Wealth and Property Taxation in the United States*

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October 10, 2025

Abstract

We study the history and geography of wealth accumulation in the United States using newly collected historical property tax records from the early 1800s onward. These records come from the administration of the General Property Tax–a comprehensive tax on all types of property. We construct wealth series at the state, county, and national levels. At the state level, we use annual assessed values of wealth from state-level reports drawn from multiple sources. Because assessed values may differ from market values, we also require assessment ratios, defined as the ratio of assessed to market wealth. We obtain state-level assessment ratios from the decadal Historical Censuses of Wealth publications, in which the Census carried out detailed valuation work, complemented with information on changes in assessment practices from the state reports, to build higher-frequency series of assessment ratios. This yields long-run annual wealth series for states from 1850 (or earlier, depending on the state) to 1935. We obtain national wealth series by aggregating these state series. At the county level, we use assessed values (or market values where available) from the Historical Censuses of Wealth for each decade, and apply either state-level or county-level assessment ratios, where available, to obtain market values of wealth for each decade from 1850 to 1930. We use these data to show, first, that the United States experienced extraordinary wealth accumulation after the Civil War and until the Great Depression. Second, spatial inequality in the United States has been large and highly persistent since the mid-1800s. We also examine the determinants of long-term wealth growth and find, among other results, that counties with a higher share of enslaved property before the Civil War or with higher wealth inequality experienced lower subsequent long-run wealth growth.

Keywords: taxation, wealth tax, wealth, inequality, convergence, property tax
JEL Codes: E01, H20, H71, N31, R12, J15

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1 Introduction

Since colonial times, local governments in the United States relied on various forms of property taxation to finance their activities. But unlike in most other countries and historical periods, these taxes applied to a broad set of assets–in principle, all property–rather than only to land. After the 1840s, the basic principles became more uniform across states and the taxes more comprehensive. They came to be known as the General Property Tax.

From the 1840s to 1930, the General Property Tax was a core element of the U.S. fiscal system, providing a large share of state and local revenues. Property was assessed by local assessors who determined its value, with the tax base covering most forms of property. Multiple layers of government–districts, municipalities, counties, and states–levied their own ad valorem taxes, typically applying the same rate to most property. After the 1930s, the role of the property tax declined as new forms of taxation replaced it. The tax evolved into the modern U.S. property tax, which applies only to certain types of real estate.

The administration of the General Property Tax generated detailed but disparate records over a long period. In this paper, we make use of these valuable records, which we collected and organized, to create a new dataset on U.S. wealth over the long run at the national, state, and county levels.

In our context, "wealth" means private, marketable, and taxable assets. This excludes public assets (such as federal land) and assets of tax-exempt entities such as religious institutions and colleges. Marketable wealth refers to assets that can be bought and sold, excluding human capital, except under slavery.[1]

To better understand the advantages and challenges of our data and approach, we provide here a brief overview, with extensive detail in Sections 4 and 5. The main challenge is that assessors often did not value property at its market price, and assessment practices varied across time and place. We therefore need to adjust assessed values to obtain true market values. This requires the *assessment ratio*, defined as the ratio of assessed wealth to market wealth. With both assessed wealth and assessment ratios, we can reconstruct the market value of wealth.

At the state level, we use a large set of detailed state reports, usually annual, to construct our assessed wealth series. These reports vary in format and naming across time and states, making their collection both valuable and challenging. To obtain assessment ratios, we start with the Historical Censuses of Wealth, which provide

[1] In slave states, enslaved people were counted as the property of enslavers, and the returns to forced labor were recorded as returns to capital. To ensure consistency over time, we also construct wealth series that exclude enslaved property.

decadal, and in some cases more frequent, data. The Census carried out careful and professional work to produce these ratios, as we describe in detail in the main text, by consulting professionals and experts and sending agents into the field. We supplement this with information from the state reports that document changes in assessment practices for additional years. Combining these sources allows us to build high-frequency series of assessment ratios. Applying these ratios to the assessed wealth series yields high-frequency (annual) market wealth series. We then construct national series by aggregating the state series.

At the county level, our main data source are the Historical Censuses of Wealth, which provide decadal assessed values for most years and market values for some years. For our benchmark series, we correct county assessed values using state-level assessment ratios, but also construct alternative series for years when county-level ratios are available and show that our results are robust to different assumptions.

Our final series thus encompass: i) annual data for states from 1850 or earlier (depending on the state) to 1935; ii) decadal data for counties between 1850 and 1930; iii) national level data from the early 1800s to 1935. It is important to keep in mind that data before 1850 are scarce and less reliable, as we describe in the main text. Therefore, we provide the full dataset for all available years but restrict our analysis to the post-1850 period.

Wealth measures for this period are exceedingly rare and producing them is our main contribution. While some historical national wealth estimates exist, our data based on the General Property Tax provide a coherent, high-frequency, and long-run source. To our knowledge, no other dataset offers similarly comprehensive and long-term subnational property measures.

It is worth highlighting that, in general, whether historically or contemporaneously, estimating the market value of wealth is extremely challenging, as it often requires strong assumptions to overcome data limitations. For instance, most modern estimates for the U.S. are based on capitalized income flows using assumed rates of return. Our approach offers several rare advantages for the period we study. Most notably, direct property assessments were made so that one does not need to indirectly back out wealth. These assessments were quite comprehensive, covering nearly all property with only few exemptions, which we document, and available at high frequency. We also do not need to rely on assessments having been made perfectly: Even with imperfect valuation at assessment, we can build on the extensive information from the Census and state reports to recover market values, as explained above.

We use our new data to answer the following core questions: How did aggregate wealth evolve in this crucial period of U.S. development? Second, how was property

distributed across space, and how did spatial inequality change over time? Third, what factors shaped local capital accumulation and growth?

We start by showing that the U.S. experienced exceptionally rapid growth in national wealth after the Civil War and that wealth growth at the national level was much faster than income growth.

Thanks to the high frequency of our data, we can also study the changes in wealth around major events, such as the Civil War, and highlight the role of enslavement in shaping long-run wealth accumulation in the South. Wealth per capita in the Northeast, Midwest, and Southern regions was relatively similar before the Civil War. However, while other regions took off and grew rapidly after the war, the South appeared to stagnate at lower wealth levels. We show that the evolution of regional wealth and the effects of the Civil War critically hinge on enslavement, under which forced labor income flows were counted as "capital" or wealth.

If we construct property series excluding the value of enslaved people, we can reveal how wealth-poor Southern states and counties were pre-Civil War. For instance, Georgia, Florida, and Alabama had more than 50% of their property in enslaved people, and their property per capita declined by more than 25% between 1860 and 1870, above and beyond excluding enslaved people from the wealth measure. The wealth of white residents in Southern states appeared much higher than in Non-Southern states before Emancipation only and entirely because of enslavement; after the Civil War, it grew at a much slower rate than in other states. Within Southern states, counties with the highest shares of enslaved property experienced much slower long-run growth over 60 years between 1870 and 1930, even conditional on a wide array of controls for geographic, demographic, economic, and inequality characteristics.

We then study spatial inequality after the Civil War. Despite powerful equalizing forces such as internal migration and the deeper integration of the U.S. national market, the level of spatial inequality was high and persistent until 1930 and beyond. More specifically, we show that there was no "sigma-convergence" (a decline in dispersion) in wealth across counties or states, that the share of national wealth held by the top 10% wealthiest counties increased, and that there was remarkable persistence in the wealth ranking of counties and states over time. Furthermore, the U.S. exhibited much slower spatial convergence in wealth per capita over time ("beta-convergence") than would appear from historical income data. Southern states primarily drove the slow convergence.

The persistence of spatial inequality and the relatively slow convergence make it even more important to understand why some places were richer than others after the Civil War and why some grew more rapidly. In other words, we want to identify the correlates of initial wealth levels and which factors drive capital accumulation, conditional

on initial wealth. We study the determinants of long-term wealth growth and capital accumulation at the county level–the most granular level for which we have comprehensive data over a long period.

We find that geographical characteristics, such as climate (temperatures and precipitation) and topography, matter substantially for initial wealth and, to a lesser extent, for subsequent growth. Soil productivity and proximity to the coast are significantly positively associated with long-run growth. A key predictor of both initial wealth and subsequent growth is the literacy rate–a measure of local human capital. There seem to be positive agglomeration effects since counties with a higher population in 1870 are wealthier and continue to grow faster. At the same time, migration appears to operate as a convergence force since places with higher recent population growth experience lower wealth growth over the subsequent decade.

We can also show that the structural transformation of the local economy throughout its development looks similar to that documented at the country level by earlier research. More specifically, places with a higher property per capita have lower shares of the population in agriculture and a higher share in commerce (e.g., retail and finance). Manufacturing follows an inverted U-shape, first increasing and then decreasing as counties become richer.

Finally, inequality in wealth, as captured by the share of wealth held by the top 10% wealthiest people in a county, exhibits a robust negative correlation with growth in property over the next 60 years, even if we control for a range of geographic, demographic, and economic factors. This latter finding at the very local level–thus holding institutional and cultural factors fixed–is particularly interesting in light of the extensive literature on the link between inequality and growth, which typically builds on cross-country evidence. One key mediating factor appears to be human capital: places with higher inequality had lower increases in literacy rates.

Our paper contributes to three strands of the literature studying (i) wealth estimates over the long run in the U.S. and other countries; (ii) development and spatial inequality in the U.S.; (iii) the economic consequences of the Civil War and enslavement. Furthermore, our data allow us to provide new quantitative facts to illustrate the history of the property tax. We review the history of the property tax and the literature studying it in Sections 2 and 4.

Wealth estimates over the long run. There exist several historical estimates of U.S. national wealth based on different sources of data (Piketty and Zucman (2014),Goldsmith (1952),Gallman (1986),Gallman and Rhode (2019)). We describe these alternative sources in Section 6 and Appendix III.6 and compare them to our national-level estimates. Kopczuk and Saez (2004) compute top wealth shares in the U.S. since 1916

using estate tax returns and the estate multiplier method. For a more recent period, Saez and Zucman (2016) construct wealth distributions for the U.S., relying on a combination of tax data, national accounts balance sheets data, and the capitalization method. For surveys of this strand of the literature, see Kopczuk (2015) and Roine and Waldenström (2015). Kuhn, Schularick and Steins (2020) construct new long-run data on income and wealth between 1949 and 2016 using the Survey of Consumer Finances. Derenoncourt et al. (2023) estimate the racial wealth gap between 1860 and 2020 to show that convergence has been slow and, if anything, the racial wealth gap has widened again since the 1980s; however, Margo (2016) shows that it has been faster than the long-run convergence in income. These recent estimates were preceded by important earlier work by Higgs (1982) for Georgia and Margo (1984) for several additional Southern states that make use of the same type of underlying data as our project.

Our measures of national wealth based on property tax data offer one of the most comprehensive and consistent (i.e., based on the same source over time) series over the long run. Relative to the literature using the estate multiplier (Kopczuk and Saez (2004)) or the capitalization method (Piketty and Zucman (2014)) our approach requires fewer assumptions because property is directly estimated. Importantly, no systematic wealth estimates at the sub-national level over the long run exist. We can provide measures at the city, county, and state levels.[2]

A body of work has constructed wealth estimates for other countries for more recent periods (typically starting in the 1970s or later): Acciari, Alvaredo and Morelli (2024) for Italy; Piketty and Yang (2022) for Hong Kong; Charalampidis (2018) for Greece; Alvaredo, Assouad and Piketty (2019) for the Middle East; and Piketty, Yang and Zucman (2019) for China. Longer-run estimates include Katic and Leigh (2016) for Australia 1915-2012; Novokmet, Piketty and Zucman (2018) for Russia 1905-2016; Toussaint et al. (2025) for the Netherlands 1854-2019; Albers, Bartels and Schularick (2022) for Germany 1895-2018; and Blanco, Bauluz and Martínez-Toledano (2021) for Spain 1900-2017.

Studying the history of public finances, Sylla, Legler and Wallis (1993) build a dataset on revenues and spending of state and local governments from 1790 to 1915, later harmonized by Hindman (2010) to include Southern States from Holt (1977), which we use to impute the property tax revenue for some of the early years before 1850, as described in Section 4. Legler, Sylla and Wallis (1988) assemble data on the revenues and expenditures of many cities by decade from 1850 to 1902. We expand their data collection for tax revenues, tax rates, and tax administration-related variables.

[2]Earlier historical wealth estimates are typically found for short periods or a few states at a time (Garmon Jr (2014), Jones (1970), Soltow (1984)) as described in Appendix III.6.

Economic development and spatial inequality. We also contribute to the literature on economic development and spatial inequality in the U.S. by providing a new, fine-grained, consistent measure of economic activity: property. Our measures can be useful complements to existing measures of economic activity, such as income (derived indirectly from occupational scores and available at low frequency).[3] Wealth and income are far from perfectly correlated across time and space, as can be seen in Appendix Figure A1.[4]

We can also highlight some key correlates of property and capital accumulation at the city, county, and state levels, adding to the literature that has studied the determinants of economic activity as measured by different indicators. We cannot do justice to all the work here, but refer to some more recent studies. Among others, Donaldson and Hornbeck (2016) examine the historical impact of railroads on U.S. economic activity (following earlier work by Fogel (1964)) as measured by agricultural output; Hornbeck (2012*a*) studies the effects of the American Dust Bowl on agricultural land values and revenues; Arthi (2018) considers its effects on human capital. Hornbeck (2012*b*) also emphasizes the role of the environment's influence on agricultural output and development. Fiszbein (2022) establishes the vital role of agriculture for the subsequent development of places in the U.S. Consistent with the study of Atack, Haines and Margo (2011), we find that land values sharply rose between 1850 and 1860, as the land was converted into farmland rapidly. Kim and Margo (2004) analyze the historical patterns of economic activity in the U.S. at the city and regional level since colonial times.

We also study domestic and international migration, which is one channel through which wealth accumulation changes across space. Historical migration and its impacts on local economic outcomes are explored in Abramitzky, Boustan and Eriksson (2012), Abramitzky, Boustan and Eriksson (2014), Collins and Wanamaker (2014), Sequeira, Nunn and Qian (2020), and Zimran (2024).

Southern wealth, enslavement, and the Civil War. Our data allow us to quantitatively illustrate some of the history of the U.S. South, the blight of enslavement, and the effects of the Civil War. Ager, Boustan and Eriksson (2021) find that white Southerner households who owned more enslaved people in 1860 lost substantially more wealth during the Civil War; we find a similar result at the county level, including a negative effect on long-run growth.[5] The negative association between enslavement

[3]Occupational scores are typically derived from the cross-over between occupations and income in the 1950 Census.

[4]The correlation between income and wealth at the state-year level is around 0.72, and a regression of wealth on income yields an R^2 of 0.53.

[5]We note that their results suggest that grandsons of large slave holders did not do as well in terms of occupational scores in 1900 than similar grandsons of smaller-scale slave holders with similar total

and subsequent economic performance is also highlighted in Wright (2022), Hornbeck and Naidu (2014), and Engerman and Margo (2011). We can measure the property loss after the Civil War directly, complementing work by Hutchinson and Margo (2006) and Feigenbaum, Lee and Mezzanotti (2022), as well as work studying the wage gap between the North and the South before and after the Civil War (Margo (2004), Goldin and Margo (1992)).

The rest of the paper is organized as follows. Section 2 provides a brief historical and institutional overview of the General Property Tax in the United States and Section 3 explains its main institutional features. Section 4 describes our newly collected data and Section 5 presents our data series construction, validation, and robustness checks. Section 6 analyzes the evolution of wealth accumulation and spatial inequality in the U.S. Section 7 considers the determinants of capital accumulation. Section 8 concludes.

2 A Brief History of Property Taxation in the United States

This section provides a quick overview of the history of property taxation in the United States, emphasizing its originality and singularity. The key "innovation" was that, as opposed to most other contexts where property tax existed, local governments in the U.S. developed a form of taxation on (almost) all property classes, not only land. We build here on a large an important literature presenting the history of property taxation in the U.S. For more information, we refer the reader to Jensen (1931) (in particular chapter 2), Benson et al. (1965), Fisher (1996), Wallis (2001) and Fisher (2002), with many more references provided below.

2.1 From Colonial Taxation to the General Property Tax

The property tax was an important component of the U.S. tax system from its inception (Benson et al. (1965)). In the American colonies, elements of property taxation existed in the form of "quitrent," based on the model of what existed historically in England. Early on, there was a complex system of property taxation on enumerated items, with different tax schedules on classes of property, such as land and improvement, livestock, merchants' equipment, or enslaved people (Jensen (1931, pp. 20), Fisher (1999, pp. 91)).[6]

wealth. Our results suggest that counties with a lot of enslaved properties experienced significant declines in wealth over the long run. Our results are compatible with the results of Ager, Boustan and Eriksson (2021), to the extent that these counties did not experience significant changes in occupational structure.

[6]The colonial tax system also included poll taxes and a faculty tax on specific occupations (Benson et al. (1965),Fisher (1999)).

In the 1790s and 1800s, states relied in large part on property tax financing, and revenues from the property tax comprised more than 60% of all state revenues (Sylla and Wallis (1998, pp. 281-282)). Moreover, the federal government briefly implemented a federal tax based on property with the 1798 and the 1813-15 direct taxes.[7] However, over the period 1800-1830, the "Era of Active State governments" (Wallis (2000)), states, despite engaging in large spending projects, progressively decreased their reliance on taxes. They instead started to rely on asset finance, i.e., massive investments in banks, canals, railroads, and other transportation improvements. Even if states decreased their reliance on the property tax during this period, the property tax remained a major source of revenues for many local jurisdictions.

From the 1830s onwards, the property tax regained its role as the most important source of state tax revenue. A deep and prolonged period of deflation began in 1839, and by 1842, eight states and the territory of Florida were in default because of their large state investments in canals and banks. Many states adopted, as the result of this episode, constitutional provisions limiting or altogether preventing the use of public funds to invest in private corporations and restricting public debt. Furthermore, many new or revised state constitutions included uniformity and universality clauses that established the major characteristics of the general property tax discussed below.[8]

2.2 The General Property Tax 1842-1933

Era of property tax finance and local government. Our core period of study, 1842-1933, is the "Era of property tax finance and local government" (Wallis (2000)). During this period, there was a movement towards common principles and institutional features of a "general property tax," although it remained a local tax, differentiated across space. Within states, there was a greater focus on harmonizing rules and practices across jurisdictions, through constitutional principles and legislation, but also with the creation of state tax commissions or boards of equalization in charge of the harmonization of assessment practices. States adopted similar constitutional principles of uniformity and universality for the property tax, and there was progress on measurement (e.g. with the decadal *Historical Censuses of Wealth* of the U.S. Census Bureau starting in 1850, which we use extensively).

As property tax financing increased, state government activity slowed considerably. The activity shifted to local governments, who took over investments in water, sanitation, transportation, public works, and schools. By 1902, local revenues were roughly

[7] The first was levied in response to the naval quasi-war with France and the second in response to the outbreak of the War of 1812 with Britain.

[8] Table A6 shows the dates at which these clauses first appear in the state constitutions, and the dates at which these practices were arguably first observed in some shape or form.

the same as state and national revenues combined (Wallis (2001)). Our data allow us to shed light on the importance of the property tax for the U.S. over this period. Figure 1 shows the total revenue from the property tax as a share of GDP in the U.S. at different levels of government: state, county, municipal and lower levels. In 1850, total property tax revenues were somewhat below 2% of GDP. They more than doubled to 5% of GDP in the 1920s.

Criticisms and Reforms at the Turn of the 20th Century. Criticisms of the property tax–often spearheaded by economists–became pronounced at the turn of the century. They focused on three issues: i) the local administration in light of property that became increasingly intangible and mobile (e.g., stocks, bonds, and other financial assets); ii) the quality of assessments, as the economy grew more complex than before, and ownership and control of wealth became more challenging to establish and assets harder to value; iii) inequities in assessment and the increase in wage earnings meant that property value became a less suitable measure of ability to pay (Benson et al. (1965), Fisher (2002)).

As criticisms over the unfairness of the tax system grew, several reforms took place. Tax commissions were generalized and given increased powers for centralizing and regulating assessment. States also pushed for the professionalization of the assessment functions by training assessors and using rigorous, scientific valuation methods. Second, a classification movement occurred, replacing the uniformity clause and allowing for lower tax rates on intangible property. [9]

The Demise of the General Property Tax After the Great Depression. The 1930s marked the era of income tax financing and the more active federal government (Wallis (2000, pp. 72-73)). Historians still debate the reasons for the demise of the General Property Tax (Hindman (2010)), but three interrelated changes likely drove it.

First, after the Great Depression, the federal government's role expanded. Large programs such as the New Deal and Social Security, welfare services, agricultural price supports, military spending, and public works implied an increase in the share of revenues collected by the federal government, which were then administered by states through a system of intergovernmental grants.

Second, new sources of financing for states–such as automobile licenses, fees, motor fuel taxes, general sales, and income taxesappeared, making the property tax less necessary. Total property tax revenue as a share of total government revenue fell from 38.8% to 25.2% between 1927 and 1938, then to 8.1% in 1946 (Benson et al. (1965)).

[9] For an exposition of the need for classification, see Bullock (1908). See, for instance, Foote (1910) for a description of the experience in Ohio.

At the same time, the fall in property values and rise in property tax delinquencies during the Great Depression meant that states started providing more extensive exemptions to property tax (Fisher (1997)). Finally, after WWII, homestead exemptions given to owner-occupied residences and limits on property tax rates put a nail in the coffin of the General Property Tax (Fisher (2002), Jensen (1936)).

Figure 1 illustrates the decline in the importance of the Property Tax after the 1930s: as a share of GDP, property tax revenues plummeted from 5% at the eve of the Great Depression to around 2.5–3% in the 1950s and beyond. The figure also shows that while property tax revenues at the state level became minimal, the property tax has remained significant for public finances at the county and municipal levels since the 1950s.

3 Institutional Features of the General Property Tax

Our main period of analysis runs from 1850 to the late 1930s. During this time, there was no single property tax system in the United States. Instead, each state had its own property tax laws, regulations, and administrative practices. Still, common features emerged. Most notably, there was a widespread aspiration towards uniformity and universality, a development that moved closer to, and helped justify, the name of a "general property tax."

In this section, we describe the key institutional principles and features of the property tax that were shared by the large majority of states. These elements are important for understanding the structure of the available data and the challenges in constructing consistent measures of property over time and across states. Appendix II provides further detail. For more background, see Jensen (1931), Benson et al. (1965), and Fisher (2002). For a detailed account of the relevant legal provisions in each state, the U.S. Census Bureau published decennial compilations of state tax laws beginning in 1850, on which we will also provide additional details in the next section.[10]

3.1 Tax Base

Universality Principle. An important feature of many states' property taxes was the principle of universality–the idea that all classes of property, both real and personal, owned by households should be taxed. While this goal was often embedded in state constitutions, as shown in Wallis (2005) who provides evidence on when different states adopted such provisions, its practical implementation faced many challenges,

[10]For an example, see the 1912 compendium of state tax laws.

as described in Legler, Sylla and Wallis (1988), Hindman (2010), Einhorn (2006), Einhorn (2001), and Wallis (2005). A key insight from Hindman (2010, pp. 18–19) is that, much like with wealth or income taxes today, attempts to apply the tax broadly often provoked backlash. Groups that stood to be affected would push for exemptions or special treatment, which worked against the principles of uniformity and universality. For example, in Southern states, supporters of the general property tax often abandoned these principles when their own forms of wealth were at stake, instead seeking favorable treatment. Fortunately, we are able to document exemptions with concrete data below. Over our core period of study, these exemptions appear to have been quantitatively small, which suggests that our data likely capture a large share of total private property.

Types of property taxed. Among the types of property subject to the property tax, real property consisted of land, buildings, and improvements. Personal property was less clearly defined and essentially included most other forms of property, such as tangible property–furniture, livestock, merchandise, and valuables–and intangible property, such as money and bank deposits, mortgages, debts and credits, stocks, and bonds. Before the abolition of enslavement, enslaved people were considered to be the personal property of the enslavers.

Appendix Figure A12 shows a breakdown of private property in Connecticut–a state for which we have detailed information on property composition–between 1865 and 1885. The figure highlights how extensive the property tax base used to be and provides some information on its composition. The bulk of assets consisted of dwellings, houses, and land, followed by mills and stores, mechanical and manufacturing investments, money, stocks, livestock, and various household goods.

The General Property Tax applied to corporate assets, too. Different states adopted different methods of taxing corporate assets–some states taxed property owned by corporations, and others taxed individuals who owned shares of stock and bonds issued by corporations. However, no state taxed *both* corporate assets and household-owned shares, implying that there was no within-state double taxation. Issues of double taxation could nevertheless arise across states: if a corporation was held by shareholders from state a, but had its physical capital in state b and state a taxed stocks and bonds of corporations on the household side, while state b taxed corporate assets directly on the corporate side and there were no provisions for double taxation. In practice, this situation was likely not that common, and several states (Utah, Massachusetts, Montana, Vermont) had explicit provisions for out-of-state corporations (Jensen (1931, pp. 121-124)).

Exemptions. Exemptions varied by states, but they were generally limited and clearly defined. Specific provisions allowed the deduction of debt and mortgages from the property tax base so that the assets they financed were not double-counted. Apart from debt and mortgages, most exemptions were related to public property (land and public buildings), religious property (e.g., churches, cemeteries, religious societies), charities, hospitals, schools, and libraries. Nevertheless, there were also specific, non-systematic private property exemptions. Some examples include Treasury bonds, abatements for individuals (e.g., one $25 watch in Vermont), or specific sectors (e.g., ten bee stands and beet sugar factories in Indiana (U.S. Census Bureau (1902)).

We document exemptions in greater detail in Appendix II. We have access to precise information about the value and nature of exemptions from 1880 to 1937 at the national level, and at the state level for the period 1890 to 1922, thanks to the detailed and thorough analyses of the Census Bureau for its decennial Census (U.S. Census Bureau (1922), National Industrial Conference Board (1939)). Appendix Figure A26, plots the exemption ratio (the share of exempt property in total property) from 1880 to 1937. The total value of exempt property was generally small and stable over time, with the exemption ratio hovering around 6% to 7%. Appendix Figure A27 shows the exemption ratios by state over the period 1890 to 1922. There was spatial variation in exemptions. In particular, a few states west of the Mississippi River show relatively high fractions of exempt property in the late 1880s. This dispersion is mostly explained by the presence of federally owned (and therefore exempt) land in those regions prior to their full incorporation into the Union, much of which was later transferred to individuals.

3.2 Tax Rates

The General Property Tax was an ad valorem tax, i.e., taxation was based on value. This fundamental concept allowed for the same tax schedule to apply to different classes of property instead of having tax schedules depend on the kind of property. It made the valuation of property a critical feature of the tax administration.

Relatedly, the uniformity principle, written into many state constitutions, required that all property be subject to the same tax rate in proportion to its value, regardless of the property class or the owner's wealth. It also meant that property taxes were not aimed at progressivity. Einhorn (2006) explains that uniformity was also a way to prevent enslaved property from being taxed at a higher rate than other types of property. Yet, it is important to note the limits to the uniformity principle, as explained carefully in Legler, Sylla and Wallis (1988), Hindman (2010), Einhorn (2006), Einhorn (2001), and Wallis (2005). For our purposes, this does not matter much, since we are interested in

the value of property, rather than the effects of tax rates.

3.3 A Local and Layered Tax

Property taxes were locally administered. Local assessors–usually elected and often residents–listed and valued property and collected property taxes.[11] This local characteristic of the property tax created a close link between the sources of revenues and government spending. The property tax thus provided valuable benefits to local taxpayers in exchange for their tax payments, making it politically and economically sustainable in the face of mobility of factors and people.[12]

Assessment was supposed to reflect the "market value" of wealth ("true," "full," or "just" valuation in the words of state constitutions (U.S. Census Bureau (1902, pp. 3-5))). In practice, there were deviations from this, which we explain in detail and account for in Section 4.

The property tax was also a layered tax. Property was assessed once, locally, but then taxed by all residing jurisdictions: city, county, state, and special districts.[13] Note that in the period 1850 to 1930, almost all states moved to annual assessments, so that assessed values capture high frequency variation in wealth. The broad parameters of the property tax were defined at the state level in the State constitutions and by the State legislator in specific laws (e.g., revenue laws). State tax commissions supervised the assessment and collection of property taxes, while boards of equalization or boards of assessors ensured some harmonization of assessment across state jurisdictions. 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 to hear appeals. The property tax was levied on a specific day of the year based on the value of the property that day.

Thanks to our data, we can compute effective property tax rates at different levels of jurisdiction (for details of the construction, see Appendix III.9).[14] Panel A of Figure 2 shows that property tax rates in municipalities and lower levels of jurisdictions in-

[11] Assessment was done once, typically at the city level by city assessors, except for assets that were beyond the city border (railroad property is assessed at the state level by the State tax commission)

[12] Some property taxes were directly targeted at financing specific activities, such as taxes on school and road districts. In addition, some states created specific state property taxes for each spending category, such as the state tax for the road or school funds.

[13] Special districts include school districts, road districts, fire districts, or drainage districts, which allowed for targeting of funds for special projects.

[14] These effective tax rates are computed as the ratio between property tax revenues and our estimates of the value of property at each level of jurisdiction. This allows us to provide consistent effective tax rates for a long period of time. However, for the more restricted period for which we have data for statutory tax rates, the effective tax rates align very well with statutory tax rates adjusted by the assessment ratio (see Figure A26).

creased from 0.3% in 1850 to 1% in 1930 while county and state tax rates remained relatively stable at around 0.3% combined. As a result, total effective property tax rates were around 0.6% in 1850 and 1.35% in 1930. There was, however, substantial geographical variation in these tax rates. Panel B of Figure 2 shows that property tax rates ranged from around 0.5% in low-tax areas to more than 3% in higher-tax ones in 1920. In that year, the average effective tax rate was 1.4%; the average city tax rate was 1%; the average county tax rate 0.24%; and the average state tax rate 0.16%.

4 Data Sources

This section describes the data sources we collected to construct private property series at the county, state, and national levels. Appendix III provides extensive further information. To better understand the description and purpose of these sources, it is important to first explain the basic principle we use to estimate the market value of wealth.

From assessed to market value. In our data, we will be able to see the assessed values of property, as recorded by assessors. The main challenge is that assessors may not always follow the requirement to assess property at its market value (see U.S. Census Bureau (1902)). Furthermore, these deviations can vary across time and space.

More formally, for a given jurisdiction i and year t, we observe the total assessed value $\tilde{W}_{it}$

$$\tilde{W}_{it} = \gamma_{it} \cdot W_{it} \tag{1}$$

To recover the true market value W_{it}, we need to also know the ratio of assessed to true value, or the "assessment ratio" $\gamma_{it} = \frac{\tilde{W}_{it}}{W_{it}}$. Fortunately, we were able to gather rich information on assessment practices and assessment ratios. Given the importance of these ratios for the robustness of our wealth measures, we describe in detail below the sources and methodologies used to estimate them.

Thus, our approach follows the methodology of the Historical Censuses of Wealth. They (and we) begin with assessed values of property and correct them with the assessment ratios to estimate wealth at market value. The main advantages of our approach over the alternative ones described in the introduction is that the assessed values are comprehensive, high-frequency and that, thanks to the assessment ratios, we will be able to correct for the differences in assessment and obtain market values.

4.1 Publications from the U.S. Census Bureau

First, we systematically collected all information published by the U.S. Census Bureau over the period 1850 to 1942. During this time period, the U.S. Census Bureau gathered rich information on property, as well as detailed information on local government finances. A list of the relevant publications can be found in U.S. Census Bureau (1948) and U.S. Census Bureau (2006).

Historical Censuses of Wealth. One of our most important source is the series of U.S Wealth Censuses conducted by the Census Bureau every decade from 1850 to 1922 (U.S. Census Bureau (1854),U.S. Census Bureau (1866), U.S. Census Bureau (1870), U.S. Census Bureau (1880), U.S. Census Bureau (1890), U.S. Census Bureau (1902), U.S. Census Bureau (1912), U.S. Census Bureau (1922)). These publications were specifically authorized by law with the goal of providing a complete census of wealth for the United States. The work of the Census Bureau consisted in collecting and aggregating data on property assessments that were made by state and local governments for the purpose of property taxation, and supplementing these with data collected by other agencies or its own estimates. Specifically, the Census made two key contributions. First, it collected information on the value of exempt property. This information is especially detailed starting with the 1880 Census of Wealth. Second, because assessments for property tax purposes did significantly differ from the true market value of property, the Census Bureau compiled information on assessment ratios.

We systematically extracted and organized the following information from the U.S. Censuses of Wealth: At the state level, all information on real and personal property, which includes assessed values and estimated true values, and all information available on exemptions. At the county level, all existing information on assessed values and estimated true values of property 1850 to 1922. The availability of county-level information varies substantially across years. For 1860, we have the estimated market values for both real and personal property; for 1870, the assessed and market values of both real and personal property, with additional details by sub-categories of property; for 1880, 1912, and 1922, the assessed values for both real and personal property, with additional details by sub-categories; and for 1890, 1900, and 1904 the assessed values for all types of property, as well as the estimated market value for real property only.[15]

[15]For the years 1850 and 1860, although the *Social Statistics Schedules* of the Census Bureau did collect information at the county level on both assessed and true valuation of property, these schedules were never systematically tabulated and published by the Census Bureau. For 1860, we were able to find the market value for real and personal property (but not the assessed values) at the county level. Margo (2000) has digitized some information on wages from these Schedules for a subset of states (see Table 2.3). Rusanov (2022) has also digitized the Social Statistics Schedules for counties from a subset of states for 1850 and 1860.

Beyond providing data on property values, the Historical Censuses of Wealth contain compendia of state tax legislation that are a uniquely detailed source of information regarding various aspects of property tax law (constitutional requirements, exemptions, tax rates, etc.) and tax practices (methods of assessments, tax administration, tax collection, etc) for each state. We extracted from these compendia information on state property tax provisions to create a comprehensive database. We use some of this information to refine our assessment ratio series as explained below and in Appendix III.2. However, there is a lot more information in the database we constructed that can be useful for future researchers.

***Financial Statistics of the States* from the U.S. Census Bureau.** Starting in 1915, the U.S. Census Bureau compiled and harmonized data from State reports (see their description below) in the series *"Financial Statistics of the States"* at an annual frequency. These publications contain detailed information on assessed values as well as assessment ratios by property type at the state level, which we extract for the period 1915-1943. These allow us to extend the information from the Historical Censuses of Wealth to the later period.

Other special studies Finally, where available, we also relied on special studies by the U.S. Census Bureau or U.S. Department of Commerce providing a time series of property taxes and assessed values of property for all states (e.g., U.S. Census Bureau (1941), U.S. Department of Commerce (1967), U.S. Department of Commerce (1982)).[16]

4.2 State Sources

Beyond publications of the Census Bureau, our primary sources are official State reports, which were the main financial documents of states and contained detailed information about revenues and spending. Often these reports were called an Auditor's, Treasurer's, or Comptroller's report and were produced annually or every two years. We also collected data from the State Tax Commission and the Board of Equalization in charge of supervising the assessment of property. The formats and names of these reports and sources varied from state to state and year to year, which implies a substantial data collection effort.

We compiled all such state reports available on the *HathiTrust* digital library from 1790 until 1940 and complemented them with reports from the Law Library Microform Consortium (LLMC) Digital archive[17] and multiple secondary sources (for instance,

[16] Where multiple sources are available, we rely on the most recently published series.
[17] The reports are taken from Hathitrust and LLMC.

Blakey and Blakey (1927), Sydenstricker (1915), Haig (1914), Linder (1923),Connecticut. Tax Study Commission (1959)). The main advantages of HathiTrust are that first, as a research consortium, it provides combined access to the catalog of the largest American libraries, and therefore contains records for all states. Second, it also includes content digitized by Google Books and the Internet Archive initiatives, significantly increasing its coverage.[18]

We created an exhaustive catalog of all available resources for each state. Because these primary sources change names over time and are available in different collections and libraries, such a catalog can be helpful for future research. Appendix Table A8 lists the state reports sources we collected for each of the 50 states and territories. Our coverage is quite comprehensive, and starts either when a property tax is first introduced or with the state's accession to the Union.[19]

From these sources, we systematically digitized information on assessed values of real and personal property. Furthermore, we collected available information on assessment practices (which will complement our assessment ratios series) and legislative changes as related to the property tax. We also systematically collected and digitized property tax rates and tax revenues (although we do not make systematic use of these in this paper, they are useful for future researchers).

4.3 Full-Count Population Census Data for 1850, 1860, and 1870.

We further supplement our data with full-count population Census data from IPUMS for the years 1850, 1860, and 1870. The 1860 and 1870 Censuses provide data on total property ownership; the 1850 Census only recorded real property. We use these household-level data for three main purposes.[20] First, we use them to validate our constructed property measures at the state and county levels for overlapping years. Second, we derive county-level measures of inequality and wealth concentration, which

[18]HathiTrust is very complete relative to the hard copies available in the libraries we were able to check (e.g. the Library of Congress, Harvard library, UC Berkeley library, etc). We believe that our current approach based on digital historical records (mainly from HathiTrust, complemented by the LLMC Digital archives) is near-exhaustive while being unlikely to create sample bias.

[19]The fact that our coverage increases over time (see Figure 3) in the first part of the 19th century reflects the increase in reporting by state auditors of state reports, rather than missing records at libraries. In fact, we often have access to state reports even before statehood and to the first published state reports. Furthermore, several state reports contain "retrospective studies" that provide data tables on assessed property combined for several earlier years, especially in the very early part of the period. For instance, the state report for New York from 1926 provides data for the years 1805-1926, which allows us to compute property series even for years where there is seemingly no state report.

[20]The completeness of the 1870 U.S. Census has been questioned (Ransom and Sutch (2001)), as it was conducted by federal officials in areas affected by conflict. However, Hacker (2013) argues that observed population gaps reflect genuine losses from the Civil War rather than deficiencies in data collection.

are used in our analyses in Section 6. Third, we reconstruct county-level property values for 1850, since these are not available in the Historical Censuses of Wealth.

A limitation of the 1870 census is that enumerators were instructed not to record personal property values below $100, resulting in left-censoring of the data. To address this, we impute the distribution of personal property below $100 using approximately 80,000 cases where enumerators did record nonzero values under this threshold, likely reflecting deviations from official instructions. As already shown in Derenoncourt et al. (2023), this adjustment has minimal impact on our results.[21] Further details on our use of the Full-Count Census data are provided in Appendix section III.7.

4.4 Data on Assessment Ratios

As explained above, a crucial element of our data are the assessment ratios, which allow us to control for differences in assessment practices and go from assessed values to market values.

Assessment Ratios from the Historical Censuses of Wealth. Our first source of assessment ratios comes from the Historical Censuses of Wealth. The Census Bureau devoted considerable resources to the exercise of measuring assessment ratios and the market value of property. It did so with a high level of professionalism, and using the best possible contemporaneous sources of information. At the state level, these measurements exist for every decade since 1850. At the county level, we have assessment ratios for 1870 for real and personal property and for 1890, 1900, and 1904 for real property only.

Here is a brief summary of the techniques used by the Census Bureau (full details are available in Appendix section II.4). From 1850 to 1870, U.S. marshals were sent to each county and tasked with gathering assessed values of all property, as well as the market value of property (and, as a result, the assessment ratio). Their detailed estimates, gathered in the *Social Statistics Schedules* of U.S. counties, are based on a set of common practices that they were instructed to follow, guaranteeing some homogeneity in the measurement of assessment ratios across space. In 1880 and 1890, the U.S. Census Bureau sent a survey to more than 25,000 experts (bankers, real estate agents, business people, and public officials) connected to the valuation of taxable property. The survey, which was stratified by state, asked the experts about market prices for various classes of assets. Assessment ratios were obtained for each asset class by comparing market prices to the prices derived from local assessed values in the property tax.

[21] For instance, for Black individuals, the average personal property remains at $15 before and after imputation, while for white individuals, the average changes only slightly from $248 to $249.

From 1900 onwards, the U.S. Census Bureau went even further and used a combination of methods based on information on asset transactions, surveys of local experts in all cities of more than 4,000 inhabitants, comparisons with direct appraisal of certain types of assets made for the U.S. Census of Manufacturing or the U.S. Census of Agriculture, and comparisons with information collected by state tax commissions. As a consequence, the Census Bureau data from the Historical Censuses of Wealth publications is the most reliable, comprehensive, and consistent source of information about assessment ratios. It enabled the Census (and, hence, us) to capture a rich level of heterogeneity in assessment practices by state and over time, as can be seen, for example, in Figure 4.

Other data sources on assessment ratios. We leverage three additional sources on assessment ratios. First, the annual state reports, especially those by state tax commissions and boards of equalization, contain rich and systematic information on assessment practices. For instance, in various states (e.g. New York, Minnesota, Kansas, California, Maryland, Indiana, Illinois, and Wisconsin), state tax commissions accumulated considerable information about sales values of real property and other assets, in order to measure assessment ratios and their distribution across counties. In Kansas, the tax commission gathered information on 40,000 real estate sales for the years 1903 to 1907 in order to compare sale prices to assessed values, offering unique insights into the within-state spatial dispersion of assessment ratios.[22] Furthermore, state reports tend to systematically record and describe significant reforms to the way property assessments are carried out, enabling us to detect variation in assessment ratios at a higher frequency than the decadal Census estimates.

Wherever available, we also collected information from contemporaneous studies by economists, historians, and tax scholars (for instance, Ely (1888), Adams, Thomas S., George E. Benton, Brough, Charles Hillman Schmeckebier and Frederick (1900), Snavely (1916), Blakey and Blakey (1927), National Industrial Conference Board (1923), National Industrial Conference Board (1925), Blakey (1930), Nelson and Mitchell (1931)), which contain information on the sales prices of assets and assessments ratios. Lutz (1921) and Chapter 12 in Jensen (1931), which contain summaries of studies of assessment ratios by tax commissions across multiple states, are particularly useful.

Finally, we also made use of information contained in the *Financial Statistics of the States* described above (U.S. Census Bureau (1915)), in which assessment ratios are

[22] See the Report of the Tax Commission of Kansas for 1908, p. 10. For a similar exercise in Maryland, see the Report of the Commission for the Revision of the Taxation System of the State of Maryland and City of Baltimore, 1912, pp. 73–168. While we do not use the county-level assessment ratios from these sources systematically because they do not cover all states and are usually snapshots, we made sure these values matched the ones we do use from the Historical Censuses of Wealth.

self-reported by assessors. While this information is typically not accurate in terms of levels, it is useful to infer spatial distributions, as well as to detect directional changes over time.

5 Construction of the Wealth Series

From the data sources described in Section 4, we created three series of wealth: at the state, county, and national level. We describe this construction next. Appendix Table A7 provides an overview of the national, state, and county-level data series we created and their coverage.

Definition of our wealth concept. We use the word wealth to mean private marketable and taxable wealth. It thus excludes public sector assets, such as federal land, as well as private-sector assets of non-taxable entities (such as religious organizations and colleges, i.e., what we might call non-profit organizations today). By marketable wealth, we mean assets that can be bought and sold, which excludes human capital except under slavery. In the latter system, income flows from the labor of enslaved people accrue to others, making forced labor income flows appear like returns to capital or wealth, which is inaccurate. To allow for a consistent definition of wealth over time, we also systematically produced wealth series excluding enslaved property.

5.1 State Level Series

Constructing high-frequency series of assessment ratios at the state level. For each state, we start from the annual assessed values of wealth from the State reports. These assessed values need to be converted into market values, which requires constructing annual series of assessment ratios.

From the Census Bureau sources, we have one reliable estimate of the assessment ratio for each state every decade. These estimates, displayed in Figure 4, reveal considerable variation across space and over time. Over the long run, assessment ratios decreased in most states. The average assessment ratio fell from around 83% in 1850 to 43% in 1922 (see also Appendix Figure A6 showing the evolution of the average assessment ratio over time).[23]

To expand our series of assessment ratios to a higher frequency, we used the rich information contained in the State reports and the additional sources described in Section

[23] Although there is no conclusive explanation for why this decline occurred, one possibility is that personal property became a larger share of private wealth and was more likely to be undervalued (Jensen (1931, pp. 282)).

4.4. They can identify changes in assessment practices and assessment ratios within each decade.[24] Because these events vary by state, Appendix III.2 describes the construction of assessment ratios for each state separately. We provide a detailed account of all the variations in assessment practices that can be identified in all existing sources that we compiled and how we used this information to build our series of assessment ratios at an annual frequency.

Wealth series To obtain wealth series for each state, we divide annual assessed values of total property by the estimated assessment ratios. Appendix Figures A29 to A37 depict the time series of assessment ratios, assessed wealth, and the market value of wealth. These state-by-state time series illustrate why information on assessment ratios is so critical. Take the example of Ohio, reproduced in Figure 5. In 1910, assessed wealth exhibited a sharp and sudden jump. Such discontinuities may cast doubt on the benefits of assessed property tax data for economic analysis. However, our data collection shows that, in 1910, Ohio experienced a clear increase in the assessment ratio because of the creation of the Ohio Tax Commission, which was responsible for equalization. When we apply this change in the assessment ratio to the assessed wealth series according to formula (1), we obtain a smooth series of the market value.

To construct the series for real and personal property separately at the state level, we apply the same technique. Namely, we use the assessed values of real and personal property and divide each by the assessment ratios series constructed.

Correction for the value of enslaved property There is evidence that enslaved property was systematically undervalued (U.S. Census Bureau (1870, pp. 8), and Piketty and Zucman (2014, Appendix, pp. 63)). Therefore, we correct these assessed values by, first, subtracting the (underestimated) value of enslaved property, and then adding back its actual market value. To measure the market value of enslaved property, we use the number of enslaved people by county from the full-count population Census (Ruggles et al. (2021*a*)), and the historical series on the price of enslaved people from Ransom and Sutch (1988), and Einhorn (2001). Our procedure is described in detail in Appendix III.3, together with a discussion of robustness to alternative price estimates.

Coverage. Figure 3 illustrates the coverage of our state property series by showing the total value of private property for each state as a share of U.S. GDP. We observe the property value for most states since their admission to the Union and, for some, since the early 1800s. The data is naturally much sparser and, as explained above, less

[24] We also checked the consistency of the decadal assessment ratios from the U.S. Census Bureau with these state level sources.

reliable before 1850, so we focus our state-level analysis on the period starting in 1850. As shown in Appendix Figure A28, the share of the contemporaneous U.S. population living in states where we have wealth data reaches 50% in 1820, then progressively increases to 100% by 1865. The state-level property per capita as national GDP series can be visualized in the maps in Appendix A39.

5.2 County Level Series

Baseline Series. Our county-level property series are decadal and constructed as follows: For 1850, we only have the market value of real property (not personal property) from the full-count Census data. We impute the market value of personal property by assuming that the ratio between assessed personal and real property is constant between 1850 and 1860 at the county level (see also Appendix section III.7 for additional details). For 1860, we can directly use the market value of real, personal, and total personal wealth from the full-count Census.[25] For 1850 and 1860, we also apply the same correction for the valuation of enslaved property as the one described for the states, using the number of enslaved people at the county level.

For 1870, we directly use the market values of real, personal, and total property reported by the Historical Census of Wealth. From 1880 to 1922, the data availability varies for personal versus real property (and total property is always obtained by summing the two). For personal property, we have only assessed values from the Historical Census of Wealth for that period. For real property, we have assessed values from the same source for 1880, 1912, and 1922 but have the market values directly for 1890, 1900, and 1904. For 1930, the assessed property values for real and personal property come from the *Financial Statistics of the States*.

Thus, for years and types of property where we only have assessed values, we need assessment ratios to convert these into market values. Unfortunately, county-level assessment ratios are very difficult to find. We nevertheless gathered the most comprehensive data available on county-level assessment ratios from the Census Bureau: county level assessment ratios for all property in 1870 and county level assessment ratios for real property only for 1890, 1900 and 1904. For our benchmark series, we use market values wherever available and otherwise use the state-level assessment ratios for the decades between 1880 and 1930 to correct assessed values. Since assessment practices did differ across counties within state, this could create measurement error, an issue we explore next.

[25] We can instead use the market values from the *Social Statistics Schedules* of the Historical Census of Wealth and the values are very similar.

Sensitivity to assessment ratios at the state and county level. To explore the sensitivity of our county-level property estimates to the use of state-level assessment ratios, we undertake several exercises using the years for which we do have county-level assessment ratios. These exercises are detailed in Appendix III.4.2 and summarized here. First, we document how assessment ratios vary across counties. While there is clear dispersion in assessment ratios across counties within states, we show in Appendix Table A10 that there is surprisingly little correlation between assessment ratios and many county-level observables once we control for state fixed-effects. This is reassuring as it rules out the presence of systematic correlation between assessment ratios at the county-level and observable county characteristics, which may affect our results.

Second, we compare the ranking of counties by estimated total property per capita using county-level versus state-level assessment ratios (Appendix Figures A40 and A41). We find that the ranking of counties is strongly preserved. The correlation between the two rankings is very high, with a β coefficient estimate of .95 and an R-squared between .85 and .9.

Then, we construct four alternative time series of county-level assessment ratios based on the available information and replicate our county-level results from Sections 6 and 7 using these alternative measures in Appendix section III.4.2. In brief, the first series assumes that the ratio of state- to county-level assessment ratios is the same as in 1870 across all years, the second rescales these ratios so that the within-state standard deviation is constant across time and equal to the one in 1870; the third and fourth series perform the same exercise but using the county-level assessment ratios from 1900. Our analysis shows that our results are very similar across all four series and our baseline series.

5.3 National Level Series.

We construct national wealth series by aggregating our state-level property estimates described in Section 5.1. For the period starting in 1850, this aggregation is immediate. For the earlier period before 1850, we need to make some more adjustments, given that the data is scarcer. First, we interpolate wealth at the state level to fill in missing years. Second, to account for the fact that in some years, we only observe some but not all states, we rescale the wealth aggregate obtained for these years by the share of national wealth held by these states in 1850. Appendix III.5 describes these procedures in detail and presents multiple sensitivity checks (see Appendix Figure A8). Alternative assumptions do not substantially change our wealth series at the national level, except for the very early period 1800-1820, where data is much scarcer, and the estimates are, hence, more sensitive to omitting particular states or to the weighting.

5.4 Validation & Robustness

We validate and probe the robustness of our series in several ways.

Comparison to data from the Census of Agriculture. First, we can use external information on the market value of specific property types. The Census of Agriculture conducted a thorough and independent assessment of the market value of farmland for certain states and years, which is compiled in Haines, Fishback and Rhode (2014). Our data contains estimates of the market value of taxable land and improvements (as a separate category) for select states and years.[26] Figure 8A shows that these estimates and the value of farmland land and buildings from the Census of Agriculture align closely.[27]

Comparison to real estate price data. Since part of wealth is in the form of real estate, we can compare the cyclicality of our wealth measure to that of real estate prices. We used the Nominal House Price Index series from Knoll, Schularick and Steger (2017), available at the national level. Figure 8B shows a strong correlation between the two series. Our measure does replicate almost perfectly the rapid surge and bust in real estate prices over the period 1910 to 1930, and it does also capture a lot of the higher-frequency movements in prices. Thus, we are able to measure meaningful high-frequency variation in the market value of wealth, driven by asset prices, and specifically real estate prices.

Comparison to the full-count Census data. We compare our property estimates to the wealth measures from the IPUMS Full Count data at the county level (for 1870) and the state level (for 1850, 1860, and 1870). These comparisons, shown in Appendix Figures A13 and A14, show that for many states, the pictures are quite consistent between these two data sources, although there are some differences across space and time. At least three factors can explain these differences. First, the IPUMS data measures the property of local residents, while our estimates measure the local property (we return to this point below). Second, our property estimates are based on assessments by tax authorities, while the IPUMS data are self-reported. Third, the IPUMS data are top-coded.

[26] Notably, we compiled data on thirteen states (Alabama, Arkansas, Florida, Georgia, Indiana, Kansas, Kentucky, Minnesota, North and South Carolina, Tennessee, Texas, and Wisconsin) between 1860 and 1910.

[27] Farmland and improvements are a subset of all taxable land and improvements, which explains the small, non-zero intercept in the log-log relationship depicted.

Benchmarking against historical episodes of local booms and busts. We were also able to check from state reports and historical sources that some of the large and sudden variations in property values (which remain unexplained by known variations in assessment practices) are due to actual local booms and busts. Appendix Figures A29 to A37 enable us to visualize multiple examples of such episodes, e.g., the Florida land boom and bust of the 1920s, the mining boom in Nevada in 1906 and 1907, the severe bust following the Panic of 1893 in Western states, particularly in Washington, or the Wyoming cattle boom in 1868-1886.

Comparison with existing national wealth estimates. While sub-national estimates of wealth for our period are largely non-existent, there are estimates of national wealth based on different data sources. Figure 7 compares our national-level wealth series to existing ones from Gallman and Rhode (2019), Goldsmith (1952), and Piketty and Zucman (2014). We describe these alternative sources in detail in Appendix III.8.

In brief, the "Goldsmith-Piketty-Zucman" series (Piketty and Zucman (2014)) is based on a combination of Census IPUMS data, national accounts, and balance sheet data and builds on Goldsmith (1952) (as well Jones (1977), Hoenack (1964), and ultimately U.S. Census Bureau (1870)). The "Gallman-Rhode" series (Gallman and Rhode (2019)) uses capital stock estimates from national accounts and land values from the Census to compute national wealth. These series are significantly sparser and of lower frequency (typically decadal) than ours from 1800 to 1870. Our finer granularity allows us, for instance, to measure the big dip in wealth-to-GDP during the Civil War, which decadal data misses.

Our series is quite well-aligned with these existing estimates for the overlapping years. For 1885-1890 and 1893-1910, our series are somewhat below the Goldsmith-Piketty-Zucman series. On the contrary, we find higher wealth in 1880 (and, to a lesser extent, in 1890 and 1900) than Gallman-Rhode.

Cross-border ownership of assets. An important characteristic of the property tax is that assets were assessed and taxed at their location rather than in their owner's location. In some cases, these locations could differ. Individuals could, for instance, own assets (a house, some livestock, etc.) in a different county than the one where they had their primary residence. Strictly speaking, our county- and state-level measures are measures of local property rather than the property of local residents. Local property is an interesting measure per se since it captures local economic activity.

