

DISSERTATION

THE POLITICAL ECONOMY OF THE PROPERTY TAX: HISTORY, INSTITUTIONS, AND
FISCAL CONFLICT IN STATE AND LOCAL GOVERNMENT

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ABSTRACT

THE POLITICAL ECONOMY OF THE PROPERTY TAX: HISTORY, INSTITUTIONS, AND FISCAL CONFLICT IN STATE AND LOCAL GOVERNMENT

This dissertation studies the property tax and its role in the development of American state and local government. As the primary source of revenue for local governments – and at one point for state and territorial governments also – the tax is essential for public service provision, including public education. Yet the property tax has been riddled in controversy since its inception and has been at the root of countless “tax revolts,” leading to large-scale reforms with lasting effects on state and local public finance. Using historical and contemporary methods, the three essays of this dissertation help make sense of two important problems associated with the property tax: the difficulty in assessing all forms of property under the old regime of the general property tax, and vertical tax competition, which impacts thousands of local governments across the country who share part of the same property tax base.

My first chapter contributes to the blossoming literature of historical political economy (HPE) and the history of taxation in the United States. In “Taxation and State-Building on the Frontier: Public Finance, Economic Development, and the General Property Tax in 19th Century Colorado,” I study the economic history of property and its taxation in an important frontier state. I accomplish this by assembling a new dataset using property tax records held at the Colorado State Archives. This essay contributes to our understanding of the development and evolution of state and local taxation systems in the Mountain West region, a geographic area largely ignored in the literature. While measures of total assessed valuation of property by county are available in the decennial census, the data I have compiled are the first *annual* statistics of assessed valuation from 1863 to 1887. Further, I provide not only total assessed valuation by county, but the assessed valuation of each specific type of property for which the general property tax applied. This allows for a much

finer breakdown of property than is available in the decennial census and thus a better understanding of the relative importance of specific forms of real property like land and improvements over more elusive forms of personal property including stocks, bonds, industrial equipment, and railroad property. I additionally show that Colorado failed to tax key forms of personal property over this period, including that of its most important industry: mineral resource extraction.

My second chapter, “The ‘Crowding Out’ Effects of Special Districts: Evidence from Colorado’s Metropolitan Districts,” explores how a distinct form of local government in the U.S. affects general purpose governments and school districts that share the same tax base. Although the literature on special districts is expansive, little attention has been paid to multipurpose development districts – known in Colorado as “metro districts” – created by real-estate developers to finance new real estate construction. Because these districts often lack residents at inception, developers can issue substantial debt that is later repaid through higher property taxes on the homeowners who buy properties in the developments. I investigate whether this dynamic constrains the fiscal capacity of overlapping governments – particularly counties, municipalities, and school districts – who themselves must obtain voter-approval for new debt of their own under Colorado’s notorious Taxpayer Bill of Rights (TABOR). Using a novel dataset linking geographic tax rates to parcel-level data on over 20 million residential properties from Cotality, I employ a quasi-experimental design to show that metro districts have crowding out effects. These effects vary by specification, level of government, and mill levy type.

My third chapter, “School Finance Reform and Local Property Tax Setting: Evidence from Michigan’s ‘Proposal A,’” examines vertical fiscal externalities by studying the effects of Proposal A, Michigan’s 1994 school finance reform that restructured the mix of state and local revenue for public education in an effort to address years of funding inequities among school districts. The shift in taxing authority reduced overall property tax burdens and limited future increases. I test whether local governments responded by raising their own non-school levies by constructing a panel of Michigan townships and municipalities spanning the years before and after Proposal A. I find that local property tax rates were sensitive to the size of school rate reductions, with larger

school rate reductions resulting in larger increases to local mills. I also find heterogeneous effects depending on certain characteristics of the jurisdictions studied. In particular, in jurisdictions where more of the tax base is made up of owner-occupied housing, local mill rate increases were considerably dampened, and in some cases, actually reduced. Other important mechanisms driving local responses include per capita levels of local debt and per capita local expenditures. These findings contribute to understanding how major tax reforms impact local government fiscal behavior and intergovernmental tax competition.

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DEDICATION

To the Allam family,

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Introduction

That the system of taxation used in the United States reflects and reinforces inequality is well documented (Auten & Splinter, 2024; Brown, 2021; Crawford, 2009; Saez & Zucman, 2020). While the federal individual income, corporate income, and estate taxes are progressive – making up a higher percentage of income for high-income households – the federal excise tax and payroll taxes for Medicare and Social Security are regressive (Joint Committee on Taxation, 2015). In total, the federal system of taxes and transfers is viewed by economists as progressive. The same cannot be said for individual states, two-thirds of which tax poorer households at higher rates than richer ones, even after transfers (Byerly-Duke & O'Neill, 2024; Fleck et al., 2025). This is largely due to flat or non-existent income taxes, regressive sales and excise taxes, and the property tax, which rises less than proportionately with household income.

It is this final tax that is swept up in the public imagination. It is the subject of intense criticism from both individual property owners who contest their assessments and broader communities that bear its burdens unequally, including the disproportionate fiscal burden placed on racial and ethnic minorities (Atuahene & Hodge, 2018; Avenancio-León & Howard, 2022). Yet, the property tax continues to generate roughly three-fourths of local government tax revenue (Broisy, 2025). Beyond its importance to the ‘total local pie,’ the tax is less volatile than income or sales taxes, which helps to stabilize local government finances during times of fiscal distress (Kenyon et al., 2023). It is contested *and* indispensable.

The property tax has always generated political conflict because it directly structures fiscal burdens and governing authority. This has led to waves of ‘tax revolts’ throughout U.S. history. Efforts to place limitations on property taxes or the growth in property values subject to taxation arose in full force in the 1970’s. Research by Martin (2008) has suggested that these limitations – including California’s Proposition 13 – developed as a defensive movement for government protection against the (housing) market rather than an anti-tax politics harbored by homeowners. We can differentiate the tax-revolts of the 1970’s – driven largely by rapid increases in property

values and associated tax burdens — from those of the Great Depression era, when widespread tax delinquency emerged precisely as local governments faced acute fiscal pressures (O’Sullivan et al., 1995).¹ Compared to those during the Great Depression, the more contemporary property tax limitations did not always arise from the grassroots level, as Smith (2004) has written. As they put it, while “anti-tax proponents and their supporters frequently draw on populist tropes, a fair number of tax limitation measures are underwritten, both financially and organizationally, by vested special interests.” And because the U.S. makes use of ballot initiatives and referenda, voters themselves are often at the wheel when it comes to major decisions around how we tax, who we tax, and how much we tax.²

The property tax has also been lamented for increasing inequality across space, especially as that pertains to funding for public education. In this dissertation, I agree with Kelly (2024) when they criticize academic work that suggests inequities across space are the product of

abstract, economic forces that determine property values. In these accounts, the free market, not the state constituting and structuring it, becomes the source of inequality. In some instances, inequality itself even becomes something to celebrate, a reflection of how a market system efficiently distributes public goods by creating the market-based ‘local public good.’ State policies shaping property values and deliberately connecting them with school funding are absent from these accounts.

This quote aptly describes much of the economic literature and its strong emphasis on public choice explanations. In such works, decisions made by voters, firms, or public officials are driven by present-day incentives (i.e., costs, benefits, electoral pressures, etc.) rather than longer-run (institutional) processes. The entire notion that individuals are simply ‘voting with their feet’ and

¹Present-day limitations can also be traced to the nineteenth century, including Jim Crow-era supermajority requirements (see Paquin (2015) for a 161-year history of state-imposed limitations, or Williamson (2025) for a thorough examination of the relationsop between democracy and taxation).

²At the time of writing, Florida Governor Ron DeSantis has proposed a ballot measure for 2026 that would eliminate the property tax on homestead properties. While less dramatic, other property tax proposals have arisen in a number of other states.

segregating themselves based on their preferences for a local basket of public goods is difficult to comprehend once history and institutions are brought into the spotlight. I make every effort in this dissertation to recognize that decisions about the property tax are shaped by historically constructed state institutions. Recognizing the property tax as such suggests that its present operation cannot be fully understood apart from the longer historical development of American fiscal systems.

The last major innovation in state and local tax policy was the general retail sales tax, enacted across the country some 100 years ago (Howe & Reeb, 1997). Despite structural changes in the U.S. economy which have generated new, potentially taxable bases (i.e., treating data collection and targeted advertising as taxable economic activities), moving away from the present, regressive system remains elusive. Calls to re-incorporate wealth into state and local tax systems are picking up steam, driven by an argument that consumption and labor are taxed by our subnational governments, but modern, concentrated forms of wealth remain out of reach. Recent proposals include enhanced inheritance and estate taxes, progressive property surtaxes on luxury real estate, taxes on millionaires and billionaires, and the taxation of unrealized capital gains. These modern proposals share much in spirit with the previous system in operation before the income and sales tax became codified across the states.

Under the old regime of the general property tax, state and local governments at least attempted to tax forms of wealth other than real estate. This earlier system was built around a principle shared by most Americans, that ability to pay should determine one's tax liability. In other words, accumulated wealth should finance government. While that institution was destabilized by industrial capitalism, revisiting how and why states failed to modernize the broad forms of property included in the general property tax may help inform modern debates about wealth taxation. In Chapter 1, I revisit how the general property tax evolved in one understudied state, Colorado. This chapter makes clear that how we define property matters because those definitions determine the tax base from which the public sector is substantiated. Those definitions also generate political conflict, as the state determines which forms of wealth are incorporated into the tax system and which remain privileged or exempt.

Who can levy property taxes has also changed over time. Special districts have replaced many functions of local government across the country, including in service areas like fire protection, sewerage, and solid waste management (Goodman & Carroll, 2024). A new form of special district has also emerged as a staple in many states, the ‘developer district.’ The rise of this form of special district has reinvigorated work on ‘private governments,’ unequal tax burdens, and ‘crowding out.’ I engage with this literature in Chapter 2, exploring the rise of developer districts in Colorado and their potential effects on overlapping governments who share part of the same tax base. This work may be the first to study the rise of ‘Metro Districts’ (as these developer districts are known) in relation to their impacts on other levels of government. I find evidence of crowding out: for counties, reliance on metro districts is associated with significantly lower voter-approved property taxes earmarked for capital projects and projects that require bond issuance. For cities, metro districts are associated with lower voter-approved property taxes earmarked for capital projects, but there is no impact on property taxes that require bond issuance. I find no evidence of crowding out for school districts.

