Wealth and Property Taxation in the United States*

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Abstract

We study the history and geography of wealth accumulation in the US, using newly collected historical property tax records since the early 1800s. The property tax in the US was a comprehensive tax on all kinds of properties (real estate, personal property, and financial wealth), making it one of the first "wealth taxes." Our new data allows us to reconstruct wealth series at the city, county, and state levels over time and to study the effects of property taxes on property values, migration, and investment. We first document the long-term evolution of household wealth in the US since the early 1800s, offering new fine-grained and high-frequency estimates of household wealth over a long period of time. The US had significantly lower wealth than Europe and only caught up with Europe after WW1, despite GDP per capita having been larger than that of France or the UK since the late 1870s. Second, we study the spatial allocation of wealth in the US over the long run. The geography of wealth is highly persistent and factors related to geography and demographics correlate strongly with wealth at the city, county, and state levels. Finally, we study the role of the property tax (i.e., a "wealth tax") on wealth accumulation, using the large variation in property tax rates across more than 300 municipalities. We find an implied elasticity of capital income with respect to the net-of-tax rate on income of about .70 after 10 years. This elasticity can be broken down into an (extensive) elasticity of migration of about .26 and an (intensive) elasticity of per capita income of about .44. The intensive margin elasticity appears to be driven in part by reporting and avoidance responses, but also by significant capitalization of property taxes in local real estate prices.

Keywords: taxation, wealth tax, wealth, inequality, convergence, property tax
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1 Introduction

The economic and political debates around wealth and capital taxation have picked up in many countries, bolstered by recent evidence on the increase of the stock of capital in national income (Piketty and Zucman (2014)), the decrease of the labor share (Karabarbounis and Neiman (2014)), and the increase in wealth inequality (Saez and Zucman (2016), Smith, Zidar and Zwick (2021)). In the US, despite a flurry of recent political proposals, the idea of a tax on the stock of net household wealth did not lead to major reforms and some refute even the idea of a wealth tax as "un-american".[1]

Yet, the United States actually invented wealth taxation. In the early 1800s, states started to comprehensively and mostly uniformly tax all forms of property, including personal and financial wealth, through the General Property Tax (GPT) on household wealth. This tax system was unique and different from tax systems in European countries at the time. For a period of close to 150 years, the GPT remained a central tenet of the political and economic system of the US. Only after the 1930s did the importance of the property tax decline, as it was replaced by other types of taxes. Over time, the property tax' base shrank to eventually become the current US property tax, which is no longer "general" and falls only on (a fraction of) real estate wealth. From the early 1800s to around 1930, the GPT was characterized by its very local nature, with multiple jurisdictions potentially competing for the same tax base. It was also characterized by uniform and relatively high effective tax rates. As a result, compared to European countries, the US relied heavily on the local taxation of wealth to fund its government expenditures and public goods.

In this paper we ask: how did this unique reliance on wealth taxation affect wealth accumulation and development in the US? Answering this question requires long-run data on wealth in the US, which has so far been lacking. It also necessitates data on and variation in tax rates.

The General Property Tax created an amazing trail of information on property and wealth that has not yet been systematically collected and used. The first part of our project leverages this information to construct consistent series of households' private wealth over a very long time period and at a granular geographical level. To this end, we combined many different historical primary and secondary sources on local tax revenues, property valuations, and tax rates for states, counties, and municipalities in the US over a century and a half.

Thanks to this newly constructed data, we document the history and geography of wealth accumulation in the US. We show that the US had significantly lower wealth

[1] https://www.wealthmanagement.com/high-net-worth/wealth-tax-simply-un-american

than Europe over the whole 19th century, and only caught up with Europe after WW1, despite GDP per capita having been larger than that of France or the UK since the late 1870s. Second, we study the spatial allocation of wealth in the US over the long run. The geography of wealth is highly persistent at the county and state levels and the US exhibited much less spatial convergence in wealth per capita over time (in either the sense of β-convergence or σ-convergence) than the previous literature (using income per capita measures) seems to suggest (e.g. Barro and Sala-i Martin (1992), Mankiw, Romer and Weil (1992)). Factors related to geography and demographics correlate strongly with wealth levels and wealth growth.

We then study how the property tax (i.e., a "wealth tax") affected these patterns of wealth accumulation over time and space. We thus leverage variations in property taxes across more than 300 municipalities driven by large reforms in municipal tax rates. We measure the responses of wealth accumulation to these large changes using a quasi-experimental event study design. We find large responses that are driven to a significant degree by the extensive margin of migration responses, and by the capitalization of tax rates in the price of local assets. Quantitatively, our estimates imply an elasticity of capital income with respect to the net-of-tax rate on capital income of about .70 after 10 years. This elasticity can be broken down into an (extensive) elasticity of migration of about .26 and an (intensive) elasticity of per capita income of about .44, where the latter is significantly driven by the capitalization of tax rates into local real estate prices.

The local taxation of wealth may be pressured by intensive tax competition. If local spillovers – for instance, due to migration– are very large, tax competition will tend to drive differences in local tax rates across jurisdictions toward zero. Eventually, this leads to all jurisdictions adopting very similar tax policies or taxation shifting to the level of a larger jurisdiction (e.g., the state or federal level). It is therefore important to understand to what extent the very local nature of the GPT led to strong migration, local spillovers, and, the convergence in tax rates across space. In the final part of the paper, we study tax competition and spillovers directly. Consistent with a tax competition channel, we find that the elasticities of wealth and migration are larger for smaller municipalities. We also find evidence for significant spillovers between a city and its neighboring cities: when neighboring cities' property tax rates increase, the city's private wealth increases, especially if it is small. We also directly test for the degree of tax competition by examining the setting of tax rates across neighboring jurisdictions and find that tax rates among spatially close cities tend to be positively correlated.

1.1 Contributions to Literature

Our paper contributes to four strands of the literature studying (i) wealth estimates over the long run, in the US and other countries (ii) development and spatial inequality in the US (iii) the impact of taxation on wealth accumulation, (iv) the history of the property tax.

Wealth estimates over the long run. Like us, Piketty and Zucman (2014) compile high-quality national wealth series for the US and 7 other countries over the long-run. Kopczuk and Saez (2004) compute top wealth shares in the US since 1916 using estate tax returns and the estate multiplier method. Saez and Zucman (2016) construct wealth distributions for the US, relying on a combination of tax and macroeconomic balance sheets data since 1913 and the capitalization method. (Goldsmith, 1951) and Gallman (1986) (see also Gallman and Rhode (2019)) reconstruct decadal wealth series for the US over a large part of the 19th century.

For surveys of this strand of the literature, see Kopczuk (2015) and Roine and Waldenström (2015). Our property tax data offers one of the most comprehensive and consistent sources of wealth across time and space 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, while still allowing us to have have finer-grained data at the city, county, and state levels over time.

Earlier historical wealth estimates are typically found for short periods of time and/or for a few states at a time (Garmon Jr, 2014; Jones, 1970; Soltow, 1984). Shorter-run estimates for recent decades are constructed for Italy over 1995-2016 (Acciari, Alvaredo and Morelli, 2020), Hong-Kong (Piketty and Yang, 2021), Greece (Charalampidis, 2018); the Middle East (Alvaredo, Assouad and Piketty, 2019), and China (Piketty, Yang and Zucman, 2019); and for the 20th century for Australia (Katic and Leigh, 2016); Russia (Novokmet, Piketty and Zucman, 2018).

Development and spatial inequality. We also contribute to the literature on the development of and spatial inequality in the US.

Existing data on wealth is sparse, available for shorter periods of time, higher levels of aggregation, or some specific sectors such as agriculture. Donaldson and Hornbeck (2016) examine the historical impact of railroads on US economic activity, specifically agricultural output; Hornbeck (2012*a*) studies the effects of the American Dust Bowl on agricultural land values and revenues. Hornbeck (2012*b*) also emphasizes the role of the environment's influence on agriculture and Hornbeck (2010) the importance of

property rights in the early modernization of agriculture. The role of agriculture in the subsequent development of places in the US is analyzed in Fiszbein (forthcoming).

We focus on migration as one of the channels through which wealth accumulation changes across space. Historical migration and its impacts on local economic outcomes are studied in Hornbeck and Naidu (2014), Collins and Wanamaker (2014), and Sequeira, Nunn and Qian (2020). The story of the US South, which we also highlight in this paper and its relation to wealth from enslaved people is studied in Ager, Boustan and Eriksson (2021). The capital destruction in some Southern states following the Civil War – which is visible in our wealth estimates – is analyzed in Feigenbaum, Lee and Mezzanotti (2018).

A major topic has been the issue of convergence between different places in the US, with a distinction made between so-called "β-convergence" (the correlation between starting income levels and income growth) and "σ-convergence" (the change in dispersion in income across places over time) (Barro and Sala-i Martin (1992) and Mankiw, Romer and Weil (1992)). At the county level, Higgins, Levy and Young (2006) and Young, Higgins and Levy (2013) find high rates of β-convergence. Quah (1993) and Friedman (1992) highlight the importance of σ-convergence, which is shown in Young, Higgins and Levy (2008) to not automatically follow from β-convergence.

Because of the scarcity of wealth data, this literature has mostly focused on income. However, long-run historical measures of income have some well-known measurement issues, as they are typically imputed from occupations and from the cross-over between occupations and income in the 1950 Census. Furthermore, wealth and income are distinct concepts and different measures, as can be seen in Appendix Figure A1. The correlation between income and wealth at the state-year level is around 0.6 (and the regression of wealth on income yields an R^2 of 0.4), suggesting that these two measures are not capturing the same phenomena. Our new wealth data has higher granularity over time and space, while being of high quality and directly measured – as opposed to imputed from other measures like occupation. Thanks to it, we can examine spatial inequality and convergences in terms of wealth instead of income and show that it looks very different. We also study some of the key correlates of wealth at the city, county, and state levels.

Impact of taxation on wealth accumulation. Because the US property tax was historically a comprehensive tax on most property, it resembles a wealth tax much more than it resembles today's property tax, which applies to real estate. Thus, our paper sheds light on the effects of wealth taxes on wealth accumulation, an area for which the evidence is growing, but still relatively scarce.

In Sweden, Seim (2017) assesses the effects of the annual wealth tax and finds sizable elasticities, including a significant role for under-reporting. Jakobsen et al. (2020) also find large elasticities for Denmark. In Switzerland, canton-level variation in wealth taxes is leveraged by Brülhart et al. (2019) to estimate substantial wealth effects, driven in part by taxpayer mobility and house price capitalization. They argue that savings play only a small role, in light of the lack of third-party reporting. On the estate tax, Kopczuk and Slemrod (2000) consider the effects of the estate tax on wealth accumulation and avoidance behavior from 1916 to 1996 (see also Joulfaian (2006)). In France, Goupille-Lebret and Infante (2018) show that the inheritance tax exhibits small effects on wealth.

There has also been a recent resurgence of interest on property taxation (Wong (2020); Avenancio-León and Howard (2019); Brockmeyer et al. (2019); Löffler and Siegloch (2021)).

The literature on the history of the estate tax is covered more extensively in Section 2.

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. Section 3 describes our newly collected data. Section 4 analyzes wealth trends over time and the evolution of spatial equality in the US. Section 5 studies the effects of the property tax on wealth accumulation. Section 6 concludes.

2 History and Institutional Setting

This section provides a brief overview of the history and system of property taxation in the United States.

2.1 Brief History of the American General Property Tax

From Colonial Times to the Invention of the American General Property Tax

The general property tax was a major component of the American tax system from its inception. Originating from England, property taxes were first recorded in the 10th century under the name of *danegeld* as a tax on land (Benson et al. (1965)). The key American "innovation" was to apply a tax on all classes of property and not only land.[2] During the period of American colonies, this translated into a complex system of taxation on enumerated items with different taxes on classes of property such as land and improvement, livestock, merchant's equipment, or enslaved people (Jensen

[2] Fisher (1996) p206.

(1931) p.20, Fisher (1999) p. 91).[3] The general property tax[4] was progressively established when these tax on enumerated items of property were merged into a uniform tax on all property classes.

While property taxation always remained primarily a local tax, with many local specificities, two movements account for the progressive transformation of existing local property taxes into an American institution, the General Property Tax, whose main characteristics were common to all states.

First, starting from 1820, most new or revised state constitutions included uniformity and universality clauses that established major characteristics of the general property tax. These clauses, which we explain in detail in the next subsection below, shared many similarities across states, and also ensured consistency in the application of the property tax, despite its local nature. The main argument behind these clauses was equality, although recent historical account question it and place the adoption of uniformity clauses as a form of protection for slaveholders. Einhorn (2001, 2008).[5] Uniformity and universality principles were based on a Jeffersonian view of democracy, with small governments administered locally, limited role for expertise or centralized administrations, and direct accountability and involvement (Fisher (1996), pp.60-61).

Second, after the sharp depression of 1842, when eight states and the territory of Florida were in default because of their large state investments in canals and banks, states started to rely more heavily on property tax as a steady source of revenues. Many states adopted as the result of this episode constitutional provisions limiting or prevent the use of public investment in private corporations, and restricting public debt.[6] This made property tax a more important source of state revenue. Coupled with the change in tax structure through uniformity and universality, property tax was the main source of government revenue. As a reaction, state government activity also slowed considerably, local government took over investments in water, sanitation, transportation, public water and schools. By 1902, local revenues were roughly the same as state and national revenues combined (Wallis (2001)).

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

[4]We use the terms "property tax" and "general property tax" interchangeably. The term general property tax referred to a uniform tax on all property classes, as opposed to the current property tax which usually applies to real estate only. Special property tax also existed that followed different principles of taxation.

[5]The view espoused by contemporaries, early 20th century writers or Benson et al. (1965); Fisher (1996) is that the general property tax is the embodiement of Jeffersonian principles of local democracy. The argument by Einhorn (2008) is that uniformity clauses originated from southern slaveholder states such as Maryland to prevent non-slaveholding majority from imposing an additional tax on enslaved people.

[6]See for instance the "Stop and Tax" policy in New York to ban state borrowing for internal improvement and preventing the state from investing in corporations following the economic collapse of 1837 (Einhorn (2008) p.221. See Fisher (1996) pp.51-56 for case studies of Ohio and Illinois after 1840.

The Principles of the General Property Tax

Property taxation was primarily a local tax, but its main characteristics were common to all states. First, **universality clauses** required all classes of property to be the subject to the property tax.[7] These clauses ensured that all classes of property be subject to the same tax, as opposed to separate taxes, valuation methods and rules for each class of property. The universality principle also ensure that there be limited and clearly defined types of exemptions. The only common types of exemptions were for property used for religious, charitable, educational, and governmental purposes, or for targeted groups (widows, orphans, those in financial distress).

Second, property taxation is **ad valorem**, i.e. taxation is on the basis of value. This key concept allowed for the same tax to apply on different classes of property, as opposed to having taxes based on the kind of property being taxed. As described below, this will make the valuation of property an essential feature of this tax.

Third, **uniformity clauses** required that all property be subject to the same tax rate in proportion to their value. This clause ensured that a unique property tax rate be used, regardless of the class of property. It also reinforced the fact that property taxes were not aimed at progressivity, as the same rate based on value applied for all levels of wealth.

Fourth, property taxes are **impersonal/in rem**. This means that the general property tax was levied against the property itself, and not against the person who owns the property (*in personam*). This turned out to be important to simplify the administration of the tax, as it allowed to levy the tax without knowing the owner of property, and was useful for a tax administered by local assessors. But some key classes of property and in particular personal intangibles (such as financial wealth) were an exception to that rule and were taxed against their owner.

Fifth, property taxes were **local**. The property tax was a local tax that was administered and levied by state and local jurisdictions (city, county, special districts, state).[8]. Overlapping jurisdictions can tax the same property, and in practice this meant that a given property will be subject to all the property taxes on the jurisdictions on which it resides. The local nature of the property tax was also reflected in its administration. The process of listing and valuing property, as well as levying and collecting

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

[8] There is no equivalent federal property tax. Congress temporarily imposed a progressive property tax in 1798 and 1812, modeled on the *impÃŽt progressif* from the French revolution, but this was unpopular discontinued. Fisher (1997)

property taxes was done by local assessors usually from the same jurisdiction they administered. These local administrators were chosen locally for their knowledge of the valuation. They tended to be elected. Another advantage of the tax being local was to link sources of revenues to government spending. Some property taxes were clearly targeted at financing specific activities, such as taxes on school and road districts. In addition, some states would create specific state property taxes for each spending category, such as the state tax for the road or school fund.

In sum, uniformity, universality, and ad valorem taxation made the general property tax similar to today's wealth taxes. Its local and impersonal nature made it ideal for ensuring clear and visible administration tied to local government spending. The property tax, historically, was ideally suited to finance governments. Many jurisdictions in the 19th century were rural with no formal business establishment. A sales or excise tax would yield limited revenue, and income tax were not feasible. A tax on property, with a fixed location, which is visible, and a value generally well known in the local area, appeared to be an ideal tax base. Moreover, revenue could be easily allocated to the government in which the property was located (Fisher (2002)).

The Importance of the General Property Tax for State, County, and City Revenues

Figure 1 shows the share of all state revenues (in Panel A) and tax revenues (in Panel B) stemming from the property tax. Until the 1900s, revenue from the property tax made up more than 60% of state revenue in all regions except the Northeast and almost 100% of state tax revenues. These shares declined after 1900 for several reasons, discussed below. The reliance on the property tax differs by region in the US, as the figure shows. In the 19th century many eastern states had investments in banks and transportation projects (such as the construction of the Erie Canal in New York from 1817-1825). New England, the Middle Atlantic and South Atlantic started relying on other taxes as soon as those were available. The states of the South Central and the Mountain divisions tended to rely more heavily on property taxes.

At the local level, Figure 2 confirms that the property tax was a backbone of city revenue as well, with an average of around 60% of all city revenue coming from it. Figure 3 shows that property tax rates in cities were on average between 1 and 2%, while county and state tax rates were lower at below 0.5%. In total, Figure 4 shows that property tax rates ranged from around 0.5% in low-tax areas to more than 5% in higher-tax ones.

Criticisms and Reforms At the Turn of the 20th Century

Political pressures and difficulty in valuation resulted in frequent criticisms. This became more pronounced as the economy grew more complex and more property became more mobile at the end of the 19-th century. Criticism of the existing general property tax system focused on its local administration, the quality of assessment, and inequities in assessment (Benson et al. (1965)).[9]

A large academic literature developed to push for reforms to the organization of the GPT.[10] Two main issues of the property tax became apparent. First, property became less visible or attached to a location as intangible property (e.g. stocks, bonds, and mortgages) grew. As the economy grew more complex, ownership and control or wealth was more difficult to establish. Second, valuation of property was made more difficult by assessors for the same reason and because of election concerns. Because of the increase in wage earnings, property value also became a less suitable measure of ability to pay (Fisher (2002)).

As criticisms over the unfairness of the tax system grew, several reforms took place. Tax commissions set up by states were in charge of centralizing and regulating assessment. States also pushed for the professionalization of the assessment functions by training assessors and using scientific valuation methods. Second, a movement of classification occurred, replacing the uniformity clause, and allowing for lower tax rates on intangible property.[11]

The Demise of the GPT After the Great Depression

After 1933, with the New Deal, the vast expansion of national government over local governments, and the introduction of the income tax, state reliance on property tax declined quickly and became marginal, triggering a demise of the GPT at the local level as well. Property tax 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)). The reason for the disappearance of the general property tax remains debated (Hindman (2010)). But

[9] The size of the administrative districts were small, which facilitated tax sheltering and rendered the valuation of property crossing jurisdictions (such as railroad) difficult. In the case of Boston, the annexation of Roxbury and Dorchester in 1868 and 1870 led nonetheless to the migration of wealthy elites as tax rates were increased, and Boston was derided by contemporaries as "the heaviest taxed city in civilization". See also the debate over classification in Boston between David A. Wells (in favor of taxing real estate only) and Thomas Hill, described in Maggor (2017), in particular pp.74-95.

[10] Economists led the charge and were at the forefront of proposals for reforms to the GPT (see Seligman (1890); McPherson (1907) for a summary of criticism, and Ely (1888); Jensen (1931); Bullock (1916); Lutz (1921) for reviews and reform proposals. Another popular proposal was a single tax on land championed by George (1882).