Nevertheless, these measures will deviate from measures of the wealth of local residents. Our estimates of local private property will tend to underestimate true household wealth in jurisdictions where residents own substantial amounts of property in

other jurisdictions and overestimate true local household wealth in jurisdictions where non-residents own significant property. Our data only provides limited consistent information relative to cross-border patterns of asset ownership. However, we do have some sparse and noisy information about cross-state ownership in 1880, based on work by the Census Bureau (U.S. Census Bureau (1880)). The methodology the Census Bureau used to get at these numbers is unclear, so we provide them as suggestive evidence only. Figure 6 shows that most states have a net cross-state position between -10% and +20% (with New York being by far the state whose residents hold the most wealth in other states). This data also shows us for which states we may need to be particularly careful when considering local property as a measure of resident wealth, namely Western states excluding the West Coast, such as Wyoming, Idaho, Nevada, or Arizona. In these states, residents of other states hold a significant share of local assets. However, for most states in the Northeast, the Midwest, the South, and on the West Coast, the local property is highly correlated with local wealth.

A final important note is that the distinction between local property and the wealth of local residents vanishes as we move to higher levels of geographical aggregation. Thus, at the national level, our aggregated measure of national property truly measures private domestic wealth, except for net foreign assets, which at the time were more limited.

6 Wealth Growth and Spatial Inequality in the U.S.

Based on the comprehensive property tax data collected and described in the previous section, we can provide new evidence on the evolution of wealth and spatial inequality in the U.S. since the early 19th century.

6.1 The Growth in U.S. Wealth 1800-1935

A rapid wealth accumulation since the early 1800s. The first important descriptive fact is that the U.S. was relatively wealth-poor at the start of the 19th century but experienced a dramatic wealth accumulation from 1800 to 1935. The red series in Figure 7 shows our baseline estimates of U.S. private wealth as a share of GDP over the period 1800-1935.

The U.S. started at relatively low wealth-to-GDP ratios of around 300% in the early 19th century. Between 1850 and 1860, the wealth-to-GDP ratio increased to 400% before plummeting to 200% during the Civil War. After the Civil War, a growth spur increased the wealth-to-GDP ratio to almost 500%. World War I led to a steep decline

in wealth-to-GDP ratios to 300%. The wealth-to-GDP ratio then rose to almost 600% on the eve of the Great Depression before crashing back to around 400%.

Is the evolution of the U.S. wealth-to-GDP ratio driven by its numerator or denominator? A11 separately depicts the numerator (U.S. wealth per capita, expressed in 2012 prices) and the denominator (GDP per capita in 2012 prices) and shows that wealth per capita drives the ratio. Wealth per capita started from a low level and grew slowly until the Civil war but took off drastically starting in 1870 and grew much more rapidly than income per capita until the crash induced by the first World War.

An important note on GDP measures is warranted. The GDP series come from Johnston and Williamson (2020) for the period pre-1929 and from the Bureau of Economic Analysis for the post-1929 period.[28] The estimates for the pre-1929 period build on McCusker (2000) (for 1793), Weiss (1992) (for 1799, 1809, 1819, and 1929), and Gallman (1966) (for 1839, 1849, and 1859). Estimates of the growth of real product before 1840 remain somewhat "conjectural" (David (1967)), and rely on assumptions about relative labor productivity and productivity growth. Because of these uncertainties surrounding GDP measures, Figure A10 plots the wealth-to-GDP ratio using two additional sources for GDP series.

The U.S. experience in wealth accumulation seems quite unique compared to other countries where wealth data exists. Cross-country comparisons are difficult, given the uncertainty around measures of historical GDP, price deflators, and exchange rates. However, we can compare wealth-to-GDP ratios, indicating wealth accumulation relative to the country's income. Figure A9 depicts the wealth-to-GDP ratios in the U.S. to those in France and the UK. The U.S. appeared relatively wealth-poor compared to the European countries over the 19th century and until the end of World War I.

The composition of U.S. wealth Our data allows us to explore the composition of U.S. wealth in terms of three broad categories: real property, property from enslaved people, and all other personal property. Figure 10 shows that real property–land, buildings, and improvements–was the largest category of wealth throughout the whole period. Enslaved people represented 15% of total U.S. wealth in 1860.

For some states, we also have the value of taxable land as a separate category (as used in Figure 8A). For these states, we can see that the importance of land in real property declines over time. Early in the 19th century, the primary source of wealth was land, which was abundant and cheap in the U.S. compared to European countries. Policies were explicitly put in place to maintain a low price of land and allow people to buy

[28] https://www.bea.gov/resources/learning-center/what-to-know-gdp

it and settle in the U.S.[29] The figure also highlights that all real property in the U.S. represented less than 200% of GDP in the U.S. before the Civil War, while land alone represented 300% of national income in the UK (Piketty and Zucman (2014)).[30] Immigrants and settlers arriving in the U.S. were usually not bringing large amounts of physical property or capital. Throughout the period 1840 to 1940, the U.S. accumulated wealth at a fast rate in the form of non-land capital.

Regional wealth evolution We can also compute wealth series by region in the U.S. Figure 9 shows the wealth per capita in each of the four major regions–Northeast, South, Midwest, and West – normalized by the U.S. GDP per capita. This measure captures a given region's wealth relative to the average national GDP per capita. The South, Midwest, and Northeast were similarly wealthy until the Civil War, although the Northeast experienced the most considerable fluctuations over time. After the Civil War, the South diverged from the other three regions and remained poorer in wealth until 1940. The West quickly became the region with the highest per capita wealth and remained so until WWI.

6.2 The Civil War and Southern Wealth

An abundant literature, referenced in the introduction, studies Southern economies and the legacy of enslavement. We can shed more light on Southern states thanks to the wealth data, particularly around the Civil War. Figure 11 presents some key statistics about the South.

Panel A shows the composition of property in Southern states. Enslaved people accounted for over 40% of the total property. Panel B shows the variation across states in the value of enslaved people as a share of the total property in 1860. In states such as Georgia, Alabama, and Florida, enslaved people represented more than 50% of the total property.[31] After the Civil War and with the restructuring of the economy, the value of land decreased, and other property increased in importance.

[29] These include the "Act to Graduate and Reduce the Price of the Public Lands to Actual Settlers and Cultivators" (1854), which "reduced the purchase or preemption price of lands opened for settlement that remained unsold for long periods" (Chused (1984, p. 53)); the Bounty Act of 1847 (Lebergott (1985, p. 194)); and the Homestead Act of 1862 (The Homestead Act (1862)) which "lowered the price of surveyed tracts of 160 acres or less to zero, contingent on a $10 entry fee, and five years of continuous residence on the property. " (Allen (1991, p. 8)).

[30] It is important, though, to distinguish between "improved" and "unimproved" land. While the latter was abundant, the former was not. As a result, improved land was not "cheap" relative to unimproved land in the U.S. and constitutes an important portion of wealth. Yet, the price of improved land in the U.S. relative to Europe was reduced by the availability of unimproved land and the various "homestead" policies enabling individuals to purchase some of this large amount of unimproved land at low prices to make improvements on it.

[31] See Appendix Figure A15 for robustness checks and shares at the county level.

Going back to Figure 9, we can compare the evolution of private property across the four U.S. regions, excluding wealth from enslaved people (the line "South, excl. wealth from enslaved"). The South now appears poorer than the other regions and not accumulating wealth at the rate witnessed in the other regions even before the Civil War. While other regions' wealth-to-income ratios grew post-Civil War, the South' stagnated. This pattern is also apparent at the state and county levels, as we show next.

Figure 12 shows the evolution of state-level property around the Civil War. Panel A depicts the rank of states in 1860 and 1870 (on the vertical axis) against their rank in 1850 (on the horizontal axis). The left figure shows this relationship for all property, including property from enslaved people; the right figure excludes property from the enslaved. The difference between the two figures is striking. If we do not count enslaved people as part of personal property, there was a strong persistence in the rank of states even after the Civil War. The rank-rank correlation is 0.73 between 1850 and 1860 and 0.57 between 1850 and 1870. Including enslaved people in the measure of property reduces the rank-rank correlation to 0.04.

Panel B depicts the decline in property per capita during the Civil War for Southern States against the share of property from enslaved people in 1860. The numbers represent the additional decline in property value, above and beyond that generated by the freeing of enslaved people, i.e., $1 - \frac{W_i,1870}{(1-S_{i,1860})W_i,1860}$, where i is the state, $W_{i,t}$ the total property in the state in year t, and $S_{i,1860}$ the share of enslaved property in total property in 1860. A zero value means that a state had the same property in 1870 as in 1860, excluding property from enslaved. For instance, in Texas, where enslaved people represented 35% of total property, property values declined by the full amount of the share of enslaved property and an additional 51%. In Mississippi, where property from enslaved people was 44% in 1860, property in 1870 was another 53% lower than wealth in 1860 excluding enslaved property. Although the relation depicted is noisy, it is increasing. States with the highest share of enslaved, such as Alabama or Mississippi, witnessed some of the most significant shortfalls in per capita property between 1860 and 1870. We show the results for all states, including non-Southern ones, in Appendix Figure A16. For comparison, property per capita in Philadelphia more than doubled over this decade.

Panel C displays the evolution of property per capita for white and black residents in Southern and Non-Southern states, normalized by the average GDP per capita in the U.S. Black residents had significantly higher property per capita in Non-Southern states than Southern states. However, even in Non-Southern states, their property was drastically lower than that of white residents. For white residents, we provide two series: one excluding enslaved property and one including it. Including enslaved property, white residents in Southern states appeared more than twice as rich as those

Non-Southern states and saw their property per capita plummet by 75% during the Civil War. If enslaved property is excluded, white residents had similar levels of property per capita in Southern and non-Southern states before the Civil War. There is a clear divergence after the Civil War, with white residents in Southern states experiencing much slower growth in their property per capita.

Overall, our new data enables a better understanding of the structure and mechanisms of economic growth in the south pre- and post-Bellum. Our estimates confirm that the Civil War led to a decline in relative growth of Southern states. And this decline goes beyond the destruction of wealth or the freeing of enslaved individuals. As suggested by Margo (2004), there is evidence that the brutality of the gang system enabled Southern states to maintain agricultural productivity and income (but not wealth) growth pre-Bellum. The disintegration of this system after the Civil War led to a decline in agricultural productivity and land values.

We can also shed some light on the public finances of the Civil War and the Reconstruction Era. Panel D shows the effective property tax rates (constructed as explained above for Panel A of Figure 2) in Southern and Northern states. Effective tax rates in Northern states were twice as high as in Southern states before the Civil War, reflecting significantly lower investments in public goods and infrastructure in the South. However, the Civil War and the Reconstruction Era drastically changed the picture of public finances in the South (Foner (1988)). Confronted with a decline in the property tax base and with significant needs to invest in public goods like public schools, newly elected Republican legislators in the South pushed for significantly higher property tax rates during Reconstruction.[32] Our data allows us to grasp the historical nature of this public finance shock: in Southern states, effective rates almost tripled in about five years, reaching a peak of 1.2% in 1870. This sudden increase in property taxes was met by a major backlash, triggering political violence, especially against black politicians (Logan (2023)). As Democrats regained control of the South, ending the Reconstruction Era's political experiment and enabling the institution of the Jim Crow regime, tax rates quickly reverted to around 0.6%, a much lower level than in Northern states.

6.3 The persistence of spatial inequality 1870-1930

The third set of facts revealed in the new data pertains to the remarkably high level of persistence of spatial inequality in the U.S. Despite potential equalizing forces, such as

[32] In order to return to the Union after the Civil War, Southern states had to ratify the 13th-15th Amendments and change their state constitutions to provide for public schools for African American children which were permitted to be de jure segregated. On the history of public education and the racial gaps in education in the South, see also Goldin (1999), Margo (1990), and Tyack and Lowe (1986).

internal migration and the deepening of the U.S. internal goods and capital markets, spatial inequality did not decline after the Civil War.

We start with Figure A39, which shows property per capita as a fraction of U.S. GDP per capita at the state level for each decade between 1850 and 1930. Figure 13 shows the equivalent statistics at the county level. The figures highlight that spatial inequality seems to be high and persistent. For instance, Southern counties and states remained persistently poorer than those in the Northeast, Midwest, or West. Furthermore, Figure A19 shows that the persistence has remained remarkably strong even until today. We compare the spatial distribution of property per capita in the 1920s (Panel A), at the fine-grained county level, to that of household income today from the Opportunity Atlas Data (Panel B). Panel C shows that the rank-rank correlation between these two variables is 0.6.

To document spatial persistence formally, we perform four additional analyses.

Dispersion of wealth across space. First, we consider the change over time in the dispersion of wealth across space, the so-called "σ-convergence". Figure A17 plots the yearly standard deviation of log property per capita across states. The dispersion of property remains roughly constant. Appendix Figure A18 shows a similar pattern for the evolution of wealth dispersion across counties. Second, Figure A21 focuses on a different metric: the share of total national wealth held by the top 10% of richest counties. It shows that property was highly spatially concentrated in the U.S. and that this concentration increased significantly from 1860 to 1930. By the end of the period, the top 10% of richest counties accounted for about 70% of total U.S. property.[33]

Rank-rank correlations at the county and state levels. Third, Panel A of Figure 14 depicts the rank-rank correlations of property per capita at the county level between 1870 and subsequent decades (1880 to 1930). The rank-rank correlation is 0.79 over ten years and remains high (0.67) even over the entire 60-year period. We see high rank-rank persistence at the state level, too (Panel A of Figure A20). These results indicate that spatial inequality was not only high, but that places that started poorer remained poorer.

Speed of β-convergence. Finally, we study the speed of convergence between poor and rich counties and states over time. We present the analysis at the county level here, whereas the state-level analysis is in the Appendix. We regress the change in

[33] Young, Higgins and Levy (2008) show that, if anything, there has been sigma divergence in income across U.S. counties since the 1970s, a result echoed by Gaubert et al. (2021) who also show that states have been diverging since the 1990s.

private property per capita in county i between 1870 and 1930 on the initial property per capita (in 1870), a constant, and a detailed set of controls measured in 1870. We infer the speed of so-called "β-convergence" from Barro et al. (1991), i.e., the correlation between initial levels and growth, from the relation:

$$\log\left(\frac{W_{i,1930}}{W_{i,1870}}\right) = \alpha - (1 - \exp(-\beta \cdot 60)) \cdot \log(W_{i,1870}) + \mathbb{X}'_{i,1870}\gamma + u_i \tag{2}$$

where $\mathbb{X}_{i,1970}$ is a vector of county-level controls measured in 1870, based on three groups of variables: i) *Geography* variables taken from Allen and Donaldson (2020), Bazzi, Fiszbein and Gebresilasse (2020), Atack (2015), Atack (2017), National Oceanic and Atmospheric Administration (2021) capture the geographical characteristics of a county such as the climate, soil properties, topography, and distance to waterways; ii) *Demographics* variables from Ruggles et al. (2021*b*) and Haines, university Consortium for Political and Research (2010) include total population, population growth, the literacy rate, the share of foreigners, gender composition, and the share of white residents; iii) *Occupational shares* in public administration, manufacturing, mining, commerce (which comprises retail, finance, business, and transportation), and agriculture from Ruggles et al. (2021*b*). Appendix III.10 provides more details on the sources and construction of these three groups of variables.

Panel B of Figure 14 shows a scatter plot of county long-term, 60-year growth rates against initial property in 1870 and reports the estimated β from a regression without controls and including the complete set of controls. Without any controls, the speed of convergence is $\beta = 0.011$. Southern counties, represented in red on the scatter plot, stagnate at lower wealth levels and growth rates: the β excluding Southern counties is 0.028. Thus, regional factors have strong explanatory power, and convergence is relatively fast except for Southern counties, which start and remain poorer. Furthermore, by adding controls, β increases to 0.024 and R^2 to 0.60. Panel B of Appendix Figure A20 replicates this same analysis at the state level and yields an even smaller $\beta = 0.007$ over 1870-1930.

The literature usually studies convergence in terms of income per capita. Table 1 shows our estimates of convergence (column "Property") at the county and state levels as compared to the estimates using income data from IPUMS, as well as to the estimates from Barro et al. (1991) at the state level. We restrict to the period 1880-1920 for comparison with these alternative sources. Without controls, β estimates are 2-2.5 times higher using income data; with controls, they are 1.5 times higher. Thus, income data conveys a picture of higher convergence than wealth data. The estimates from Barro et al. (1991) are somewhat lower than those from the IPUMS data but still show faster convergence unless controls are included.

Our results indicate that despite the shock of the Civil War, the U.S. experienced limited spatial convergence from 1870 to 1930. This slow convergence was largely driven by the Southern states and led to persistent inequality in terms of property per capita across places that still reflects in the spatial inequality of income today.

7 The Correlates of Capital Accumulation

The previous analysis showed that the U.S. experienced relatively limited spatial convergence after the Civil War and until 1930. Using our rich and granular data, we now explore the reasons for such slow spatial convergence. We want to study the characteristics of poorer and richer places after the Civil War and why some places grew faster than others, given their initial conditions. We perform this analysis at the county level–the most granular level for which we have comprehensive data over a long period.

Linking back to our previous convergence analysis in Figure 14, there is slow convergence conditional on initial property $W_{i,1870}$, but convergence is faster when controlling for additional characteristics. Therefore, we ask two questions:

1. Which characteristics are correlated with property levels in 1870 (i.e., with initial conditions)? To answer this question, we run a regression of the following form:

$$\log W_{i,1870} = \mathbb{X}'_{i,1870}\gamma_0 + u_i \tag{3}$$

   We include in $\mathbb{X}$ the same set of (standardized) variables related to *Geography*, *Demographics*, and *Occupational Shares* as described in Section 6.3, as well as two measures of inequality (the share of enslaved property in 1860 and the share of wealth held by the top 10% wealth holders). Panel A of Figure 15 shows the estimated coefficients.

2. Which characteristics in $\mathbb{X}$ correlate with the growth in property per capita from 1870 to 1930, conditional on initial property in 1870? To this effect, we plot the estimated coefficients γ from specification (2) in Panel B of Figure 15.[34]

In addition to the regression results, we also compute the contribution of each group of variables to the total variance in property per capita in 1870 (Panel A) and 60-year

[34]Tables A1-A2 show more detailed regression results at the county level, including for wealth growth over ten years and adding state fixed effects. These estimates reveal similar patterns regarding the role of geography, demography, and occupational structure.

growth in property (Panel B).[35] The share of variance explained by each group of variables is reported next to the header. We confirm these simple linear model results using a more sophisticated prediction model–a random forest model that allows for more flexible interactions among all variables in the model. Figure A23 reports the most important variables, ranked by predictive power.

7.1 Geography, demography, and economic structure.

Geography. Figure 15 shows that characteristics related to *Geography* are strongly correlated with initial wealth in 1870 but less so with subsequent growth (controlling for initial wealth). Geographical characteristics explain 21% of initial property per capita and 9% of subsequent conditional growth. Climate–temperatures and precipitations–is an important predictor of initial wealth. For instance, one standard deviation higher temperature in July–characteristic of Southern counties–is associated with a 25% lower initial wealth. More abundant winter precipitation–indicating harsher winter conditions–are associated with significantly lower initial wealth as well as slightly lower growth. As captured by elevation and ruggedness, topography is negatively related to wealth in 1870 but not significantly correlated with growth in wealth over the long run. Better soil productivity and a lower distance to the coast are significantly positively correlated with long-run growth.

Overall, these results suggest that counties significantly differ in terms of environmental advantages or disadvantages. These differences affected wealth levels in 1870 but are less predictive of the subsequent local growth path.[36]

Demography. *Demographic* variables strongly correlate with initial property stock in 1870 and subsequent long-run growth. Together they explain 20% of the variance in property in 1870 and 4% of the variance in conditional growth. Among them, the literacy rate–a proxy for education levels and the local stock of human capital–exhibits the highest correlation and explains 10% of the variance in initial property.[37] Agglomeration effects also seem to matter. Counties with a higher population in 1870 were

[35] More precisely, we add each variable sequentially in the linear regressions described in the text. For each new variable entering the model, we compute its partial adjusted R^2. Because the order in which the variables are added can affect the R^2, we randomly draw sequences in which the variables are introduced, and, for each variable, we average the partial adjusted R^2 over all draws.

[36] These findings align with the results in Hornbeck (2012*b*), who finds that, for a subset of counties in the Plains for 1920-2002, environmental characteristics had a constant relative influence on agricultural land values.

[37] These results confirm the work of Soltow (1975) showing similar correlations between literacy and wealth using Census data. Soltow and Stevens (1981) also provide a detailed account of the role played by density and property tax base in the rise of the provision of common schools in the U.S., which were a key driver of the quick rise in literacy during that time. See also Higgs (1982), and Margo (1984).

wealthier and grew faster over the long run. These results are consistent with the scale effects in innovation and growth documented in Jones (1995, 2002, 2022). Conditional on population size, a higher share of foreigners is also significantly positively associated with higher long-run growth.

At the same time, migration seems to operate as a force that reduces spatial inequality. Indeed, counties that experienced a higher ten-year population growth and had a higher share of foreigners (a proxy for migration) had lower property in 1870. Appendix Table A1 shows that systematically, over the whole period, lagged higher population growth is associated with lower wealth growth over each next decade. This is suggestive that migration flows foster some convergence: richer places see inflows of migrants moving in Allen and Donaldson (2020), but on average, these newcomers have lower wealth and dilute the wealth per capita over the next decade.[38]

Economic structure. Another important potential determinant of long-term accumulation highlighted in the "structural transformation" literature is the structure of the local economy (Herrendorf, Rogerson and Valentinyi (2014)), which we capture using *occupational shares*. For each occupation j, we rank all counties by the share of their population employed in occupation j and create an indicator variable equal to one if the county belongs to the top decile. Occupational shares explain 12% of the variance in initial property per capita and 3% of the variance in long-run growth.

Figure 15 shows that counties with a higher level of specialization in public administration, mining, and commerce were significantly richer in 1870. More agricultural counties, on the contrary, were significantly poorer and also tended to accumulate property at a significantly slower rate between 1870 and 1930.

Furthermore, we can shed some light on the economic transformation at the local level over the course of development and compare it to the one at the country level (explored, among others, by Herrendorf, Rogerson and Valentinyi (2014)). Appendix Figure A22 reveals that the structure of occupations at the county level follows the same evolution as the one found at the aggregate country level. The fraction of people employed in agriculture declines steadily, and the fraction in services increases as a county's property per capita increases. The fraction employed in manufacturing follows a characteristic hump shape, first increasing and then decreasing as counties grow richer.[39] This evidence suggests that "structural transformation" away from agriculture is a relevant pattern of development even at the local labor market level.

[38] Collins and Zimran (2023) show that between 1850 and 1940, the assimilation of European immigrants was U-shaped, with earlier cohorts assimilating more quickly. The comparative performance of immigrants and natives is explored in Ferrie (1996) and Ferrie (1997).

[39] This non-monotone pattern for employment in manufacturing also explains why the linear regressions from Figure 15 do not detect a precise effect.

7.2 The blight of enslavement.

Section 6.3 highlighted that the experience of Southern economies is key to understanding the lack of spatial convergence in the U.S. after the Civil War. This prompts us to explore the role of enslavement and the unequal distribution of wealth.

Nunn (2007) and Mitchener and McLean (2003) have documented a significant negative correlation between the share of enslaved and economic outcomes today. We first highlight how the reliance on enslavement at the county level, captured by the fraction of enslaved property in total property, correlates with wealth accumulation in the decades following the abolition of enslavement. We then explore the mechanisms through which this occurred using a mediation analysis.

Results in Figure 15 show that counties in which enslaved people represented a larger share of total property in 1860 were significantly poorer in 1870 (panel A) and, importantly, also accumulated property at a significantly lower rate in the sixty subsequent years, even conditional on the full set of other observables in $\mathbb{X}$ (Panel B). The magnitude of the correlation is large: a 10 percentage point (p.p.) increase in the share of enslaved property in total property, conditional on initial property level in 1870, reduces the growth rate of property in the next 60 years by 5 percent.

We next focus exclusively on Southern counties to check whether this negative correlation is driven by non-Southern counties, for which the fraction of enslaved wealth was zero and which grew fast after 1870. Figure 16A shows that there is still a strong negative association between the fraction of enslaved property in total property and long-run development after the Civil War in Southern counties only. Although the magnitude is smaller than when we include non-Southern counties, these results suggest that the "intensity" of reliance on enslaved property also mattered for long-run growth. In addition, this association is robust to introducing our extensive set of county-level geographic, demographic, and occupational characteristics.

Sokoloff and Engerman (2000) formulated the argument that, after its abolition, enslavement remained detrimental for long-run development because it increased initial economic inequality. To test this hypothesis, we follow Nunn (2007) and check whether the association between enslavement and subsequent growth remains significant when introducing direct controls for the level of initial inequality after the Civil War. Consistent with the argument in Sokoloff and Engerman (2000), the fraction of enslaved property is indeed positively correlated with higher initial wealth inequality (Appendix Figure A24). Nevertheless, a strong negative and significant correlation between enslavement and growth remains, even when controlling for initial inequality.[40] Appendix Table A3 shows that the estimated correlation between the fraction of

[40] Nunn (2007) uses data on land inequality in 1860 and also finds no support for the hypothesis in

enslaved wealth in 1860 and future growth is not strongly affected by the introduction of controls for county-level inequality: at most, inequality mediates one-sixth of the effect of slavery. The impact of enslavement on the slow convergence of the U.S. South was not only through high levels of wealth inequality after the Civil War. Instead, systemic policies and the Jim Crow regime played critical roles.

7.3 The shadow of inequality

Despite inequality not being the main reason for the lasting consequences of enslavement for capital accumulation in the South, there nevertheless is a significant negative correlation between initial inequality levels, measured by the top 10% wealth share in 1870, and local long-run capital accumulation, even conditional on the full array of controls, including enslaved shares (panel B of Figure 15).

A vast literature on the link between growth and inequality mainly relies on cross-country correlations (see, among others, Perotti (1996), Alesina and Rodrik (1994), Acemoglu et al. (2007), Banerjee and Duflo (2003), Barro (2000), Baselgia and Foellmi (2022) for a recent survey). Our key advantage is that we can measure the relationship between inequality and long-term growth across places at a granular level within the same country and state. This granularity allows us to keep fixed many characteristics, such as institutional or cultural factors.

We explore the relationship between local (county-level) inequality and long-term growth in Figure 16B. The figure plots the long-term growth of counties in 25 equally-sized bins by top 10% wealth shares, with and without conditioning on the full array of local controls in $\mathbb{X}$ (i.e., geography, demographic, occupational shares, and enslaved property share. For full results see also Table A4). Highly unequal counties, with top 10% shares close to 100% in 1870, such as Baton Rouge, LA or Charleston, SC, had almost 70 percent lower growth of property per capita over the next 60 years than counties such as Douglas, NE or Larimer, CO, where the initial top 10% wealth share was about 75%. This strong relationship remains highly significant, even after adding controls: a 10 p.p. increase in a county's top 10% wealth share is associated with 20 percent lower property growth over the subsequent 60 years.

To understand the potential mechanisms underlying this strong negative correlation, we perform a mediation analysis by running specifications of the following form:

Sokoloff and Engerman (2000) that the legacy of slavery on future development was mediated by initial inequality.

$$\log\left(\frac{W_{i,1930}}{W_{i,1870}}\right) = \alpha - (1 - \exp(-\beta \cdot 60)) \cdot \log(W_{i,1870}) + \mathbb{X}'_{i,1870}\gamma + \Lambda \text{Top Wealth Share}_{i,1870} + \mathbb{Z}'_{i,1870-1930}\gamma_z + u_i$$

where the vector $\mathbb{Z}$ includes changes in the composition of the population, in its level of education, or in the occupational structure of the local economy between 1870 and 1930. We are interested in how the addition of these mediators affects the estimated correlation Λ between inequality and growth.[41]

The results in Appendix Tables A4 and A5 indicate that the most important mediator is the pace of human capital accumulation as captured by the change in the literacy rate of the local population. Lower growth of literacy rates in areas with higher inequality alone account for 20% of the association between higher inequality and lower long-run growth. Earlier work (e.g., Ramcharan (2006) or Acemoglu et al. (2007)) had already suggested a negative correlation between inequality in land ownership in 1860 and school enrollment or education expenditures. Our results confirm that a lower rate of human capital accumulation is a strong mediator of the inequality-growth link.

8 Conclusion

The U.S. General Property Tax was a comprehensive tax that applied to many kinds of property, such as real estate, personal property, and financial wealth. Thanks to the paper trails left by the administration of this tax, we can construct new fine-grained and high-frequency wealth series in the U.S. This data allows us to document the evolution of wealth and spatial inequality over time. At the national level, U.S. wealth grew extraordinarily rapidly after the Civil War. At the same time, spatial inequality was large and highly persistent. Southern economies, which relied heavily on exploiting enslaved people, remained stagnant and poor even over the long run. We document a strong link between inequality and growth, even at a granular geographic level: places that were more unequal in 1870 had significantly lower subsequent 60-year growth, among others, because they accumulated human capital at a slower rate.

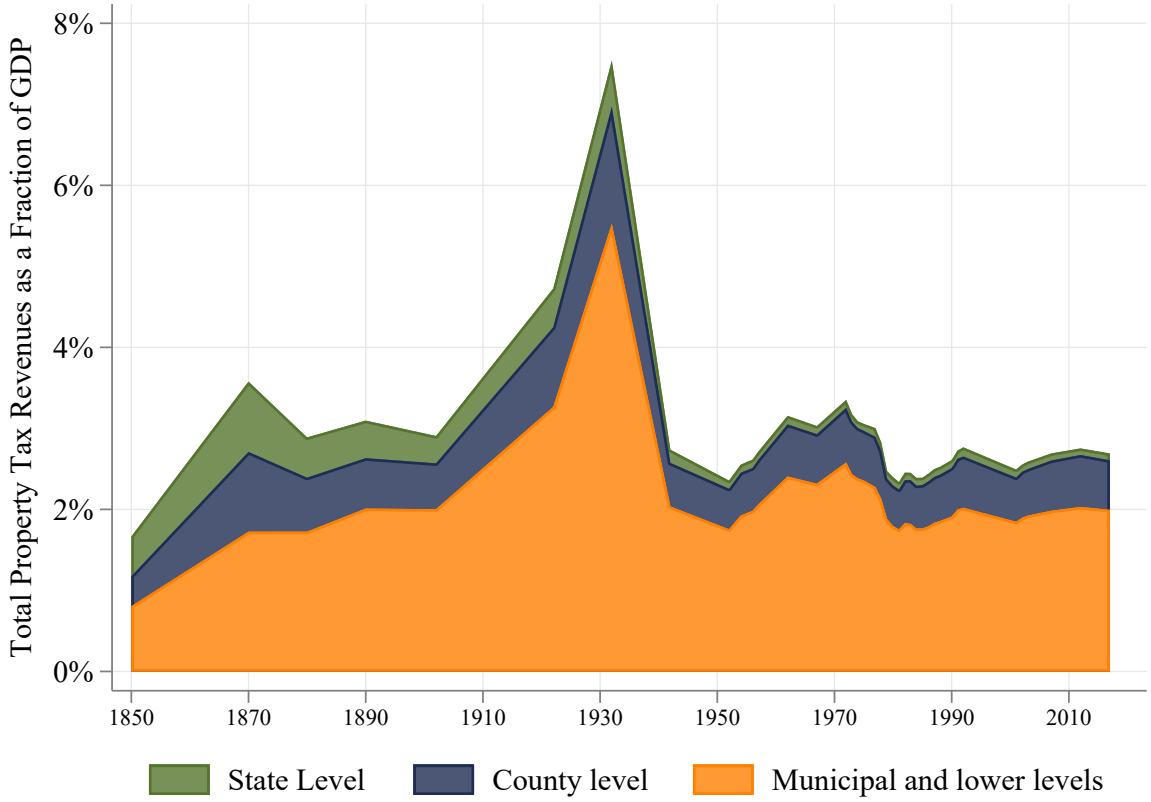
The property tax data is especially useful for the post-1850 period, when its quality and availability is much better than before, which is why we restrict our main analysis

[41] The algorithm is as follows. Pick one of the mediating variables, Z_j. We select the mediator variables from the vector $\mathbb{Z} = \{Z_1, Z_2, ...Z_n\}$ in a random sequence and repeat this sequencing x times. For each random sequence, we add the mediating variables sequentially to the regression, in the order of the sequence. We measure the importance of the mediating effect of Z_j on Λ by computing for each sequence the change in estimated Λ 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 Λ over all x sequences.

to that period. However, there is still a lot of information for many states before 1850, as we show in our Appendix figures, which is available in the data we provided. This data can be used to construct better national and sub-national measures of economic activity before 1840, a period which American historians often refer to as a "statistical dark age" (David (1967)).

Future work can leverage the exhaustive wealth and property data to compare and contrast with the results from earlier work on the determinants of economic activity using income data. Along these lines, we showed that the speed of convergence in wealth is very different from that of income. It would also be interesting to consider the effects of local wealth on other economic outcomes, such as innovation or education. Finally, it may be interesting to perform a finer analysis of different types of wealth, leveraging the additional information in the data trail left by the administration of the General Property Tax.

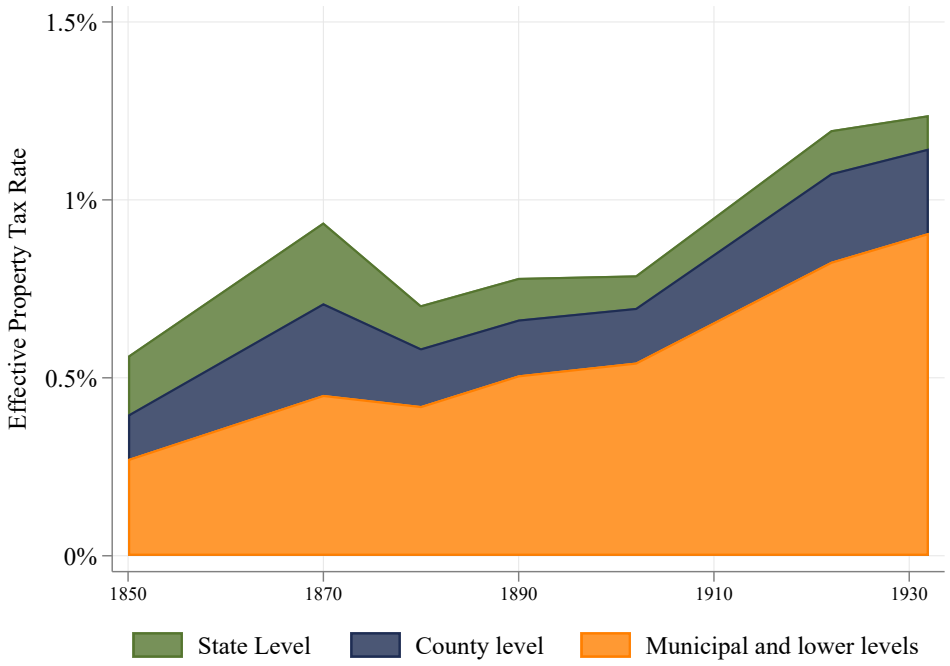
Figure 1: Total Property Tax Revenues as a Share of GDP 1850-2020



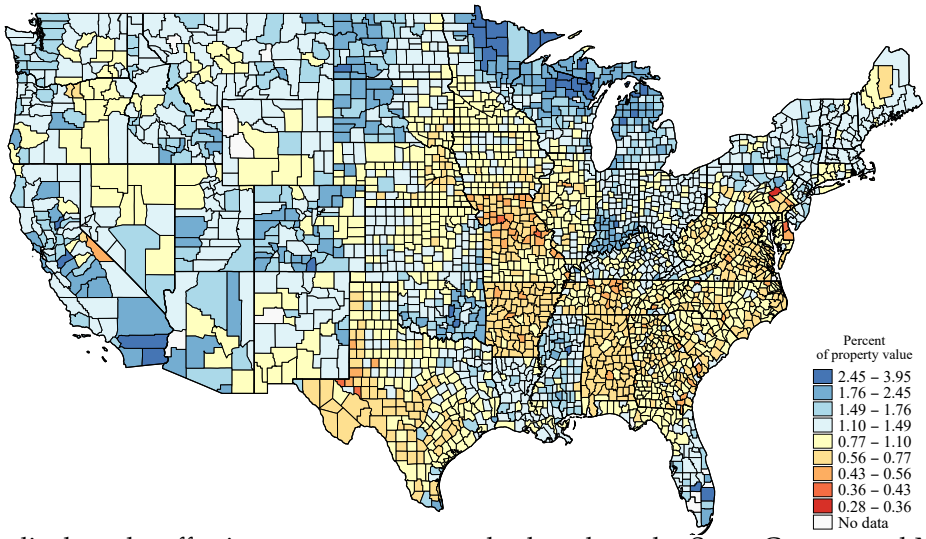
Notes: This figure shows total property tax revenues as a share of GDP for the United States. It includes all states in the Union for a given year. Property tax revenues are broken down by i) State-level, ii) County-level, and iii) Municipal-level and lower levels (which would include districts as listed in the text). For the data sources and construction, see Appendix III.9. The GDP data comes from the series by Johnston and Williamson (2020).

Figure 2: Effective Tax Rates

A. Effective Tax Rates by Level of Government

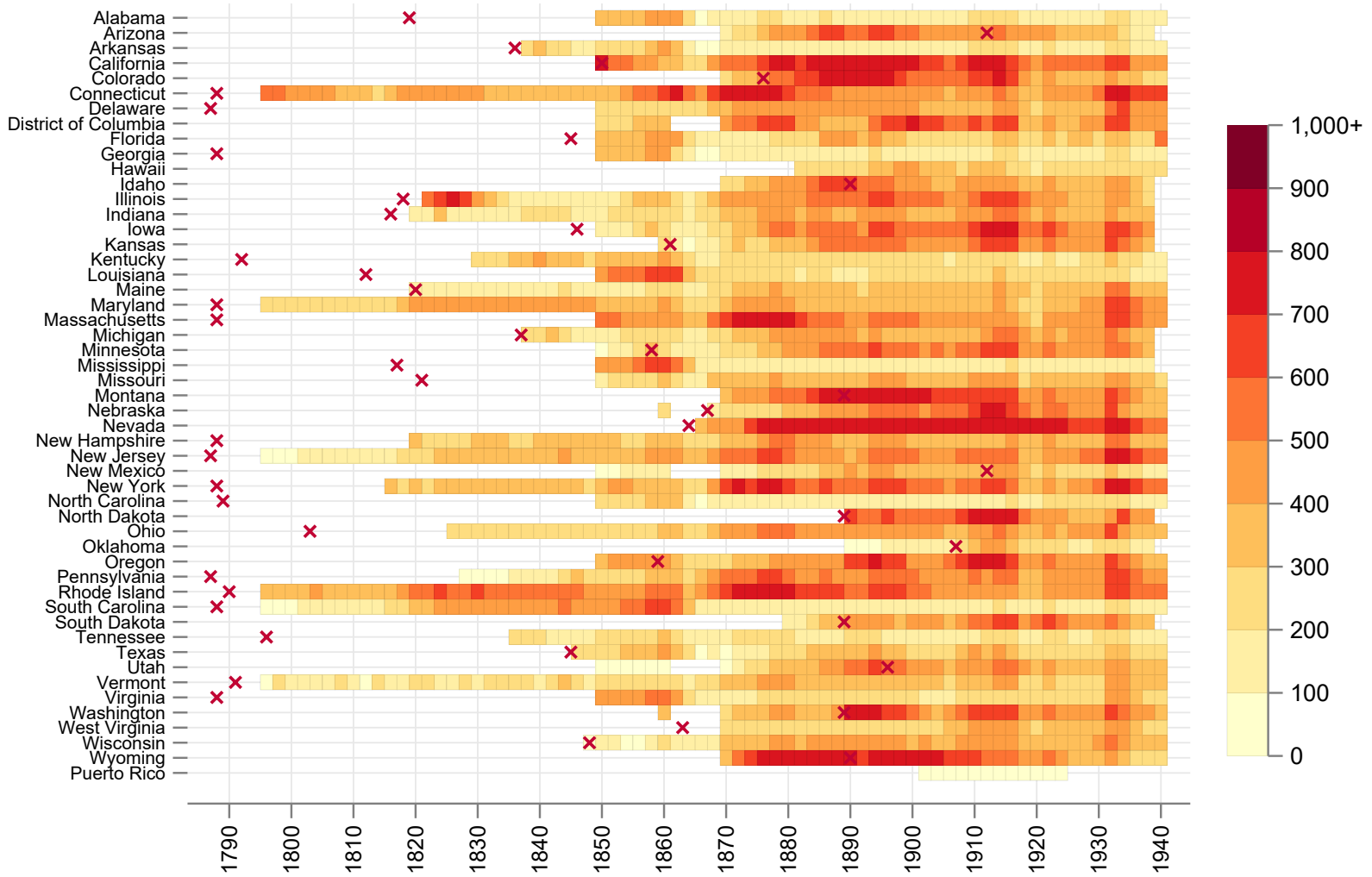


B. Total Effective Property Tax Rate - 1920



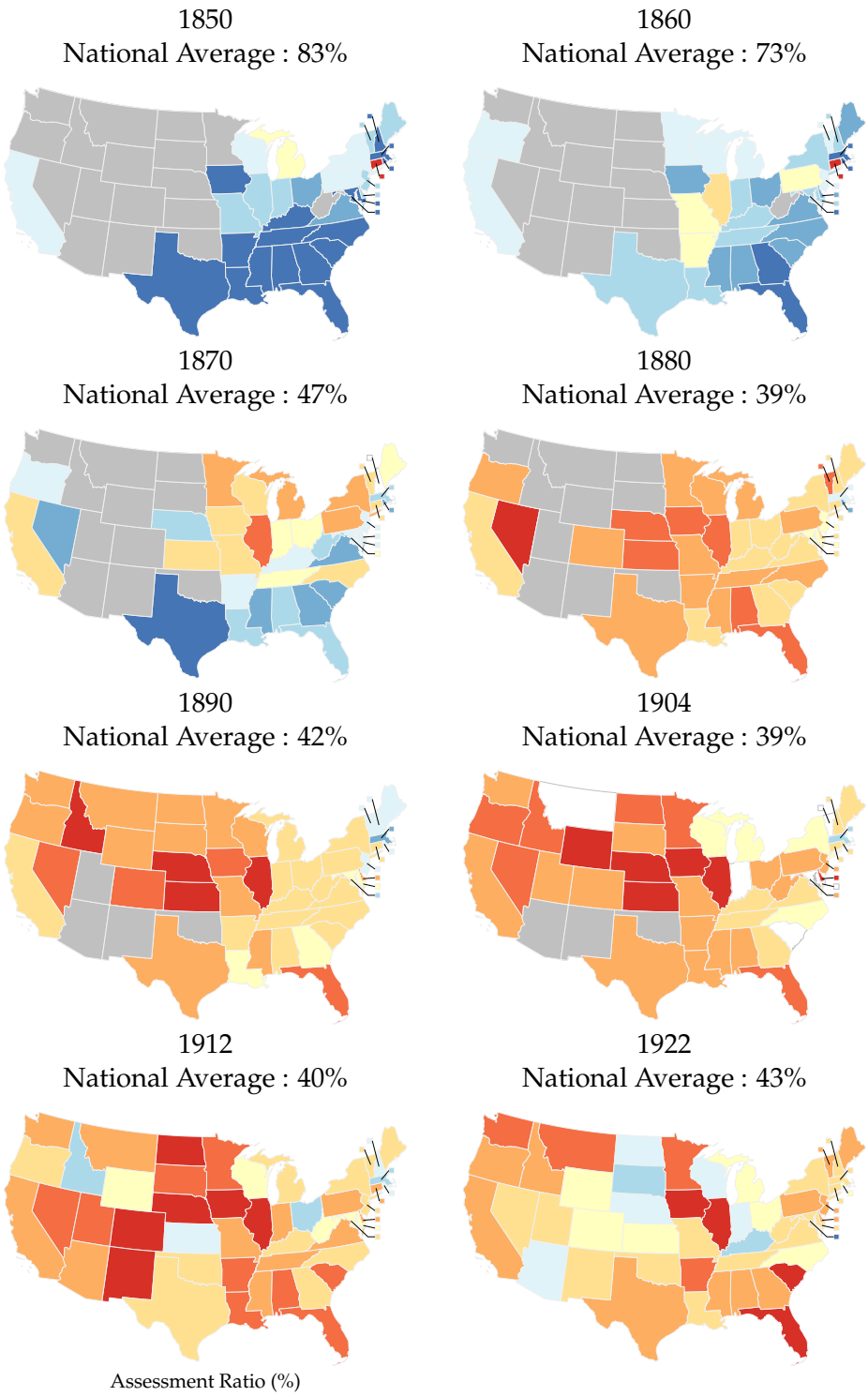
Notes: Panel A displays the effective property tax rates broken down by State, County, and Municipal and lower levels of jurisdiction. We compute effective tax rates as the ratio between the tax revenues and the total value of property. For the data sources and construction, see Appendix III.9. Panel B shows the effective property tax rate at the county level. It includes all property taxes (district, city, county and state levels).

Figure 3: Private Property by State as a Share of National GDP (%)



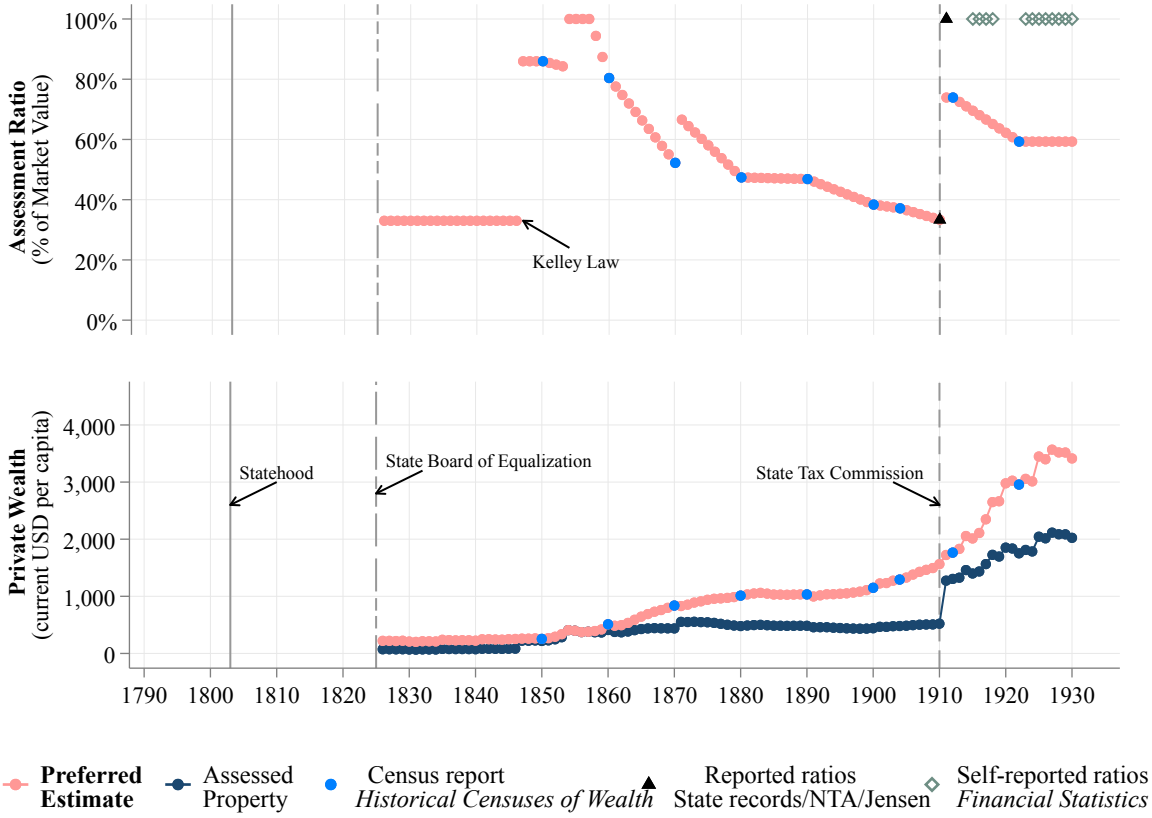
Notes: This figure shows the coverage and trends in property share for all 50 states, the District of Columbia and Puerto Rico. Property shares are measured as the ratio of private property per capita in the state over national GDP per capita. Red crosses indicate the year of the admission of the state to the Union. Property values are linearly interpolated for missing years. For coverage without interpolation, see Panel C of Figure A4.

Figure 4: Assessment Ratios at the State Level over Time



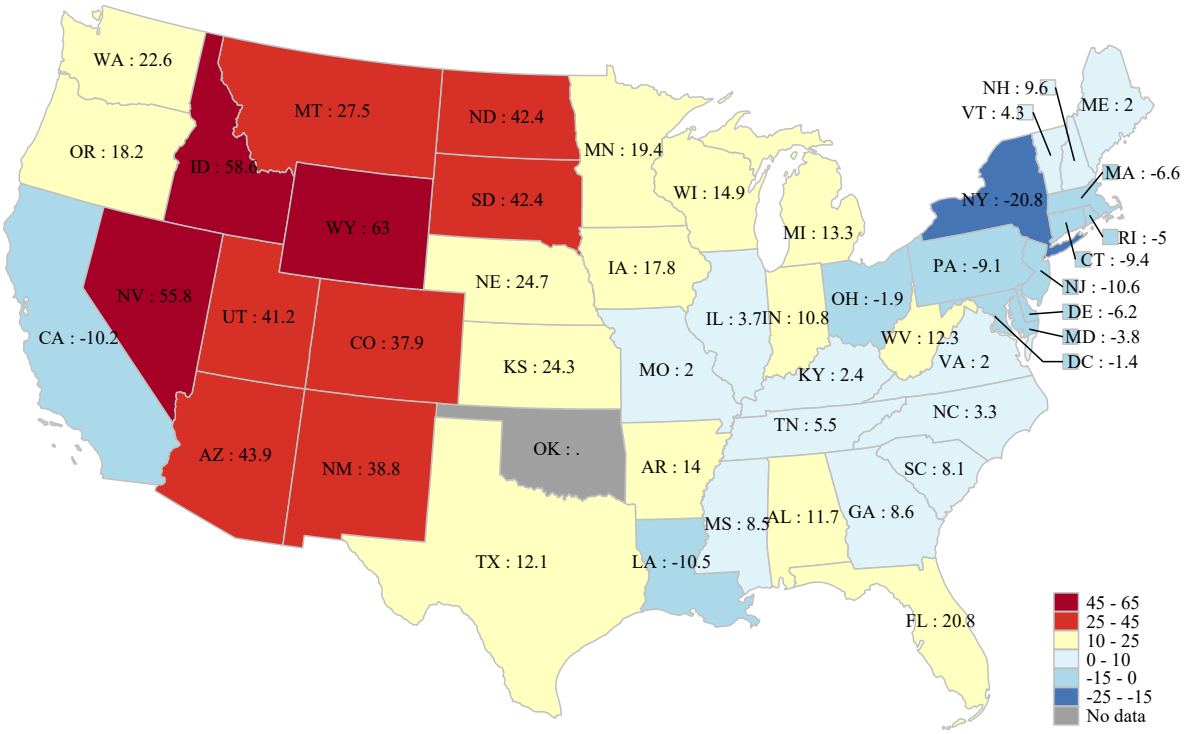
Notes: This figure displays the average assessment ratio of assessed to true value of all property for each state from the US Census Bureau. Assessment ratios for US territories prior to admission in the Union are not displayed. Note that the high assessment ratios in Southern states pre 1870 displayed here are not accounting for the large under-assessment of enslaved property. We do correct for underassessment of enslaved property. Our procedure is described in section 5.1.

Figure 5: Example: Assessment Ratio and Property Estimates in Ohio



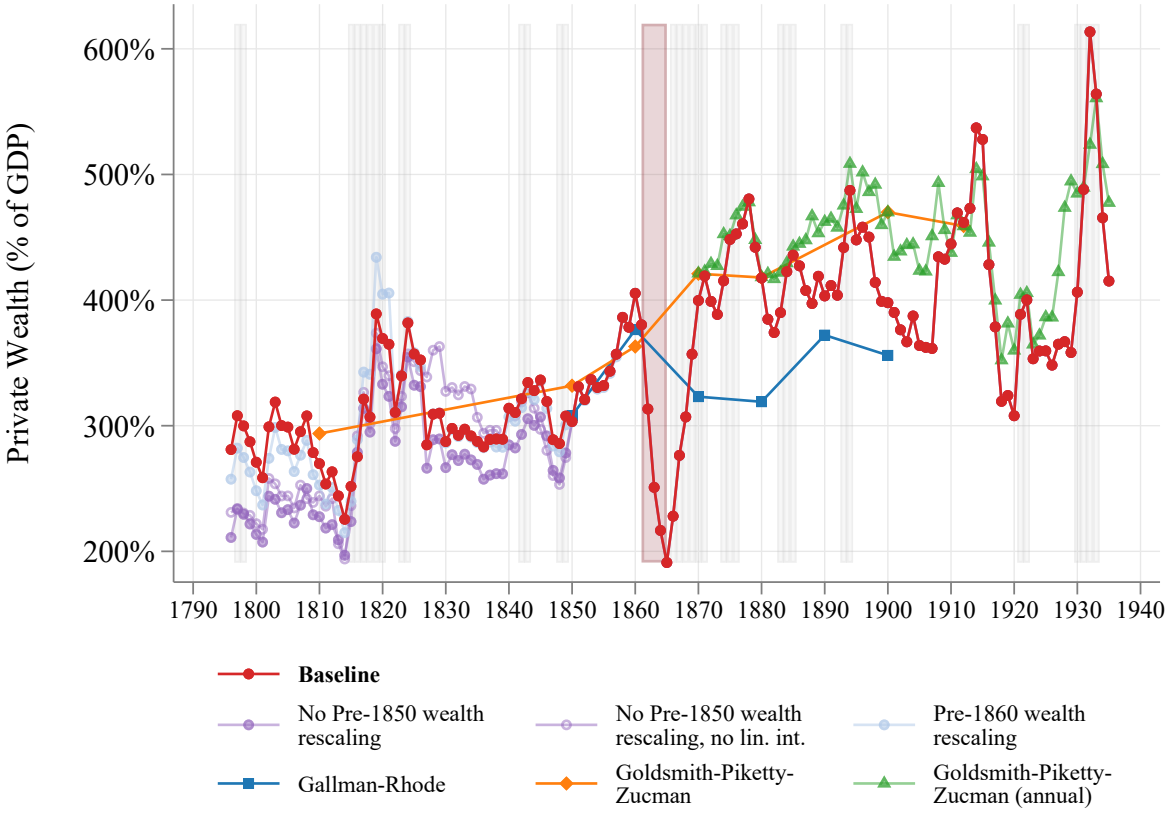
Notes: The top chart depicts the data sources for and values of assessment ratios for Ohio. The bottom chart compares the assessed property values as collected from primary sources with the market value of property obtained by rescaling assessed values using the assessment ratio. Detailed information on the development of the assessment ratio is given in Appendix III.2.3. Various episodes of sudden changes in assessment ratios are visible in the top panel, corresponding to well-documented events in state sources. For instance, the "Kelley Law" in 1847 specified for the first time that all real and personal property should be subject to taxation, amending the previous legislation, which left large classes of personal property exempt. In 1910, the creation of the Ohio Tax Commission also led to a well-documented and sharp increase in assessment ratios. Note that wealth series here are not corrected for slave prices and property before 1865, i.e. the corrections described in section 5.1 are not yet applied.