With so many governments and quasi-public entities sharing parts of the same tax base for revenue-generating purposes, it is no surprise that governments respond strategically to decisions made by each other. In this sense, the property tax at least partially structures intergovernmental behavior. I study this concept in Chapter 3 by examining how governments respond to exogenous changes in overlapping tax systems. Specifically, I analyze how local governments (towns and cities) in Michigan, responded to a statewide, heterogeneous reduction in school property taxes as part of a school finance reform in the 1990’s. I find that local property tax rates were sensitive to the size of school rate reductions, with larger school rate reductions resulting in larger local increases. I also find heterogeneous effects depending on certain characteristics of the jurisdictions studied. In particular, in jurisdictions where more of the tax base is made up of owner-occupied housing, local rate increases were considerably dampened, and in some cases, actually reduced. These findings contribute to the vertical tax competition literature and help explain how major tax reforms shape local government fiscal behavior.

In a U.S. economy that continues to shift markedly toward inequality, understanding the history and political economy of the property tax can help inform debates over the governance challenges facing subnational governments. Taken together, the chapters of this dissertation contribute to that effort while providing new evidence that the American property tax is steeped in conflict – as much today as in the past.

Chapter 1

Taxation and State-Building on the Frontier: Public Finance, Economic Development, and the General Property Tax in 19th Century Colorado

1.1 Introduction

The 19th century represents a tumultuous period in American history, marked by a rapidly transforming economy, a civil war, and a dramatic expansion of United States territorial claims. Rapid expansion westward, culminating in the acquisition of former Mexican territory in 1848, brought vast new lands and diverse populations under federal sovereignty. Congress quickly established territorial governments, modeled closely on eastern prototypes, and endowed them with broad police and fiscal powers, including the authority to tax and spend.

The general property tax stood at the center of this state-building project. With newfound need to “finance the state,” territories and states enshrined in their constitutions provisions that mimicked those of the eastern states from which they came. By taxing the assessed value of both real and personal property, these governments tapped into wealth held by individuals and businesses in the form of land, buildings, stocks and bonds, tangible household possessions, merchandise, livestock, and more. The 1870 Census of Wealth Taxation and Public Indebtedness confirms the fiscal architecture: states and territories relied almost exclusively on the general property tax, supplemented only modestly by other “receipts into the State treasury,” including money from land sales, license taxes, and taxes on insurance companies and other corporations (United States Census Bureau, 1872b). The general property tax was overwhelmingly the key source of revenue, and remained so until the 1920’s, with the introduction of the income tax at the federal level (following ratification of the Sixteenth Amendment in 1913), and at the state level on a gradual, piecemeal basis.

At the time of the formation of western territories and states, the general property tax was viewed as an expedient method by which these governments could generate the funds necessary for the public purse. The “promise of a locally administered tax system that would tax all in proportion to their wealth had an intuitive appeal,” as Fisher (1997) has written, although few gave attention to the “political and practical problems of administering such a tax.” However expedient they might have been, these tax policies were not simply the outcome of a democratic system that expressed the preferences of everyone in the region – let alone those who had little say on questions of citizenship, land rights, or taxation.³ Instead, they might better be viewed as the outcome of a “tax bargain,” with unequal political and economic resources held by those at the bargaining table. This is particularly evident as territories sought admission to the Union, a transition that brought greater political and fiscal autonomy. As Manning (2023) has argued, the fiscal systems forged at these critical moments in state formation tend to “become ‘taken for granted’ arrangements that inscribe the scope and roles of the state and the boundaries of the political community entitled to protection and services from the state” (p. 65). They continue, suggesting that the tax bargain...

...entrenches the political and economic power of dominant actors at the time the bargain is set, and those advantages gain momentum and widen the gap between them and others not privileged by the tax bargain and the social contract it supported... When those understandings are challenged at ‘critical junctures’ by social or political mobilization that seeks to expand the role of the state and the political community, the tax bargain serves as a rally point and a concrete policy tool to support an agenda of resistance to change (p. 65).

Indeed the very history of the U.S. government has often been viewed – at least since Beard (1913) – in this fashion. The ‘dominant actors’ who drafted the Constitution were property-owning elites who would benefit from key provisions of the document’s ratification. They just needed the right coalition to make it happen.

³See Limerick (1987), Montoya (2020) for summaries of the exclusionary processes through which Western state-building unfolded.

Such “economic interpretations of history” as Seligman (1902) would describe them, once played a lively role in political economy research. In particular, the early years of the American Economic Association were filled with such ‘interpretations.’ Richard Ely, the progressive political economist and founder of the AEA, was one notable proponent. In his monumental work, *Taxation in American States and Cities*, Ely (1888) questioned the ability to understand any modern institution without first tracing its historical roots. “Laws and institutions are a growth,” he wrote, “and consequently they cannot be understood without an historical examination of their past” (p. 105).⁴ Building on this tradition, contemporary work in the New Fiscal Sociology emphasizes how early fiscal arrangements not only reflect underlying power structures but also shape the long-run evolution of tax institutions (Backhaus, 2005; Campbell, 1993; Martin & Prasad, 2014; Martin et al., 2009; Mehrotra, 2013). Tracing the fiscal history of Tennessee and Arkansas over the long run, O’Brien et al. (2025) suggest that decisions made more than two centuries ago help explain the rather dramatic differences between the two states today – Arkansas, a centralized, “fiscally powerful state”; Tennessee, a highly decentralized state with county governments playing a larger role than the state. Place-specific fiscal histories thus play a larger role in explaining present day phenomena than is often recognized. Yet, scholars interested in pursuing this line of inquiry are frequently constrained by limited data availability. While the U.S. Census provides useful decennial data on state and local public finance (see Derenoncourt et al. (2024), Dray et al. (2025), and Heckelman and Wallis (1997)), more fine-grained data remain scarce.

To address this limitation, I construct a new dataset drawing on archival property tax records from territorial and early-statehood Colorado to demonstrate how the general property tax both responded to and selectively incorporated new forms of wealth during a period of rapid industrialization and corporate growth. Since the general property tax depended on property – the exact definitions of which were conferred certain legal protections – the state determined what could be assessed and what remained outside the tax base. As new forms of wealth emerged, Colorado

⁴In a later work, Ely’s prose remained poetic, playing on Emerson: “And if institutions are the lengthened shadows, each of some one man, we may have satisfaction in contemplating our shadows” (Ely, 1910, p. 75).

expanded the tax base to include assets such as bank stock, railroad property, and capital employed in manufacturing, all while other forms of wealth – most notably those tied to mining – remained excluded. This uneven incorporation produced systematic differences in the effective taxation of wealth across sectors, with particularly favorable treatment for the mining industry.

The chapter is organized as follows. Section 2 situates Colorado within the nineteenth-century legal and economic framework governing state policy. Section 3 explores the General Property Tax in historical context in the United States, including a discussion of the federal treatment of mineral lands, their importance to the region, and their taxation (or lack thereof). Section 4 describes the construction of a new archival dataset providing annual, county-level assessed valuations, by property type, for the years 1863 to 1887. Section 5 concludes by discussing the broader research agenda enabled by this dataset.

1.2 State-building and policymaking in the 19th Century

Growth in the United States unfolded unevenly across the Nineteenth century. President Jefferson’s pursuit of controlling the entirety of the Mississippi River culminated in the Louisiana Purchase, which doubled the size of the U.S. geographic domain in 1803 (Vandenbroucke, 2008). But the nation’s territorial ambitions were far from satisfied. By 1846, during the Mexican-American War, U.S. leaders entertained visions of annexation so vast that, as Meinig (1993) observed, they were actually contemplating “gobbling up the whole of Mexico” (p. 147).⁵

The Treaty of Guadalupe Hidalgo, signed February 2, 1848, ended the Mexican American war and included the largest territorial cession in US history. Mexico ceded 55 percent of its territory, including present-day New Mexico, Arizona, California, Nevada, Utah, Colorado, as well as parts of Wyoming, Kansas, and Oklahoma. While the US military occupied and administered much of the acquired land immediately following the treaty, the Compromise of 1850 established Utah and New Mexico as territorial governments and admitted California into the Union as a free state.

⁵Meinig (1993) notes that the war began over and was defined in terms of specific territories, and “at each stage of the war as their armies ranged across much of the Mexican nation and their warships blockaded its harbors, American leaders pored over maps to consider how big a bite to take out of their victim” (p. 146).

Shortly thereafter, Congress passed an Organic Act for each territory: 1850 for Utah and New Mexico; 1855 for Kansas and Nebraska; 1861 for Colorado, Nevada, and Dakota; and 1863 for Arizona. These Acts established the form and substance of each territorial government – statutes that created territorial institutions on a nearly uniform template.⁶ Like previous territories established as the US expanded westward, the Organic Acts established executive power and authority under a governor, legislative power and authority under a legislative assembly, judicial power under a Supreme Court, District Courts, Probate Courts, and in justices of the peace, and a territorial secretary appointed by Washington.⁷

The institutional design of territorial government and the fiscal arrangements adopted in the nineteenth-century West also reflected the underlying priorities and constraints of the capitalist state, in which public authority both enabled and depended upon private accumulation. Understanding these logics helps clarify why U.S. territories and states had tax policies that varied so dramatically from place to place, despite their uniform reliance on the general property tax.