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

clearly, as programs financed by national governments and granted to state and local governments started expanding, revenue collection shifted dramatically towards the national government, which financed itself with other forms of taxation. At the same time, the fall in property value and rise in property tax delinquencies during the Great Depression meant that state began adopting state sales and income tax, while providing larger exemptions to property tax (Fisher (1997)). Finally, after WWII, homestead exemptions given to owner-occupied residence and limits on property tax rates put a nail in the coffin of the GPT Fisher (2002); Jensen (1936).

2.2 Institutional Setting of the General Property Tax

Types of property. The General Property Tax was conceived as a tax on the value of all property held by households. Many states distinguish between real property and personal property. Real property is the value of land, buildings, and improvements. Personal property has a much less clear definition and essentially includes 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.

The GPT applied in principle to all forms of property, both private and corporate, regardless of ownership.[12] In general, corporate property is taxed on the same basis as individual property. While there was not a generally agreed method of taxing corporate assets –some states taxed property owned by corporations, other taxed individuals who owned shares of stock and bonds issued by corporations–no state taxed *both* corporate assets and household-owned shares, implying that there was no within-state double taxation.[13] Issues of double taxation could arise 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 (Jensen (1931) pp.121-124). Some states (Utah, Massachusetts, Montana, Vermont) explicitly try to avoid the taxation of

[12]Some states specifically require that both people and corporations are subject to the property tax (Illinois, Idaho, Nebraska, Utah, Washington). A common constitutional provision by states required 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).

[13]Jensen (1931)p122-124. 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) p190-194). Commercial banks were often taxed treated separately and taxed on the value of the shares (Jensen (1931) p206)

shares of stock in corporations when the property on which the shares are based has been taxed, including on out-of-state corporations.

Before the abolition of enslavement, enslaved people were considered as part of personal property; they were assessed as such in property tax records, and the same uniform property tax applied to enslaved people as for other types of property.

Specific provisions allowed the deduction of debt from property value. At least eighteen states allowed the deduction of debt from the taxpayer's solvent credits in 1931,[14] 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.[15] Similarly, special provisions on mortgages allowed its deduction on either the lender or borrower to avoid double taxation.[16]

Some property was exempt and exemptions varied by state. Public property (land and public buildings), religious property (e.g., churches, cemeteries, religious societies), charities, hospitals, schools, and libraries were typically exempt from the GPT. In some states, other exemptions were imposed through public policies, for instance on Treasury bonds, abatements for individuals (e.g., one $25 watch in Vermont), or specific sectors (e.g., 10 bee stands and beet sugar factories in Indiana (U.S. Census Bureau (1902))). Provisions to avoid double taxation, as just described for corporate assets and mortgages or debt also meant that one side of these assets was exempt.

Tax legislation and administration. Property taxes applied to private property were layered for each jurisdiction that the property was part of: city, county, state, and special districts. Special districts include school districts, road districts, fire districts, or drainage districts, which allowed for targeting of funds for special projects.

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. In U.S. Census Bureau (1902) (p 617) it is stated that "In general, the state laws leave wide discretionary powers to the local governments as to matters relating to taxation, but in

[14] 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.

[15] For instance, West Virginia prevented the deduction of contingent liabilities (Jensen (1931) p116).

[16] 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) p.622-623 for more details.

each state there are some statutory provisions of a general character intended to bring about uniformity in the levy and collection, even of local taxes, within the state." There were also local legislative bodies at the city or county level whose role was to adjust differences in individual assessments by local assessors, and hear appeals.[17]

Taxes were collected on a tax day. The property tax was levied at the place and at the value it has on a specific day of the year. Loss of value or changes in location during the year were not recognized until tax day of the next year. There were early exceptions to this rule for property subject to manipulation for tax avoidance or to avoid obvious inequities. For instance, merchants' and manufacturers' inventories were made on the basis of average values rather than on a specific day.

3 Data and Wealth Series Construction

In this section, we describe the various new data sources we collected and used to construct wealth series at the city, county, state, and national levels. Appendix III provides more detailed information on data sources and construction.

3.1 General Issues: From Reported Statistics to Measures of Private Wealth

We first discuss some important measurement issues when using property tax data for inferring private wealth.

From assessed wealth to the market value of wealth First and foremost, one needs to account for the fact that the assessed value of a property reported by tax assessors may systematically differ from its true market value. Ultimately, the information on the value of property comes from state and city assessors charged with enumerating and valuing property for the purpose of property taxation. Assessors might deviate from the requirement of assessing at "market value" ("true," "full," or "just" valuation in the words of state constitutions) (U.S. Census Bureau (1902) p3-5). Typically, the assessed values of property for the purpose of property taxation were significantly lower than the actual market value.

In other words, we observe for jurisdiction i in year t the property tax revenues R_{it}, the nominal tax rate on assessed value of property τ_{it}, and the total assessed value of

[17] 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.

property measured by assessors $\tilde{W}_{it}$.

$$\begin{aligned} R_{it} &= \tau_{it} \cdot \tilde{W}_{it} \\ &= \tau_{it} \cdot \gamma_{it} \cdot W_{it} \end{aligned}$$

To reconstruct private wealth, we need the true market value W_{it}, which requires knowing the ratio of assessed to true value, or the so-called "assessment ratio" $\gamma_{it} = \frac{\tilde{W}_{it}}{W_{it}}$. Legally, $\gamma = 1$ in most states, but in practice, $\gamma < 1$

Double-counting and omissions. One worry about double counting may arise when accounting for corporate assets or for credits, loans, and mortgages. However, as explained in Section 2.2, corporate assets were – depending on the state– taxed either on the household side or the corporate side, but not double-taxed within-state. There is thus no double-reporting or double-counting of corporate assets in our constructed wealth measures. Furthermore, debts could be deducted, so that they are also not double counted.

Regarding omissions, we are missing some of the exemptions that represent private wealth, which varied by state, as explained in Section 2.2. Many exemptions related to public and religious property, charities, schools, or hospitals, and are not part of private wealth.

Assigning wealth to the right place: cross-border ownership of real assets. Real estate and real assets were taxed in the jurisdiction where they are located, rather than in the jurisdiction of residence of its owner. This means that our estimates of local household wealth will tend to underestimate true household wealth in jurisdictions where residents own important amounts of real estate in other jurisdictions. And it will overestimate true local household wealth in jurisdictions where a lot of real estate is owned by non-residents. In practice though, cross-border ownership of real estate is limited, and especially so across US states. This in turn suggests that the bias introduced by cross-border ownership of real estate is likely to be limited when looking at more aggregated levels of geography. For corporate assets, we may double-count wealth in two different states in the same situations as described in Section 2.2 in which double-taxation arises and which are limited.

3.2 Data Construction

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3.2.1 State-level property tax and wealth measures.

Assessed Wealth. We collected data from a variety of sources on the valuation of total private property, distinguishing between real and personal property and the tax rate on property. Our primary sources are official State reports, which were the chief financial documents of states and contained detailed information about sources of spending and revenues raised, in particular as relates to property taxation. The format and name of these reports varied from state to state (see examples in Table A6, but were usually either called an Auditor', Treasurer's or Comptroller's report and were produced annually or every two years. We compiled a list of all state reports available on the *HathiTrust* digital library from 1790 until 1940. We also collected data from the State Tax Commission and the Board of Equalization in charge of supervising the assessment of property subject to taxation. Starting in 1915, the U.S. Census compiled and harmonized data from State reports in the series *"Financial Statistics of the States"* (U.S. Census Bureau, 1915). 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 valuation for all states (U.S. Census Bureau (1941); U.S. Department of Commerce (1967, 1982) [18]

Before the abolition of enslavement, enslaved people were assessed as property in property tax records. In some Southern states, reports offer a direct breakdown of personal property into enslaved people and other types of personal property. When this breakdown is not available, we measure the value of enslaved people in total property using the number of enslaved people by county from from the Census and the historical series on the price of enslaved people from Ransom and Sutch (1988) and Einhorn (2001).

Table A6 gives the list of the sources used to construct state-level wealth series from state reports for each of the 52 states and territories. Figure A30 illustrates the coverage of our state wealth series by showing the total value of wealth as share of GDP for each of the states. We observe the value of wealth for most states since their admission to the Union or since the early 1800s. As shown in Figure 8, the share of the US population (at the time) covered in our state-level wealth series reaches 50% in 1820, then progressively increases to 80% by 1865.

Assessment Ratios We leveraged the existence of rich information on assessment practices coming from several main sources, which we compiled. At the state level, we use State reports and the Census analysis from the *"Wealth, Debt, and Taxation"* series, conducted decennially from 1870 to 1920. In particular, State tax commissions and

[18] Where multiple sources are available, we rely on the most recently published series.

the Census conducted extensive comparisons of assessed to true valuation. Second, wherever available, we also collected information from contemporaneous studies by economists, historians, and tax scholars (for instance, Ely (1888); Adams, Thomas Sewall Barnett, George Ernest Benton and Brough, Charles Hillman Schmeckebier (1900); Jensen (1931); Lutz (1921); National Tax Association (1927); Board (1923, 1925)) that documented the ratio of assessment to market values of property. Third, we supplement this with information on assessment ratios from the series *"Financial Statistics of the States"* (U.S. Census Bureau, 1915). In the latter publication, the assessment ratios are self-reported by assessors, so we only use it to detect directional changes, but not to infer levels of assessment ratios.

Figure A4 depicts the evolution of assessment ratios over time. It shows the average and the interquartile range of the assessment ratios across US states for the period 1800 to 1940. The graph reveals that over the long run, the assessment ratios decreased in the US, perhaps because personal property became a larger share of private wealth for American households.

Cross-validation To further validate the quality of our data on assessment ratios, we conducted additional validation exercises using various external sources of information on the market value of specific property. For instance, the Census of Agriculture conducted for certain states and years a thorough and independent assessment of the market value of farmland. Figure 7 compares our estimates of the market value of taxable land and improvements, which we obtain by scaling up assessed values from our property tax sources with the relevant assessment ratio, and the value of farmland land and buildings from the Census of Agriculture. Note that the definition of farmland and improvements is more restrictive than taxable land and improvements that we observe in the property tax data, as not all land is farmland. This explains the presence of a small intercept in the log-log relationship depicted. Reassuringly, we find that the best linear fit line lies very close and is parallel to the 45-degree line, with an estimated slope of 1. This cross-validation suggests that our assessment ratios offer a reliable estimate of the difference between property values reported in the tax data and their true market values. Furthermore, in our empirical analysis, we systematically explore the sensitivity of our estimates to our chosen assessment ratios.

3.2.2 County-level property tax and wealth measures.

We collected data on county-level wealths from statistics compiled every decade from property tax lists by the Census in their *Wealth, Debt and Taxation* publications between 1870-1930 (U.S. Census Bureau, 1880, 1890, 1902, 1912, 1922). These statistics provided

information on total, real, and personal property value, as well as the property tax rates for all counties. We supplement these statistics with data on real and personal property value from Census questions asked directly to individuals in 1860 and 1870.[19]

We use our constructed state-level assessment ratios for county-level assessment ratios. For 1870, the *"Wealth, Debt, and Taxation"* publications directly provide county-level assessment ratios, which we can use to cross-check the validity of the state-level estimates.

3.2.3 City-level property tax and wealth measures

Our city-level data is from the series *Financial Statistics of Cities* from 1899 to 1938. Following an act of Congress, this series was initially compiled by the Bureau of Labor Statistics from 1899 to 1938, and then continued by the U.S. Census Bureau until 1938. These publications aggregated information on municipal finance from the book of accounts of city governments(U.S. Census Bureau (1948, 2006)). They contain detailed annual statistics on property taxes, including rates, revenues, property valuation, and assessment ratios. The cities covered in these reports were all cities with population over 30,000 people (311 cities overall), and for cities with population higher than 100,000 for the years 1932-1938 (95 cities). The data are harmonized for all municipal governments so that they are comparable across cities (U.S. Census Bureau, 1899-1931, 1932-1938).

The city-level assessment ratio was provided annually in the *Financial Statistics of Cities*, based on self-reported estimates by assessors and city officials, which we rescale so that the population-weighted average city assessment ratio corresponds to the average state-level ratio.[20]

3.2.4 National wealth.

TBW

4 Wealth in the US: Descriptive Facts

In this section, we provide new evidence on the dispersion and evolution of wealth in the US since the early 19th century.

[19]The Census also asked about property value in 1850, but only from real property.

[20]Self-reported assessment ratios in the **"Financial Statistics of Cities"** series have not been subject to a critical investigation by the Census, which considered these ratios "only approximately correct"[21], but they offer some useful additional information regarding heterogeneity in practice across local assessors.

4.1 National and Regional Wealth Evolution

The US versus Europe. Panel A of Figure 10 shows GDP per capita in the US since 1800 as compared to France and the UK (taken from Bolt and Van Zanden (2020)). The US overtook Europe in the 19th century in terms of GDP per capita. Yet, if we compared wealth per capita across these countries (Panel B of Figure 10), the US appears much poorer relative to the European countries over the whole course of the 19th century and until the end of the first world war. The convergence in wealth per capita is driven by European countries' wealth per capita dropping sharply following World War I. The US essentially started from a very low level of wealth as a share of GDP, but wealth grew rapidly. Panel A of Figure 11 shows that wealth per capita in the US grew much faster than income per capita. As a result, starting from a low level of wealth, the US managed to more than double its private wealth to GDP ratio, from around 200% to close to 500% in the pre-World War II period.

The US experience of wealth accumulation is peculiar due to its history. Early in the 19th century, the main source of wealth was land, which was abundant and cheap. Immigrants and settlers arriving in the US were usually not bringing large amounts of physical property or capital, but they had their human capital.

It is interesting to compare the lessons form our long-run wealth estimates to earlier work providing annual series since 1870, and 10-year series since 1810 (Goldsmith, 1951; Piketty and Zucman, 2014), as well as to the decadal series in Gallman (1986) and Gallman and Rhode (2019). Appendix Figure shows that, while the more recent data points are relatively well-aligned with earlier estimates, we have more information on the fluctuations in wealth within decades, for instance, during the Civil war.

Regional wealth evolution Our data allows us to also construct wealth series by region in the US. Panel A of Figure 12 shows the wealth per capita in each of the four major regions – Northeast, South, Midwest, and West – as a share of US GDP per capita. This measure captures how wealthy a given region is relative to the average national GDP per capita. The South, Midwest, and Northeast were similarly wealth until the Civil war, although the Northeast experienced the largest 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 wealth per capita to US GDP per capita ratio and remained so until World War I.

We can zoom into the structure of the wealth in the South to better understand the decline in wealth after the Civil war. Figure 13A shows the decomposition of wealth per capita as a share of GDP per capita in the South into real property, personal property, and enslaved people. Wealth from enslaved people accounted for around one third

of total wealth. After the Civil War, real property gained in importance, while personal property declined in share. Panel B of Figure 12 repeats the analysis from Panel A, showing wealth per capita as a share of US GDP per capita, but excluding wealth from enslaved people. The picture appears quite different. The South was already poorer than the other regions and not accumulating wealth at the rate witnessed in the other regions. While other regions' wealth to income ratios grew post Civil wear, the South' stagnated. This pattern will appear at the county level as well, we show in the next section.

4.2 Wealth inequality across space & time

We now study how wealth inequality across places in the US has persisted over time and analyze some of the factors correlated with it.

Persistence of wealth over time Figure 14 shows wealth per capita as a fraction of US GDP per capita at the county level for each decade between 1860 and 1920. The figure highlights a high degree of spatial variation, as well as of persistence. For instance, the counties in the South became poorer after the Civil War and this persisted until the 20th century. The persistence is remarkably strong especially if we compare the spatial distribution of wealth in the 1920s to that of household income today form the Opportunity Atlas Data (see Figure 16).

To study this persistence more precisely, we perform several additional analyses. First, Panel A of Figure 18 depicts the correlations in rank at the county level between 1870 and subsequent decades (1880 to 1930). Although the correlation weakens over time from 0.8 over a ten-year period to 0.6 over a 60-year period, it remains strong, with many points especially towards the middle of the distribution remaining close to the 45-degree line after 60 years. Figure A8 shows that the persistence in wealth ranking is strong after 1870 at the state level too. For stages, we can go back to 1850, pre-Civil war and see that the correlation between rank in 1850 and rank in 1880 is essentially zero. The Civil war thus reshuffled rankings substantially, but those ranks then persisted until the 1940s (and beyond).

Second, we study the speed of convergence between poor and rich counties and states over time. For this, we first construct 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 or state, in terms of climate, soil, topography, and distance to waterways; ii) *Demographics* variables from Ruggles et al.

(2021) and Haines et al. (2010) that measure the population, change in population, literacy rate, share of foreigners, gender composition, and the share white; iii) *Occupation shares* in public administration, production, mining, commerce, and agriculture from Ruggles et al. (2021). These variables and their sources are defined more precisely in Appendix III.8.

To estimate the speed of convergence, we regress the change in total household property value in county i between 1870 and 1930 on starting wealth and a time-varying county-level constant, year fixed effects, and a growing number of controls. Without any controls, we infer the speed of so-called "β-convergence" from Barro et al. (1991), from the relation:

$$\log\left(\frac{W_{i,1930}}{W_{i,1870}}\right) = a_{i,1930} - (1 - \exp(-\beta)) \cdot \log(y_{i,1870}) + u_i, 1930$$

Panel B of Figure 18 reports the estimated β for different sets of controls: i) no controls; and adding progressively ii) *Geography* controls; *Demographics* controls; *Occupational shares* controls. The persistence we find without any controls corresponds to $\beta = 0.01$, which is a relatively slow rate of convergence as compared to the literature discussed in the introduction. Note that the scatter plot represents Southern counties in red. It is clear that these counties stagnate at overall lower wealth levels and lower growth rates: the β excluding Southern counties is 0.036. Furthermore, by adding controls for geography, which essentially filters out a lot of the differences by region, β doubles to 0.02 and the R^2 increases from 0.32 from the regression without controls to 0.50 in the one with controls for geography. Adding controls for *Demographics* and *Occupational Shares* only marginally increases β to 0.025 and R^2 to 0.54. Thus, regional and geographical factors have strong explanatory power and convergence is relatively fast in the US, except in the South that is trapped in a low convergence, poorer state.

Figure A9 replicates this same analysis at the state level, and yields an even smaller $\beta = 0.008$ over the period 1870-1939. In particular, this speed of convergence is much slower than the one found in Barro et al. (1991) using income data across U.S. states. This is also true at the county level, as shown in Panel C of Figure 18. Income per capita shows much faster convergence that is not sensitive to the inclusion of geography controls and that does not look very different in Southern counties. Thus, the speed of convergence appears very different with income versus wealth data. While we cannot definitively explain the different patterns by income versus wealth, measurement issues in income–which is imputed from occupations– are likely to be at least partially a cause.

Third, we consider the so-called "sigma-convergence" or "σ-convergence, which refers to the change in dispersion across space. As Young, Higgins and Levy (2008) outline,

σ-convergence need not accompany β-convergence. Using county level data on income in the US, they find no evidence of σ-convergence across counties and within-US states over the period 1970-2010. Thanks to our wealth measures, we can show that there is also no σ-convergence in wealth over an earlier period. Panel D of Figure 18 plots the wealth dispersion across counties in our data (log wealth per capita) and the dispersion of log income per capita. While the dispersion of log income per capita declines, the dispersion of wealth remains constant, unless we exclude Southern counties. Panel B of Figure A9 shows a similar pattern for the evolution of wealth dispersion across states, benchmarked against the series of income per capita from Barro and Sala-i Martin (2004).

Thus, while earlier evidence on income per capita shows both σ and β convergence at the state level, our new wealth per capita data shows slower β convergence and no σ convergence at the county and state levels.

Correlates of initial wealth and wealth growth Which of the individual variables in the *Geography*, *Demographics*, and *Occupational Shares* set are correlated with wealth levels and wealth growth? Panel A of Figure 19 shows the correlates of initial wealth, i.e., log total household property value per capita at the county level in 1870. The coefficients come from a regression simultaneously controlling for geography (which are time-invariant at the county-level) and demographic characteristics and occupational shares lagged by 10 years. Panel B instead has as outcome variable the growth in total household property value per capita over the period 1870-1930, controlling for all covariates and initial wealth in 1870. Tables A1-A2 show more detailed regression results at the county level, including for wealth growth over 10 years and adding state fixed effects. Figure A11 and Table A3 focus on the state level correlates of wealth.

