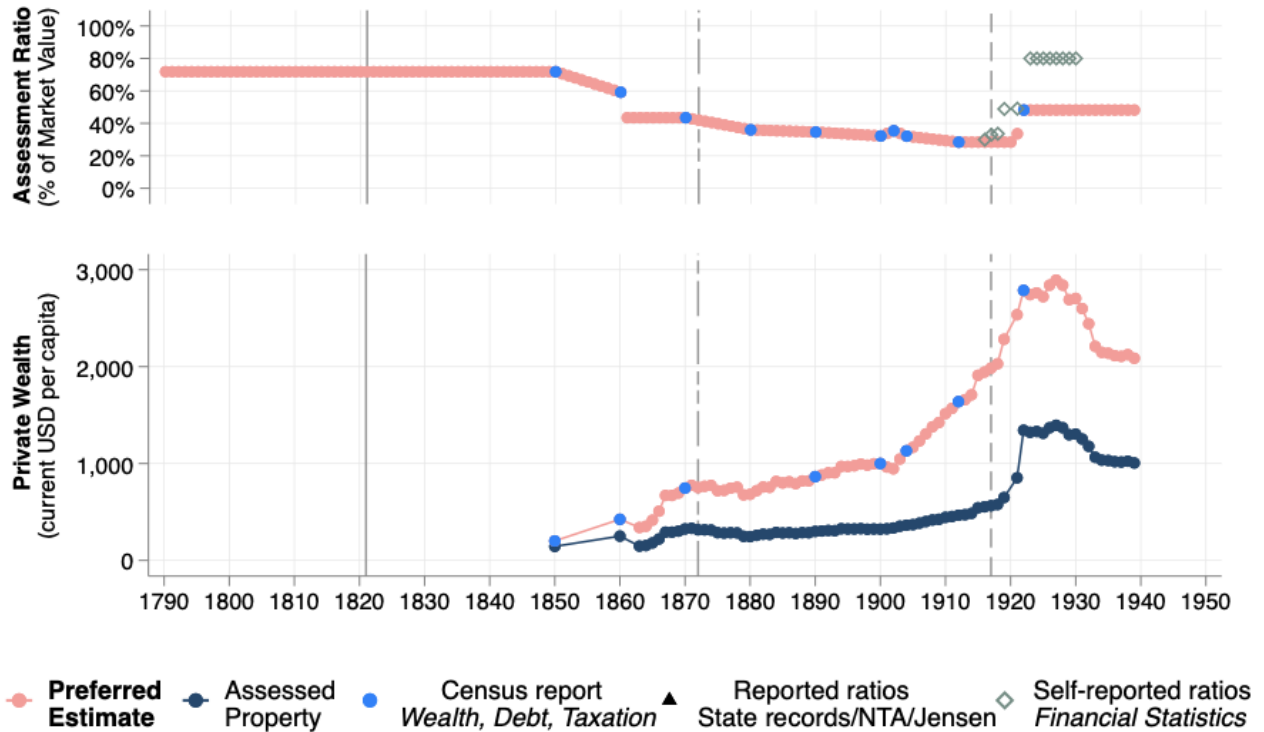
# Minnesota



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

# Missouri

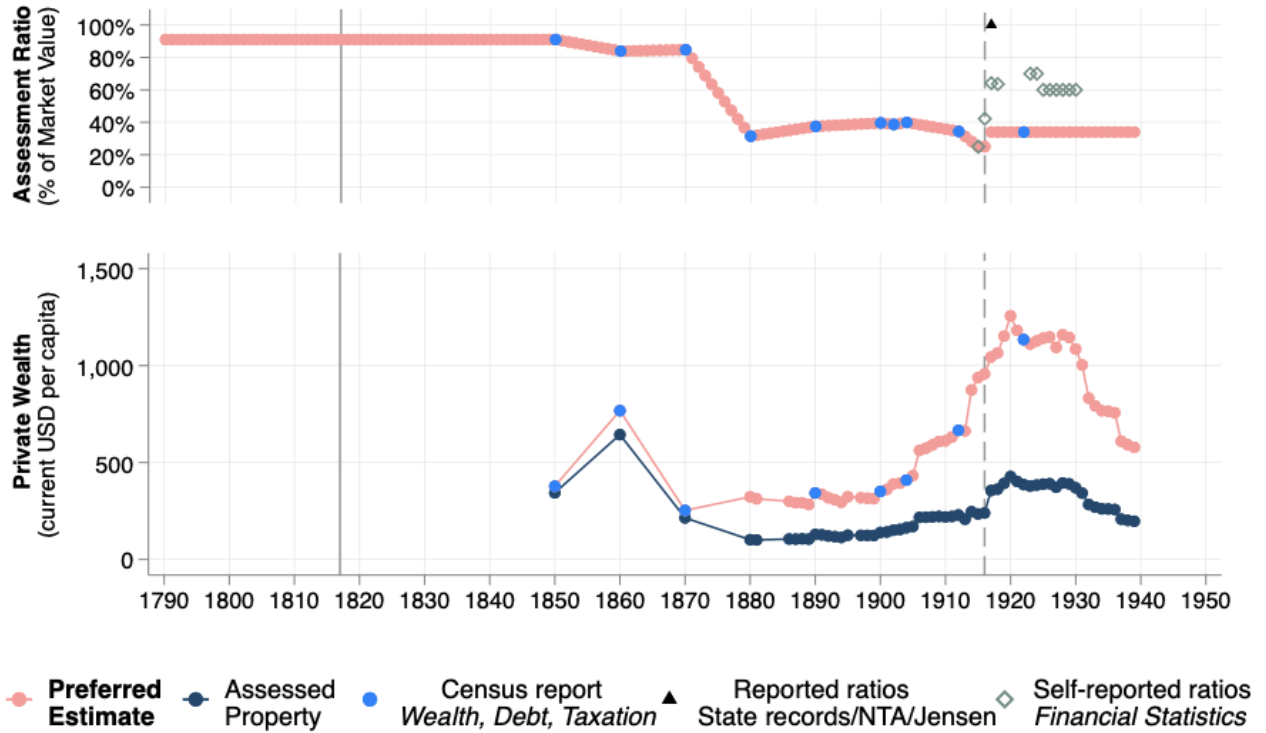
## Missouri



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

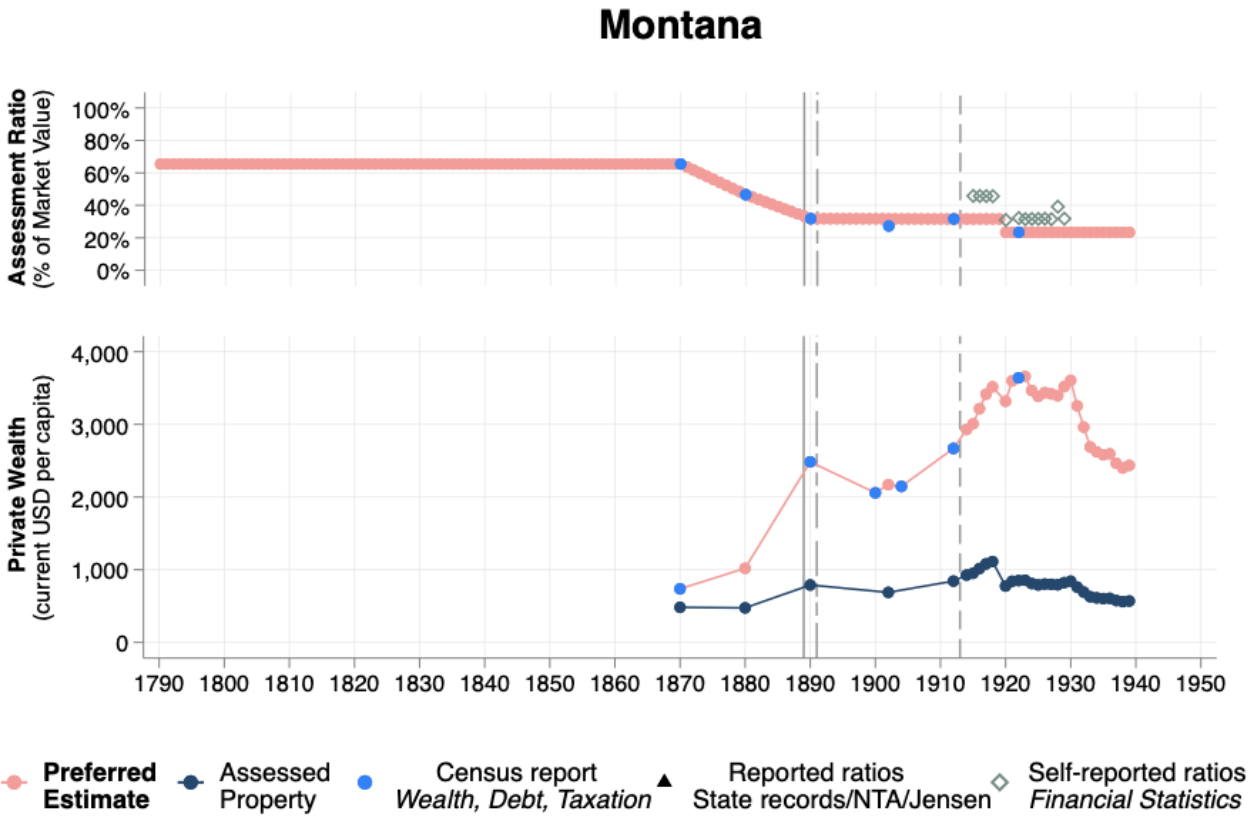
# Mississippi

## Mississippi



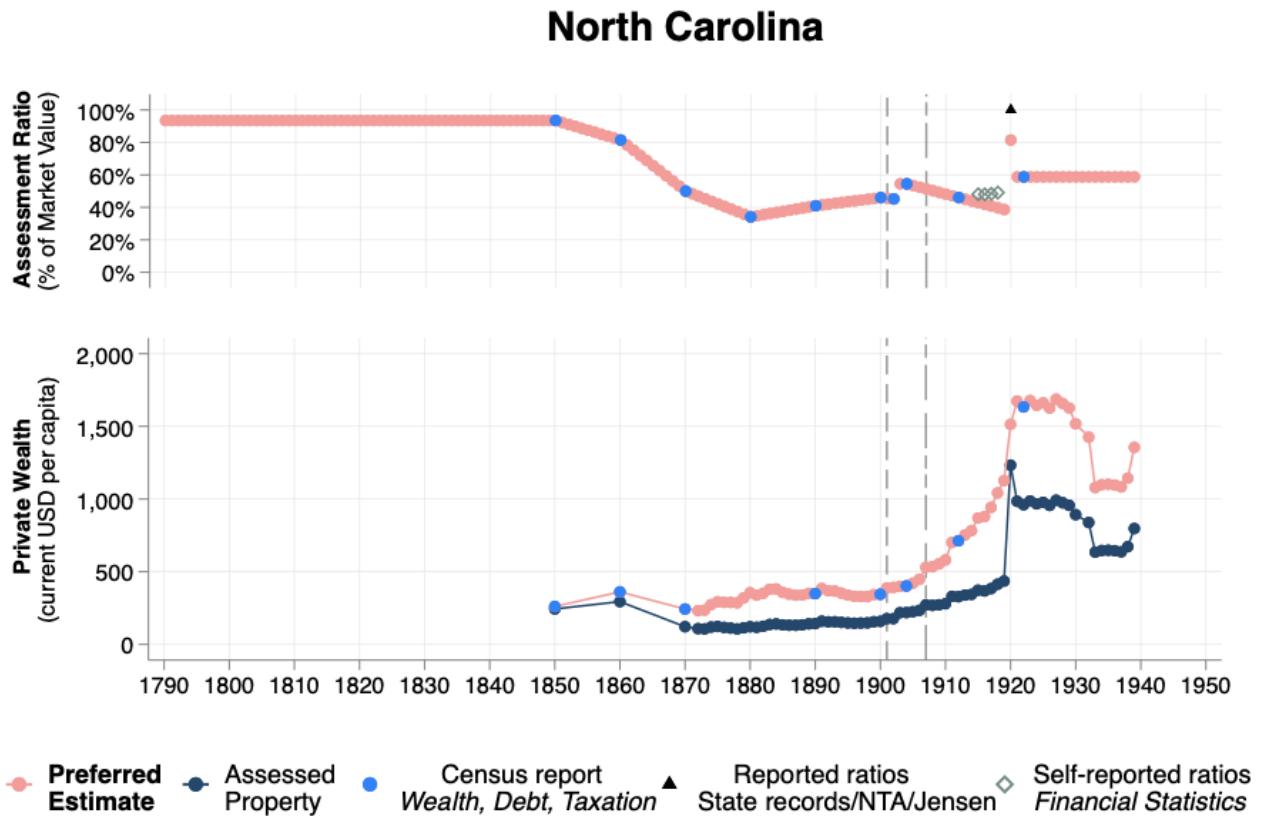
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Census ratios for 1880 and 1902 are inferred from tax rates.

Montana



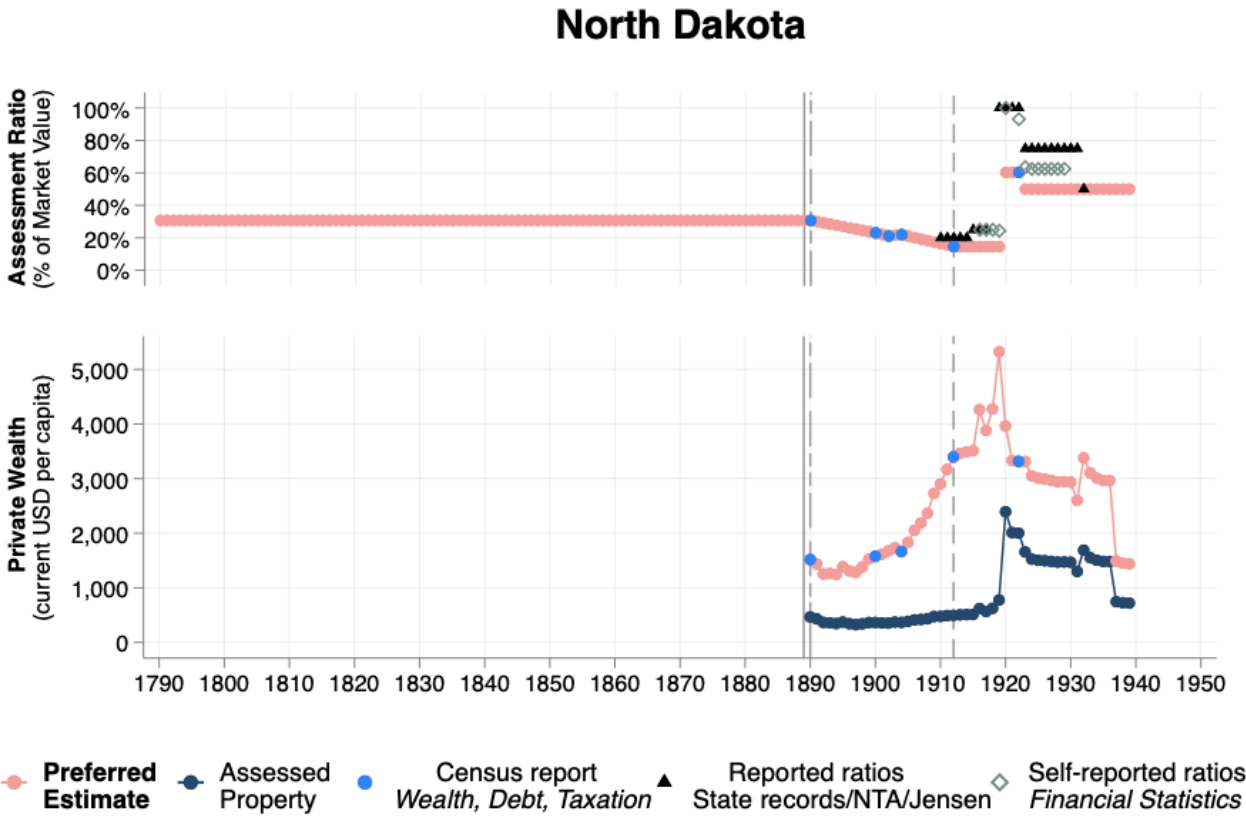
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## North Carolina



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

North Dakota

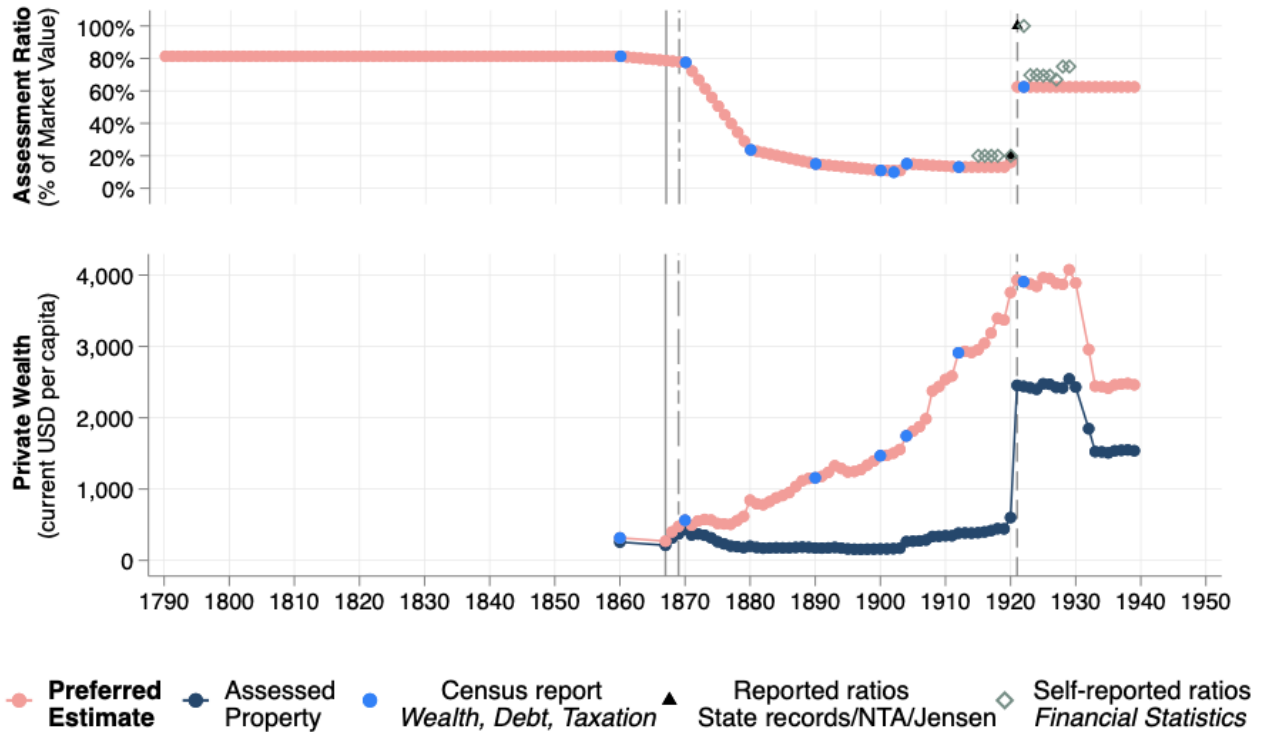


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.