Figure 6: Net Cross-State Asset Positions in 1880



Notes: The Figure shows the net cross-state position of each state for year 1880, in percentage of their total private property. A positive value means that non-residents own part of the property of the state; a negative value means that residents of that state own property in other states. The data comes from U.S. Census Bureau (1880).

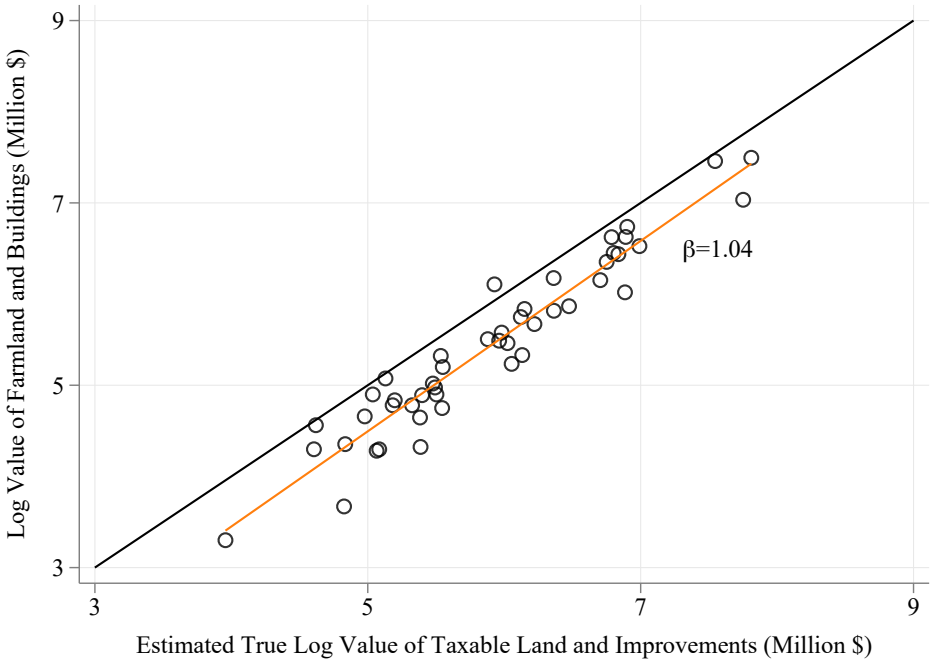
Figure 7: Comparison with Other Estimates and Sensitivity Analysis



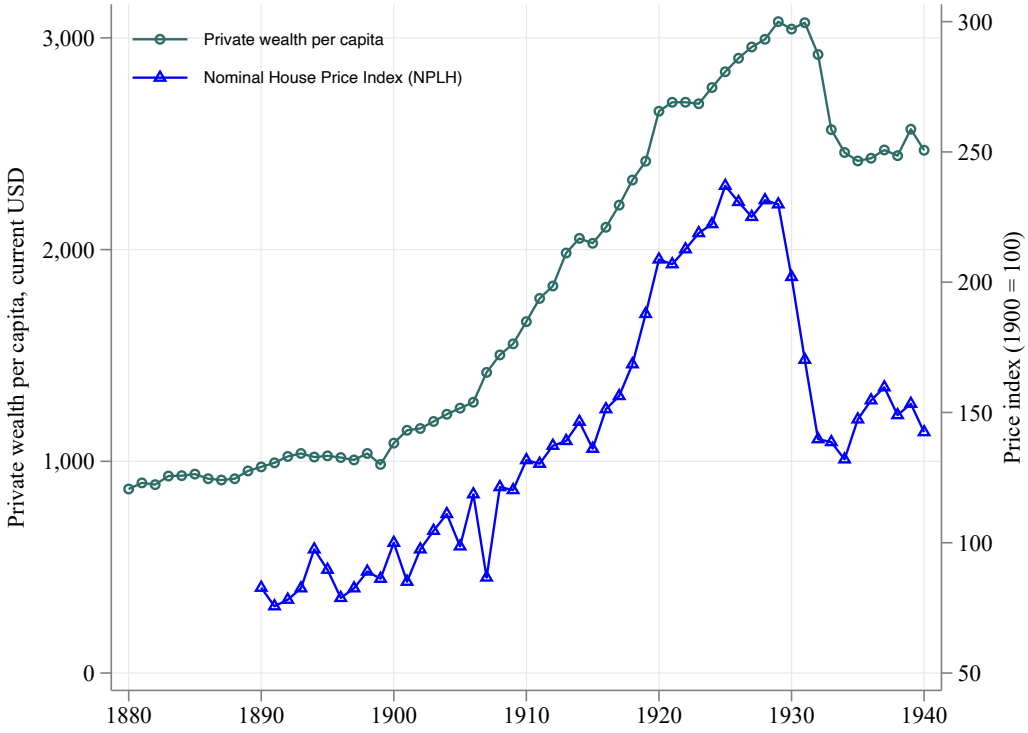
Notes: This figure compares our baseline wealth estimate with other estimates (see Appendix III.6 for a description of these alternative estimates). The main text and Appendix III.5 provide all details for the construction of our "Baseline" series and of the sensitivity series plotted on this graph. The series "No Pre-1850 wealth rescaling." does not reweigh states before 1850; the series "No Pre-1850 wealth rescaling, no lin. int." in addition does not use linear interpolation for years in which state-level wealth is missing; the line "Pre-1860 wealth rescaling" uses 1860 as the benchmark year to re-weigh states. Grey areas indicate recessions; the red shaded area indicates the Civil War.

Figure 8: Cross-Validation: Land, Property and Private Wealth Values

A. Comparison of the Estimated Value of Taxable Land from Property Tax Records and Values from the Census of Agriculture (1860-1910)

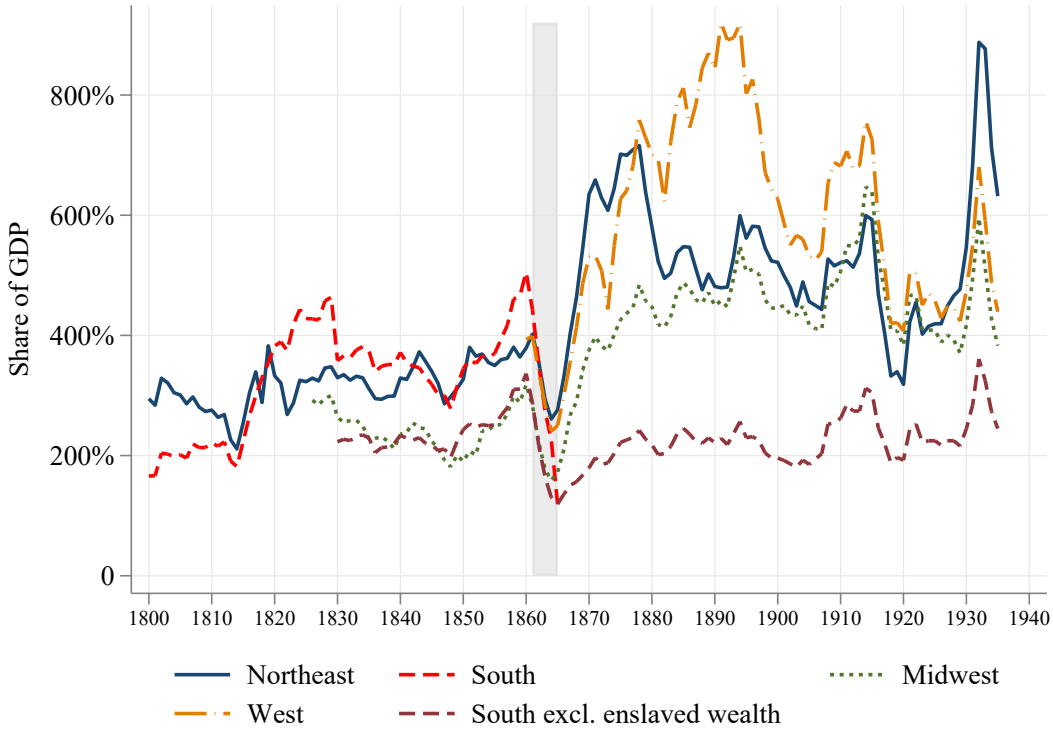


B. Private Wealth per capita and Nominal House Price Index(NPLH) in the US



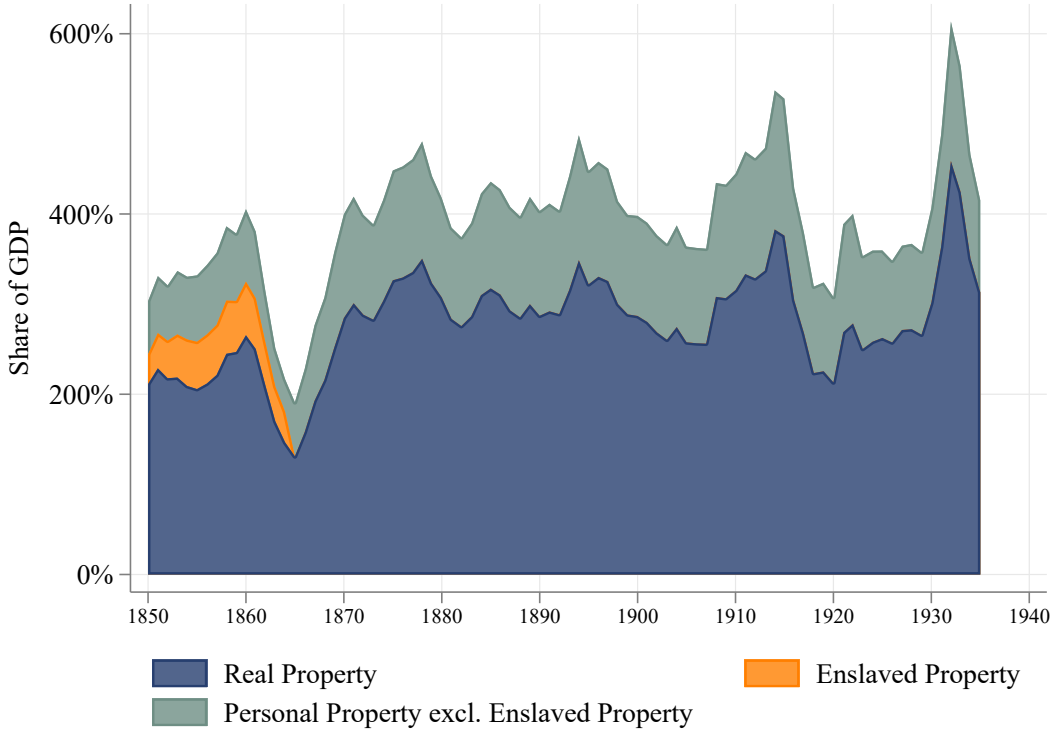
Notes: Panel A compares the estimated value of taxable land in our property tax data to the estimated value of agricultural land from the Census of Agriculture. Data from the Census of Agriculture is derived from Haines, Fishback and Rhode (2014). The value of taxable land is a sub-category of real property and is reported separately for 13 states from 1860 to 1910: Alabama, Arkansas, Florida, Georgia, Indiana, Kansas, Kentucky, Minnesota, North and South Carolina, Tennessee, Texas, and Wisconsin. Note that the agricultural land is a subset of all taxable land; therefore we expect levels not to match. However, the correlation is almost 1. Panel B instead displays the evolution of Private wealth per capita and the Nominal House Price Index in the US (year 1900 is used as the index, i.e. 1900=100). The latter series is taken from Knoll, Schularick and Steger (2017).

Figure 9: Property per Capita by Region, as a Share of National GDP per Capita



Notes: The figure shows the average ratio of property per capita in four US regions over the national (US) GDP per capita.

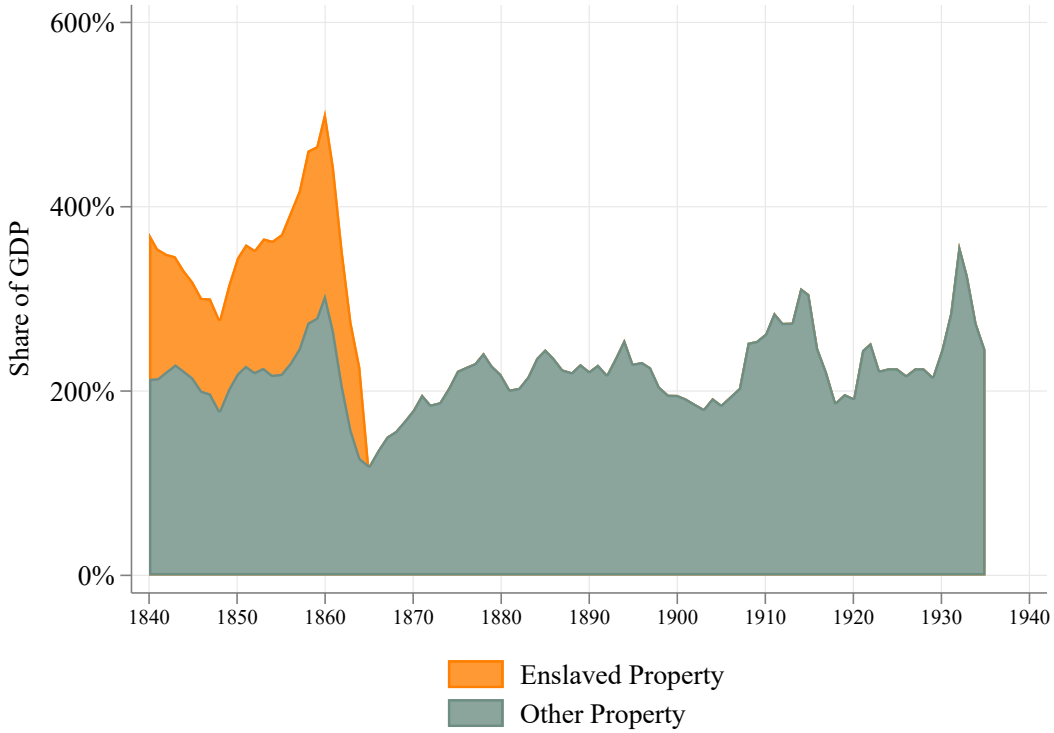
Figure 10: The Composition of US Wealth 1850-1935



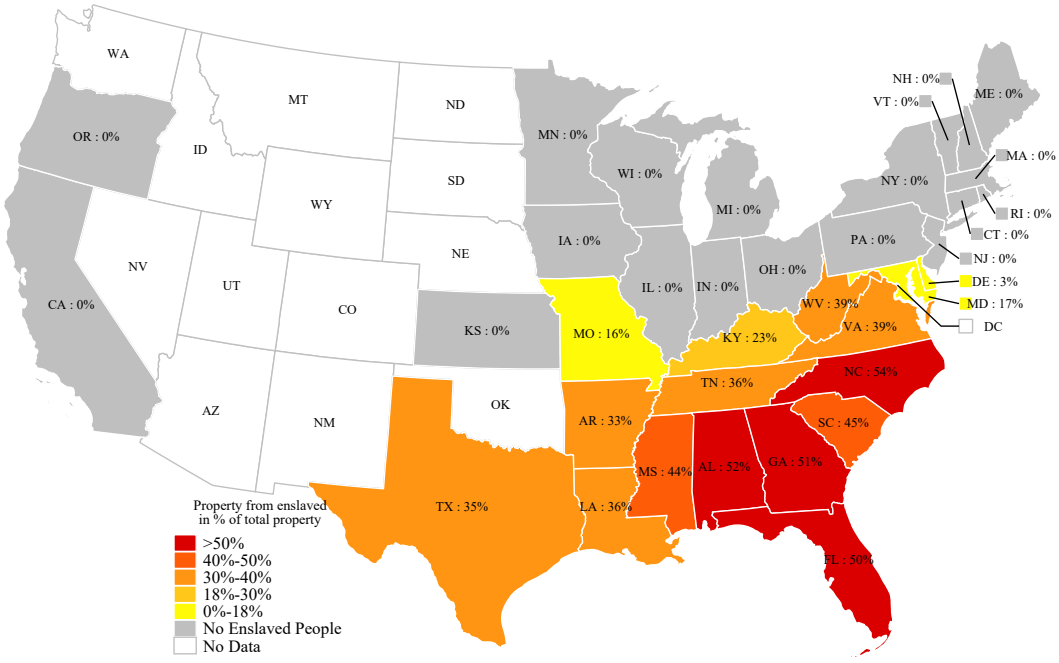
Notes: The figure shows the decomposition of wealth per capita in the US into three categories: real property; personal property excluding enslaved wealth, and the value of enslaved wealth. For the construction of enslaved wealth series see Appendix Section III.3.

Figure 11: Enslaved People in Property in Southern States 1840-1935

A. Composition of Property as share of GDP



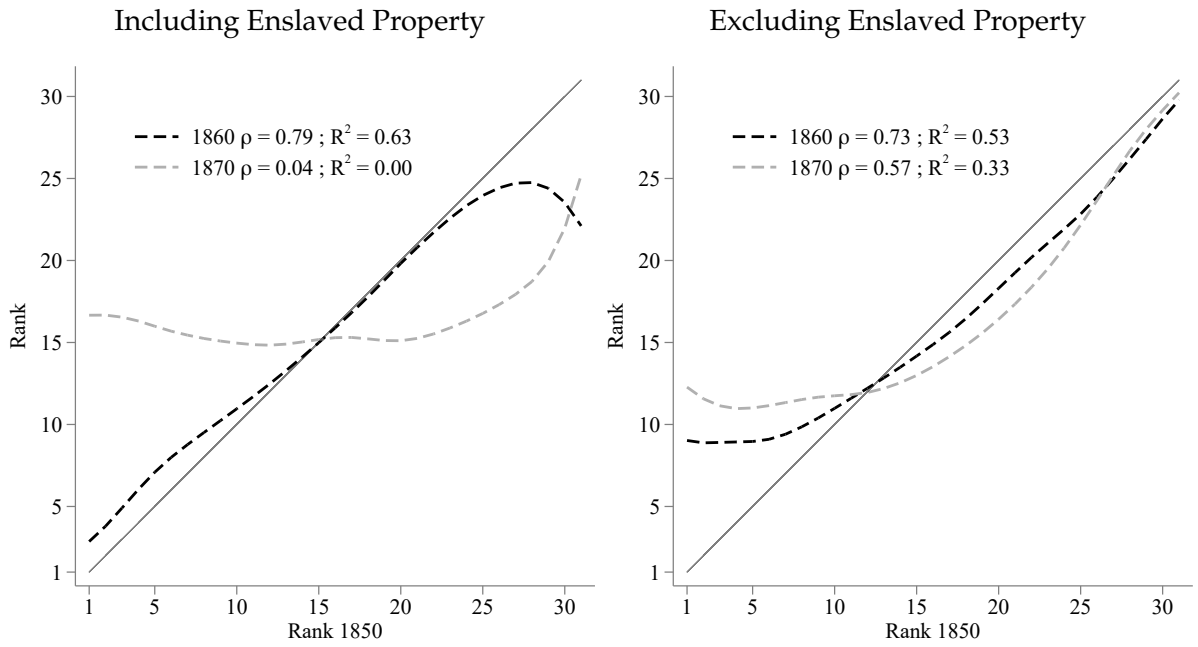
B. Share of Enslaved Property in 1860



Notes: Panel A shows the decomposition of property per capita for Southern states into two categories: enslaved property and all other property. For the construction of this series see Appendix Section III.3. Panel B shows the share of enslaved property in total property by state in 1860.

Figure 12: The Civil War and Enslaved Property

A - Persistence of Property Pre- and Post Civil War



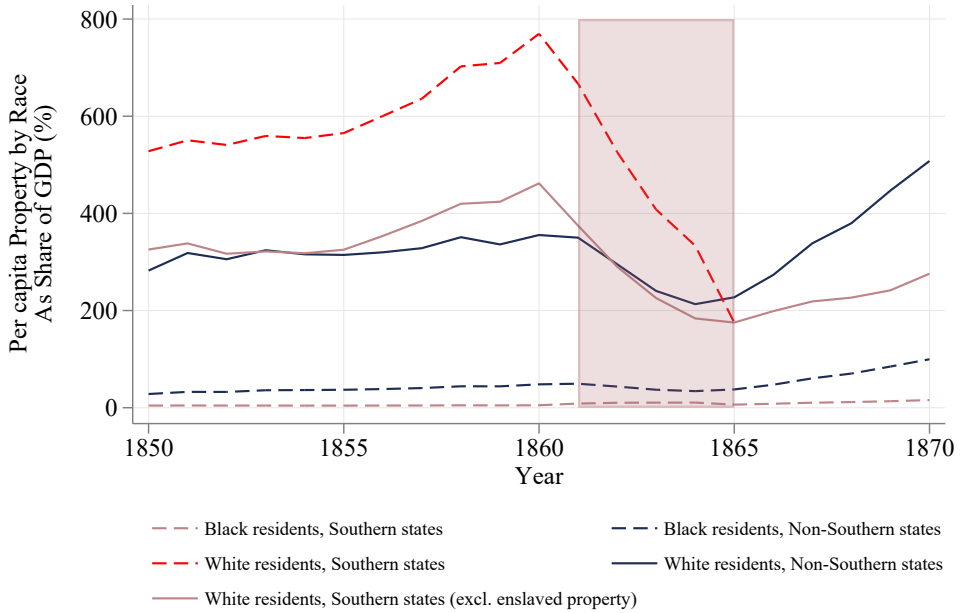
B - Decline in Property per Capita during Civil War beyond Enslaved Property by Share of Enslaved Property

Notes: Panel A displays the persistence of state per capita property rank between 1850, 1860, and 1870. The left plot includes enslaved property; the right plot excludes it. Panel B displays the percent decline in per capita property beyond the disappearance of the enslaved property between 1860 and 1870. A value of 0 means the property per capita in 1870 is equal to the property per capita in 1860 excluding enslaved property, i.e., $1 - \frac{W_i,1870}{(1-S_{i,1860})W_i,1860}$, where i is the state, $W_{i,t}$ the total property in the state in year t, and $S_{i,1860}$ the share of enslaved property in total property in 1860 (enslaved people are always included in population counts).

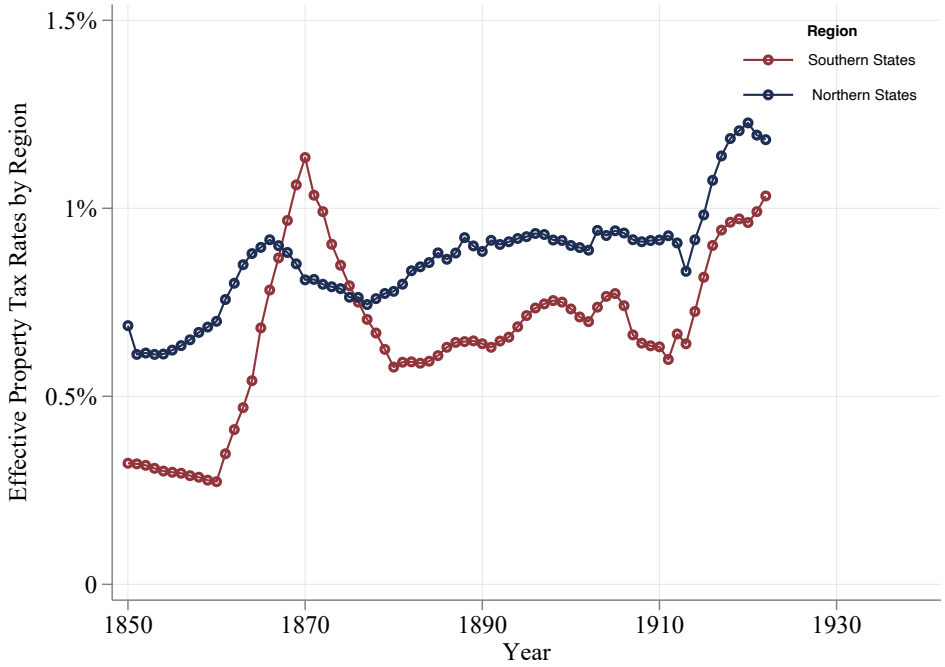
Continued on the next page

Figure 12: The Civil War and Enslaved Property (continued)

C - Evolution of Property by Race, in Southern and non-Southern States

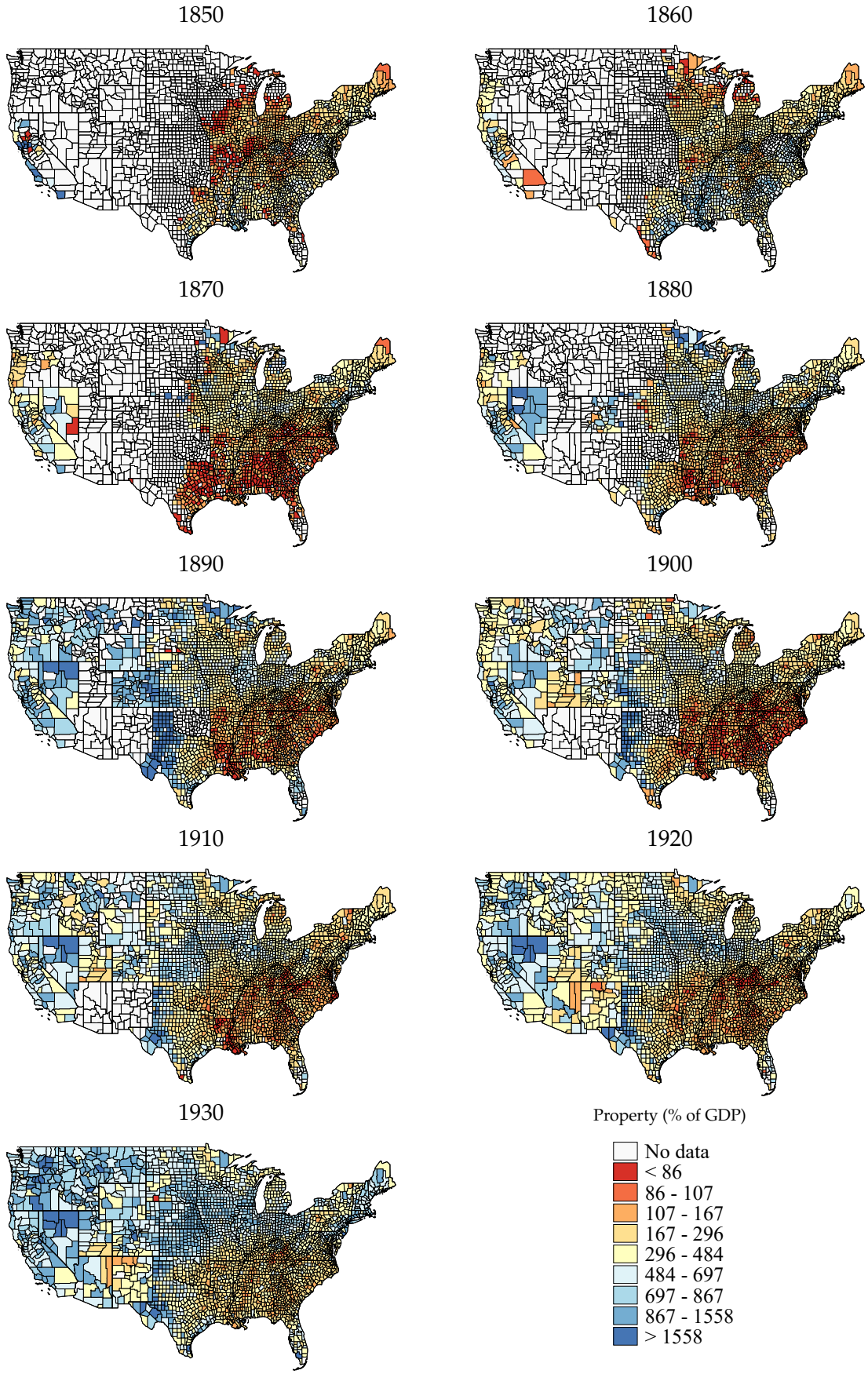


D - Effective Tax Rates by Region



Notes: Panel C displays the evolution of the average value of property per capita for Black and white residents in Southern and Non-Southern states, as a share of US GDP. The source that allows us to break down property by race is the individual level full count census data for 1850, 1860 and 1870. This gives us a share of total wealth held by race for each state for 1850, 1860 and 1870. These ratios are then linearly interpolated for all years in between 1850, 1860 and 1870. These ratios are then applied to our estimates of the total value of property for each year and state. Panel D displays the effective property tax rates for Southern and Northern States. For the data sources and construction, see Appendix III.9.

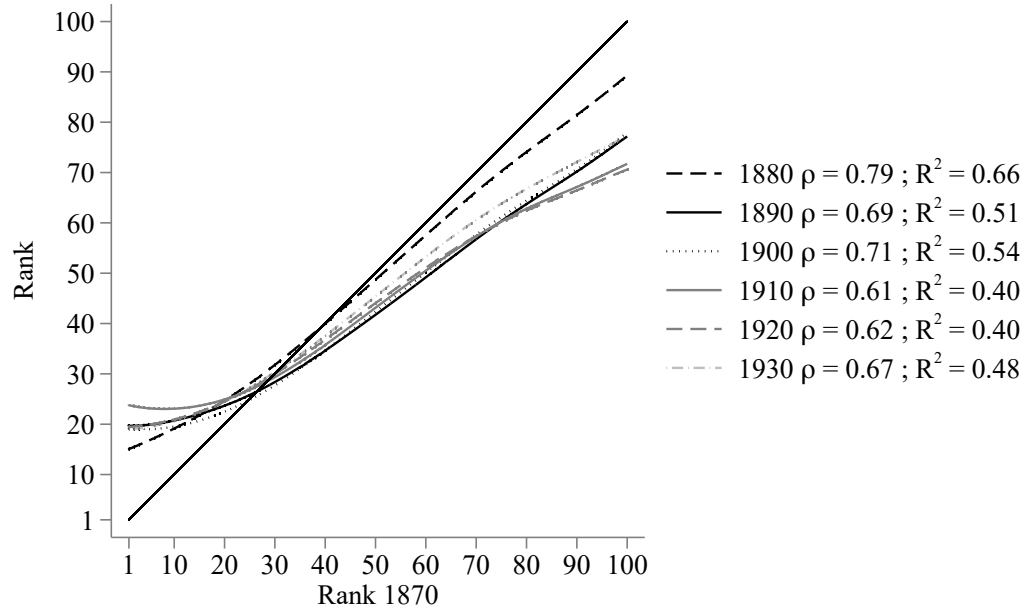
Figure 13: Property Per Capita by County As a Share of National GDP Per Capita



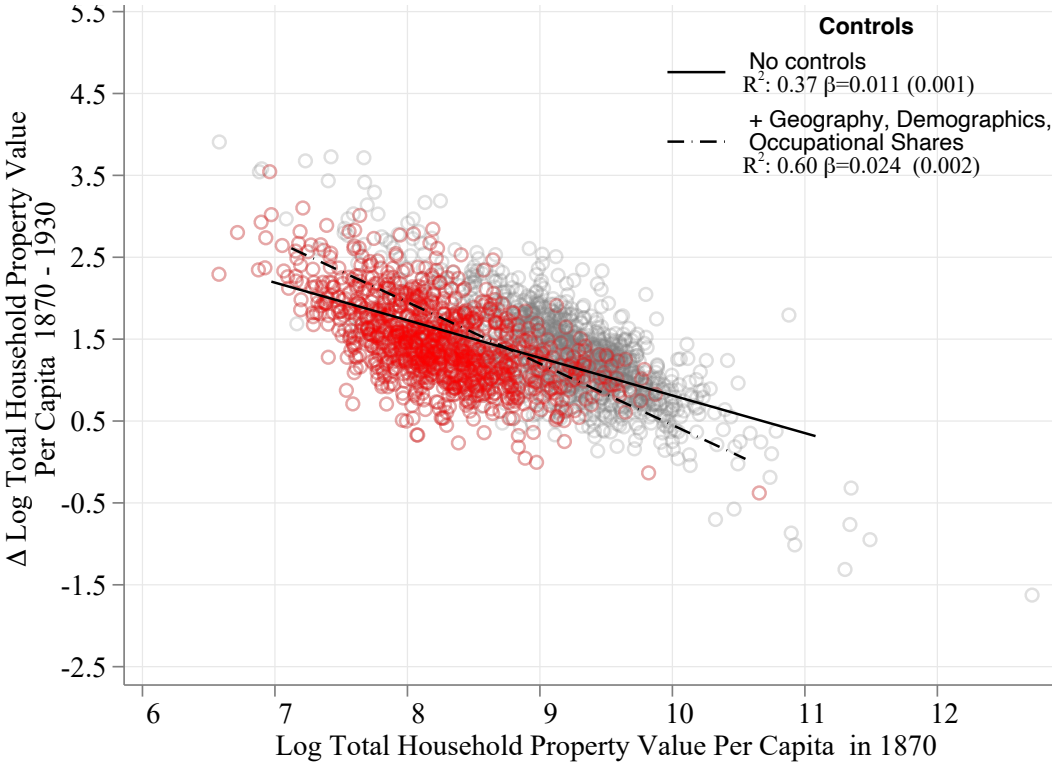
Notes: The figure shows the value of property per capita by county normalized by the national GDP per capita for each decade between 1850 and 1930. Data for counties in US territories prior to admission in the Union are not displayed.

Figure 14: County-level Persistence and Convergence

A. Rank-Rank Correlation Across Time of County-Level Property Per Capita



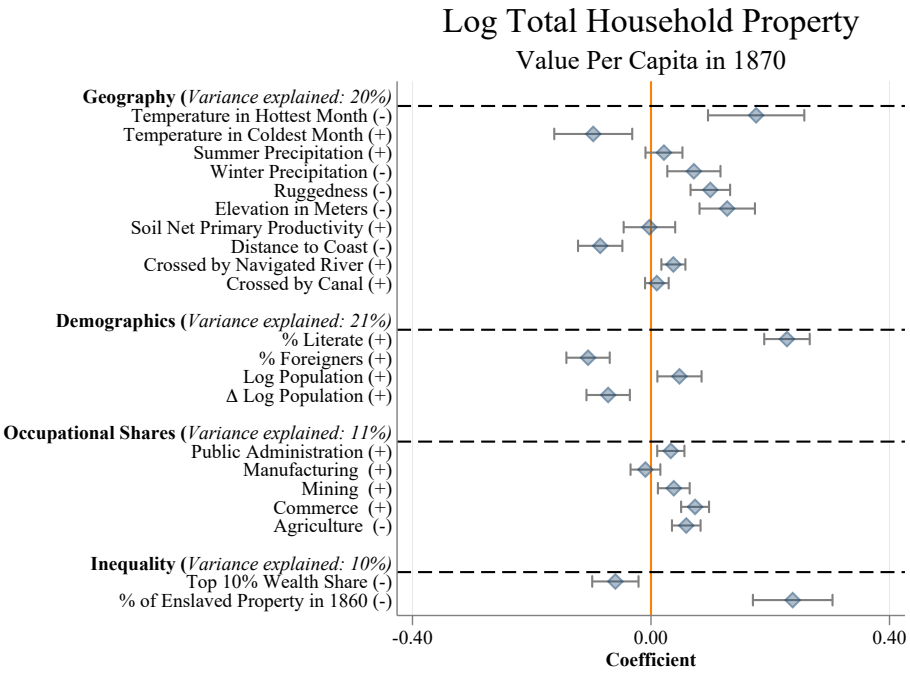
B. β-Convergence at the County Level



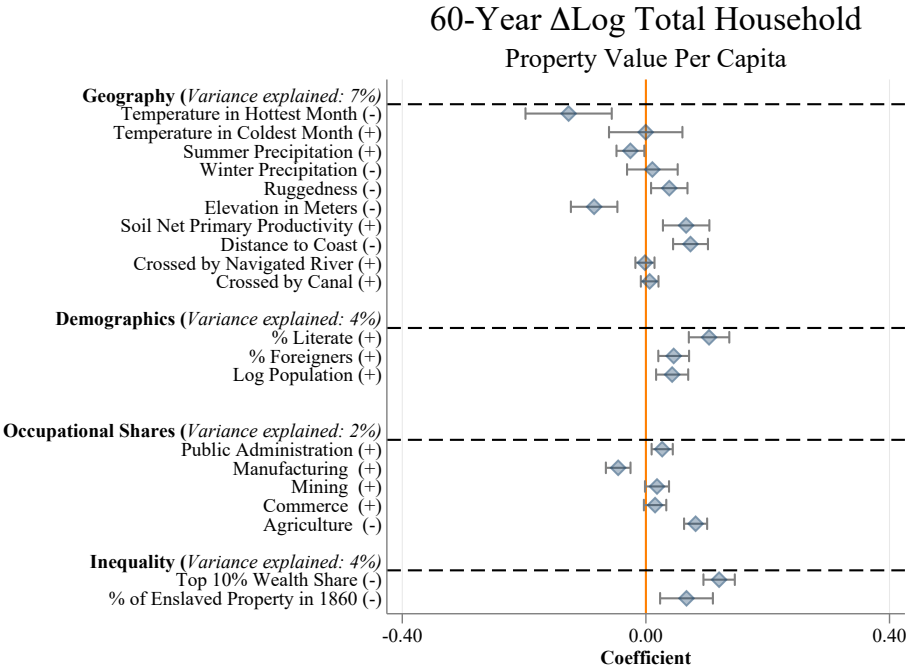
Notes: Panel A shows the rank-rank correlation of county-level property per capita for different years (ρ) and the R^2 for each year t of a simple regression of county-level property capita in year t on county-level property per capita in 1870. Panel B shows the relationship between the growth rate of county-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 structure (dashed line). Southern counties are represented in red.

Figure 15: Correlates of Property at the County Level 1870-1930

A. Log Total Property per Capita in 1870



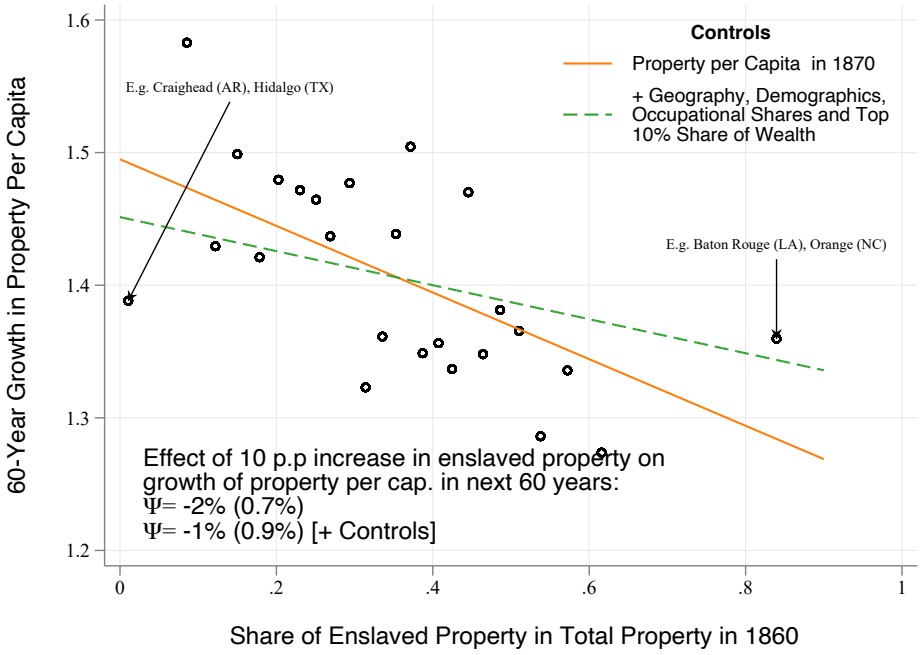
B. 60-Year Δ log Total Property per Capita



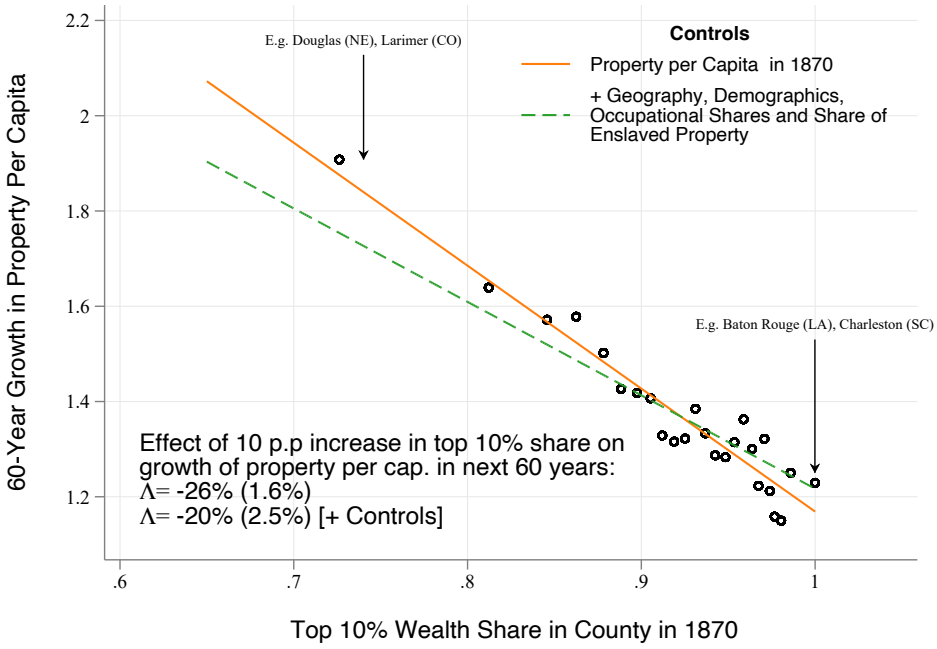
Notes: Panel A presents coefficients from the regression of log property in 1870 on inequality measures, and geographic, demographic, and economic characteristics from equation (3) . Panel B presents coefficients from the regression of the change in log property between 1870 and 1930 on the same controls, from equation (2). The controls included are described in Section 6.3 and Appendix III.10 and are standardized. Commerce includes retail, finance, transportation and business. We also include but do not show year fixed effects, % of white, and % of male individuals. 90% confidence intervals are depicted. A minus sign next to the variable name indicates that the variable was included with a minus sign for expositional ease.

Figure 16: The Legacy of Enslavement and Inequality on Growth

A. Enslavement



B. Inequality



Notes: Panel A displays a binscatter of the county-level relation between the 60-year growth in property per capita between 1870 and 1930 and the share of property from enslaved people in total property in 1860. Counties are grouped into 25 equally-sized bins by their share of property from enslaved people. Panel B displays a binscatter of the county-level relation between the 60-year growth in property per capita between 1870 and 1930 and the share of wealth held by the top 10% of wealth holders in a county in 1870. Counties are grouped into 25 equally-sized bins by their share of wealth held by the top 10%. In both panels, the correlation is residualized on controls for geography, demographics, occupational shares, and other relevant variables as described in Section 7. The controls are the same as in Figure 15. See Appendix III.10 for the sources and construction of these variables.

Table 1: Convergence at the county and state level

(a) County convergence 1880-1920

Without controls			With controls for regions		
Income (IPUMS)	Property	Barro & Sala-i-Martin	Income (IPUMS)	Property	Barro & Sala-i-Martin
.026	.010	-	.036	.020	-

(b) State convergence 1880-1920

Without controls			With controls for regions		
Income (IPUMS)	Property	Barro & Sala-i-Martin	Income (IPUMS)	Property	Barro & Sala-i-Martin
.021	.011	.016	.034	.021	.019

Notes: Panel A and B display the estimated rate of convergence at the county and state level respectively. Computations are made using Barro and Sala-i Martin (1992) methodology. In Panel B, we use Easterlin (1960) data to compute the values for Barro and Sala-i Martin (1992).

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ONLINE APPENDIX

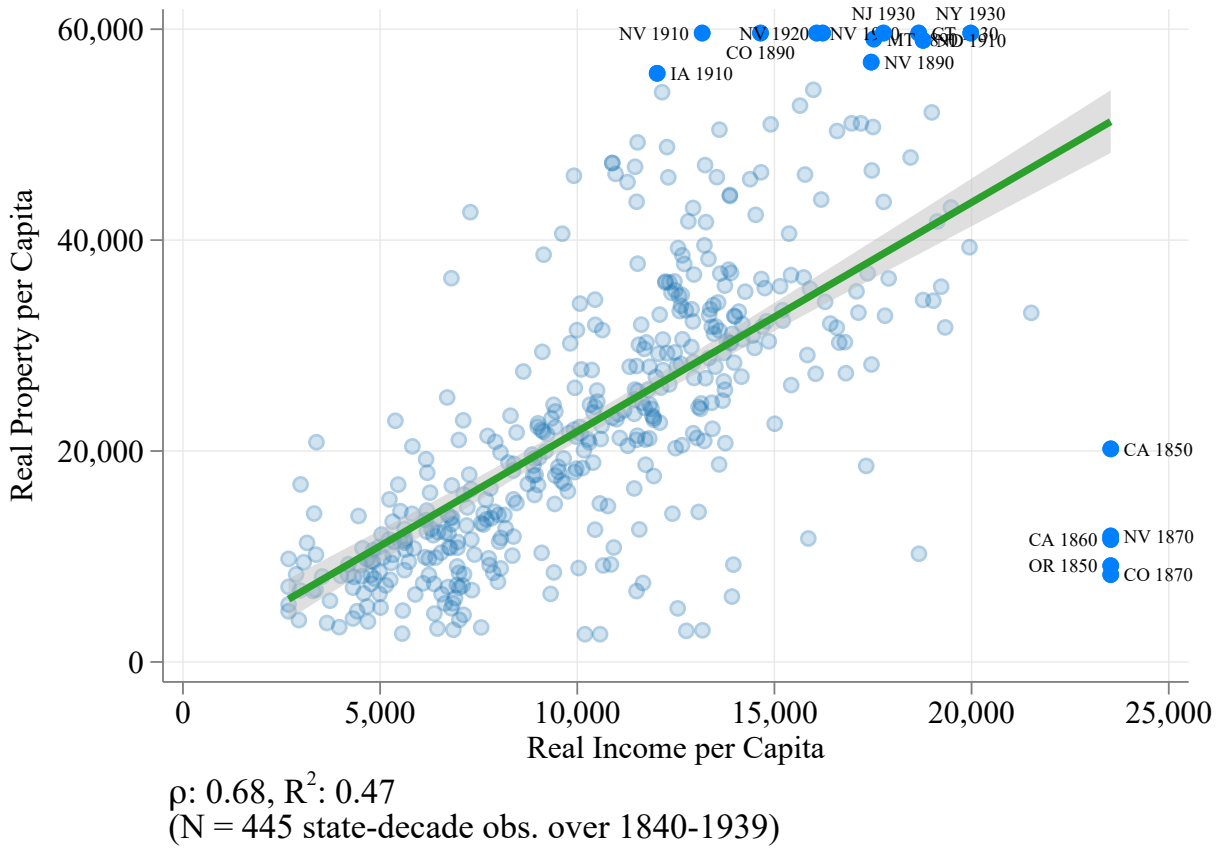
for "Wealth and Property Taxation in the United States"

by Sacha Dray, Camille Landais, and Stefanie Stantcheva

Contents

I. Additional Tables and Figures

Figure A1: Property and Income Per Capita

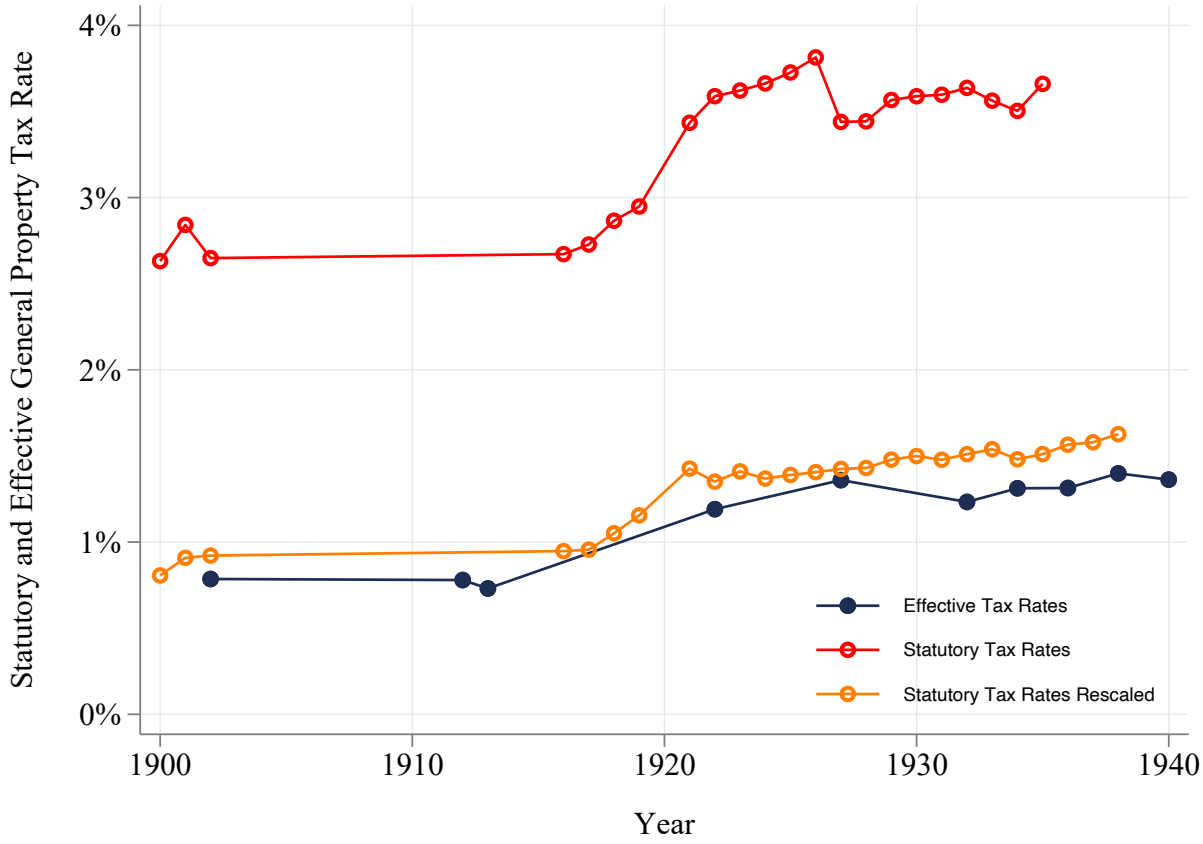


Notes: This graph plots the relationship between real property per capita and real income per capita between 1840 and 1939 at the state level. The values are winsorized at 1% and 99%.

Figure A2: State Property Tax Rates

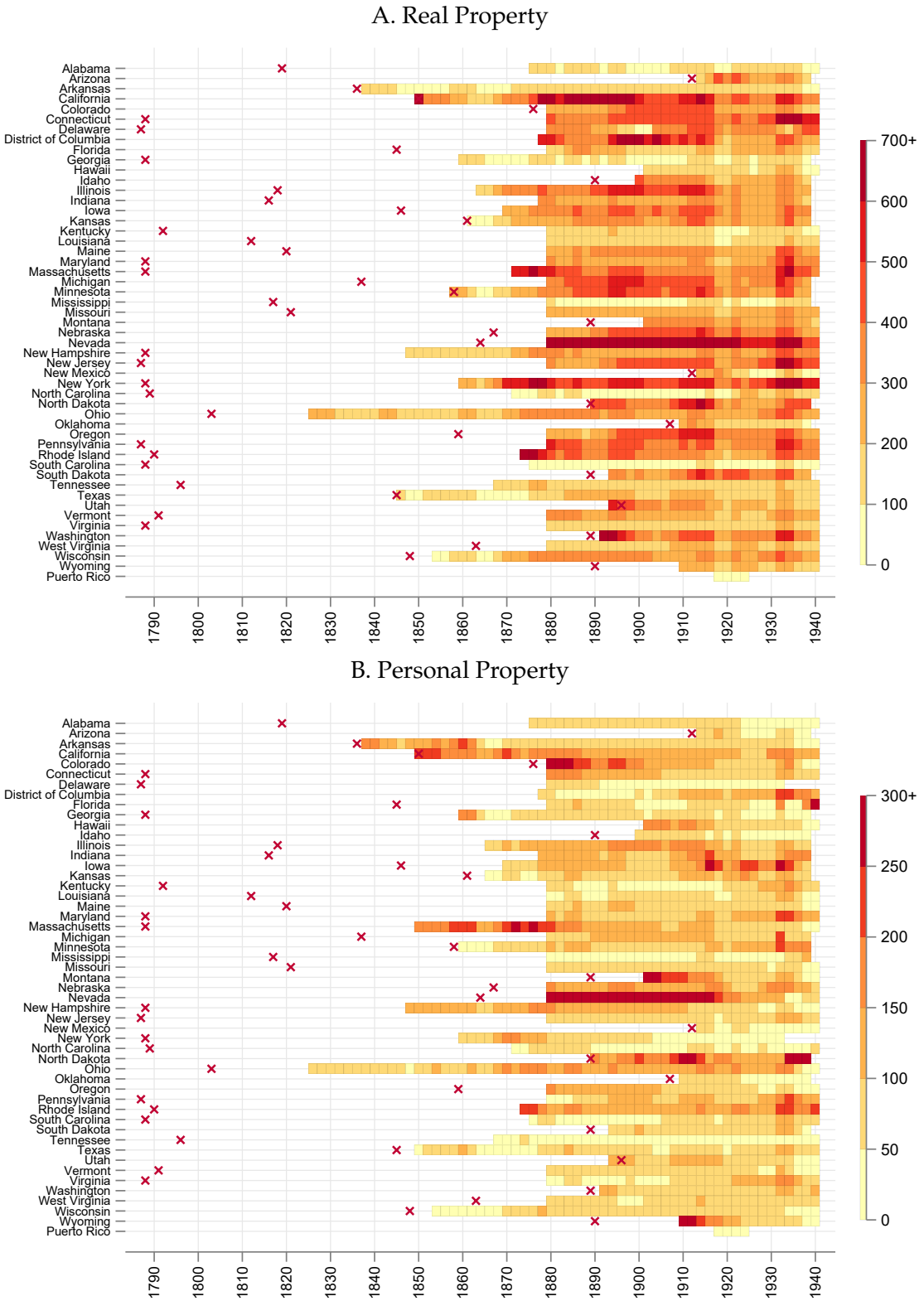
Notes: This figure shows the effective state property tax rates for all states, the District of Columbia and Puerto Rico. Values are interpolated every year at the state level and winsorized for 5th and 95th percentile. Red crosses indicate the year of the admission of the state to the Union.