Characteristics related to *Geography* are strongly correlated with initial wealth in 1870 and less so with subsequent growth (controlling for initial wealth). Climate is an important predictor of wealth in 1870. For instance, a one standard deviation higher temperature in July – characteristic of Southern counties– is associated with a 25% lower initial wealth, but not with growth over 1870-1930. More abundant winter precipitations –indicating harsher winter conditions– are associated with significantly lower initial wealth as well as with lower growth. Topography– as captured by elevation and ruggedness – is negatively related to wealth in 1870, but not significantly correlated with growth in wealth over the long run. Soil productivity is associated with significantly higher initial wealth and long-run wealth growth.

Among *Demographics* variables, higher literacy rates have the highest correlation with both initial wealth and subsequent long-run wealth growth. Places that were richer in 1870 had on average a somewhat smaller share of foreigners, but a higher share

of foreigners is significantly positively associated with higher long-run growth. In 1870, wealthier counties had somewhat higher population levels, but initial population levels in 1870 are not significantly associated with growth over the long-run. The 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 of some of the convergence being driven by migration flows: 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.

5 The Effects of Property Taxation On Wealth Accumulation

We leverage the geographical and historical depth of our wealth data, along with the rich variation in tax rates created by the local nature of the US general property tax, to study how property taxation affected wealth accumulation.

We focus our analysis here on the municipality level for two reasons. First, among all local jurisdictions (states, counties, municipalities, school districts) that rely on the general property tax base to levy revenues, municipalities are the ones that impose by far the largest tax rate, as shown in Figure 3. Second, we have data at an annual frequency across a large number of municipalities and over a period of close to 40 years. This allows us to exploit the large variation in municipal tax rates over time.

5.1 Variance Decomposition

To gauge the importance of property taxation in explaining local wealth accumulation, we start with a variance decomposition exercize. We focus on the 153 municipalities for which we have consistent data, for the period 1900 to 1931, on property valuations, property tax rates and assessment ratios, on municipal finances, as well as on all correlates of wealth described in the previous section above. For these municipalities, we try to explain the dispersion in property value per capita in 1931 with the same rich set of regressors as in Tables A1-A2, now also adding to the model 19 variables capturing property tax history and the structure of municipal revenues and expenditures over the period 1900 to 1931. We group these additional variables into four categories. First, *Government Expenditures*, which comprises the average yearly total municipal government expenditures over the period 1920 to 1930, as well as the average structure of

these expenditures in 9 categories, and the average interest rate on municipal bonds.[22] Second, *Tax Enforcement*, which consists in a dummy for the existence of a State tax commission, a dummy for the presence of tax ferrets, and an indicator for property tax classification. Finally, we split property tax history variables between *Assessment Ratios* and *Tax Rates*, the latter consisting in the average log net of tax rate on property for each of the periods 1900-1910, 1910-1920 and 1920-1930.

We start with a simple linear model estimated using OLS, adding each variable sequentially, and computing the corresponding adjusted $R-$squared. Panel A of Figure 20, which reports the results, shows the important role played by geography, demography and the occupational structure of the economy. Together, these variables explain around a quarter of the total variance in per capita municipal wealth. But the graph also suggests that public policy variables are key determinants of the geographical allocation of per capita wealth. In particular, the sequence of past property tax rates from 1900 to 1930 explains about a tenth of the variance across municipalities in 1931.

We confirm this diagnosis using more sophisticated prediction models of per capita wealth. In panel B of Figure 20, we report a "variable importance" plot for a random forest model that allows for more complex interactions between all determinants of wealth.[23] While geography and the structure of government expenditures matters, both average tax rates in the past 10 and 20 years appear among the 10 most important variables of the model. Overall this evidence suggests that the past dynamics of property taxes may be an important determinant of the geographic dispersion of wealth across US cities. But one of the drawbacks of these exercises of course, is that they cannot establish whether this relationship between property taxes and the long run evolution of per capita wealth is causal, nor can it shed light on the underlying mechanisms. For this reason, we now turn to an event-study approach that helps us isolate quasi-experimental variations in property tax rates across cities to study their dynamic impact on wealth accumulation.

[22] Expenditures categories are: Health, Sanitation, Highways, Public Assistance, Education, Recreation, Public Order, General Government, and a residual.

[23] We show the importance of the ten most important variables in the model, normalized to the strongest variable. In practice, we grow 1000 trees with a training sample (40The remaining observation 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 recoded and attributed to the variable that is used for the split. At the end, we sum up all the improvements in RMSE within a tree and across all trees per variable. Hence, each variable contributes in total to a certain amount of RMSE improvement. For each variable, we then normalize the contribution to RMSE improvement to that of the variable with the highest contribution.

5.2 Event Study Approach

We start by identifying in the data episodes of large, sudden and persistent increases in effective property tax rates. We apply a data-driven selection algorithm described in detail in the Appendix. In short, the algorithm isolates the 400 largest year-on-year changes in nominal tax rates. Then we restrict attention to changes that are persistent, i.e. the nominal property tax rate must remain persistently larger in the 10 years following the event. We also focus on events that are unique at the municipal level, and that are not accompanied by additional changes in enforcement practices, or assessment ratios. Our algorithm ends up selecting eight large events, listed in the Appendix.

To ensure that these events are not correlated with time specific shocks at the municipal level, we conducted two types of checks. First, we manually validated, ex-post, using local historical sources, that our eight selected events were not accompanied by other obvious confounders such as a change in city boundaries, local economic shocks, natural disasters, default on municipal debt, etc.

Second, we use the extensive data we collected on local municipal finances, to investigate whether our events are triggered, or followed by local shocks to government revenues or spending.

To measure the effect of these eight large and persistent property tax increases, we rely on a Generalized Synthetic Control Approach (Xu (2017)). This approach builds on Generalized Interactive Fixed Effects models *à la* Bai (2009), of which synthetic control models are just a special case. As a result, this approach has the advantage of allowing the flexible aggregation of multiple synthetic control experiments, and also allows dimension reduction *à la* Abadie and L'Hour (2021)

Main results Figure 21 starts by showing the "first stage" results, that is, the evolution of the effective tax rates on property around the time of the event, in our eight treated municipalities, relative to synthetic control municipalities. The graph confirms that our selected events correspond to large and persistent increases in the tax rate of about .6 percentage points. The effective tax rate being on average around 1 percent for our eight treated municipalities prior to the event, the magnitude of the increase is substantial.

Figure 22 then shows the evolution of the log of total household property value in treated municipalities, as a function of time to the event. The graph shows that the event triggers a very strong and significant decline in total property values, which stabilizes after about five years. To get a sense of the magnitude of the effect, we can scale it by the first stage and and translate the response in terms of the elasticity

of the total stock of household wealth with respect to the net of average tax rate on wealth. Because the average tax rate on income is close to zero though, this elasticity is extremely large, and hard to interpret. Instead, we express the result in terms of the implied elasticity of the flow of capital income rW with respect to the net-of-tax rate on capital income $t = \tau/r$ where τ is the average effective tax rate on property, and r is the interest rate. This makes the result easily comparable to elasticities of taxable income used in the public finance literature. We find an implied elasticity of capital income $\varepsilon \approx 1$, which is very large.

In Figure 23, we further decompose the effect in terms of extensive and intensive responses. Panel A shows the evolution of the log population size. The graph reveals a large decline in population following the event, indicating that a significant part of the response of local household wealth is driven by the extensive margin of in and out migration. The implied elasticity of the population stock with respect to the net-of-tax rate on capital income is $\varepsilon_N \approx .3$, which is in line with estimates in the migration literature.[24] Panel B shows the response of log wealth per capita. The graph confirms the presence of a large and significant response at the intensive margin as well, with an implied elasticity of per capita capital income with respect to the net-of-tax rate on income: $\varepsilon_W \approx .7$. This number is in line with estimates from Jakobsen et al. (2020), looking at the effect of wealth taxation on the household wealth at the top of the distribution in Denmark.

Decomposing per capita wealth responses We now investigate three main mechanisms that may drive the large observed drop in wealth per capita in response to property tax increases.

The first is **selective migration**. We know that municipal tax increases trigger large extensive margin responses. If the households who migrate out of or do not migrate to the city in response to the tax increase have higher average wealth than those who remain, then average wealth per capita would increase because of compositional effects due to selective migration, even absent any intensive margin response of private wealth accumulation. While we do not have data on wealth at the individual level, we observe a large number of demographic and economic characteristics of the city population that correlate with household wealth. To test for selective migration, we therefore predict average household wealth at the municipal level in all control municipalities and apply this prediction to our treated municipalities. Using this predicted wealth as an outcome enables us to test whether the change in the characteristics of the population following the tax increase can explain of the change in per capita wealth.

[24]The estimates appear a bit larger than estimates of Jakobsen et al. (2022) who study the impact of wealth taxation on migration patterns of the very wealthy in Scandinavia.

The results, reported in Figure 23, suggest that selective migration is not driving the per capita wealth response.

The second mechanism we explore is the role of **reporting and evasion** behaviors. Figure 24B shows the evolution of personal property per capita, and reveals the presence of a significant drop in personal property per capita. While somewhat gradual, the magnitude in the reduction of the stock of personal household wealth seems too large to be driven by changes in savings or consumption choices alone and is therefore indicative of possibly large avoidance and evasion behaviors. We also do not detect any significant changes in enforcement and assessment practices around the time of the event.[25] Furthermore, we do not find significant differences in the response of personal property per capita between municipalities with high quality of enforcement vs low quality of enforcement.

The final mechanism we investigate is **capitalization** of tax variations into the prices of local assets. In Figure 24A, we display the evolution of per capita real estate wealth, and find a strong response, with a semi-elasticity of real estate property value in the first five years $\approx .25$. This large response in the stock cannot be driven so quickly by changes in savings and consumption flows only. It is *prima facie* evidence of significant capitalization of local property taxes into prices of local real estate assets. To further investigate this, we collected information on real estate prices from property tax records for a subset of municipalities.

5.3 Spillovers & Tax Competition: Further Insights From TWFE Model

To further investigate the role of property taxation on local wealth accumulation, we now turn to a two-way-fixed-effect model that leverages all the variation across all municipalities over time. This gives us the critical power to explore heterogeneity in responses and to study the presence of local spillovers and tax competition. We model the conditional expectation of outcome Y in municipality i in year t as:

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

where $\bar{\tau}_{i,t-10}$ is the average effective tax rate in city i in the ten years before year t, and $\bar{r}_{i,t-10}$ is the average risk free interest tax rate in city i in the ten years before year t. The coefficient ε measures the flow elasticity of capital income with respect to the implied tax rate on capital income, as in the previous subsection.

[25] As explained above, this is by construction, as our selection algorithm rules out large changes correlated with modifications of enforcement or assessment ratios at the municipal level.

Elasticity of the wealth tax base strongly decreases with population size We start by showing in Figure 25 panel A that the elasticity ε of total household wealth decreases with the initial population size of the city. In panel B, we show that this gradient is almost entirely driven by the gradient in the population size elasticity: municipalities in the bottom quintile of the size distribution of cities are seeing a much stronger percentage reduction in their population size than the largest cities. This is what would be expected in a model of tax competition, where initial size matters.

Local spillovers & tax competition To model spillovers and tax competition more formally, we consider specifications of the form:

$$Y_{it} = \beta \ln(1 - \bar{\tau}_{i,t-10}/\bar{r}_{i,t-10}) + \rho \ln(1 - \bar{\tau}_{-i,t-10}/\bar{r}_{-i,t-10}) + X'_{it}\gamma + \eta_i + \zeta_t$$

where $\bar{\tau}_{-i,t-10}$ is the average effective tax rate in all neighboring cities of city i. We can define "neighboring" cities as those being within a given distance in miles in planar measure. In our benchmark use, we use cities within 100 miles.

We first estimate this regression using as outcome the log of total property value. Table 2 shows that a city's own net-of-tax rate is significantly positively correlated with its own tax rate. It is also negatively correlated with the average effective tax rate in neighboring cities, although the effect is not significant on the full sample. Yet, if we restrict the sample to smaller cities, as is done in Panel B, the effect of own tax rate becomes larger and the effect of neighboring cities' tax rate becomes larger and significant. We then estimate this regression using as outcome the average log effective net-of-tax rate from t to $t + 5$. We find that, as expected, there is positive correlation in tax rates within a city over time. Furthermore, there is also a positive (and mostly significant) correlation with the net-of-tax rate of neighboring cities. These patterns between a city and its neighbors are suggestive of tax competition.

6 Conclusion

The general property tax was one of the first wealth taxes. It was a comprehensive tax that applied mostly uniformly 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 of household wealth in the US. This new data allows us document the evolution of wealth and spatial inequality over time. The geography of wealth is highly persistent and strongly correlated with factors related to geography and demographics. We also study the impacts of the property tax on wealth accumulation, using quasi-experimental variation

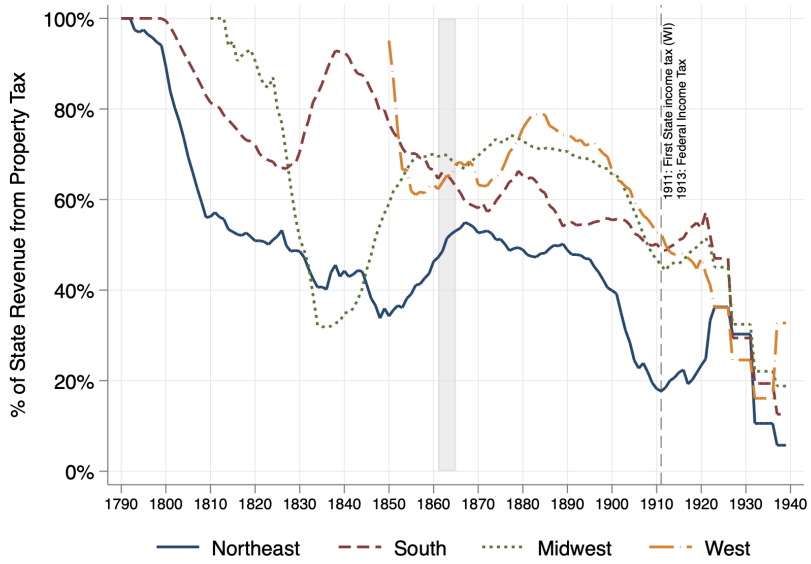
of tax rates across municipalities. We find that, given the very localized nature of the tax, the implied elasticities of capital income are large. Around one third of it is accounted for by migration responses (extensive margins) which represents a spillover to neighboring jurisdictions. Another two third are driven by responses of per capita wealth (intensive margin) and are related to significant capitalization of property taxes in local real estate prices. Because of these sizable effects and spillovers, the equilibrium is one of tax competition and tax convergence across jurisdictions.

Our historical evidence confirms the difficulty of relying on very localized taxes to generate significant revenues. Future work can leverage the exhaustive wealth data to compare and contrast to the results from earlier work on the determinants of economic activity that uses income data. We showed that results on convergence for instance look very different in terms of wealth and income. It would also be interesting to consider the effects of local wealth on an array of other economic outcomes, such as innovation or education. Finally, it may be interesting to perform a finer analysis by different types of wealth, leveraging the additional information in the data.

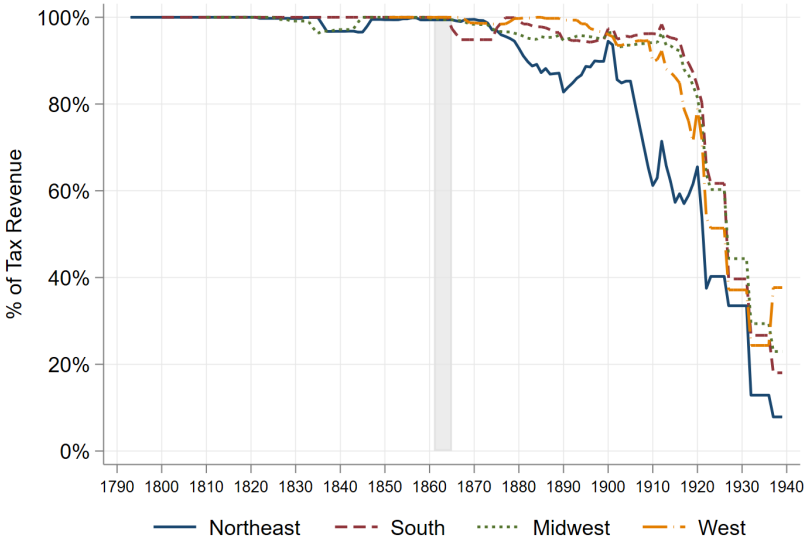
Figures

Figure 1: The Importance of the Property Tax for State Revenues

A. Property Tax Revenue as a Share of State Revenue

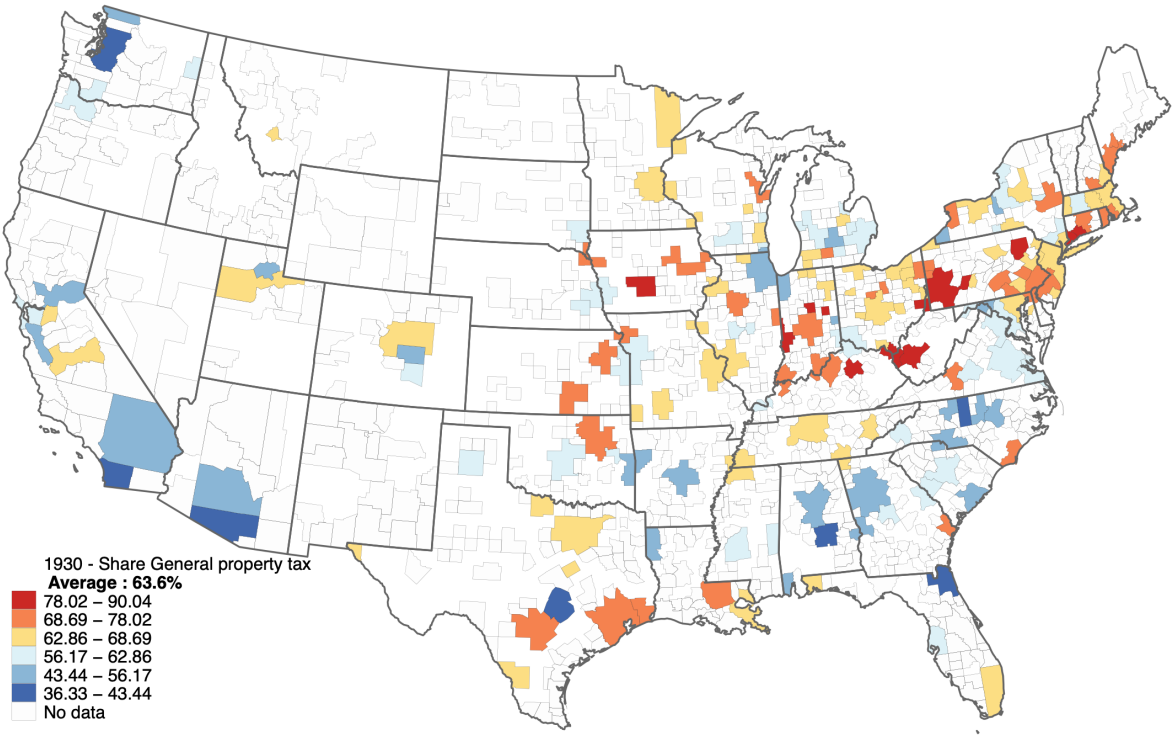


B. Property Tax Revenue as a Share of State Tax Revenue



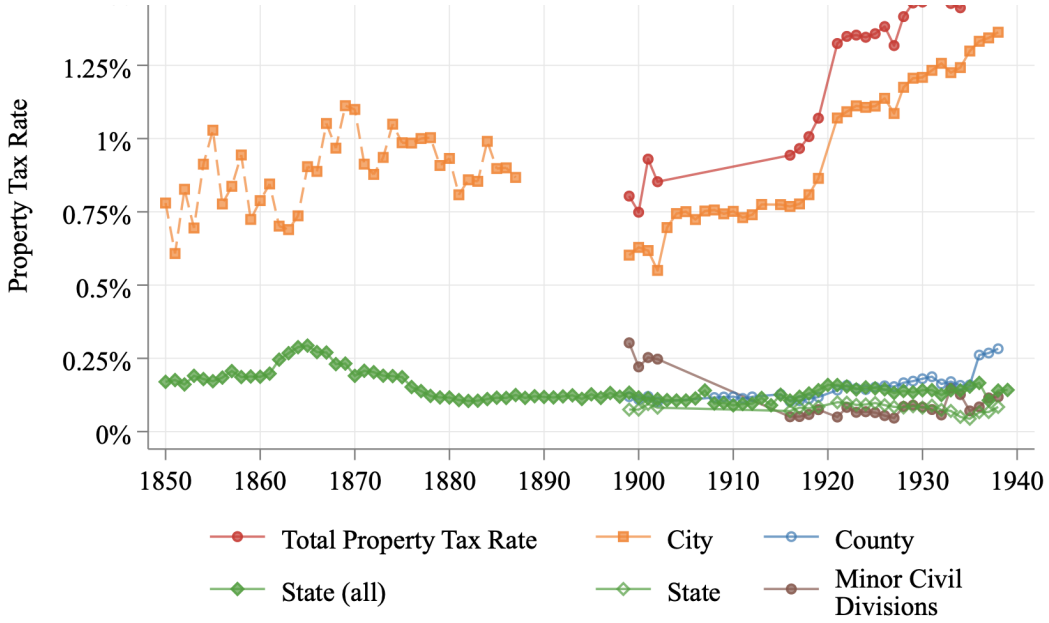
Notes: Panel A shows the average share of state revenue (both tax and non-tax revenues) from property tax, while Panel B shows the average share of tax revenue from property tax. Values are displayed as a moving average over 10 years.