# Nebraska

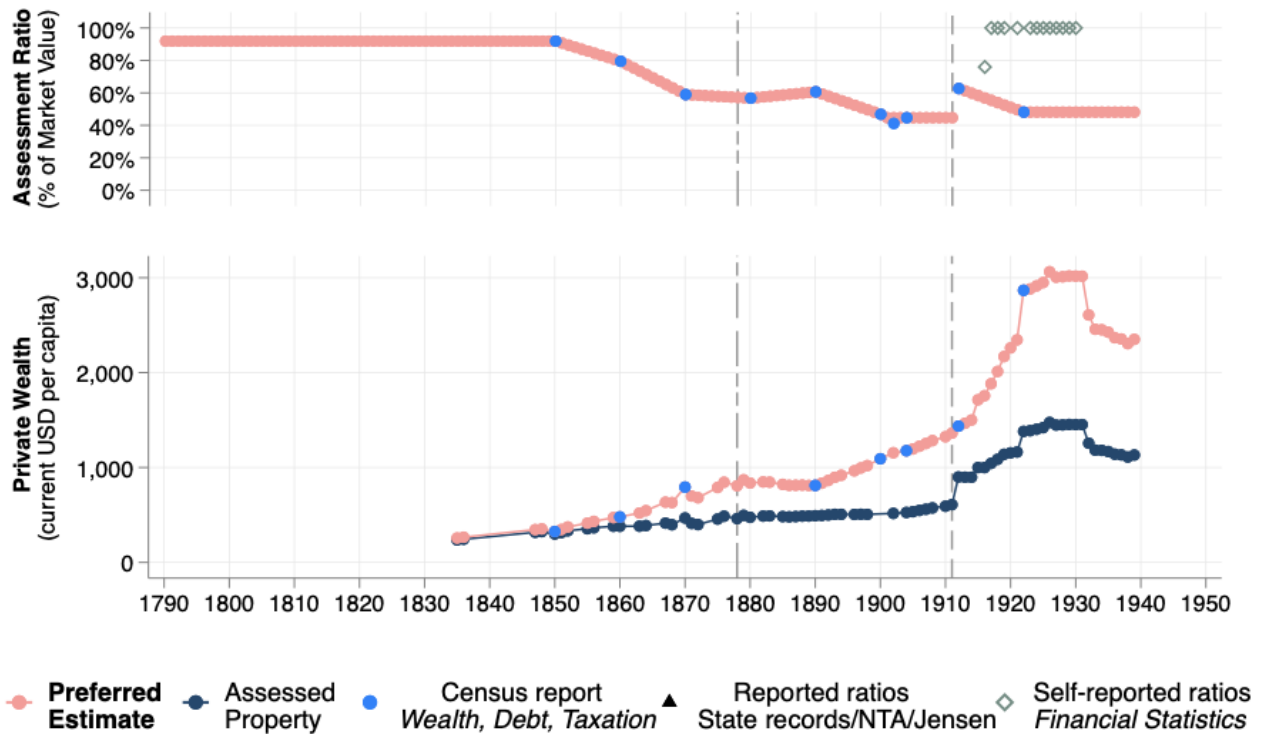
## Nebraska



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

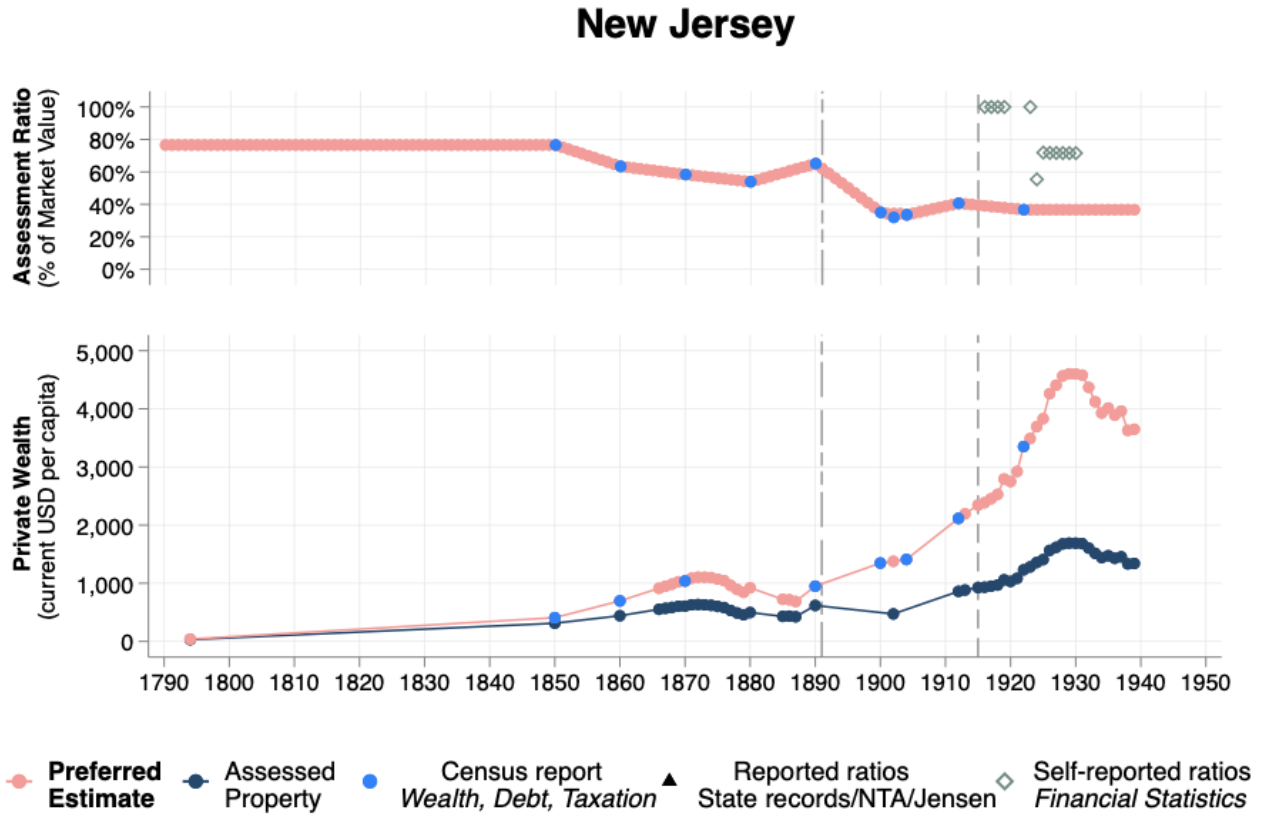
## New Hampshire

### New Hampshire

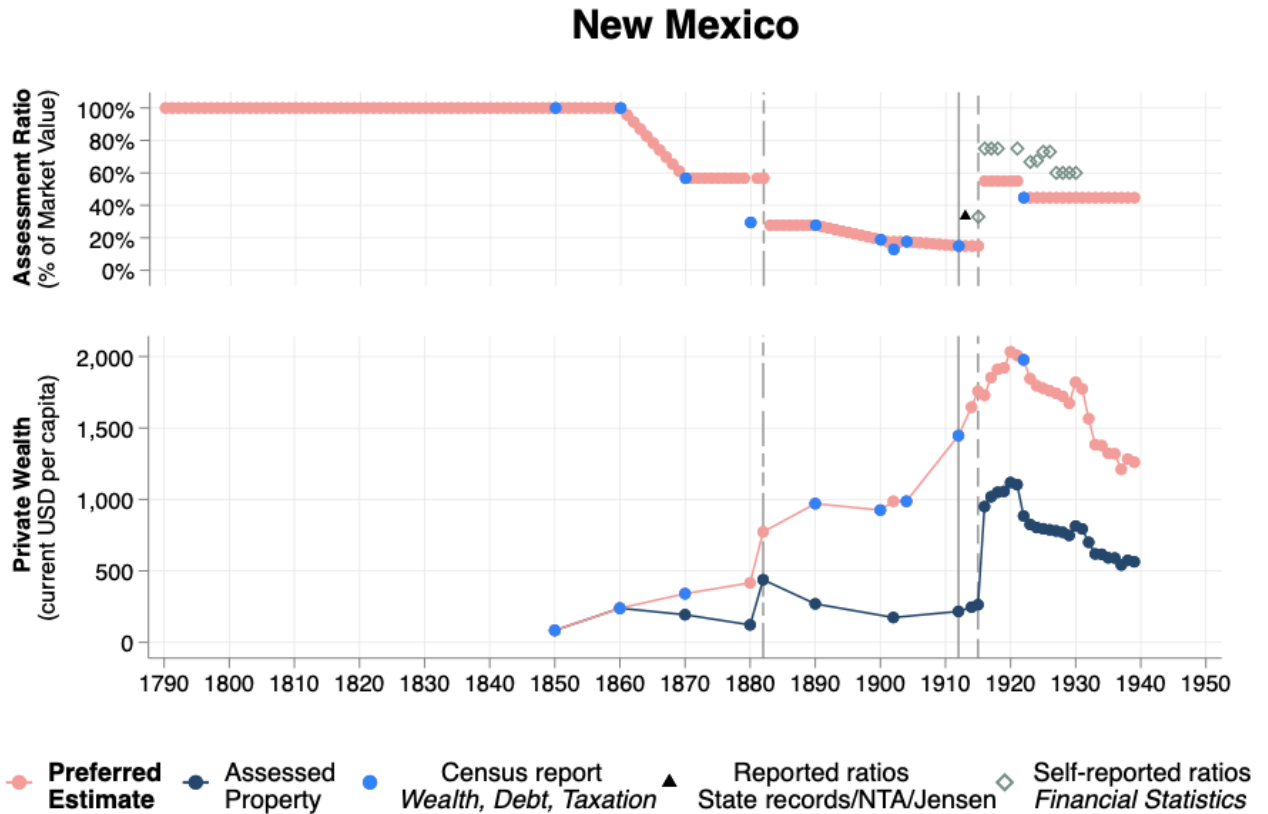


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## New Jersey

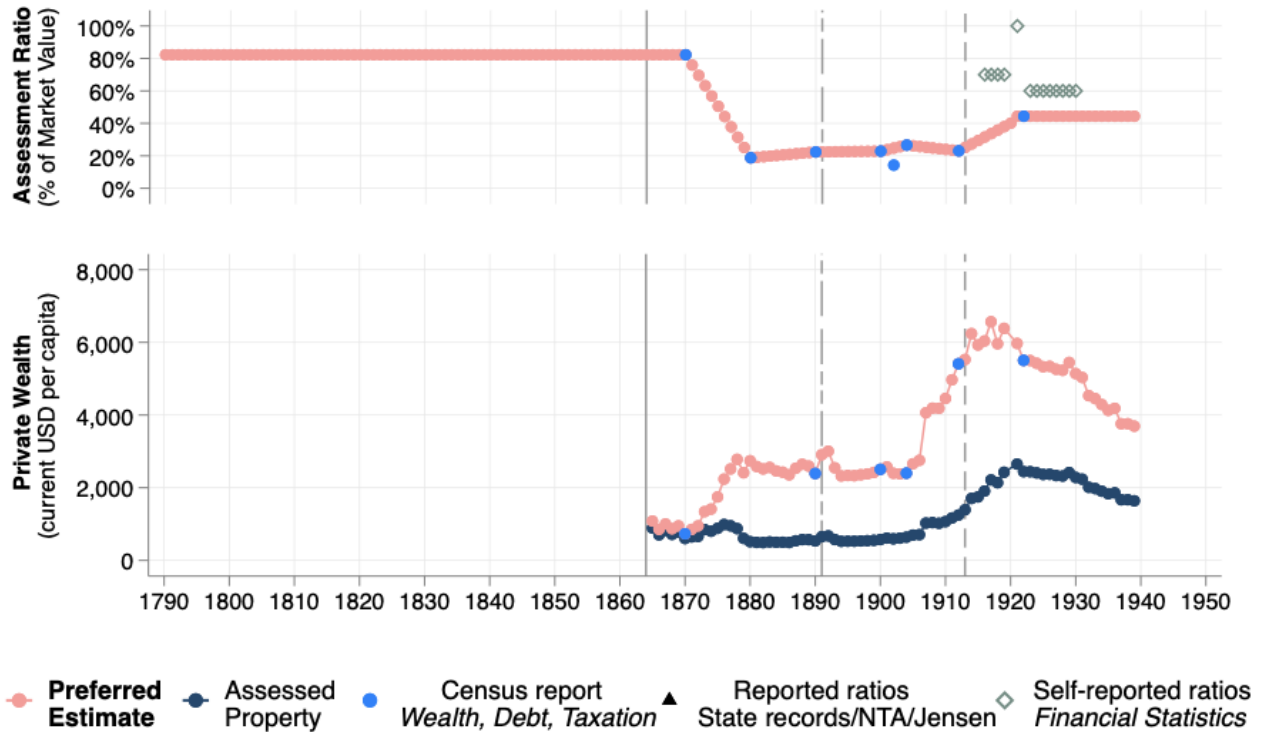


## New Mexico



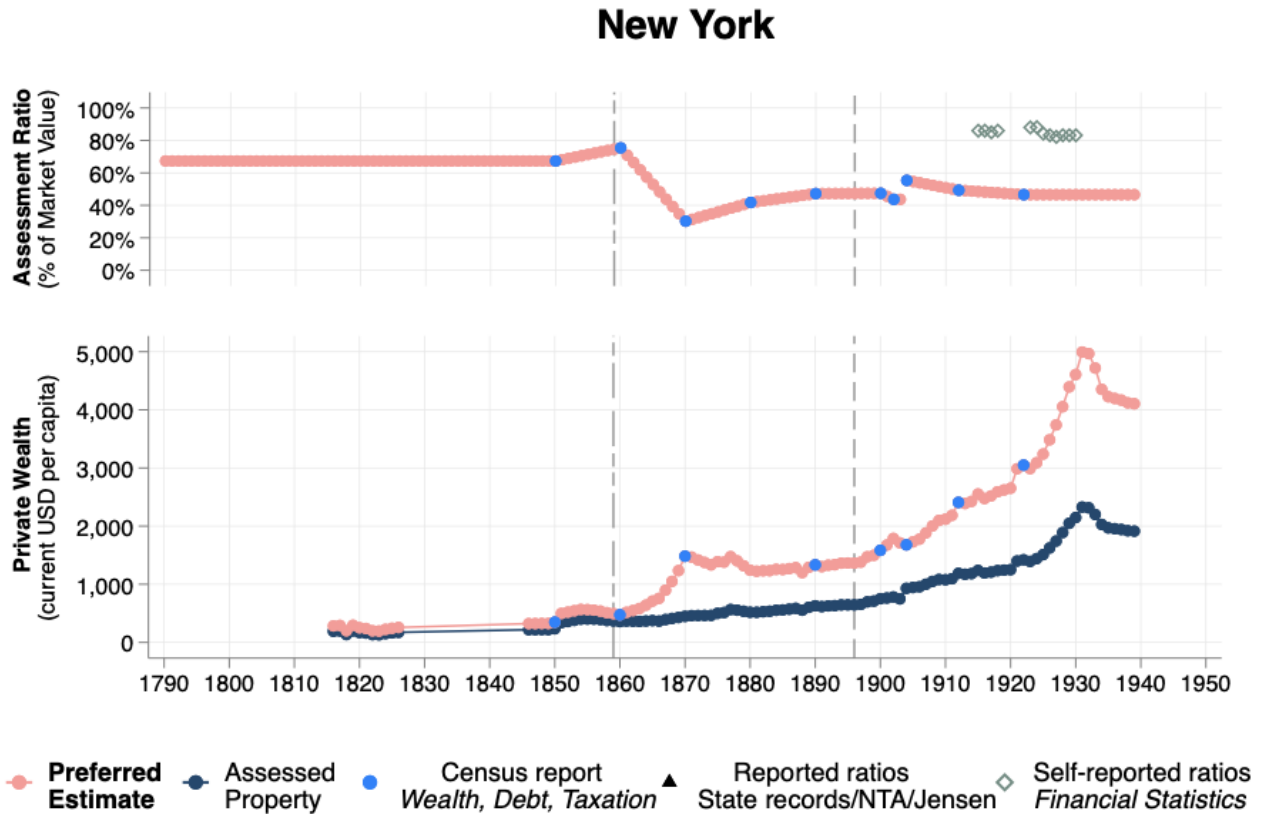
# Nevada

## Nevada



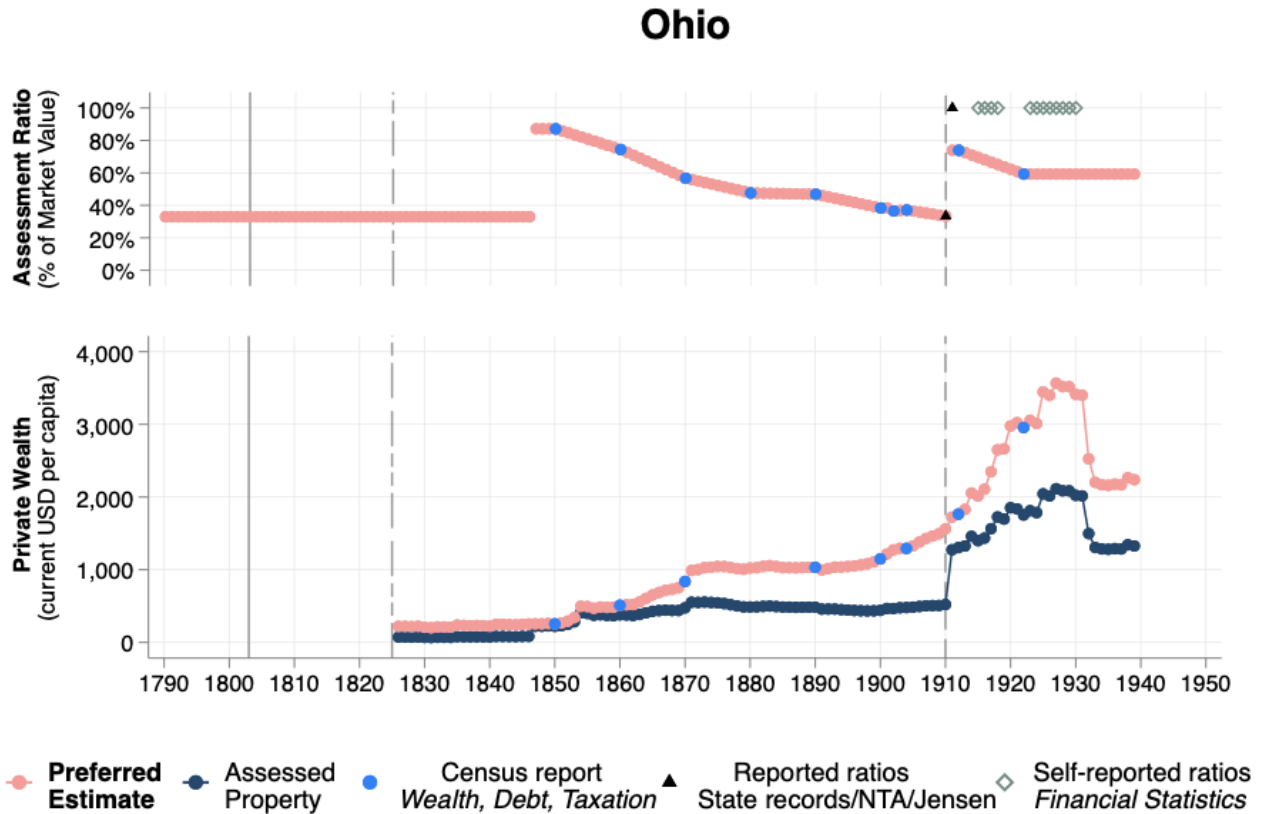
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