1.2.1 The state in capitalism and the capitalist state

O'Connor (1973) carefully details the dual contradictory nature of the capitalist state in his classic work, *Fiscal Crisis of the State*. He suggests that the state fulfills two functions: accumulation and legitimization, meaning it must “try to maintain or create the conditions in which profitable capital accumulation is possible” and it must secure social and political stability by maintaining the support of the population (O'Connor, 1973, p.6). This occurs through public service provision and through symbolic commitments to fairness. The latter function is, of course, largely about managing the social contradictions that come from the first function, as capitalist development

⁶Importantly, these territories followed a similar institutional path to those organized under the Northwest Ordinance, which provided a template for eventual self-government and the protection of property rights. This broader legal framework was reinforced by the U.S. Supreme Court in *Strader v. Graham*, 51 U.S. (10 How.) 82, 96–97 (1851), which affirmed the authority of states to determine the legal status of persons and property within their borders. As Lamar (2000) writes, the Ordinance “guaranteed the sanctity of private property and inviolability of contracts and provided rules to govern the transference and descent of property. So clearly were these property clauses expressed that the Founding Fathers copied them almost verbatim into the Constitution” (p. 7).

⁷For examples, see [the 1861 Colorado Organic Act](#) and [the 1850 New Mexico Organic Act](#).

produces wildly uneven outcomes for those existing within it. Edel (1992) similarly writes of the capitalist state existing at two levels: a tax and spending body, and the “very economic base of capitalism, as the guarantor, through laws and force, of private property and the wage labor system” (p. 128). These two levels are linked, because the state requires private accumulation for its revenues, and thus depends on “maintaining the rules of the game that allow corporations to exist and prosper” (Edel (1992, p. 128)). While private industry depends on the State to maintain the system with which it generates surplus (a ‘free’ labor market and a system of private property), the State depends on – and must hold some claim to – wealth that is generated privately.

Writing in 1968, Adolf Berle and Gardiner Means discuss this relationship between productive property and taxation:

Corporations derive their profits partly indeed from their own operations, but partly also from their market position and increasingly from techniques resulting from state expenditures of taxpayers’ money. In this sense, the American state is an investor in practically every substantial enterprise; without its activity, the enterprise, if it could exist at all, would be or would have been compelled to spend money and effort to create position, maintain access to market, and build technical development it currently takes for granted. Under these circumstances, there is little reason or justification for assuming that all profits should automatically accrue to stockholders. Put differently, stockholders – not having created the entire enterprise – are no longer the sole residuary legatees (after production costs and depreciation) of all the profits of an industrial progress, much of which is derived from state outlay” (Berle & Means, 1968, p. xvi).

While Berle and Means were discussing a 20th century capitalist system with a highly developed stockholding arrangement, earlier writers recognized that the state may make claim to private profits. Ely and Hess (1937) criticized those who went as far as to “deny the right of the State to take private property by taxation. These writers forget that there is no such thing as absolutely private property. As the *state determines the conditions of its existence*, and the most fundamental

condition of private property is the obligation to contribute to the support of the state” (Ely & Hess, 1937, emphasis added, p. 919).

Actually taxing private property fell largely to the states in the nineteenth century. The federal government, relying primarily on tariffs and excise taxes, operated within the constraints of the “negative rights” embedded in the U.S. Constitution – protections against government action that limited federal authority over private property. In the language of O’Connor (1973), these constraints structured the boundaries within which capital accumulation could proceed, positioning the federal government primarily within the accumulation function.

By contrast, state governments operated under constitutions that increasingly articulated “positive rights” – claims to public goods such as education and infrastructure – which imposed affirmative obligations on the state. These obligations both required and justified the taxation of private property. In doing so, state governments helped secure political support by delivering material benefits (i.e., roads, education, supports for the poor, public hospitals, etc.), thereby more directly performing the legitimization function. The property tax, in this sense, was the primary tool through which states financed and sustained this role.

This is not to say that state governments were not active players in creating the conditions for capital accumulation to proceed. In the nineteenth-century, both federal and state governments were engaged in ongoing processes of reproduction and expansion: economic development on the one hand, and state-building on the other. Crucially, however, neither process unfolded along a linear path. As Skowronek (1982) emphasizes, state-building is shaped by many factors:

State building is prompted by environmental changes, but it remains at all times a political contingency, a historical-structural question. Whether a given state changes or fails to change, the form and timing of the change, and the governing potential in the change — all of these turn on a struggle for political power and institutional position, a struggle defined and mediated by the organization of the pre-established state (Skowronek, 1982, p.ix)

The 19th century contained no shortage of struggles. Whether capital-capital, capital-labor, or labor-labor, the State stood on top of, in between, or absent from those struggles entirely, depending on the confrontation. Policymaking aimed toward addressing these struggles was, for the most part, a matter of State legislatures and their courts. In fact, prior to the Civil War, the U.S. federal government maintained a considerable distance on almost all issues of state government affairs. While the national government was largely tasked with international trade, diplomacy, and military interventions (including an ever-expanding geographic reach), states were responsible for most everything else – all during a time of significant economic transformation. The U.S. Constitution provided state governments with policy responsibilities in numerous areas. This is unsurprising considering many states preceded the national government itself. Labor, commerce, banking, and railroad regulations all originally fell to state governments. Thus, while the federal government played a central role in facilitating the conditions for capital accumulation, state governments were also deeply involved in shaping those conditions through their regulatory and fiscal authority. “Federalism,” Scheiber (1987) remarked, “provided a receptive structure for expressions of state autonomy and pursuit of state-oriented economic objectives, not only as a matter of constitutional theory and the distribution of formal authority, but also as a matter of real power” (p. 419). ‘Internal improvements’ provide one key example of active state intervention in the economy during this era.

1.2.2 Internal Improvements

The needs of a rapidly expanding population caused state and local governments to get involved in ‘internal improvements’ – the often large-scale infrastructure projects necessary for agriculture, transportation, and public wellbeing. While the Erie Canal (completed in 1825) is likely the example par excellence, many states followed New York’s example in planning large projects capable of providing the “facilities necessary to develop commercial agriculture on a profitable basis, to link emergent urban commercial entrepôts and processing centers with the rural producing areas, and to develop areas of the state that were as yet sparsely settled” (Scheiber, 1987, p. 422).

These endeavors were both engineering marvels and required innovative governmental organizations capable of financing and managing the large amounts of money required for executing the projects. Bonds were issued in Northern and Western states to finance the canals and railroads, while in Southern states they were channeled into state banking institutions (Wallis et al., 2004). On the issue of state and local use of sovereign credit to finance internal improvements in the 1830's and 1840's, Henry C. Adams describes his understanding as follows:

The States borrowed money to build public highways. That public highways should be built was one of the imperative demands of the times. That the States should undertake this work rather than the central government or corporations, was the result of this historical accident – that the call for inland improvements came just when, in the development of political ideas, there had been a reaction against the policy of federal administrative control, and before the doctrine of laissez-faire had in this country produced any results except in matters of foreign commerce. The general confidence in the States which led men to place money freely at their disposal, was in part merely an expression of the general confidence of the times; in part an indirect consequence of the easy payment by the Federal government of its debt; and in part because men saw in the public improvements which the States were undertaking an additional advantage beyond that of a mere investment of so much capital. All these forces taken together made up the atmosphere of the times, which, to say the least, proved very invigorating to those who breathed it (Adams, 1892, p. 347).

Adams' expertly describes the dominance of states government vis-à-vis the federal government, who had not yet assumed their control over many aspects of the economy, especially through federal judicial power. The expansion of national administrative capacities was to come decades later. For now, state governments continued to expand their own active participation in the economy, as evidenced through internal improvements financed (mostly) with debt. According to estimates compiled by Wallis (2000), by 1841, state governments had accumulated \$193 million in debt, or 86% of total federal, state, and local debt. Put another way, state debt was eight times local

debt and 30 times the national debt. Investors were eager to swoop up American (state and local) bonds, including those states newly admitted to the Union. As discussed in Bi and Traum (2019), those states which issued the most debt also relied more heavily on foreign national creditors, especially England and Holland.

Things did, however, come crashing down following the financial panic of 1837. The ensuing depression saw eight states and the territory of Florida default by 1842 (Wallis, 2000). In response, numerous states and territories passed laws establishing debt limitations, including maximum dollar amounts, capping the allowable debt to some proportion of the assessed valuation in the state, and other procedural safeguards like public or legislative referenda (Goodrich, 1950; Titolo, 2023). Between 1848 and 1859 five states (Wisconsin, Michigan, Maryland, Minnesota, and Kansas) even went so far as to prohibit state works entirely (p. 156). While provisions in state constitutions aimed at preventing the type or extent of borrowing continued to accumulate, state involvement in financing internal improvements did not exactly falter. In the 1850's and 1860's in particular, state-aided railroad projects flourished, as did many municipal projects in states where aid was prohibited. Between 1841 and 1870, total local debt increased from just \$25 million to \$516 million, while total state debt jumped from \$193 million to \$352 million (Wallis, 2000).

For Richard Ely, the debt of states and cities was inconsequential. In his nationwide examination of debt in the late 1880's, Ely (1888) remarked that total state and city debt paled in comparison to the total property belonging to states and cities, let alone the productive property owned by states and cities in the aggregate.⁸ Total state debt declined to \$297 million in 1880, and to \$228 million 1890, where it remained steady through the turn of the century. Local debt on the other hand, continued its growth unabated, reaching \$826 million in 1880 and thereafter doubling in size by the turn of the century (Wallis, 2000).

⁸On this point, Ely specifically mentions the city of Baltimore, whose productive property was "...a great deal more than the debt. The city owns 32,500 shares of Baltimore and Ohio stock, which for years paid ten percent dividends. It is said that the city practically owns the Western Maryland Railroad" (Ely, 1888, p. 514). Whether other cities were in as good a shape as Baltimore is difficult to say, especially considering the uneven impact of the Panic of 1873, which saw a withdrawal of European capital so large that by 1875, a quarter of all railroads with outstanding railroad bonds had defaulted (Dutta, 2024).

Despite the widespread use of credit markets to funnel public dollars to development, states and territories were not entirely free to regulate economic development and industry more broadly. Scheiber (1987) describes two obstacles that stood in the way: a rapidly evolving industrial economy that states found difficult to keep up with, and federal judicial oversight of state laws, including the Supreme Court's insistence on overturning a "significant range of state legislation regarding railroad commissions, regulation of labor hours and working conditions, and health and tax matter" (p. 427).⁹ It is these latter (tax) matters which most impacted the very sustenance of the subnational governments, who depended not only on debt and development for their reproduction, but on the tax revenues derived from property within their boundaries to repay debt and establish state institutions. I turn next to the general property tax and its vital role in 19th century political economy.