Figure 2: The Property Tax as Backbone of City Revenue



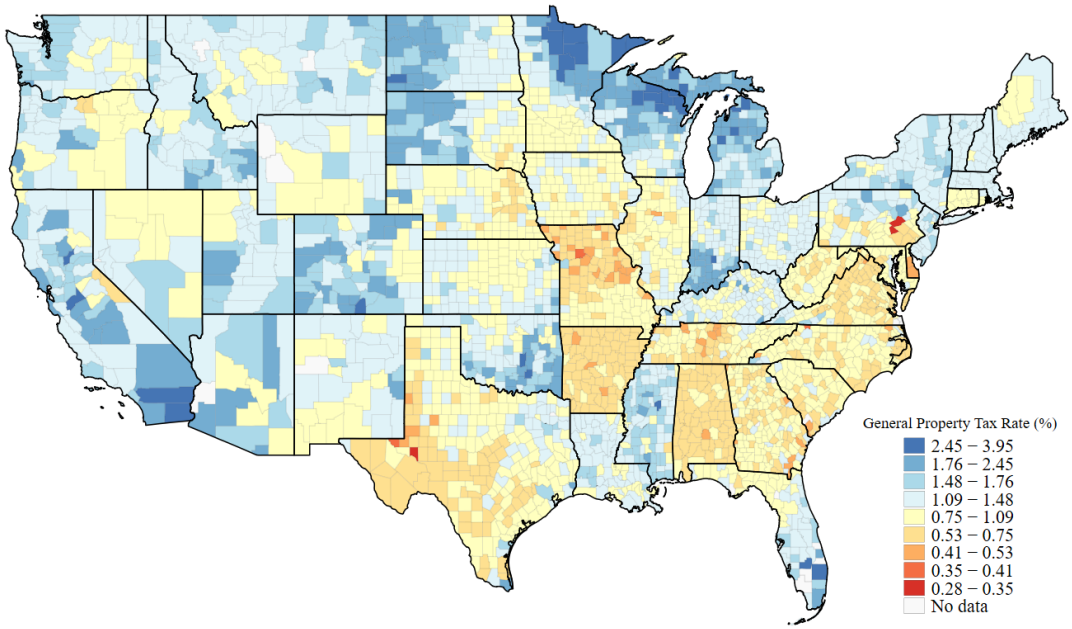
Notes: This figure shows the share of municipal revenue derived from the general property in 1930. The sample of cities are those with a population above 30,000 population. The shares are averaged and displayed on core-based statistical areas for readability.

Figure 3: Average Effective Rates of Taxation



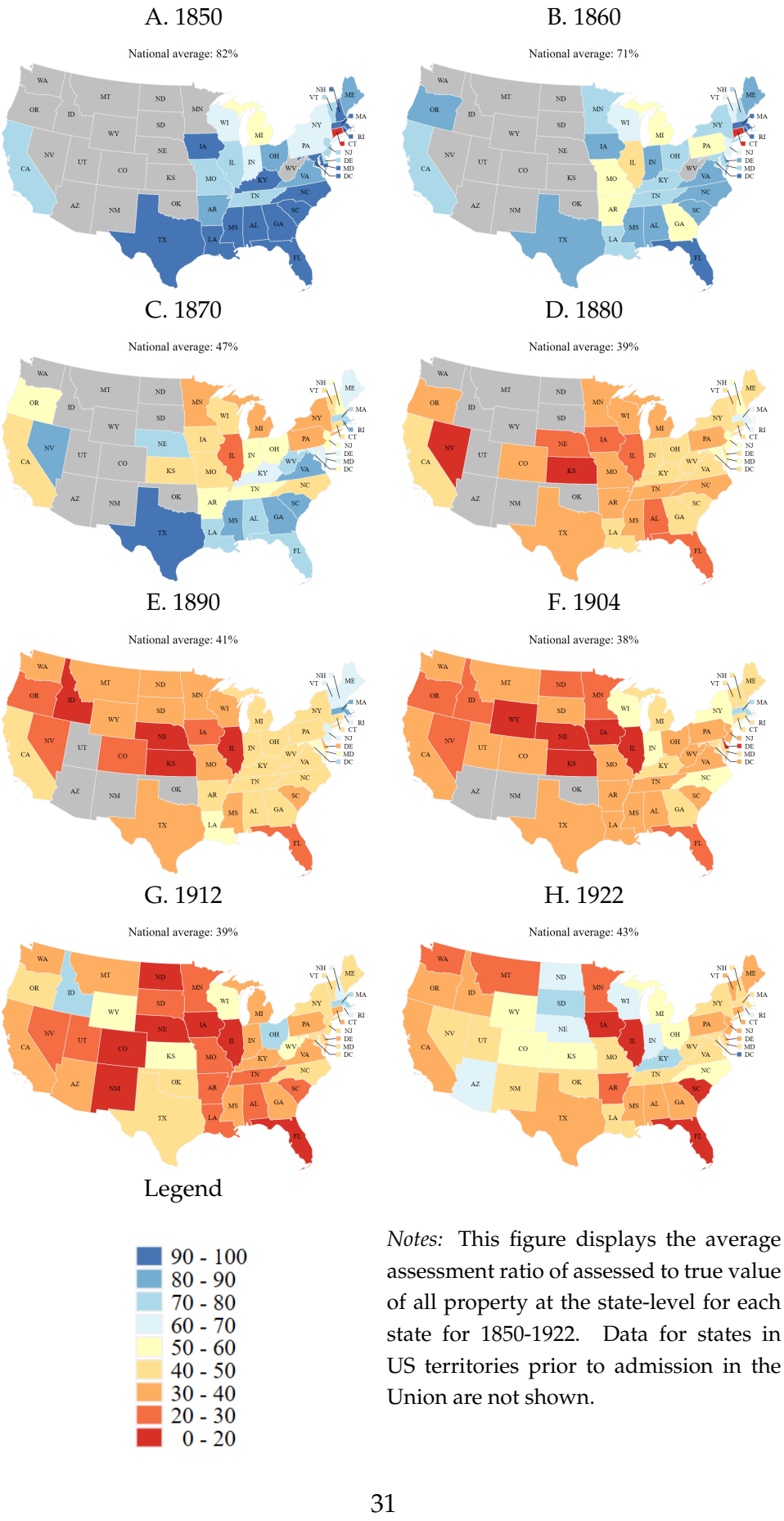
Notes: The time series for the period 1899-1938 are from U.S. Census Bureau (1899-1931, 1932-1938), and from Baltimore, Boston and Cincinnati prior to 1899. Sources for the state and county time series for the remaining period are listed in Appendix Table A5. Finally, Minor Civil Divisions are the primary divisions of a county (see Census).

Figure 4: Total Effective Property Tax Rate - 1920



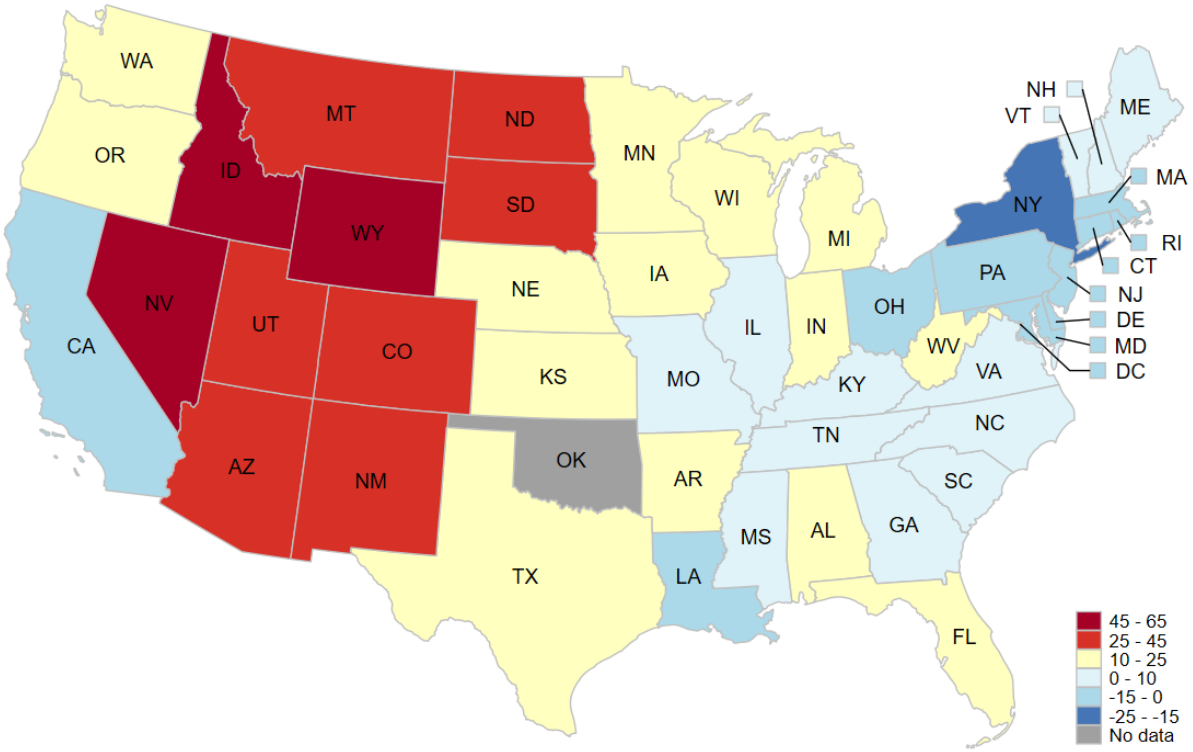
Notes: This figure shows the effective general property tax rate, including property taxes at the district, city, county and state level. It is computed as the ratio between the tax levy and the total value of property.

Figure 5: Assessment ratios



Notes: This figure displays the average assessment ratio of assessed to true value of all property at the state-level for each state for 1850-1922. Data for states in US territories prior to admission in the Union are not shown.

Figure 6A: Net Cross-State position map



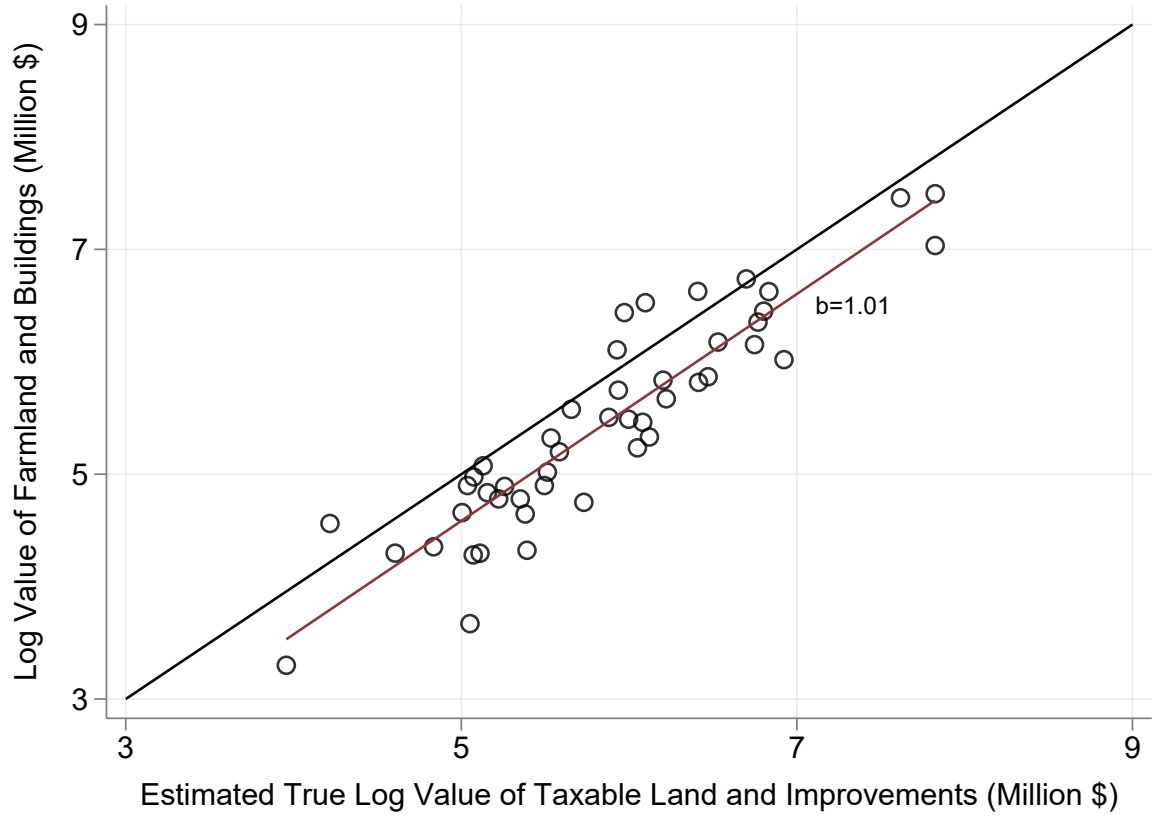
Notes: The Figure shows the net cross-state position of each state for year 1880, in percentage. A higher position means that the state's value is higher than the state's ownership. Data from the Census 1880: Report on Valuation, Taxation, and Public Indebtedness in the United States. (U.S. Census Bureau (1880))

Figure 6B: Net Cross-State position in 1880

State	Net Cross-state Position (%)	State	Net Cross-state Position (%)
New York	-20.78	Indiana	10.83
New Jersey	-10.57	Alabama	11.68
Louisiana	-10.47	Texas	12.12
California	-10.2	West Virginia	12.29
Connecticut	-9.37	Michigan	13.29
Pennsylvania	-9.13	Arkansas	13.99
Massachusetts	-6.56	Wisconsin	14.93
Delaware	-6.15	Iowa	17.78
Rhode Island	-5	Oregon	18.18
Maryland	-3.82	Minnesota	19.44
Ohio	-1.95	Florida	20.83
District of Columbia	-1.36	Washington	22.58
Maine	1.96	Kansas	24.34
Virginia	1.98	Nebraska	24.68
Missouri	2.05	Montana	27.5
Kentucky	2.44	Colorado	37.92
North Carolina	3.25	New Mexico	38.78
Illinois	3.68	Utah	41.23
Vermont	4.3	North Dakota	42.37
Tennessee	5.53	South Dakota	42.37
South Carolina	8.07	Arizona	43.9
Mississippi	8.47	Nevada	55.77
Georgia	8.58	Idaho	58.62
New Hampshire	9.64	Wyoming	62.96

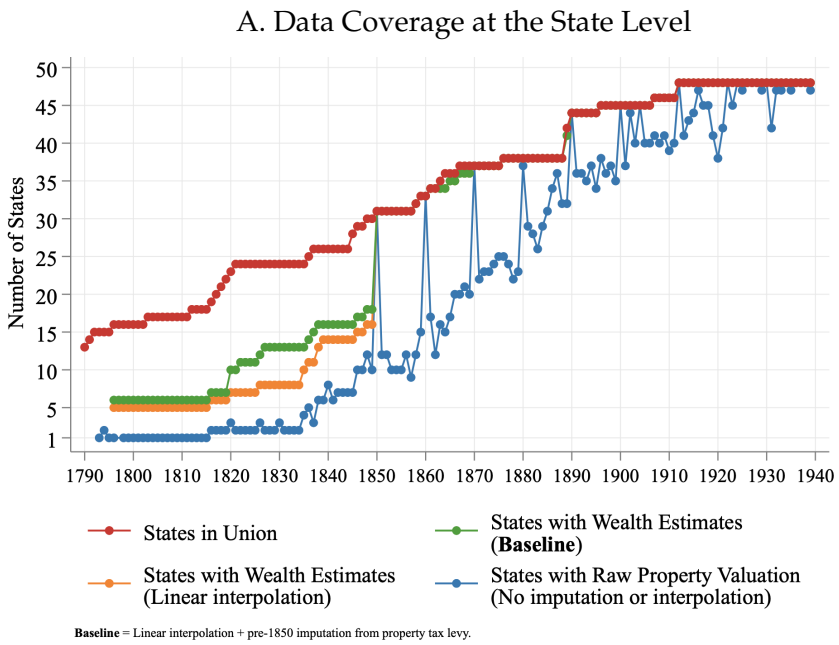
Notes: The Table shows the net cross-state position of each state for year 1880, in percentage. A higher position means that the state's value is higher than the state's ownership. Data from the Census 1880: Report on Valuation, Taxation, and Public Indebtedness in the United States. (U.S. Census Bureau (1880))

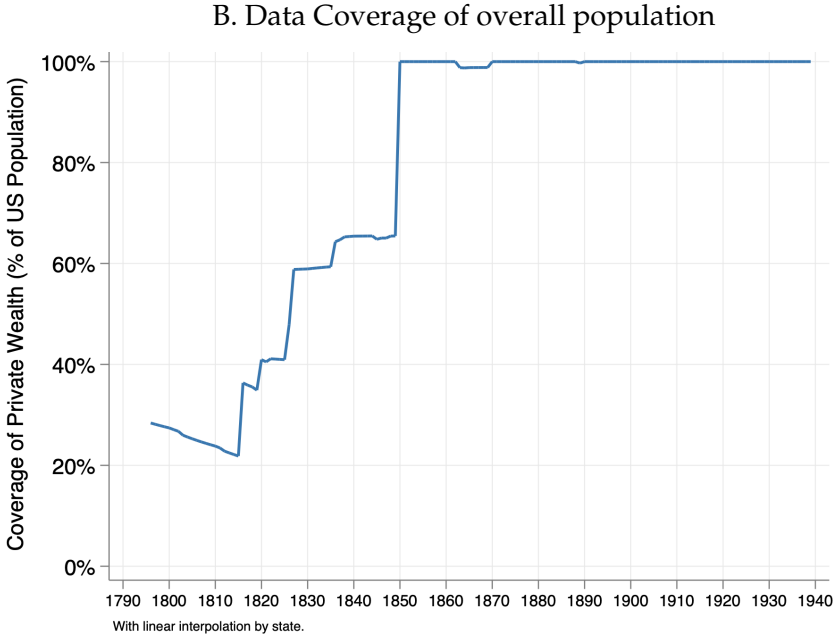
Figure 7: Estimated Value of Taxable Land vs Census of Agriculture Value of Land



Notes: This figure compares the estimated value of taxable land from state reports and the estimated value of land from the Census of Agriculture. Data from the Census of Agriculture is derived from ICPSR 35206. The value of taxable land is a subset of the assessed value of real property as reported in state reports.