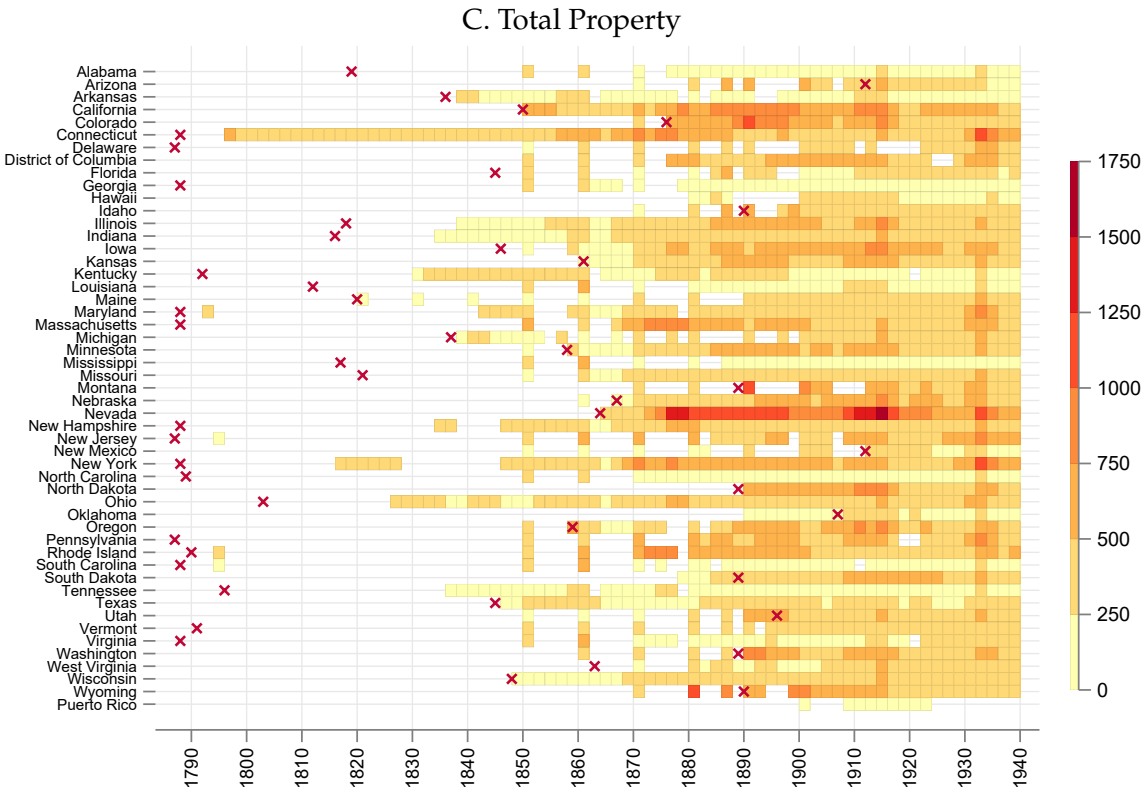
Figure A3: Total Statutory and Effective Tax Rates (%)



Notes: This graph plots the statutory tax rates on the general property tax, the statutory rate rescaled by the assessment ratio, and the effective tax rates (computed as the ratio of tax revenue to the tax base). For the data sources and construction, see Appendix III.9.

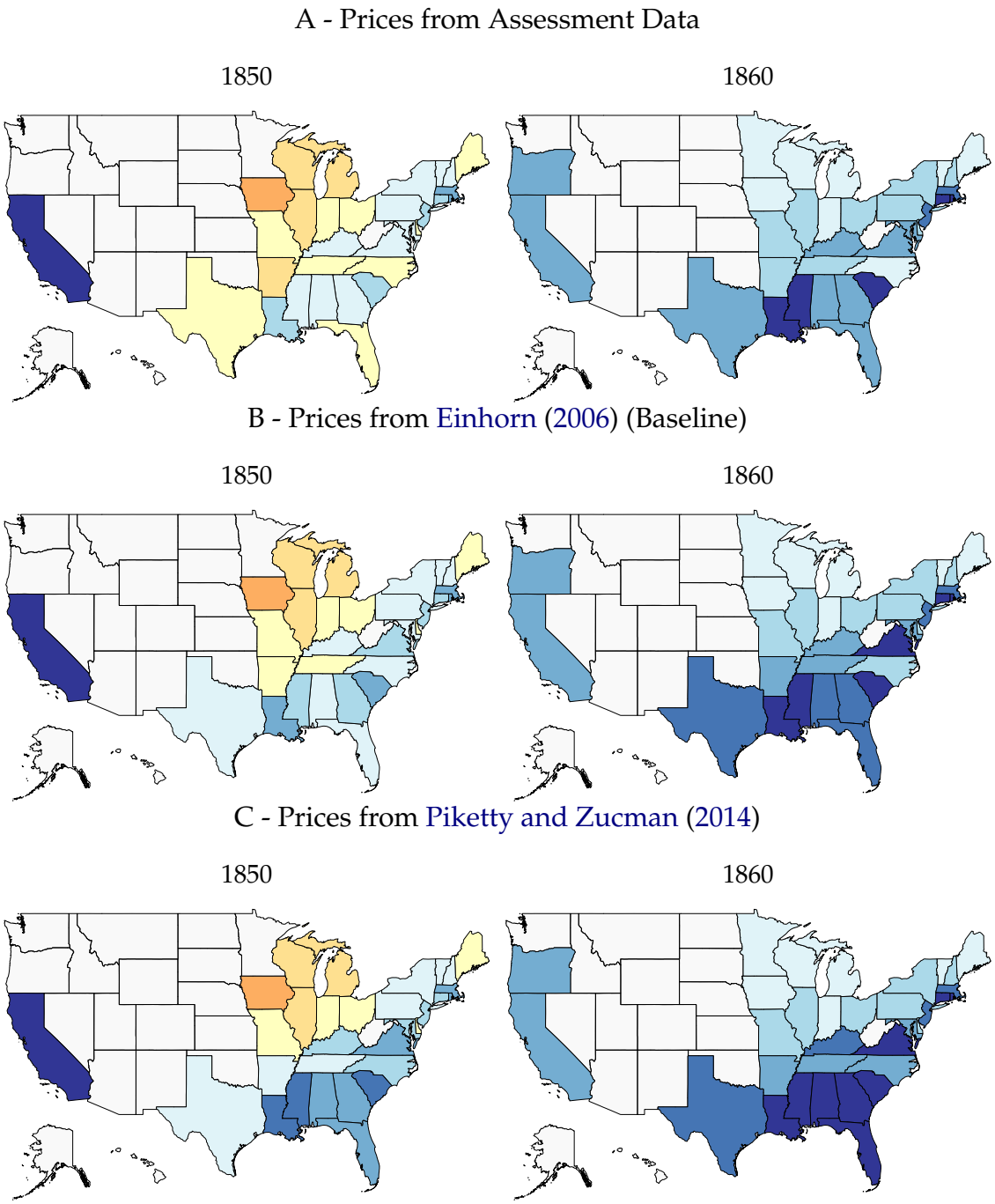
Figure A4: Real, Personal, and Total Property per Capita at the State Level as a Share of U.S. GDP (%)





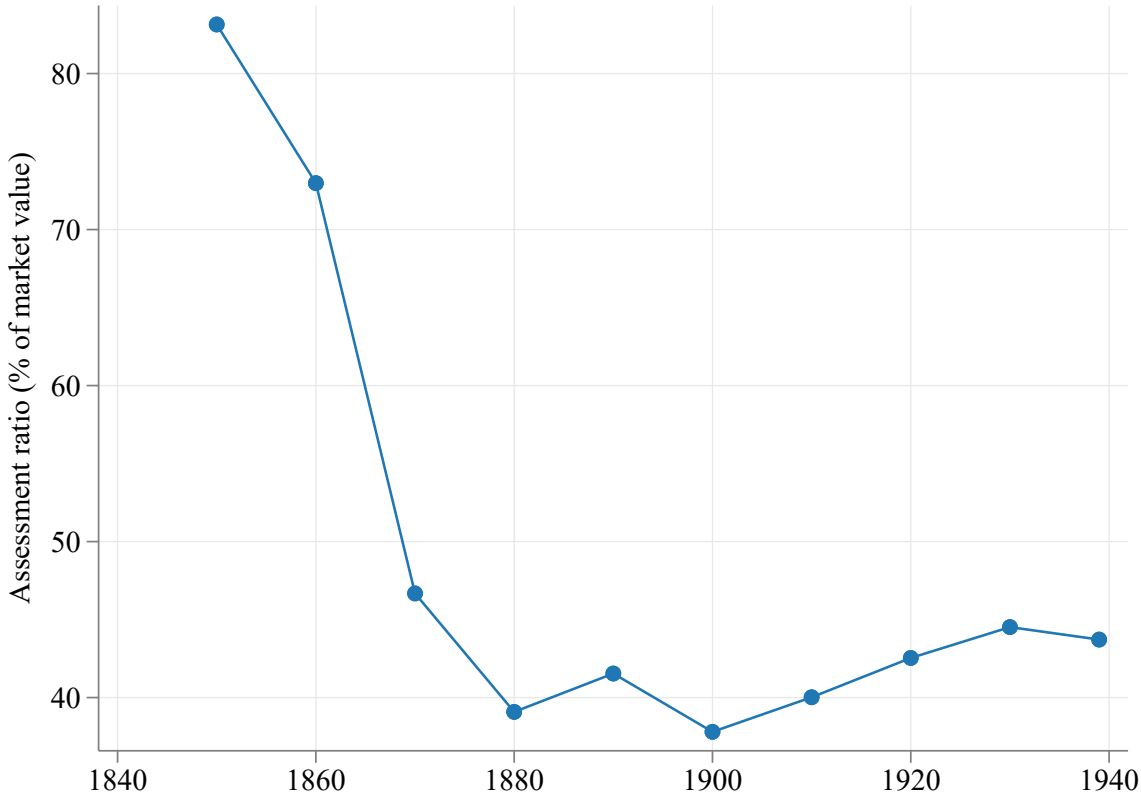
Notes: The figure shows the coverage for two major subcomponents of property: real property (in Panel A) and personal property (Panel B) for all 50 states, the District of Columbia and Puerto Rico. Panel C shows total property per capita. Real, personal, and total property are expressed as a share of national GDP per capita. Red crosses indicate the year of the admission of the state to the Union.

Figure A5: Sensitivity Analysis: State-Level Property in 1850 and 1860 using Different Prices for Enslaved People



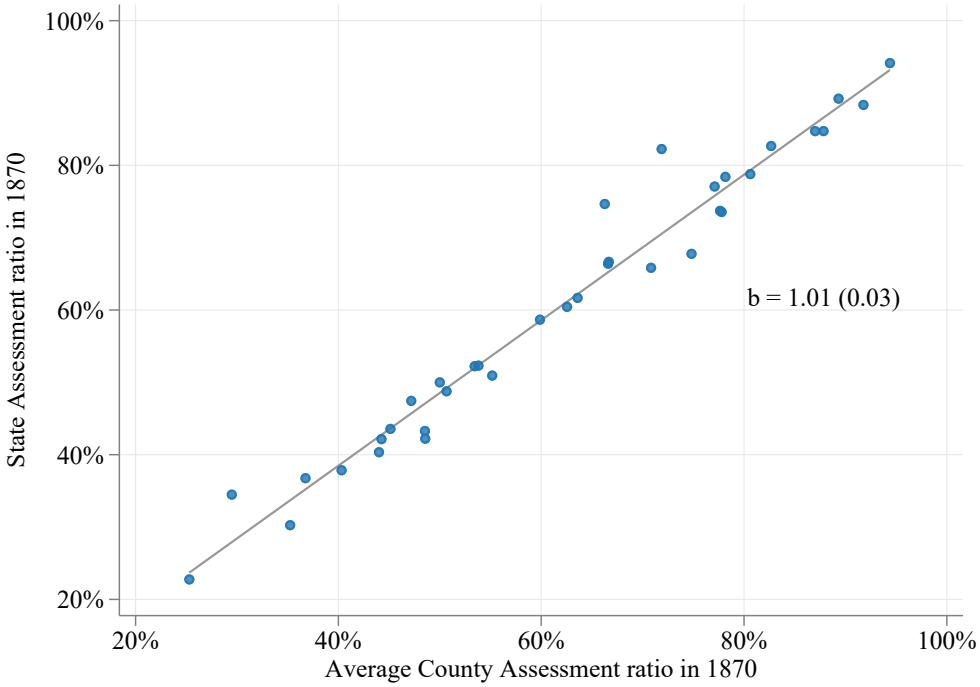
Notes: This figure displays the value of property per capita at the state level, using different prices for enslaved people. Panel A uses the implied prices from property assessments ($250 in 1850 and $430 in 1860). Panel B uses prices from Einhorn (2006) ($401 in 1850 and $774 in 1860, which constitutes our baseline). Panel C uses the prices from Piketty and Zucman (2014) ($800 in 1850 and $1000 in 1860).

Figure A6: Assessment Ratio



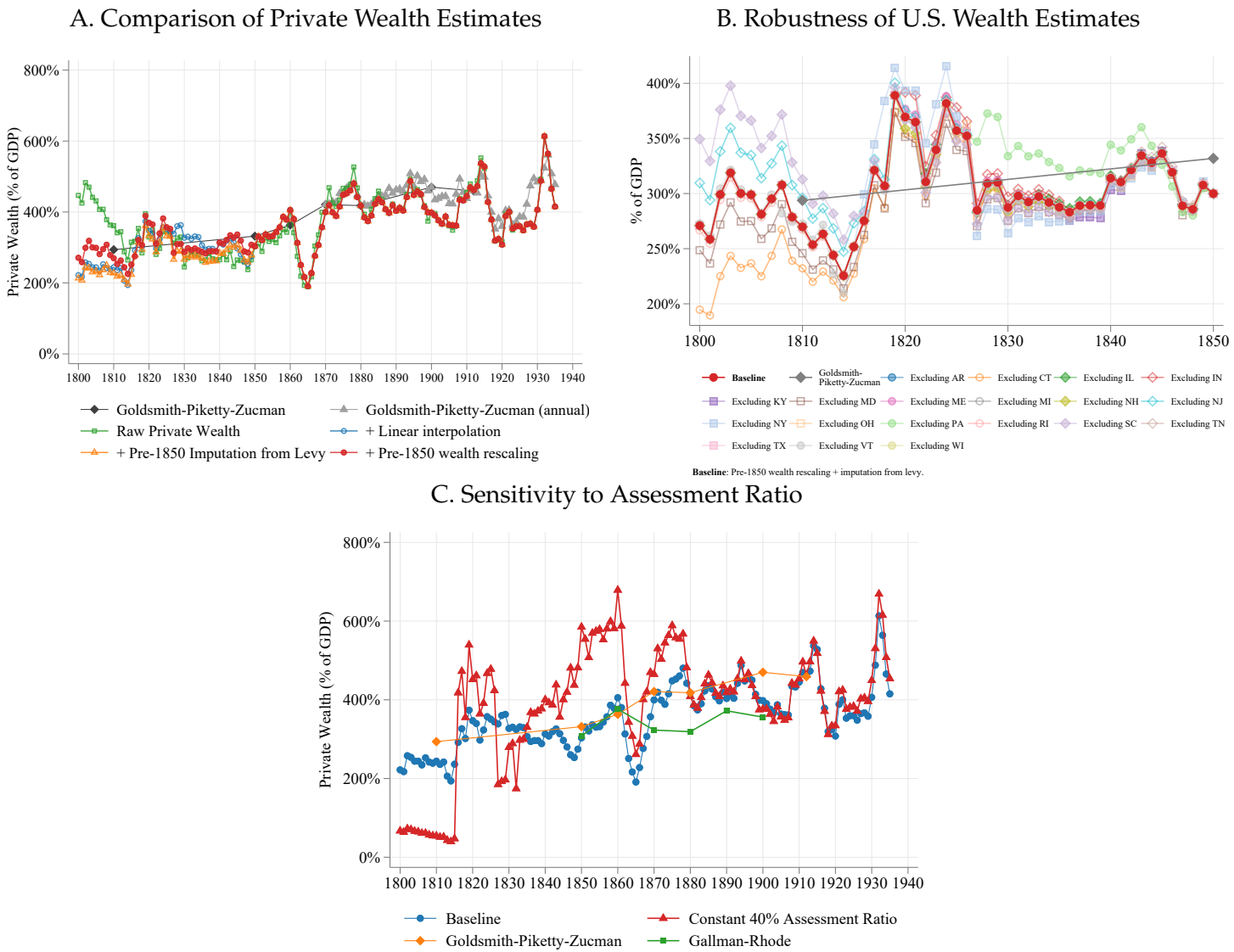
Notes: The figure shows the average assessment ratios over time. It is conjectured that the decline in 1850-1880 is due to the increase in importance of intangible property during industrialization (the share of personal property in the tax base remains stable). The increase after 1910 is likely due to adoption of state tax commissions and increased enforcement (average year of adoption: 1908).

Figure A7: Comparison of State and Counties Assessment Ratios in 1870



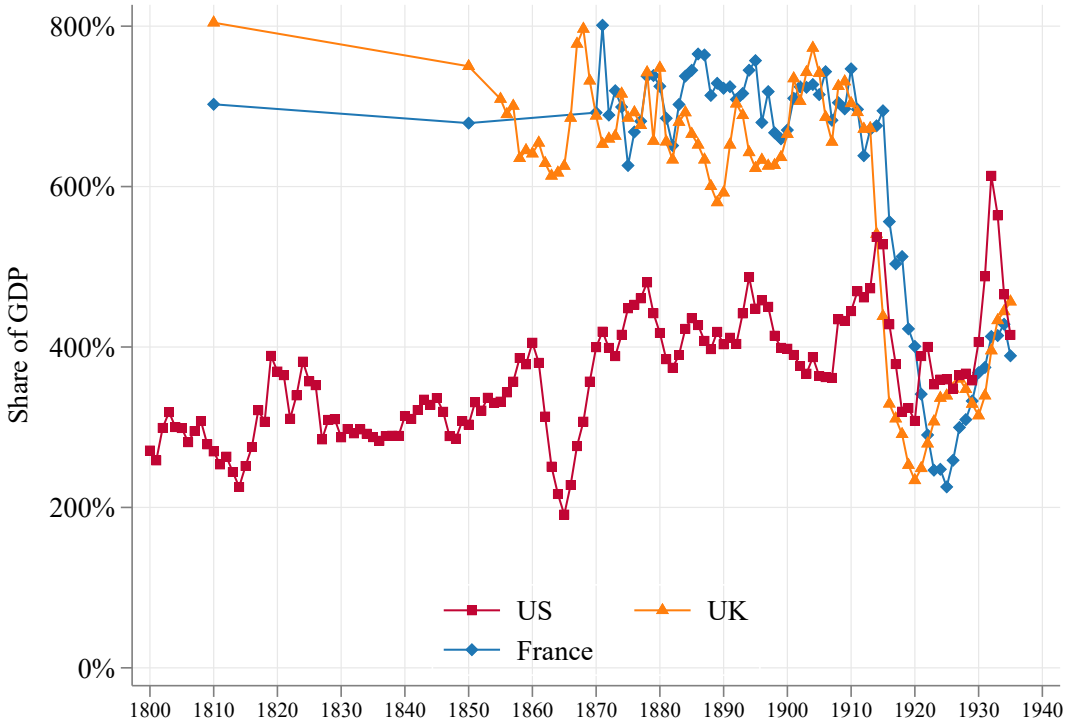
Notes: The figure compares the state assessment ratios (on the vertical axis) to the average, population-weighted assessment ratios across counties in the state. The correlation is 1.01.

Figure A8: Sensitivity of National Wealth Estimates



Notes: The figure performs the sensitivity analyses described in Appendix III.5. Panel A compares different core wealth estimates. Panel B compares the estimates' sensitivity to excluding specific states. Panel C compares our wealth estimate and those from Goldsmith (1951) and Piketty and Zucman (2014) to that obtained by assuming a constant assessment ratio equal to 40%.

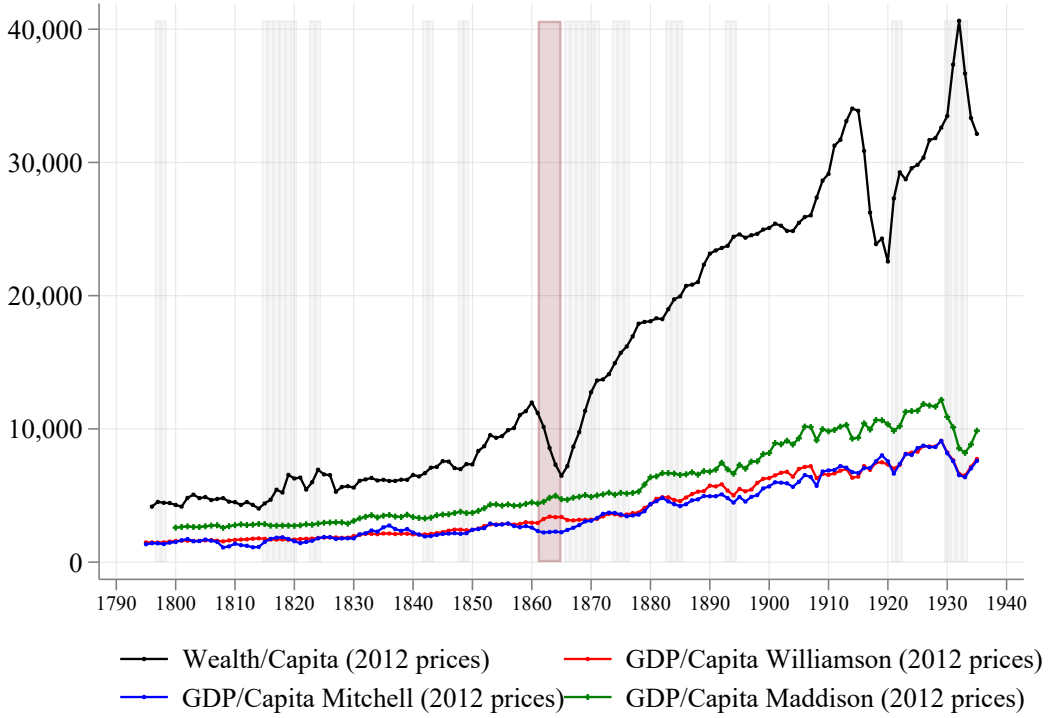
Figure A9: Wealth-to-GDP Ratios in the United States, France, and United Kingdom



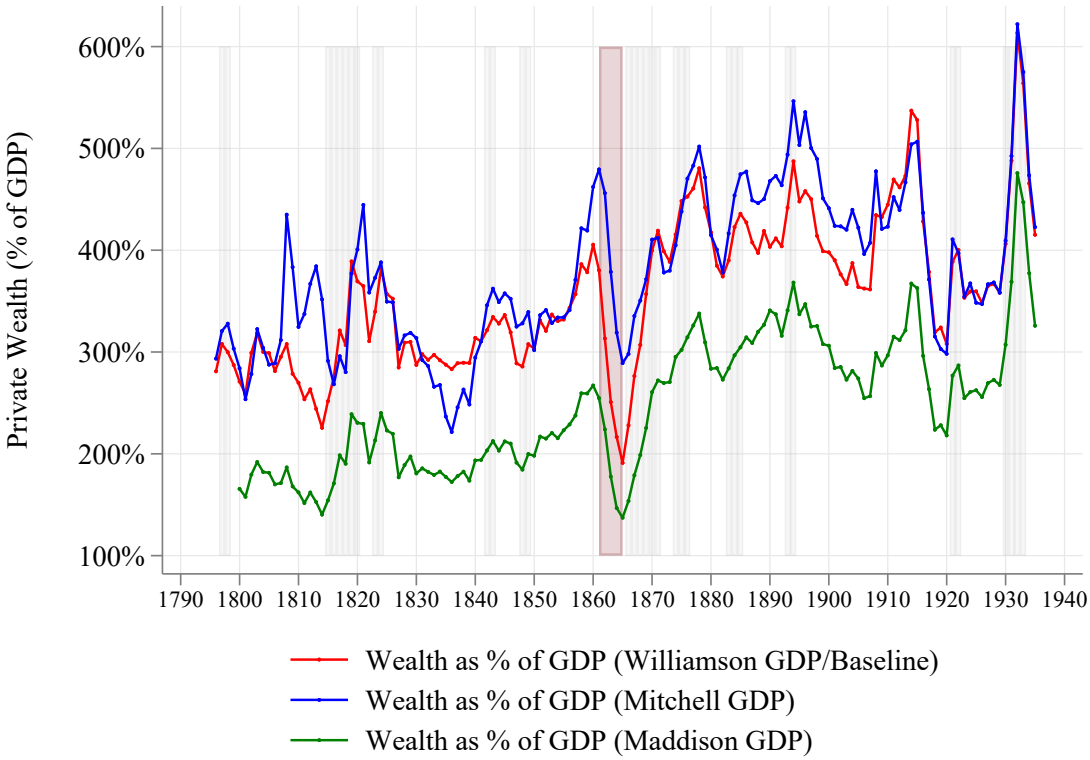
Notes: The figure shows the evolution of the private wealth-to-GDP ratio for the United States, France, and the United Kingdom. Data for the United Kingdom and France come from the World Inequality Database and Piketty (2014).

Figure A10: Sensitivity to Alternative GDP Series

A. National Wealth and GDP estimates

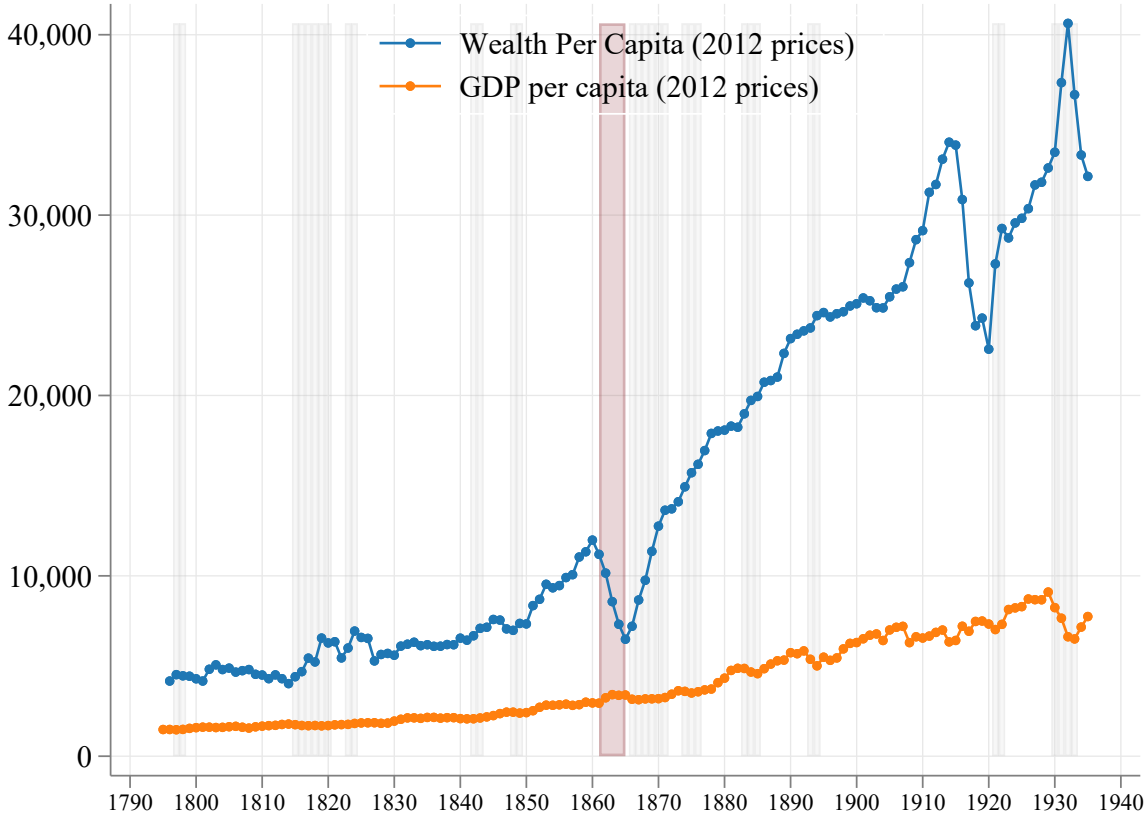


B. Sensitivity of the Wealth-to-GDP Ratio to Different GDP estimates



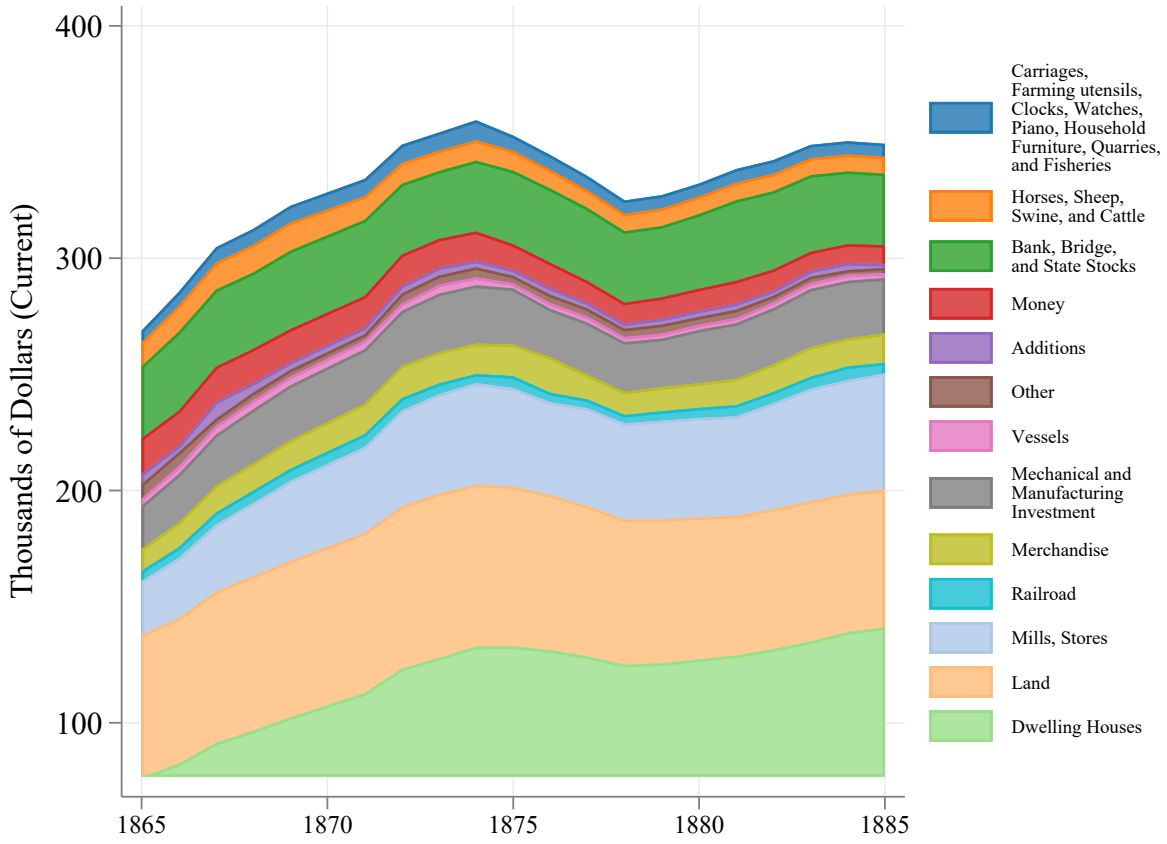
Notes: The figure explores different existing GDP estimates. Panel A shows our wealth estimate and compares it to different GDP estimates from Johnston and Williamson (2020) (in red), Mitchell (2007) (in blue), and Bolt and Van Zanden (2020) (in green). Panel B displays our estimated national wealth as a share of GDP, where the GDP measure is taken from the three different sources.

Figure A11: Private Wealth & GDP Per Capita: U.S. (1795-1935)



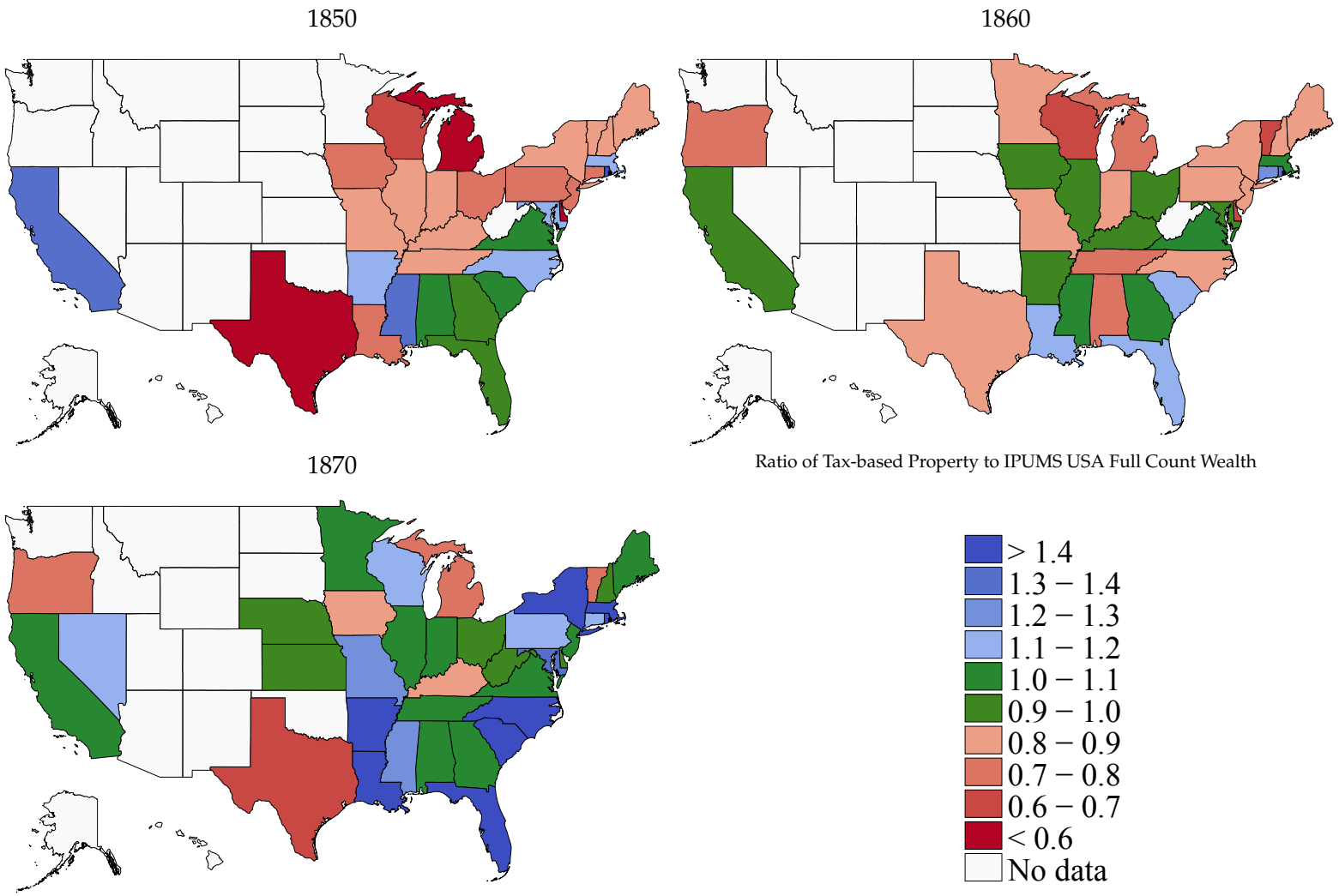
Notes: The figure displays both Wealth per capita (the numerator) and GDP per capita (the denominator) over the same period. Grey areas indicate recessions; the red shaded area indicates the Civil War.

Figure A12: Composition of Private Property in Connecticut



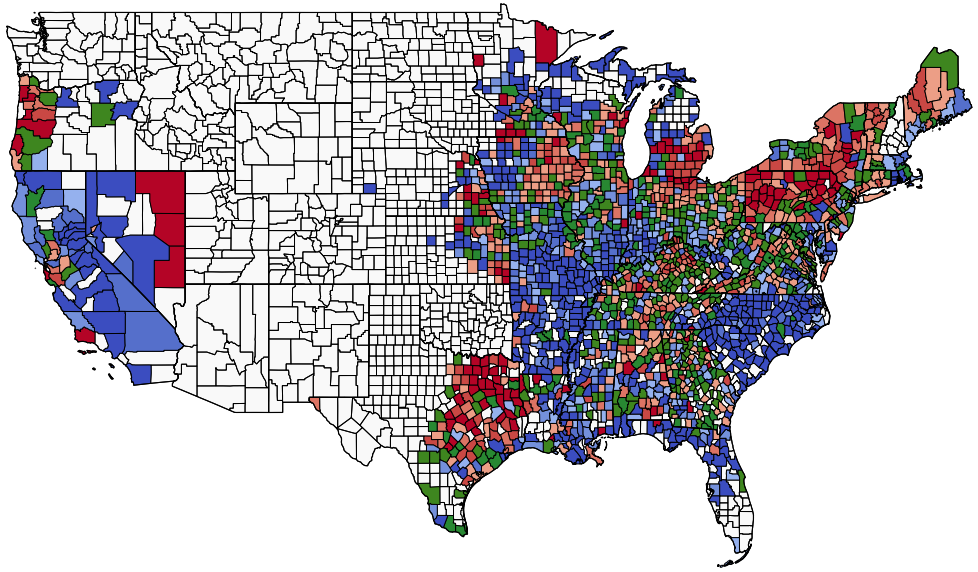
Notes: This figure shows the decomposition of private property subject to the general property tax in Connecticut. The data comes from the *Grand List of Connecticut* as presented by Ely (1888, pp. 503–506).

Figure A13: Comparison to the IPUMS USA Full Count Wealth Measure: Ratio of Tax-based Property and IPUMS USA Full Count Wealth Measure 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 U.S. territories prior to admission in the Union are not displayed.

Figure A14: Comparison to the IPUMS USA Full Count Wealth Measures: Ratio of Tax-based Property and IPUMS USA Full Count Wealth Measures at the County Level in 1870

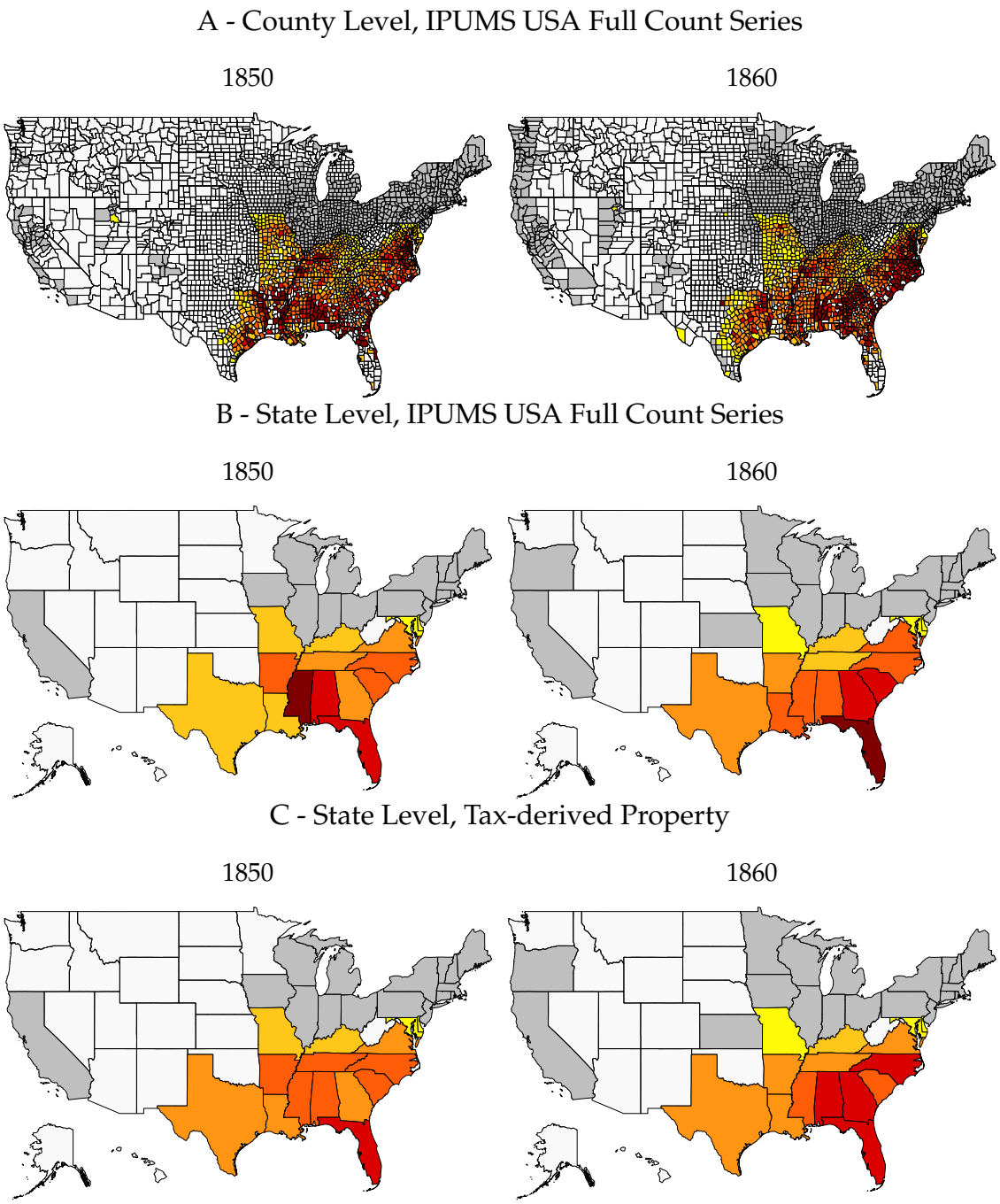


Ratio of Tax-based Property to IPUMS USA Full Count Wealth

- > 1.4
- 1.3 − 1.4
- 1.2 − 1.3
- 1.1 − 1.2
- 1.0 − 1.1
- 0.9 − 1.0
- 0.8 − 0.9
- 0.7 − 0.8
- 0.6 − 0.7
- < 0.6
- No data

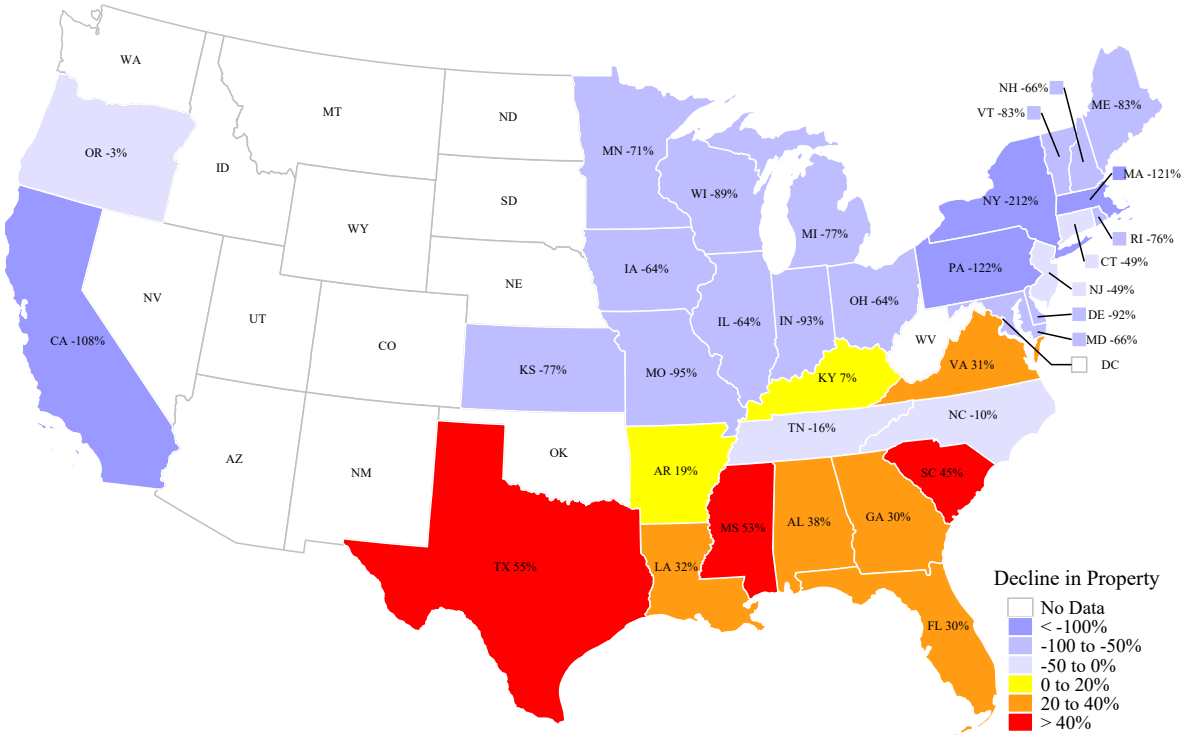
Notes: The figure shows the ratio of the tax-based to the IPUMS USA Full Count wealth measure at the county level in 1870.

Figure A15: Comparison of Data Sources: Share of Wealth and Property from Enslaved People



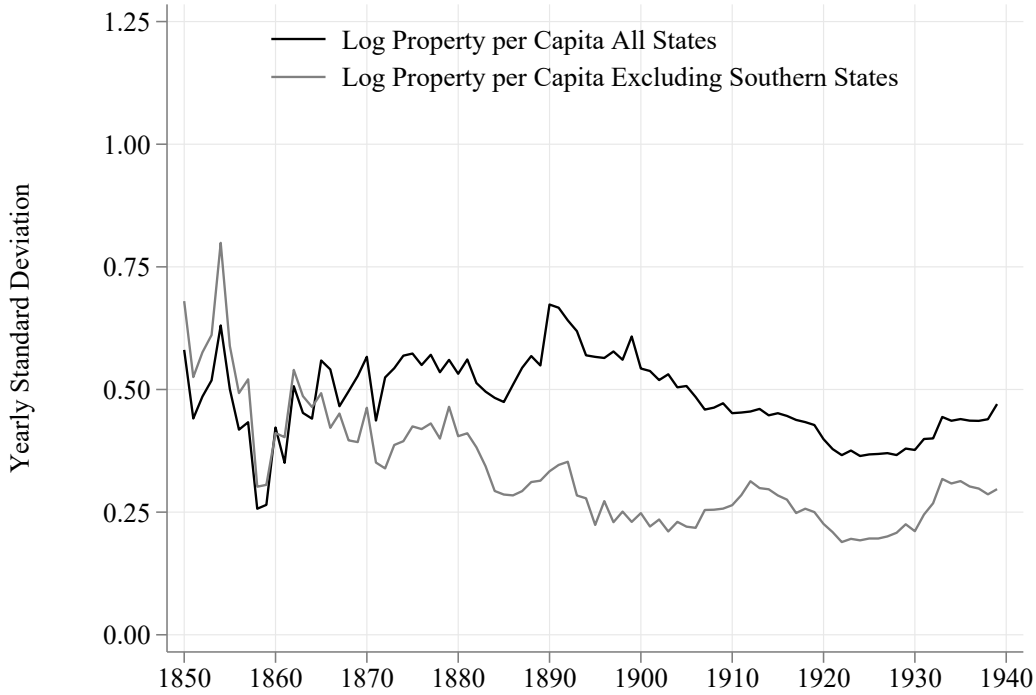
Notes: The figure shows the value of wealth and property from enslaved people at the county level (Panel A) and state level (Panels B and C) as a share of total private wealth/property in 1850 and 1860. Panels A and B use the IPUMS USA Full count wealth data. Panel C uses the property tax data. The construction of wealth from enslaved people is described in Appendix III.3. Data for states in U.S. territories prior to admission in the Union are not displayed.

Figure A16: Decline in Property per Capita from 1860 to 1870 beyond Enslaved Property



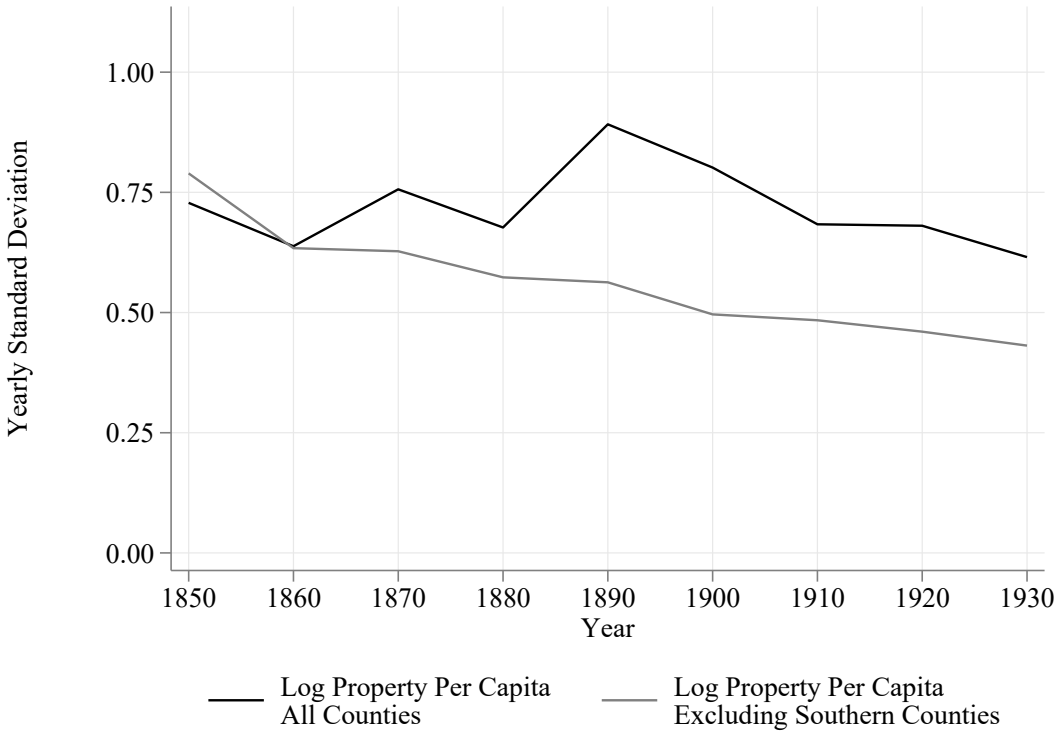
Notes: The figure displays the percent decline in per capita property above and beyond the one following the freeing of the enslaved property. A value of 0 means the property per capita in 1870 is equal to the property per capita in 1860 excluding enslaved property, i.e., $1 - \frac{W_{i,1870}}{(1-S_{i,1860})W_{i,1860}}$, where i is the state, $W_{i,t}$ the total property in the state in year t, and $S_{i,1860}$ the share of enslaved property in total property in 1860. Enslaved people are always counted in the population total.

Figure A17: Dispersion in Property per Capita across States over Time



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

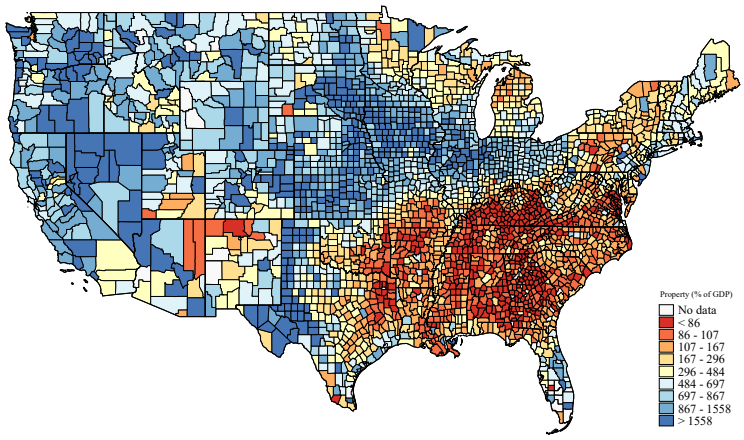
Figure A18: Dispersion in Property across Counties over Time



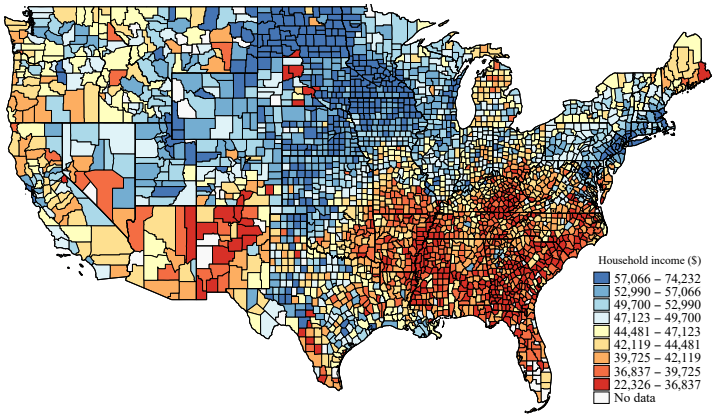
Notes: The figure displays the yearly standard deviation of property per capita across counties for all counties (solid black line) and excluding Southern counties (grey line).