## New York



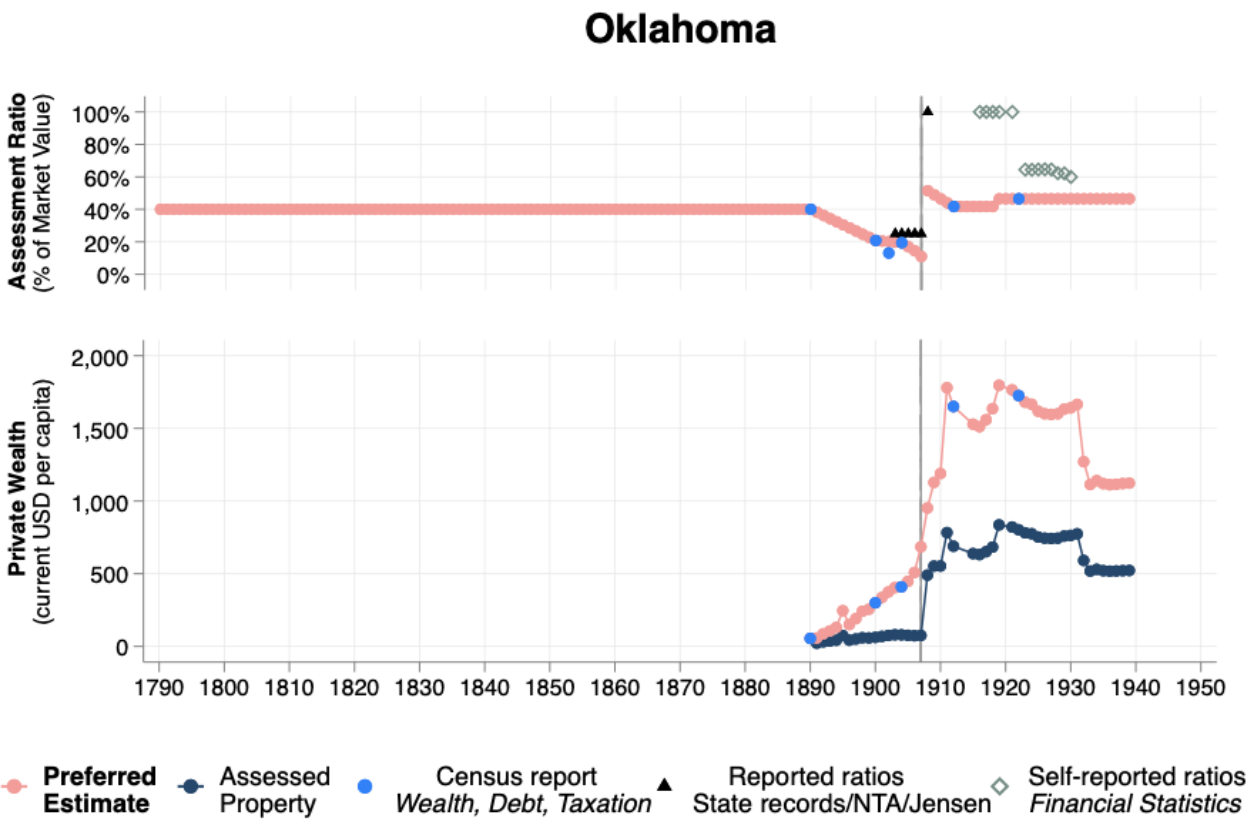
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

# Ohio



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

Oklahoma

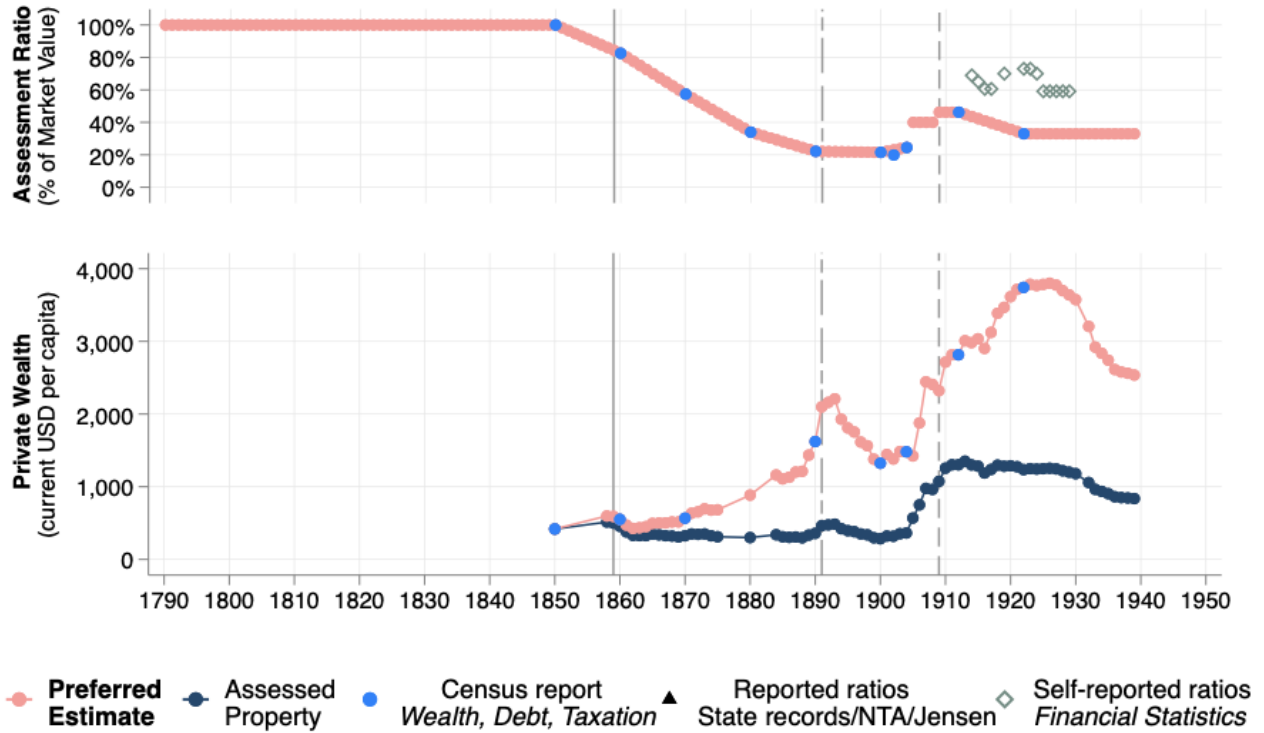


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.



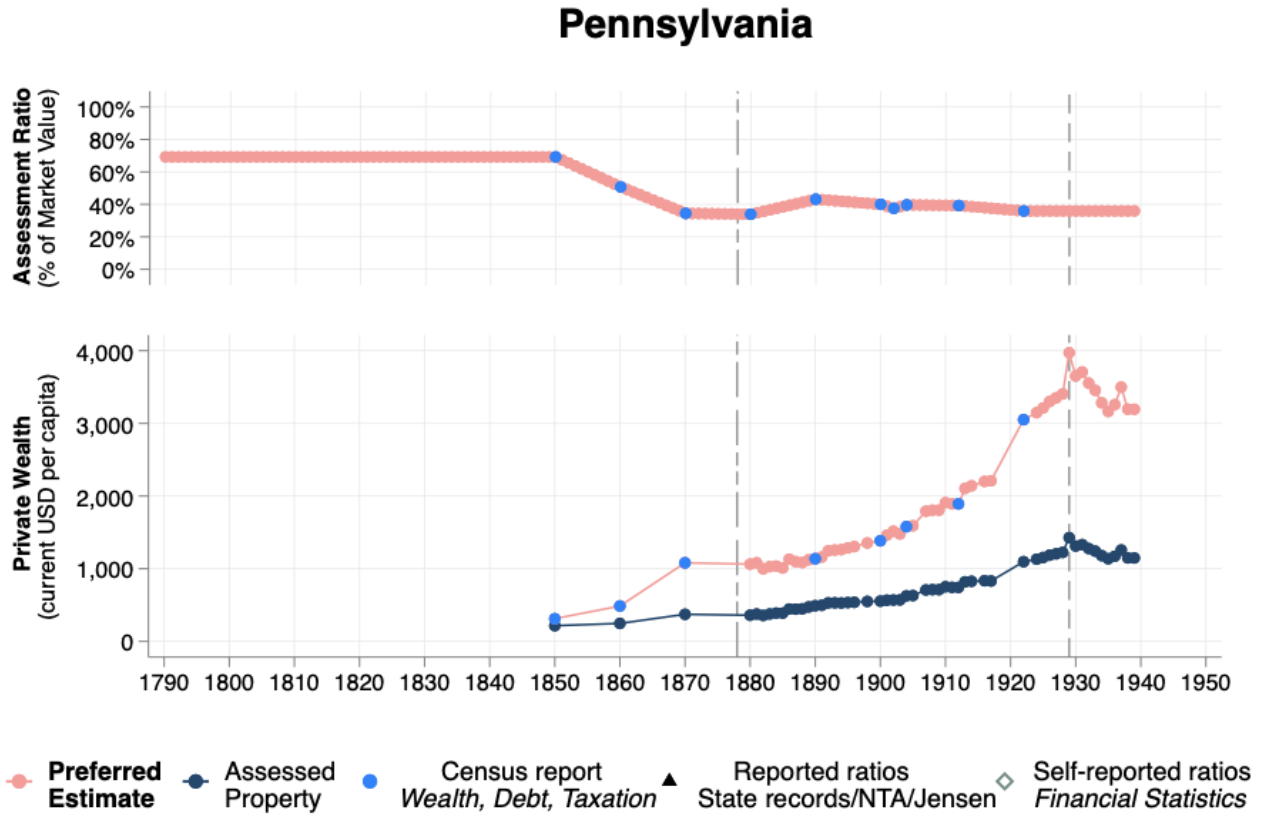
# Oregon

## Oregon



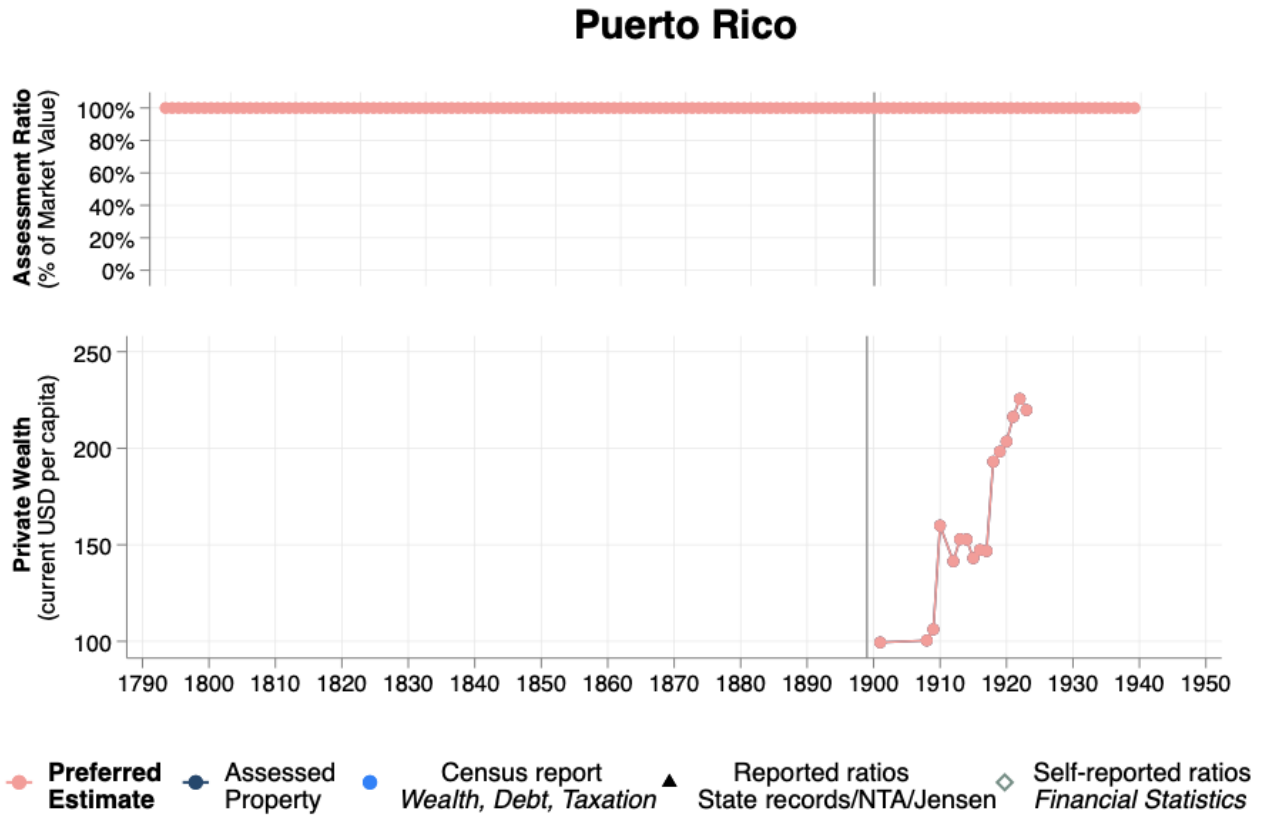
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

# Pennsylvania



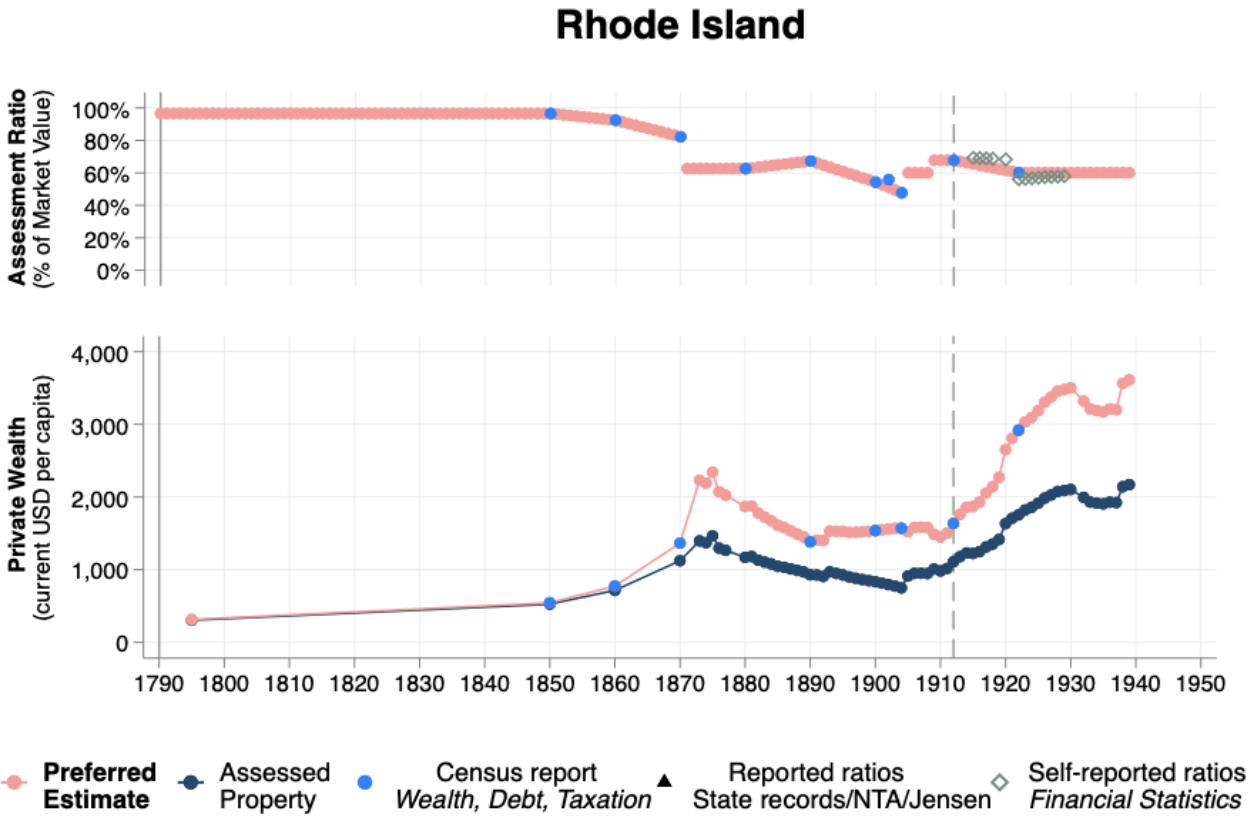
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

## Puerto Rico



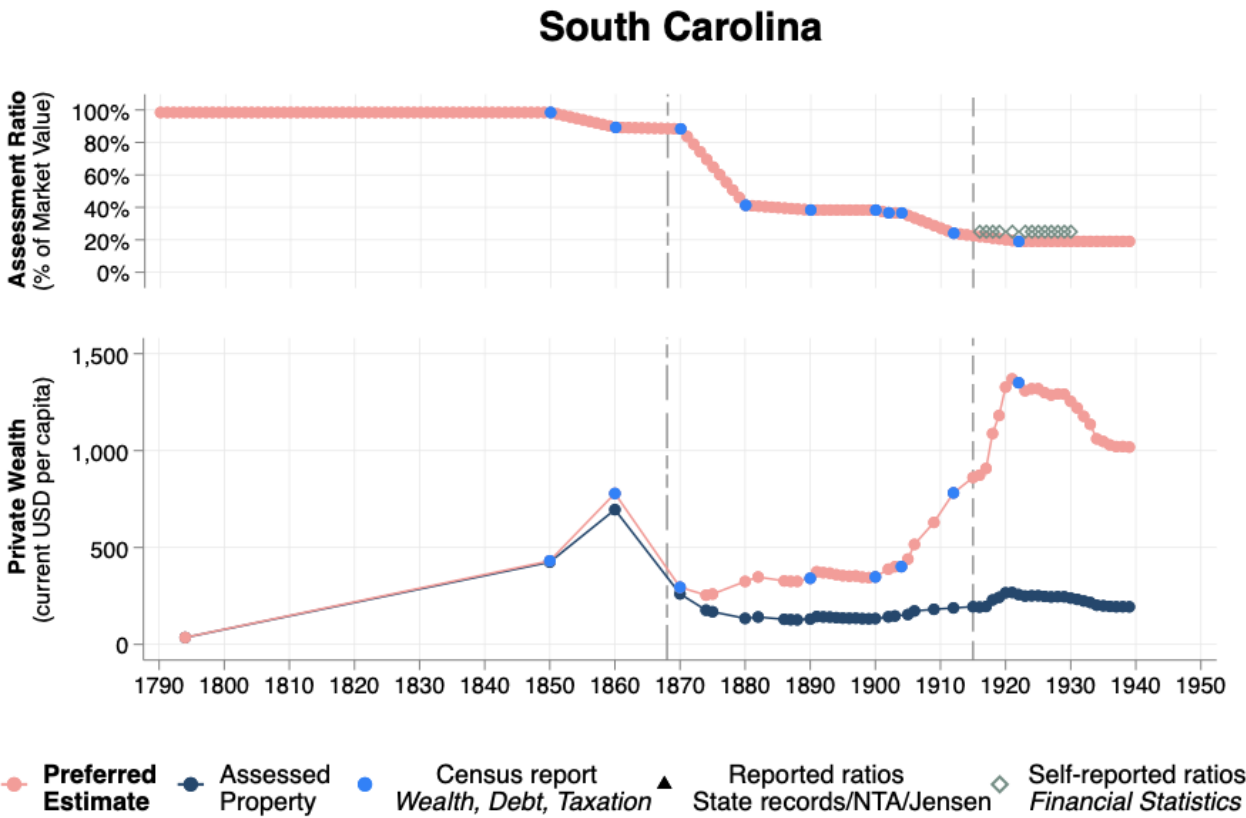
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.