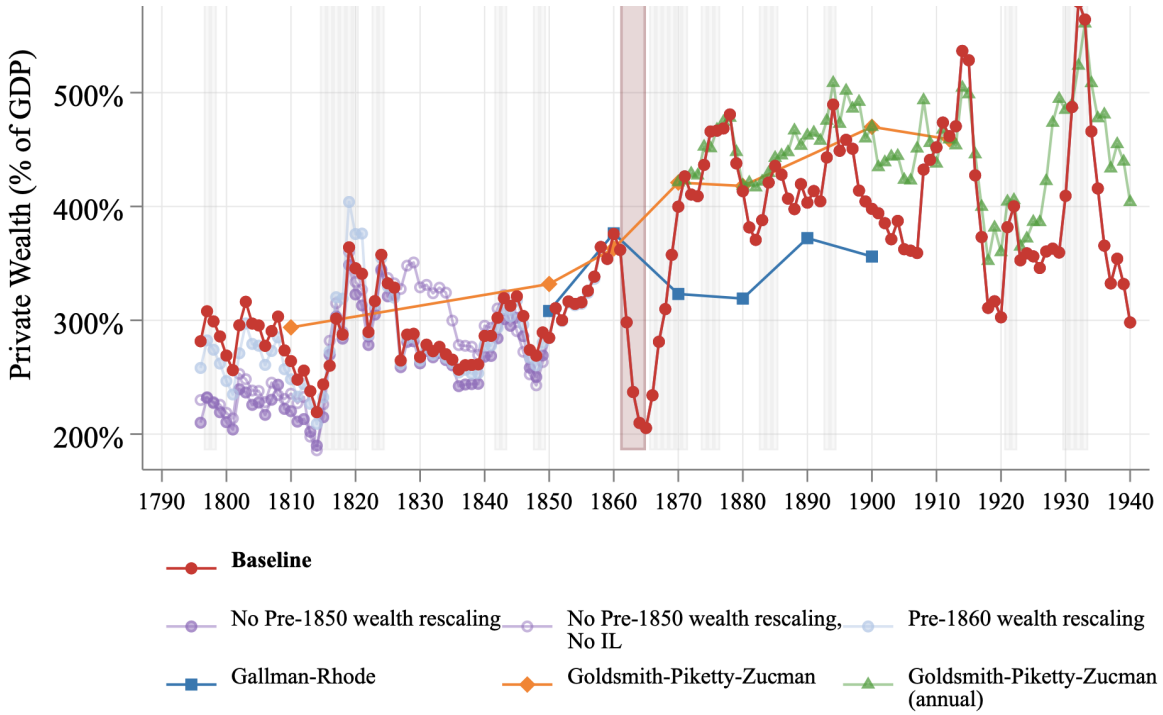
Figure 8: Data Coverage of Private Wealth Data





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. Panel B shows the fraction of population for which data on private wealth is present.

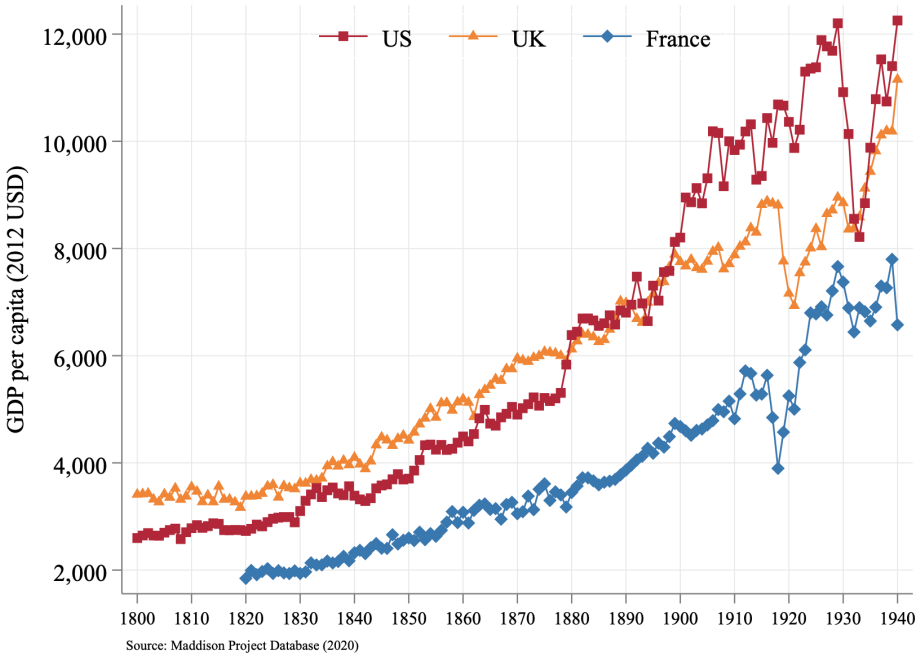
Figure 9: Comparison of Wealth Estimates



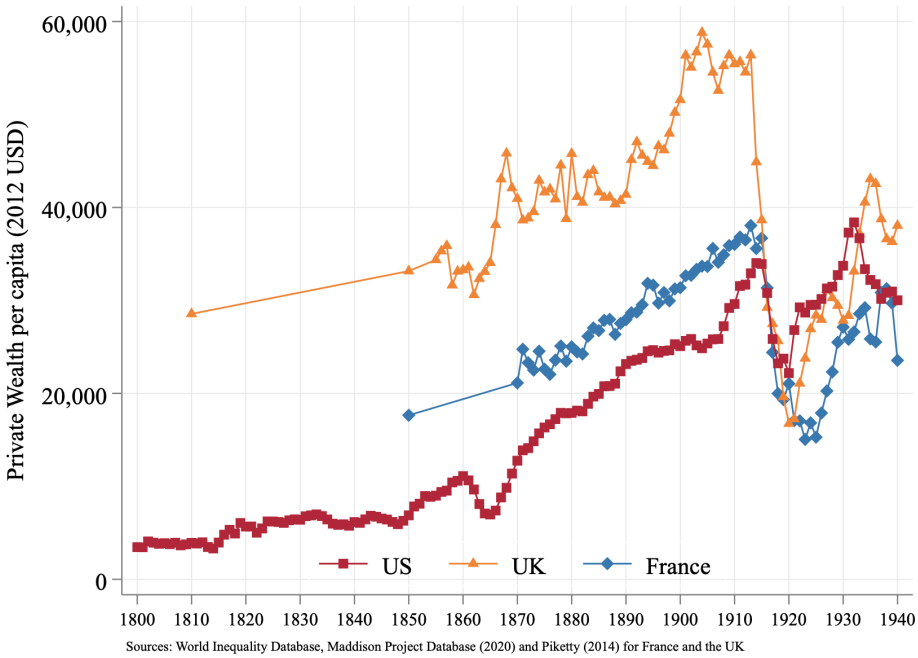
Notes: This figure compares the different Wealth Estimates. Baseline is Pre-1850 wealth-rescaling+IL. IL=Pre-1850 imputation from property tax levy. Gray lines indicate recessions. Red area indicates the Civil War.

Figure 10: Wealth and GDP per capita in the US vs. France & UK

A. GDP Per Capita: US, UK & France (1800-1940)



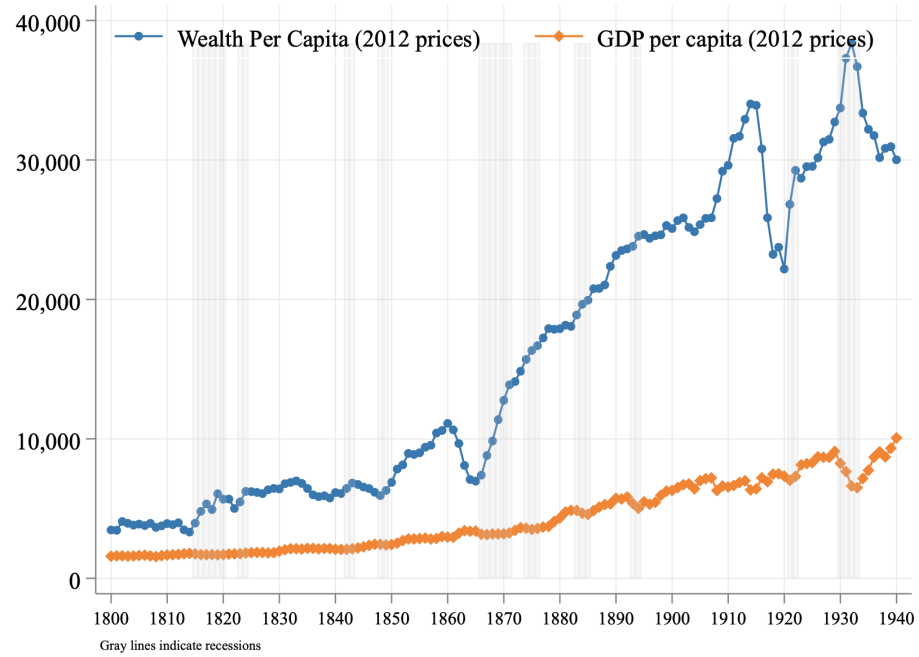
B. Private Wealth Per Capita: US, UK & France (1800-1940)



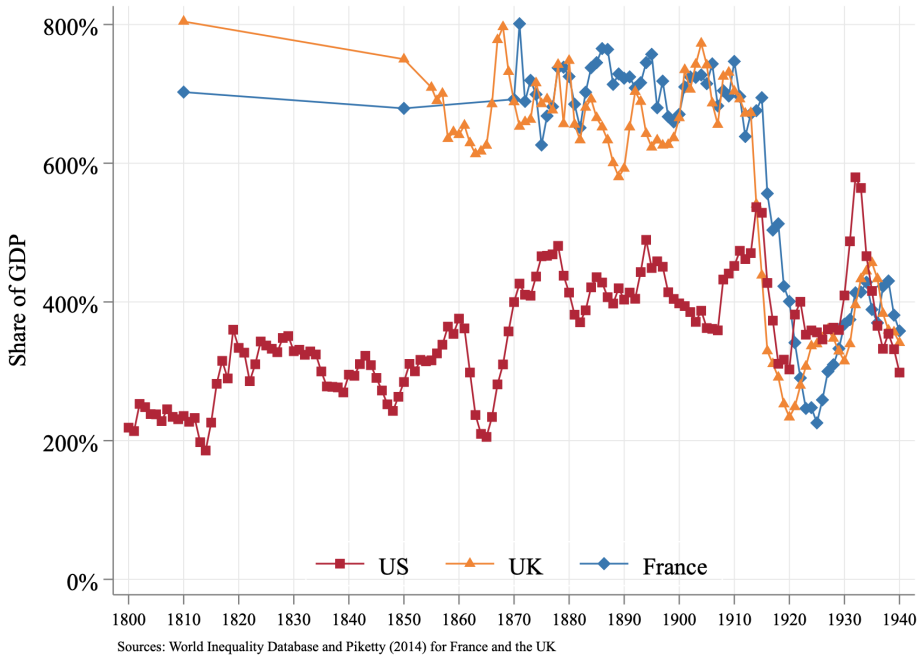
Notes: Panel A shows the evolution between 1800 and 1940 of GDP per capita in the United States, United Kingdom and France in 2012 prices. Data come from the Bolt and Van Zanden (2020). Panel B shows the evolution over the same period of private wealth per capita in the United States, United Kingdom and France in 2012. Data for the United States comes from our US-level wealth series.

Figure 11: Growth in wealth and GDP per capita in the US vs. France and the UK

A. Private Wealth & GDP Per Capita: US (1800-1940)



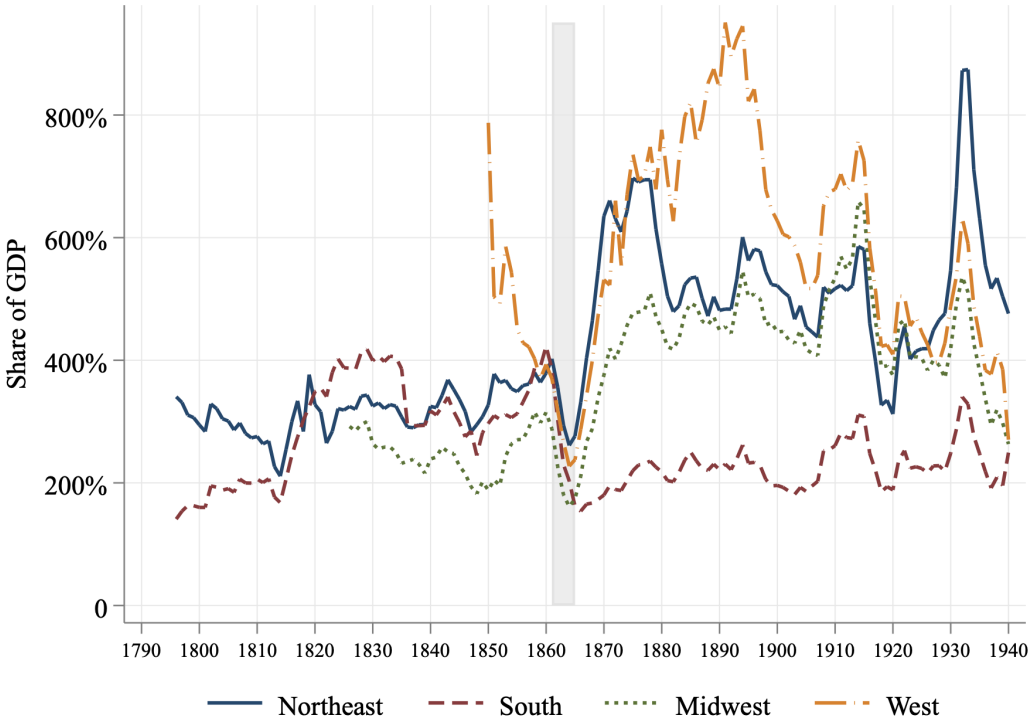
B. Private Wealth To GDP Ratios: US, UK & France (1800-1940)



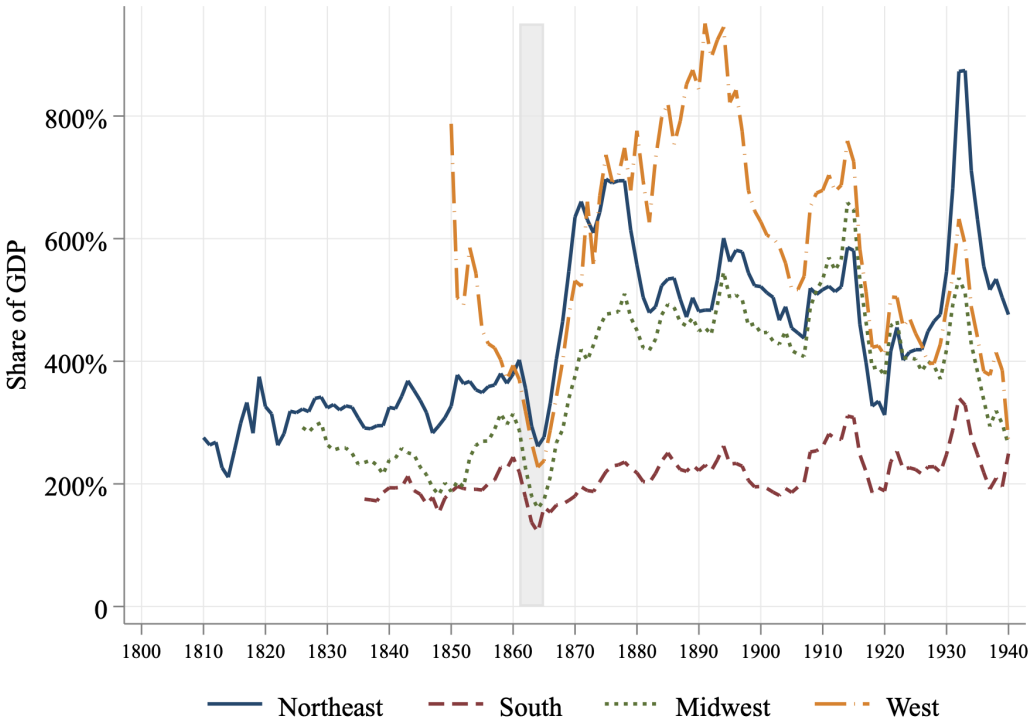
Notes: Panel A shows the national level of wealth and GDP per capita in the United states in 2012 prices. Gray lines indicate recessions. Panel B shows the ratio of private wealth to GDP in the United States, United Kingdom and France between 1800 and 1940. Data for the United States comes from our US-level wealth series. Data for the United Kingdom and France come from the World Inequality Database and Piketty (2014).

Figure 12: Wealth per capita as fraction of US GDP per capita by regions in the US

A. All Private Wealth



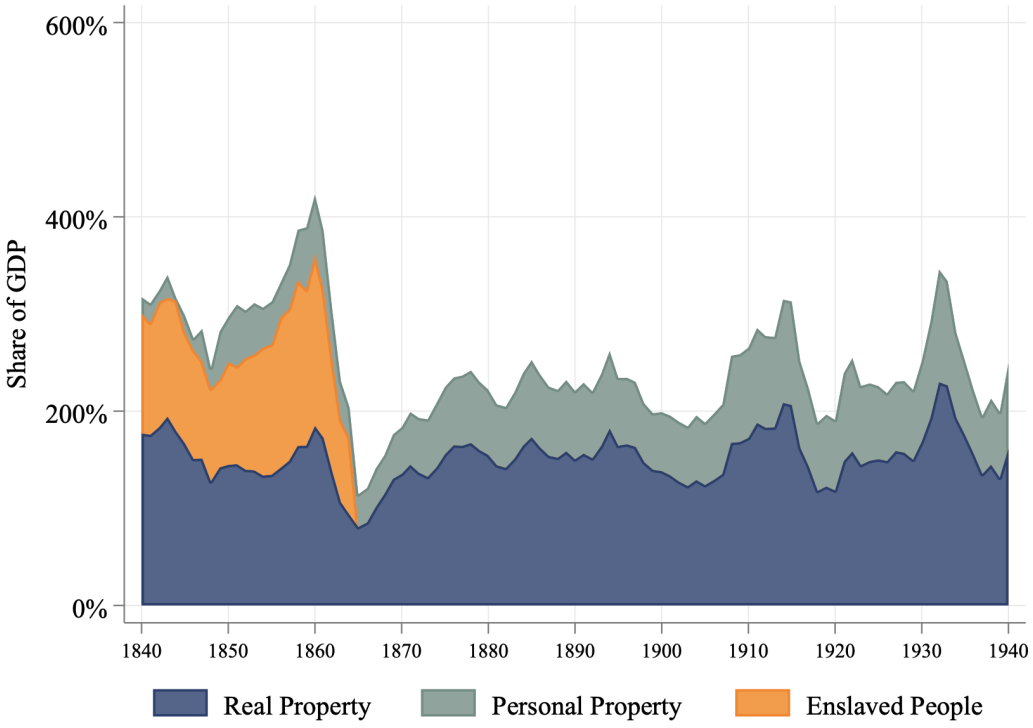
B. Excluding enslaved people from Private Wealth calculation



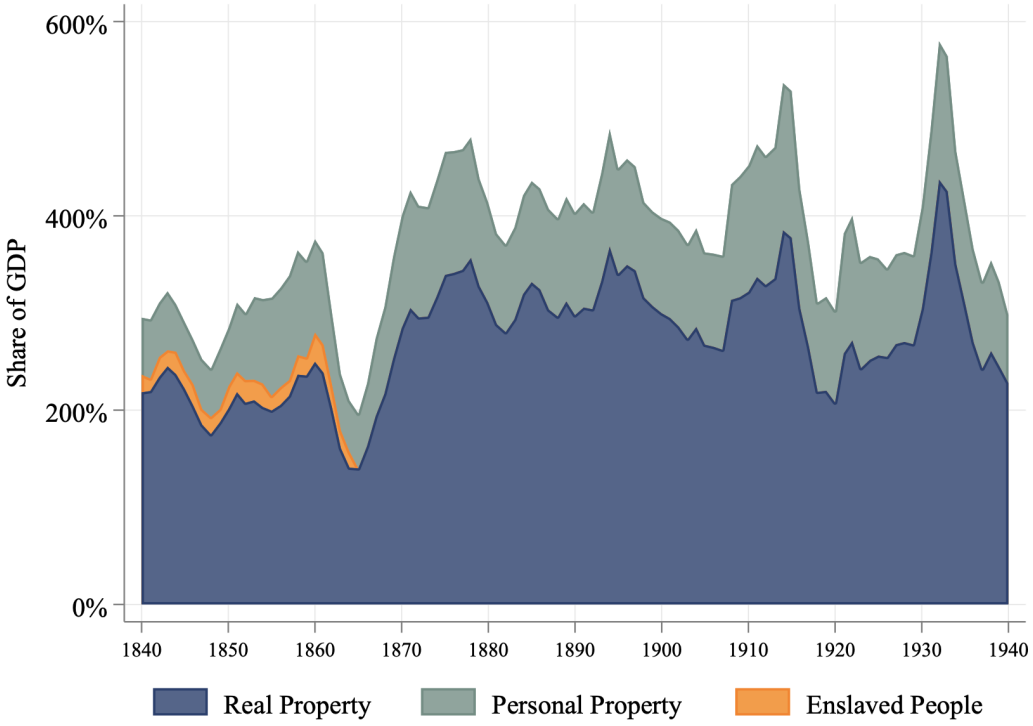
Notes: Panel A shows the average ratio of wealth to GDP by regions in the United States. Values are shown as a moving average over two years and winsorized at the 5th and 95th percentile. Panel B shows the average value of wealth per capita as a share of US GDP per capita in US regions, excluding the value of enslaved people in Southern States. Enslaved people are always counted in the denominator for population.