Figure A19: County Level Property in 1920 and Income in 2014 (Opportunity Atlas Data)

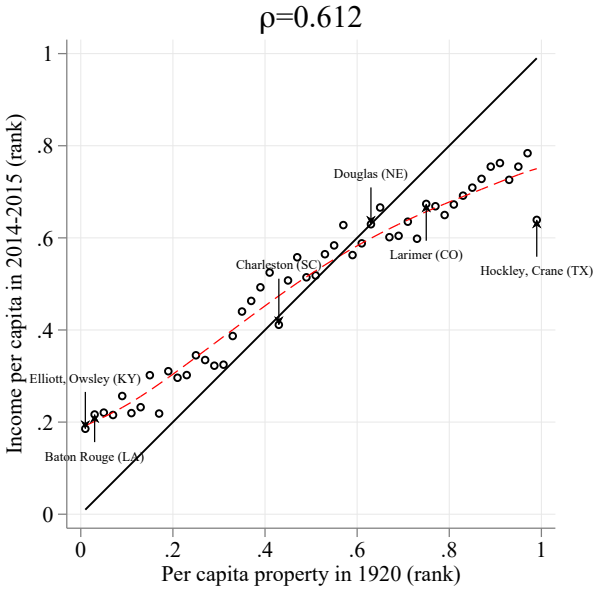
A. Property per Capita in 1920



B. Income in 2014 (Opportunity Atlas Data)



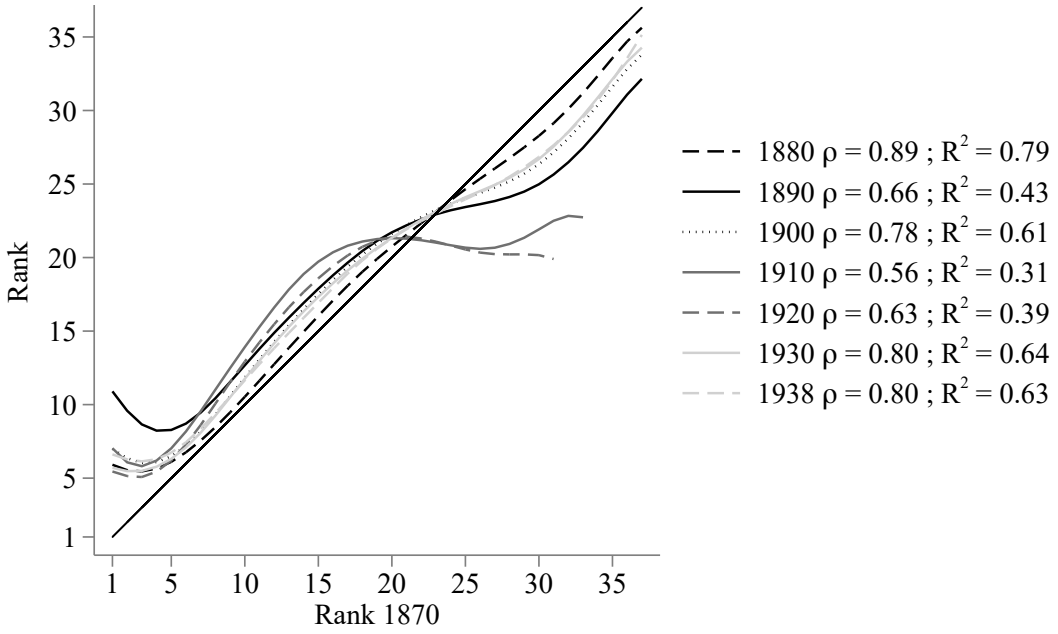
C. Persistence of Property and Income



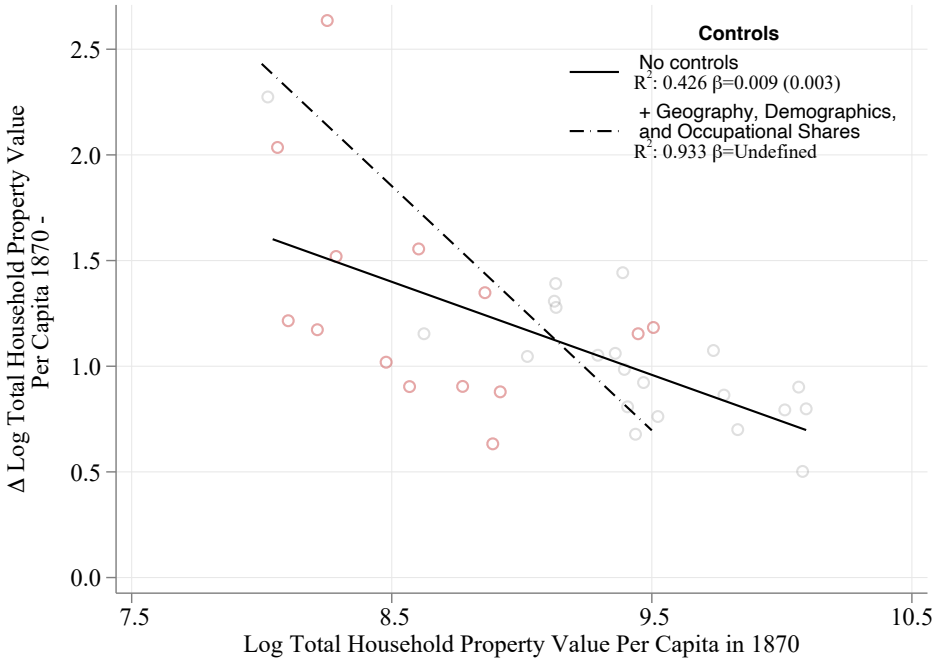
Notes: Panel A shows county property per capita as a share of national GDP per capita in 1920; Panel B depicts average annual household income in 2014 and 2015 for children whose mothers grew up in the United States, with data from the Opportunity Atlas. Panel C shows the rank-rank correlation between property per capita in 1920 and Income in 2014/15.

Figure A20: State Persistence and Convergence

A. State Persistence



B. β - Convergence - Property per Capita from 1870



Notes: Panel A shows the rank-rank correlation of state-level property per capita for different years (ρ) and the R^2 for each year t of a simple regression of state-level property 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.

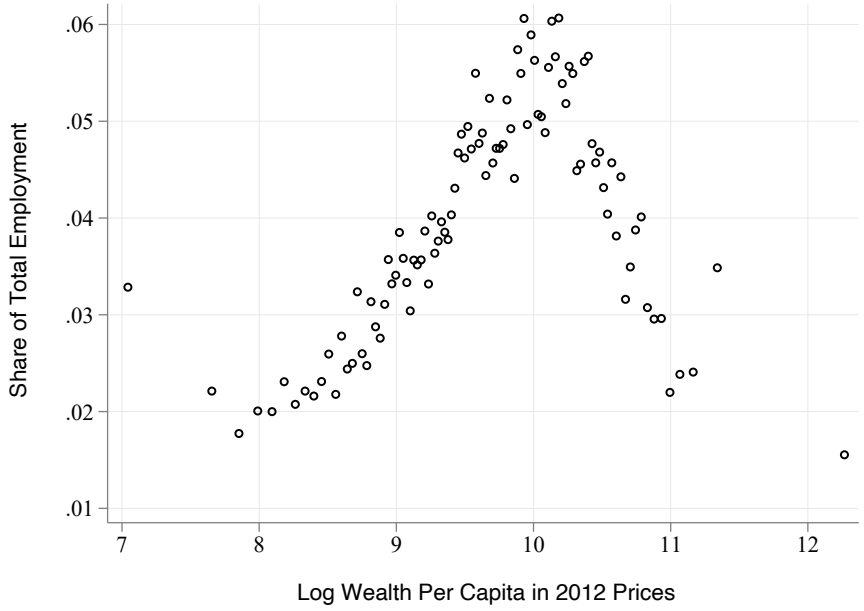
Figure A21: Evolution of Spatial Inequality across Counties Based on Share of National Property Owned by the Top 10%

Notes: The figure displays the evolution of the share of national property owned by the top 10% wealthiest counties between 1860 and 1930. 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 A22: 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

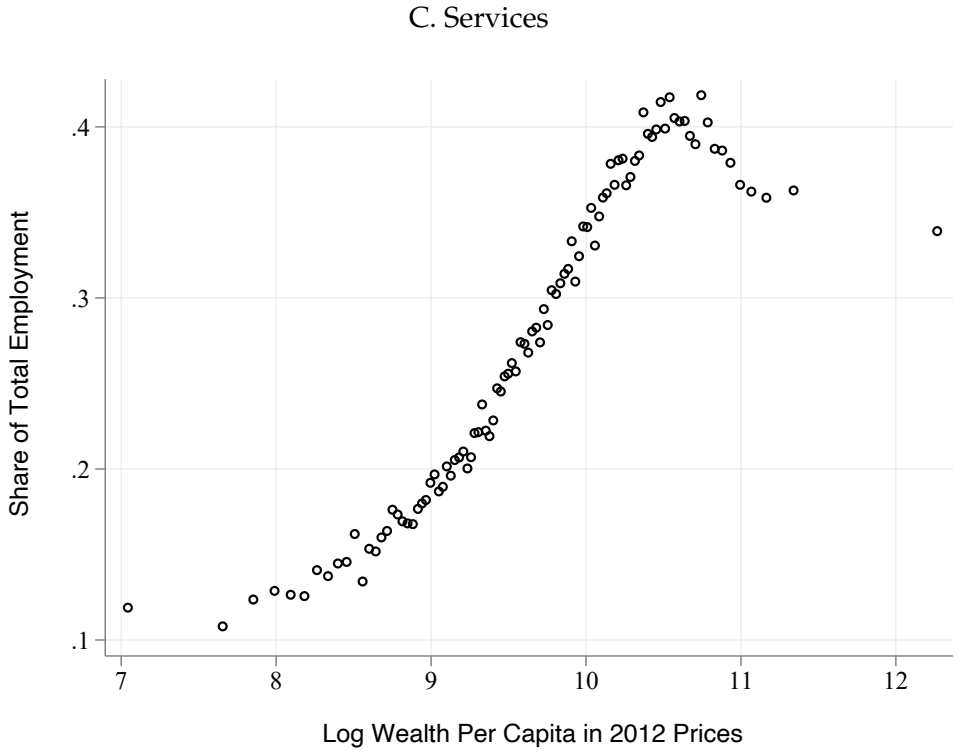
A. Agriculture

B. Manufacturing



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 U.S. 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 U.S. dollars. Counties are ranked by this measure of log of property per capita in 100 bins pooling all years.

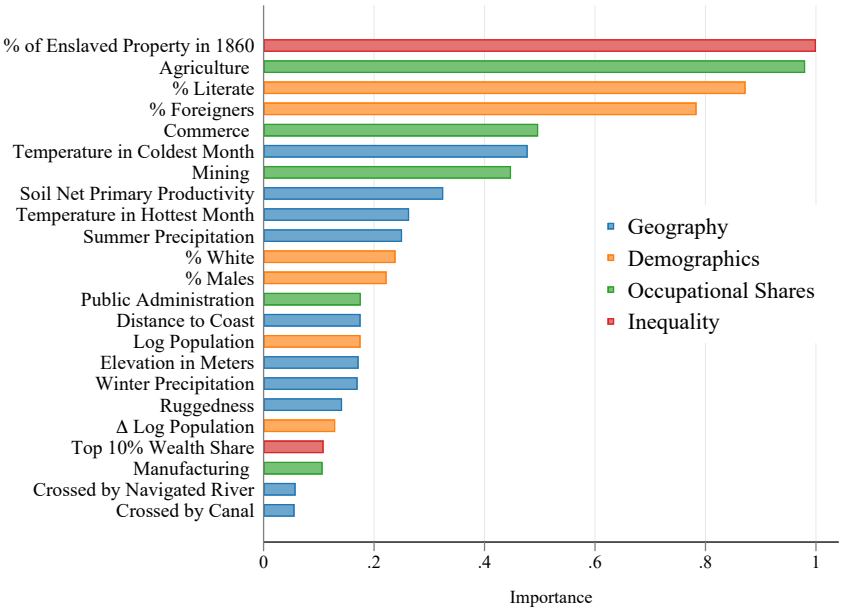
Figure A22: Structural Transformation Over the Course of Development: Occupational Shares in Total Employment and Log Property Per Capita by County



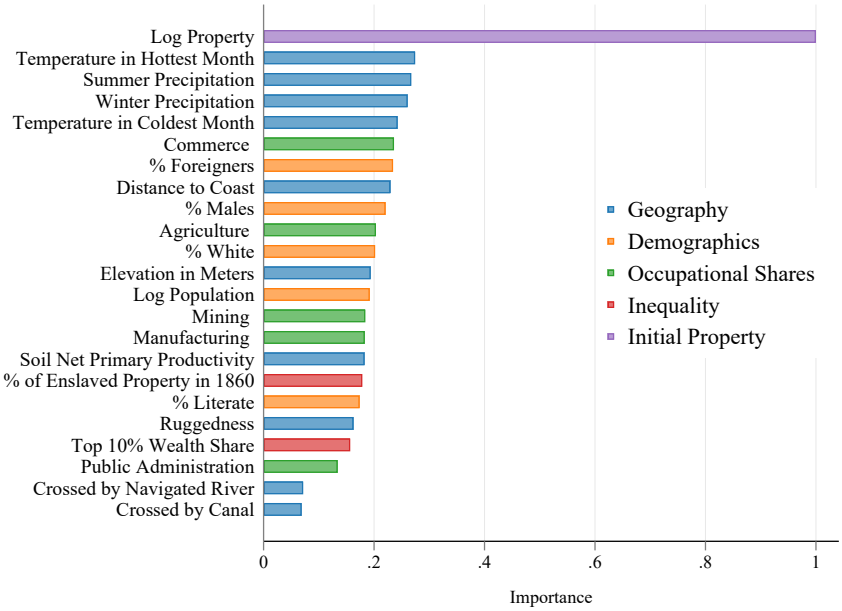
Notes: Panel C presents the relationship between the share of services in the total employment in the county and the log of the county property per capita expressed in 2012 U.S. dollars for the period between 1860 and 1940. The service sector is built by adding the fraction of people working in business, 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 A23: Variable Importance Plot Using Random Forest Algorithm

A. Property Value per Capita in 1870



B. 60-year Growth in Property per Capita (1870 to 1930)

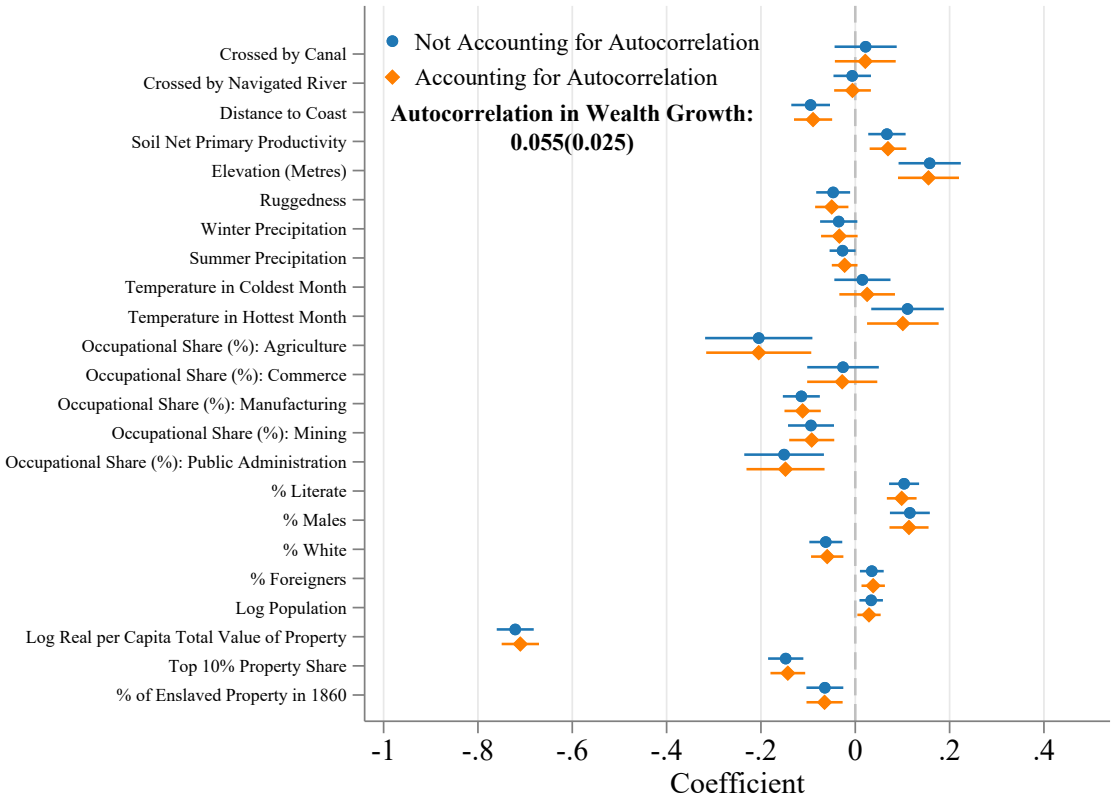


Notes: The figure displays the ranking of variables by importance based on their explanatory power for the value of property per capita in 1870 (Panel A) and conditional growth between 1870 and 1930 (Panel B). The importance ranking is obtained using a random forest approach. We depict the "Mean Decrease in Impurity," which is derived by summing the improvements in the objective function (RMSE) for each variable, given in the splitting criterion over all internal nodes of a tree and across all trees in the forest, normalized by that of the variable with the highest importance. More specifically, we grow 1000 trees with a training sample (40% of all observations). For each tree, we do a bagging (i.e., using only a random subset of observations to reduce overfitting). The remaining observations for each tree constitute our out-of-bag samples. After growing each tree, we pass along the out-of-bag samples down the tree, and at each split of the tree, the improvement in RMSE is recorded and attributed to the variable used for the split.

Figure A24: 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 A25: Controlling for Spatial Auto-Correlation, Baseline vs Spatial Auto-Regressive Model



Notes: This figure reproduces our convergence analysis in our baseline model, and when taking spatial autocorrelation into account. The Moran test is statistically significant, indicating the presence of spatial autocorrelation. In order to deal with spatial autocorrelation, we add to the model a spatial lag of the outcome specified by a spatial weighting matrix where weights are based on the inverse of the distance between counties. Despite the presence of spatial autocorrelation, convergence results are extremely similar and are virtually unchanged for all regressors of interest.

Table A1: Correlates of Property at the County Level

	Dependent variable: Log Total Household Property Value Per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
	10-Year Δ	10-Year Δ	10-Year Δ	10-Year Δ	60-Year Δ	in 1870
Log Real Per capita Total Value of property	-0.209***	-0.315***	-0.383***	-0.401***	-0.721***	
	(0.008)	(0.011)	(0.013)	(0.012)	(0.025)	
A. Geography						
Temperature in Hottest Month		-0.031**	-0.004	0.000	0.141***	-0.156***
		(0.013)	(0.015)	(0.014)	(0.048)	(0.055)
Temperature in Coldest Month		0.001	0.053***	0.040***	-0.001	-0.127***
		(0.012)	(0.012)	(0.012)	(0.038)	(0.041)
Summer Precipitation		-0.074***	-0.024***	-0.026***	-0.029*	0.022
		(0.006)	(0.006)	(0.006)	(0.016)	(0.021)
Winter Precipitation		-0.053***	-0.045***	-0.034***	-0.014	-0.041
		(0.009)	(0.010)	(0.010)	(0.025)	(0.026)
Ruggedness		-0.023***	-0.013*	-0.013*	-0.039*	-0.094***
		(0.007)	(0.008)	(0.008)	(0.020)	(0.023)
Elevation in meters		0.008	0.004	-0.001	0.148***	-0.180***
		(0.011)	(0.011)	(0.011)	(0.041)	(0.049)
Soil Net Primary Productivity		0.025***	-0.002	-0.006	0.065***	0.009
		(0.007)	(0.008)	(0.008)	(0.023)	(0.027)
Distance to Coast		-0.009	0.008	0.007	-0.100***	0.054*
		(0.007)	(0.007)	(0.007)	(0.023)	(0.028)
Crossed by Navigated River		0.007	0.006	0.004	-0.003	0.095***
		(0.008)	(0.008)	(0.008)	(0.020)	(0.025)
Crossed by Canal		0.003	-0.005	0.007	0.015	0.003
		(0.014)	(0.014)	(0.014)	(0.030)	(0.040)
B. Demographics						
% Literate			0.169***	0.154***	0.097***	0.208***
			(0.011)	(0.011)	(0.019)	(0.022)
% Foreigners			0.064***	0.058***	0.038***	-0.114***
			(0.008)	(0.007)	(0.013)	(0.018)
Log Population			-0.029***	-0.041***	0.039**	0.102***
			(0.007)	(0.007)	(0.016)	(0.021)
Δ Log Population			-0.223***	-0.221***		0.237***
			(0.025)	(0.023)		(0.065)
% Males			0.033***	0.026***	0.063**	0.214***
			(0.012)	(0.009)	(0.025)	(0.042)
% White			-0.009	-0.005	-0.061***	-0.109***
			(0.007)	(0.006)	(0.020)	(0.025)
C. Occupational shares:						
Public Administration				0.032***	0.028**	0.033**
				(0.004)	(0.011)	(0.014)
Manufacturing				-0.021***	-0.046***	-0.018
				(0.004)	(0.012)	(0.015)
Mining				-0.004	0.017	0.029*
				(0.004)	(0.012)	(0.016)
Commerce				0.005	0.015	0.063***
				(0.004)	(0.010)	(0.013)
Agriculture				-0.042***	-0.087***	-0.068***
				(0.004)	(0.012)	(0.015)
D. Inequality						
Top 10% Wealth Share					-0.165***	0.130***
					(0.022)	(0.031)
% of Enslaved Property in 1860					-0.065**	-0.233***
					(0.027)	(0.041)
Observations	16,112	13,360	11,075	11,063	1,617	1,619
Number of units						
Period Dep. Variable						
Adjusted R^2	0.31	0.36	0.43	0.44	0.57	0.62
Implied Convergence						

Notes: Columns 1-4 report the coefficients obtained by regressing the 10-year change in log property on initial property, geography variables, demographics, occupational shares, inequality variables, and year fixed effects. Column 5 reports the set of coefficients from the regression of the change in log property between 1870 and 1930 on 1870 property, 1870 controls, and the 1860 share of enslaved property, as described in the main text equation (2). Column 6 presents the set of coefficients from the regression of log property in 1870 on 1870 controls and 1860 share of enslaved property as described in equation (3).

Table A2: Correlates of Property at the County Level, with State Fixed Effects

	Dependent variable: Log Total Household Property Value Per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
	10-Year Δ	10-Year Δ	10-Year Δ	10-Year Δ	60-Year Δ	in 1870
Log Real Per capita Total Value of property	-0.390***	-0.419***	-0.449***	-0.466***	-0.732***	
	(0.010)	(0.011)	(0.013)	(0.012)	(0.025)	
A. Geography						
Temperature in Hottest Month		0.023	0.025	0.024	0.079	0.100
		(0.019)	(0.020)	(0.019)	(0.061)	(0.070)
Temperature in Coldest Month		-0.019	-0.008	-0.025	-0.058	-0.051
		(0.016)	(0.017)	(0.017)	(0.054)	(0.060)
Summer Precipitation		-0.004	0.003	-0.000	-0.003	0.006
		(0.010)	(0.010)	(0.010)	(0.028)	(0.032)
Winter Precipitation		-0.052***	-0.054***	-0.047***	-0.056*	-0.049*
		(0.009)	(0.010)	(0.010)	(0.029)	(0.029)
Ruggedness		-0.034***	-0.022***	-0.022***	-0.029	-0.071***
		(0.008)	(0.008)	(0.008)	(0.025)	(0.024)
Elevation in meters		0.053***	0.025	0.018	0.108*	0.061
		(0.016)	(0.017)	(0.017)	(0.057)	(0.059)
Soil Net Primary Productivity		0.029***	0.023**	0.016	0.046*	0.038
		(0.010)	(0.010)	(0.010)	(0.026)	(0.030)
Distance to Coast		-0.074***	-0.049***	-0.044***	-0.232***	-0.071**
		(0.010)	(0.011)	(0.011)	(0.030)	(0.035)
Crossed by Navigated River		0.016**	0.013	0.010	-0.010	0.043**
		(0.008)	(0.008)	(0.008)	(0.018)	(0.021)
Crossed by Canal		0.039**	0.027*	0.031*	0.049	0.019
		(0.016)	(0.016)	(0.016)	(0.032)	(0.040)
B. Demographics						
% Literate			0.135***	0.120***	0.044**	0.177***
			(0.011)	(0.011)	(0.018)	(0.022)
% Foreigners			0.045***	0.040***	0.028*	-0.063***
			(0.009)	(0.008)	(0.015)	(0.020)
Log Population			-0.017**	-0.034***	0.074***	0.019
			(0.008)	(0.008)	(0.015)	(0.025)
Δ Log Population			-0.214***	-0.219***		0.386***
			(0.023)	(0.022)		(0.066)
% Males			0.036***	0.030***	0.057*	0.048
			(0.013)	(0.010)	(0.031)	(0.048)
% White			-0.016**	-0.014*	-0.042*	-0.209***
			(0.008)	(0.007)	(0.022)	(0.028)
C. Occupational shares:						
Public Administration				0.027***	0.012	0.043***
				(0.004)	(0.010)	(0.013)
Manufacturing				-0.012***	-0.029***	-0.007
				(0.004)	(0.011)	(0.014)
Mining				0.000	-0.002	0.017
				(0.004)	(0.011)	(0.015)
Commerce				0.010***	0.015*	0.060***
				(0.004)	(0.009)	(0.012)
Agriculture				-0.038***	-0.069***	-0.067***
				(0.004)	(0.011)	(0.013)
D. Inequality						
Top 10% Wealth Share					-0.096***	0.109***
					(0.021)	(0.029)
% of Enslaved Property in 1860					-0.061**	-0.183***
					(0.029)	(0.043)
Observations	16,112	13,360	11,075	11,063	1,617	1,619
Number of units						
Period Dep. Variable						
Adjusted R^2	0.43	0.45	0.49	0.49	0.67	0.73
Implied Convergence						

Notes: Columns 1-4 report the coefficients obtained by regressing the 10-year change in log property on initial property, geography variables, demographics, occupational shares, inequality variables, state fixed effects, and year fixed effects. Column 5 reports the set of coefficients from the regression of the change in log property between 1870 and 1930 on 1870 property, 1870 controls, and the 1860 share of enslaved property, as described in the main text equation (2). Column 6 presents the set of coefficients from the regression of log property in 1870 on 1870 controls and 1860 share of enslaved property as described in equation (3).

Table A3: Effect of Enslaved Property in 1870 on 60-Year Property Growth

	Dependent variable: 60-year Growth in Property per Capita				
	(1)	(2)	(3)	(4)	(5)
	Baseline	Geography	Demographics	**Occupation**	Top 10% Share
Enslaved Property (Ψ)	-0.229 (0.070)	-0.183 (0.076)	-0.179 (0.090)	**-0.178** **(0.089)**	-0.146 (0.091)
Property in 1870	-0.495 (0.023)	-0.564 (0.025)	-0.633 (0.028)	**-0.666** **(0.029)**	-0.663 (0.029)
Controls:					
Geography		X	X	**X**	X
Demographics			X	**X**	X
Occupation				**X**	X
Top 10% Share					X
Observations	863	863	863	863	863

Notes: The table presents the results from a regression of the 60-Year Property Growth per capita on the share of enslaved property in the county. Column 1 is the most parsimonious specification, with only the initial log of property per capita in 1870 as a control. Column 2 adds 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 adds 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, which adds the occupational shares in public administration, manufacturing, mining, commerce, and agriculture. Column 5 adds the share of the total wealth owned by the top 10% as a control.

Table A4: Effect of Top 10% Share of Property in 1870 on 60-Year Property Growth

	Dependent variable: 60-year Growth in Property per Capita				
	(1)	(2)	(3)	(4)	(5)
	Baseline	Geography	Demographics	**Occupational Shares**	Enslaved Property
Top 10% Wealth Share (Λ)	-2.581	-1.828	-1.663	**-1.911**	-2.211
	(0.162)	(0.182)	(0.194)	**(0.193)**	(0.242)
Property in 1870	-0.501	-0.655	-0.751	**-0.774**	-0.741
	(0.014)	(0.016)	(0.017)	**(0.017)**	(0.020)
Controls:					
Geography		X	X	**X**	X
Demographics			X	**X**	X
Occupation				**X**	X
Enslaved Property					X
Observations	1797	1797	1797	1797	1617

Notes: The table presents the results from a regression of the 60-Year Property Growth per capita on the share of wealth held by the top 10% wealthiest people in the county. Column 1 is the most parsimonious specification, with only the initial log of property per capita in 1870 as a control. Column 2 adds 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 adds 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, which adds the occupational shares in public administration, manufacturing, mining, commerce, and agriculture. Column 5 adds the share of enslaved property in 1860 as a control.

Table A5: Mediation of the Effect of Top 10% Share of Property in 1870 on 60-Year Property Growth

		Estimated Λ from specification (4): -1.911
Mediators	Change in Estimated Λ when adding mediator to specification (4)	Fraction of Λ explained by mediator
Average ETR	.048	2%
Demographics:		
Δ % Literate	.423	16%
Δ % Foreigners	.065	3%
Δ Log(Population)	.003	0%
Δ Males	.005	0%
Δ White	.003	0%
Δ ***Top 10% of Population in***:		
Public Administration	.024	1%
Production	-.009	0%
Mining	-.027	-1%
Commerce	.007	0%
Agriculture	.129	5%

Notes: This table presents the mediation analysis of the effect of Top 10% Share of Wealth on 60-Year property growth. We use the baseline specification from column 4 (in bold) in Table A4 that includes controls for geography, demographics, and occupational shares. The algorithm is as follows. Pick one of the mediating variables, Z_j. We select the mediator variables from the vector $\mathbb{Z} = \{Z_1, Z_2, ...Z_n\}$ in a random sequence and repeat this sequencing x times. For each random sequence, we add the mediating variables sequentially to the regression, in the order of the sequence. We measure the importance of the mediating effect of Z_j on Λ by computing for each sequence the change in estimated Λ 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 Λ over all x sequences.

II. Institutional and Historical Appendix

This section provides additional information on the institutional and historical background of the general property tax.

II.1. Historical Sources on Property Tax Laws, Administration & Enforcement

While property tax legislation shared many important features across U.S. states, it still differed in each state, which can make it complicated to precisely follow the historical developments of property tax laws for each state. But a series of key historical sources enable to have a panoptic view of property tax legislation and its evolution.

First, the Decennial Censuses of Wealth offer every decade a state by state account of the main provisions of the property tax. These accounts start in 1880 (U.S. Census Bureau (1880)), and are very detailed starting in 1890 (U.S. Census Bureau (1890)). The 1902, 1912 and 1922 versions are particularly useful (U.S. Census Bureau (1902), U.S. Census Bureau (1912) and U.S. Census Bureau (1922)) offering a separate digest of all property tax laws for each state. Importantly, the reports provide important details on the administration of the property tax, methods of assessments, etc. As we discuss below, they also provide a very thorough estimate of the assessment ratio (i.e. the ratio between the assessed value of property and the true market value of property).

Second, a series of publications by academics and tax practitioners of that time offer crucial insights about some differences in tax legislations and practices. Jensen (1931) is, from that point of view, a very unique source, offering a comprehensive snapshot of property taxation across all states at the end of the 1920s.

Third, state reports offer very precise information about property tax legislation and its developments for each state. The Tax Commission and Board of Equalization reports are particularly useful. We provide a full list of references and links to these publications in section III.2 below.

II.2. Tax base

Uniformity and universality The universality provision principle implied that, unless otherwise specified, all properties were subject to the general property tax. 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). Table A6 below provides information for all states relative to their constitutional requirements and actual practice of universality and uniformity.

Corporate assets Provisions for the taxation of corporate assets were in place to avoid double taxation of share-holders and corporations. No state required both the owner side and the corporate side to be taxed for the same asset (Jensen (1931, pp. 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 treated separately and taxed on the value of the shares (Jensen (1931, p. 206)).

Debt 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.

Table A6: 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.

Exemptions There were some exemptions from the property tax, which varied by state. Most exemptions were related to public property (e.g. federal land, public buildings, etc), religious property (e.g., churches, cemeteries, religious societies), charities, hospitals, schools, and libraries. Exemptions related mostly to the public good nature of the property considered. Exemptions of specific private wealth were rare, because it directly contradicted the universality principle that was at the heart of the general property tax, and enshrined in constitutional requirements for most states. Nevertheless, there may be specific, nonsystematic private property exemptions. Some examples include Treasury bonds, abatements for individuals (e.g., one $25 watch in Vermont), or specific sectors (e.g., ten bee stands and beet sugar factories in Indiana, mining in New Mexico).[1]

The Census Bureau conducted very thorough analyses of the value of exempted property for each state for its decennial Census. We therefore have precise information about the value of exempted property, relative to total property, for each state, for 1890, 1900, 1904, 1912, and 1922 (see U.S. Census Bureau (1922) "Estimated National Wealth", Table 7 p.25). The Census Bureau also produced an estimate for 1880 of the total value of exempted property at the national level, without breaking it down by state. Finally, the National Industrial Conference Board published estimates of the total value of exempted property for years 1922 to 1937 (National Industrial Conference Board (1939)). Figure A26 reports the evolution of the total value of exemptions as a fraction of total national wealth from 1880 to 1937. And Figure A27 shows how the fraction of exempt property to total true value of property varied across states from 1890 to 1922. Three main insights emerge from this evidence.

First, the value of all exemptions as a fraction of total wealth is small overall, around 6 to 7%. Second, the value of exemptions in total wealth is remarkably stable over time in the period 1880 to 1930. The small and stable value of exemption in total wealth reflects the broad and continuous application of the universality and uniformity principles of the general property tax over this period. Interestingly, we note that exemptions increased in the early 1930s. This reflects the introduction of exemption and classification of real estate property in various states in the aftermath of the Great Depression. As we discuss in the main text, this movement coincides with the start of the demise of the general property tax in local public finances.

The third insight that emerges from the figures is that despite most states having very little exempted property as a fraction of total wealth, there is a bit if geographical dispersion. In fact, a few U.S. territories exhibit large exempted property, in the late 1800s,

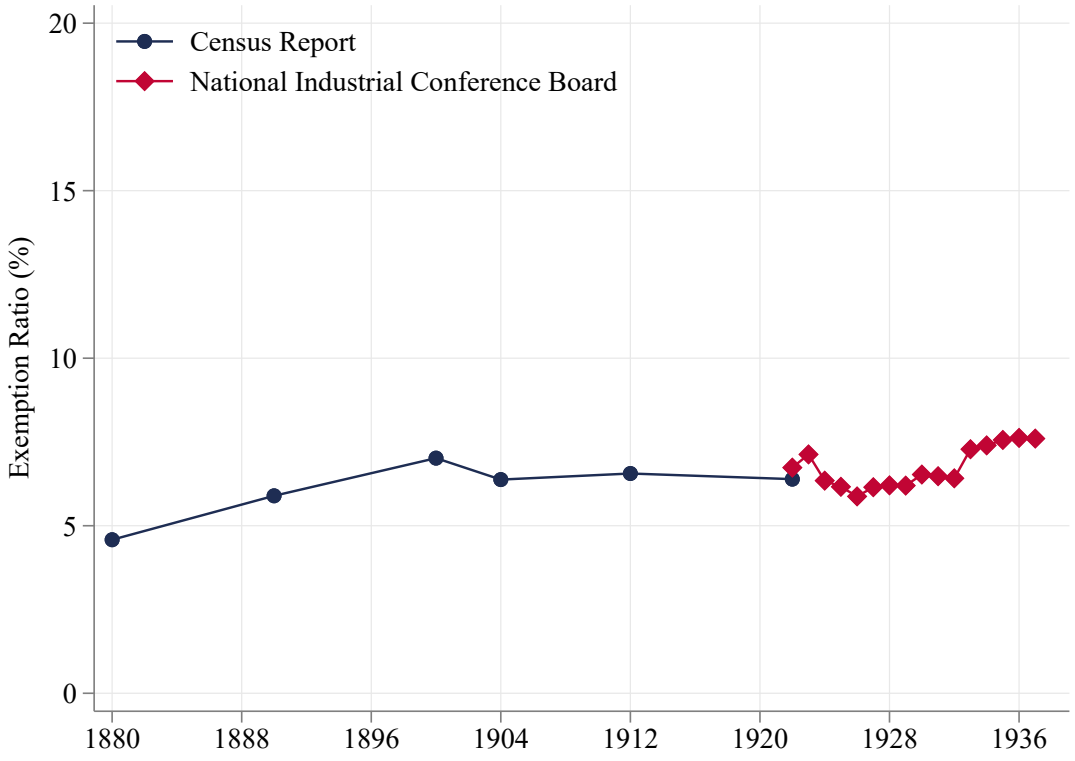
[1] We can follow the evolution of these exemptions state by state in the very detailed digests of property tax laws compiled by the Census every ten years from 1880 to 1922.

prior to their accession to statehood. This reflects first the fact that in these U.S. Territories, a very large share of land was property of the federal government in the 1880s, and that federal land was progressively transferred to individuals through homesteading, explaining the quick decline in the fraction of exempted property over time in these regions west of the Mississippi River.[2] Second, in these territories, mining boom was supported by temporary exemptions on mining claims in the late 1800s. These temporary exemptions (typically 10 years, as in Arizona or New Mexico) were progressively abandoned in the early 1900s.

A final important point is in order: There is a critical conceptual difference between exemption and assessment. In other words, the fact that the exemption rate was very small stemmed from the universality principle, stating that all forms of properties should be taxed. But a low rate of exemption was not necessarily synonymous with a high effective rate of assessment of taxable property. Some real or personal property may have "escaped" taxation because of classification or low assessment ratios. This will be captured by assessment practices, which we discuss extensively below.

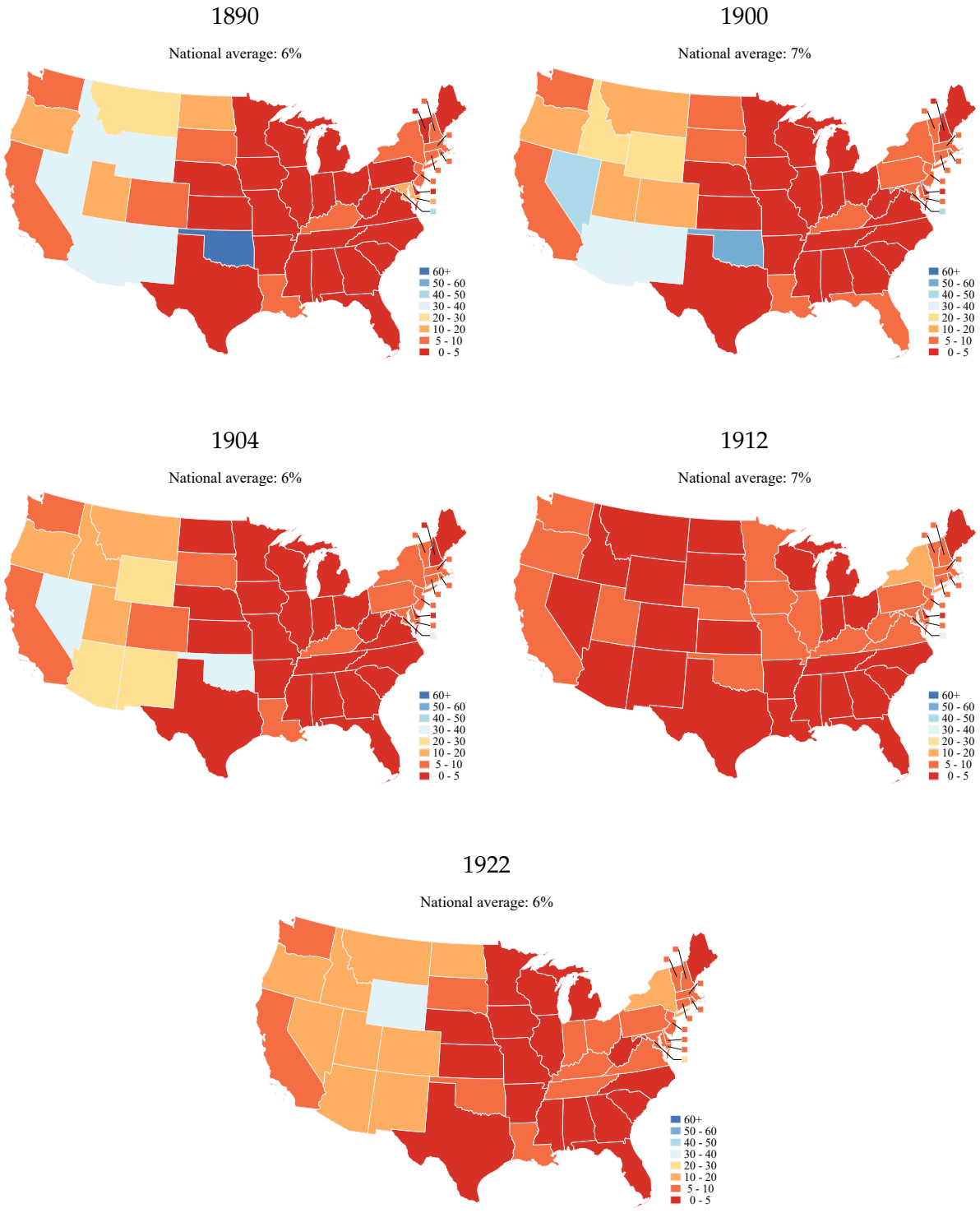
[2]Example: Oklahoma before statehood in 1907: U.S. territory, with Indian reservations, and Unassigned Land, property of federal gvt. Big land runs on unassigned lands after 1890. New Mexico: statehood on 1912. same thing, lots of federal land + Legal issues about common ownership of millions of acres in land grants + temporary 10 year exemptions on mines, from the date of discovery.

Figure A26: Ratio of Exemptable Property to Total Property



Notes: This figure shows the ratio of exemptable property to total property at the national level. The blue series is taken from U.S. Census Bureau (1922), which has estimates for 1880, 1890, 1900, 1904, 1912 and 1922. The red series comes from National Industrial Conference Board (1939), who report total exempted property from 1922-1937, which we combine with our constructed total property series (i.e. for the denominator) to calculate the exemption ratio. See Appendix III.1 for further details on that series' data sources, and how it is constructed.

Figure A27: Ratio of Exemptable Property to Total Property, by State



Notes: This figure shows the ratio of exemptable property to total property for each state, as reported in U.S. Census Bureau (1922), which has values for 1890, 1900, 1904, 1912 and 1922.

II.3. Tax administration

Steps to implement a general property tax Taken from Fisher (1996, pp. 80–81)

1. **Define taxable property**. Need a legal definition, and attribute rights to owners when not clear (e.g. multiple owners, mortgages)
2. **Define value**. Usually not explicit but refers to "selling price".
3. **Define jurisdiction to tax**. It is necessary that the jurisdiction be defined so that all property has one and only one tax location.
4. **Establish a tax date**. Ideally, same day across jurisdiction to avoid double taxation and avoidance.
5. **List taxable property**. Requires physical inspection, and complete cadastral maps. Each property must be assigned a taxing location.
6. **Value every parcel or item of property**. This compound the usual issue of appraising value, maintaining geographical equality and preventing political pressures to keep valuation low (also used for apportionment which pushes for low assessment).
7. **Levy taxes**. Official act of imposing the tax. States regulate the procedures to be followed by each jurisdiction and can impose levy limits.
8. **Compute tax rates and tax bills**. Apportioned dollar amounts must be converted to rates.
9. **Collect taxes**. Taxes levied in rem become an automatic lien on the property and good title cannot be passed until taxes are paid.
10. **Distribute the proceeds to local governments** if tax collector collect taxes for several units of government.

The administration of the property tax shared many important features across the U.S. Taxes were collected annually, on a specific tax day. The property tax was levied at the place and at its value on a specific day of the year. [3] The assessment of property was done

[3] 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.

by assessors – usually elected officials and often local residents– who listed and valued property and collected property taxes. Etc.

Despite these common features, the administration of the tax varied significantly across states. But these variations are well documented. In particular, the Census produced every ten years in its digest of property tax laws a detailed account of the concrete administrative features of the property tax, for each state (see U.S. Census Bureau (1890), U.S. Census Bureau (1902), U.S. Census Bureau (1912), and U.S. Census Bureau (1922)). State reports, in particular reports of the state comptroller, reports of the state tax commission, or of the state board of equalization, also offer a granular vision of local administrative practices of the property tax.

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. In particular, tax commissions and boards of equalization were key institutions set up in almost all states to guarantee uniformity in the administration of the property tax.[4] In section III.2.3 below, we provide state by state information about the creations of each of these institutions and how they affected the administration of the property tax. Dates of creations of these institutions are also reported for each state in Figures A29 to A37.

II.4. Assessment Practices

In terms of administration and enforcement practices, knowing how assessments took place is a critically important for estimating the true value of property across space and over time. While most states stipulated that all property should be assessed at its market value, it is well understood that assessment ratios were quite systematically significantly smaller than 1.

Importantly, we have precise information about assessment practices and how they differed across states and over time. The **Census Bureau** conducted decennial investigations to precisely estimate state assessment ratios. These investigations were authorized by Congress since 1850 and were part of a "national inventory or stock taking" of wealth in the United States (U.S. Census Bureau (1902, p. 3)). The method of investigation differed by class of property and decade. Below is a description of some of the methods used

[4]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.

by the Census.

- In 1850, 1860, and 1870:
  U.S. marshals were tasked with obtaining estimates of the "true valuation" while conducting Census enumeration. They were given information that precisely made the distinction between the value of property as assessed for taxation, and the true valuation of property, and asked to obtain both values.

- For 1880 and 1890:
  the Census relied on a a survey of more than 25,000 bankers, real estate agents, business men, and public officials connected with the valuation of taxable property, and found an average assessment ratio of 65 percent for real property. The true value of personal property was then directly estimated by the Census, which allows us to obtain an overall assessment ratio for all property.

- For 1900:
  Census enumerators conducted separate exercises for real and non-real property.

  For real property, they separately appraised the true value of real property used for farming and that used for manufacturing purposes using the extensive work conducted for the U.S. Census of Agriculture, and the U.S. Census of Manufacturing. Regarding residential real property, the Census Bureau sought to recover the ratio of assessed to true value of real property by a fairly sophisticated process that is based on the combination of the 5 following methods described below: (1) for counties in which farm land constitutes at least 85 percent of the assessed acre property (2,000 out of the 2,800 counties), the ratio computed for land used the Census' appraisal of farm land is used for all real property.
  (2) An alternative ratio was obtained using records of sales of real property as a check on the first method. This second method resulted in only slight differences for state-level assessment ratio.[5]
  (3) Census Bureau agents visited all cities with over 4,000 inhabitants as part of the 1900 enumeration and surveyed all "competent persons" that could give information on the assessment ratio for real property. This was again used as a check on the method (1) and (2), and used whenever a ratio could not be obtained if not separate assessed value of acre property was available (most of the adjustments did not occur at the state-level but county-level, which is not used for our analysis).

[5]The difference was less than 1 percent and 0.1 percent in Ohio and Iowa

(4) Ratios given in financial journals and publications were used as check. This information generally came from analysis of people with knowledge of local affairs who compiled this information for the basis of municipal credit.
(5) Analysis conducted by the state tax commissions on the question of assessment ratio was compiled and used whenever more precise information on the assessment was available.[6]

Regarding **personal property**, a measure of true value was appraised by census enumerators directly for livestock,[7] farm equipment, manufacturing machinery,[8] gold and silver.[9] The true value of other classes of property, such as railroads, street railways, or canals, was also separately ascertained by the Census.

- 1912 and 1922:
  A similar approach as in 1900 was taken in 1912 and 1922, although less detailed in the appraisal of real property. The Census obtained assessment ratios from state reports in 1912 (U.S. Census Bureau (1912, p. 16)), and requested state and county officials to provide a ratio for real property based on sales records in 1922 (U.S. Census Bureau (1922, p. 4)). For both years, the true value of personal and other property was separately estimated by the Census Bureau as detailed above for 1902, with the explicit objective of striving for continuity in the estimation methods. (U.S. Census Bureau (1922)).

In addition, we gathered assessment ratios estimates from other sources such as State tax commissions, auditor reports, independent analyses by contemporaneous economists or tax specialists, and annual statistics reported in the Financial Statistics of States. These help us detect more granular changes in methods of assessment. These changes in assessment ratios can generally be traced to changes in tax legislation or practices. These data sources and the assessment ratios we construct are described in detail in Appendix III.2.

[6] A sixth test is employed to verify the assessment ratio obtained through indirect methods 2-5, but only applies to counties.
[7] Using values from the Department of Agriculture.
[8] using values from the Census of manufactures.
[9] Using values from the Director of the Mint.

III. Data Appendix

In this section, we present details about the historical series we constructed. We start with a brief overview of all the series we constructed (variables, geographical level, time span, etc) in section III.1. Then, we present our state level series of private wealth in section III.2, which form the backbone of our analysis: almost all other series (county level, national level) stem from this data. These series do require special adjustments to account for the value of enslaved people. We present these adjustments in section III.3. We then present how we constructed series at the county level in section III.4. And we present how we constructed national wealth series in section III.5. After this, we present in section III.6 existing data sources of wealth, and wealth series that have been constructed in the literature. We explain how our series differ in terms of sources and methodologies from these estimates, and compare our results in sections III.7 and III.8. Finally, in sections III.9 and III.10, we present other auxiliary data we use for our analysis (data on property tax revenues, data on geography, etc).

III.1. General Overview of Series Constructed

Our approach consists in following the method used by the Historical Censuses of Wealth, namely to start from the assessed values of property and correct them by the assessment ratios to get at the market value.

The first and most important series we constructed are therefore series of assessment ratios.

In terms of property, we constructed series of estimates of the true market value of property for three main types of property outcomes: total private property, real property and personal property. Real property includes land, improvements, town lots. Personal property includes merchants and manufacturers' stock, 'money and credits' (wealth held in bank account, stocks, bonds and credits), equipment, livestock, watches, pianos, etc.

We finally constructed series of "nominal" tax rates (applied on the assessed value of property) and "effective" tax rates (taxes paid as a fraction of true value of property).

For all these outcomes, series are available at two subnational geographical levels: state level, county level. The backbone of all estimates are the state level data series. For example, county level estimates of assessment ratios are indirectly derived from key information on assessment available at the state level (see details in subsection below). National level series are obtained from aggregating state level series, following methodologies explained below.

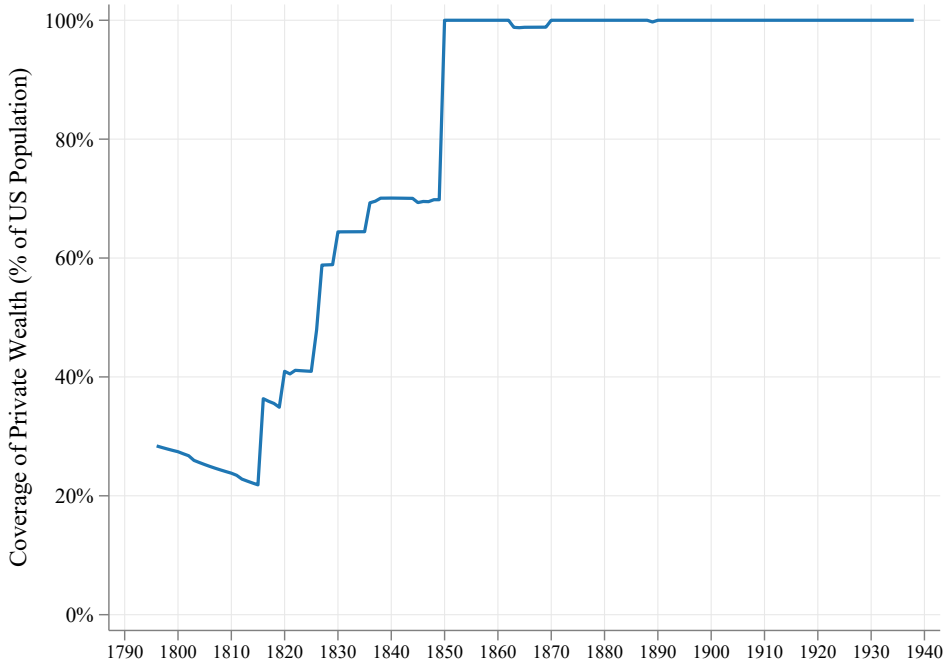
After constructing these series, we are able to measure private wealth for a significant portion of the U.S. population, going back as far as 1793 for our state-level measure in some cases. We measure private wealth for close to 100% of the U.S. population from 1850 onwards. The below exhibits summarize the coverage of our data. Table A7 below details all the property series that we constructed, their main sources and time coverage. Figure A28 shows the fraction of the population for which we have private property data per each year. This is also illustrated at the state-level in Figure 3, which shows the total value of private property for each state as a share of U.S. GDP.

Table A7: Overview of wealth data series constructed

Variable	Unit	Period	Frequency	Sample	Sources	Note
Assessment ratio	County	1860-1930	Decennial	All counties	*US Census of Wealth - Census Bureau* 1870, 1890, 1900 and 1904	$N = 23,071, n = 3,368$
	State	1798-1940	Annual	All States + Washington DC and Puerto Rico	*US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939) State reports & special studies (e.g. Jensen (1931))	$N = 5,289, n = 52$
Total Private Property	County	1850-1930	Decennial	All counties	Full Count Population Census (1850, 1850, 1870) *US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939)	$N = 18,242, n = 3,159$
	State	1793-1940	Annual	All States + Alaska, Washington DC and Puerto Rico	State reports, Ely (1888), U.S. Census Bureau (1941) *US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939)	$N = 4,583, n = 52$
Real Property	County	1850-1930	Decennial	All counties	Full Count Population Census (1850, 1850, 1870) *US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939)	$N = 10,200, n = 3,089$
	State	1826-1940	Annual	All States + Washington DC and Puerto Rico	State reports, Ely (1888), U.S. Census Bureau (1941) *US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939)	$N = 2,227, n = 51$
Personal Property	County	1850-1930	Decennial	All counties	Full Count Population Census (1850, 1850, 1870) *US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939)	$N = 10,160, n = 3,092$
	State	1826-1940	Annual	All States + Washington DC and Puerto Rico	State reports, Ely (1888), U.S. Census Bureau (1941) *US Census of Wealth - Census Bureau* (1850-1922) *Financial Statistics of States* (1915-1939)	$N = 2,161, n = 51$
Property tax rates	County	1870-1930	Decennial	All counties	*US Census of Wealth - Census Bureau* & *Financial Statistics of States* (1930)	$N = 16,243, n = 3,204$
	State	1816-1940	Annual	All States + Washington DC and Puerto Rico	State reports, Ely (1888) Financial Statistics of States (1915-1939)	$N = 2,753, n = 51$

Notes: N denotes the total number of observations in the series. For county-level series, this represents the number of county-year observations. *n* denotes the number of unique units in the series. For county-level series, this corresponds to the number of distinct counties in the dataset. All property series are created by dividing the assessed value of property by the assessment ratio. We use the same assessment ratio for creating the real property series, personal property series, and total property series. The sources listed for the property series correspond to where the information regarding the assessed value of property is coming from. For assessment ratio series at the county level, our baseline series for property are created using for each county, the state-level assessment ratio. But we also created 4 alternative series of assessment ratios (described in Appendix section III.4.2) where we use information about variation in assessment ratios within state across counties available in the *US Census of Wealth - Census Bureau* for 1870, 1890, 1900 and 1904 . Alternative series of property at the county level can therefore easily be reconstructed using these alternative AR series. For property tax rates, we created two series. One of nominal tax rates and one of effective tax rates (i.e. total taxes paid divided by total market value of property).