Rhode Island



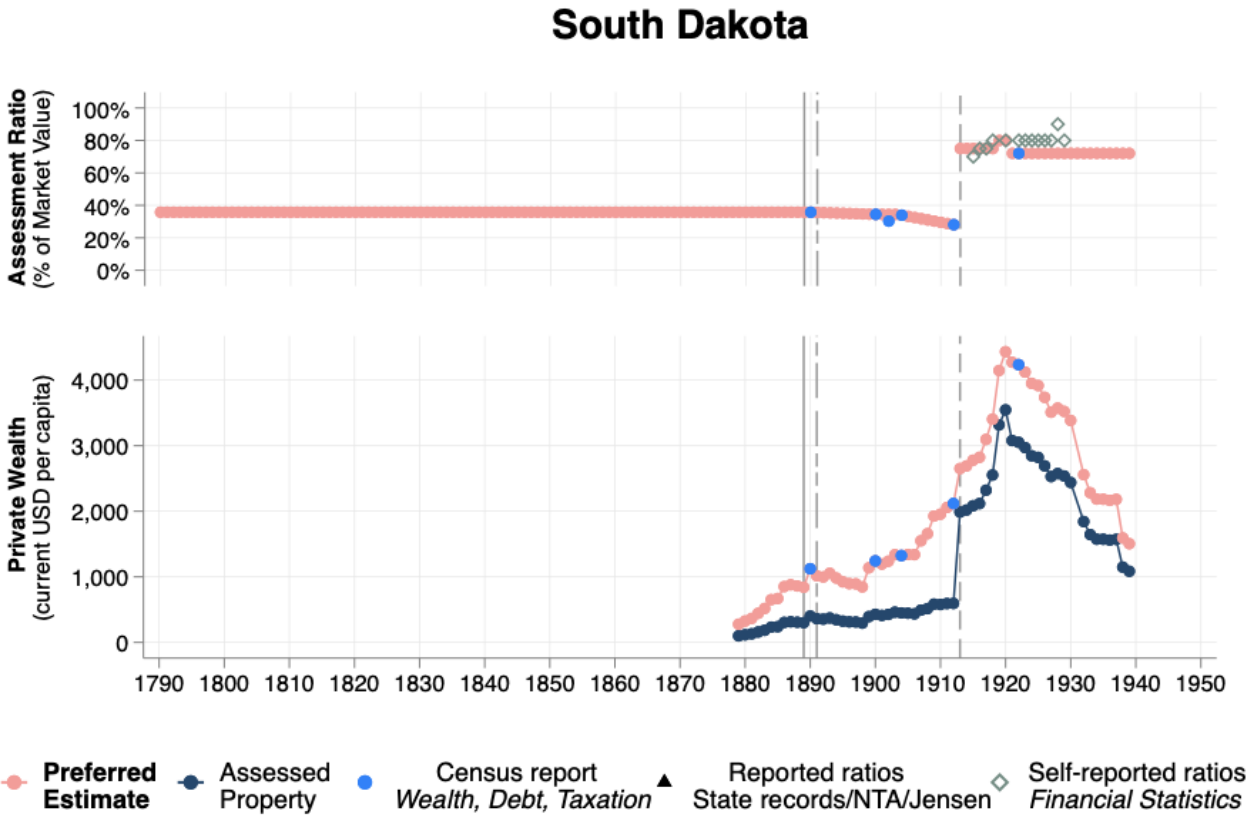
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

South Carolina



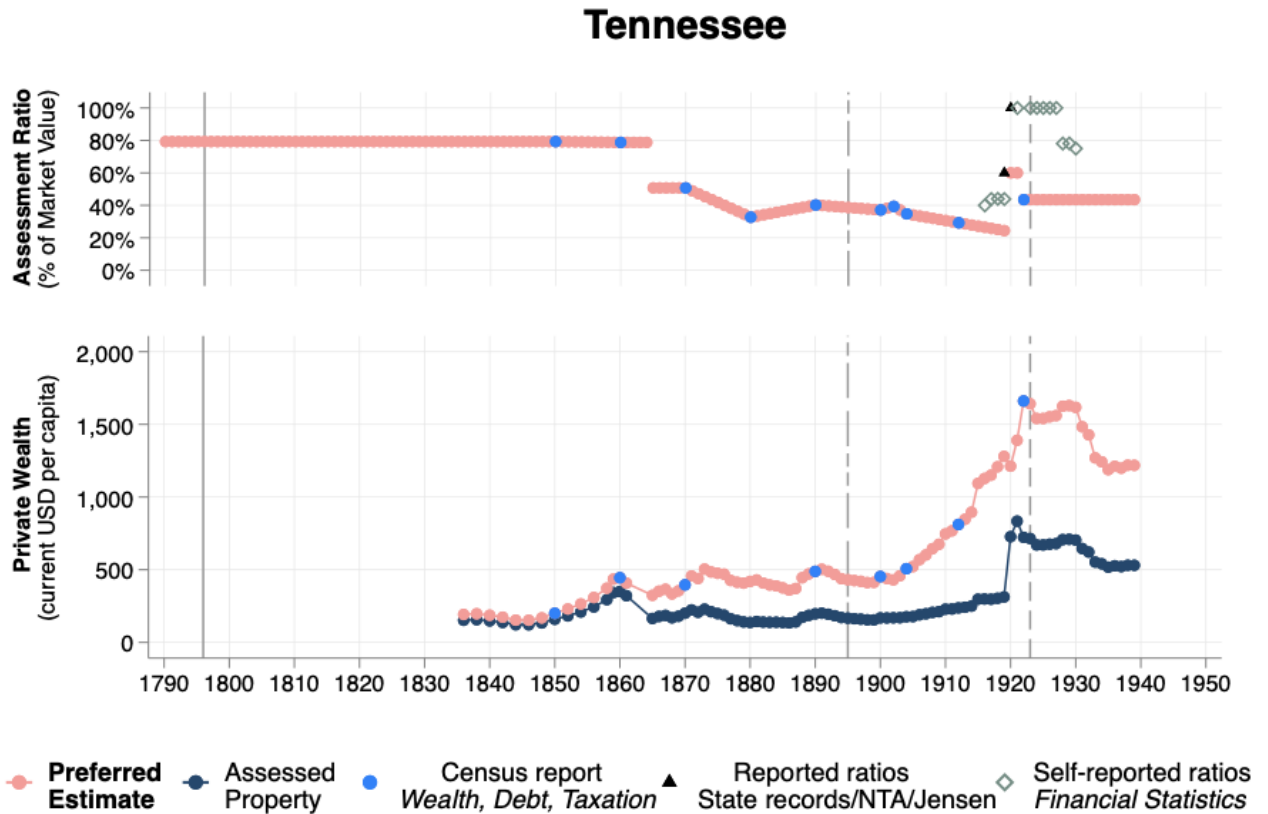
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

South Dakota



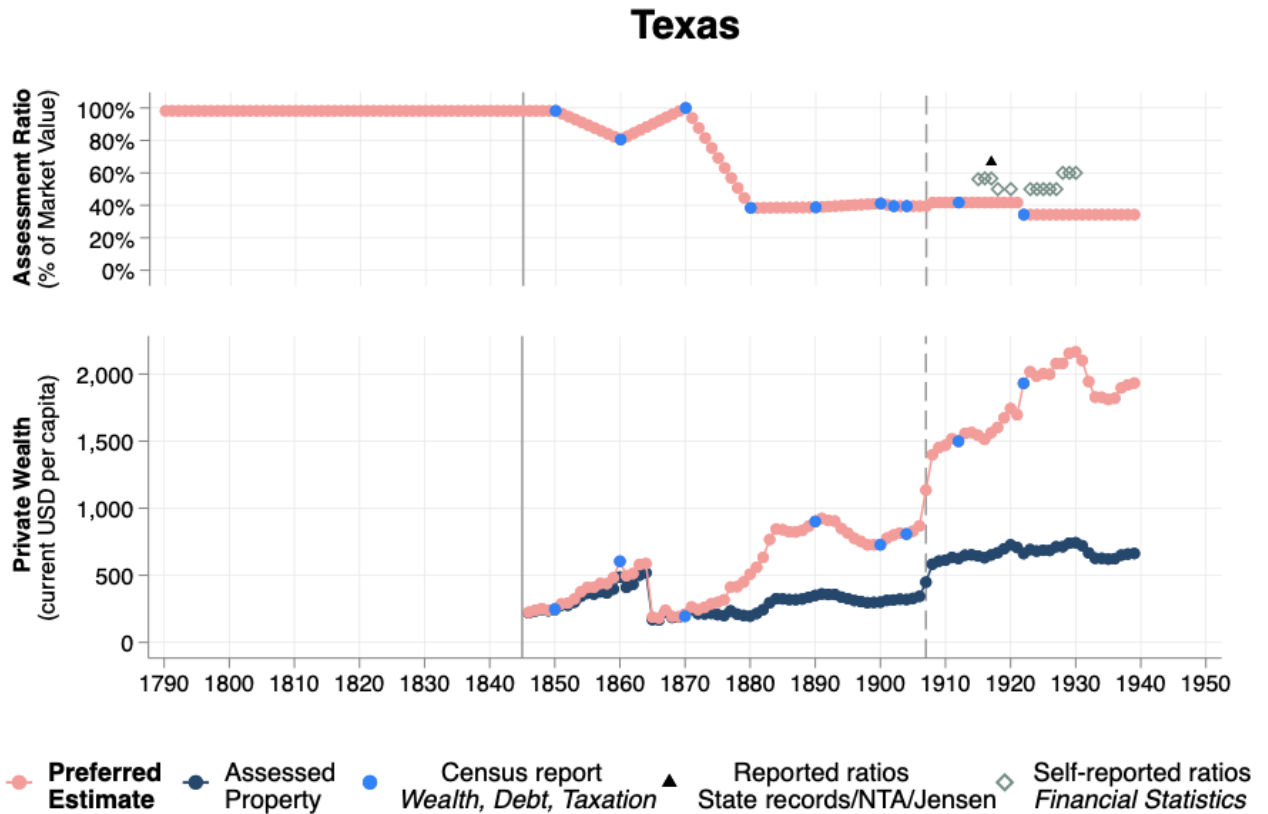
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

# Tennessee



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## Texas

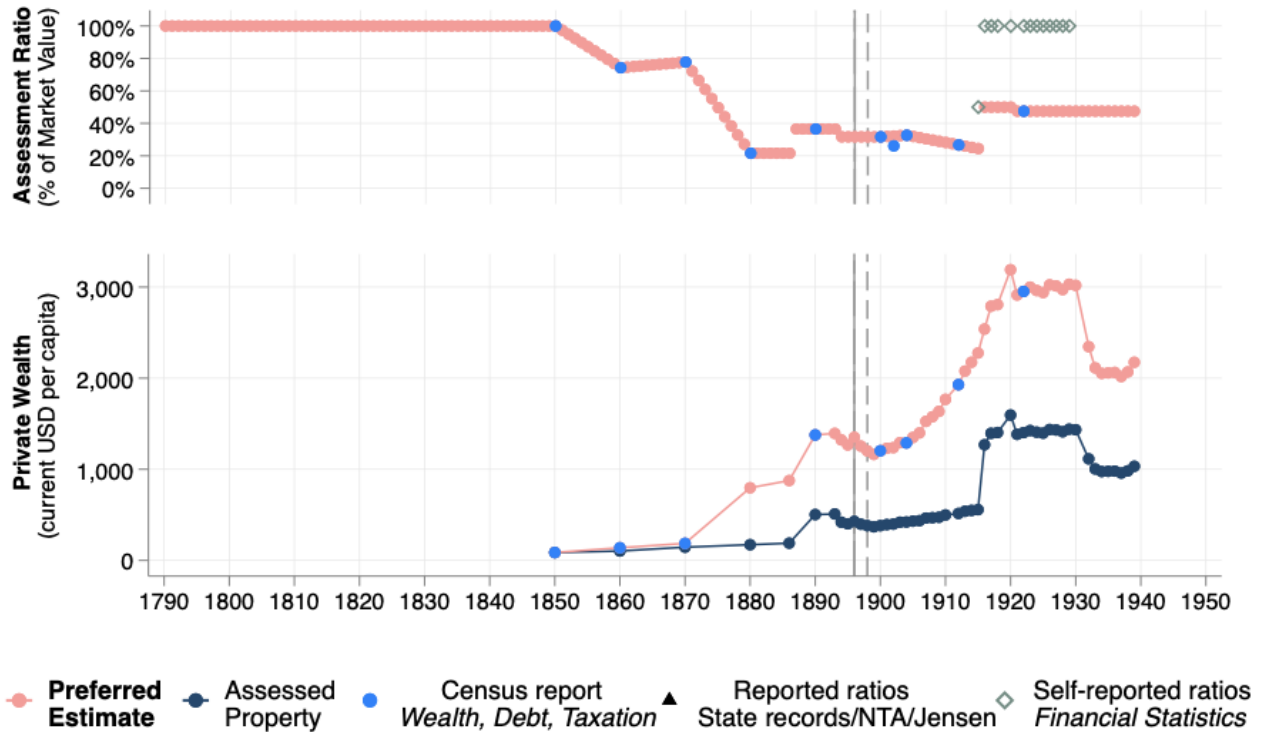


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
 Census ratios for 1880 and 1902 are inferred from tax rates.