Figure 13: Decomposition of Wealth Per Capita(1830-1940)

A. Southern States only

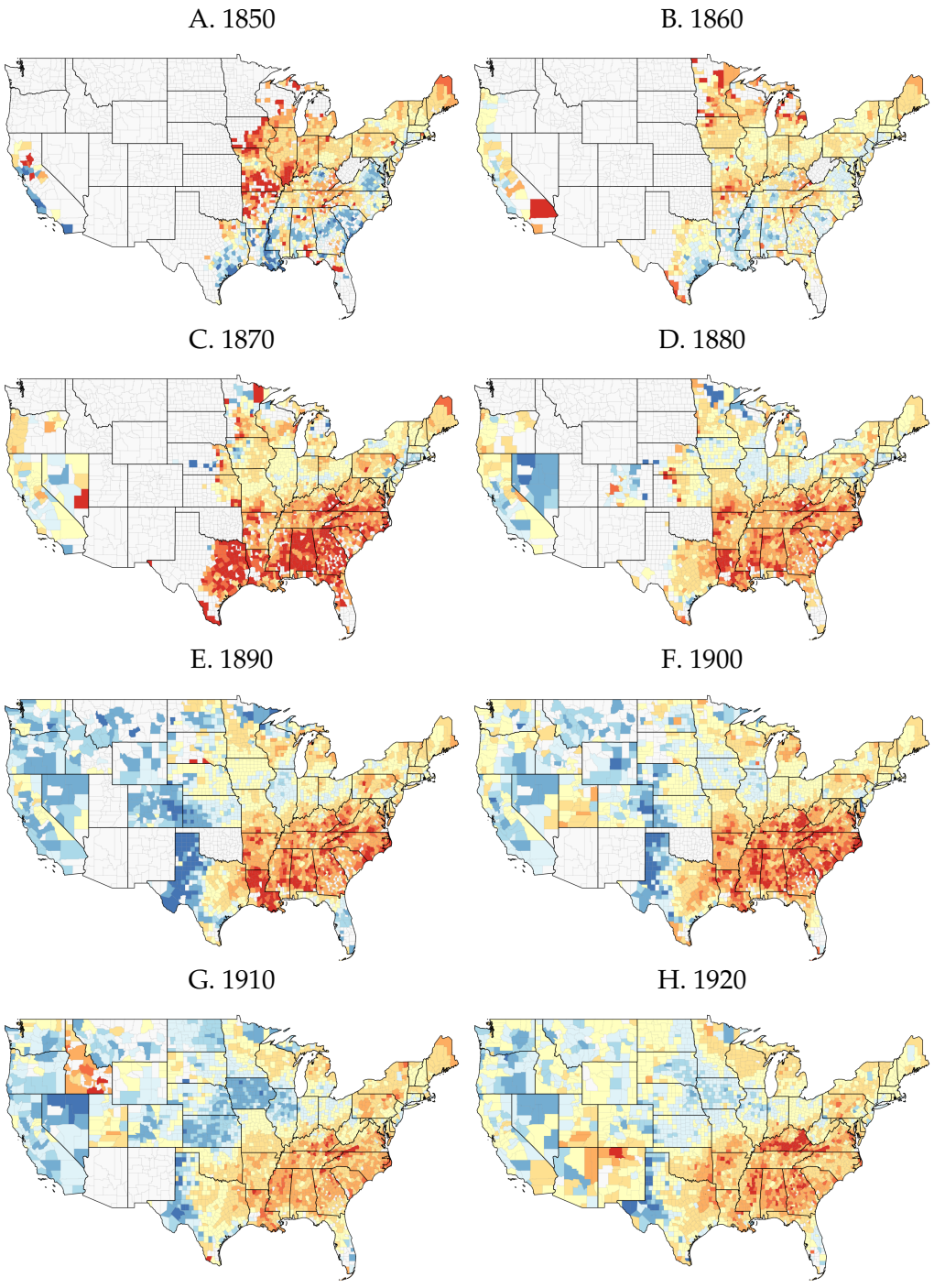


B. All states



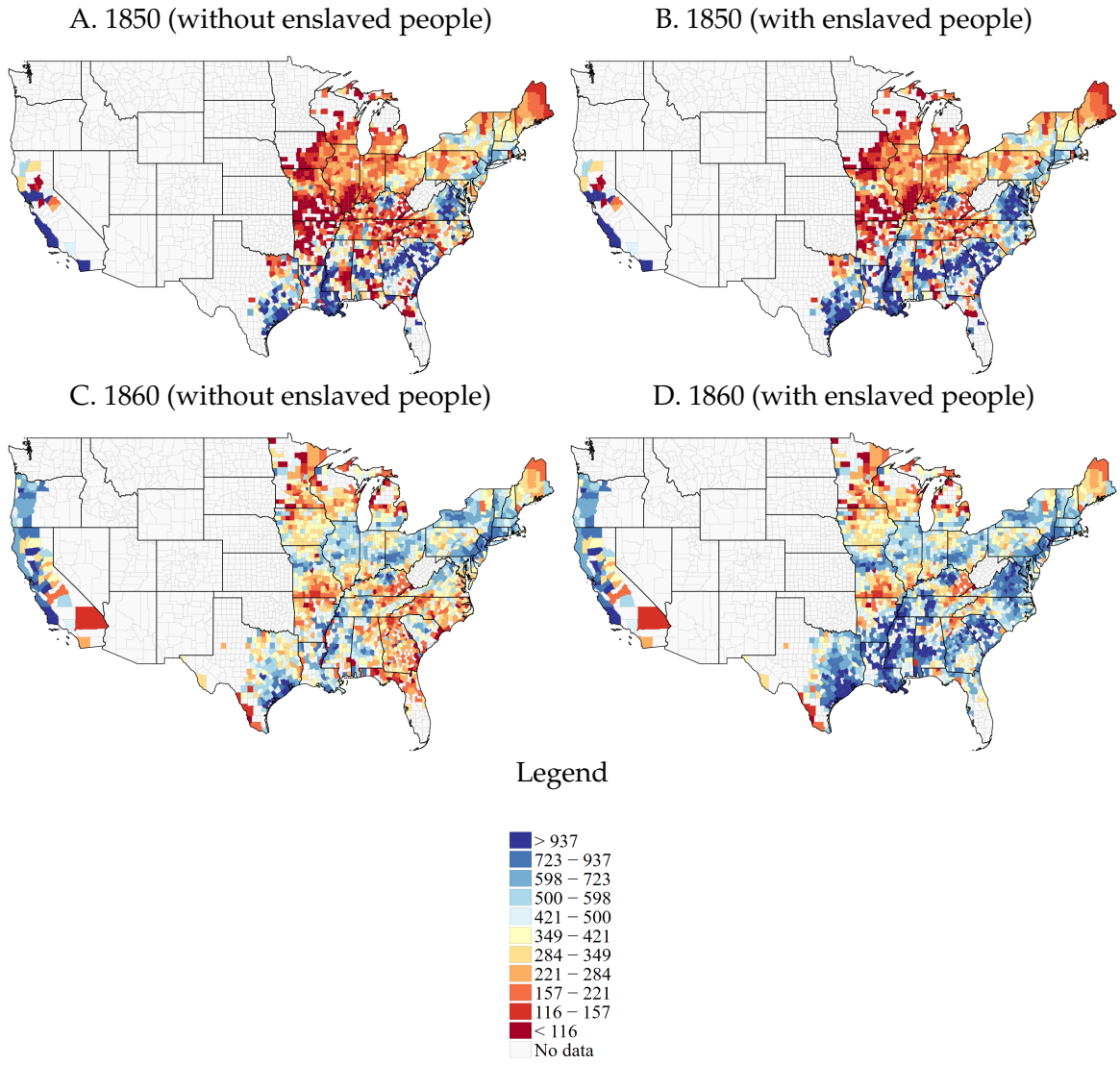
Notes: Panel A shows the decomposition of wealth per capita between real property, personal property, and the value of enslaved people in Southern States. Panel B shows the decomposition of wealth per capita between real property, personal property, and the value of enslaved people in all States. The value of enslaved people is derived from Einhorn (2001) and state reports. Southern states are classified using Census region classification.

Figure 14: Wealth Per Capita As Fraction of US GDP Per Capita By County



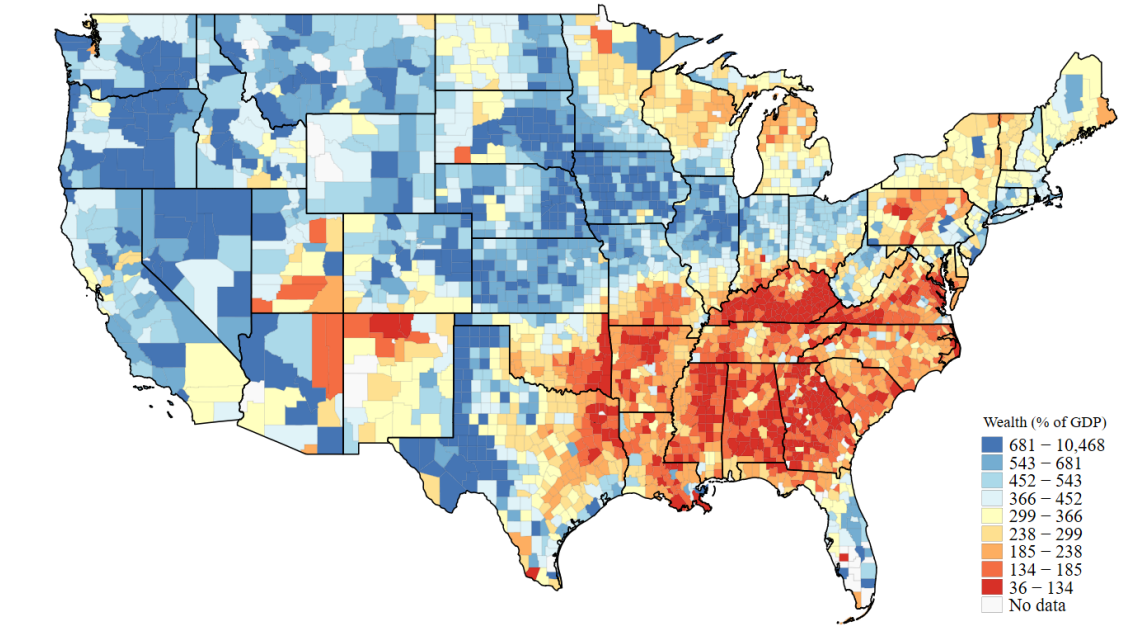
Notes: This figure shows the value of wealth per capita in counties as a share of national GDP per capita in each decade between 1850-1920. Data for counties in US territories prior to admission in the Union are not shown.

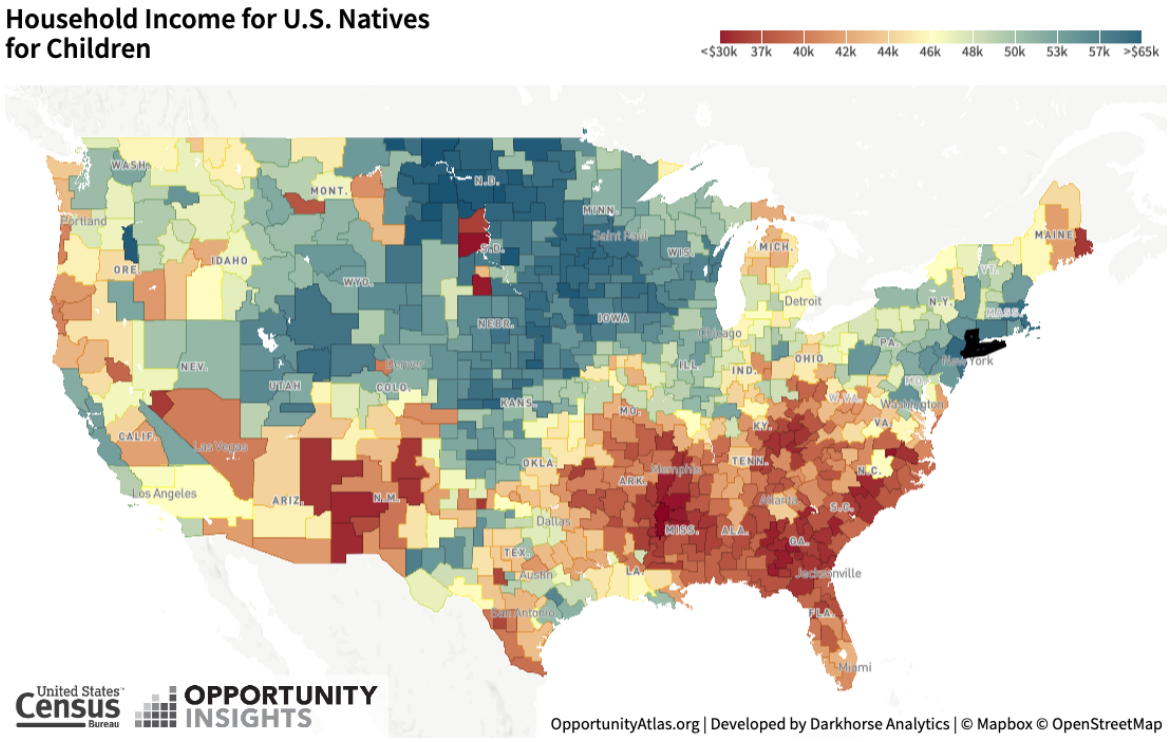
Figure 15: Average Wealth per County (in US$)



Notes: These maps show the average wealth in each county (with and without anslaved people) for years 1850 and 1860. The cutoffs for the legend represent the 5th, 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, 90th percentile values for wealth with enslaved persons across both years.

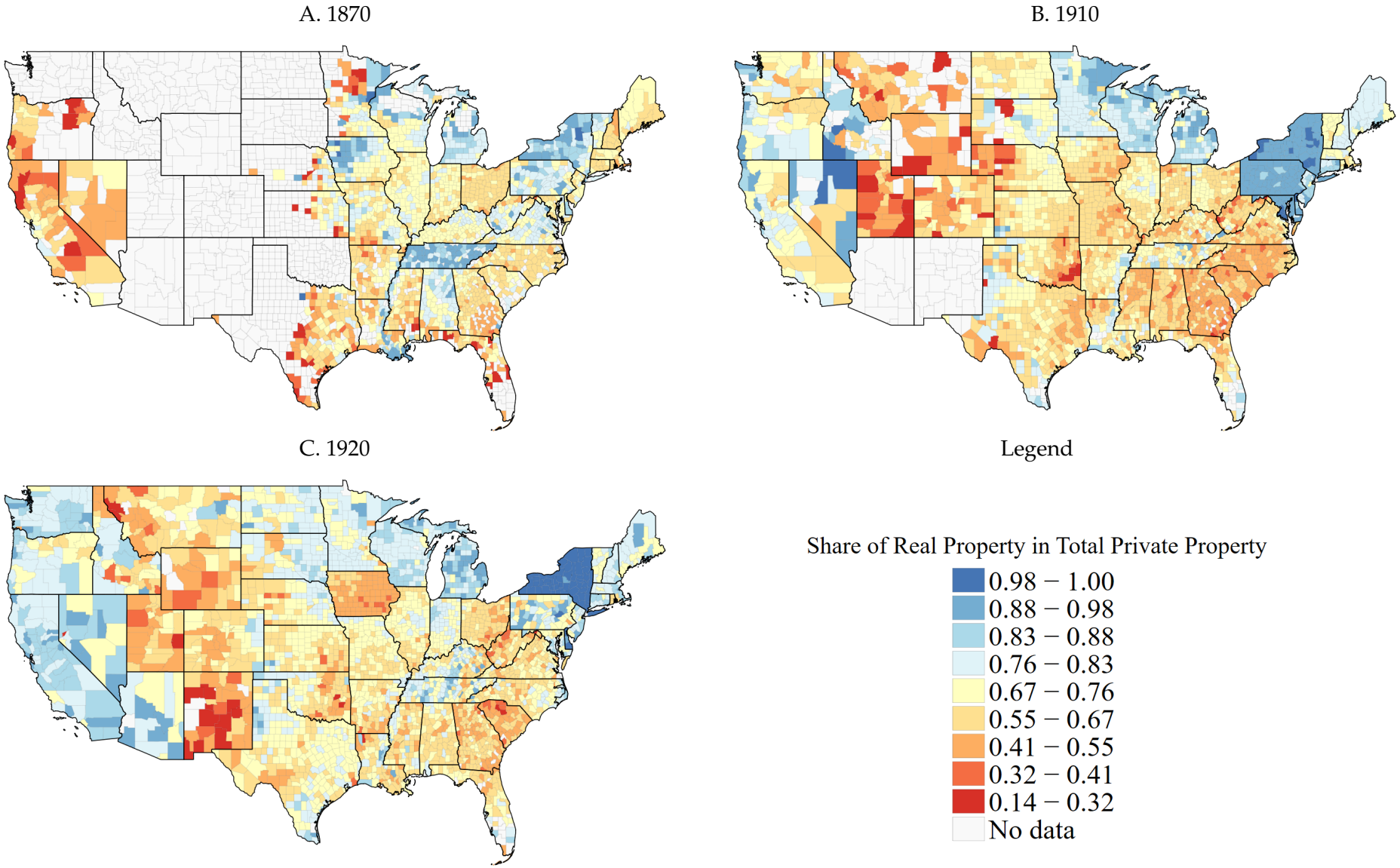
Figure 16: County Level Wealth in 1920 vs Opportunity Atlas Income Data





Notes: This figure compares the share of county wealth per capita as a share of national GDP per capita in 1920 to the distribution of average annual household income in 2014-15 for children whose mother grew up in the United States from the Opportunity Atlas.