1.3 The General Property Tax in Historical Context

1.3.1 Assessing the Wealth of the Nation

As public and other development projects catapulted the United States into the industrial era, the country's governments (federal, state, and local) grew – as evidenced by the scope of public institutions in existence and the tax revenues available to fund those programs. The two things were, of course, mutually dependent on each other. As Einhorn (2006) suggests, the growth in state-level per capita property taxes in both the North and South after 1835 owed largely to demands for increased public services. It also grew in order to pay for debts related to internal improvement projects that went belly-up following the Panic of 1837 (see above). Besides the nine states (including the territory of Florida) that actually defaulted, many others revised their tax codes or increased property taxes to deal with the issue. Whether to pay for prisons, social welfare, educational activities, or to pay back the debt incurred for internal improvements, a large, stable, and expanding tax base proved up to the task. While a number of states experimented with taxes

⁹See also Cushman (1922) for a careful examination of the Court's application of Fourteenth Amendment to 'social legislation,' including that related to taxation.

on banks, insurance companies, and other ‘intangible’ items in the first half of the 19th century, the property tax was already in use by most, owing to its colonial origins.¹⁰ Variation across the country was still evident, though.

Importantly, the general property tax was a Northern institution. Southern states relied on elaborate license schedules – on as niche of industries and professions as turpentine distillers and blackface minstrel groups – and differential rates for real estate if/when it was even taxed.¹¹ The general property tax made its way into the state books of the Northwest states by the 1850’s – in the older states (Ohio, Illinois, and Indiana) as well as the newcomers (Michigan, Wisconsin, Iowa, Minnesota, and Oregon). The tax was, however, adopted “to raise local rather than territorial funds” (Einhorn, 2006, p. 230). Wisconsin Territory created a ‘Territorial Revenue’ in 1839 by “instructing county boards to forward five percent of their local tax receipts” (p. 230). This statute was then mimicked elsewhere.

By the middle of the 19th century, many states and territories had reformed their tax laws by implementing the general property tax. The tax was favored by some as the best way to incorporate an ‘ability-to-pay’ principle into the tax code, as it applied a uniform tax rate imposed on all forms of property subject to taxation, whether real or personal.¹² Enshrined in many state constitutions, uniformity clauses required that property be assessed by value, not by specific rates applied to specific properties (\$5 per carriage, for example). And when new territories were granted statehood, their first constitutions often included these provisions. But uniformity clauses were not a Jeffersonian appeal to democratic tax assessment practices. As Einhorn (2001) has discussed, the uniformity clause first appeared in sixteen states before the Civil War, emerging “from the explic-

¹⁰According to Walker (1984), prior to 1812, while most states had some experience with poll and property taxes, many relied heavily on non-tax revenue, which was often sufficient to meet their modest revenue needs. “The early reluctance of the states to develop systems of taxation at a time when there was a rising call for public schools created circumstances in which local taxation systems were born out of necessity. Since the property tax was the only tax that could be administered locally with any degree of efficiency, the course of action was clear” (p. 273).

¹¹Einhorn (2006) notes that land was not even assessed in Louisiana, Alabama, and Mississippi until 1846, 1847, and 1850, respectively.

¹²For key historical explorations of (at the time) ‘modern’ state and local taxation systems, see (Adams, 1892; Ely, 1888; Jensen, 1936; Le Rossignol, 1902; Seligman, 1902)

itly anti-democratic demands of slaveholders in the south rather than from the egalitarian demands of frontier farmers” (p. 974).¹³

As opposed to their eastern and southern counterparts, western territories adopted the uniformity clause at their inception. This was a product of federal policy, however, not local choice. Congress expected territorial governments to rely on local taxation for revenue and codified that expectation in the Organic Acts that established the territories. For example, the Organic Act of 1861 – which established the Territory of Colorado – included the following (and only) reference to taxation:

And be it further enacted, That the legislative power of the Territory shall extend to all rightful subjects of legislation consistent with the Constitution of the United States and the provisions of the act; but no law shall be passed interfering with the primary disposal of the soil; no tax shall be imposed upon the property of the United States; nor shall the lands or other property of non-residents be taxed higher than the lands or other property of residents; nor shall any law be passed impairing the rights of private property; nor shall any discrimination be made in taxing different kinds of property; but all property subject to taxation shall be in proportion to the value of the property taxed (Sanger, 1863, p. 174).

We see in this language the common uniformity clause of the era, forbidding discrimination among different kinds of property and requiring all taxable property to be taxed in proportion to value (uniform ad valorem taxation). We also see the declaration that federal lands could not be taxed. Other than that, territorial governments were given authority to determine, on their own, how to finance their existence through tax policy.

The first Colorado Territorial Legislative Assembly quickly passed an Act to “provide for the expenses of Colorado Territory” (Colorado General Assembly, 1861c). The Act sets forth the powers of the Auditor of the Territory to issue Territorial warrants and requires the annual reporting

¹³Regardless of its precise origins, the uniformity clause led to considerable problems later on – especially when states began trying to implement income taxes.

to the legislative assembly of an “estimate of the probable amount of revenue derivable from the various sources” (p. 51). In “An Act Providing for the Collection of Revenue” – hereon the “Revenue Act” – the Board of County Commissioners are provided the instruction to levy taxes on the “assessed value of the taxable property in the county” with the following rates established:

For Territorial Revenue, three mills on a dollar, when no rate is directed by the census board: For ordinary county revenue, including the support of the poor, not more than six mills on a dollar, and a poll tax of fifty cents. For support of schools, not less than one half mill, nor more than two mills and a half on a dollar. (Colorado General Assembly, 1861b, p. 117).

In the very next legislative session, the General Assembly increased the maximum mill from 6 to 10 for county purposes. The Revenue Act lists nine classes of property omitted from taxation, including property of the US government, university and school lands, fire implements and engines, the grounds and buildings of library, scientific, benevolent and religious institutions or societies, and others. These exemptions mimicked many of the state revenue laws in more eastern states.

The resulting tax revenues in Colorado were different, in size and ownership level, from other territories. As shown in Table 1.1, per capita taxes varied in both amount and degree of centralization. Nevada and Colorado’s exceptional per capita revenues can be contrasted with Dakota and New Mexico’s minimal collections. The degree of centralization – which level of government collected the most revenue – is also highly noticeable. While the average territory or state collected roughly one-quarter of every dollar of revenue generated, Colorado Territory collected just 18 cents on the dollar - the majority flowing to county governments instead. In New Mexico – a much more centralized territory – more than half of each dollar in tax revenue collected flowed to the territory.

Table 1.1: Taxes Per Capita in Western Territories, 1870 (dollars)

	Territory or State	County	Town/City	Total
Colorado	1.59	6.70	0.79	9.09
Dakota	0.09	0.89	—	0.98
Kansas	2.22	3.18	1.93	7.34
Nebraska	2.13	6.12	0.10	8.35
Nevada	7.02	11.72	0.56	19.31
New Mexico	0.37	0.28	0.01	0.66
Utah	0.45	0.93	0.55	1.93
Washington	1.41	4.98	0.46	6.85
Wyoming	0.68	3.10	—	3.78

Source: Authors calculations using *1870 Census: Volume 3. The Statistics of Wealth and Industry of the United States. Table II.*

By 1880, total per capita taxes declined in four territories/states (Kansas, Nebraska, Nevada, and Washington) but increased in five (Colorado, Dakota, New Mexico, Utah, and Wyoming). The degree of centralization also changed markedly over these ten years. In the territories of Dakota, Utah, and Wyoming, the share of revenue collected by the territory increased substantially. In all other territories/states, the direction was towards decentralization instead.

Table 1.2: Taxes Per Capita in Western Territories, 1880 (dollars)

	Territory or State	County	Town/City	Total
Colorado	1.90	6.20	2.90	11.10
Dakota	0.75	2.19	0.59	3.54
Kansas	0.89	2.07	1.48	4.43
Nebraska	0.79	3.36	2.02	6.17
Nevada	2.59	9.94	1.47	14.00
New Mexico	0.47	0.59	—	1.06
Utah	1.03	1.08	0.91	3.02
Washington	0.96	5.23	0.54	6.73
Wyoming	3.93	6.54	0.60	11.07

Source: Authors calculations using *1880 Census: Volume 7. Report on Valuation, Taxation, and Public Indebtedness in the United States. Table III.*

The taxes collected in the western territories, like elsewhere, depended on the assessed value of property, the primary form of wealth and the base with which the tax rates of the general property tax were applied. The assessed values of property varied dramatically from place to place, and in the 1870 Census, the U.S. government sought to understand this differentiation for the first time. After all, determining the value of all property across the country could help put an actual number to the “wealth of the nation.” In his “Remarks on the Statistics of Wealth and Public Indebtedness,” Superintendent of the Census, Francis A. Walker, wrote of the difficulties incurred collecting both the assessed value of real and personal property for state or local taxation, as well as an estimate of the “true value of both species of property combined.” Importantly, he notes that, “Without a knowledge of the laws of each community in respect to exemptions, as well as a knowledge of the customs of assessment in each, assessed values must always bear a very uncertain relation to real wealth” (United States Census Bureau, 1872a, p. 2). Thus, the officers in charge of the collection of these statistics had to estimate the degree and extent of undervaluation across the country. Further, and much more difficult to do, they needed to determine the extent to which personal property was 1) exempted from taxation by State or Federal laws; 2) disregarded in assessment entirely (notably in “furniture, apparel, equipage, and small amounts of money in hand or in bank;” and 3) missing from assessment due to evasion or fraud (United States Census Bureau, 1872a, p. 4).

Indeed, the quickly changing economic landscape in the United States made taxing some things, like land, much easier than other forms of property. As Howe and Reeb (1997) note, general property tax complaints “became more widespread as critics argued that increasing amounts of household and business property (e.g., diverse forms of business intangible personality such as stocks and bonds) were exempt from taxation, underreported, or underassessed” (p. 114) This necessarily meant that different property classes (i.e., residential or industrial) paid into the system in an inequitable way.