# Utah

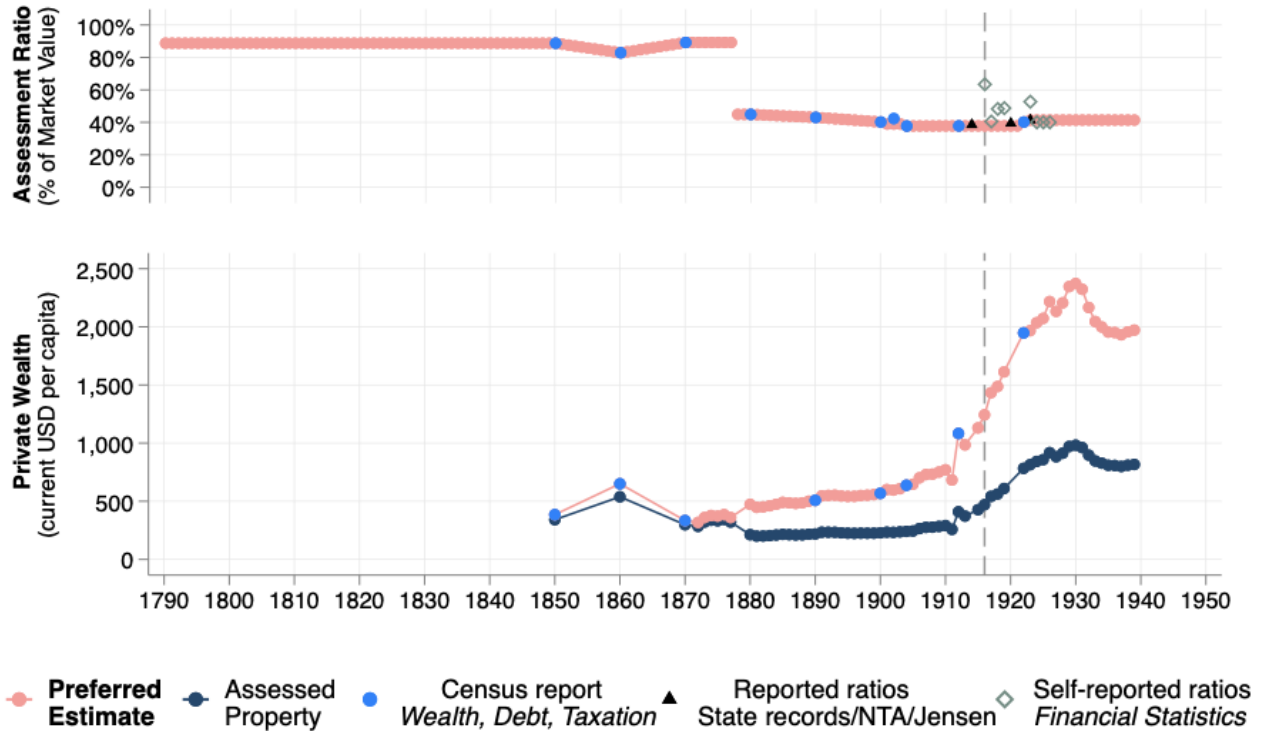
## Utah



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

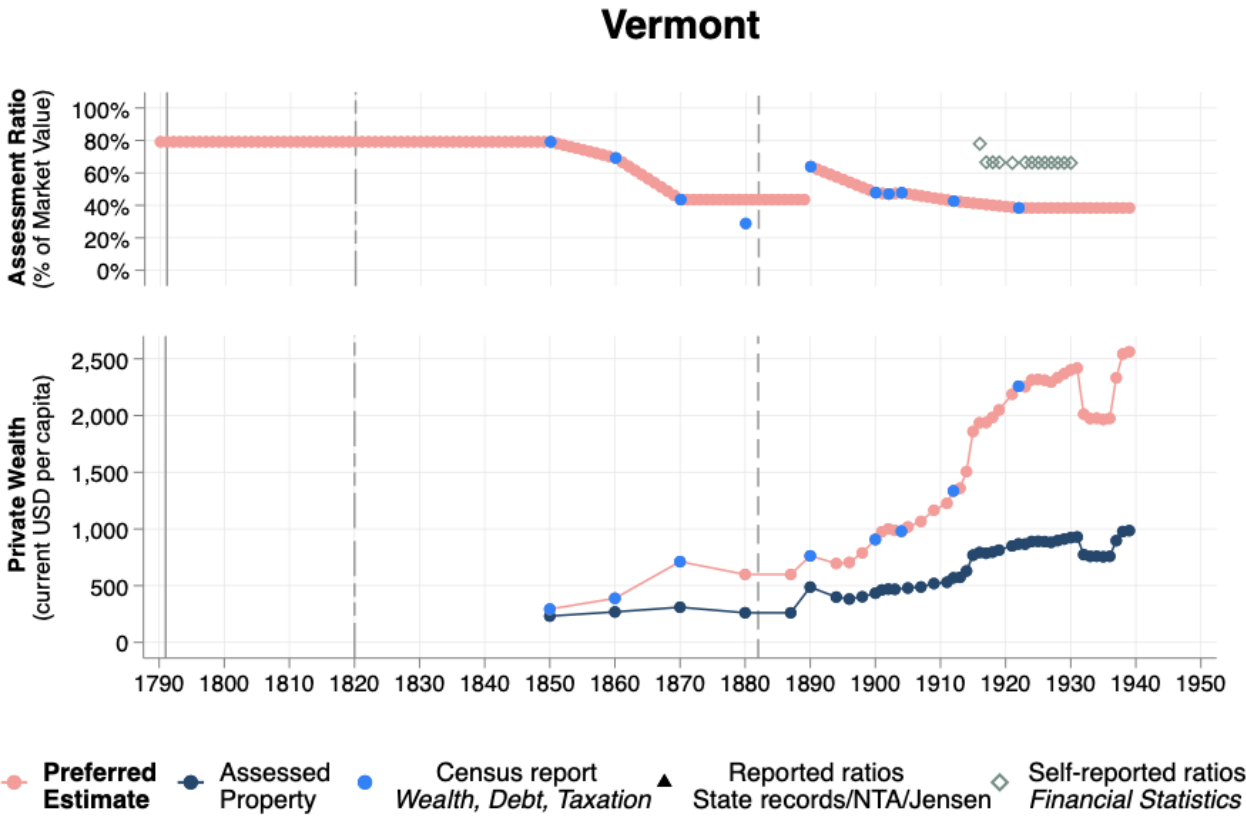
# Virginia

## Virginia



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

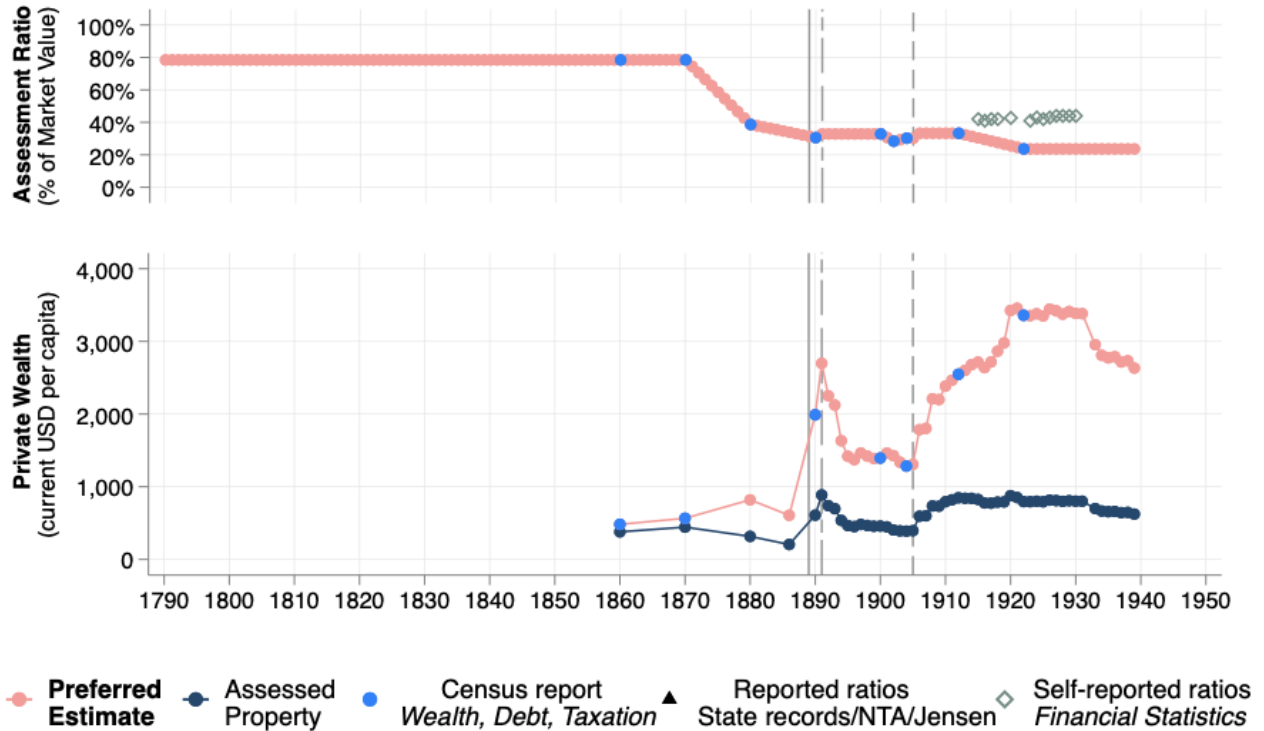
Vermont



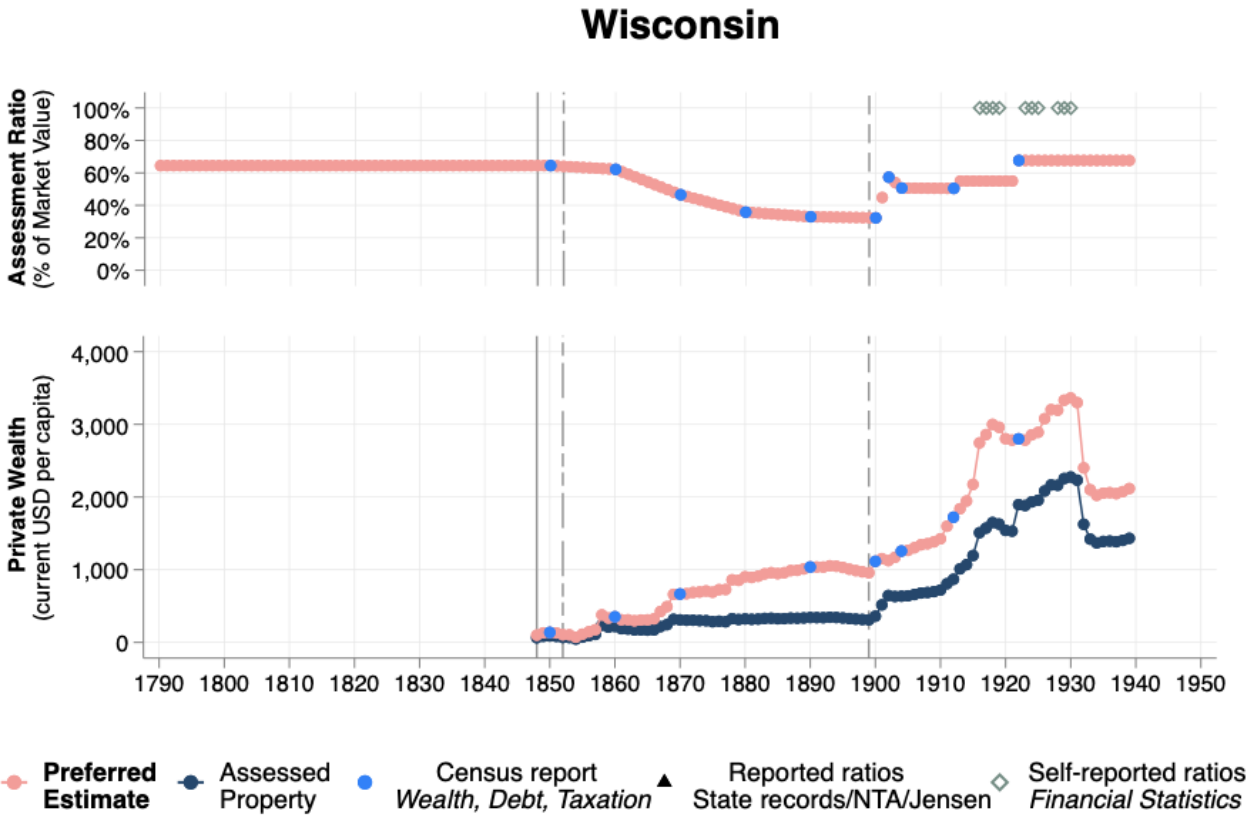
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## Washington

### Washington

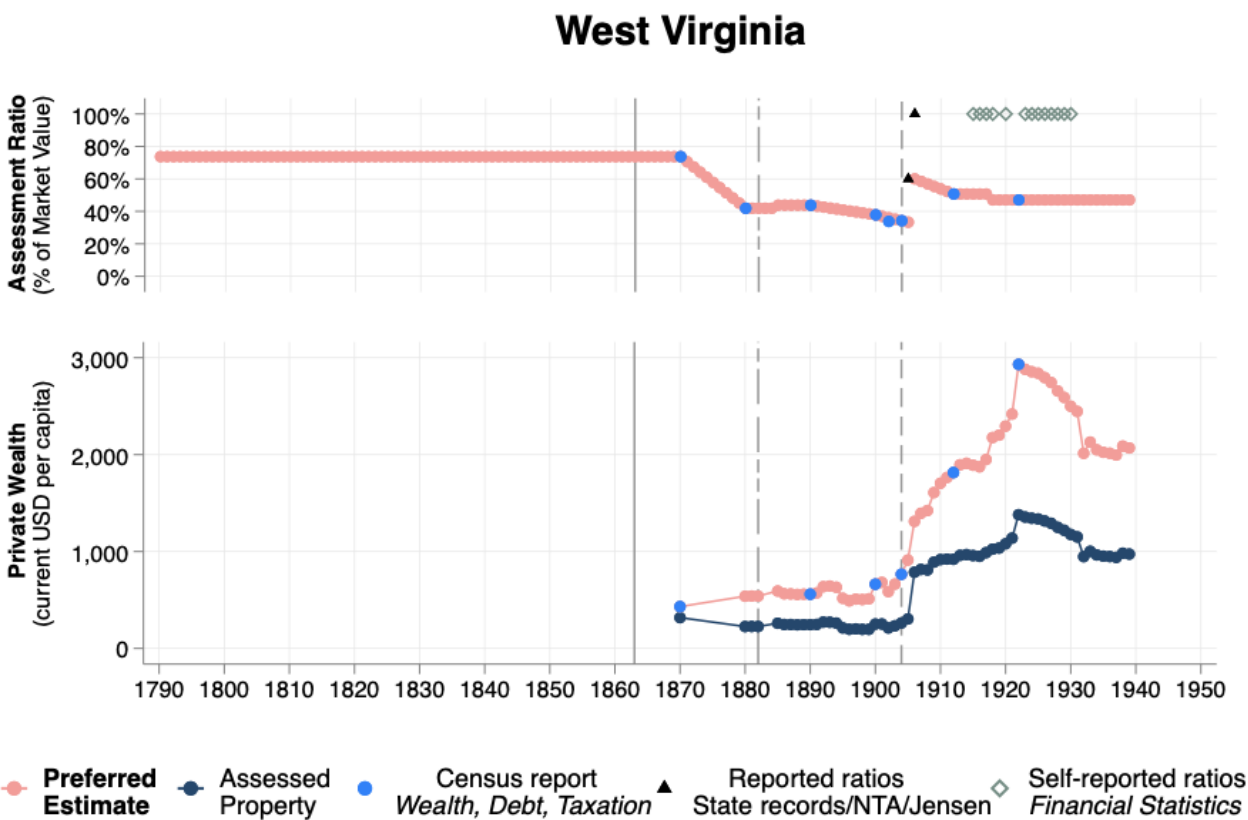


Wisconsin



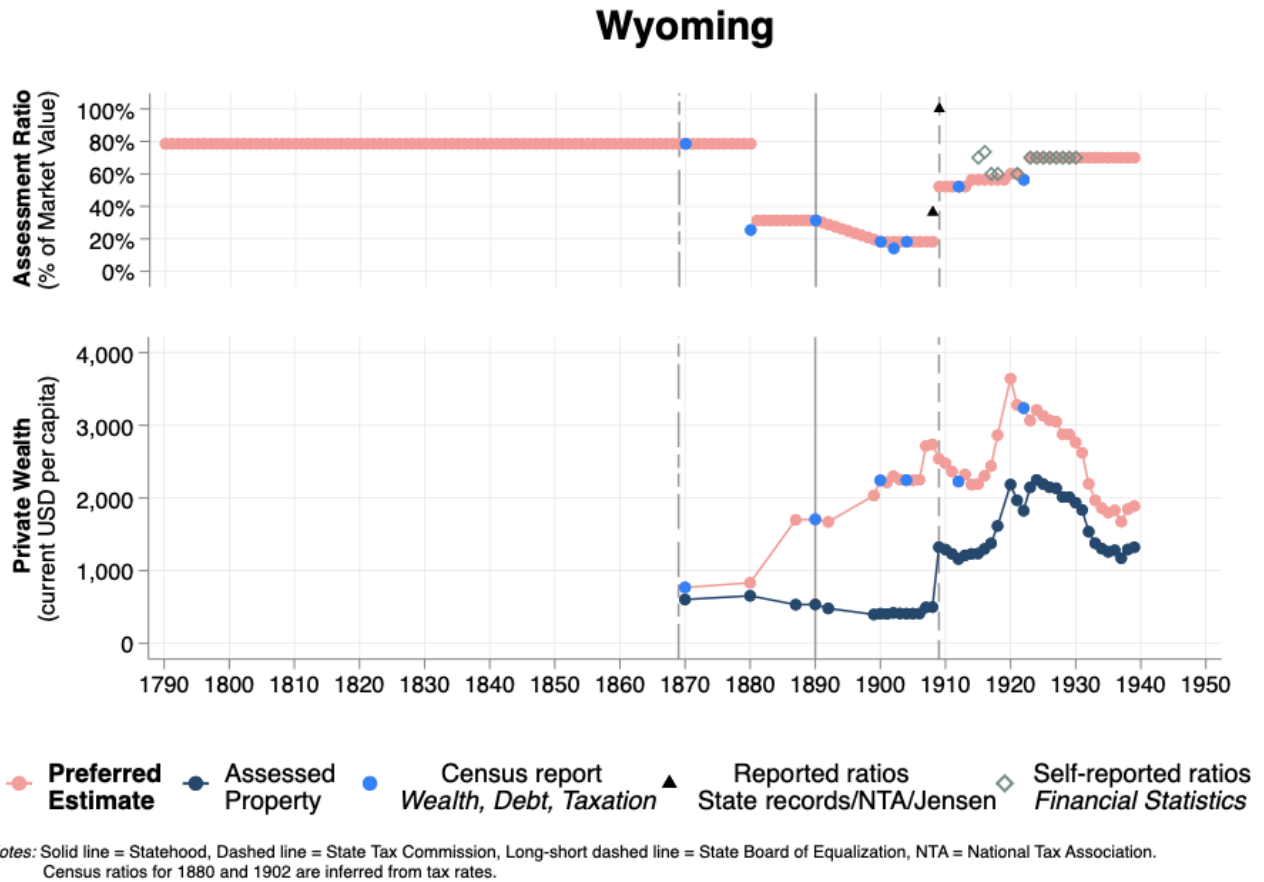
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

West Virginia



Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association.  
Census ratios for 1880 and 1902 are inferred from tax rates.

## Wyoming



### III.4. County Level property data

**1870-1930 decadal data.** We measure county-level property by using measures of assessed property for property tax purposes compiled in the Census Wealth Debt Taxation for 1870-1930 every decade. We obtain a measure of the actual property by using state-level assessment ratios obtained from state reports, as described in Appendix Section III.3. We separately observe real and personal property. As detailed in the 1870 report, both real and personal property values were measured as assessed values used for the purpose of property taxation in State and local governments. There was no harmonisation to account for differences in exemption, assessment practices or differences in what counts as real vs personal property across States. However, these statistics were compiled with great care. For instance, in 1870 the collection of these statistics were devoted to members of the US

marshal service that were specially commissioned for this task, with extensive training and access to all the existing official data available at the time.

For 1870, we have county-level assessment ratios from the Census report on Wealth, Debt, and Taxation<sup>11</sup>. We can thus compare the state assessment ratios described in Section III.3 to the average county-level assessment ratios. Figure A11 shows that these values are broadly quite similar, so that our assumption of using the state-level assessment ratio for the counties is well-justified.

**1850 and 1860 wealth estimation based on Census data.** For 1850 and 1860, we obtain county-level wealth data from the Census, as described in Section III.1. In order to have consistency between the county-level data and the state-level data, we rescale county-level wealth by multiplying it by factor (fixed at the state-level) equal to the ratio of state-level wealth to the sum of county-level wealth for each state.

To obtain series of wealth excluding the value of wealth from enslaved people, we subtract the series of wealth from enslaved people *Val. Enslaved*, the construction of which was described in Section III.2.

### III.5. City Level property data

Municipal wealth series come from the Census *Annual Financial Statistics of Cities* that compile statistics on assessed property values, tax rates, and assessment ratios from tax assessment records for the largest US cities between 1899 and 1938. Sampled cities had a population above 30,000 for 1899-1931, and above 100,000 for 1932-1938. This corresponds to 311 and 95 cities in 1931 and 1938 respectively. These annual statistics were obtained from municipal records and harmonized by the Census Bureau. Prior to 1899, city tax rates for Baltimore, Boston, and Cincinnati were obtained from Ely (1888).

From the Annual Financial Statistics of Cities, we use available variables on *Government Expenditures*, which contain the total municipal spending in nine general categories (excluding payment for public enterprises, debt interest repayments, and capital expenses). These categories cover all forms of general expenditures by municipalities as reported in their financial records. They are:

1. *General government*: expenditures for the legislative office, executive office, judicial department, elections, and maintenance of government buildings.

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<sup>11</sup>See Ninth Census-Volume III, Tables 2 on wealth, taxation, and public indebtedness giving both assessed and true valuation of property for each county, from which we extract an assessment ratio.



2. *Public order*: expenditures for the protection of people and property, which includes the police department, fire department, militia, and register of deeds. It also includes expenses related to correction facilities.
3. *Health*: expenditures for vital statistics, prevention of communicable diseases, conservation of child life, food regulation and inspection, and city hospitals.
4. *Sanitation*: expenditures for sewage disposal, street cleaning, and refuse collection.
5. *Highways*: expenditures for the construction and maintenance of highways, roadways, waterways, and bridges.
6. *Public Assistance* ("Charities"): expenditures for the care of children, the poor, old age assistance, veterans' relief, or public institutions for physical and mental health.
7. *Education*: all expenditures for schools and libraries.
8. *Recreation*: expenditures for recreational facilities, public parks, and trees.
9. *Miscellaneous*: all other expenditures of general natures, including public trust funds.

Second, we also derive from the Annual Financial Statistics records variables related to *Property Tax Enforcement* which is an indicator for the presence of property tax classification, i.e. the use of different tax rates by class of property. Classification was mainly used to better enforce taxation of personal property, which would otherwise tend to avoid taxation.<sup>12</sup> We complement these variables by state-level indicators of enforcement, namely the presence of tax ferrets in the State (officials remunerated for discovering properties avoiding the property tax) from [Parrillo \(2013\)](#), and the presence of a State tax commission (in charge of centralizing and regulating assessment) from [Jensen \(1931\)](#) and [Benson et al. \(1965\)](#).

We also construct three indicator variables corresponding to different levels of the assessment ratio (between 0 and 20%, between 20% and 40%, between 40% and 60%, between 60% and 80%, between 80% and 100% and above 100%) and three variables related to past property net-of-tax rates. For any year  $t$ , these are the average net-of-tax rate between i)  $t - 10$  and  $t$ ; ii)  $t - 11$  and  $t - 20$ ; iii) and  $t - 21$  and  $t - 30$ .

---

<sup>12</sup>We additionally rely on information about the adoption of classification from the Census 1902 Wealth, Debt, Taxation, [Jensen \(1931\)](#), [Benson et al. \(1965\)](#), and the Kansas 1918 Tax Commission (p40).

Municipal tax rates come mainly from the Financial Statistics of Cities (U.S. Census Bureau (1899-1931, 1919, 1921, 1932-1938)) for cities having a population over 30000, but also partly from Ely (1888) for 8 cities. In total, we have data between 1899 and 1940 for 586 cities in 47 states, Puerto Rico, and the District of Columbia.

### III.6. Land property data

The assessed values of taxable land at the state level are available in some of the State reports from which we source our assessed property data (see Table A11 and Section III.3), from 1854 to 1938. We corrected this assessed value using the same assessment ratio as for the rest of the property (see Appendix Section III.3.1). In total, we have 602 year-state observations of the value of taxable land, for 19 states.

We construct the share of land in total property at the state level where available and linearly interpolate at the state level. This results in a total of 791 year-state interpolated observations. We also assume a constant share of land in total property at the state level between 1840 and 1860. To construct Figures 13 for all the Union, we compute the average share of land at the national level by taking the average value across states, weighted by their population. We depict the 5-year moving average of the national shares on the figures. Figure 15 (for the South only) proceeds similarly, but only for Southern states.