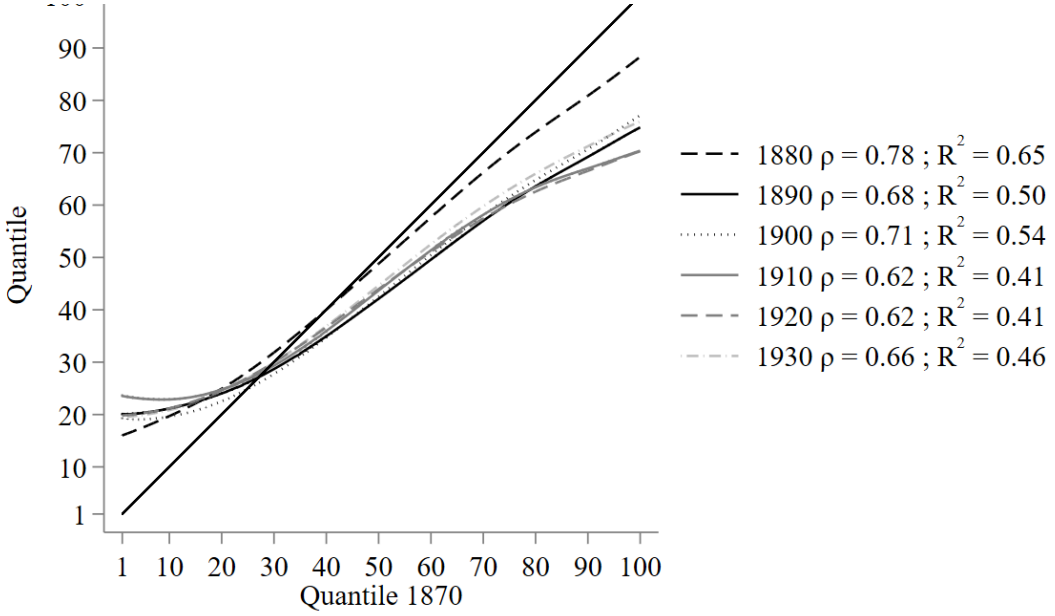
Figure 17: Share of Real Property in Total Private Property



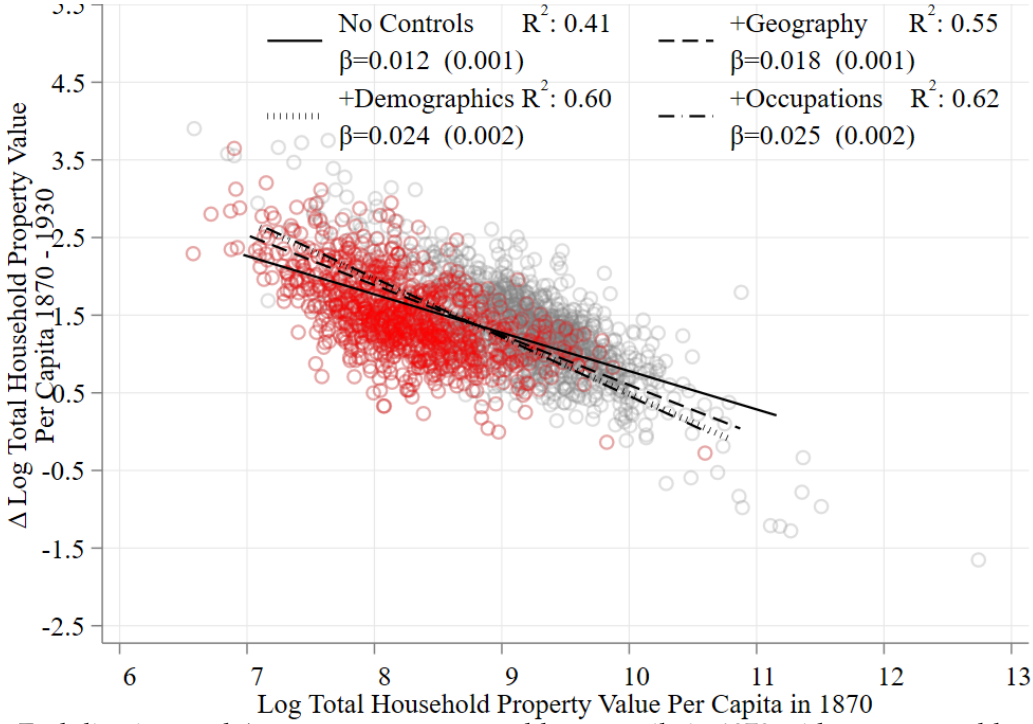
Notes: These maps show the share of county real property as a share of total private property as defined for property taxation between 1860-1880. The cutoffs for the legend represent the 5th, 10th, 25th, 50th, 75th, 90th, 95th and 99th percentile values across all years.

Figure 18: County Persistence

A. Wealth Rank Persistence for Counties



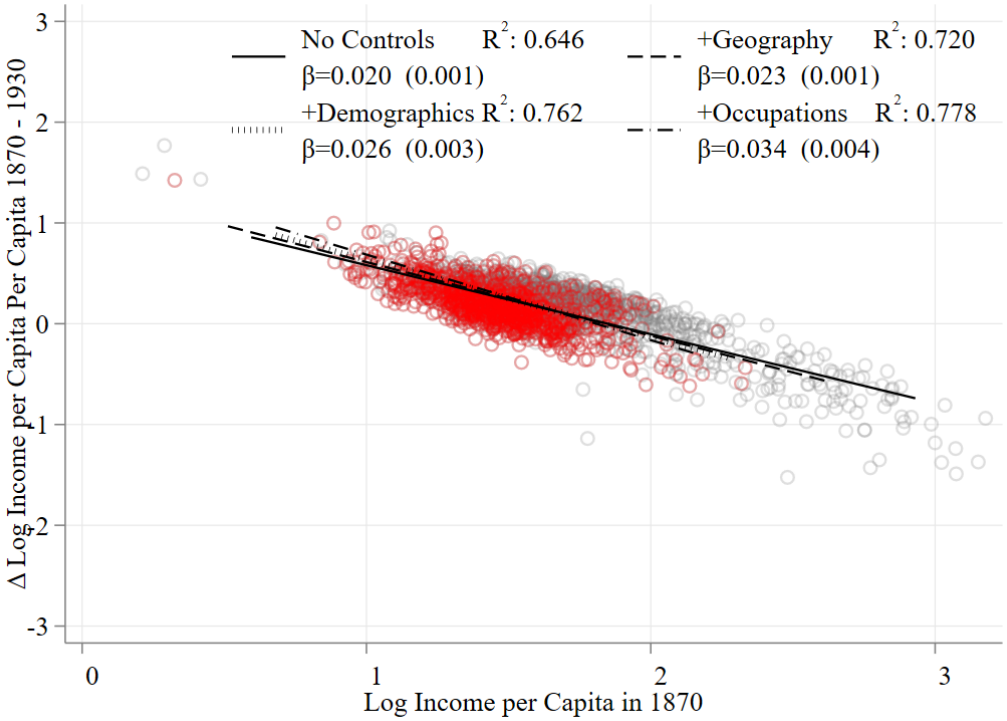
B. β-Convergence - Initial Wealth vs Growth Rate of Wealth By County



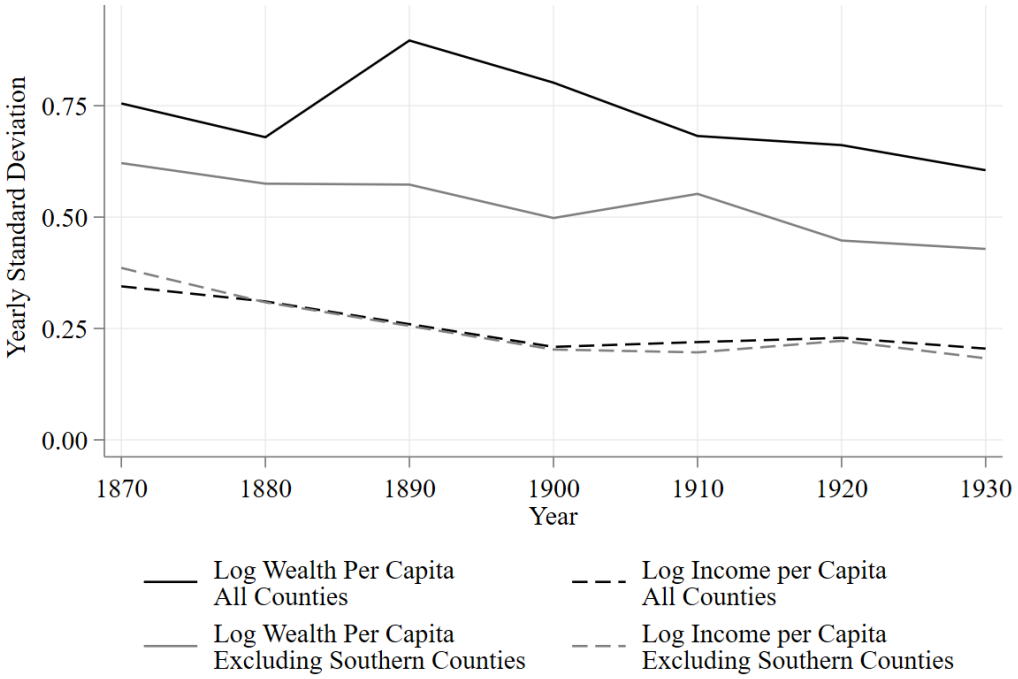
Notes: Each line in panel A compares county wealth percentile in 1870 with county wealth percentiles in the subsequent decade, as described by the legend. Wealth is measured as per capital wealth in 2012 prices, and both correlation coefficients and R^2 are reported for each time frame. Panel B shows the relationship between change in log wealth between 1870 and 1930 and wealth in 1870. Groups of controls, i.e. geography, demographics, and occupation shares are progressively added. Geographic variables are time-constant and standardized, while demographic variables are standardized. Moreover, Southern counties are coloured in red in the latter panel.

Figure 18: County Persistence

C. β-Convergence - Income per Capita



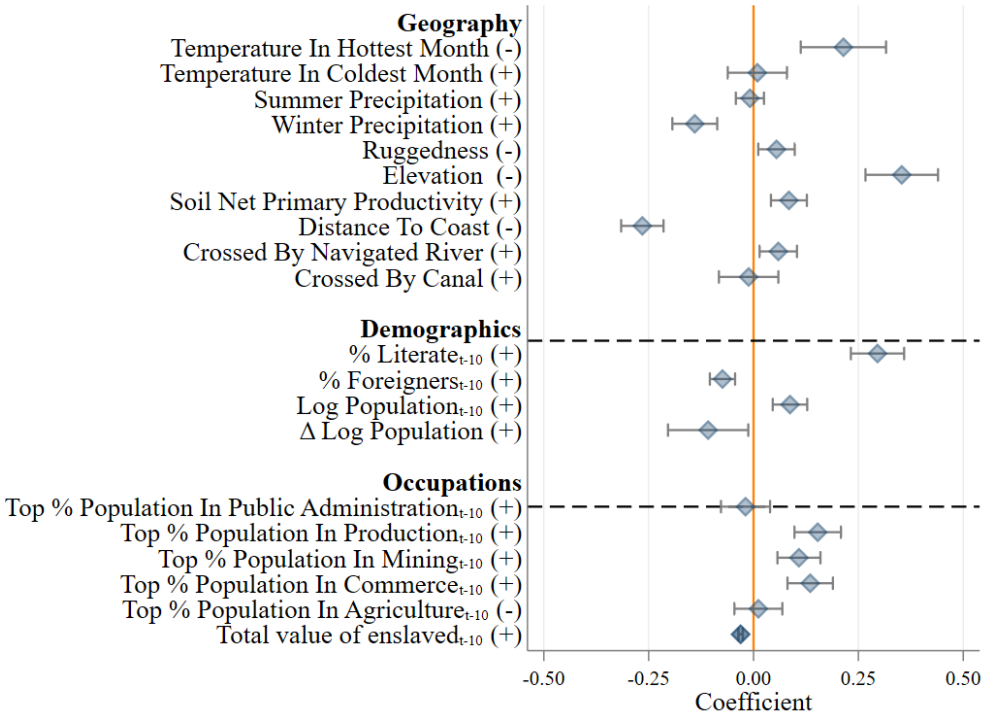
D. σ - Convergence



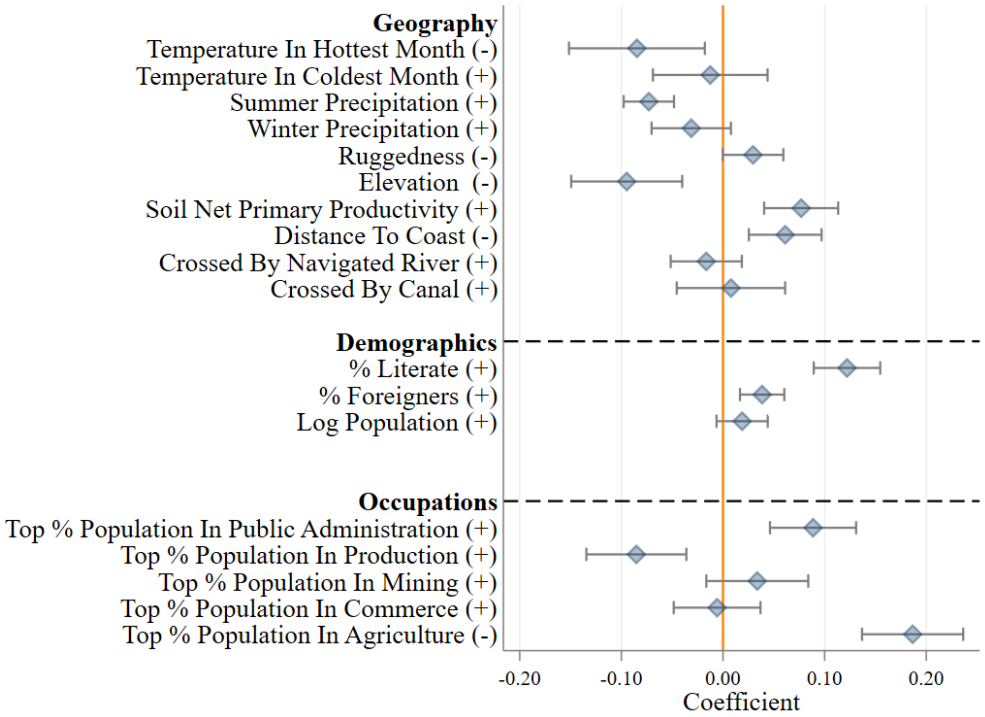
Notes: Panel C shows the relationship between change in log income per capita between 1870 and 1930 and income per capita in 1870. Income per Capita is measured by the County-average Occupational score as defined by Ruggles et al. (2021), excluding counties for which such a variable is zero. Groups of controls, i.e. geography, demographics, and occupation shares are progressively added. Geographic variables are time-constant and standardized, while demographic variables are standardized. Moreover, Southern counties are coloured in red in the latter panel. Panel D provides the evolution of US counties' wealth dispersion and the dispersion in income, again measured as the county-average Occupational score.

Figure 19: Correlates of Wealth - County Level Estimates (1870-1930)

A. Log Total Household Property Value per Capita in 1870



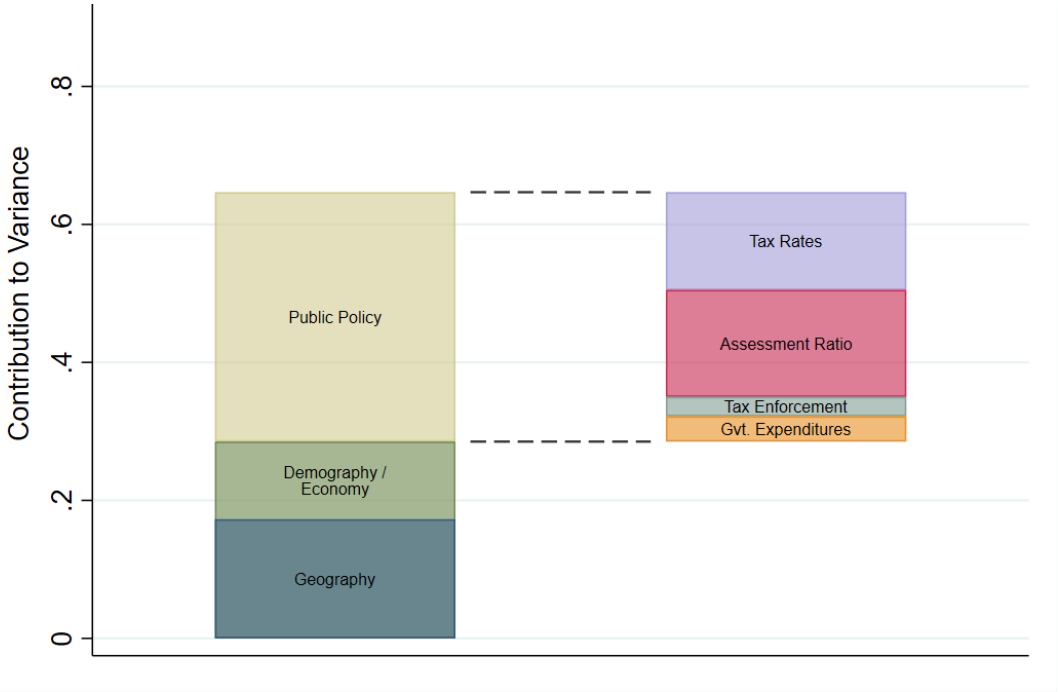
B. 60-Year Δ log Total Household Property Value per Capita



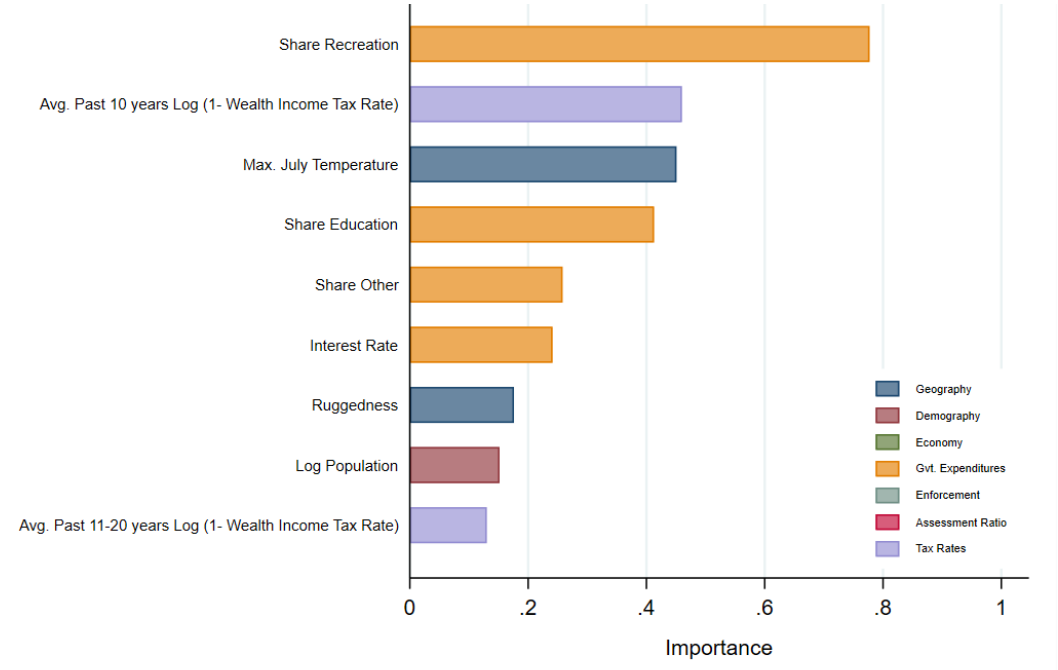
Notes: Panel A presents the set of coefficients coming from the regression of log wealth in 1870 on 1860's determinants. Panel B presents the set of coefficients coming from the regression of the change in log wealth between 1870 and 1930 on 1870's wealth and controls. Geography is time-constant and standardized, Demography is standardized, and every coefficient is shown with its 90% confidence interval. Furthermore, the minus sign tells that the sign of the coefficient was switched for graphical purposes. Year fixed effects, % of white and % of male individuals are included in this specification.