One such critic was Justice Thomas M. Cooley, who in his presentation at the annual meeting of the American Social Science Association in 1878, concluded that “the most prominent evils in state taxation at the present time are to be found in the habitual undervaluation of property, and the

neglect to assess at all a large proportion of all personalty” (Cooley, 1878, p. 197). Such disparities are evident in the statistics provided in the Census itself. In 1860, of the roughly \$12 billion in assessed valuation across the entire country, 58 percent came from real estate, the rest from personal property (United States Census Bureau, 1872a, p. 10). By 1870, the total assessed valuation had increased slightly, to \$14 billion, while the proportion owing to real estate had grown to 70 percent. This was due mostly to the fact that the assessed value of personal property actually declined by 16 percent over the decade, owing mostly to the abolition of slavery.¹⁴ Examining instead the “true valuation” (or market value) of property in the country, the Census reports impressive growth, from \$16.2 billion to over \$30 billion. Clearly, much property escaped valuation, and frustrations mounted with each passing tax year. Ely (1888) describes the sorry state of affairs when he quotes an unnamed elected official in Wisconsin:

You see in me a monument of the iniquity of our present system of taxation. When I was a poor and struggling young man, with five or six hundred dollars' worth of personalty, I paid on all that I had, but now that I really have something, I keep still and pay taxes only on a part of my property. Indeed, when I think about taxation in our states and cities, I feel like turning anarchist and blowing things up with dynamite (p. 172).¹⁵

Frustrations about the evasion of personal property from taxation were widespread, and states took different approaches to ‘reign in’ this evasion. All the while, larger trends were taking place at the federal level regarding land – its protection, disposal, and whether and what forms it might be taxed by states and territories.

¹⁴Following the Thirteenth Amendment to the U.S. Constitution, enslaved people – previously treated as taxable personal property in slave states – were removed from local tax rolls.

¹⁵Ely (1888) quotes another observer, this time the West Virginia Tax Commission, who similarly recognized how much “invisible property” – meaning personal property – avoided taxation: “The truth is, things have come to such a condition in West Virginia that, as regards paying taxes on this class of property, it is almost as voluntary and is considered pretty much in the same light as donations to the neighborhood church or Sunday-school” (p.174).

1.3.2 Mineral Extraction and Federal Land Policy

With the opening of more than 300 million acres following the Treaty of Guadalupe Hidalgo, debate around allocating land from the public domain took up much interest in Congress. The widespread adoption of disposing land to the public through fee simple tenure – that is, granting the virtually unrestricted right of the owner to do what they wanted with their land – was supported by both pioneer settlers and capitalists. It nonetheless resulted in the “devastation of a major portion of our forests, rapid dissipation of mineral resources, and serious deterioration of a large proportion of our range resources, and the social dislocations that flow from these devastations” (V. W. Johnson & Barlowe, 1954, p. 59).

Before the General Mining Act of 1872, there was little established law dictating patent for federal lands where a mineral claim had been located (or ‘staked’). Congress’ decision to open mineral lands to the public domain came long after mineral riches were discovered in the West. The Northwest Ordinance of 1785 had reserved mineral lands from sale, but the government began leasing lands in Indiana, Ohio, and the Lake Superior region in the early 1800’s. In 1846, Congress allowed for the sale of certain lead and iron-ore lands, and in 1851 finally classified public lands into “non-mineral” and “mineral,” despite any sufficient knowledge of what lands were indeed mineral-producing (Sakolski, 1857). This led to private individuals acquiring large tracts of “non-mineral” land because they had private knowledge of the land’s mineral content. By the time of the California gold rush in 1849, the federal government had very little ability to enforce its own land laws, or stop the flow of squatters entering the region to begin mining operations. While trespassing on the federally owned public domain, local regulations in the mining camps of the goldfields developed out of necessity. Such “miners’ codes” were developed to safeguard the firstcomer against claimjumpers. Congress gave some consideration to setting up a system that might, at least, produce some public revenue from “the gold that was being taken from land that, technically, was the property of all citizens” (Wyant, 1982, p. 168). In the 1860’s at least three resolutions were introduced proclaiming the federal government’s title to its mineral lands, all of which were “met with indignation and resentment from the entire West” (Roberts, 1944, p. 66).

Unlike the farmers of prior years that had purchased their farmland from the federal government – and unlike homesteaders, who at least met certain residency and improvement requirements – the miners eagerly stripped the public lands without comparable obligations.

No federal tax upon mines was ever established, and the legal disposal – or “stupendous giveaway” as Wyant (1982) put it – of the richest known mineral lands in the world finally came to fruition in 1866, when Congress passed an act that provided public lands to be opened to exploration and occupations by citizens or those who declared their intention to become citizens. Six years later, Congress passed the General Mining Act of 1872, which finally required a claimant to make discovery of mineral to be valid. The claim was valid without patenting as long as the claimant did \$100 worth of “assessment work” on it annually. After \$500 worth of improvements had been made on a claim that had been surveyed, a federal patent to the land could be obtained. As Sakolski (1857) notes, “Despite the large number of individual claims and patents, in a brief time the mineral lands in California and the neighboring states came under ownership of wealthy individuals and large corporations.” This law remained the entirety of U.S. mining law for 50 years, until the Mineral Leasing Act of 1920.

Mineral Lands in Colorado

Each of the booms associated with mining in the West had interesting parallels with the general economic conditions afflicting other parts of the country. Many poor agrarian farmers moved back and forth across the West, at times giving up their plots of land in the hopes of ‘striking it rich’ somewhere unknown. Paul (1963) describes the various stimuli pushing labor in the direction of mining booms:

Just as the ‘Oregon fever’ of 1843 was inspired in part by hard times in the Mississippi Valley, so the Colorado rush of 1858-1859 drew many recruits from those who were suffering from the worst effects of the panic of 1857. The Middle West was harder hit than any other section by that financial disaster (p. 41).

Movement into Colorado also came from the West, with experienced miners from the prior ‘rush of 1849’ seeking greater success in the Rocky Mountains. Census data confirms the absolute dominance of mining in 1860. Of the roughly 27,000 people with an occupation to report, fully 82 percent list “miner” (United States Census Bureau, 1864, p. 549).

The scale of mineral extraction during this period was immense. From 1858 to 1867, the total value of recovered metals in Colorado was over \$25 million, owing almost entirely to gold (Henderson, 1926). Over the next decade, the amount increased by 84 percent, to \$46.7 million. In just one more decade, the total value of recovered gold, silver, copper, and lead reached an astounding \$210.7 million - growth of over 350 percent. Compared to Nevada, another state rich in mineral resources, Colorado did not experience the ‘bust’ that often accompanied the boom. As shown in Table 1.3, growth in Colorado never let up, while Nevada’s flush period of the 1860’s and 1870’s (associated with the Comstock Lode) turned into an ebb in the 1880’s.

Table 1.3: Mining Production in Colorado and Nevada, 1868–1887 (dollars)

Period	Colorado	Percent Change	Nevada	Percent Change
1858–1867	25,427,923	—	83,962,023	—
1868–1877	46,735,500	84%	303,622,817	262%
1878–1887	210,682,229	351%	112,051,636	-63%

Notes: Values are authors calculations of total reported production of recovered metals, in nominal dollars. Percent change calculated relative to the previous decade. Colorado series from Henderson (1926). Nevada series from Couch and Carpenter (1943).

Not only was mining dependent on labor flowing from the Midwest and elsewhere, once gold and silver was discovered, supplies were needed that could only be made in urban manufacturing centers. The Midwest again, met these needs for Colorado. Paul (1963) writes that “some of the earliest mining equipment was built at Burlington, Iowa, from plans obtained from the experienced San Francisco manufacturers” (p. 54). He continues, writing that the

exceedingly active life of Colorado, Nevada, and the northern Rockies contrasts with the limited amount of mining in Utah, Arizona, and New Mexico in the decade 1858-1868. During the early and middle 1860's all of the former regions experienced true flush periods that transformed them from desert and wilderness into states and territories that claimed thousands of citizens and hundreds of camps and towns" (p. 53).

These camps and towns “acted as the center, the magnet for a widening economic unit,” as Smith (1967) has written. “In the community were the businesses who depended on outside sources for their merchandise and who in turn had to rely upon the transportation arteries leading into the district to secure their stock. This situation created a demand for better roads, then railroads ...” (Smith, 1967, p. 102). In a short period of time, manufacturing and mechanical industries developed in cities like Denver and Pueblo in order to process ore. Their presence was significant, as was the capital invested in these plants. In 1870, of the roughly \$2.8 million of capital employed in manufacturing, three quarters belonged to just 15 companies involved in quartz milling - the 19th century process used to extract gold from hard rock (quartz) ore (United States Census Bureau, 1872c).¹⁶

Both individual miners and the industry overall were aided by a territorial government that viewed mineral extraction as the engine of growth. They were eager to encourage mining in particular and very hesitant to tax those interests. William Gilpin, the first territorial governor, recommended just three years after the first settlements sprouted in Colorado that the “condition and wants of our mining region be reported to the Federal Congress. To aid in perfecting the processes of economical mining and coin, the liberal assistance of the Government and of science ought to be invoked, and it will be given” (Colorado General Assembly, 1861a).¹⁷ This boosterist orien-

¹⁶This itself is significant, as it indicated how quickly the production process was changing. Quartz milling allowed for hard rock (lode) mining, which required fixed capital and organized investment, unlike the earlier placer mining, which relied on individual miners.