### III.7. National wealth series

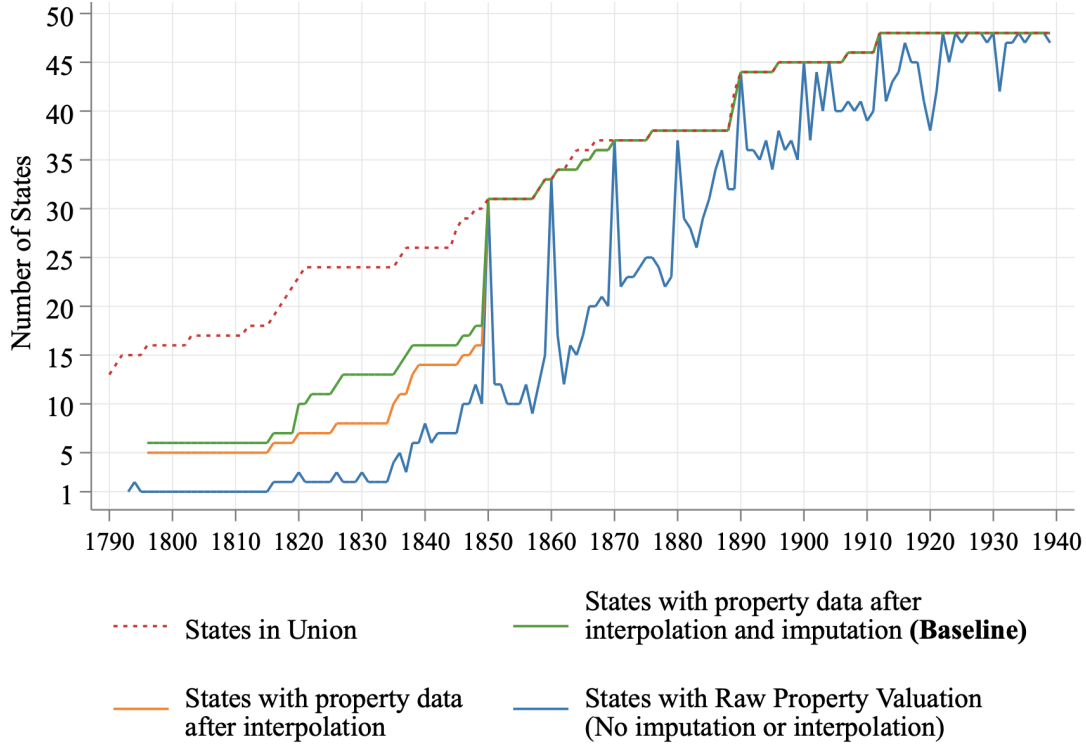
The national wealth series that we constructed is based on the aggregation of state-level wealth series. We explained the construction of these series in Section III.3. It is worth distinguishing the method used before and after 1850.

**Post-1850** We measure the national wealth per capita as the population-weighted average of wealth per capita in each state, where state-level property is constructed as explained in Section III.3.

**Pre-1850** Prior to 1850, we lack systematic information on wealth per capita for all states in the Union. The coverage for wealth at the state level can be seen in Figure 4. Therefore, we estimate national wealth using two additional approaches:

(1) When assessed property value is missing for a state before 1850 but we observe the revenues (or levy) from property taxes, we impute property valuation using the first observed tax rate before 1850 and tax levy, such that:

Figure A31: Data Coverage at the State Level



Notes: Panel A shows the number of state admitted to the Union for which data on private wealth is present in our database of state-level wealth.

$$\tilde{W}_{it} = \frac{R_{it}}{\tilde{\tau}_{it_{first}}} \quad (4)$$

where  $\tilde{W}_{it}$  indicates the assessed value of property in state  $i$  and year  $t \leq 1850$ ,  $R_{it}$  the property tax revenue, and  $\tilde{\tau}_{it_{first}}$  the first-observed tax rate on assessed property value.

(2) We obtain a national wealth estimate for each year by rescaling the sum of total wealth from states with observed wealth in that year (either directly, or through the imputation in equation (4) by the share of national wealth from these states in 1850 (1850 is the first year when wealth is observed for all states in the Union). Specifically, for years  $t \geq 1850$ , national wealth is simply the aggregate of state-level wealth:  $W_t^{nat} = \sum_i W_{it}$ . For years  $t < 1850$ , let  $I_t$  be the set of states for which we have an estimate of wealth in year  $t$ . Our estimate of national wealth is then

$$W_t^{nat} = \sum_{i \in I_t} W_{it} \cdot \frac{W_{1850}^{nat}}{\sum_{i \in I_t} W_{i,1850}} \quad (5)$$

**Robustness and sensitivity analysis.** We also construct national wealth series under alternative assumptions.

First, we examine how national wealth series change if we use fewer imputations. Panel A of Figure A12 reports these alternative methods that range from the least to the most imputations. The line “raw private wealth” shows the national series based on the property tax data from state-reports with no imputations for missing wealth estimates pre-1850 (the blue series in Panel C of Figure A12). We then show national series that impute missing wealth using linear interpolations in state series (line “Linear interpolation”) and also imputing missing wealth from property tax revenue pre-1850 following formula (4) (line “Pre-1850 Imputation from Levy”). In the final series, we also rescale pre-1850 national wealth series using formula (5) (line “Pre-1850 wealth rescaling”). As we can see in the Figure, these alternative assumptions only affect our estimates of national wealth for the very early years 1800-1818, for which the data is significantly scarcer and noisier. For the period 1800-1818 in which the uncertainty of our estimates is highest, our preferred estimates show a relatively constant national wealth at around 300% of GDP, while the alternative methods without imputations show a decline of wealth from about 500% to 300% of GDP between 1800 and 1818.

Second, we show an alternative method to rescaling wealth pre-1850 in Panel B of Figure A12. Our preferred rescaling in formula (5) uses all the available wealth data from states with non-missing property tax data. We can, however, test how sensitive the national wealth estimates are if we exclude one state at a time. Similar to the previous alternative method, we find that most of the changes in national wealth estimates are concentrated in the first decades of our series, here between 1796-1816. Our preferred estimates of national wealth around 300% of GDP during this period is a medium estimates, with alternative methods varying from 150-400% of GDP depending of which state is excluded.

Third, we show in Panel C of Figure A12 the values of national wealth using a constant assessment ratio of 40%. As explained in Section III.3, assessment ratios were not uniform across State or time, and these estimates should only be seen as providing some bounds on uncertainty arising from assessment ratios. The value of 40% assessment ratio was chosen as this is the average ratio in our sample. As shown in the figure, these are some differences between our preferred national wealth estimates and national wealth obtained with a constant assessment ratio for the period 1880-1940. Using a state-specific assessment ratios based on all the data available leads to national wealth substantially below that predicted by a constant 40% assessment ratio prior to 1880, as the average assessment ratio for that period was on average 78% (see the evolution of assessment ratios

by state and on average at the state level in Figure 6).

### III.8. Existing wealth data in the U.S. 1770-1939

In addition to the assessed property tax data that we use, there exist limited other sources for wealth. These are typically only available at the national level and not at more disaggregated levels, such as state or county. Over the historical period we consider, there are four alternative methods, to which we compare our estimates in Section III.9:

1. **Measures based on individual-level Census questions.** The Census directly asked individuals about the value of their real wealth (in 1850, 1860, and 1870) and personal wealth (in 1860 and 1870), as described in Section III.1. It has the advantage of directly measuring wealth that can be aggregated at city, county and state-level, but is only available for two years (since 1850 really only measures real wealth). We compare this data to our estimates at the state level, as detailed in Section III.9, and use it with some modifications to extend our county-level data to 1860 and 1850 (see Section III.4).
2. **Measures based on the perpetual inventory method.** This method indirectly estimates capital by cumulating past investment flows into a measure of the stock of capital, while also accounting for changes in relative prices. These national-level estimates are constructed by Goldsmith (1952) for almost every decade from 1850 to 1950, using capital expenditures provided in national accounts. They are used by Piketty and Zucman (2014), along with other estimates, to produce a long-term wealth series. We describe the data constructed by Piketty and Zucman (2014) in more detail in Section III.9.
3. **Measures of wealth based on national balance sheets data from national accounts.** Such balance sheets information becomes available only in 1916 for the US, so it does not cover most of our period of study. This data was used by Goldsmith (1952) to estimate national-level wealth from 1916 to 1945. It also forms the basis of wealth estimates in Piketty and Zucman (2014) for that period.
4. **Measures of wealth based on national accounts and Census data on the value of land.** This method relies on national accounts to measure the stock of capital in each sector and of Census data on the value of land. It was used in Gallman and Rhode (2019) to construct national-level wealth for every decade from 1850 to 1900.

There are some other methods for wealth estimation, but these are not available on a consistent basis. [Garmon Jr \(2014\)](#) studies the 10 most populous states in 1785-1815. [Jones \(1970\)](#) uses probate records for 1774 for some counties in Pennsylvania, New Jersey, and Delaware. [Jones \(1972\)](#) estimates the wealth of the Middle Colonies and New England in 1774. [Soltow \(1984\)](#) estimates wealth for 10-20% of counties in Maine, Massachusetts, Connecticut, New York, Pennsylvania, Maryland, North Carolina, Georgia, and Tennessee for the period 1798-1860.

### **III.9. Comparison with Other Sources**

In this section, we compare our database on wealth to the other historical sources described in Section [III.8](#).

#### **III.9.1. Comparison with the Census of Agriculture Data at the state level**

In Figure [9](#), we compare our measure of taxable land and improvements, for states that separately reported this, to the average value of farmland and buildings in the Census of Agriculture, as compiled by [Haines \(2014\)](#). We compile data on thirteen states (Alabama, Arkansas, Florida, Georgia, Indiana, Kansas, Kentucky, Minnesota, North and South Carolina, Tennessee, Texas and Wisconsin) between years 1860 and 1910.

#### **III.9.2. Comparison with the IPUMS USA Full Count**

At the state level, Figure [A15](#) shows that for many states, the ratio of our property-tax based measure and the IPUMS USA Full Count measure is between 80% and 120% for all years. In 1850, this is the case for 18 out of 30 states; in 1860 24 out of 33 states, and in 1870 22 out of 37 states. There are some states with large discrepancies between the tax-based and IPUMS USA Full Count data in 1850: Texas and Michigan, (where the tax-data significantly underestimates wealth relative to the Census). In 1870, there are some states where the tax data yields higher wealth levels than in the IPUMS USA Full Count. These are Arkansas, Louisiana, South and North Carolina, Florida, New York, Rhode Island and Massachusetts.

At the county level, Figure [A16](#) shows the ratio between tax-based property measures and the IPUMS USA Full Count measures in 1870 (which is the only year in which we can compare these data sources at the county level). There are, again, more discrepancies between these two data sources in terms of Personal Wealth rather than real wealth, but there is no clear systematic over- or undervaluation by any of these data. As alluded to

multiple times, the definition of Personal Wealth is not streamlined in the property tax assessments and could vary across and within states. The comparisons by type of wealth are thus much noisier.

### III.9.3. [Piketty and Zucman \(2014\)](#)

[Piketty and Zucman \(2014\)](#) constructed a harmonized series of ratios of private wealth / national income approximately every decade for 1850-1910 as well as for 1770 and 1810, and annual ratios for the period 1870-1940.

Below are data sources and adjustments for each estimates of private wealth for the [Piketty and Zucman \(2014\)](#) harmonized series :

- **1770:** Estimates of private wealth from probate records in 1774 from [Jones \(1970\)](#) after (i) converting current pounds into current dollars (1 pound sterling = 4.44 US dollar) (ii) converting “per free capita” into “per capita” assuming that enslaved people made up about 20% of the total population of the Thirteen Colonies in 1774 (iii) upgrading 1770 per capita national income by 5% to take into account real and nominal growth between 1770 and 1774.
- **1810:** Estimate of private wealth from [Blodget \(1806\)](#) based on the compilation of national statistics on the value of real and personal wealth.
- **1850:** Estimates from [Goldsmith \(1952\)](#) inflated by 20%.
- **1860:** Estimates from [Hoenack \(1964\)](#).
- **1870:** Estimates from [Goldsmith \(1952\)](#) inflated by 20%.
- **1880:** Estimates from [Hoenack \(1964\)](#).
- **1900:** Estimates from [Goldsmith \(1952\)](#).
- **1912:** Estimates from [Goldsmith \(1952\)](#).
- **1870-1916 (annual estimates):** Annual estimates of private wealth using decade-level estimates above, private saving flows from [Kutznets \(1961\)](#), and assuming a constant annual rate of real capital gains of 1.8% for 1870-1880, 1.0% for 1880-1900, 0.7% for 1900-1912, and 1.0% for 1912-1916.
- **1916-1945 (annual estimates):** Mid-year household wealth estimates from [Kopczuk and Saez \(2004\)](#), based on balance sheets of [Goldsmith \(1952\)](#) and [Wolff and Marley](#)

(1898). [Piketty and Zucman \(2014\)](#) make two adjustments: (i) they exclude consumer durables<sup>13</sup> (ii) they upgrade household net wealth by 7% for consistency with their post-1945 data. [Kopczuk and Saez \(2004\)](#) estimates also exclude non-transmissible wealth.

#### **III.9.4. [Gallman and Rhode \(2019\)](#)**

([Gallman and Rhode, 2019](#)) wealth estimates for 1850-1900 are based on Gallman's capital stock measures by two-digit industrial sector estimated from national accounts, and a measure of the value of land. The series used here for comparison comes from Rhode's completion and compilation of these estimates into a consistent national wealth series presented in ([Gallman and Rhode, 2019](#)), Table 2.4. For comparison, we use the series on domestic wealth, measured as the sum of capital stock and the value of land. As detailed in ([Gallman and Rhode, 2019](#)), this wealth concept excludes paper claims, consumer durables, and human capital.

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<sup>13</sup>They use series from the BEA for 1925-1945, linear interpolation based on [Goldsmith \(1952\)](#) estimates for 1901, 1913 and 1923, then assume a constant fraction of durables before 1901 (33%, the 1901 value).



### III.10. Data on Property tax revenues and tax rates

We also collect property tax revenue data from multiple sources.

Figure 1 plots the ratio of the revenues (levies) from the general property tax raised at different levels of government and the GDP of the states in the Union in any given year.

We collect the data on revenues from the following sources:

- For the period 1993 to 2020, we use the Annual Surveys of State and Local Government Finances produced by the US Census Bureau: ([U.S. Census Bureau \(1993-2020\)](#))).
- For the period 1900 to 1992, we rely on several sources:
  - The annual Statistical abstracts of the United States prepared by the chief of the Bureau of Statistics of the Treasury Department, providing data on recent years, especially at the county and the local levels: ([U.S. Census Bureau \(1942-1992\)](#))).
  - The two major censuses: the 1967 Census of government ([U.S. Department of Commerce \(1967\)](#)) and the 1982 Census of Governments ([U.S. Department of Commerce \(1982\)](#)) that provide historical data for past years.
  - The Census 1922: Wealth, Debt and Taxation ([U.S. Census Bureau \(1922\)](#)) for several years between 1900 and 1922
- For the period 1850 to 1900, we use the decennial Report on Valuation, Taxation, and Public Indebtedness in the United States by the US Census Bureau for the years 1850 ([U.S. Census Bureau \(1854\)](#)), 1870 ([U.S. Census Bureau \(1870\)](#)), 1880 ([U.S. Census Bureau \(1880\)](#)), 1890 ([U.S. Census Bureau \(1890\)](#)) and the report Wealth, Debt and Taxation of 1902 by the US Census Bureau ([U.S. Census Bureau \(1902\)](#))).

For the denominator (i.e the GDP), we are using different GDP series for the States in the Union at that time:

- For the period 1929 to 2021, we use the US Census Bureau of Economic Analysis GDP series ([U.S. Census Bureau \(2022\)](#))).
- For the period 1879 to 1928, we use the Dincecco-Prado GDP series ([Dincecco, Mark and Prado, Mauricio \(2013\)](#))).

- For the period 1850 to 1878, we use the Lindert and Williamson GDP series (Lindert, Peter and Williamson, Jeffrey (2011), Lindert, Peter and Williamson, Jeffrey (2012) and Lindert, Peter and Williamson, Jeffrey (2016)).

Because the names of the different levels of government can vary from one period to another, we decided to collect consistent series on state, county and “lower levels” of government decomposition, instead of trying to go to finer local levels. From the sources just described, we recover four main variables: the *total levy*, the *state levy*, the *local levy*, and the *county levy*. The *other local levy* describing municipal and lower levels of government is obtained by subtracting the county levy from the local levy.

For the year 1850, the data is available for only some of the states. The 1850 decennial report estimates a \$43,000,000 total levy using the data they had available. In order to control if that estimation is plausible, we make use of the 1860 total levy by state. We compute the shares of each state in the 1860 total (national) levy. We then use these shares to compute what would be the missing state levies in 1850 if their shares of the total levy were identical to 1860 and if the total national levy was indeed \$43,000,000. Summing these estimations, we are getting a total estimation close to \$43,000,000. Therefore, we decided to go with the estimation provided by the 1850 Decennial report.

In order to recover the levies for all the levels of government in 1850, we assume that the shares of each level of government for the pool of states available is a good representative for the shares for all states and apply them to the Census estimate of the national levy (\$43,000,000).

In Figure 3, the numerator is the levies such as computed for Figure 1. The denominator is the property valuation. In Panel D of Figure 16, the sources are similar to those just described. However, we use the values of total revenues by state, where available.

The sources are similar than the ones used for the Figure 1 above. Here, we are using the values of the total levy broken down by States when the information was indeed available. As mentioned above, in 1850, we had to estimate the values for some States by using the total estimation given in the 1850 Decennial report and the shares of these States in the total levy in 1860.