Figure A28: Share of the Population Covered in the Property Data



Notes: This figure shows the fraction of the national population for which data on private property is available in any given year.

III.2. State Level Property Data

In this section we describe our data and approach for the construction of assessed values of property, assessment ratios and market value of wealth at the state level.

III.2.1. Assessed value of property.

For each state, we constructed harmonized series measuring the total assessed value of property. These series come from three main types of sources:

(i) the assessed values of property published each decade in the Historical Censuses of Wealth for the period 1850 to 1922 (also referred to as the *Wealth, Debt, Taxation* publications from the U.S. Census Bureau). (See main text, section 4.1 for details on these publications)

(ii) the annual series published in the *Financial Statistics of States* from the U.S. Census

Bureau for the period 1915 to 1943. (See main text, section 4.1 for details on these publications)

(iii) The assessed valuation of property available in State reports. Information on assessed values of property is typically reported in the reports from the State Auditor, the State Board of Equalization, or the State Tax Commission. Table A8 below lists all the State reports that we consulted. Note that in a companion paper, Dray, Landais and Stantcheva (2025), we provide further details on these important data sources: we document their origins, structure, and general content. We also discuss how the information contained in these State reports can be used for further research. We finally provide a list of links where these State reports can be downloaded or of libraries where hard copies can be consulted.

From these sources, we were able to reconstruct a measure of total assessed property value typically since around after statehood to 1930. Note that when multiple sources were available, we prioritized assessed values reported in the State reports, which tend to be more complete, provide further details (such as breakdown by large classes of property types, etc), and are often the original source of information for the series of assessed values published by the Historical Censuses of Wealth or the Financial Statistics of States.

In very few cases (128 observations out of 3,409), no information was reported for assessed valuations in State reports, but we were able to retrieve an assessed value of property from information on the tax rate and the revenue of the general property tax. More precisely, we use the 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.[10]

We also created series of assessed value of personal property and real property. The breakdown of total property between personal property and real property is typically available for all sources, except in some early State reports.

[10]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).

Table A8: State Coverage and Sources

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

Table A8 continued from previous page

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

Table A8 continued from previous page

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

Table A8 continued from previous page

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

Table A8 continued from previous page

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

Table A8 continued from previous page

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

Table A8 continued from previous page

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

Table A8 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 Biennial Reports of the State Tax commissioner Biennial Reports of the Comptroller
Texas	1845	1846 - 1940	Annual Reports of the Tax Commissioner Annual Reports of the Treasurer Miller (1916)
Utah	1896	1850 - 1939	Biennial Reports of the State Auditor Biennial Reports of the State Treasurer County financial Reports Reports of the State Board of Equalization
Vermont	1791	1796 - 1939	Biennial Reports of the Commissioner of Taxes Biennial Reports of the Treasurer Biennial Reports of the Auditor of Accounts
Virginia	1788	1850 - 1939	Reports of the State Tax Commission Reports relative to the Assessment of Taxes on Property of Corporations Tax Bulletins Annual Reports of the Treasurer Annual Reports of the State Accountant Reports of the Second Auditor Annual Reports of the Auditor of Public Accounts Sydenstricker (1915)

Table A8 continued from previous page

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

III.2.2. Assessment ratios.

Next, we estimate the market 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) Assessment ratio calculations done by the Census Bureau over the period 1850 - 1922 in the *Historical Censuses of Wealth*; (see section II.4 above for details on how these assessment ratios were constructed).

(ii) State reports: we relied on the rich and systematic information on assessment practices collected in annual state reports, in particular by state tax commissions and boards of equalization. For instance, in various states (e.g. in New York, Minnesota, Kansas, California, Maryland, Indiana, Illinois, Wisconsin), state tax commissions accumulated considerable information about sales values of real property and other assets, in order to measure assessment ratios and their distribution across counties. For example, in Kansas, the tax commission gathered information on 40,000 real estate sales for the years 1903 to 1907 in order to compare sale prices to assessed values, offering unique insights on the within-state spatial dispersion of assessment ratios.[11] Furthermore, state reports tend to systematically record and describe significant reforms to the way property assessments are carried out, enabling us to detect variation in assessment ratios at higher frequency than the decadal Census estimates.

(iii) Secondary sources: wherever available, we also collected information from contemporaneous studies by economists, historians, and tax scholars (for instance, Ely (1888); Adams, Thomas S., George E. Benton, Brough, Charles Hillman Schmeckebier and Frederick (1900); Snavely (1916); Blakey and Blakey. (1927); National Industrial Conference Board (1923, 1925); Blakey (1930); Nelson and Mitchell (1931)) that collected ample information on sale prices of assets and documented the ratio of assessment to market values of property. Of particular usefulness are Lutz (1921) and Chapter 12 in Jensen (1931), which contain summaries of studies of assessment ratios by tax commissions across multiple states. The proceedings of the National Tax Association conferences from 1907 to 1925 also offer useful information.

[11] See the Report of the Tax Commission of Kansas for 1908, p. 10. For a similar exercise in Maryland, see the Report of the Commission for the Revision of the Taxation System of the State of Maryland and City of Baltimore, 1912, pp. 73–168.

(iv) Information on assessment ratios given by state tax officials between 1915-1930. These assessment ratios, collected by the Census of *Financial Statistics of States* correspond to self-reported assessment ratios by local assessors.[12]

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

1. First, we start from the Census ratios available for approximately one year per decade from 1850 to 1920.[13] As discussed in section II.4, the Census Bureau devoted considerable resources to the exercise of measuring assessment ratios and the true value of property. As a consequence, the Census data from the decadal *Historical Censuses of Wealth* publications is the most reliable, comprehensive and consistent source of information about assessment ratios across states.

2. In general, changes in assessment practices are slow-moving. As a result, our baseline approach consists in linearly interpolating decadal assessment ratios from the Census for each state to obtain annual assessment ratios series.

3. But in some instances, assessment practices may change abruptly in between two Census publications. Indeed, we note the presence of sharp breaks in some of the time series of assessed values of property. When this is the case, we rely on additional information on assessment ratios provided by State reports and legislation, by secondary sources, or by the *Financial Statistics of States*, capturing assessment basis used by assessors. This information helps us better identify the timing of changes in assessment ratios. We can for instance check in these State sources for the presence of major events (such as the creation of a tax commission or of a State board of equalization) or changes in legislation, which explain these sudden breaks in assessment. Take Ohio for instance. Assessed values exhibit a large and sudden increase from 1910 to 1911. This corresponds to the creation of the State Tax Commission, which led to a large increase in assessment ratios in Ohio, well-documented in the reports of the State Tax Commission.

In section III.2.3 below, we describe the construction of assessment ratios for each state separately: we provide a detailed account of all the variations in assessment practices that

[12]Because of their self-reported nature, the Census characterizes these ratios as being "only approximately correct" (Census 1921, p. 21). We only use them to detect and validate time variations in our estimates from other sources, but not to ascertain the true levels of assessment ratios.

[13]For 1880 and 1902, the Census Bureau 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.2.3.

can be identified in all existing sources that we compiled and how we used this information to build our series of assessment ratios at an annual frequency.

After having created assessment ratio series for each state and year for which we have assessed valuations of property, we divide the assessed valuations by the assessment ratio to obtain a market value of property. We did not attempt to reconstruct separate assessment ratios for real property and personal property. As a result, we obtain our estimates of market value of real and personal property by dividing the assessed values of personal and real property by the same assessment ratio. We finally apply corrections for the value of enslaved individuals, described in section III.3 below.

III.2.3. 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 Census ratios for 1850, 1860 and 1870.
- Use 1880 Census ratio for 1876 - 1879. Note that the decrease in assessed wealth in 1875-1881 is due to the 1873 Panic and the subsequent economic Depression (1873-1879) that had a severe impact on Alabama's economy. Bank failures, reduced investments, and a downturn in the cotton market affected both agricultural and industrial sectors.
- In 1881, efforts are made towards a better equalization of assessed values, as mentioned in the Report of the Auditor. This effort is reflected in an increase in assessed values in 1881. To account for this increase in assessment ratios, we set the 1881 AR such that the (ratio of 1881 AR to 1880 AR) equals the (ratio of 1881 assessed value to 1880 assessed value).
- After this increase in assessment ratio, there is a steady decline in assessment practices, clearly indicated by the Report of the Auditor.
- After the 1886 Report of the Auditor expressed dissatisfaction with underassessments, a gradual increase in assessment ratios is put in place starting in 1887, as explained in the 1887 Report of the Auditor.
- Use 1890 Census ratio for 1891 - 1893.
- Use 1900 Census ratio for 1894 - 1899.

- Linearly interpolate between Census ratios for 1900-1904, and 1904 - 1912.
- Use 1912 Census ratio for 1912 - 1919.
- Use 1922 Census ratio for years 1920 and later.

Alaska Note that Alaska did not levy a general property tax at the level of the whole Territory before 1949, but incorporated towns did. The annual reports of the governor of Alaska provides detailed information about valuation of taxable property for all incorporated towns. A thorough Survey of Taxation exists for 1938. It indicates an average assessment ratio of 60% across towns (see Survey of Taxation 1938, page 31).

- We use 60% assessment ratio as a baseline for all years
- Set 1911-1913 ARs to 0.4 and interpolate between 1907 and 1911. It smooths unjustified drop in the series around 1910.

Arizona

- Use Census ratios for 1870 and 1880.
- Use 1890 Census ratio for 1887.
- Use 20% Census ratio for 1900 to 1904.
- Use 25% assessment ratio for 1905 - 1911.
- Use 1912 Census ratio for 1912.
- Set the 1913-1920 ARs to .8. This accounts for the broadening of the tax base (e.g. intangible property) and the improvement of assessment practices starting in 1913.
- Note that the peak in private wealth from 1913 to 1920 reflects a mining boom, as Arizona was a leading producer of copper. The demand for copper skyrocketed during World War I. Following the end of WWI, reduced copper prices and stockpiled bullion left from the years of high production caused a bust to Arizona's economy.
- Set the 1921 AR to .73.
- 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, 1900-1904, and 1904-1912.
- Use 1912 Census ratio for 1912 - 1921.
- Use 1922 Census ratio for years 1922 and later.

California

- The Historical Censuses of Wealth publication indicates a total true value of property of $21,923,173 for 1850. The Report of the state controller of California in 1854 provides much larger assessed valuations for 1850. The discrepancy could be due to (i) the fact that 1850 was the year that California was integrated in the Union, and (ii) the Historical Censuses of Wealth publication indicates that for some territories, only partial information had been collected. We therefore take the assessed valuation produced in the state reports of the controller as our valuation of property for California for 1850.
- We use the assessment ratio produced by the 1860 Census (Historical Censuses of Wealth publication) for years 1860 and earlier.
- Linearly interpolate between Census ratios for 1860-1870, 1880-1890, 1890-1900, 1900-1902, 1900-1904, 1904-1912, and 1912-1922.
- Set the 1871 AR to the 1870 Census AR.
- The jump in assessment ratios in 1872 reflects the increase in assessed property due to the renovation of the State Board of Assessors and Equalization and the formalization of assessment practices, thanks to the first adoption of the California Political Code on the 12th March 1872 which demanded that all property be assessed at its full cash value. Subsequently, the State Board issued rules and regulations to the Assessors (see Report of the State Board of Equalization for 1872-1873, p.4-6)
- Set the 1879 AR to the 1880 Census AR.
- Linearly interpolate between 1872 and 1879.
- Use 1922 Census ratio for years 1922 and later.

Colorado

- Use Census ratio for 1870.
- Use Census ratio for 1880 for years 1877 to 1870.
- Linearly interpolate between Census ratios between 1880-1890, 1890-1900.
- Use Census ratio for 1900 and 1904.
- We smooth the jump in assessed values around 1900-1904 to smooth unjustified jumps in private wealth by (i) setting the 1901 AR such that the (ratio of 1900 AR to 1901 AR) equals the (ratio of 1900 assessed value to 1901 assessed value), (ii) setting the 1902 AR to .36, (iii) setting the 1903 AR to the 1904 Census ratio.
- Linearly interpolate the Census ratios between 1904-1912.
- Set the 1913 AR to the 1922 Census ratio. This jump in assessment ratio is well-documented in State reports and accounts for the creation of the Colorado State Tax

Commission (see 1913 Report of Tax Commission, p.3-7; and 1914 Report of Tax Commission, p.3)

- The 1915 drop in assessed values is due to a law decreasing the assessment ratio of mining property (see 1915 Report of the Tax Commission, p.8). To account for this change in AR, we (i) set the 1916 AR such that the (ratio of 1913 AR to 1916 AR) equals the (ratio of 1913 assessed value to 1916 assessed value), and (ii) interpolate between 1913 and 1919, passing by 1916.
- Use 1922 Census ratio for 1919 and later

We note that the large peak of wealth observable around 1890 corresponds to the well-documented historical episode of the Colorado Silver Boom, following the discovery of a major silver lode near Leadville in 1878. The Sherman Silver Purchase Act of 1890 invigorated silver mining, and Colorado's last, but greatest, gold strike at Cripple Creek a few months later lured a new generation of gold seekers. The repeal of the Sherman Silver Purchase Act in 1893 led to a staggering collapse of the mining and agricultural economy of Colorado.[14]

Connecticut

- 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).
- Note that until 1896, the grand list that is reported in the annual reports is the "Town Grand List". This List has typically a lower total assessed value than the State Grand List, or than the total assessed value of property estimated in Historical Censuses of Wealth for years 1850 to 1922. For consistency, we therefore report assessed values as the value assessed in the Town Grand List. To convert these assessed values into a true value, we use the fact that for all Historical Censuses of Wealth years, we do have precise estimates from Historical Censuses of Wealth of the total true value of property. Our Census assessment ratios reported in Figure A30 panel A therefore corresponds to the ratio of the Historical Censuses of Wealth estimate of total true value for that year divided by the assessed value in the Town Grand List for the same year available from State reports.
- Use 6% assessment ratio stipulated by the 1808 Statutes for year 1790 - 1820.

[14] See https://en.wikipedia.org/wiki/Colorado_Silver_Boom

- For the period 1808 to 1850, we observe (i) discontinuous drops in aggregate valuation of property in the grand list in 1821, 1828, and 1845. This decline in assessment ratios over the period is attested by the fact that the 1850 Census estimated a 3% assessment ratio, despite the assessment ratio of 6% indicated in the 1808 Statutes and in state records. To account for this, we adjust downwards the assessment ratio in three steps, to reflect the observed decline in assessed values in 1821, 1828, and 1845. More precisely, we use 4.4% assessment ratio for 1821 - 1827, 4% for 1828 - 1844, and 3.6% for 1845.
- Use 1850 Census ratio for 1850 and linearly interpolate assessment ratio between 1846 and 1850. Note that the 3% assessment ratio corresponds to the ratio mentioned in the revision of the statutes of 1851, p.53, Section 8.
- Linearly interpolate between 1850 and 1861 using 1850 and 1860 Census ratios, and following the same trend for 1861
- In 1860, property was required to be set in the Grand List at its actual valuation. The change becomes effective in the Grand List in 1862. This leads to a large increase in assessed values. To account for the fact that properties did not end up assessed at their full value, we use instead the assessment ratio estimated by the Census in 1870 for all years 1862 to 1870.
- Linearly interpolate between ratios for 1870-1880, 1880-1890, 1890-1900, 1900-1904, and 1904-1912
- Set 1913-1920 ARs to 1912 ratio
- Use 1922 Census ratio for years 1921 and later

Note also that from 1910 to 1922, Connecticut conducted a detailed quadrennial survey of the value of all tax-exempt property. The State of Connecticut also published manuals destined to assessors for property valuations, which offer a unique description of assessment practices.

Delaware

- Use Census ratio for years 1850, 1860, 1870, 1880.
- Linearly interpolate between Census ratios for 1880-1890, 1890-1900, and 1912-1922
- Set 1901 and 1902 AR to the 1912 Census ratio to smooth the drop in assessed values in this period. The drop is actually due to the change on the manufactures' tax due to the passage of the Act of March 12, 1901 (see 1913 Report of the Tax Commission, p.12-13)
- Use 1904 Census ratio for 1903 - 1911
- Use 1922 Census ratio for years 1922 and later

District of Columbia

- Use Census ratio for years 1850, 1860 and 1870
- Set 1877-1878 ARs to 1870 Census ratio to turn the unjustified sudden increase in private wealth into a smooth increase
- Linearly interpolate between Census ratios for 1880-1890, and 1890-1900
- Set (i) 1902,1903 and 1905 to the 1904 Census ratio, (ii) 1906-1908 AR to .45, and (iii) 1909-1917 AR to 1912 Census ratio to smooth the drop in 1902 assessed value and retrive a justified trend in private wealth
- Set 1918-1921 ARs to .7 to smooth the private wealth series, in order to compensate for the jump in assessed value du to the introduction of intangible property into the property tax (see 1919-1920 Report of the Auditor, p.6)
- 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, 1900-1904, 1904-1912, and 1912-1922
- Use 1922 Census ratio for years 1922 and later

The boom in private wealth and assessed values in the 1920s is due to the Florida land boom, that faded away in the second half of the 1920s[15]. Thus, growth in total assessed valuation in those years is mostly driven by the growth in the valuation of real estate (see 1929 Report of the Comptroller, p.434).

Georgia

- Use Census ratios for years 1850 and 1860
- Use 1860 Census ratio for 1860-1864
- Use 1870 Census ratio for 1865-1874
- Use 1880 Census ratio for 1879-1880
- Linearly interpolate between Census ratios for 1880-1890, 1890-1900, 1900-1904, 1904-1912, and 1912-1922
- Use 1921 ratio in the Financial Statistics of States for 1920
- Use 1922 Census ratio for years 1922 and later

[15] see https://en.wikipedia.org/wiki/History_of_Florida and https://en.wikipedia.org/wiki/Florida_land_boom_of_the_1920s

The increase in per capita assessed property in 1860-64 has two main explanations:

(i) In April 1863, an extra session of the Legislature requiring all persons to return their property at its fair market value. It led to a tremendous increase in the property returned in 1863 compared with 1862 (see 1863 Report of the Comptroller General, partI p.4-5)
(ii) The prices of lands surged (see 1863 Report of the Comptroller General, part I p.5, part II p.2-5; and 1864, part I p.5, part II p.134-7).

The drop in per capita assessed property in 1866 is consistent with reports and the historical context:

(i) the drop in property following the Civil War under its 1860 value (see 1866 Report of the Comptroller General, part 1, p.27 and Tables A to E in part 2, p.2-31)
(ii) the devastating effects of Sherman's march in Georgia which started in December 1864 (see https://en.wikipedia.org/wiki/History_of_Georgia_(U.S._state)).

Our adjustment in AR series aim at taking those historical facts into account.

Also note that the decrease in assessed values and private wealth in the middle of the 1890s is due to a financial depression (see 1902 Report of the Comptroller General, p.5)

Hawaii

- The Historical Censuses of Wealth reports did not estimate the property of Hawaii.
- We use the 1930 assessment ratio reported in the Financial Statistics of States throughout.

Idaho

- We use Census ratio for years 1850 and 1860.
- We linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1904.
- Use 1904 Census ratio for 1905 - 1910
- In early 1910s, Idaho made important reforms to assessment and equalization practices (see e.g. recommendations of the State Auditor in his 1909-1910 Reports) leading up to the creation of the State Tax Commission. Assessment ratios were increased significantly in 1911 as a result. While State sources indicate that assessment ratios went from 40% to 100%, this seems unrealistic. First because the 40%

ratio in 1910 appears too high relative to Census estimates for 1900 and 1904. Second, because the 100% ratio appears too high relative to the 1912 Census ratio. We therefore keep the 1910 ratio to the 1904 Census ratio level and we set the 1911 AR to .7 to match the observed increase in assessed value between 1910 and 1911.

- We linearly interpolate between Census ratios for 1912-1922.
- 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, 1900-1904
- The creation of the Board of Equalization in 1873 led to a significant but temporary increase in assessment ratios documented in State reports. Concretely, we: (i) use 1870 Census ratio for 1870-1872; (ii) set the 1873 AR so that the (ratio of 1872 AR to 1873 AR) equals the (ratio of 1872 assessed value to 1873 assessed value); (iii) linearly interpolate from 1874 to 1880 to reach the 1880 Census ratio.
- In 1899 and 1900, the small jump and subsequent drop in assessed value is entirely driven by a temporary change in assessment practices in Cook county. This is abundantly commented in the Reports of the Illinois State of Board of Equalization of 1899 and 1900. The change in assessment practices in Cook county was sufficiently large that it made newspapers headlines throughout the U.S. (see for instance, this article of New York Times of June 2nd 1899.) We have decided not to adjust the value of the Illinois state assessment ratio for this historical episode, as this change in assessment only affected Cook county.
- In 1909, assessment ratios increased in exchange for a decrease in the rate of the state property tax, although no specific regulation was passed to specify a new rate of assessment. In order to smooth the jump in assessed value in 1909, we: (i) apply the 1900-1904 slope in ARs to 1905-1908; (ii) set the 1909 AR such that the (ratio of 1908 AR to 1909 AR) equals the (ratio of 1908 assessed value to 1909 assessed value); (iii) linearly interpolate from 1909 to 1912, to reach the 1912 Census ratio value.
- The creation of the Tax Commission in 1919 led to a sharp rise in assessment ratios due to improved assessment practices that are well-documented in the reports of the board of equalization. Concretely we: (i) use the 1922 Census ratio for 1919-1926; (ii) set the 1918 AR such that the (ratio of 1918 AR to 1919 AR) equals the (ratio of 1918 assessed value to 1919 assessed value); (iii) linearly interpolate between the 1912 Census ratio and 1918

- There is a well-documented increase in assessment ratios in 1927 (see for instance reported basis of assessment in practice for Illinois in the Financial Statistics of States). The overall levels of these reported ratios are generally too high relative to the ratios estimated by the Decennal Census reports. We therefore match the jump in ratios reported in 1927 by the Financial Statistics of States for Illinois, but not the levels. Concretely, we use a 40 % assessment ratio for years 1927-1930.

Indiana

- Use 1850 Census ratio for years 1850 and earlier
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870.
- There is a significant increase in assessed values in 1873, but the exact changes in assessment practices responsible for this increase is not well documented. To account for this increase in assessment, we: (i) set the 1873 AR such that the (ratio of 1873 AR to 1872 AR) equals the (ratio of 1873 assessed value to 1872 assessed value); (ii) linearly interpolate between 1873 and 1880 to reach the 1880 Census ratio
- Linearly interpolate between Census ratios for 1880-1890.
- The creation of the Tax Commission in 1891 led to an increase in assessment in 1891. We account for this by increasing the AR in 1891 to the Census 1900 ratio level.
- We linearly interpolate between Census ratios for 1900-1910
- Set the 1903 AR to the 1902 AR to slightly smooth the series.
- Assessed values surged due to the extended powers given to the Board of Tax Commissioners in 1918. This surge is well-documented in the reports of the Tax Commission. In practice we: (i) set the 1918 AR to the 1918 State Records ratio[16], and (ii) linearly interpolate between the 1912 Census ratio and the 1918 State Records ratio
- We use the 1922 Census ratio for 1919 and later.

Iowa

- We use 1850 Census ratio for 1850.
- We 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 1922-1930

[16]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.

Kansas

- Use 1850 Census ratio for 1850.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1904, and 1912-1922
- The creation of the Tax Commission led to a surge in assessed values. This is surge is well-documented in various sources. In practice, we: (i) use 16.5% ratio for 1907[17]; (ii) linearly interpolate between 1904 Census ratio and 1907; (iii) use 80% assessment ratio for 1908[18]; (iv) linearly interpolate between 1908 and the 1912 Census ratio
- Use 1922 Census ratio for 1922 and after

Note that the rise and fall of private property around 1920 is due to the Kansas Oil Boom following the discovery of the El Dorado oil field in 1915, as well as the expansion of the farm economy during WWI. The collapse of wheat prices led to a bust in property values starting in 1922. The report of the Tax Commission speaks of "falling market prices of almost all classes of animals in the state, and of the different varieties of grain held by farmers, and by the general tendency downward of prices of most kinds of personal property" (see 1921-1922 Report of the Tax Commission, p.179).

Kentucky

- 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, 1904-1912
- The creation of the Tax Commission led to a well-documented jump in assessment ratios. In practice we: (i) use 1912 Census ratio for 1912-1914; (ii) set 1915-1917 AR to 50%; (iii) use 1922 Census ratio for 1918 and later years

Louisiana

- Use 1850 Census ratio for 1850.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1904, 1904-1912
- Use 1912 Census ratio for 1912-1917
- The creation of the Tax Commission led to a sharp increase in assessment ratios in 1918. We use 50% ratio for 1918-1921 (in line with Financial Statistics of States)
- Use 1922 Census ratio for 1922 and later years

[17] cf Proceedings of 1908 National Tax Association conference reported in its digest, p. 225.

[18] Reform of the basis of assessment in 1908 cf. Jensen (1931, p. 473), the Historical Censuses of Wealth 1912 estimated the new assessment ratio to be around 80% (see p. 20)

Maine

- Use 1850 Census ratio for 1850 and earlier years
- Use Census ratios for 1860, 1870, 1880 and 1890.
- Linearly interpolate between Census ratios for 1890-1900, 1900-1904, 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, 1900-1912, and 1912-1922
- The jump in assessed values in 1896 is due to a change in assessment laws and the appointment of a Boards of Control and Review (see 1897 Report of the Tax Commission, p.6,8-9). To smooth this jump, we: (i) set the 1896 AR so that the ratio of 1894 AR to 1896 AR equals the ratio of 1894 assessed value to 1896 assessed value; (ii) linearly interpolate between 1896 and the 1900 Census ratio
- Use 1922 Census ratio for 1922 and later years

Massachusetts

- Use 1850 Census ratio for 1850
- 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
- The creation of the Board of Equalization led to a sharp increase in assessments. In practice, we: (i) set the 1851 AR to 40% and the 1852 AR to 30%; (ii) set the 1853 AR to 68%; (iii) use 1860 Census ratio for 1854-1860
- Linearly interpolate between Census ratios for 1860-1870, 1870-1880, 1880-1890, 1890-1904, 1904-1912
- Set the 1903 AR to 1904 Census ratio to account for the jump in assessed value in 1903 due to the entry of railroads, and express, telephone and telegraph companies into the *ad valorem* tax from March 1, 1903 on (see Act No. 173 of the 1901 Legislature discussed in the 1903-1904 Report of the Tax Commission, p.8-9)

- Use 1912 Census ratio for 1912-1919
- Use 1922 Census ratio for 1920 and later years

Minnesota

- Use 1850 Census ratio for 1850 and earlier years
- Linearly interpolate between Census ratios for 1860-1870, 1880-1890, 1890-1900, and 1904-1912
- In 1873, the Board of Equalization significantly increased the assessments of property values. The increases in assessment ratios mandated by the new equalization procedure, county by county, are very well-documented (see for instance, 1873 Report of the Auditor, p.53). To account for this surge, we: (i) set 1871-1873 AR to the 1870 Census ratio; (ii) set the 1874 AR so that the (ratio of 1873 AR to 1874 AR) equals the (ratio of 1873 assessed value to 1874 assessed value); (iii) linearly interpolate between 1874 ratio and 1880 Census ratio
- Use 1900 Census ratio for 1900-1901, use 1904 Census ratio for 1902-1904
- Use 1912 Census ratio for 1912 - 1919
- Set 1920 AR to 32%, set 1921 AR to 30% to account for the temporary increase in assessment ratios documented in the Financial Statistics of States.
- Use 1922 Census ratio for 1922 and later years

Note that the drop in property values in 1896 corresponds to a regional banking panic crisis that hit Minnesota[19].

Mississippi

- Use Census ratios for 1850, 1860, 1870 and 1880
- Linearly interpolate between Census ratios for 1880-1890, 1890-1900, 1900-1904, and 1904-1912
- The creation of the State Tax Commission led to an increase in assessments. In practice, we: (i) use 25% assessment ratio for 1915-1916 (i.e. the Financial Statistics ratio for 1915) (ii) linearly interpolate AR between the 1912 Census ratio and the 1915 Financial Statistics ratio (iii) we use the 1922 Census ratio for 1917 and later years

Missouri

[19] see https://www.federalreservehistory.org/essays/banking-panics-of-the-gilded-age

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

Note the belated effect of the creation of the Tax Commission on assessed values. It only became effective after, in 1921, a representative from the Tax Commission visited various counties to give "help, information and instructions to the various officers as would promote efficiency and uniform compliance with the law" (see 1921-1922 Report of the Tax Commission, p.36-38).

Montana

- Use Census ratios for 1870, 1880 and 1890.
- Linearly interpolate between Census ratios for 1900-1912
- There is a drop in assessment ratios in 1920 following the banking crisis in Montana. We stick closely to the documented evolution of ARs in the Financial Statistics. In practice, we: (i) set the 1918 AR such that the ratio of 1918 AR to 1920 AR equals the ratio of 1918 assessed value to 1920 assessed value; (ii) linearly interpolate between 1912 Census ratio and 1918 ratio
- Use 1922 Census ratio for 1920 and later years

Note: The economy of Montana was badly hit by the post WWI slump, with agricultural prices plummeting. This led to a statewide banking crisis, with more than half of banks disappearing in Montana over the period 1920-25. See https://mhs.mt.gov/education/WWI/MontanaBanking1910-1925_1.pdf.

Nebraska

- Use 1860 Census ratio for 1860
- Linearly interpolate between Census ratios for 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1904-1912
- Use 1900 Census ratio for 1900-1903
- Use 1912 Census ratio for 1912-1919

- The creation of the Tax Commission led to a sharp increase in AR. We stick closely to the documented increase in AR in the Financial Statistics. In practice, we: (i) Use 16% ratio in 1920 (ii) 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
- Set the 1901 ratio to the 1902 ratio
- Use 1922 Census ratio for 1921 and later years

Note that the tremendous increase in assessed property starting in 1904 is driven by the mining boom. The surge is particularly impressive for years 1906 to 1907 (see Report of the State Controller from 1907 on, p.22) and due to counties like Esmeralda, Lincoln, Nye where gold and silver production more than tripled in 1906-1907 (see Annual Report of the State Controller for detailed county tables - 1906: p.33, 1907: p.31). Also note that the annual assessment for 1906 is described as "incomplete" in Reports of the State Controller, even in later years (e.g 1918 summary table, p.22). It actually seems that the assessed value of property is unreported in the Nye County in 1906 (p.33). Thus, the series might slightly overestimate the true jump in assessed property between 1906 and 1907.

New Hampshire

- Use Census ratio for 1850, 1960, 1870 and 1880.
- Linearly interpolate between Census ratios for 1880-1890, 1890-1900, 1904-1912, and 1912-1922
- Set 1902 ratio to 45%
- Use 1904 Census ratio for 1903-1904
- The drop in assessed values in 1909 is due to savings bank deposit, building and loan association capital stock, and insurance capital not being reported in state reports anymore. To account for this change in assessed property reported, we set the 1909 AR such that the ratio of 1908 AR to 1909 AR equals the ratio of 1908 assessed value to 1909 assessed value
- The creation of the Tax Commission led to an increase in assessed values. We set the 1911 AR such that the ratio of 1912 AR to 1911 AR equals the ratio of 1912 assessed value to 1911 assessed value.

- Linearly interpolate between 1909 and 1911
- Use 1922 Census ratio for 1922 and later years

New Jersey

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

New Mexico

- Use Census ratio for 1850, 1860, 1870, 1880.
- Use 1870 Census ratio for 1870-1879 and 1881
- In 1882, the creation of the state board of equalization led to an increase in assessed values. We set the 1882 AR such that the private wealth value in 1882 corresponds to a linear interpolation between the Census true values of 1880 and 1890.
- Use Census ratio for 1890
- Linearly interpolate assessment ratios between 1900 and 1904 for which we have assessment ratio estimates from the Census (i.e. in effect, this sets the 1902 ratio to 18%).
- Use 1912 Census ratio for 1912-1915
- The creation of the Tax Commission led to a sharp increase in assessments in 1916, which is well documented, and also observable in the AR reported in Financial Statistics. We account for this surge by setting the 1916-1921 ratio to 50%
- 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, 1904-1912, and 1912-1922
- Use 1900 Census ratio for 1900-1903
- Use 1922 Census ratio for 1921 and later years

North Carolina

- Use Census ratio for 1850, 1860 and 1870.

- Linearly interpolate between Census ratios for 1870-1880, 1880-1890, 1890-1900, 1900-1904, and 1904-1912
- The creation of the Tax Commission led to a well-documented increase in assessment ratios. In practice we: (i) set 1902 AR to 1901; (ii) set 1903 AR to 1904 Census ratio
- Before the Revaluation Act, assessment ratios continued to decline. We therefore prolong the 1904-1912 declining trend in ARs to the period 1913-1919
- The 1919 Revaluation act had an important impact on AR, by standardizing property valuation. This is well documented in a special report of the state Tax Commission for 1920.[20] We set 1920 AR to 80%
- Use 1922 Census ratio for 1921 and later years

North Dakota

- Use 1890 Census ratio for 1890 or earlier years
- Linearly interpolate between Census ratios for 1890-1900, 1900-1904, 1904-1912
- Use 1912 Census ratio for 1912-1919
- Note that in 1919, North Dakota experienced an important change in the basis of assessment which considerably increased all valuations (see 1932 Proceedings of the Board of Equalization of 1932, p. 96).[21]
- Use 1922 Census ratio for 1920-1922
- Use 50 % ratio for 1923 or later years (ratio estimated by the Board of Equalization in 1932, p.95)

The sharp increase in private wealth starting in 1915 corresponds to the agricultural boom and bust due to World War I. The demand for wheat and other crops surged, leading to higher prices and increased farming activity. After the war, European agricultural production recovered, leading to a drop in demand for American crops. This resulted in plummeting prices and financial distress for North Dakota farmers.

Ohio

- Use 33% ratio for 1846 or earlier years

[20] See Report of State Tax Commission on Revaluation, available here.

[21] The State Constitution was limiting tax rates on property to 4 mills. Owing to the fact that sufficient state revenues could not be raised due to the assessment ratios prescribed by the Classification Law of 1917, the Legislature in 1919 passed a new Classification Law under the provisions of which property was divided into two classes. Class One (essentially railroads and other public utilities) was required to be valued and assessed at 100% of true value and Class Two at 50% of true value.

- Use 1850 Census ratio for 1847-1849,
- Note that there were several well-documented revaluations of real property. The most important happened in 1847, 1854, 1871. These revaluations led to increases in assessment ratios.
- The largest of these, in 1847, was due to the "Kelley Law". While the Ohio General Assembly had established a general property tax in 1825, the Kelley Law specified for the first time that all real and personal property should be subject to taxation, amending the previous legislation, which left much personal property exempt (Bates, 1888; Scheiber, 1978).
- Apart from these episodes of revaluations, we linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1904, 1904-1910 and 1912-1922
- In 1911, there was a sudden increase in assessment ratios following the creation of the State Tax Commission. The surge in assessment ratios is well-documented. In practice, we (i) use 33% assessment ratio for 1910 (this ratio is the one documented in Historical Censuses of Wealth for the period just before the creation of the State Tax Commission, cf. Historical Censuses of Wealth 1912 Assessed Valuation p. 28. available here, (ii) use 1912 Census ratio for 1911
- Note that there were also small partial revaluations, under the Warnes law, in 1914, 1915 and 1920. But in the absence of precise information and given their limited effect on assessed values, we did not attempt to correct for them.
- We use 1922 Census ratio for 1922 and later years

Oklahoma

- Use 1900 Census ratio for 1900 and earlier years
- Linearly interpolate between Census ratios for 1900 - 1904
- There was a decline in assessment ratio prior to 1907. We set ratios to 17% in 1905, 14.5% in 1906, 11% in 1907
- In 1907, Oklahoma entered the Union and moved to a full cash basis for assessment, leading to a very sharp increase in assessment ratios to 51.5% in 1908.
- We apply the same trend in AR decline in assessment to 1908-1912 after reform towards use full cash basis for assessment: 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

Oregon

- Use 1850 Census ratio for 1850.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1890-1900, 1900-1904, and 1912-1922
- For the period 1884 to 1890, we account for the observed decline in assessed values by linearly interpolating between the Census ratio for 1880 and an AR of 25% for 1889. The resulting increase in AR between 1889 and 1890 does match the observed increase in assessed values.
- Use 40% ratio for 1907-1909 and linearly interpolate between 1904 Census ratio and 1907
- Use 1912 Census ratio for 1910-1912
- Use 1922 Census ratio for 1922 and later years

Pennsylvania

- Use 1850 Census ratio for 1850.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, and 1900-1904
- Use 1922 Census ratio for 1913 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. We assume a similar ratio for 1795.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1880-1890, 1890-1900, 1900-1904, and 1912-1922
- Use 1870 Census ratio for 1871-1879
- Set the 1881 AR such that the (ratio of 1880 Census ratio to 1881 AR) equals the (ratio of 1880 assessed value to 1881 assessed value)
- Linearly interpolate between 1881 and 1890
- Set the 1905 AR such that the (ratio of 1904 AR to 1905 AR) equals the (ratio of 1904 assessed value to 1905 assessed value)
- Set 1902 AR to 1905 AR
- Set the 1911 AR such that the (ratio of 1912 AR to 1911 AR) equals the (ratio of 1912 assessed value to 1911 assessed value)

- Linearly interpolate between 1905 and 1911
- Use 1922 Census ratio for 1922 and later years

South Carolina

- Use 1850 Census ratio for 1850. We assume a similar ratio for 1795.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1912, 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
- The creation of the state tax commission led to a sharp and well-documented increase in assessment ratio. We 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, 1900-1904, 1904-1912
- Use 1860 Census ratio for 1860-1864
- Use 1870 Census ratio for 1865-1870
- Extrapolate declining trend 1904-1912 for 1913-1919
- The 1919 jump in assessed values results from the extension of the Board of Equalization following legislative action. After its creation in 1895 and until 1919, it had just been dedicated to railroads and telegraphs. This new Board of Equalization started its work in 1919, with first effects in 1920 (see 1922 Report of the State Tax Commissioner, part 1, p.28). This led to a well-documented jump in AR jumps to 60% ratio (see Tax Commission 1922).
- 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, 1900-1904, and 1912-1922
- Use 1904 Census ratio for 1904-1907
- Use 1912 Census ratio for 1908-1912
- 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
- In 1915, the 1915 Legislature passed a law limiting the levies and necessitating a sharp and well documented increase in assessment of all property. (see 1915-16 Report of the Board of Equalization, p.5). We use a 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.
- Linearly interpolate between Census ratios for 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1912, and 1912-1922
- Use 1922 Census ratio for 1922 and later years

Note that the 1890 peak in the assessed value is due to the introduction of a statewide property tax (see the 1893-1894 Report of the Tax Commission, p.3 mentionning the "Laws of 1890"; and https://vermonthistory.org/journal/76/VHS760101_1-18.pdf).

Virginia

- 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, 1904-1912, and 1912-1922

- Use 1870 Census ratio for 1870-1877
- Use 1880 Census ratio for 1878-1880
- 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, 1900-1904, and 1912-1922
- Use 1900 Census ratio for 1891-1900
- Set the 1892 AR such that the (ratio of 1891 AR to 1892 AR) equals the (ratio of 1891 assessed value to 1892 assessed value), to take into account the fact that assessed property was highly undervalued in 1892 according to the State Auditor (see 1891-1892 Report of the State Auditor 1891-92, p.15).
- Use 1904 Census ratio for 1904-1905
- Use 1912 Census ratio for 1906-1912
- Use 1922 Census ratio for 1922 and later years

Note the particularly impressive boom and bust of private wealth around 1890. The bust followed the *Panic of 1893*, which led to the first large scale depression in Western states, hitting particularly badly Washington State. This episode is well-documented in Ramsey, Bruce (2018). The Panic of 1893: The Untold Story of Washington State's First Depression. Caxton Press. ISBN 978-0870046216.

West Virginia

- Use 1870 Census ratio for 1870.
- 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
- The creation of the tax commission led to a sharp increase in assessment ratios to 60% in 1905 (See Proceedings of 1907 National Tax Association conference reported in its digest, p. 17).
- Linearly interpolate between 1905 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, 1890-1900, and 1904-1912
- The creation of the tax commission led to an increase in assessments starting in 1901. In practice we set 1901-1903 ARs to 1904 Census ratio
- Set 1912-1915 and 1920-1921 ARs to the 1912 Census ratio
- Set the 1916 AR such that the (ratio of 1915 AR to 1916 AR) equals the (ratio of 1915 assessed value to 1916 assessed value)
- Interpolate between 1916 and 1920
- Use 1922 Census ratio for 1922 and later years

Note that the 1899-1902 period covers a transition towards more efforts in the assessment process, to secure a better compliance with the law (see 1901-1902 Report of the Tax Commission, p.11 and p.16). It echoes the increasing trend in assessed values observed in this period.

Since 1903, railroads have been assessed by the State Tax Commission on an *ad valorem* basis – under the "Unit Rule" – and taxed at the average state rate (see 1954 Report of the Tax Commission, p.6). Before 1903, an annual license fee was instead used, in lieu of taxes upon property and franchises. Street railway and Telegraph companies experienced the same transition in 1907-1908 (see 1905-1906 Report of the Tax Commission, p.123; and 1907-1908 Report of the Tax Commission, p.89). In 1925, other utilities were brought under this same Unit Rule of assessment, and taxed at the average state rate in 1929.

In 1927, the legislature repealed the long standing statute which provided for the assessment of the shares of banks as general property and substituted therefor the corporation income tax (see 1930 Report of the Tax Commission, p.38).

Wyoming

- Use 1870 Census ratio for 1870 and earlier years
- Linearly interpolate between Census ratios for 1880-1890, 1890-1900, and 1900-1904
- Use 1870 Census ratio for 1870-1879
- Use 1904 Census ratio for 1905-1906
- Set the 1907-1908 ARs such that the (ratio of 1906 AR to 1907 AR) equals the (ratio of 1906 assessed value to 1907 assessed value)
- The creation of the tax commission in 1909 led to a well-documented increase in assessment ratios. In practice, we set the 1909 AR such that the (ratio of 1908 AR to

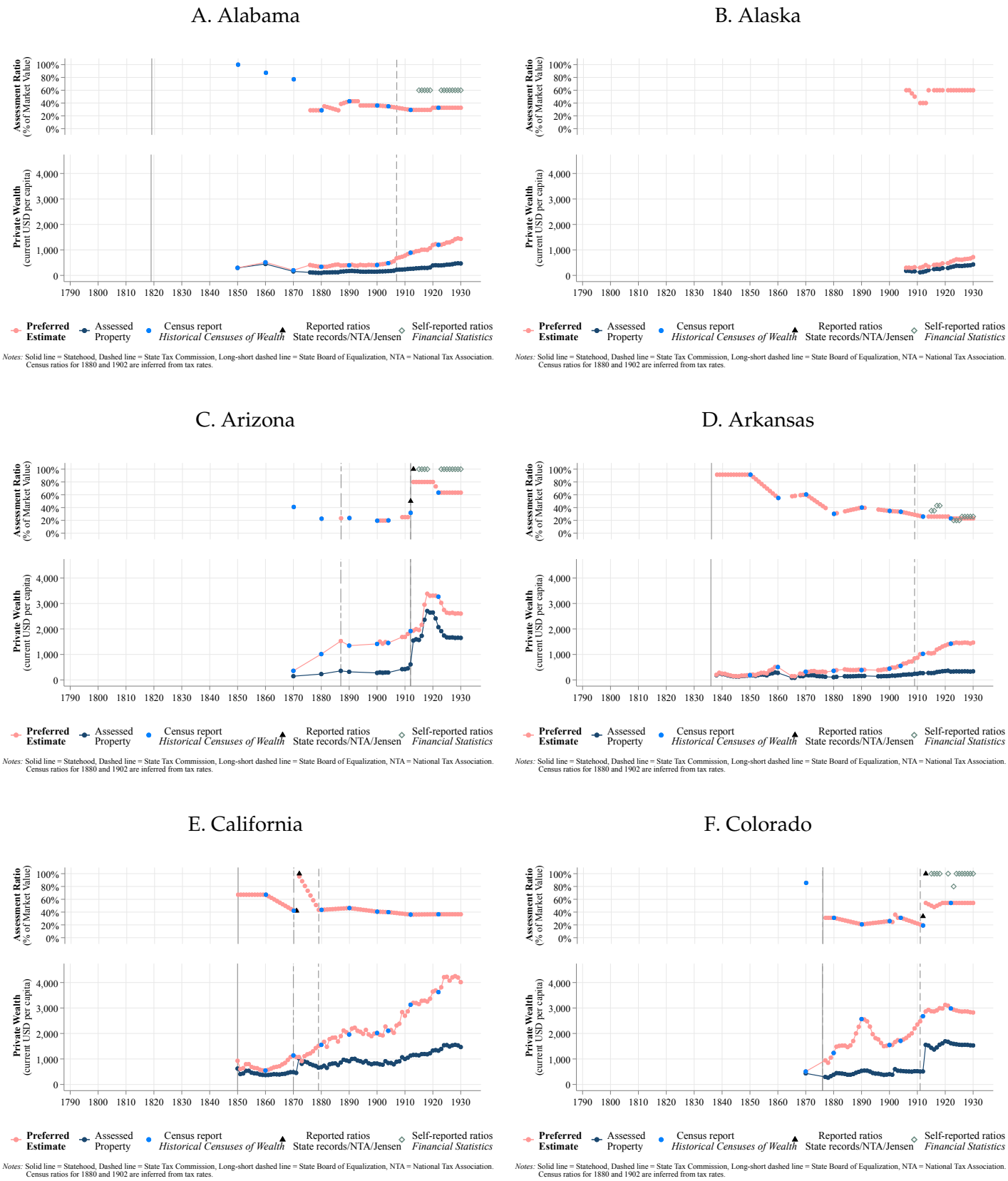
1909 AR) equals the (ratio of 1908 assessed value to 1909 assessed value)

- Linearly interpolate between 1909 and 1912 Census ratio
- Use 1922 Census ratio for 1913-1919 and 1922
- Use 60% ratio for 1920-1921 and 70% ratio for 1923 and later years (Financial Statistics of States for 1921 and 1923-1930 respectively)

Note the impressive increase in property values from the 1870s to the mid 1880s. It corresponds to the well-documented "Wyoming cattle boom" (1868-1886). The boom was led to an end by arctic winter temperatures for a series of winters that decimated herds, while global beef prices were also plummeting.[22]

[22]See for instance https://www.wyohistory.org/encyclopedia/wyoming-cattle-boom-1868-1886

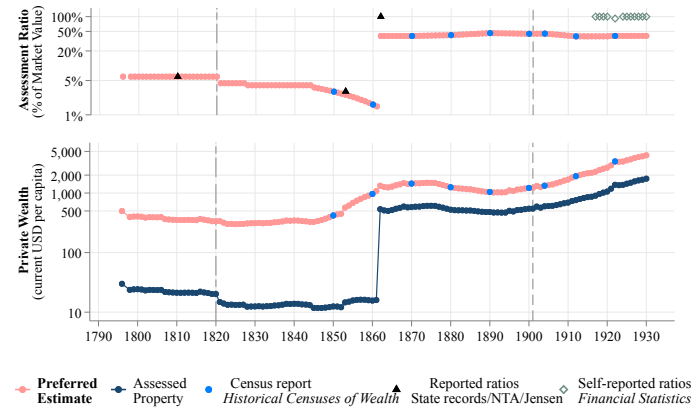
Figure A29: Assessed Property Value, Assessment Ratio and Private Wealth series



Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions).

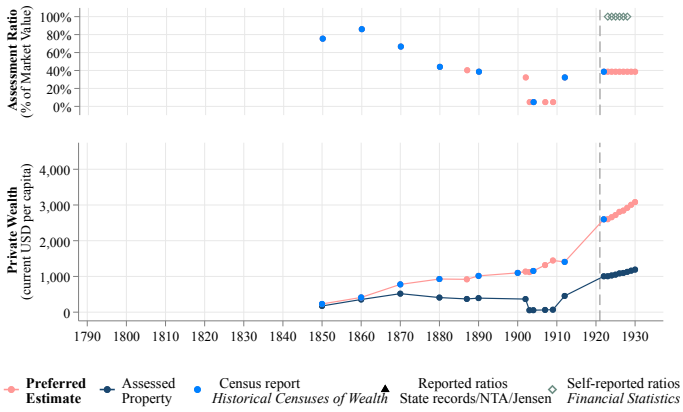
Figure A30: Assessed Property Value, Assessment Ratio and Private Wealth series

A. Connecticut



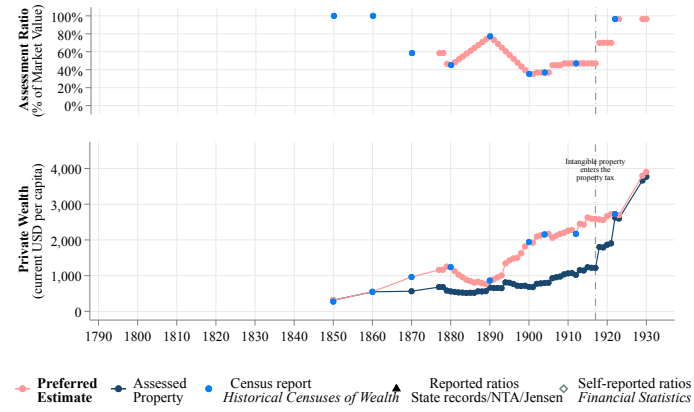
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

B. Delaware



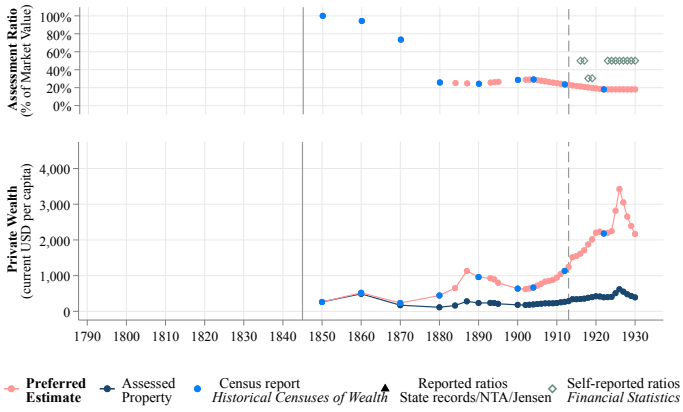
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

C. District of Columbia



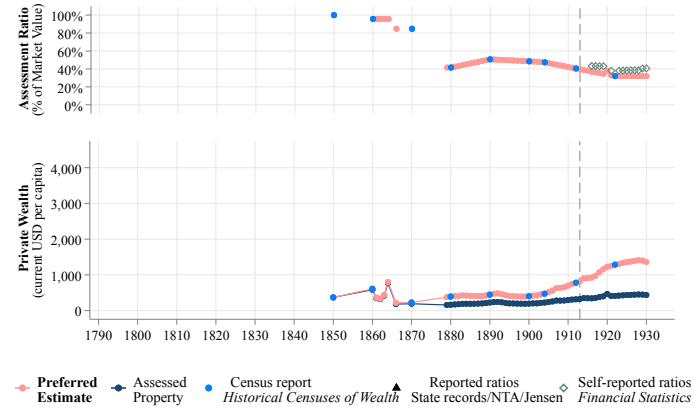
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

D. 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.

E. Georgia



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.

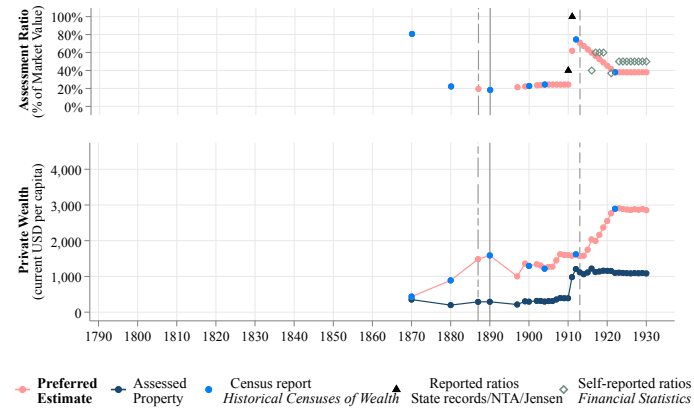
F. Hawaii

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.

Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions). A log transformation is applied to the y-axis of Connecticut.