¹⁷Rhetoric supportive of mining was almost universal in the early years of the territory. John Evans, the second territorial governor, spoke in the same light: “Mining is the most important interest of the Territory. Any legislation therefore that may be calculated to foster and protect it, to encourage its more rapid development, or to render more secure the rights and privileges of miners, shall receive my hearty approval, and have my earnest cooperation in carrying it into execution” (Colorado General Assembly, 1864)

tation was celebrated by the mine owners, who benefited from a constant increase in new, cheap laborers to work the mines. In February of 1870, the Colorado territorial legislature adopted a resolution encouraging the immigration of cheap Chinese laborers to “hasten the development and early prosperity of the region” (Goodstein, 2003, p. 174).¹⁸

What began as a rather simple vocal support for mining turned into a fervor by the time of statehood. The highest-order politicians in Colorado supported mining interests at every turn. In his inaugural address to the legislature in 1879, Governor Pitkin expressed his desires to do whatever was necessary to encourage “capital to open up valuable mines and to bring them to that state of development in which they become remunerative” (Colorado General Assembly, 1879, p. 95). Pitkin’s ‘encouragement’ extended to the question of taxation as well. As he put it,

We should keep the expenses of the State and municipal corporations at the lowest point consistent with efficient government. Many interests can ill afford the burdens of the least expensive government. No interests, however profitable, willingly submit to large taxation. If we can give the benefits of stable and effective government with light taxation, it will be a fact which keen eyed capital of other States will be quick to discover. Economy can only be secured by reduced expenditures. I ... strongly urge upon you the necessity of keeping the expenses and thereby the taxation of the State at the lowest point possible.

¹⁸In his message to the Eighth Session of the Legislative Assembly just one month prior, Territorial Governor Edward M. McCook expressed his racist views on the need for Chinese immigration into the state: “They may be of inferior race, and lower in natural traits than ourselves; they are undoubtedly pagan in religion; but notwithstanding all these moral disabilities, they are exceedingly muscular; and if we can first avail ourselves of their muscle, we can attend to their habits and their morals afterwards. They will supply what this country eminently needs,—an abundance of cheap labor; and as they will come to us in the future anyhow, whether we will or no, we of this generation may as well welcome them, and derive what benefit we can from their labor and their numbers” (Colorado General Assembly, 1870, p. 22). Within a decade, however, public attention had turned against Chinese immigration. The U.S. Congress passed the Chinese Exclusion Act in 1882 and by 1887 the state of Colorado was, by statute, surveilling the “number and condition of the Chinese in the State; their social and sanitary habits; number of married and or single; the number employed and the nature of their employment; the average wages per day at each employment, and the gross amount yearly; the amount expended by them in rent, food and clothing, and in what proportion such amounts are expended for foreign and home productions respectively; to what extend their labor comes in competition with the other industrial classes of the State” (Colorado Bureau of Labor Statistics, 1888).

Indeed, taxation was light – at least on the mines. The first state Constitution of 1876 specifically exempted mines from taxation for a period of ten years, except for taxes upon net proceeds and surface improvements (Roberts, 1944, p. 157). The Legislature failed, however, to establish the tax upon net proceeds in statute. Lake County, home of Leadville, nonetheless attempted to do so, and for three years the county assessed the mines as such, but the Little Pittsburgh Mining Company became purposefully delinquent in 1880, calling the tax illegal. The courts agreed, citing the legislatures failure to provide a method for carrying out the net proceeds tax (Crockett, 1945). The effect of this decision was felt in and beyond Lake County. Roberts (1944) has suggested that County expenses were high on account of the region being so “plagued with a steady succession of homicides, suicides, and litigation over claim-jumping” (p. 160). With the Little Pittsburgh decision, Lake County warrants – short term debt instruments commonly issue when governments didn’t have enough cash on hand – dropped to a value of 40 cents on the dollar. The holders of these warrants, mostly Denverites, began advocating for heavier taxation of mining operations (Roberts, 1944). Thus, fiscal stress caused by the courts translated directly into political demands over the distribution of the tax burden. Despite mine tax bills introduced in the legislature in the early 1880’s, though, nothing materialized.

Where Colorado failed to establish a tax on mining income, rather than property, Nevada succeeded. Unlike all other territories, Nevada displayed a continuity of policy with its tax on net proceeds (net income). As Roberts (1944) has suggested, this occurred primarily for two reasons: “the early discovery of the Comstock Lode and the early formation of state government, the one forming a productive base for mine taxation and the other the necessity for revenue” (p. 82). In the first session of Nevada’s territorial legislature, a tax of forty cents on each \$100 of assessed value of property was established for territorial purposes, while a tax not to exceed sixty cents on each \$100 of assessed value of property was established for county purposes (for a total of \$1 per \$100 in assessed property). The definitions of real and personal property included in the law were extensive. Namely, mineral lands and the production thereon were treated as personal property, meaning they were treated much like any other form of property that the general property tax ap-

plied to. In 1864, the territory became a state, and this first Legislature chose to exempt mining from the property tax:

...gold and silver bearing ores, quartz or minerals, from which gold or silver is extracted, when in the hands of the producers thereof shall not mean nor be taken to mean, nor be listed and assessed under the term “personal property,” as used in this section of this Act, but is specially excepted therefrom, and shall be listed, assessed and taxed as hereinafter provided ((Nevada Revised Statutes 85.05, 1864)).

So while the general property tax continued to apply to most other forms of real and personal property – and the tax increased to \$2.75 per \$100 of assessed value¹⁹ – both the mines and mining claims were exempt. Instead, a net proceeds tax of \$1 per \$100 “on all ores, quartz, or minerals from which gold and silver, or either, is extracted by any mill, arastra, smelting furnace, or any process whatever” applied (*Nevada Revised Statutes 85.99, 1864*). While \$20 per ton could be deducted from the value of ores, 75 percent of the remainder was to be taxed, levied, and collected.

The amounts generated from the net proceeds tax in Nevada were not trivial. At the peak of production (1876 and 1877), the mines were assessed at over \$24 million annually, roughly 45 percent of the total property tax assessments of the state that year (see Figure 1.1). This proportion would only decline with the decrease in production and with efforts to add further deductions to the law, to which the mining companies formally succeeded in 1885. Despite the very boom and bust nature of Nevada mining, the state successfully taxed the industry, something that helped finance the state institutions relying on that revenue.

¹⁹This \$2.75 per \$100 of assessed value was broken down as follows: 95 cents for state purposes; 25 cents appropriated to the payment of territorial debt (to be assumed by the state); 5 cents for support of the State University and Common Schools; and a county levy maximum of \$1.50.

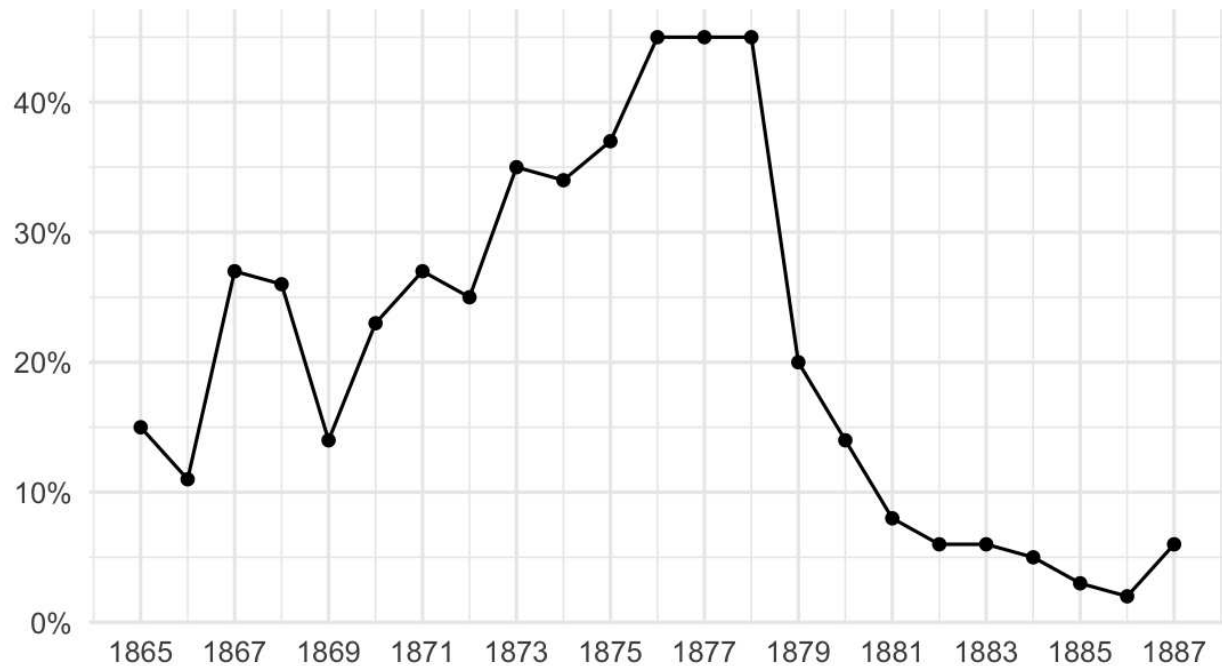


Figure 1.1: Net Proceeds as a Percent of Total Assessed Value, Nevada

Note: Author's calculations based on data compiled by Roberts (1944).

Early attempts in Colorado to establish a net proceeds tax universally failed, but calls for such a tax resurfaced in 1887 upon the expiration of the ten year constitutional limitation exempting mines from taxation. Outgoing Governor Benjamin H. Eaton summed up the sentiment in his message to the legislature that year:

The exemption in the beginning was an error. Its continuance would be a crime. ... I have been at much pains, through correspondence and otherwise, to discover the sentiments of active, practical mining men in various parts of the State, whose personal interests are most closely identified with the prosperity of this great branch of industry, and I feel perfectly warranted from my knowledge of their sentiments in conveying to you the assurance that any attempt to further exempt such property from its full and equitable share of the public burden would be regarded by them as the vainest and frothiest of demagoguery (Colorado General Assembly, 1887a, p. 76-77).

Bills were quickly introduced, and the ultimate law – drafted between legislators and an appointed committee of mining men – established a tax on all mines with at least \$1,000 in production, and assessed at one-fifth of that value for tax purposes (Colorado General Assembly, 1887b). Taxing only mines with at least \$1,000 in production ensured only active, commercially meaningful mines were responsible while small producers remained exempt. And by assessing only one-fifth of the gross proceeds, the tax base was set far below its full value. This was a major concession to the large mining interests, who were hardly assessed at their “full and equitable share of the public burden,” as Governor Eaton had suggested was necessary. Passage of this proceeds tax was “scarcely contested by the mines”, wrote Roberts (1944), “and the mining papers saluted it as a compromise measure of considerable merit.”