Because there are missing values for the property valuation and the levies broken down by State, we decided to go with a linear interpolation of both the property valuation and

Table A9: Data Coverage for Property Tax Revenues

| Year | Total | State | Local | County | Year | Total | State | Local | County | Year | Total | State | Local | County |
|------|-------|-------|-------|--------|------|-------|-------|-------|--------|------|-------|-------|-------|--------|
| 1850 | X     | X     | X     | X      | 1908 |       |       |       |        | 1965 | X     | X     | X     |        |
| 1851 |       |       |       |        | 1909 |       |       |       |        | 1966 | X     | X     | X     |        |
| 1852 |       |       |       |        | 1910 |       |       |       |        | 1967 | X     | X     | X     | X      |
| 1853 |       |       |       |        | 1911 |       |       |       |        | 1968 | X     | X     | X     |        |
| 1854 |       |       |       |        | 1912 | X     |       |       |        | 1969 | X     | X     | X     |        |
| 1855 |       |       |       |        | 1913 | X     | X     | X     |        | 1970 | X     | X     | X     |        |
| 1856 |       |       |       |        | 1914 |       |       |       |        | 1971 | X     | X     | X     |        |
| 1857 |       |       |       |        | 1915 |       |       |       |        | 1972 | X     | X     | X     | X      |
| 1858 |       |       |       |        | 1916 |       |       |       |        | 1973 | X     | X     | X     | X      |
| 1859 |       |       |       |        | 1917 |       | X     |       |        | 1974 | X     | X     | X     | X      |
| 1860 | X     |       |       |        | 1918 |       |       |       |        | 1975 | X     | X     | X     | X      |
| 1861 |       |       |       |        | 1919 |       |       |       |        | 1976 | X     | X     | X     |        |
| 1862 |       |       |       |        | 1920 |       |       |       |        | 1977 | X     | X     | X     | X      |
| 1863 |       |       |       |        | 1921 |       |       |       |        | 1978 | X     | X     | X     | X      |
| 1864 |       |       |       |        | 1922 | X     | X     | X     | X      | 1979 | X     | X     | X     | X      |
| 1865 |       |       |       |        | 1923 |       | X     |       |        | 1980 | X     | X     | X     | X      |
| 1866 |       |       |       |        | 1924 |       | X     |       |        | 1981 | X     | X     | X     | X      |
| 1867 |       |       |       |        | 1925 |       | X     |       |        | 1982 | X     | X     | X     | X      |
| 1868 |       |       |       |        | 1926 |       | X     |       |        | 1983 | X     | X     | X     | X      |
| 1869 |       |       |       |        | 1927 | X     | X     | X     |        | 1984 | X     | X     | X     | X      |
| 1870 | X     | X     | X     | X      | 1928 |       | X     |       |        | 1985 | X     | X     | X     | X      |
| 1871 |       |       |       |        | 1929 |       | X     |       |        | 1986 | X     | X     | X     | X      |
| 1872 |       |       |       |        | 1930 |       | X     |       |        | 1987 | X     | X     | X     | X      |
| 1873 |       |       |       |        | 1931 |       | X     |       |        | 1988 | X     | X     | X     | X      |
| 1874 |       |       |       |        | 1932 | X     | X     | X     | X      | 1989 |       |       |       |        |
| 1875 |       |       |       |        | 1933 |       |       |       |        | 1990 | X     | X     | X     | X      |
| 1876 |       |       |       |        | 1934 | X     | X     | X     |        | 1991 | X     | X     | X     | X      |
| 1877 |       |       |       |        | 1935 |       |       |       |        | 1992 | X     | X     | X     | X      |
| 1878 |       |       |       |        | 1936 | X     | X     | X     |        | 1993 | X     | X     | X     |        |
| 1879 |       |       |       |        | 1937 |       |       |       |        | 1994 | X     | X     | X     |        |
| 1880 | X     | X     | X     | X      | 1938 | X     | X     | X     |        | 1995 | X     | X     | X     |        |
| 1881 |       |       |       |        | 1939 |       | X     |       |        | 1996 | X     | X     | X     |        |
| 1882 |       |       |       |        | 1940 | X     | X     | X     |        | 1997 | X     | X     | X     |        |
| 1883 |       |       |       |        | 1941 | X     | X     | X     |        | 1998 | X     | X     | X     |        |
| 1884 |       |       |       |        | 1942 | X     | X     | X     | X      | 1999 | X     | X     | X     |        |
| 1885 |       |       |       |        | 1943 |       |       |       |        | 2000 | X     | X     | X     |        |
| 1886 |       |       |       |        | 1944 | X     |       |       |        | 2001 | X     | X     | X     | X      |
| 1887 |       |       |       |        | 1945 | X     | X     | X     |        | 2002 | X     | X     | X     | X      |
| 1888 |       |       |       |        | 1946 | X     | X     | X     |        | 2003 | X     | X     | X     | X      |
| 1889 |       |       |       |        | 1947 | X     | X     | X     |        | 2004 | X     | X     | X     |        |
| 1890 | X     | X     | X     | X      | 1948 | X     | X     | X     |        | 2005 | X     | X     | X     |        |
| 1891 |       |       |       |        | 1949 | X     | X     | X     |        | 2006 | X     | X     | X     |        |
| 1892 |       |       |       |        | 1950 | X     | X     | X     |        | 2007 | X     | X     | X     | X      |
| 1893 |       |       |       |        | 1951 | X     | X     | X     |        | 2008 | X     | X     | X     |        |
| 1894 |       |       |       |        | 1952 | X     | X     | X     | X      | 2009 | X     | X     | X     |        |
| 1895 |       |       |       |        | 1953 | X     | X     | X     |        | 2010 | X     | X     | X     |        |
| 1896 |       |       |       |        | 1954 | X     | X     | X     | X      | 2011 | X     | X     | X     |        |
| 1897 |       |       |       |        | 1955 | X     | X     | X     |        | 2012 | X     | X     | X     | X      |
| 1898 |       |       |       |        | 1956 | X     | X     | X     | X      | 2013 | X     | X     | X     |        |
| 1899 |       |       |       |        | 1957 | X     | X     | X     | X      | 2014 | X     | X     | X     |        |
| 1900 |       |       |       |        | 1958 | X     | X     | X     |        | 2015 | X     | X     | X     |        |
| 1901 |       |       |       |        | 1959 | X     | X     | X     |        | 2016 | X     | X     | X     |        |
| 1902 | X     | X     | X     | X      | 1960 | X     | X     | X     |        | 2017 | X     | X     | X     | X      |
| 1903 |       |       |       |        | 1961 | X     | X     | X     |        | 2018 | X     | X     | X     |        |
| 1904 |       |       |       |        | 1962 | X     | X     | X     | X      | 2019 | X     | X     | X     |        |
| 1905 |       |       |       |        | 1963 | X     | X     | X     |        | 2020 | X     | X     | X     |        |
| 1906 |       |       |       |        | 1964 | X     |       |       |        | 2021 |       |       |       |        |
| 1907 |       |       |       |        |      |       |       |       |        |      |       |       |       |        |

the levies of the general property tax.

### **III.11. Data Appendix Tables**

Table A10: Overview of wealth data series constructed

| Variable                      | Unit   | Period                       | Frequency | Sample                                                                                | Sources                                                                                                                        | Note                                                                                                 |
|-------------------------------|--------|------------------------------|-----------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Total Private Property</b> | City   | 1899-1938                    | Annual    | 1899-1931: All cities >30,000 population<br>1932-1938: All cities >100,000 population | <i>Financial Statistics of Cities</i>                                                                                          | $N = 7,026, n = 327, \bar{T} = 21.5$<br>139 cities in 1899, 311 cities in 1931,<br>95 cities in 1938 |
|                               | County | 1860-1930                    | Decennial | All counties                                                                          | Census (1860-1870)<br><i>Wealth, Debt, Taxation</i> (1870-1930)                                                                | $N = 18,242, n = 3,159, \bar{T} = 5.8$                                                               |
|                               | State  | 1793-1940                    | Annual    | All States + Alaska, Washington DC and Puerto Rico                                    | State reports, <a href="#">Ely (1888)</a> , <a href="#">Census (1941)</a><br><i>Financial Statistics of States</i> (1915-1939) | $N = 4,583, n = 52, \bar{T} = 88.1$                                                                  |
|                               | City   | 1899-1938                    | Annual    | 1899-1931: All cities >30,000 population<br>1932-1938: All cities >100,000 population | <i>Financial Statistics of Cities</i>                                                                                          | $N = 6,998, n = 327, \bar{T} = 21.4$<br>139 cities in 1899, 311 cities in 1931,<br>95 cities in 1938 |
| <b>Real Property</b>          | County | 1860, 1870, 1910, 1920, 1930 | Decennial | All counties                                                                          | Census (1860-1870)<br><i>Wealth, Debt, Taxation</i> (1870-1930)                                                                | $N = 10,200, n = 3,089, \bar{T} = 3.3$                                                               |
|                               | State  | 1826-1940                    | Annual    | All States + Washington DC and Puerto Rico                                            | State reports, <a href="#">Ely (1888)</a> , <a href="#">Census (1941)</a><br><i>Financial Statistics of States</i> (1915-1939) | $N = 2,227, n = 51, \bar{T} = 43.7$                                                                  |
|                               | City   | 1899-1938                    | Annual    | 1899-1931: All cities >30,000 population<br>1932-1938: All cities >100,000 population | <i>Financial Statistics of Cities</i>                                                                                          | $N = 6,453, n = 322, \bar{T} = 20$<br>139 cities in 1899, 311 cities in 1931,<br>95 cities in 1938   |
|                               | County | 1860, 1870, 1910, 1920, 1930 | Decennial | All counties                                                                          | Census (1860-1870)<br><i>Wealth, Debt, Taxation</i> (1870-1930)                                                                | $N = 10,160, n = 3,092, \bar{T} = 3.3$                                                               |
| <b>Personal Property</b>      | State  | 1826-1940                    | Annual    | All States + Washington DC and Puerto Rico                                            | State reports, <a href="#">Ely (1888)</a> , <a href="#">Census (1941)</a><br><i>Financial Statistics of States</i> (1915-1939) | $N = 2,161, n = 51, \bar{T} = 42.4$                                                                  |
|                               | City   | 1899-1938                    | Annual    | 1899-1931: All cities >30,000 population<br>1932-1938: All cities >100,000 population | <i>Financial Statistics of Cities</i>                                                                                          | $N = 6,963, n = 327, \bar{T} = 21.9$<br>139 cities in 1899, 311 cities in 1931,<br>95 cities in 1938 |
|                               | County | 1870-1930                    | Decennial | All counties                                                                          | <i>Wealth, Debt, Taxation</i> (1870-1930)                                                                                      | $N = 16,243, n = 3,204, \bar{T} = 5.1$                                                               |
|                               | State  | 1816-1940                    | Annual    | All States + Washington DC and Puerto Rico                                            | State reports, <a href="#">Ely (1888)</a><br><i>Financial Statistics of States</i> (1915-1939)                                 | $N = 2,753, n = 51, \bar{T} = 54$                                                                    |
| <b>Property tax rate</b>      | City   | 1899-1938                    | Annual    | 1899-1931: All cities >30,000 population<br>1932-1938: All cities >100,000 population | <i>Financial Statistics of Cities</i>                                                                                          | $N = 7,027, n = 327, \bar{T} = 21.5$<br>139 cities in 1899, 311 cities in 1931,<br>95 cities in 1938 |
|                               | County | 1860-1930                    | Decennial | All counties                                                                          | State reports<br><i>Wealth, Debt, Taxation</i>                                                                                 | $N = 23,071, n = 3,368, \bar{T} = 6.7$                                                               |
|                               | State  | 1798-1940                    | Annual    | All States + Washington DC and Puerto Rico                                            | State reports<br><i>Wealth, Debt, Taxation</i>                                                                                 | $N = 5,289, n = 52, \bar{T} = 101.7$                                                                 |
|                               |        |                              |           |                                                                                       |                                                                                                                                |                                                                                                      |
| <b>Assessment ratio</b>       | City   | 1899-1938                    | Annual    | 1899-1931: All cities >30,000 population<br>1932-1938: All cities >100,000 population | <i>Financial Statistics of Cities</i><br>State reports<br><i>Wealth, Debt, Taxation</i>                                        | $N = 7,027, n = 327, \bar{T} = 21.5$<br>139 cities in 1899, 311 cities in 1931,<br>95 cities in 1938 |
|                               | County | 1860-1930                    | Decennial | All counties                                                                          | State reports<br><i>Wealth, Debt, Taxation</i>                                                                                 | $N = 23,071, n = 3,368, \bar{T} = 6.7$                                                               |
|                               | State  | 1798-1940                    | Annual    | All States + Washington DC and Puerto Rico                                            | State reports<br><i>Wealth, Debt, Taxation</i>                                                                                 | $N = 5,289, n = 52, \bar{T} = 101.7$                                                                 |
|                               |        |                              |           |                                                                                       |                                                                                                                                |                                                                                                      |

Table A11: State Coverage and Sources

| State      | Admission | Sample period | Sources                                                                                                                                                                                      |
|------------|-----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alabama    | 1819      | 1850 - 1939   | Reports of the State Auditor<br>Reports of the Treasurer                                                                                                                                     |
| Alaska     | 1959      | 1906 - 1940   | Reports to the Secretary of the Interior<br>Reports of the Governor<br>Revenue and Taxation in Alaska (1962)<br>Survey of Taxation in Alaska (1938)                                          |
| Arizona    | 1912      | 1870 - 1939   | Reports of the State Tax Commission of Arizona<br>Reports of the Territorial Auditor,<br>Reports of the Territorial Treasurer<br>Reports of the Bank Comptroller<br>Reports of the Treasurer |
| Arkansas   | 1836      | 1838 - 1939   | Biennial Reports of the Auditor<br>Biennial Reports of the Secretary of State<br>Biennial Reports of the Treasurer of State<br>Biennial Reports of the Arkansas Tax Commission               |
| California | 1850      | 1850 - 1939   | Reports of the State Board of Equalization<br>Biennial Reports of the State Comptroller<br>Biennial Reports of the State Treasurer                                                           |
| Colorado   | 1876      | 1870 - 1939   | Biennial Reports of the Auditor of State<br>Reports of the State Board of Equalization<br>Annual Reports of the Colorado Tax Commission<br>Annual Reports of the Public Examiner             |

Table A11 continued from previous page

| State                | Admission | Sample period | Sources                                                                                                                                                                                                             |
|----------------------|-----------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connecticut          | 1788      | 1796 - 1940   | Biennial Reports of the Tax Commissioner<br>Reports of the Comptroller<br>Reports of the Treasurer<br>Assessment and Collection of Taxes by Town Officials<br>Report of the Connecticut Tax Study Commission (1959) |
| Delaware             | 1787      | 1850 - 1939   | Annual Reports of the State Auditor<br>Biennial Reports of the Treasury Department<br>Reports of the Delaware State Revenue and Taxation Commission                                                                 |
| District of Columbia | N/A       | 1850 - 1939   | Reports of the Assessor<br>Reports of the Auditor                                                                                                                                                                   |
| Florida              | 1845      | 1850 - 1939   | Reports of the Comptroller<br>Reports of the State Treasurer<br>Biennial Reports of the Tax Commission                                                                                                              |
| Georgia              | 1788      | 1850 - 1939   | Annual Reports of the Comptroller General<br>Instructions of the Comptroller-General to Tax Collectors<br>Annual Reports of the State Tax Commissioner                                                              |
| Hawaii               | 1959      | 1881 - 1939   | Reports of the Auditing Department<br>Reports of the Minister of Finance<br>Annual Reports of the Governor of Hawaii<br>Statement of the Revenues and Expenditures                                                  |

Table A11 continued from previous page

| State    | Admission | Sample period | Sources                                                                                                                                                                                                                       |
|----------|-----------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Idaho    | 1890      | 1870 - 1939   | Proceedings of the State Board of Equalization<br>Biennial Reports of the Department of Finance<br>Biennial Reports of the Territorial Treasurer<br>Biennial Reports of the State Treasurer                                   |
| Illinois | 1818      | 1822 - 1939   | Biennial Reports of the Auditor of Public Accounts<br>Biennial Reports of the Treasurer<br>Proceedings of the Illinois State Board of Equalization<br><a href="#">Haig (1914)</a>                                             |
| Indiana  | 1816      | 1820 - 1939   | Annual Reports of the Auditor of State<br>Annual Reports of the Treasurer<br>Proceedings of the Indiana State Board of Tax Commissioners                                                                                      |
| Iowa     | 1846      | 1850 - 1939   | Biennial Reports of the Auditor of State<br>Biennial Reports of the Treasurer of State<br>Reports on Municipal Finances                                                                                                       |
| Kansas   | 1861      | 1860 - 1939   | Biennial Reports of the Auditor of State<br>Reports of the Treasurer of State<br>Reports to the Legislature by the Tax Commission                                                                                             |
| Kentucky | 1792      | 1850 - 1939   | Annual Reports of the Auditor of Public Accounts<br>Reports of the Kentucky Tax Commission<br>Biennial Reports of the State Treasurer<br>Reports of the Comptroller<br>Reports and proceedings of State Board of Equalization |



Table A11 continued from previous page

| State         | Admission | Sample period | Sources                                                                                                                                                                                                                                                        |
|---------------|-----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Louisiana     | 1812      | 1850 - 1939   | Annual Reports of the Louisiana Tax Commission<br>Annual Reports of the Commissioner of the Department of Public Finance<br>Biennial Reports of the Auditor of Public Accounts<br>Reports of the State Board of Equalization                                   |
| Maine         | 1820      | 1820 - 1940   | Reports of the State Auditor<br>Annual Reports of the Board of the State Assessors<br>Reports of the Commissioners on the valuation of the State of Maine (1881)<br>Maine State Valuation Reports<br>Reports of the Treasurer<br>Reports of the Tax Commission |
| Maryland      | 1788      | 1793 - 1939   | Annual Reports of the Comptroller<br>Reports of the State Tax Commissioner                                                                                                                                                                                     |
| Massachusetts | 1788      | 1850 - 1939   | Reports of the Auditor of Accounts<br>Aggregates of Polls, Property, Taxes, Etc<br>Reports of the Treasurer and Receiver-General<br>Reports of the Tax Commissioner<br><a href="#">Bullock (1916a)</a>                                                         |
| Michigan      | 1837      | 1837 - 1939   | Reports of the Auditor General<br>Annual Reports of the Board State of Auditors                                                                                                                                                                                |
| Minnesota     | 1858      | 1850 - 1939   | Reports of the Auditor of State<br>Annual Reports of the State Treasurer<br>Minnesota Tax Commission Report                                                                                                                                                    |
| Mississippi   | 1817      | 1850 - 1939   | Biennial Reports of the Auditor of Public Accounts                                                                                                                                                                                                             |

Table A11 continued from previous page

| State         | Admission | Sample period | Sources                                                                                                                                                                                                                |
|---------------|-----------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Missouri      | 1821      | 1850 - 1939   | Reports of the State Auditor<br>Journals of the State Board of Equalization<br>Biennial Reports of the State Treasurer<br>Biennial Reports of the Missouri State Tax Commission                                        |
| Montana       | 1889      | 1870 - 1940   | Annual Reports of the Auditor<br>Annual Reports of the Treasurer<br>Annual Reports of the State Board of Equalization<br>Annual Reports of the State Examiner<br>Biennial Reports of the Montana State Tax Commission. |
| Nebraska      | 1867      | 1860 - 1939   | Annual Reports of the State Tax Commissioner<br>Biennial Reports of the State Board of Equalization and Assessment<br>Biennial Reports of the State Treasurer<br>Biennial Reports of the Auditor of Public Accounts    |
| Nevada        | 1864      | 1865 - 1940   | Reports of the State Board of Assessors and Equalization<br>Annual Reports of the State Treasurer<br>Reports of the Nevada Tax Commission<br><a href="#">Adams (1918)</a>                                              |
| New Hampshire | 1788      | 1820 - 1939   | Annual Reports of the State Tax Commission<br>Reports of the Board of Equalization<br>Reports of the State Auditor                                                                                                     |
| New Jersey    | 1787      | 1794 - 1939   | Annual of the Comptroller of the Treasury<br>Annual Reports of the State Board of Assessors                                                                                                                            |

Table A11 continued from previous page

| State          | Admission | Sample period | Sources                                                                                                                                                                                                                                                                                   |
|----------------|-----------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| New Mexico     | 1912      | 1850 - 1940   | Reports of the Auditor<br>Reports of the Traveling Auditor and Bank Examiner<br>Reports of the Treasurer<br>Biennial Reports of the State Tax Commission                                                                                                                                  |
| New York       | 1788      | 1816 - 1939   | Annual Reports of the State Tax Commission<br>Annual Reports of the State Treasurer<br>Annual Reports of the Comptroller                                                                                                                                                                  |
| North Carolina | 1789      | 1850 - 1939   | Reports of the Commissioner of Revenue<br>Biennial Reports of the Treasurer<br>Reports of the Comptroller of Public Accounts<br>Annual Reports of the Auditor<br>Annual Reports of the State Board of Assessment<br><a href="#">Forster et al. (1942)</a><br><a href="#">Lewis (1951)</a> |
| North Dakota   | 1889      | 1890 - 1939   | Biennial Reports of the State Auditor<br>Proceedings of the State Board of Equalization<br>Reports of the North Dakota Tax Commission                                                                                                                                                     |
| Ohio           | 1803      | 1826 - 1939   | Annual Reports of the Auditor of State<br>Annual Reports of the Tax Commission<br>Comparative Statistics Counties of Ohio (1906)                                                                                                                                                          |