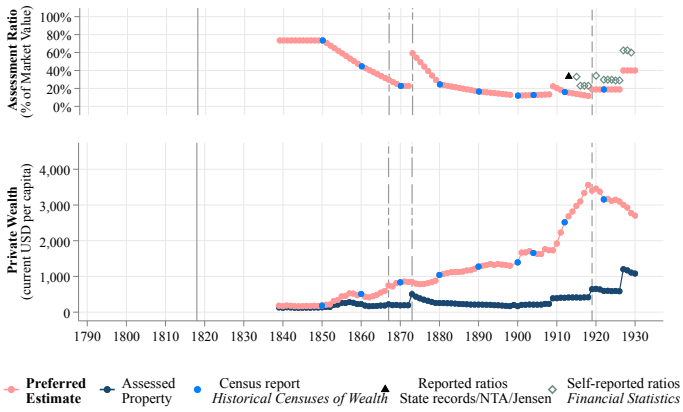
Figure A31: Assessed Property Value, Assessment Ratio and Private Wealth series

A. Idaho



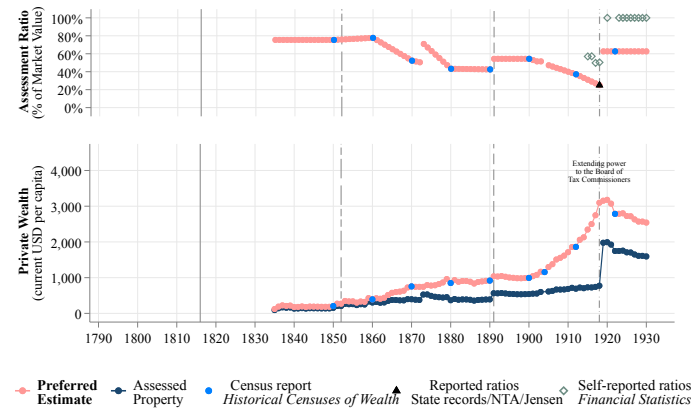
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

B. Illinois



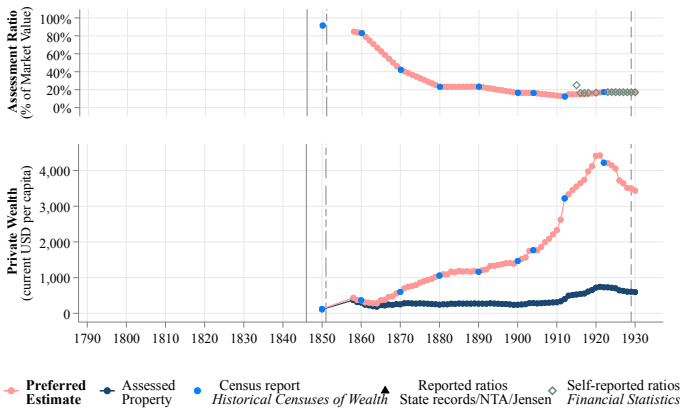
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

C. Indiana



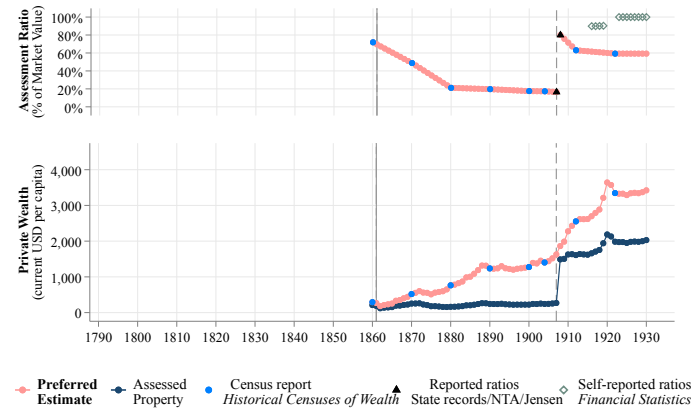
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

D. Iowa



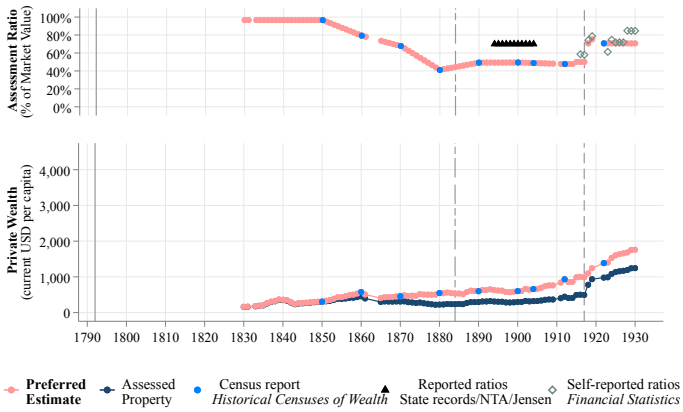
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

E. 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.

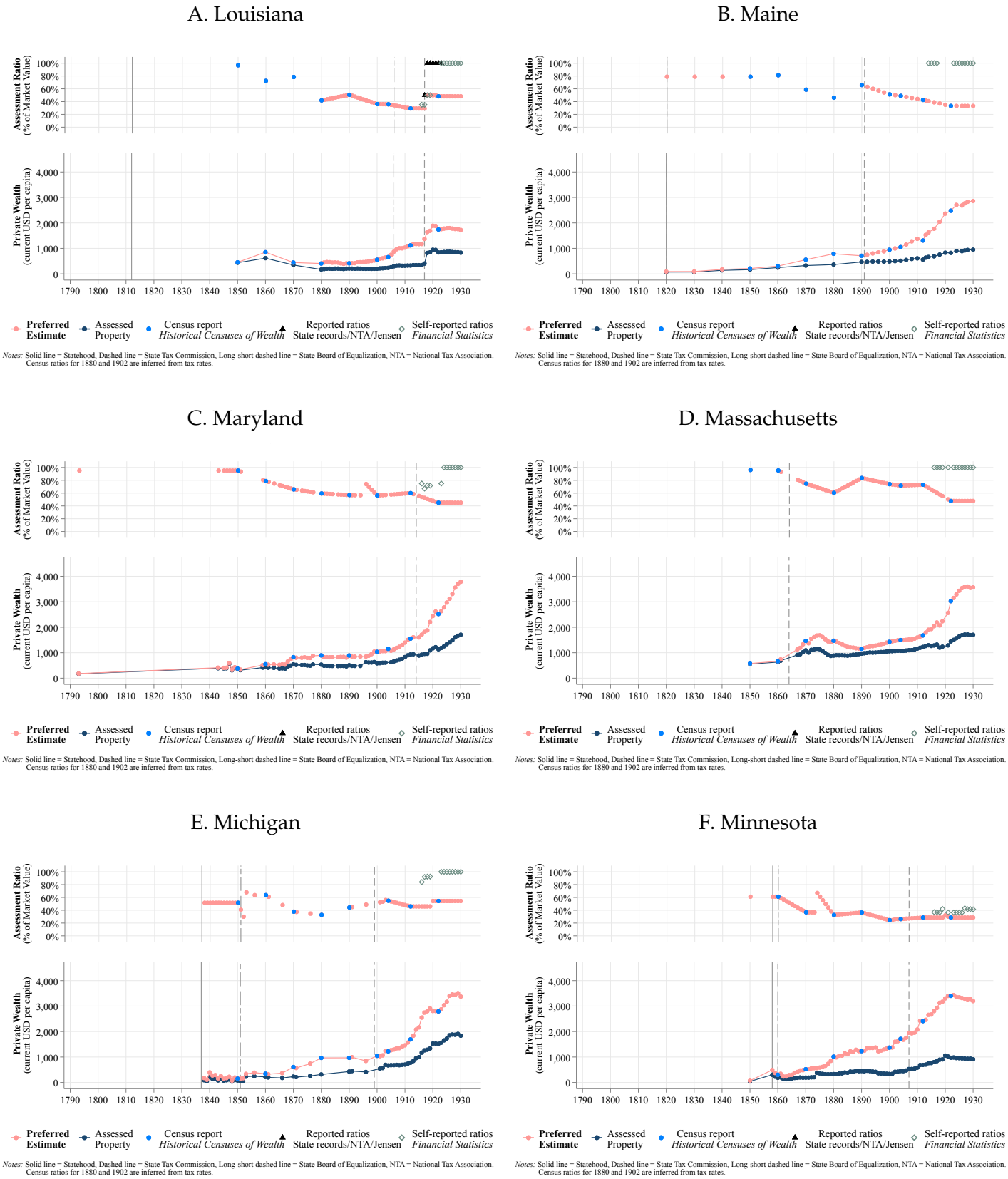
F. Kentucky



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.

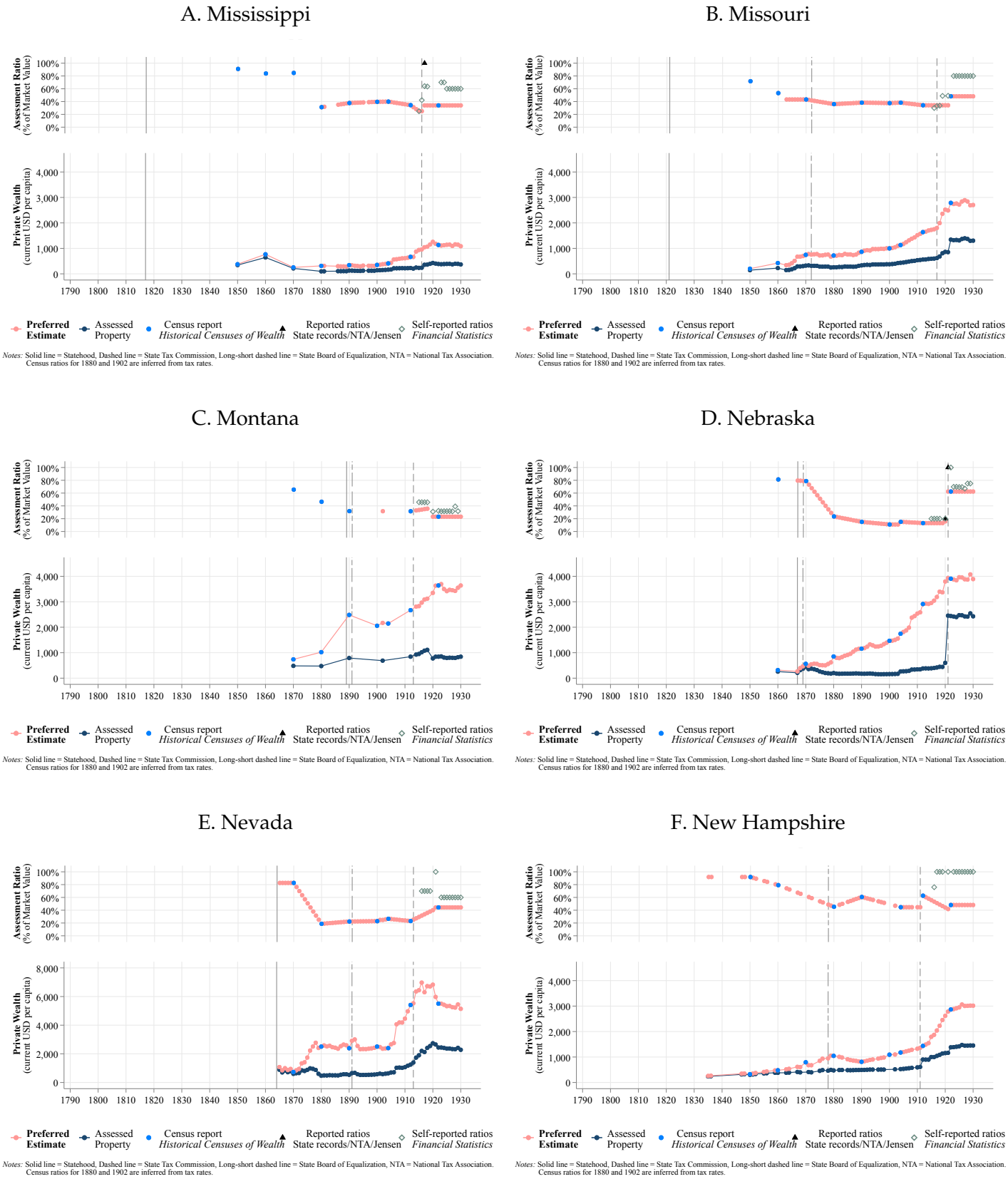
Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions).

Figure A32: Assessed Property Value, Assessment Ratio and Private Wealth series



Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions).

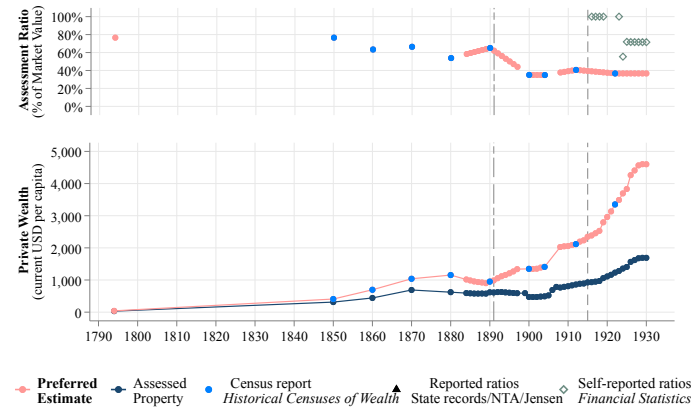
Figure A33: Assessed Property Value, Assessment Ratio and Private Wealth series



Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions). Please note the change in y-axis scale for Nevada.

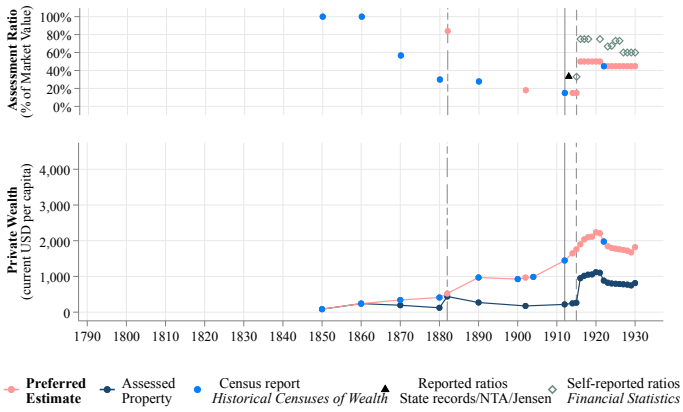
Figure A34: Assessed Property Value, Assessment Ratio and Private Wealth series

A. New Jersey



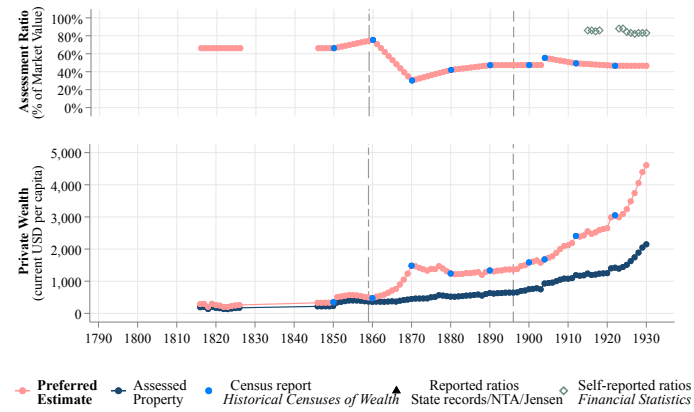
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

B. New Mexico



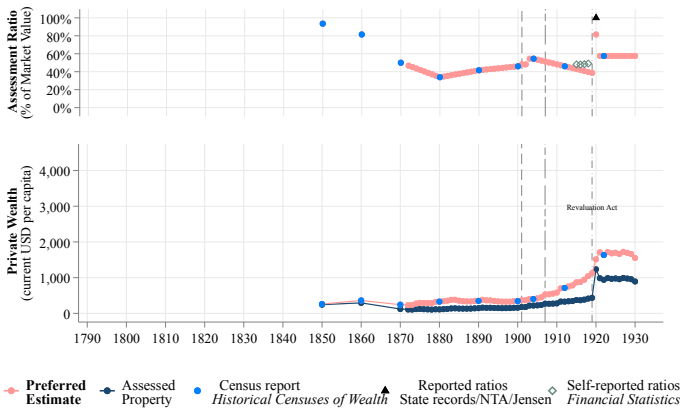
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

C. New York



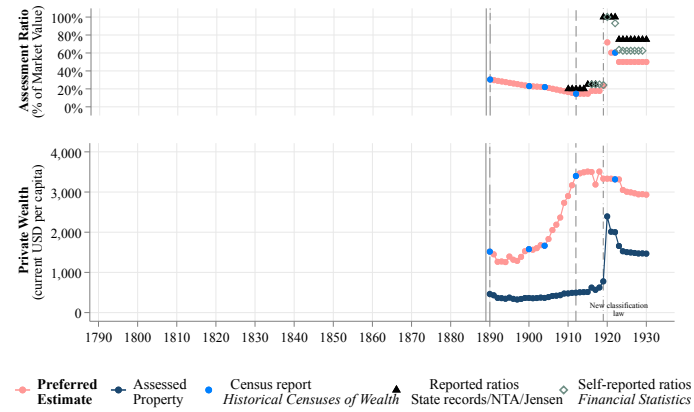
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

D. North Carolina



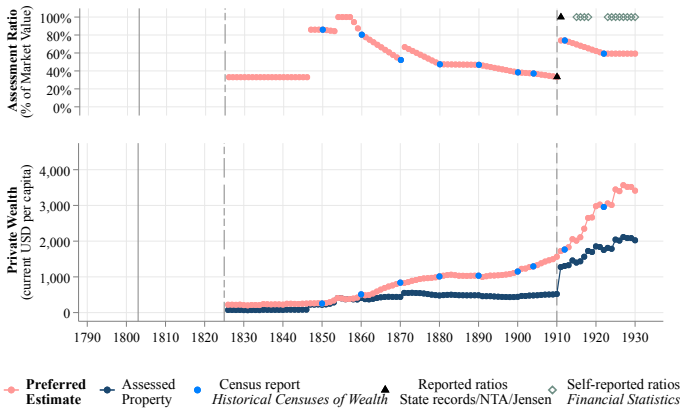
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

E. 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.

F. Ohio

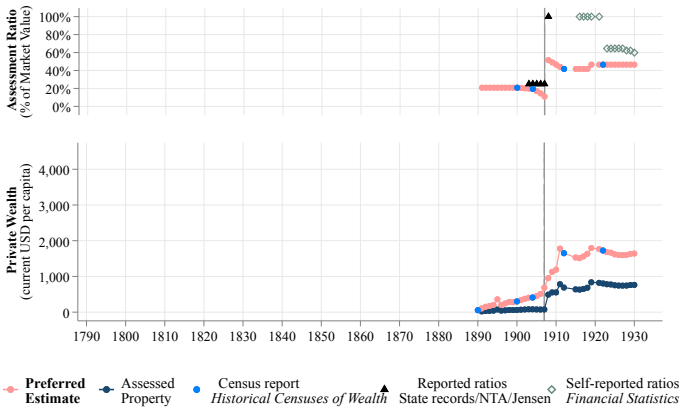


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions). Please note the change in y-axis scale for New Jersey, New York, and North Dakota.

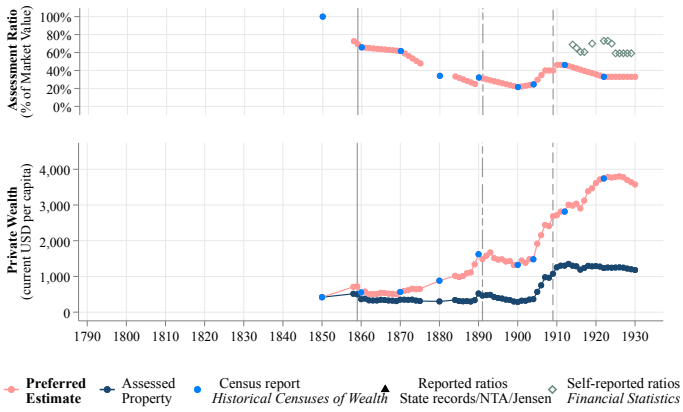
Figure A35: Assessed Property Value, Assessment Ratio and Private Wealth series

A. Oklahoma



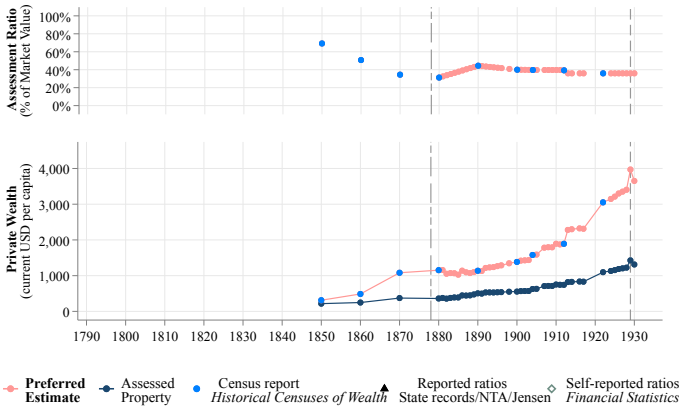
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

B. 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.

C. Pennsylvania

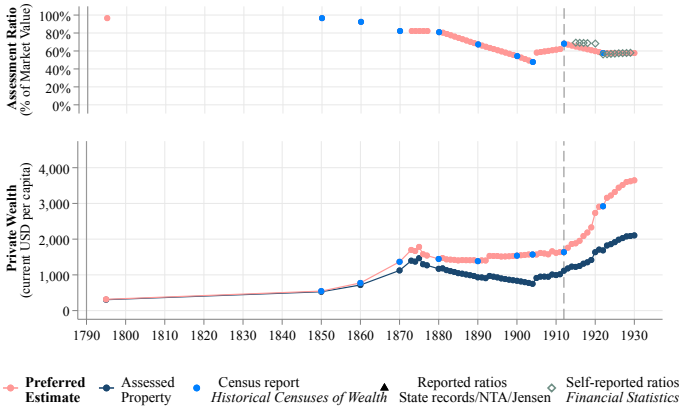


Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

D. Puerto Rico

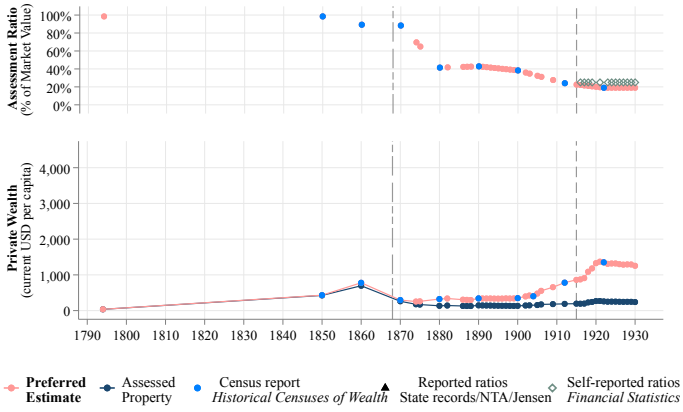
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

E. 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.

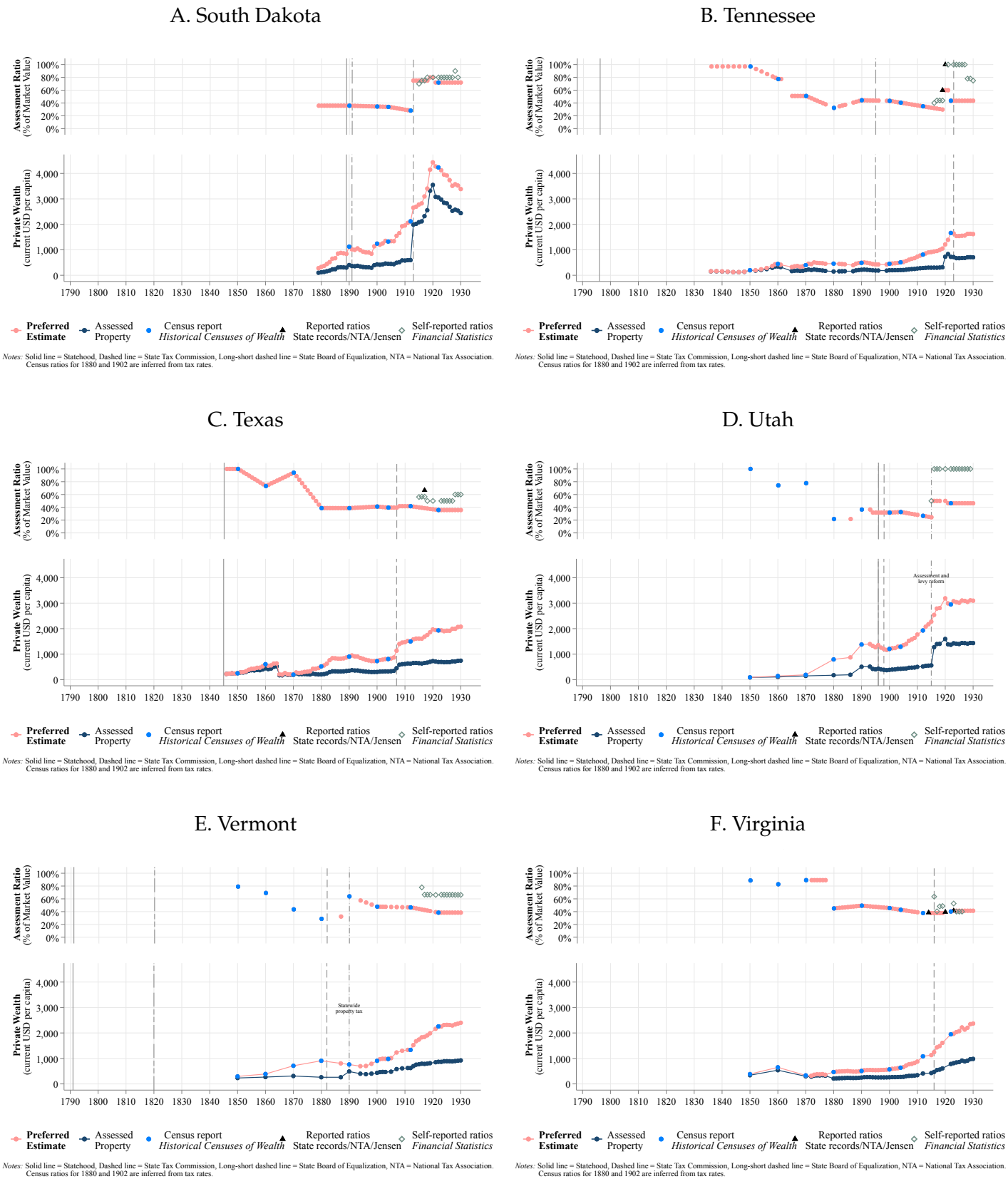
F. South Carolina



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.

Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions).

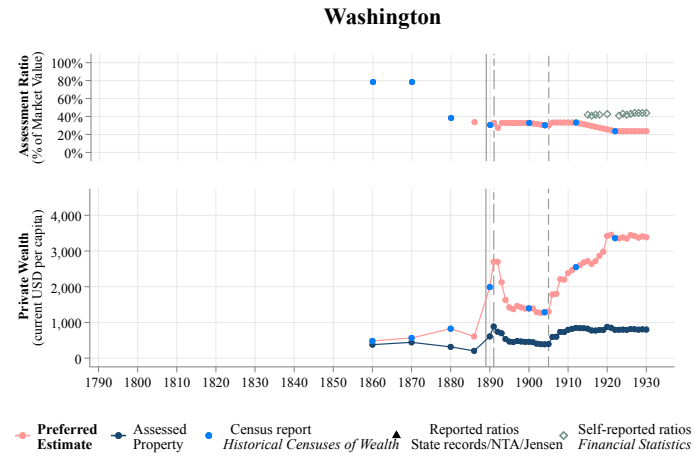
Figure A36: Assessed Property Value, Assessment Ratio and Private Wealth series



Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions).

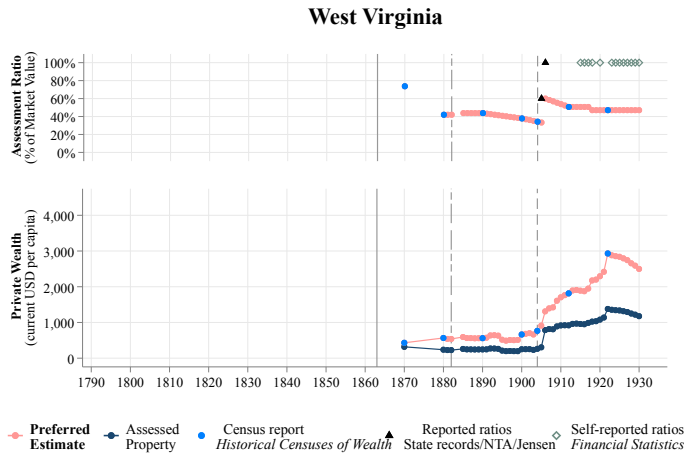
Figure A37: Assessed Property Value, Assessment Ratio and Private Wealth series

A. Washington



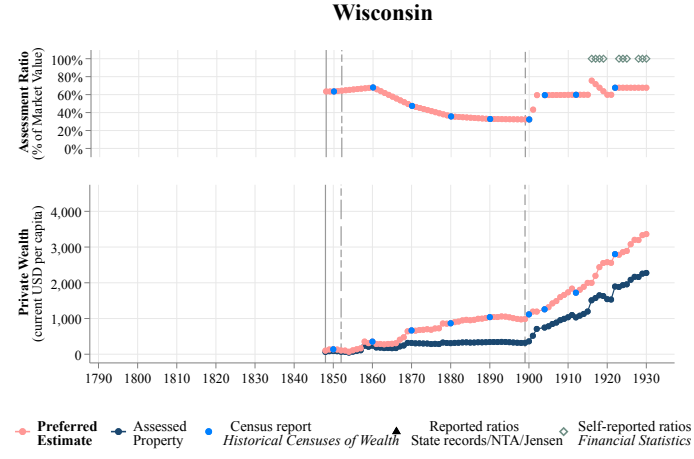
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

B. West Virginia



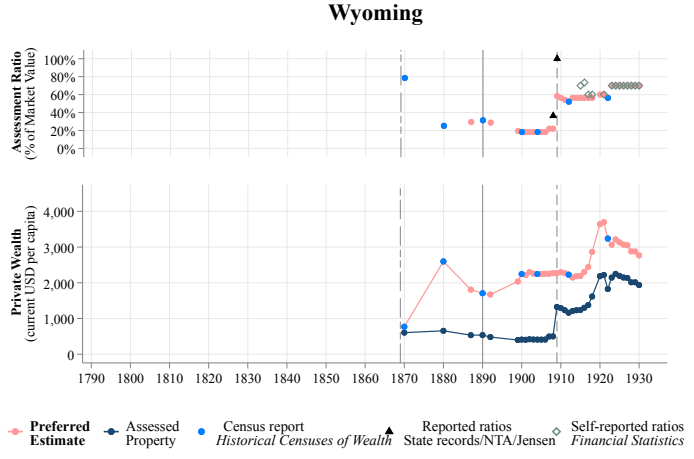
Notes: Solid line = Statehood, Dashed line = State Tax Commission, Long-short dashed line = State Board of Equalization, NTA = National Tax Association. Census ratios for 1880 and 1902 are inferred from tax rates.

C. 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.

D. Wyoming



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.

Notes: Those wealth series are not corrected for slave prices and property before 1865, i.e. the corrections described in Appendix III.3 are not applied yet. For 1900 and 1904, Historical Censuses of Wealth assessed values are missing. Thus, 1900 and 1904 assessment ratios are retrieved from mixed sources: (i) Report assessed valuations and (ii) Historical Censuses of Wealth true value of taxable wealth. These wealth series do not include property exempt from property tax (e.g. federal land, etc. See section II for details on exemptions).

III.3. 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. Select estimates are summarized in Table A9. Piketty and Zucman (2014) use prices of $800 for 1850 and $1000 for 1860. For these same years, Einhorn (2006) estimates the prices to be $401 and $774, 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) imply an average price of $150 for 1805, $250 for 1850, and $420 for 1860. Those values were estimated for 1805 by Goldsmith (1952, p. 318); for 1850 by Goldsmith (1952, p. 317), and for 1860 by U.S. Census Bureau (1870) (pp. 8–10). There are good reasons to believe that the assessed wealth from enslaved people was under-estimated by tax assessors (U.S. Census Bureau (1870, p. 8), and Piketty and Zucman (2014, p. 63 of Appendix)).

Table A9: Prices Estimates of Enslaved Persons 1810-1860

Series	U.S. Census Bureau (1870)	Piketty and Zucman (2014)	Einhorn (2006)	Ransom and Sutch (1988)
1810	-	500	265	277
1850	250	800	401	377
1860	420	1000	774	778

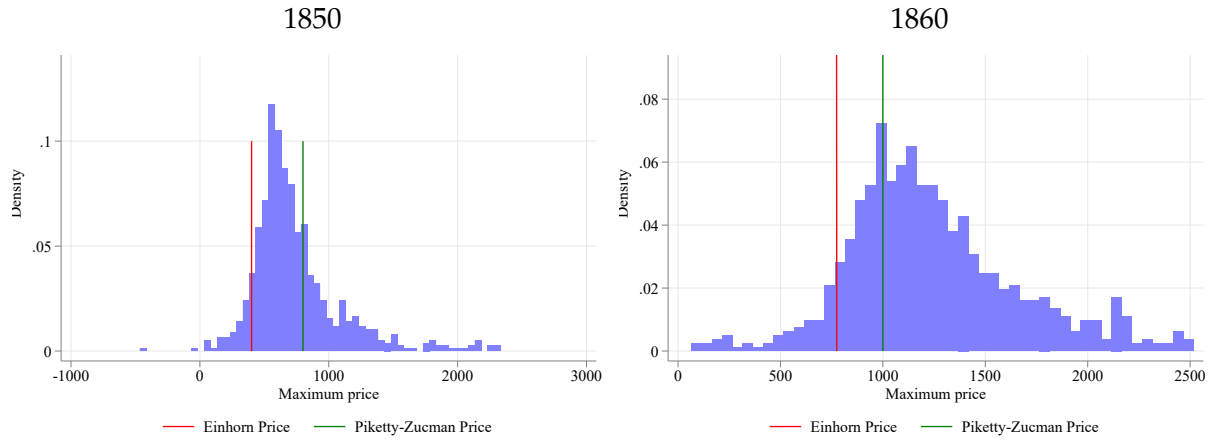
Notes: Column 3 (Einhorn, 2006) corresponds to a 3-year average of Ransom and Sutch (1988).

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 (2006).

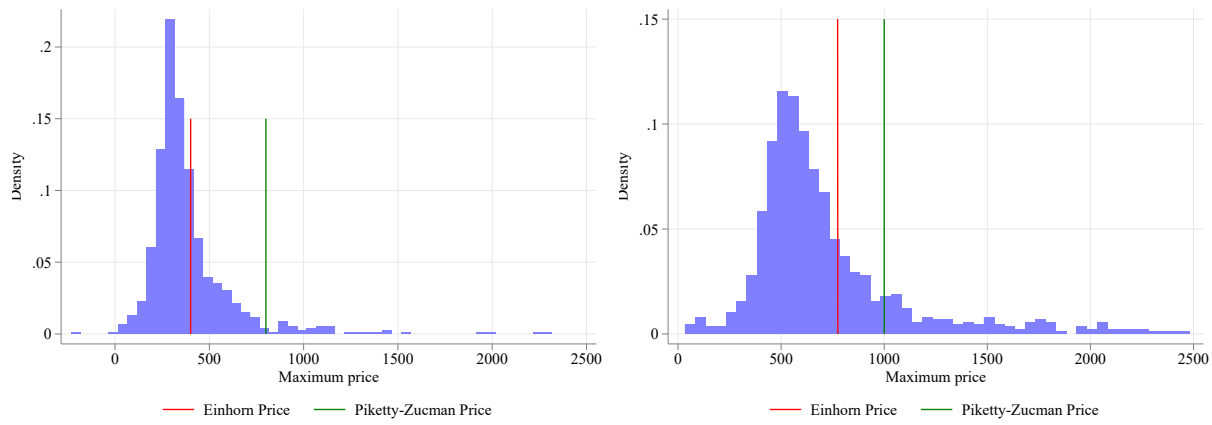
To get a sense of possible bounds on the price of enslaved people, Figure A38 shows the distribution of the implied price per enslaved person in 1850 and 1860 under three hypothetical scenarios, namely that wealth from enslaved people represents i) 100%, ii) 50%, or iii) 20% of Personal Wealth measured in the Census for Southern states. The prices by Einhorn (2006) 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.

Figure A38: Distribution of the Upper Bounds on Prices of Enslaved People

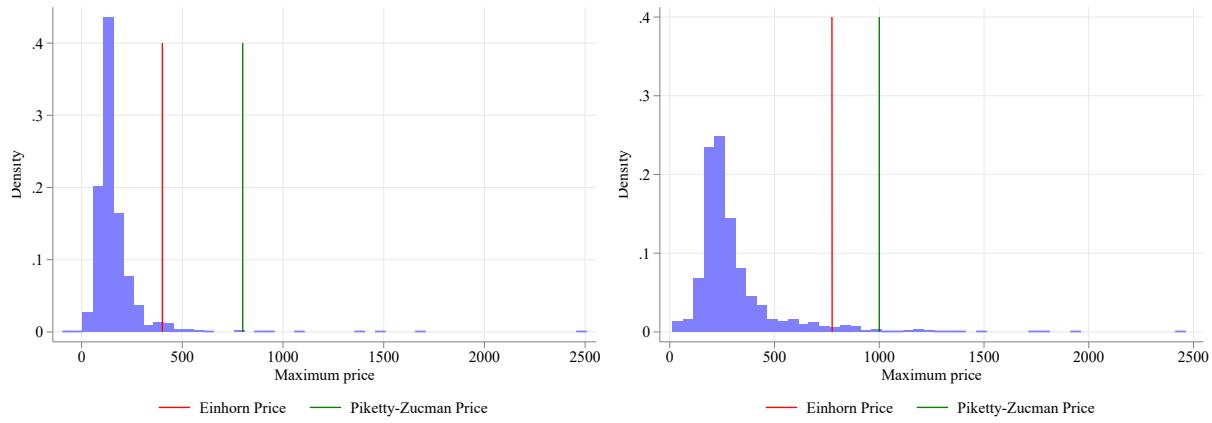
A - Wealth from Enslaved People = 100% of Personal Wealth



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 (2006) and Piketty and Zucman (2014).

Computing wealth from enslaved people. To compute the wealth from enslaved people, we use the number of enslaved people at the county and state levels from Haines, university Consortium for Political and Research (2010) and Gibson and Jung (2002) and multiply it by a given price for each year. We call this variable *slaveprop* (county level) or *val_true_slave* (state level). Our benchmark case uses the 3-year moving average prices from Einhorn (2006), available for each year from 1805 to 1860.

Figure A15 shows the share of wealth from enslaved people i) at the county, ii) at the state level using IPUMS USA Full Count series, and iii) at the state-level using our property tax-based measure.

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-estimates (U.S. Census Bureau (1870, p. 8), and Piketty and Zucman (2014, Appendix p. 63)). Therefore, we want to correct these assessed values by (i) subtracting the (underestimated) value of wealth from enslaved people, and (ii) adding the actual market price of wealth from enslaved people.

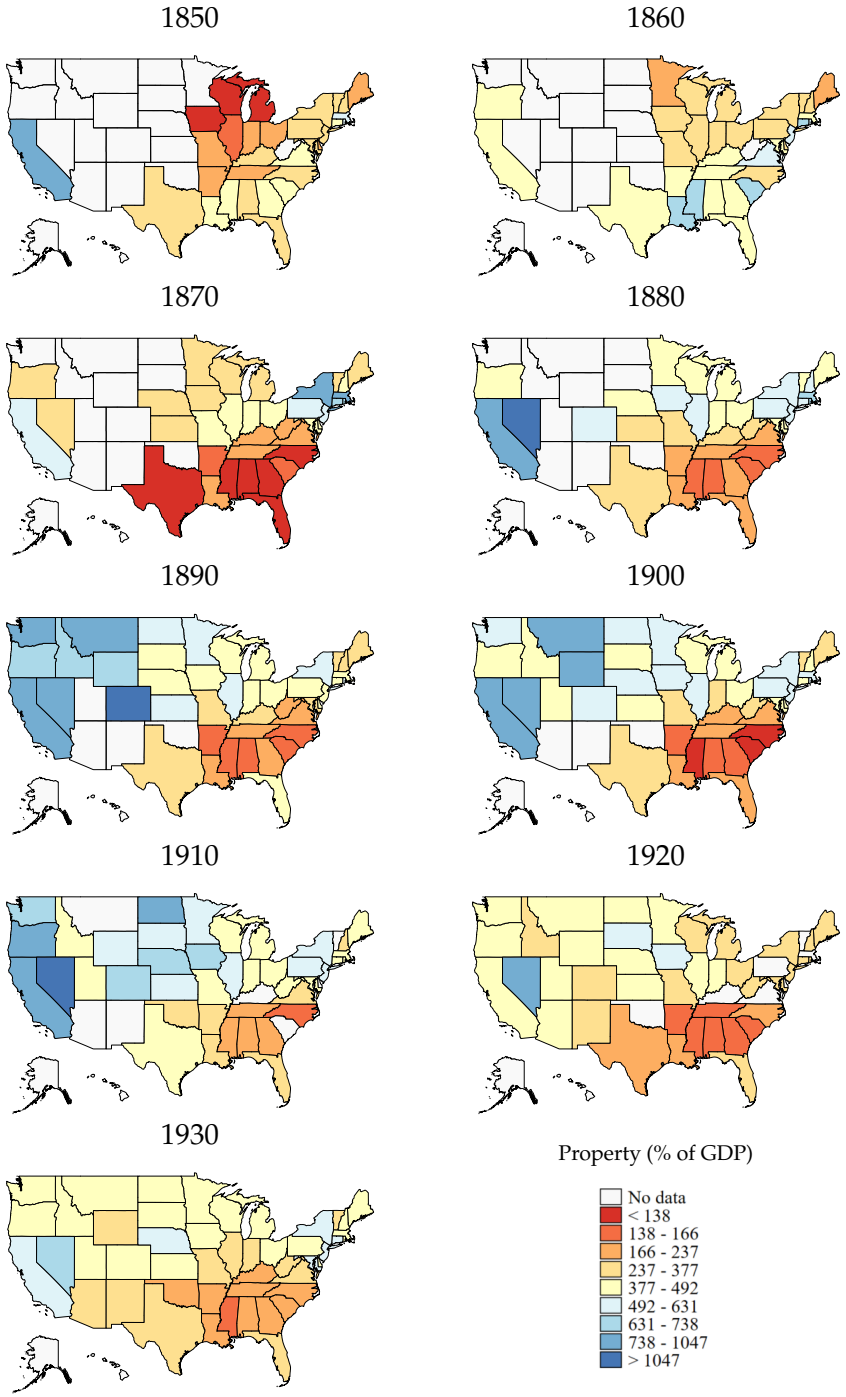
First, we subtract the (underestimated) value of wealth from enslaved people from tax-assessed wealth. To do so, we use the estimates of the implicit price per enslaved person used by assessors, referenced above, from Goldsmith (1952), p.318 for 1805 ($150), p. 317 for 1850 ($250), and U.S. Census Bureau (1870), p. 8 for 1860 ($420). We linearly interpolate these prices for missing years.

Second, we add actual market prices. To retrieve actual market prices, we use the prices from Einhorn (2006) to multiply the number of enslaved people at the state level, as explained in Appendix III.3.

This approach assumes that the price of enslaved people was the same across states in a given year. This was likely not the case in practice. Nevertheless, our correction for the undervaluation of wealth from enslaved people in the tax assessment data seems important, albeit imperfect.

We also have alternative sources of prices, as described in Appendix Section III.3, Table A9, which we can use for robustness instead of the prices in Einhorn (2006). Figure A5 shows the state-level wealth using these alternative prices. The picture remains similar in terms of the spatial distribution and time trends.

Figure A39: Property Per Capita by State As a Share of National GDP Per Capita



Notes: This figure shows the value of property per capita by state normalized by the national GDP per capita for each decade between 1850 and 1930. Data for states in U.S. territories prior to admission in the Union are not displayed.

III.4. County Level property data

III.4.1. General approach for construction of county level series

1870-1930 decadal data. We construct county-level property using assessed property for property tax purposes compiled in the Historical Censuses of Wealth 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.2. For 1870, we have county-level assessment ratios from the Census report on Historical Censuses of Wealth[23]. We can thus compare the state assessment ratios described in Section III.2 to the average county-level assessment ratios. Figure A7 shows that these values are very 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 full count individual level Census, as described in Section III.7. 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. 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

$$\rho_{s,t} = \frac{W_{s,t}}{\sum_{c \in s} w_{c,t}} \tag{1}$$

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

$$\widetilde{w_{c,t}} = \rho_{s,t} * w_{c,t} \tag{2}$$

to be 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 1850.

Social Statistics Schedules. Note that for years 1850, 1860 and 1870, the Social Statistics Schedule of the Census did collect information at the county level on both assessed and

[23]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.

true valuation of property.[24] The county level information we use for 1870 stems from these schedules. Unfortunately, these schedules were never systematically tabulated and published by the Census Bureau for 1850 and 1860, making it impossible to compute assessment ratios at the county level for all counties in the U.S. for these years. Margo (2000) has digitized some information on wages from these Schedules for a subset of states (see Table 2.3). Rusanov (2022) has also digitized social statistics schedules of counties for a subset of states, enabling him to provide for these states assessment ratios at the county level for 1850 and 1860.

County-level wealth excluding wealth from enslaved. 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.3.

III.4.2. Alternative County-level series and Robustness

Construction of alternative county-level AR series This section presents the construction of alternative assessment ratios (ARs). The goal is to see whether results are robust to the use of county-specific ARs instead of state ARs. Because of data constraints, building such county-level ARs entails creating proxy ARs. Thus, we use some county-level information we were able to gather to build 4 main types of alternative ARs. By default, "AR" refers to the AR of total property.

AR1 – Using the 1870 data on county-level AR To construct alternative series AR1, we use Historical Censuses of Wealth data on county AR that exists for 1870. Unfortunately, this county-level information does not exist after 1870. For every year y, we then rescale our baseline AR by the 1870 county to state AR ratio:

$$\text{AR1}_{y,s,i} = \text{State AR}_{y,s} * \frac{\text{County AR}_{1870,s,i}}{\text{State AR}_{1870,s}} \tag{3}$$

AR2 – Using the 1900 data on county-level real property AR To construct alternative series AR2, we use 1900 data on real property AR at the county level. In 1900, AR are available in Historical Censuses of Wealth at the county level but only for real estate. We

[24] See example of such schedules here.

first retrieve a 1900 proxy for total property AR in county i and state s by applying the following formula:

$$\text{County proxy AR}_{1900,s,i} = \text{County real property AR}_{1900,s,i} * \frac{\text{State AR}_{1900,s}}{\text{State real property AR}_{1900,s}} \tag{4}$$

Then, we use this 1900 County proxy AR to rescale our baseline series by the 1900 county to state AR ratio:

$$\text{AR2}_{y,s,i} = \text{State AR}_{y,s} * \frac{\text{County proxy AR}_{1900,s,i}}{\text{State AR}_{1900,s}} \tag{5}$$

AR3 – Rescaling AR1 To build AR3, we use AR1 rescaled by the 1870 intra-state AR standard deviation. The goal for this new series is to keep the 1870 within-state standard deviation of county ARs constant over time. That is to say that for all year y, all state s and all counties 1 to N in state s, we want:

$$Var_{y,s}\left(\frac{1}{N}\sum_{i=1}^{N}\text{AR3}_{y,s,i}\right) = Var_{1870,s}\left(\frac{1}{N}\sum_{i=1}^{N}\text{county AR}_{1870,s,i}\right)$$

with $\frac{1}{N}\sum_{i=1}^{N}\text{county AR}_{y,s,i}$ the AR of state s in year y. Note that the sums can be weighted by county population.

The steps for building the AR3 series are the following:

1. We compute $sd_{1870,s}$ the 1870 standard deviation of state s's AR, computed using 1870 county-level AR.
2. For all county i in state s and year y , we rebuild AR1 (see equation (3)).
3. Then we compute $sd_{y,s}$, the standard deviation of state s's AR based on county AR1 for all years y.
4. Then, we rescale AR1 by the ratio of AR standard deviation in state s and year y to the AR standard deviation in state s and year 1870:

$$\text{AR3}_{y,s,i} = \text{AR1}_{y,s,i} * \frac{sd_{1870,s}}{sd_{y,s}} \tag{6}$$

5. Finally, we divide the assessed value of true property by AR3 to retrieve the true value of property at the county level for each year.

We derive this computation for 2 types of standard deviation values:

a. $sd_{1870,s}$ and $sd_{y,s}$ are computed at the state level without any weight on county AR

b. $sd_{1870,s}$ and $sd_{y,s}$ are computed at the state level using county population weights

AR4 – Rescaling AR2 To build AR4, we use AR2 rescaled by the 1900 intra-state AR standard deviation. The goal for this new series is to keep the 1900 within-state standard deviation of county ARs constant over time. That is to say that for all year y, all state s and all county 1 to N in state s, we want:

$$Var_{y,s}\left(\frac{1}{N}\sum_{i=1}^{N}\text{AR4}_{y,s,i}\right) = Var_{1900,s}\left(\frac{1}{N}\sum_{i=1}^{N}\text{county proxy AR}_{1900,s,i}\right)$$

with $\frac{1}{N}\sum_{i=1}^{N}$ county $\text{AR}_{y,s,i}$ the AR of state s in year y. Note that the sums can be weighted by county population.
Again, the 1900 county proxy AR is built from the proxy described in equation (4).

The steps for building the AR4 series are the following:

1. We compute $sd_{1900,s}$ the 1900 standard deviation of state s's AR, computed using 1900 county proxy described in equation (4).

2. For all county i in state s and year y, we rebuild AR2 (see equation (5)).

3. Then we compute $sd_{y,s}$, the standard deviation of state s's AR based on county AR2 for all years y.

4. Then, we rescale AR2 by the ratio of AR standard deviation in state s and year y to the AR standard deviation in state s and year 1900:

$$\text{AR4}_{y,s,i} = \text{AR2}_{y,s,i} * \frac{sd_{1900,s}}{sd_{y,s}} \tag{7}$$

5. Finally, we divide the assessed value of true property by AR4 to retrieve the true value of property at the county level for each year.

We derive this computation for 2 types of standard deviation values:

a. $sd_{1900,s}$ and $sd_{y,s}$ are computed at the state level without any weight on county AR

b. $sd_{1900,s}$ and $sd_{y,s}$ are computed at the state level using county population weights

These series allow us to explore how assessment ratios vary across counties. While there is clear evidence of dispersion across counties within states, there is reassuringly little correlation between assessment ratio and county-level observables, after controlling for state fixed-effects. We test for this by regressing assessment ratio on observable characteristics at the county level under various specifications. The results of these regressions are reported in Table A10.

In addition, in a robustness exercise, we compare the ranking of counties in terms of estimated true wealth using both the county assessment ratio versus the state assessment ratio, for 1870 and 1900. Figure A40 and Figure A41 show the scatterplots of these series, respectively. Reassuringly, we find that the ranking of the counties is strongly preserved, and the correlation between the two series is high, with β coefficient estimates of .91 and .95, and an R-squared of .83 and .90.

Together, these results suggest that while there is some spatial variation in assessment ratio within states, our procedure is unlikely to be biased as a result, and our constructed assessment ratio serves as a good proxy for the actual county assessment ratio.

Replication of results using alternative AR series Below, we check the sensitivity of our results to the use of these alternative county-level AR series. To this effect, we reproduce all our main results using these various AR series. Results prove very robust to the use of these alternative AR series.