This fiscal history closely reflects the “tax bargain” described in Manning (2023). From the outset, mining interests benefited from minimal taxation, including a ten-year moratorium on the taxation of mines and mining claims. By the time this constitutional provision expired – a “critical juncture” in Manning’s terms – hundreds of millions in value had already been generated, yet those advantaged by the tax code continued to resist efforts at reform. Although this arrangement can be described as a compromise between the state and mining interests, no other sector secured comparable treatment. Agricultural property, town and city lots, and other forms of taxable wealth remained fully subject to the general property tax, lacking the political leverage to codify comparable exclusions from the tax base or similarly favorable assessment practices.

Three points may be gleaned from this section. First, the areas of the West that developed the quickest did so because of the precious metals beneath their surfaces. This is well established.²⁰ Second, in those places where mining boomed, growth followed. This necessitated an increase in public expenditures (both territorial or state, and local), financed primarily through the general property tax. Finally, despite its central role in driving economic development, Colorado went a quarter century without imposing a special tax on the mining industry. Although mines were

²⁰As Caffey (2014) aptly reminds us, “If the Gilded Age was a time of exploitation and development, the western territories offered much to exploit and develop” (p. 4).

formally incorporated into the property tax base in 1887, they were assessed on only one-fifth of their proceeds, reflecting a deliberate policy of under-taxation. This raises a central question: if not the mining industry, what property did Colorado successfully tax? Archival records provide a detailed answer to this question.

1.4 Archival Evidence: County-Level Property Taxation, 1862-1888

This section introduces a newly constructed dataset derived from annual abstracts of assessment compiled by Colorado county clerks and transmitted to the territorial (and later, State) auditor (Colorado General Assembly Auditor, 1862-1888). I photographed and digitized these records at the Colorado State Archives to assemble a county-year panel of assessed values for all types of taxable property in the state. To our knowledge, this is the first dataset to systematically compile these materials into consistent annual measures of assessed valuation across counties during Colorado's territorial and early statehood period.

The dataset consists of 724 county-year observations covering 42 Colorado counties between 1862 and 1888. Because new counties were created over time, the panel is unbalanced, with the number of counties increasing from 16 in 1863 to 41 in 1888.²¹ While the series extends through 1888, the archival record for that year is incomplete because the assessment abstract for Arapahoe County – then home to Denver – is unavailable. Consequently, the data are most complete for the period 1863–1887. The dataset contains 31 variables reporting assessed valuations by property type. In some county-years the abstracts contained physical measures of taxable property, including land acreage, railroad mileage, and livestock inventories, which were recorded when available. The earliest abstracts, covering the initial years of territorial organization, exhibit uneven formatting and reporting quality. Some counties submitted standardized printed returns, while others

²¹Importantly, this extensive decentralization presents a challenge to researchers exploring county-level trends, as historical property valuations cannot easily be assigned to modern day boundaries without detailed – parcel by parcel – estimates. For reference, Appendix A.1.2 shows every boundary change in Colorado over this period.

provided handwritten statements listing only aggregate valuations. The documentation becomes increasingly systematic as territorial administration matured and Colorado approached statehood. As an illustration of the materials, Tables 1.4 and 1.5 reproduce the unadjusted abstract of assessment for Jefferson County in 1863 and 1888, respectively.

Table 1.4: Abstract of Assessment, Jefferson County, 1863 (nominal dollars)

Number of	Property	Valuation
—	Lands listed in the County	\$69,862
—	Town and City Lots	15,810
209	Horses	13,700
65	Mules	4,430
1,275	Cows	31,080
1,130	Oxen	27,963
990	Calves	7,147
8	Sheep	27
184	Swine	1,275
2	Goats	10
—	Musical Instruments	207
—	Clocks, Watches, and Jewelry	1,489
—	All other property, including money and credits	51,354
—	Total Valuation	\$224,354

Source: Jefferson County Abstract of Assessment, 1863. Colorado State Archives (1862–1888), General Assembly Auditor Records (Archives No. 89-188), Container No. 8884.

Table 1.5: Abstract of Assessment, Jefferson County, 1888 (nominal dollars)

Number of	Property	Valuation
—	Acres of Land	\$2,013,534
—	Improvements on Lands	54,770
—	Town and City Lots	457,215
—	Miles of Railroads and Railroad Property	717,320
—	Telegraph and Telephone Co's	6,420
—	Average Value of Merchandise	46,417
—	Amount of Capital employed in Manufactures	18,608
4,502	Horses	248,779
195	Mules	16,835
15,861	Cattle	225,323
433	Sheep	861
592	Swine	2,126
26	All other Animals	214
212	Musical Instruments	9,627
757	Clocks and Watches	5,082
—	Jewelry, Gold and Silver Plate	1,092
—	Amount of Money and Credits	50,992
1,273	Carriages and Vehicles of every description	37,424
—	Household Property	4,655
—	All other property,	26,432
	Bank Stock or Shares in any Bank,	
—	or Stock or Shares in any Corporation	1,560
	or Company doing business in this state	
—	Total Valuation	\$3,945,286

Source: Jefferson County Abstract of Assessment, 1888. Colorado State Archives (1862–1888), General Assembly Auditor Records (Archives No. 89-188), Container No. 8884.

These two abstracts reveal several important features of Jefferson County's tax base. In 1863, 38 percent of the total valuation of the county came from land and the improvements thereon (including town and city lots). Livestock represented another 38 percent of the total assessed valuation of the county, while all other personal property brought in the final 24 percent. By 1888, Jefferson county counted 64 percent of their total assessed value from real property, 15 percent from livestock, and only 21 percent from all other personal property. These tables provide a clear picture of how much this county grew over 25 years, and how the burden of taxation was distributed

across property types. While the number of livestock grew tremendously over this period, their share of the overall tax base shrank, as the county became more centered on land, urban property, and more capital-intensive enterprises (especially the railroad).

In what follows, I summarize statewide trends in these data, documenting how the composition of taxable property changed over time. I focus on broad categories – real and personal property – as well as their underlying components. In order to adjust for inflation, I use the Minneapolis Fed’s historical estimates before the modern U.S. consumer price index (CPI) (Federal Reserve Bank of Minneapolis, 2025).²²

1.4.1 Statewide Trends in Assessed Valuation

Total, Real, and Personal Property

Within two years of territorial organization (1863), the total assessed value of all property in the state totaled \$103.5 million (in 2024 dollars). By the year of statehood (1876), this figure reached over \$1.3 billion, an increase of 1,159%. By 1887, total assessed value had grown another 277%, totaling over \$4.9 billion. This growth reflects both rapid settlement and the expansion of market activity, but also the increasing capacity of the state to identify and assess taxable wealth. Figure 1.2 shows this increase in assessed valuation in nominal and real terms.

²²This dataset provides an annual average price index going back to 1800. For reference, prices are over 31 times higher today (2024) than in 1862, the first year of our dataset.

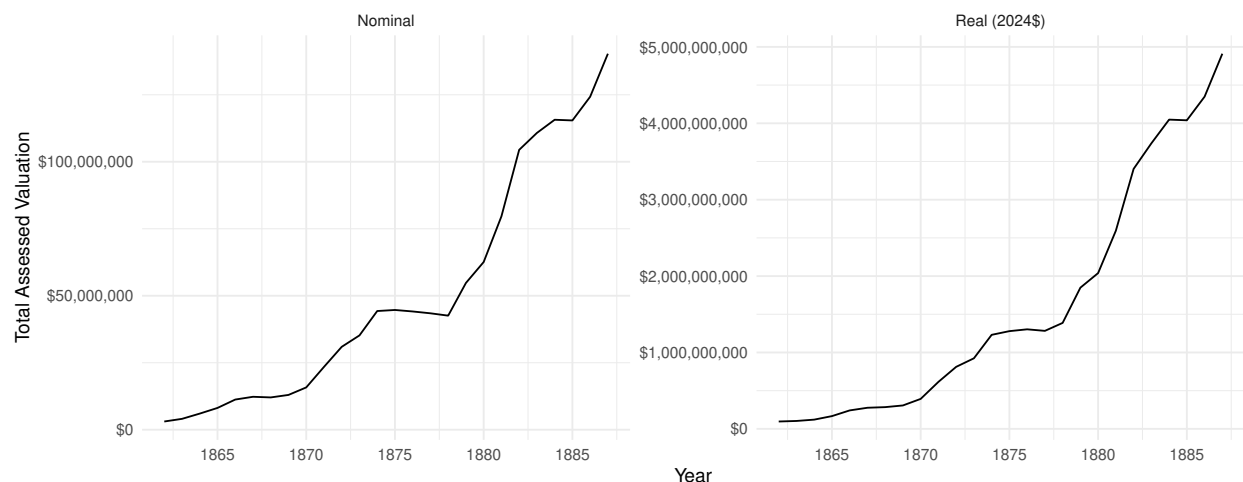


Figure 1.2: Total Assessed Valuation, Nominal and Real (1863–1887)

Over the period 1863–1887, total assessed valuation grew at an average annual rate of approximately 17.4%. Personal property grew more slowly (about 15.1% annually), while real property expanded more rapidly (about 20.8% annually).²³ Tables 1.6 and 1.7 show the real value of statewide assessed property at the beginning (1863), middle (1876), and end (1887) of our sample, as well as the percent growth in each category.

Table 1.6: Assessed Valuation of Colorado Property, 1863–1887 (Real, 2024 dollars)

Year	Real Property	Personal Property	Total Valuation
1863	\$31,127,407	\$70,513,382	\$103,522,231
1876	\$748,418,082	\$552,277,086	\$1,303,083,137
1887	\$2,869,225,929	\$2,041,583,012	\$4,910,808,941

Source: Colorado State Archives, Abstracts of Assessment; author’s CPI-U adjustments to 2024 dollars.

²³These are remarkable growth rates that express just how rapidly the territory developed over this period. Unfortunately, reliable population estimates are not available on an annual basis, otherwise per capita statistics would be presented.