Table A11 continued from previous page

| State          | Admission | Sample period | Sources                                                                                                                                                                                                                                                   |
|----------------|-----------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oklahoma       | 1907      | 1890 - 1939   | Biennial Reports of the State Treasurer<br>Biennial Reports of the State Auditor<br>Annual Reports of the State Examiner<br>Annual Reports of the Inspector of the State<br>Reports of the Governor of Oklahoma<br>Governor's messages to the Legislature |
| Oregon         | 1859      | 1850 - 1939   | Reports of the Board of Commissioners<br>Biennial Reports of the Secretary of State<br>Biennial Reports of the State Treasurer                                                                                                                            |
| Pennsylvania   | 1787      | 1827 - 1939   | Reports of the Auditor General<br>Receipts and expenditures in the Treasury of Pennsylvania<br>Annual Reports of the Secretary of Internal Affairs<br>Reports of the State Treasurer<br>Reports of the Tax Commission                                     |
| Puerto Rico    | N/A       | 1901 - 1923   | Reports of the Auditor<br>Reports of the Treasurer                                                                                                                                                                                                        |
| Rhode Island   | 1790      | 1795 - 1939   | Reports of the Auditor<br>Assessor's valuation of taxable property<br>Reports of the Board of State Valuation<br>Reports of the Governor<br>Reports of the State Treasurer<br>Reports of the Tax Commission                                               |
| South Carolina | 1788      | 1794 - 1939   | Annual Reports of the South Carolina Tax Commission                                                                                                                                                                                                       |

Table A11 continued from previous page

| State        | Admission | Sample period | Sources                                                                                                                                                                                                                                                                                                                                   |
|--------------|-----------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| South Dakota | 1889      | 1879 - 1939   | Reports of the Auditor                                                                                                                                                                                                                                                                                                                    |
| Tennessee    | 1796      | 1836 - 1939   | Reports of Department of Finance and Taxation<br>Biennial Reports of the State Tax commissioner<br>Biennial Reports of the Comptroller                                                                                                                                                                                                    |
| Texas        | 1845      | 1846 - 1940   | Annual Reports of the Tax Commissioner<br>Annual Reports of the Treasurer<br><a href="#">Miller (1916)</a>                                                                                                                                                                                                                                |
| Utah         | 1896      | 1850 - 1939   | Biennial Reports of the State Auditor<br>Biennial Reports of the State Treasurer<br>County financial Reports<br>Reports of the State Board of Equalization                                                                                                                                                                                |
| Vermont      | 1791      | 1796 - 1939   | Biennial Reports of the Commissioner of Taxes<br>Biennial Reports of the Treasurer<br>Biennial Reports of the Auditor of Accounts                                                                                                                                                                                                         |
| Virginia     | 1788      | 1850 - 1939   | Reports of the State Tax Commission<br>Reports relative to the Assessment of Taxes on Property of Corporations<br>Tax Bulletins<br>Annual Reports of the Treasurer<br>Annual Reports of the State Accountant<br>Reports of the Second Auditor<br>Annual Reports of the Auditor of Public Accounts<br><a href="#">Sydenstricker (1915)</a> |

Table A11 continued from previous page

| State         | Admission | Sample period | Sources                                                                                                                                                                                                                                                                    |
|---------------|-----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Washington    | 1889      | 1860 - 1939   | Biennial Reports of the State Tax Commissioner<br>Biennial Reports of the State Treasurer<br>Biennial Reports of the State Auditor<br>Comparative Statistics by the Department of Auditor of State<br>Minutes and official proceedings of the State Equalization Committee |
| West Virginia | 1863      | 1870 - 1939   | Biennial Reports of the Auditor of State<br>Annual Report, Audit of the Finances<br>Biennial Reports of the Treasurer of West Virginia<br>Public Hearings of West Virginia Tax Commissions<br><a href="#">Armentrout and Haygood (1953)</a>                                |
| Wisconsin     | 1848      | 1848 - 1940   | Biennial Reports of the State Treasurer<br>Biennial Reports of the Wisconsin Tax Commission<br>Proceedings of the meeting of the Supervisors of Assessments<br><a href="#">Rosa (1925)</a>                                                                                 |
| Wyoming       | 1890      | 1870 - 1939   | Biennial Reports of the State Board of Equalization<br>Biennial Reports of the Treasurer<br>Biennial Reports of the Commissioner of Taxation                                                                                                                               |

### **III.12. Additional variables: geography, weather, occupations, and demographic characteristics**

#### **III.12.1. County level**

##### **Geography**

Most of the geographical variables used were obtained from [Allen and Donaldson \(2020\)](#). The authors divided the U.S. into 570 sub-county spatial grid cells, each approximately 125km by 125km and attributed to them several geographical characteristics, whose sources and units of measurement are listed below.

- Average Minimum January Temperature
  - Unit: Celsius Degrees
  - Source: [WorldClim.org](http://worldclim.org)
- Average Maximum July Temperature
  - Unit: Celsius Degrees
  - Source: [WorldClim.org](http://worldclim.org)
- Average January Precipitation
  - Unit: millimeters
  - Source: [WorldClim.org](http://worldclim.org)
- Average July Precipitation
  - Unit: millimeters
  - Source: [WorldClim.org](http://worldclim.org)
- Average Soil Net Primary Productivity
  - Unit: Original Index: -1.0 grams of carbon per square meter per day (tan) to 6.5 grams per square meter per day
  - Source: [http://neo.sci.gsfc.nasa.gov/view.php?datasetId=MOD17A2\\_M\\_PSN](http://neo.sci.gsfc.nasa.gov/view.php?datasetId=MOD17A2_M_PSN)
- Average Elevation
  - Unit: meters

- Source: <http://www.fao.org/soils-portal/soil-survey/soil-maps-and-databases/harmonized-world-soil-database-v12/en/>
- Average Ruggedness
  - Unit: Terrain Ruggedness Index, in millimetres
  - Source: <http://diegopuga.org/data/rugged/>

Starting from the grid elaborated by the authors we used QGIS to map spatial units to counties. In particular, geographic characteristics were averaged within each county's borders and across time, so as to have time-constant variables.

Furthermore, we complemented such a subset of variables with the following:

- Distance to the coast: time-constant variable computed directly on QGIS using the minimum distance from a county to the shoreline ([National Oceanic and Atmospheric Administration, 2021](#)) (Source: [here](#)).
- Canal crossing: time-varying indicator variable coming from [Bazzi, Fiszbein and Gebresilasse \(2020\)](#) that takes value 1 if a canal crossed the county.
- Steamboat-navigated river crossing: time-constant indicator variable obtained through QGIS from [Atack \(2015\)](#) taking value 1 if a steamboat-navigated river crossed the county.

## Demographics

Demographic variables were obtained from [Ruggles et al. \(2021b\)](#) and consist of population, fraction of foreigners living in a county, fraction of males living in a county, fraction of white people living in a county, and fraction of the county population that is literate.

## Occupation Shares

Occupation shares were obtained from [Ruggles et al. \(2021b\)](#) and were combined as follows:

- Agriculture (code 100)
- Mining (code 200)
- Production: sum of Manufacturing (code 300), and Non-durable production (code 400)



- Commerce: sum of Transportation (500), Retail/Trade (code 600), Finance (code 700), and B usiness (code 800)
- Public Administration (code 900)

For each of these economic sectors we created an indicator variable taking value 1 if a county in a specific year belongs to the top quartile in the fraction of the population working in such a sector and zero otherwise.

### **Presence of oil**

- Source: [Michaels \(2011\)](#)
- An oil abundant county is a county located above an oilfield. To match our sample, we only keep counties located above an oilfield in Texas, Oklahoma and Louisiana (N=171)

### **III.12.2. State level**

All geography variables are from [Allen and Donaldson \(2020\)](#) and averaged at the state level. For distance to the coast, we used the minimum distance between the coast and any county in the state.

Finally, Demographics and Occupation shares are from [Ruggles et al. \(2021b\)](#) and as described for the county level.

### **III.12.3. City level**

#### **Number of patents**

- This is a count of patents between 1836 and 1975 in a city-year
- Source: the [Petralia \(2019\)](#) database
- The image recognition technique does not uniquely identify patent information, we construct three counts: counts of unique patents (uniquely identified), minimum and maximum count in a city-year

#### **Railroad Length**

- We use a state-year measure of railroad construction
- Source: [Sequeira, Nunn and Qian \(2020\)](#) data
- Unit = kilometer, N = 48 states + DC, T = 15 years from 1830-1921

## Demographics

- Percentage of farm households based on Census questions, with the Census identifying a farm if any household contained a member which was a farmer, or if the household lived on a farm<sup>14</sup>
- Percent of population engaged in commerce: based on Census question and using the 1950 Census industry classification, denoting Commerce as the sum of Manufacturing (codes 300, 400) Trade (600), Finance (700) Business (800)

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<sup>14</sup>The definition of farm household used by the Census has evolved over time, see the Census Bureau's definition summarized by IPUMS for the variable entry "farm".

## References

- Adams, Romanzo C.** 1918. *Taxation in Nevada: A History*. Vol. 1, State Printing Office.
- Allen, Treb, and Dave Donaldson.** 2020. "Persistence and path dependence in the spatial economy." NBER Working Paper 28059.
- Armentrout, Walter W., and Tyler F. Haygood.** 1953. *Property Tax Assessment in West Virginia*. West Virginia University Agricultural Experiment Station.
- Atack, Jeremy.** 2015. "Historical Geographic Information Systems (GIS) database of Steamboat-Navigated Rivers During the Nineteenth Century in the United States."
- Bazzi, Samuel, Martin Fiszbein, and Mesay Gebresilasse.** 2020. "Frontier culture: The roots and persistence of "rugged individualism" in the United States." *Econometrica*, 88(6): 2329–2368.
- Benson, George C. S., Summer Benson, Harold McClelland, and Procter Thomson.** 1965. *The American Property Tax: Its History, Administration, and Economic Impact*. Claremont: College Press.
- Blodget, Samuel Jr.** 1806. *Economica: A statistical manual for the United States of America*. author.
- Bullock, Charles J.** 1916a. "The taxation of property and income in Massachusetts." *The Quarterly Journal of Economics*, 31(1): 1–61.
- Bullock, Charles J.** 1916b. "The Taxation of Property and Income in Massachusetts." *The Quarterly Journal of Economics*, 31(1): 1–61–3079.
- Census.** 1941. "A Decade of Assessed Valuations;: 1929 - 1938." *Special Studies of the Census Bureau*.
- Cohen, R.** 2018. "Danegeld: The Land Tax In England, 991-1162." PhD diss. University of Oxford.
- Dincecco, Mark and Prado, Mauricio.** 2013. "Nominal GDP Series, 1870-2000, Technical Report, Global Prices and Incomes Database."
- Einhorn, Robin L.** 2008. *American taxation, American slavery*. University of Chicago Press.
- Ely, Richard T.** 1888. *Taxation in American States and Cities*. New York : T. Y. Crowell.
- Fisher, Glenn W.** 1996. *The worst tax? : a history of the property tax in America*. Lawrence, Kan : University Press of Kansas.
- Forster, Garnet W., et al.** 1942. *Recent Changes in Tax Rates on Farm Real Estate in North Carolina*. North Carolina Agricultural Experiment Station, Department of Agricultural Economics and Rural Sociology.
- Gallman, Robert E., and Paul W. Rhode.** 2019. *Capital in the Nineteenth Century*. University of Chicago Press.
- Garmon Jr, Frank W.** 2014. "Wealth Levels and Distribution in the Early American Republic, 1785–1815." 12–14.
- George, Henry.** 1882. *Progress and poverty*. Vol. 142, Doubleday, Page, and Company.
- Gibson, Campbell, and Kay Jung.** 2002. "Historical Census Statistics on Population Totals by Race, 1790 to 1990, and by Hispanic origin, 1970 to 1990, for the United States, Regions, Divisions, and States." *Census Working Paper*.
- Goldsmith, Raymond W.** 1951. "A perpetual inventory of national wealth." In *Studies in Income and Wealth, Volume 14*. 5–73. NBER.

- Goldsmith, Raymond W.** 1952. "The Growth of Reproductive Wealth of the United States of America from 1805 to 1950." Vol. 2, 247–328.
- Haig, Robert M.** 1914. *A History of the General Property Tax in Illinois*. Vol. 3, University of Illinois.
- Haines, Michael.** 2014. "United States Agriculture Data, 1840-2012."
- Haines, Michael R., et al.** 2010. "Historical, demographic, economic, and social data: the United States, 1790–2002." *Ann Arbor, MI: Inter-university Consortium for Political and Social Research* 2896.
- Hoенack, Stephen A.** 1964. "Historical Census and Estimates of Wealth in the United States." In *Measuring the Nation's Wealth*. 177–218. U.S. Government Printing Office.
- Jensen, Jens P.** 1931. *Property taxation in the United States*,. Chicago, Ill., The University of Chicago press.
- Jones, Alice H.** 1970. "Wealth estimates for the American middle colonies, 1774." *Economic development and cultural change*, 18(4, Part 2): 1–172.
- Jones, Alice H.** 1972. "Wealth Estimates for the New England Colonies about 1770." *The Journal of Economic History*, 32(1): 98–127.
- Kopczuk, Wojciech, and Emmanuel Saez.** 2004. "Top Wealth Shares in the United States, 1916-2000: Evidence From Estate Tax Returns." *National Tax Journal*, 57(2): 445–87.
- Kutznets, Simon S.** 1961. *Capital in the American Economy: Its Formation and Financing*. Princeton University Press.
- Lamoreaux, Naomi R., and John J. Wallis.** 2017. *Organizations, Civil Society, and the Roots of Development*. Chicago University Press.
- Lewis, Henry W.** 1951. *Property Tax Collection in North Carolina*. Vol. 3, Institute of Government, University of North Carolina.
- Lindert, Peter and Williamson, Jeffrey.** 2011. "American Incomes before and after the Revolution." *The Journal of Economic History*, 73: 725–765.
- Lindert, Peter and Williamson, Jeffrey.** 2012. "American Incomes 1774-1860." National Bureau of Economic Research Working Paper 18396.
- Lindert, Peter and Williamson, Jeffrey.** 2016. *Unequal gains: American growth and inequality since 1700*. Princeton University Press.
- Lutz, Harvey.** 1921. "The State Tax Commission and the Property Tax." *The Annals of the American Academy of Political and Social Science*, 95: 276–283.
- Maggor, Noam.** 2017. *Brahmin Capitalism*. Harvard University Press.
- McGregor, Gwyneth.** 1956. "Taxation in the Ancient World." *Canadian Tax Journal*, 4(4): 271–277.
- McPherson, John H. T.** 1907. "The General Property Tax as a Source of State Revenue." Vol. 1, 475–484, JSTOR.
- Michaels, Guy.** 2011. "The Long Term Consequences of Resource-Based Specialisation." *Economic Journal*, 121(551): 31–57.
- Miller, Edmund T.** 1916. *A Financial History of Texas*. University of Texas.
- National Oceanic and Atmospheric Administration.** 2021. "NOAA Medium Resolution Shoreline."
- Parrillo, Nicholas R.** 2013. *Against the profit motive : the salary revolution in American government, 1780-1940*. New Haven : Yale University Press.
- Petralia, Sergio.** 2019. "HistPat International Dataset."

- Philipps, Ulrich B.** 1966. *American Negro slavery: a survey of the supply, employment and control of Negro labor as determined by the plantation regime*. Baton Rouge : Louisiana State University Press.
- Piketty, Thomas, and Gabriel Zucman.** 2014. "Capital is back: Wealth-income ratios in rich countries 1700–2010." *The Quarterly Journal of Economics*, 129(3): 1255–1310.
- Rabushka, Alvin.** 2008. *Taxation in colonial America*. Princeton University Press.
- Ransom, Roger, and Richard Sutch.** 1988. "Capitalists Without Capital: The Burden of Slavery and the Impact of Emancipation." *Agricultural History*, 62(3): 133–160.
- Rosa, Charles D.** 1925. "The Wisconsin Real Estate Sales Method of Equalization."
- Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek.** 2021a. "IPUMS Ancestry Full Count Data: Version 3.0 [dataset]." *Minneapolis, MN: IPUMS*.
- Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek.** 2021b. "IPUMS USA: Version 11.0 [dataset]." *Minneapolis, MN: IPUMS*.
- Seligman, Edwin R. A.** 1890. "The General Property Tax." *Political Science Quarterly*, 5(1): 24–64.
- Sequeira, Sandra, Nathan Nunn, and Nancy Qian.** 2020. "Immigrants and the Making of America." *Review of Economic Studies*, 87(1): 382–419.
- Soltow, Lee.** 1984. "Wealth inequality in the United States in 1798 and 1860." *The Review of Economics and Statistics*, 444–451.
- Sydenstricker, Edgar.** 1915. *A Brief History of Yaxation in Virginia*. Vol. 21, D. Bottom, Superintendent Public Printing.
- U.S. Census Bureau.** 1854. "1850 Census: Compendium of the Seventh Census."
- U.S. Census Bureau.** 1870. "Report on Valuation, Taxation, and Public Indebtedness in the United States."
- U.S. Census Bureau.** 1880. "Report on Valuation, Taxation, and Public Indebtedness in the United States."
- U.S. Census Bureau.** 1890. "Report on Wealth, Debt, and Taxation at the Eleventh Census: 1890, Part II, "Valuation and Taxation"."
- U.S. Census Bureau.** 1899-1931. "Financial Statistics of Cities Having a Population of Over 30,000."
- U.S. Census Bureau.** 1902. "Wealth, Debt, and Taxation."
- U.S. Census Bureau.** 1919. "Financial Statistics of Cities Having a Population of Over 30,000."
- U.S. Census Bureau.** 1921. "Financial Statistics of Cities Having a Population of Over 30,000."
- U.S. Census Bureau.** 1922. "Wealth, Debt, and Taxation. Estimated National Wealth."
- U.S. Census Bureau.** 1932-1938. "Financial Statistics of Cities Having a Population of Over 100,000."
- U.S. Census Bureau.** 1942-1992. "Statistical abstract of the United States prepared by the chief of the Bureau of Statistics, Treasury Department."
- U.S. Census Bureau.** 1993-2020. "Annual Survey of State and Local Government Finances."
- U.S. Census Bureau.** 2022. "Nominal GDP Series."

- U.S. Department of Commerce.** 1967. "Historical Statistics on Governmental Finances and Employment."
- U.S. Department of Commerce.** 1982. "Historical Statistics on Governmental Finances and Employment."
- Walker, Billy D.** 1984. "The Local Property Tax for Public Schools: Some Historical Perspectives." *Journal of Education Finance*, 9(3): 265–288.
- Wolcott, Oliver.** 1796. "Direct Taxes H.R. Doc. No. 100-4."
- Wolff, Edward N., and Marcia Marley.** 1898. *Long-Term Trends in U.S. Wealth Inequality: Methodological Issues and Results*. University of Chicago Press.