Figure 20: Variance Decomposition of Municipal Wealth Per Capita in 1931

A. Fraction of Total Variance Explained by Each Group of Variables - OLS Model

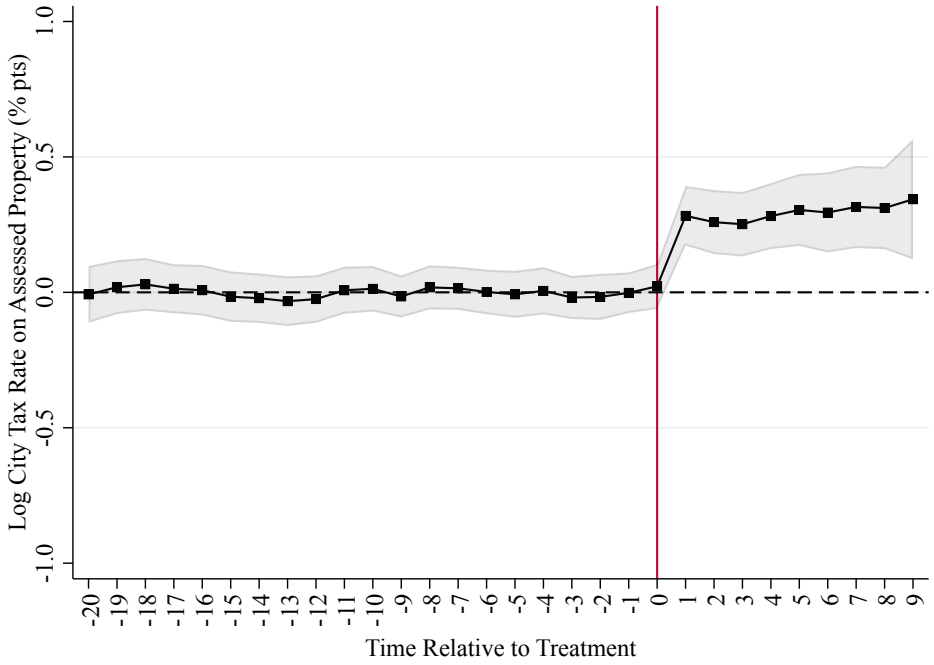


B. Variable Importance Plot - Random Forest Model



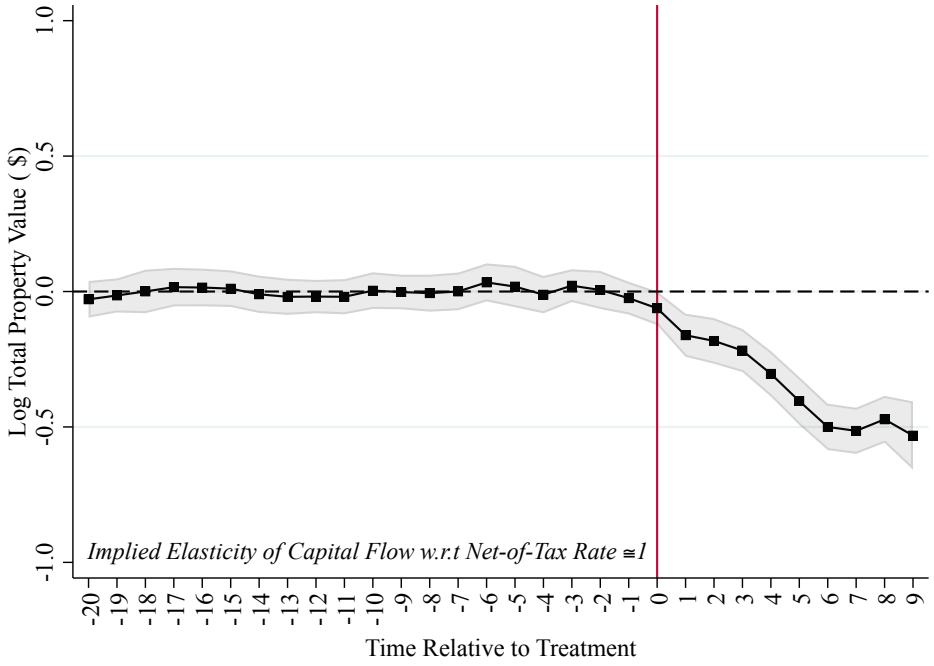
Notes: This figure reports two "variance decomposition" exercizes of per capita municipal wealth in 1931. In panel A, we estimate via OLS a linear model of per capita wealth at the municipal level using the same set of explanatory variables as in Figure 19, to which we add a set of variables capturing the past dynamics of property taxes and local government finances. We report the partial adjusted R-squared for different groups of variables. The group "demography & economy" corresponds to the demographics and occupational shares variables from Figure 19. See text for details. In panel B, we predict municipal wealth in 1931 using random forests and report a variable importance plot.

Figure 21: Tax Rates Around Tax Increase Events - Generalized Synthetic Control Estimates



Notes: This figure is based on the Generalized Synthetic Control Approach - GSYNTH (Xu (2017)). The figure reports the first stage of an increase in the city-level property tax rate. The grey shading represents 95% confidence intervals, and the red line shows the timing of the tax reform.

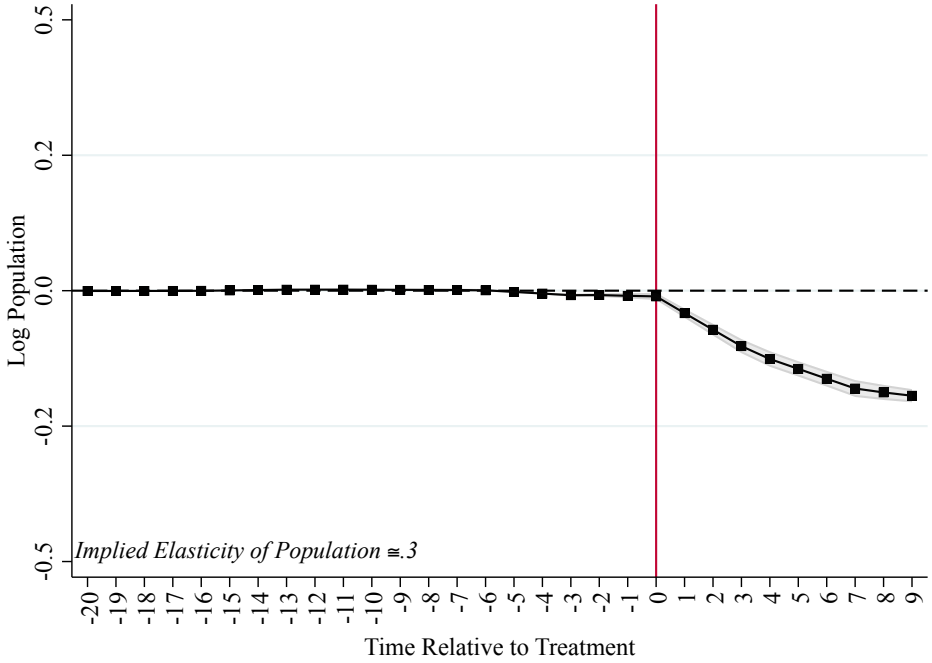
Figure 22: Total Property Value: Tax Increases - Generalized Synthetic Control Estimates



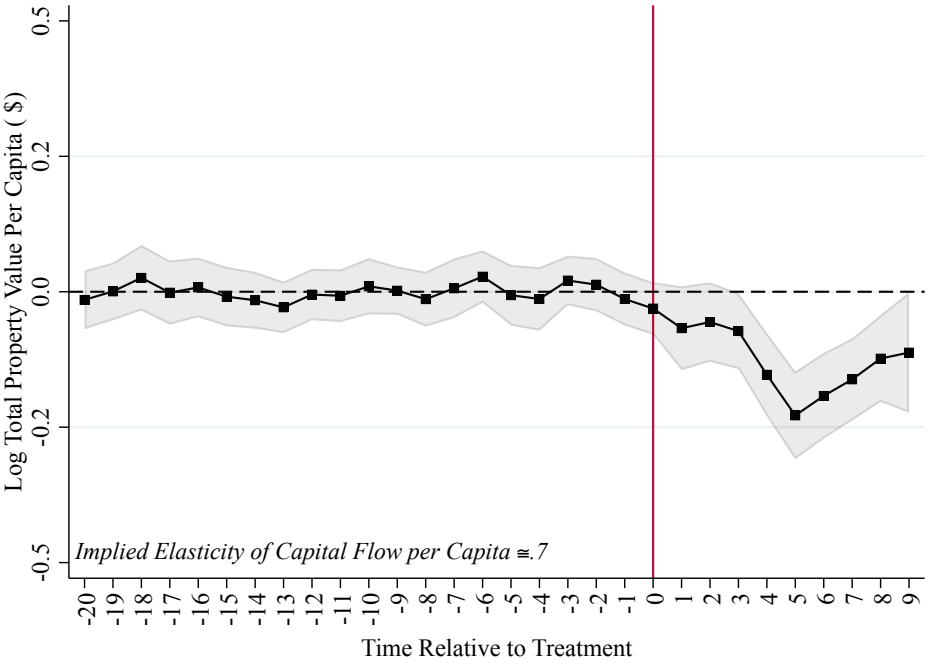
Notes: This figure is based on the Generalized Synthetic Control Approach - GSYNTH (Xu (2017)). The figure reports the average treatment effect on treated cities of an increase in the city-level property tax rate on the total property value. It shows that, for our selected events, an increase in the property tax rate leads to a decrease in total property value. The implied elasticity of capital flow with respect to net-of-tax rate is 1. The grey shading represents 95% confidence intervals, and the red line shows the timing of the tax reform.

Figure 23: Extensive vs Intensive Responses - Generalized Synthetic Control Estimates

A. Extensive Margin Response (Log Population)



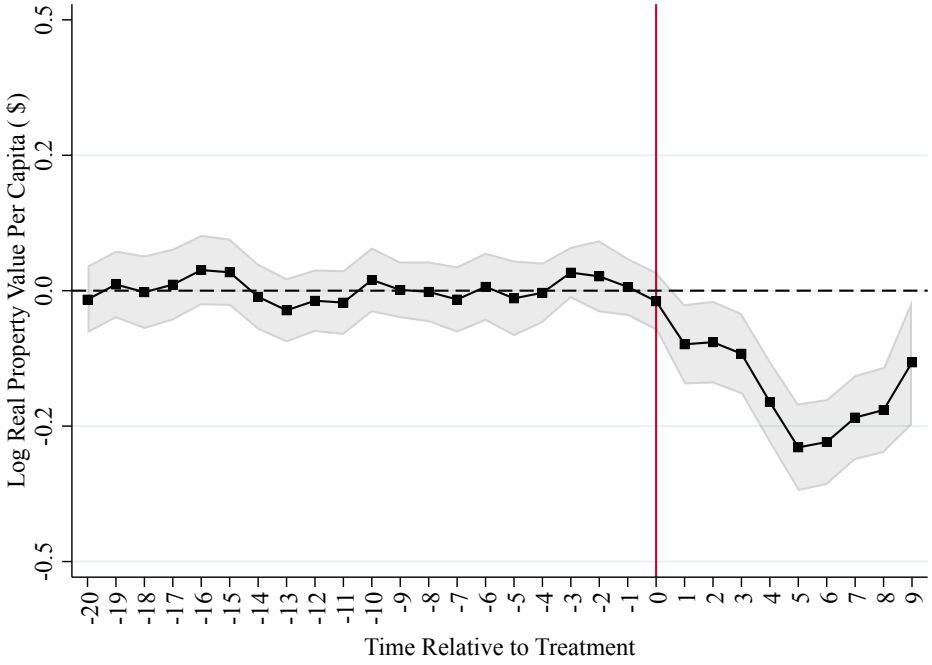
B. Intensive Margin Response (Log Wealth Per Capita)



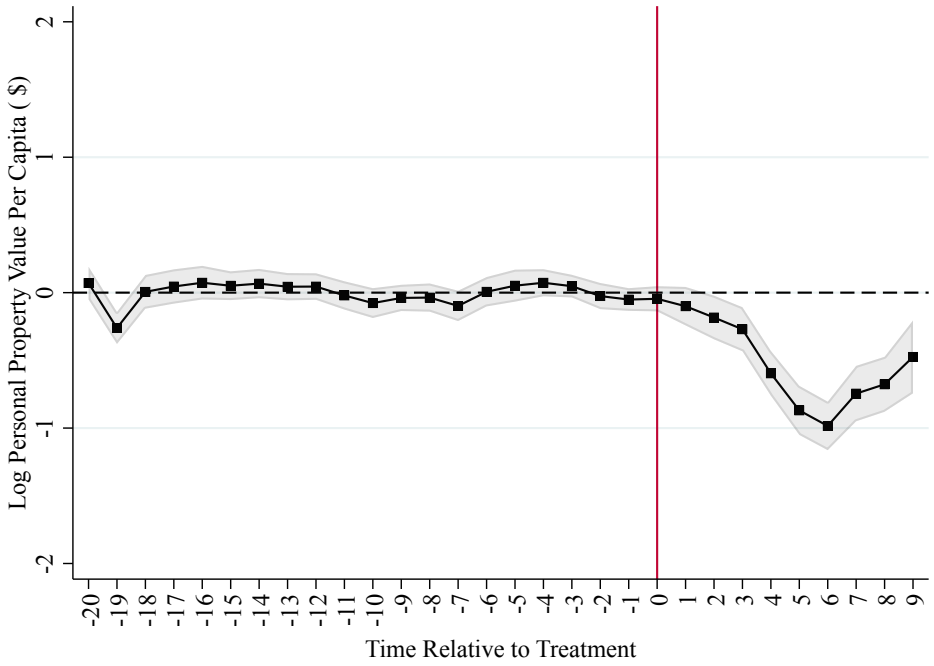
Notes: This figure is based on the Generalized Synthetic Control Approach - GSYNTH (Xu (2017)). Panel A reports the average treatment effect on treated cities of an increase in the city-level property tax rate on city population. It shows that, for our selected events, an increase in the property tax rate leads to a decrease in city population. The implied elasticity of population with respect to net-of-tax rate is 0.3. Panel B reports the average treatment effect on treated cities of an increase in the city-level property tax rate on total property value per capita. It shows that, for our selected events, an increase in the property tax rate leads to a decrease in total property value per capita. The implied elasticity of capital flow with respect to net-of-tax rate is 0.7. The grey shading represents 95% confidence intervals.

Figure 24: Intensive Responses - Generalized Synthetic Control Estimates

A. Intensive Margin Response (Log Real Estate Wealth Per Capita)



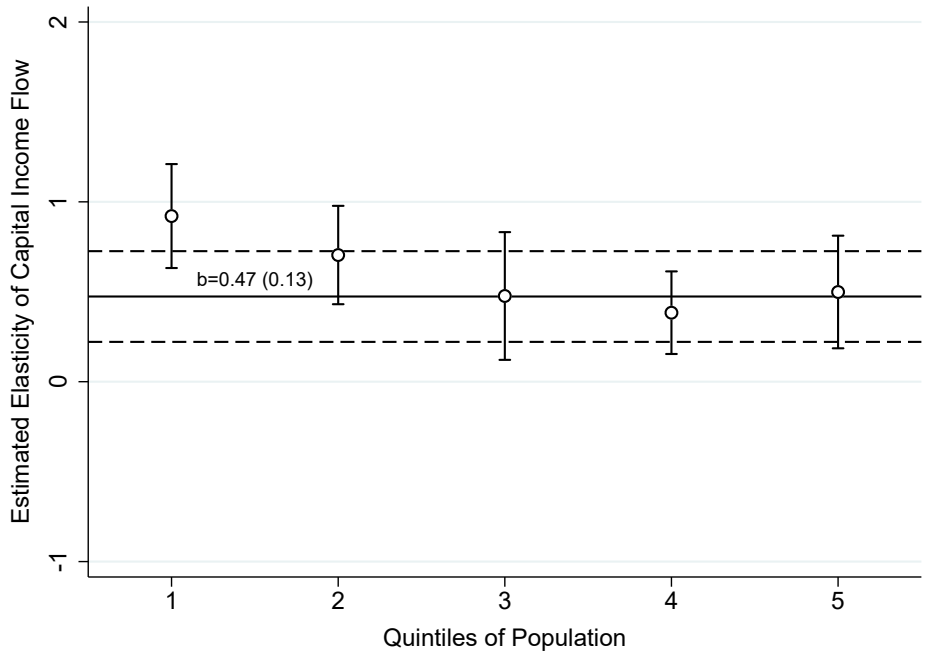
B. Intensive Margin Response (Log Personal Wealth Per Capita)



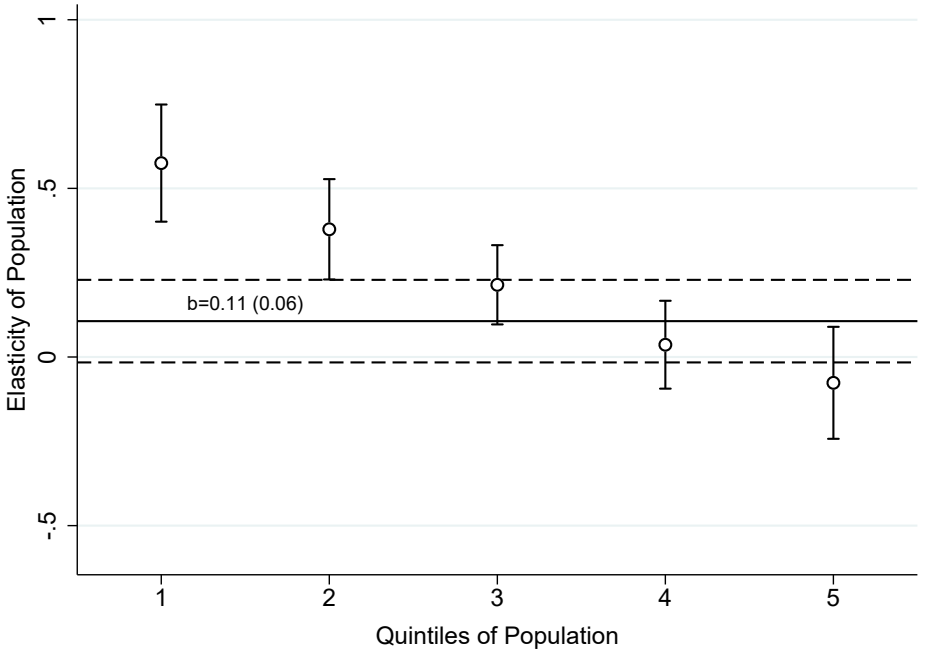
Notes: This figure is based on the Generalized Synthetic Control Approach - GSYNTH (Xu (2017)). Panel A reports the average treatment effect on treated cities of an increase in the city-level property tax rate on personal property value per capita. It shows that, for our selected events, an increase in the property tax rate leads to a decrease in personal property value per capita. Panel B reports the average treatment effect on treated cities of an increase in the city-level property tax rate on real estate property value per capita. It shows that, for our selected events, an increase in the property tax rate leads to a decrease in real estate property value per capita. The grey shading represents 95% confidence intervals, and the red line shows the timing of the tax reform.

Figure 25: Heterogeneity Analysis - TWFE Estimates Using All Variation Across Cities

A. Wealth Elasticity



B. Population Elasticity



Notes: This figure reports estimated elasticities from a TWFE regression with city and year fixed effects that leverages all the variation across all cities from 1899 to 1940. Panel A displays the estimated flow elasticity of capital income with respect to the implied net-of-tax rate on capital income. Panel B shows the estimated population elasticity with respect to the implied net-of-tax rate on capital income. Both panels show heterogeneous elasticity estimates and corresponding 95 percent confidence intervals by population quintiles. The overall estimated elasticity and its corresponding 95 percent confidence interval are shown by the dashed and solid lines. Standard errors are clustered at the city level.

Tables

Table 1: Tax Competition: Own Tax Rate as function of Past Own Tax Rate and Neighbors' Tax Rates

Dependent variable: Average log of eff. net of tax rate from t to t+5			
	MA_{10} (1)	MA_{10} (2)	MA_{10} (3)
$Log(1 - \frac{PropertyTaxRate}{InterestRate})$	0.496**	0.368	0.276
	(0.200)	(0.225)	(0.254)
$OtherLog(1 - \frac{PropertyTaxRate}{InterestRate})$	0.224**	0.205	0.285*
	(0.109)	(0.129)	(0.168)
Observations	5321	4894	4132
Number of cities	251	249	243
Adjusted R^2	0.839	0.844	0.866
Year fixed effects	X	X	X
City fixed effects	X	X	X
Public Policy Covariates	X	X	X
Economic Covariates		X	X
Demographic Covariates			X

Notes: Standard errors clustered at the city level.

Table 2: Spillovers: Elasticity of Property Value at City-Level to Own & Neighboring Cities' Tax Rates

(a) Full Sample: Small and Large Cities

Dependent variable: Log Total Property Value			
	MA_{10} (1)	MA_{10} (2)	MA_{10} (3)
$Log(1 - \frac{PropertyTaxRate}{InterestRate})$	0.496**	0.620***	0.461***
	(0.203)	(0.184)	(0.136)
$OtherLog(1 - \frac{PropertyTaxRate}{InterestRate})$	-0.226	-0.093	-0.064
	(0.172)	(0.152)	(0.144)
Observations	5596	4995	4234
Number of cities	252	250	244
Adjusted R^2	0.967	0.967	0.977
Year fixed effects	X	X	X
City fixed effects	X	X	X
Public Policy Covariates	X	X	X
Economic Covariates		X	X
Demographic Covariates			X

(b) Small Cities (Population < 25,000)

Dependent variable: Log Total Property Value			
	MA_{10} (1)	MA_{10} (2)	MA_{10} (3)
$Log(1 - \frac{PropertyTaxRate}{InterestRate})$	0.739*	0.998**	0.976***
	(0.428)	(0.398)	(0.356)
$OtherLog(1 - \frac{PropertyTaxRate}{InterestRate})$	-0.861*	-0.851*	-0.521*
	(0.437)	(0.442)	(0.312)
Observations	1047	1019	1019
Number of cities	76	76	76
Adjusted R^2	0.895	0.887	0.900
Year fixed effects	X	X	X
City fixed effects	X	X	X
Public Policy Covariates	X	X	X
Economic Covariates		X	X
Demographic Covariates			X

Notes: The table shows regression results from specification (5.3) with dependent variable log of total property value. Panel A considers the full sample, while Panel B restricts the sample to small cities. Standard errors clustered at the city level.

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