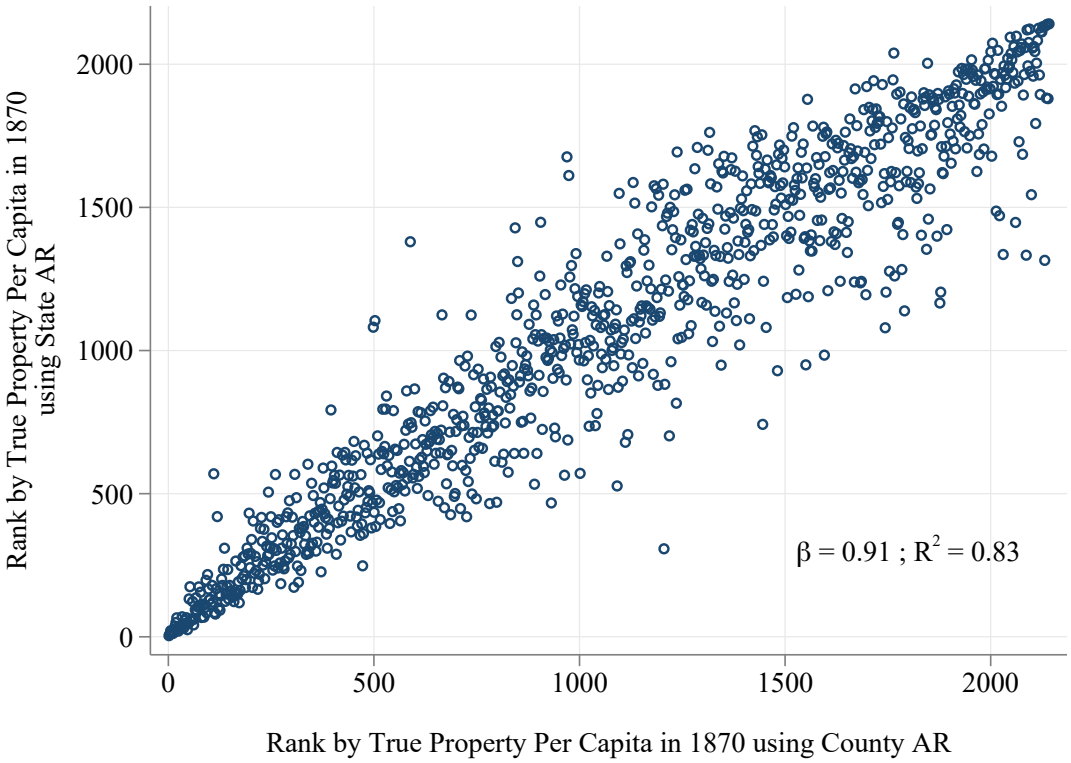
Table A10: Determinants of County-level AR in 1870

	(1) County AR	(2) County AR	(3) County AR	(4) County AR
A. Geography				
Temperature in coldest month	-0.036	-0.036	-0.009	-0.009
	(0.020)	(0.020)	(0.014)	(0.016)
Temperature in hottest month	0.074***	0.074**	0.029*	0.029*
	(0.020)	(0.022)	(0.014)	(0.013)
Winter precipitation	0.006	0.006	-0.011	-0.011
	(0.010)	(0.016)	(0.007)	(0.008)
Summer precipitation	0.013	0.013	0.007	0.007
	(0.011)	(0.008)	(0.008)	(0.008)
Elevation in metres	0.048*	0.048	0.031*	0.031*
	(0.021)	(0.026)	(0.014)	(0.015)
Ruggedness	-0.000	-0.000	0.004	0.004
	(0.009)	(0.007)	(0.006)	(0.005)
Soil Net Primary Productivity	-0.005	-0.005	-0.012	-0.012
	(0.010)	(0.011)	(0.007)	(0.007)
Distance to Coast	-0.024	-0.024	-0.024**	-0.024
	(0.013)	(0.020)	(0.009)	(0.013)
Crossed by Canal	0.001	0.001	-0.013	-0.013
	(0.015)	(0.017)	(0.010)	(0.010)
Crossed by Navigated River	0.017*	0.017	0.011	0.011
	(0.008)	(0.010)	(0.006)	(0.006)
B. Demographics				
Log population	-0.013*	-0.013	-0.020***	-0.020***
	(0.006)	(0.008)	(0.005)	(0.005)
% literate	0.006	0.006	-0.006	-0.006
	(0.007)	(0.008)	(0.006)	(0.008)
% males	0.023*	0.023**	0.017*	0.017**
	(0.009)	(0.008)	(0.007)	(0.006)
% white	-0.030*	-0.030	-0.009	-0.009
	(0.013)	(0.018)	(0.009)	(0.014)
% foreigners	-0.015*	-0.015*	-0.002	-0.002
	(0.006)	(0.007)	(0.004)	(0.005)
C. Occupational shares:				
Agriculture	0.001	0.001	0.004	0.004
	(0.005)	(0.005)	(0.003)	(0.003)
Mining	-0.006	-0.006	-0.000	-0.000
	(0.005)	(0.006)	(0.004)	(0.003)
Manufacturing	-0.005	-0.005	0.000	0.000
	(0.005)	(0.004)	(0.003)	(0.004)
Commerce	0.006	0.006	0.005	0.005
	(0.004)	(0.004)	(0.003)	(0.003)
Public Administration	0.003	0.003	0.002	0.002
	(0.004)	(0.004)	(0.003)	(0.002)
D. Inequality & Political:				
% of Enslaved People in 1860	-0.043**	-0.043**	-0.015	-0.015
	(0.014)	(0.016)	(0.010)	(0.012)
Top 10% Property Share	0.011	0.011	-0.009	-0.009
	(0.008)	(0.007)	(0.007)	(0.010)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$			-0.471***	-0.471***
			(0.068)	(0.076)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$ x Top 10% Property Share			0.021*	0.021
			(0.009)	(0.012)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$ x % males			-0.036***	-0.036**
			(0.010)	(0.010)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$ x % literate			0.016*	0.016
			(0.008)	(0.012)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$ x Log Population			0.023***	0.023**
			(0.007)	(0.008)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$ x $\mathbb{1}_{\text{Southern State}}$			0.009	0.009
			(0.018)	(0.051)
$(\mathbb{1}_{\text{(State AR-County AR)}>0})$ x Number of years since admitted in the Union			-0.075***	-0.075*
			(0.012)	(0.036)
Constant	0.747***	0.747***	0.898***	0.898***
	(0.053)	(0.075)	(0.046)	(0.045)
Observations	1644.000	1644.000	1644.000	1644.000
R^2	0.690	0.690	0.854	0.854
State clust.	No	Yes	No	Yes

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

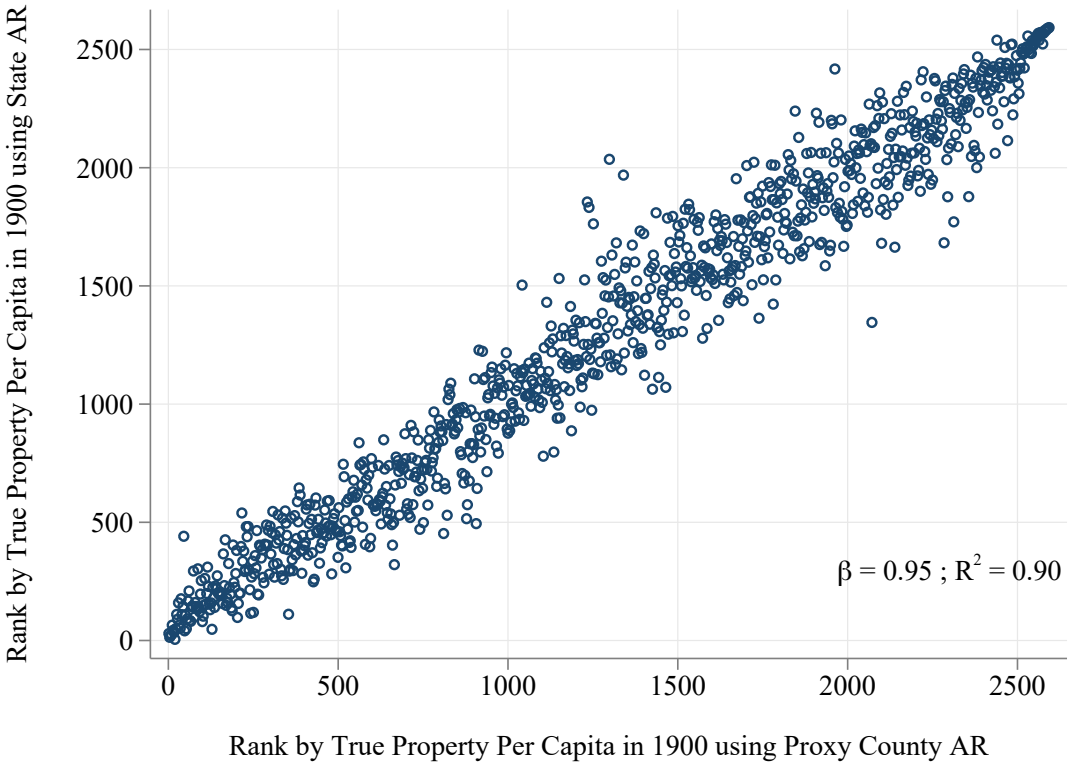
Notes: Columns 1-2 report the coefficients obtained by regressing the value of county assessment ratios in 1870 (Historical Censuses of Wealth) on geography variables, demographics, occupational shares, inequality variables, and a state fixed effect. Columns 3-4 additionally control for a dummy equal to one if the difference between state and county AR is positive, and its interactions which is other variables of interest. Columns 2 and 4 clusterize errors at the state level.

Figure A40: Rank-rank relation between True Property Per Capita at the County level in 1870, using baseline AR v AR1



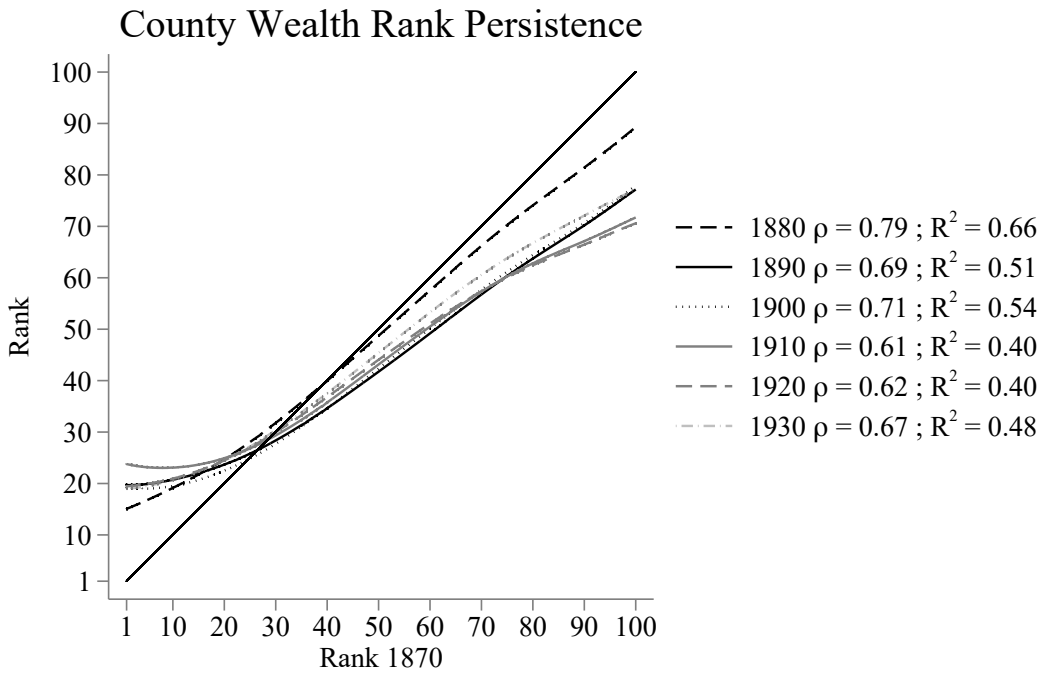
Notes: This graph compares the rank of true property per capita at the county level using baseline AR v AR1. Data points are gathered in 1000 bins. β is the regression coefficient associated with the rank of the true property per capita at the county level using AR1, when regressing the rank of the true property per capita at the county level using baseline AR on the rank of the true property per capita at the county level using AR1. R^2 stems from this same regression. The construction of AR1 is detailed in Appendix III.4.2.

Figure A41: Rank-rank relation between True Property Per Capita at the County level in 1900, using baseline AR v AR2



Notes: This graph compares the rank of true property per capita at the county level using baseline AR v AR2. Data points are gathered in 1000 bins. β is the regression coefficient associated with the rank of the true property per capita at the county level using AR2, when regressing the rank of the true property value at the county level using baseline AR on the rank of the true property per capita at the county level using AR2. R^2 stems from this same regression. The construction of AR2 is detailed in Appendix III.4.2.

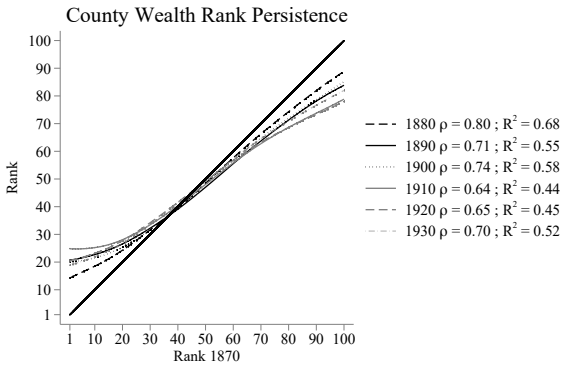
Figure A42: Rank Persistence of County Total Wealth Per Capita, baseline AR



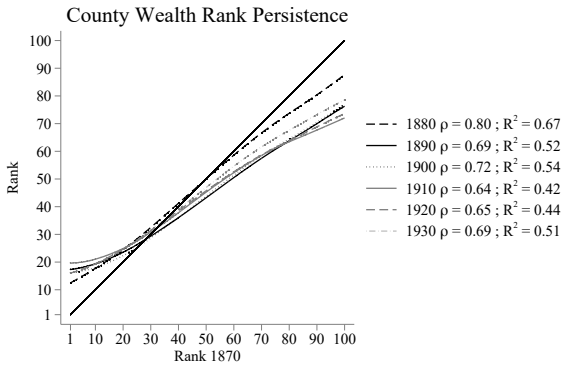
Notes: This figure shows the rank persistence of total wealth per capita in counties over time, using the baseline AR. It is broken down into percentiles. The 45-degree line represents a case of perfect persistence: the wealth per capita county ranking would be exactly the same between years 1870 and year y. ρ corresponds to the correlation coefficient between percentiles for years 1870 and year y. R^2 stem from the regression of the percentile in year y on the percentile in year 1870.

Figure A43: Rank Persistence of County Total Wealth Per Capita, alternative AR

AR1

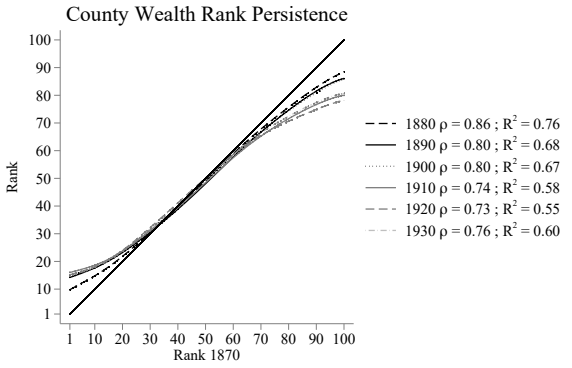


AR2

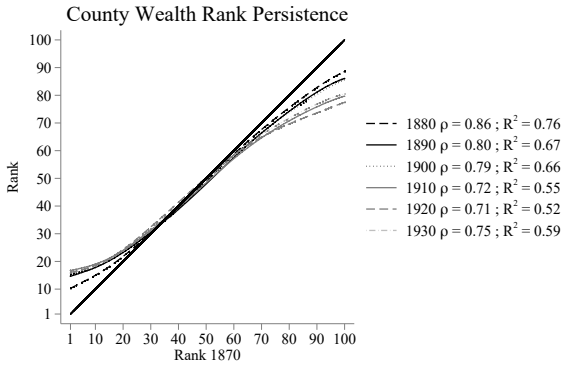


AR3 using:

No weight

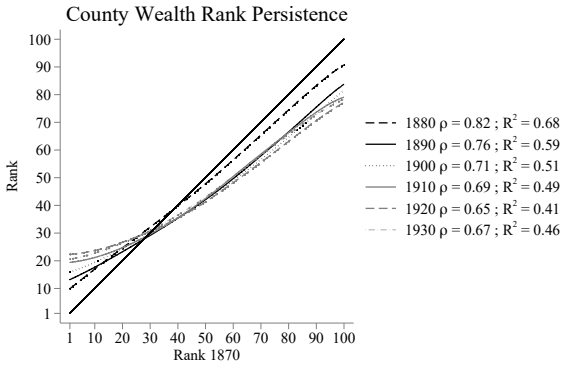


County population weights

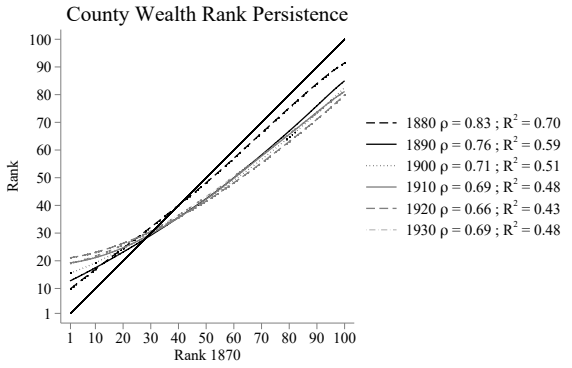


AR4 using:

No weight



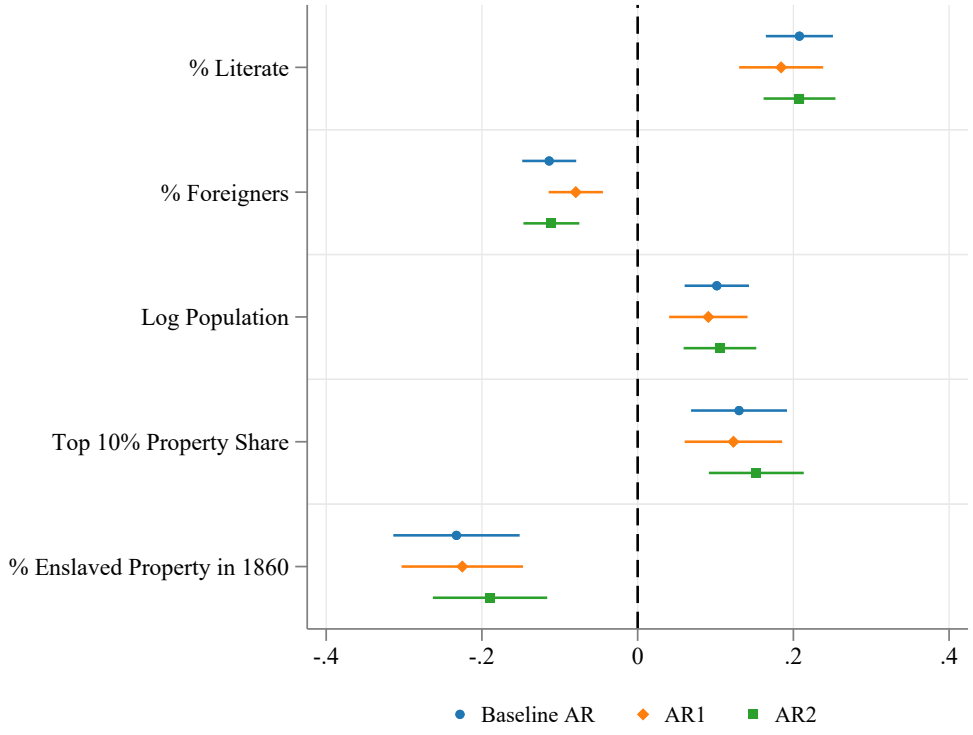
County population weights



Notes: Those figures show the rank persistence of total wealth per capita in counties over time, using alternative AR. It is broken down into percentiles. The 45-degree line represents a case of perfect persistence: the wealth per capita county ranking would be exactly the same between years 1870 and year y. ρ corresponds to the correlation coefficient between percentiles for years 1870 and year y. R^2 stem from the regression of the percentile in year y on the percentile in year 1870. The construction of alternative AR is detailed in Appendix III.4.2.

Figure A44: Determinants of County Total Property Per Capita in 1870, baseline AR v alternative ARs (coefficients of interest only)

A. Baseline v AR1 and AR2



B. Baseline v AR3

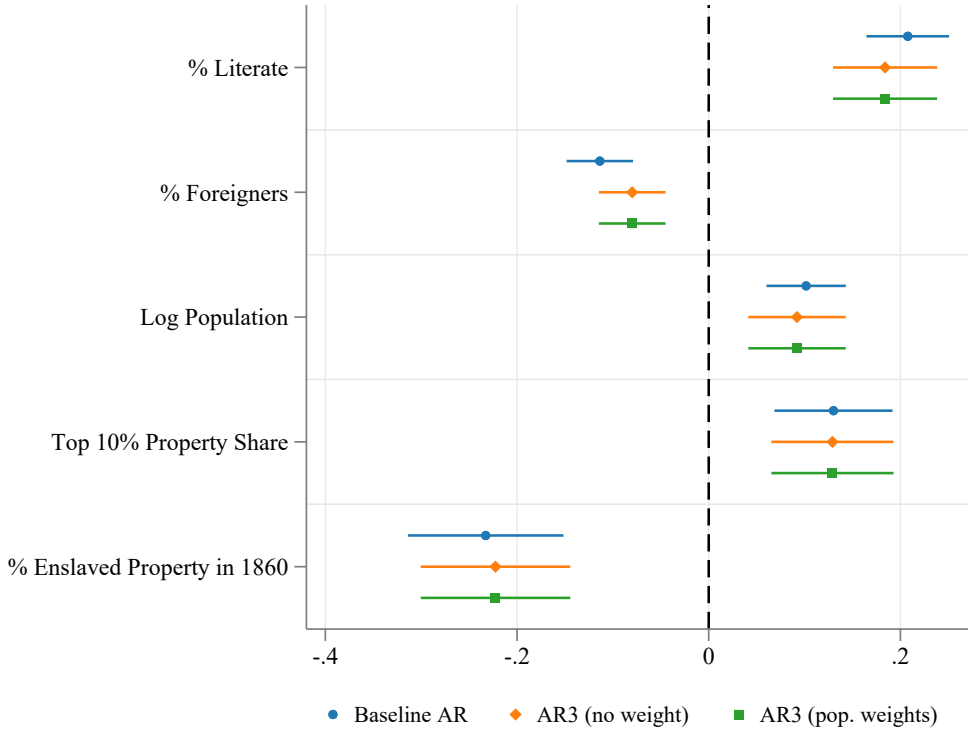
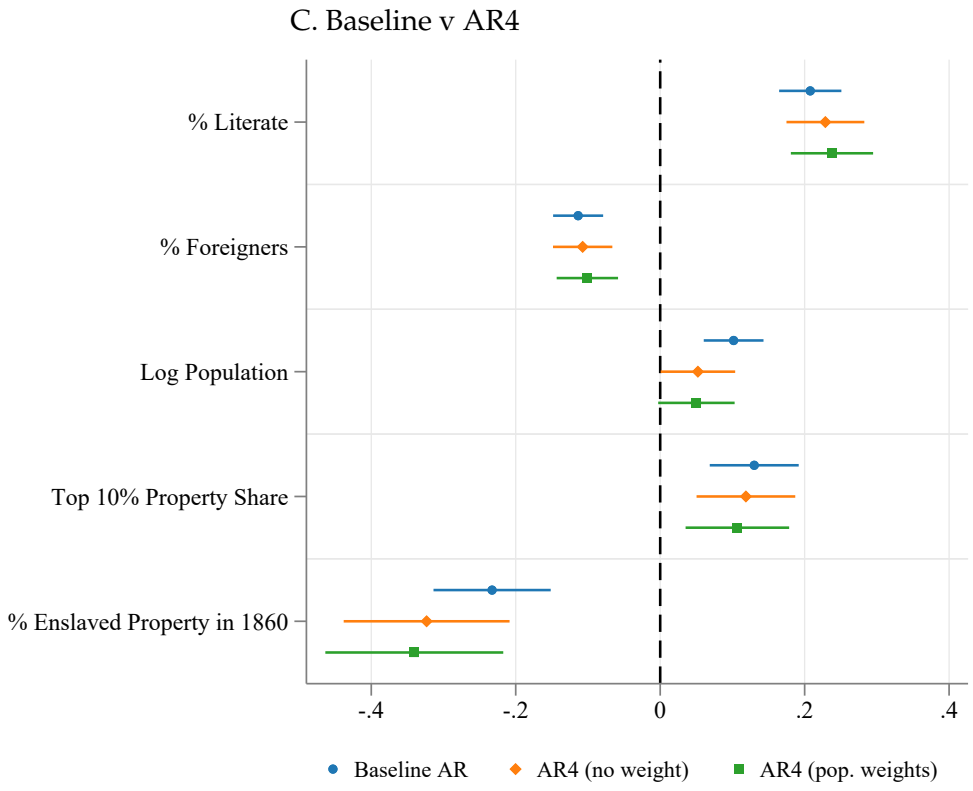


Figure A44: Determinants of County Total Property Per Capita in 1870, baseline AR v alternative AR (coefficients of interest only)



Notes: This figure presents coefficients from the regression of log property per capita in 1870 on inequality measures, and geographic, demographic, and economic characteristics from equation (3) of the paper. Each panel compares the results obtained with baseline v alternative AR for the main coefficients of interest. Controls are standardized, and described in Section 4.3 and Appendix III.10 of the paper. 95% confidence intervals are depicted.

Figure A45: Determinants of County 1870-1930 Growth in Total Property Per Capita, baseline AR v alternative ARs (coefficients of interest only)

A. Baseline v AR1 and AR2

B. Baseline v AR3

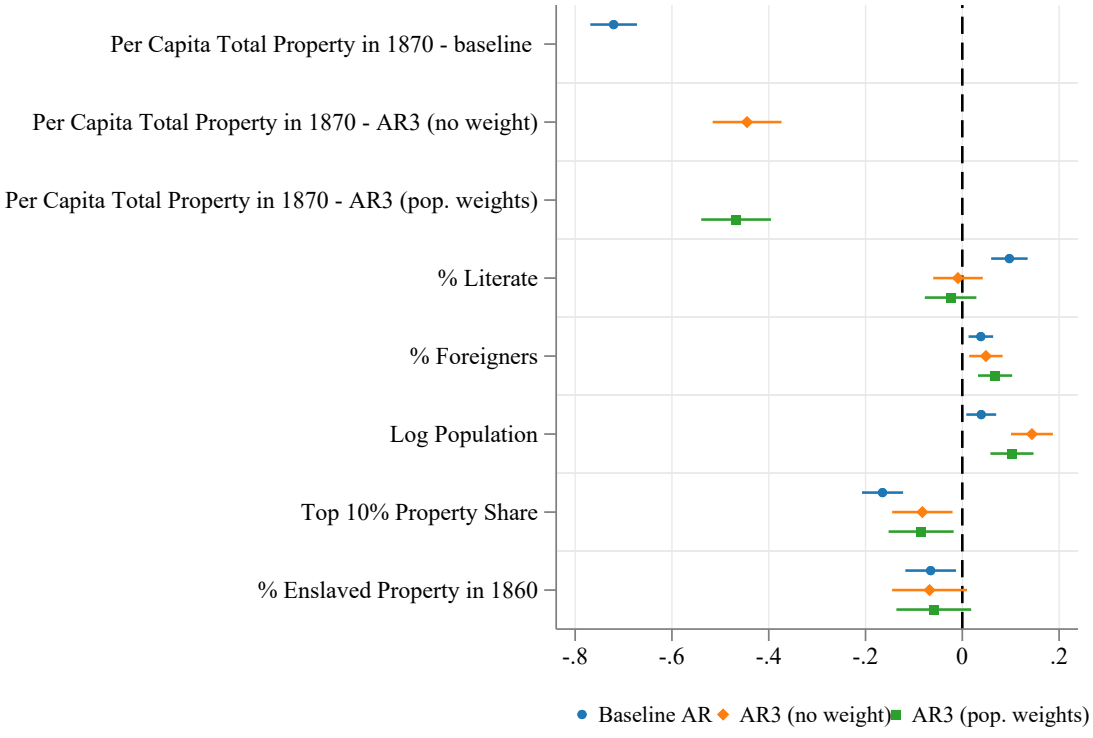
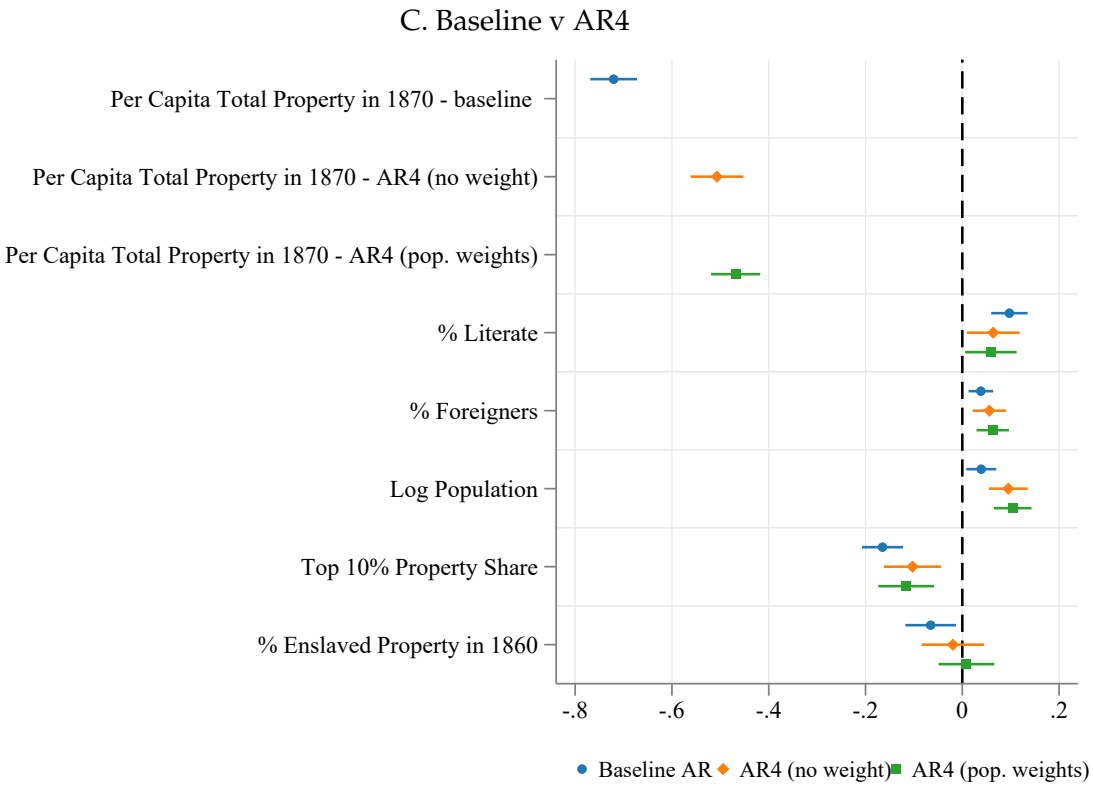


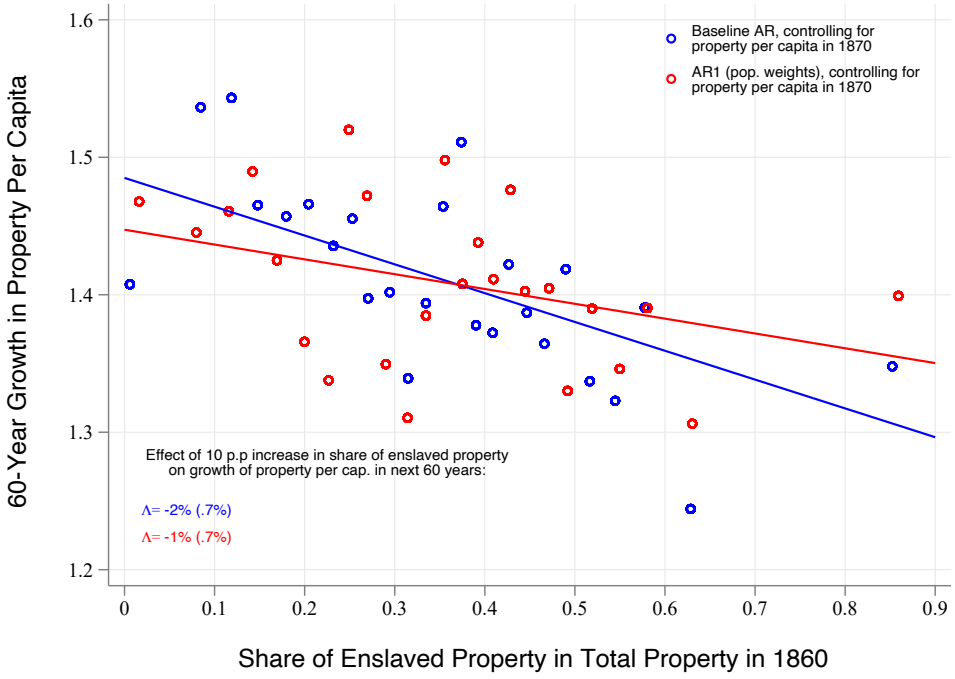
Figure A45: Determinants of County 1870-1930 Growth in Total Property Per Capita, baseline AR v alternative AR (coefficients of interest only)



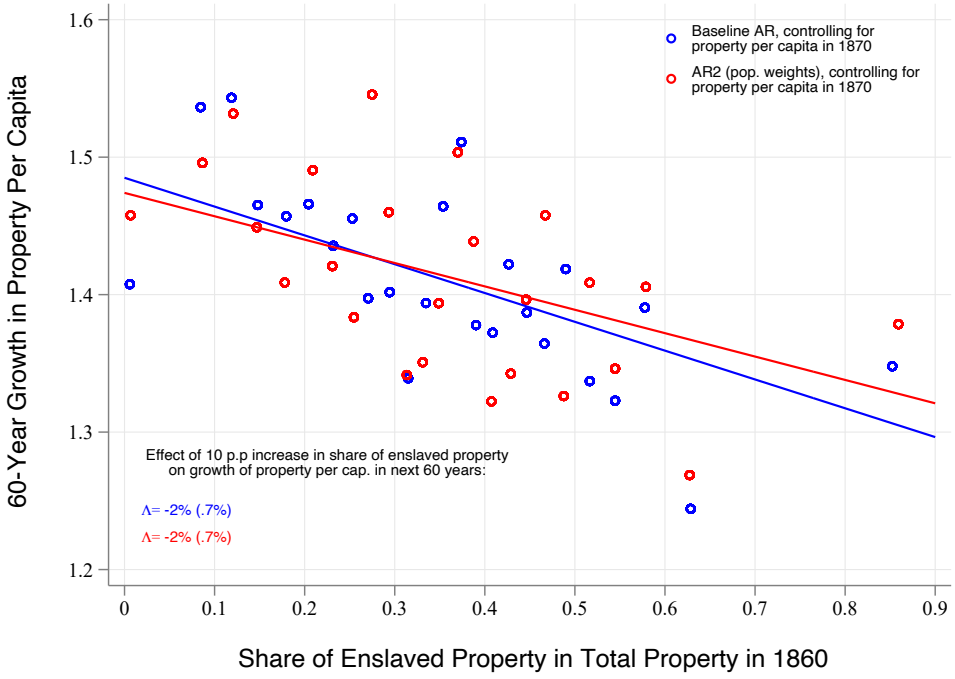
Notes: This figure presents coefficients from the regression of the 1870-1930 growth in total property per capita on inequality measures, and geographic, demographic, and economic characteristics from equation (2) of the paper. Each panel compares the results obtained with baseline v alternative AR for the main coefficients of interest. Controls are standardized, and described in Section 4.3 and Appendix III.10 of the paper. 95% confidence intervals are depicted.

Figure A46: The Legacy of Enslavement on Growth: County-Level Correlations, baseline v alternative ARs

A. Baseline v AR1



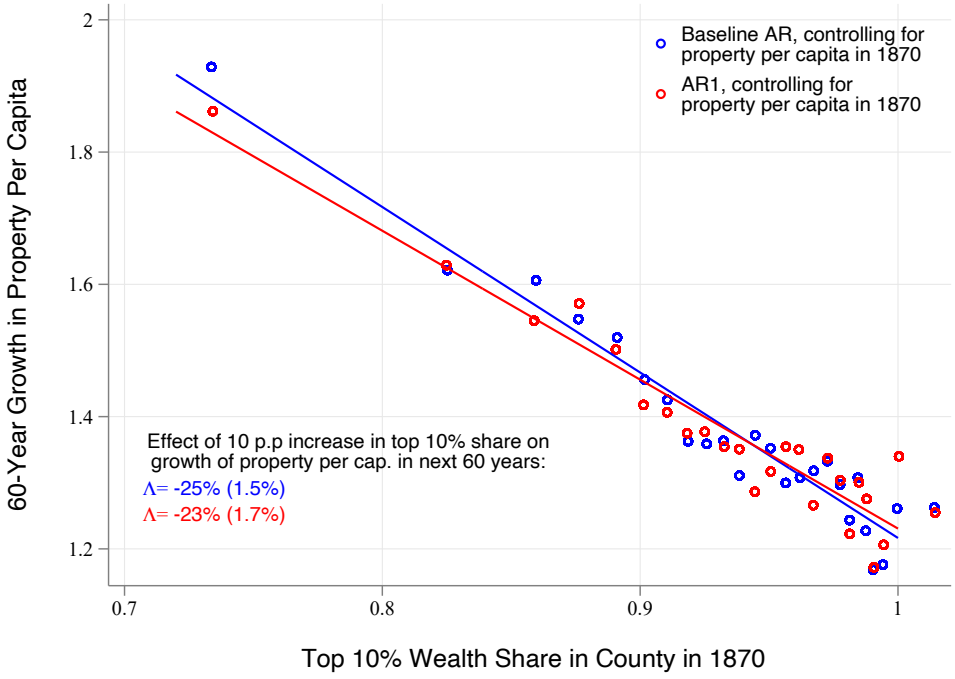
B. Baseline v AR2



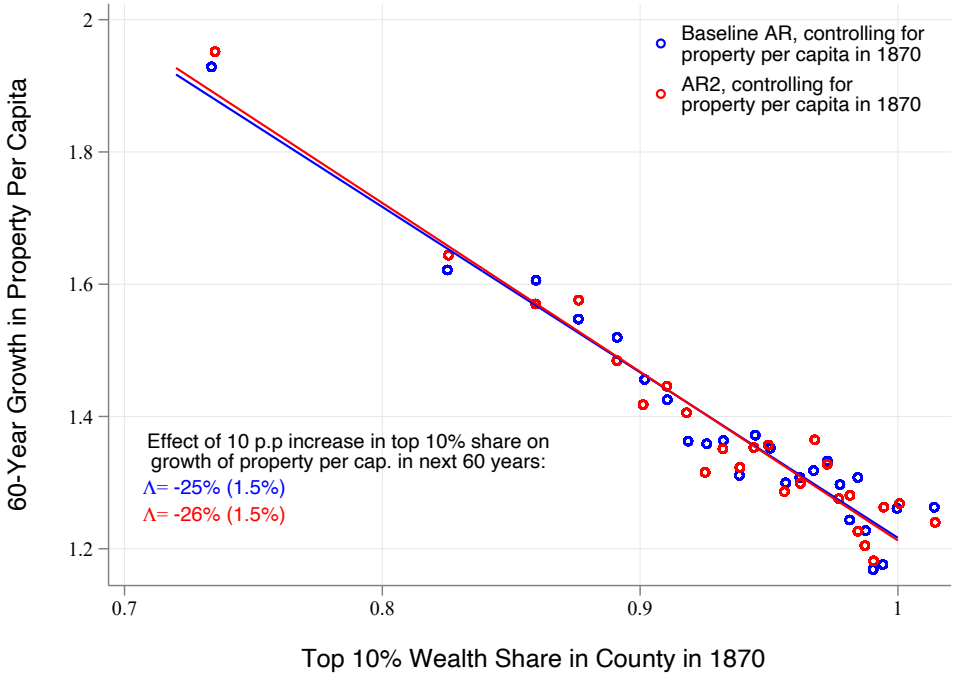
Notes: This figure displays binscatters of the county-level relation between the 60-year growth in property per capita between 1870 and 1930 and the share of property from enslaved people in total property in 1860, for baseline v alternative AR series. Counties are grouped into 25 equally-sized bins by their share of property from enslaved people. The correlation is residualized on county property per capita in 1870. The construction of alternative AR is detailed in Appendix III.4.2.

Figure A47: Inequality and Growth: County-Level Correlations, baseline v alternative ARs

A. Baseline v AR1



B. Baseline v AR2



Notes: The figure displays binscatters of the county-level relation between the 60-year growth in property per capita between 1870 and 1930 and the share of wealth held by the top 10% of wealth holders in a county in 1870, for baseline v alternative AR series. Counties are grouped into 25 equally-sized bins by their share of wealth held by the top 10%. The correlation is residualized on county property per capita in 1870. The construction of alternative AR is detailed in Appendix III.4.2.

III.5. National wealth series

Our national wealth series are based on the aggregation of state-level wealth series (from Appendix III.2).

The coverage of our data in terms of population is shown in Figure 3. As can be seen there and in Figure A48 (the blue series shows our raw coverage at the state-level), prior to 1850, we lack systematic information on wealth per capita for all states in the Union. As such, it is worth distinguishing between the methods used before and after 1850.

Because of this limitation, 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:

$$\tilde{W}_{it} = \frac{R_{it}}{\tilde{\tau}_{it_{first}}} \tag{8}$$

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. The data coverage after performing these imputations and interpolating is the line "States with property data after interpolation and imputation (Baseline)" in Figure A48.

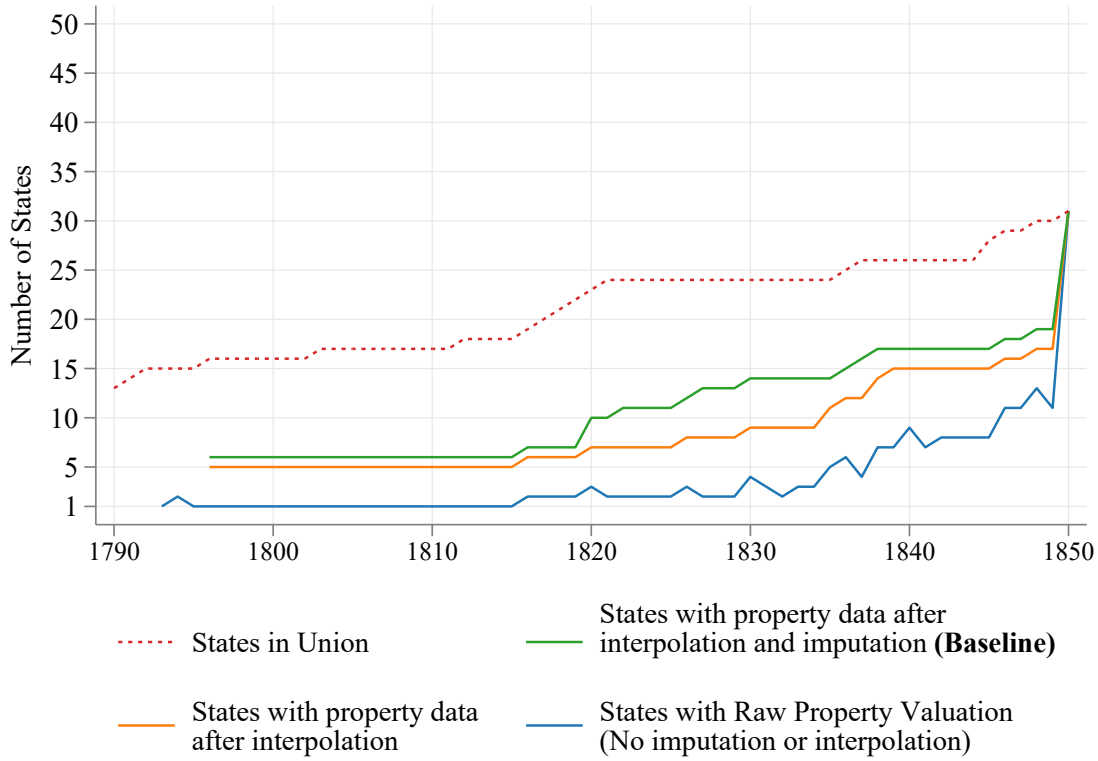
(2) We obtain a national wealth estimate for each year by rescaling the sum of total wealth from states with observed wealth in that year (either directly, or through the imputation in equation (8) by the share of national wealth from these states in 1850 (1850 is the first year when wealth is observed 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

$$W_t^{nat} = \sum_{i \in I_t} W_{it} \cdot \frac{W_{1850}^{nat}}{\sum_{i \in I_t} W_{i,1850)}} \tag{9}$$

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 A8 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

Figure A48: Data Coverage at the State Level Before 1850



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.

pre-1850 (the blue series in Panel C of Figure A8). 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 (8) (line "Pre-1850 Imputation from Levy"). In the final series, we also rescale pre-1850 national wealth series using formula (9) (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 A8. Our preferred rescaling in formula (9) 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 A8 the values of national wealth using a constant assessment ratio of 40%. As explained in Section III.2, 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 4).

GDP estimates. We sometimes use GDP estimates at the national level as a scaling factor. To show the robustness of our results, we compare our results using three different GDP series in Appendix Figure A10:

- Our benchmark estimate is Johnston and Williamson (2020), who provide annual GDP data from 1790 to 2020, building on McCusker (2000), Weiss (1993), and Gallman (1966).
- Bolt and Van Zanden (2020) provide annual GDP data for many countries, including the United States from 1800 to 2020. Their work builds on Prados de la Escosura (2009) and Sutch (2006).
- Mitchell (2007) provides statistics from 1789 to 2005 on GNP (before 1993) and GDP (after 1993).

III.6. 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 for measuring wealth, to which we compare our estimates in Section III.8:

1. **Measures based on individual-level Census questions.** The Census directly asked individuals about the value of their their real wealth (in 1850, 1860, and 1870) and personal wealth (in 1860 and 1870), as described in Section III.7. 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.8.

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 Section III.8.

3. **Measures of wealth based on national balance sheets data from national accounts.** Such information only becomes available in 1916 for the U.S., and, hence, 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 on 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, andTennessee for the period 1798-1860.

III.7. Comparison with Census (IPUMS USA Full Count) Data at the County, State and National Levels

For comparison with our data, we construct wealth series at the county and state levels using the IPUMS USA Full Count data (Ruggles et al. (2021*a*)) 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 personal 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. Note that personal wealth is defined here as excluding enslaved property. This means that our procedure assumes that the rate of growth of personal property *excluding slaves* was the same as the rate of growth of real estate property. This is an important precision, because between 1850 and 1860, the rise in the price of enslaved property means that it is unlikely that the rate of growth of enslaved property is the same as that of real estate.

If c is a county and $W^{real}_{c,1860}$ is the real wealth in the county in 1860, $W^{pers}_{c,1860}$ is the personal wealth in the county in 1860, we consider the ratio between personal and real wealth:

$$\rho_{c,1860} = \frac{W^{pers}_{c,1860}}{W^{real}_{c,1860}} \ , \ \rho_{c,1850} = \frac{W^{pers}_{c,1850}}{W^{real}_{c,1850}} \tag{10}$$

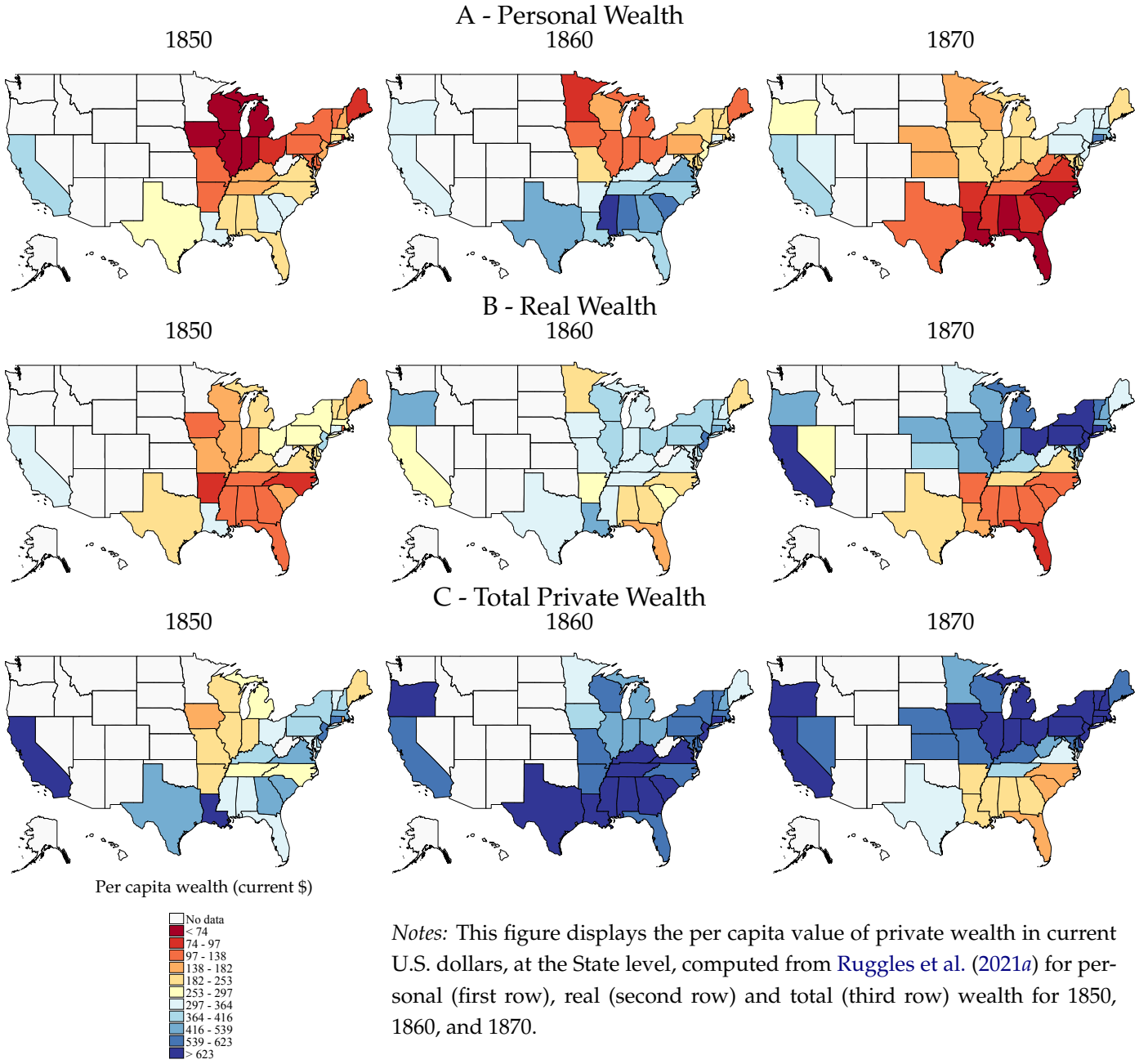
We consider that this ratio is constant over time : $\rho_c = \rho_{c,1860} = \rho_{c,1850}$. With available IPUMS USA full count data, we are able to compute $\rho_c = \rho_{c,1860}$, and then to retrieve:

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

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.

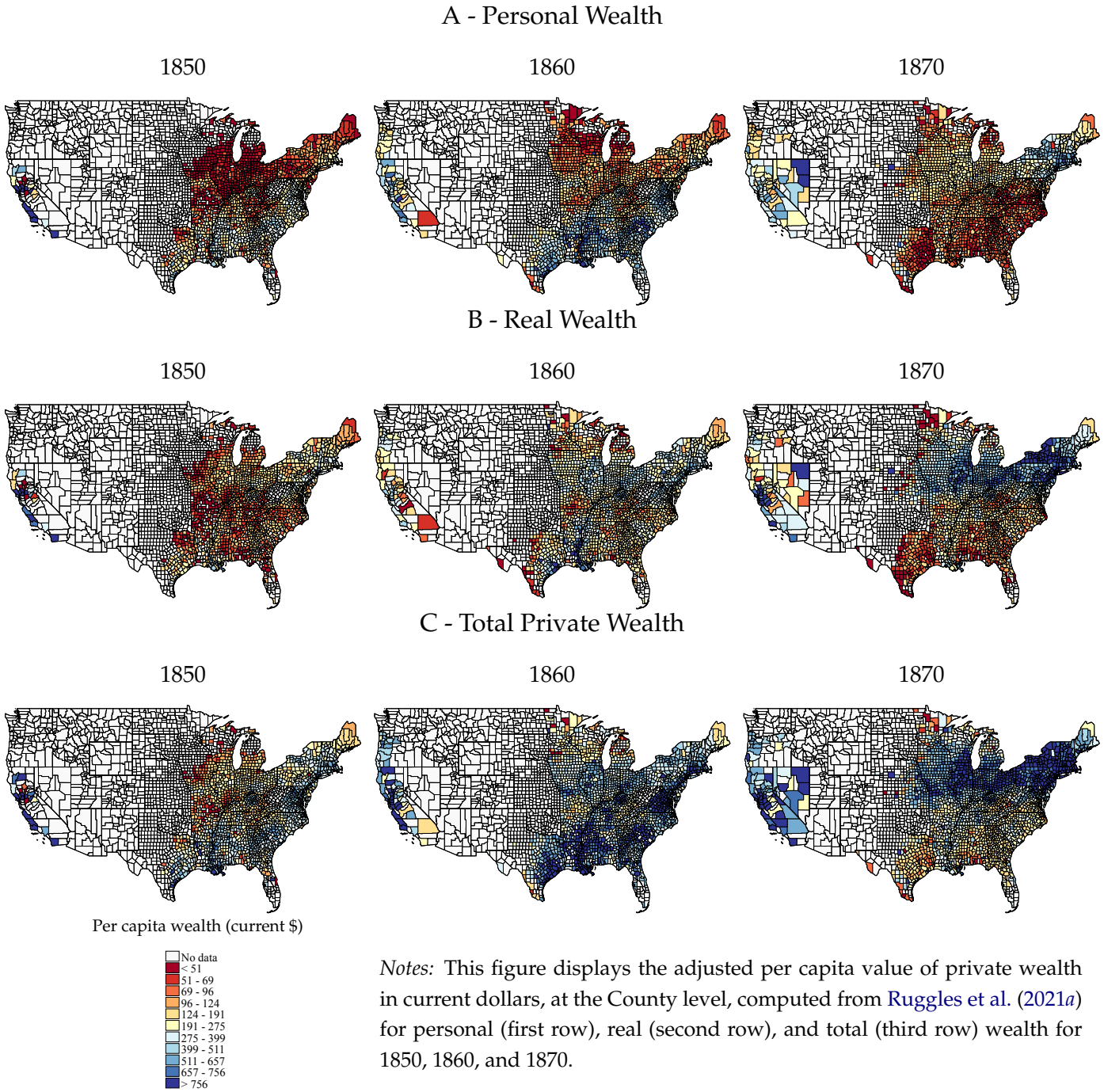
Figure A49 shows private wealth from the IPUMS USA Full Count raw data series at the state level and Figure A50 shows private wealth at the county level between 1850 and 1870.

Figure A49: Private Wealth at the State Level 1850-1870 based on IPUMS USA Full Count



Notes: This figure displays the per capita value of private wealth in current U.S. dollars, at the State level, computed from Ruggles et al. (2021*a*) for personal (first row), real (second row) and total (third row) wealth for 1850, 1860, and 1870.

Figure A50: Private Wealth at the County Level 1850-1870 based on IPUMS USA Full Count



Notes: This figure displays the adjusted per capita value of private wealth in current dollars, at the County level, computed from Ruggles et al. (2021*a*) for personal (first row), real (second row), and total (third row) wealth for 1850, 1860, and 1870.

At the state level, Figure A13 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 A14 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). Our tax-based measures are quite aligned with the Census ones for this overlapping year.

III.8. Comparison with Other Sources

In this section, we compare our database on wealth to the other historical sources described in Section III.6.

III.8.1. Comparison with the Census of Agriculture Data at the State Level

In Figure 8A, 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, Fishback and Rhode (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.8.2. 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 U.S.

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 (1989). Piketty and Zucman (2014) make two adjustments: (i) they exclude consumer durables[25] (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.8.3. Gallman and Rhode (2019)

The 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

[25] 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).

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.

III.9. 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. This data comes from the following sources:

- For the period 1993 to 2020, we use the Annual Surveys of State and Local Government Finances produced by the U.S. 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: Historical Censuses of Wealth (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 U.S. 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 Historical Censuses of Wealth of 1902 by the U.S. Census Bureau (U.S. Census Bureau (1902)).

For the denominator (i.e the GDP), we are using the GDP series for Johnston and Williamson (2020).
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.

Table A11: 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														

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 check whether this estimate 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 2, the numerator is the levies such as computed for Figure 1. The denominator is the property valuation. For Panel D of Figure 12, the sources are similar to those just described but we use total revenues by state.

III.10. Additional Variables: Geography, Weather, Occupations, and Demographic Characteristics

III.10.1. County Level

All county-level data is based on the boundaries of counties on the year of observation. We did not choose to rely on time-constant definition of counties.

Total population
The total population variable stems from Haines, university Consortium for Political and Research (2010). This variable encompasses both free and enslaved people. When missing, total population is retrieved from Historical Censuses of Wealth (90 missing observations are replaced in this way). Finally, we replace total population by the IPUMS population value (Ruggles et al. (2021*a*)) for one outlying observation (county Lincoln, Nebraska in 1870).

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: https://worldclim.org/
- Average Maximum July Temperature
  - Unit: Celsius Degrees
  - Source: https://worldclim.org/
- Average January Precipitation
  - Unit: millimeters
  - Source: https://worldclim.org/
- Average July Precipitation
  - Unit: millimeters
  - Source: https://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
- 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 milimetres
  - 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 is 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. (2021*b*) and consist of 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. (2021*b*) and were combined as follows:

- Agriculture (code 100)
- Mining (code 200)
- Manufacturing (code 300), and Non-durable production (code 400, not shown in the figures).
- Commerce: sum of Transportation (500), Retail/Trade (code 600), Finance (code 700), and Business (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.

Top 10% Wealth Share

We construct the share of wealth owned by the 10% richest individuals at the county level using the IPUMS Census individual data (Ruggles et al. (2021*a*)).

III.10.2. 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. Demographics and Occupation shares are as described for the county level.

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