Table 1.7: Percent Change in Assessed Value of Colorado Property from Previous Decade

Period	Real Property	Personal Property	Total Valuation
1863–1876	2,304%	683%	1,159%
1876–1887	283%	270%	277%
1863–1887	9,118%	2,795%	4,644%

Source: Colorado State Archives, Abstracts of Assessment; author's CPI-U adjustments to 2024 dollars.

Notes: Percent change computed from Table 1.6 values.

Real and Personal Property: Components

There was explosive growth in the assessed valuation of real property over this period. In particular, town and city lots – which reach nearly \$1.8 billion in 1887 – drove this growth. Valuation of personal property was not miniscule either. From 1863 to 1887, the assessed value of personal property increased by nearly 2,800 percent. By the late 1870's, two categories of personal property played a large role: railroads and the property of merchants. Figures 1.3 and 1.4 show the annual amounts of each component of real and personal property, respectively.

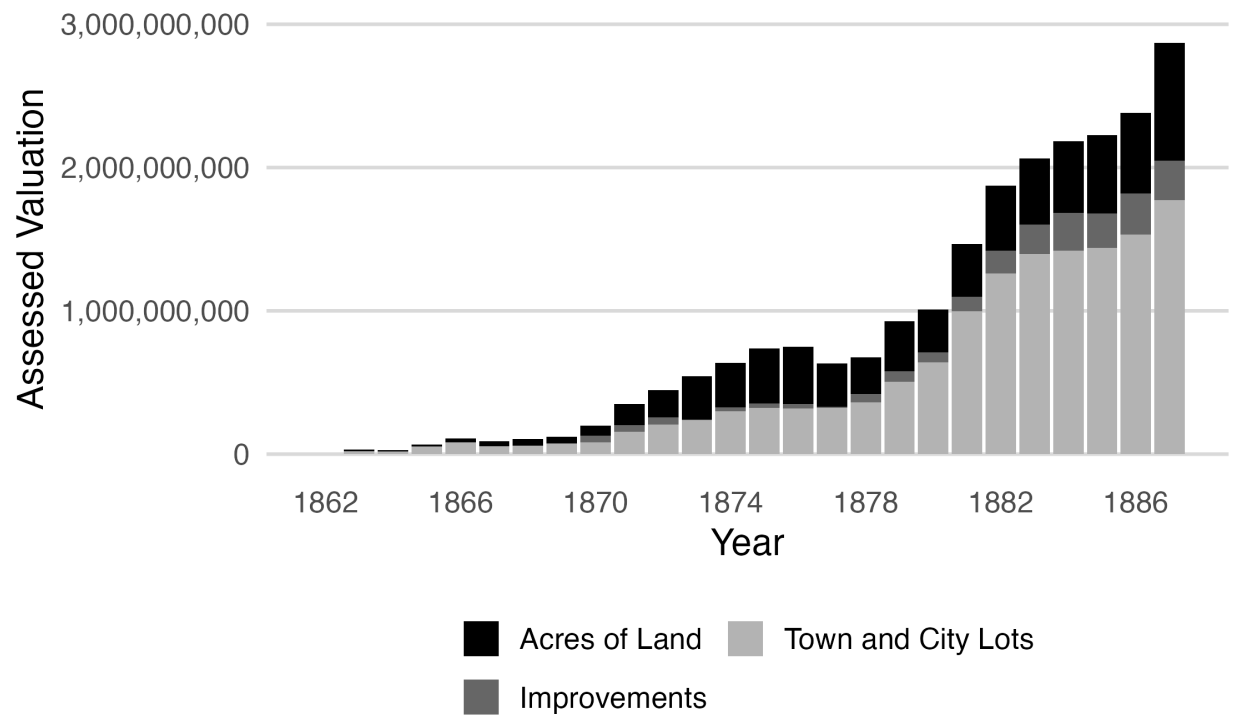


Figure 1.3: Assessed Valuation of Real Property (Real, 2024 Dollars)

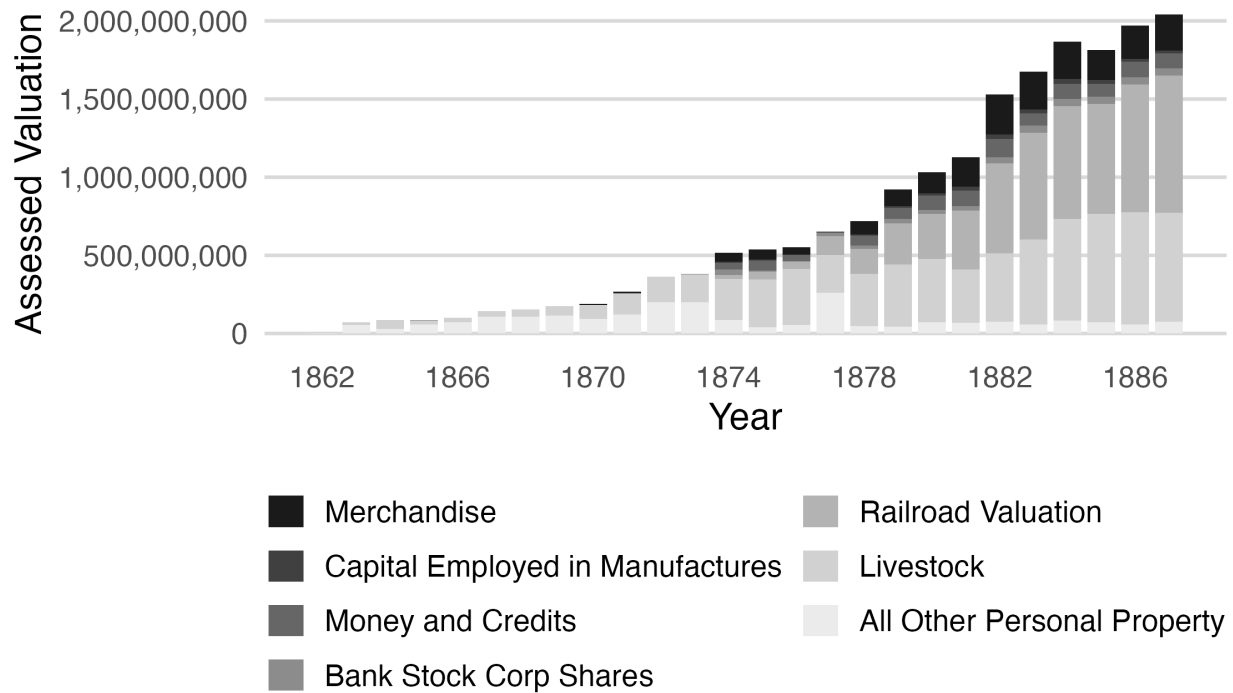


Figure 1.4: Assessed Valuation of Personal Property (Real, 2024 Dollars)

These patterns reveal what property Colorado successfully taxed. Like elsewhere in the country, the general property tax in nineteenth-century Colorado was formally designed to reach all forms of wealth, but tended to capture mostly what was observable and fixed. Those whose property consisted of land, buildings, livestock and other highly visible assets always made it onto the rolls. Those whose property consisted of intangible personal property – including stocks, bonds, and emerging forms of corporate wealth – were shielded.²⁴ This problem persisted well into the 20th century. Writing many decades later, Waldrop (1928) summarized Colorado’s experience with the general property tax as follows:

²⁴That the tax laws were determined at the Territorial and State level but enforced by local governments led to notable conflict. Higgens-Evenson (2003) suggests that locally elected assessors “lacked the know-how but also the inclination to assess stocks and bonds because energetic assessment meant unpopularity and defeat in the next election” (p. 13-14).

Property is no longer the criterion of ability to pay. Personal property is no longer visible. It more and more takes the form of mortgages, bonds and stocks, securities of all kinds. Slowly in Colorado, then more rapidly, personal property has slipped out of the assessment lists, leaving the general property tax a real property tax, and causing injustice and inequality between classes and individuals. The tax on personal property has come to be in inverse ratio to its quantity; the more it has increased the less it has paid.

The dataset constructed here cannot directly measure the extent of property that escaped taxation. It nevertheless provides a detailed picture of what was recorded in the assessment rolls and how the composition of assessed property evolved over time. In doing so, it offers new empirical grounding for a range of questions pertaining to the political economy of the era.

1.5 Conclusion

The development of western territories may have followed a specific playbook, owing to the legal requirements coming from Washington. But their trajectories were highly variable due to the unique political economy of each place. In Colorado, like elsewhere, a general property tax on real and personal property helped finance the state institutions necessary for a growing public. But the state actively shielded its main industry – mining – from the burden of taxation for the first two-and-a-half decades of its existence. As highlighted earlier, this was the exact opposite approach of another mining-reliant territory – Nevada – which established and relied heavily upon a net proceeds tax on mineral resources. By creating a new dataset from archival records, this paper identifies the forms of property (wealth) that Colorado successfully assessed and taxed instead. Broadly speaking, Colorado relied on both real (immovable, land-based) property and personal (movable or intangible) property throughout the period studied, although various forms of personal property evaded the tax assessor, particularly as new forms of intangible wealth materialized. By the end of our sample, town and city lots (real property) and railroads (personal property) represented over half of all property assessed for taxation in the state.

Our dataset is particularly well-suited to studying a handful of empirical questions. First, it enables analysis of the impacts of major financial shocks on local tax bases, including episodes such as the Panic of 1873 (known also as the first “Great Depression”). The same year also included the famous Coinage Act (the “Crime of ’73”) which contributed to a major deflationary period following the demonetization of silver it induced. By severing the link between silver production and money, the Act destabilized local economies tied to silver mining. The county-level, annual structure of the dataset makes it possible to trace how these shocks were reflected in the assessed values of property over time.

Second, this dataset provides a foundation for examining patterns of land speculation in Colorado, especially in towns and cities. This period was flush with complaints about those who “profiting from the privilege of owning land,” yet rising real estate values also constituted the territory’s primary source of revenue. The data make it possible to examine whether changes in the composition of assessed valuation, especially the rapid growth of town and city lots, reflect patterns consistent with land speculation. Paired with other data – such as railroad arrival, mining discoveries, and town formation or incorporation – the dataset would allow for analysis of whether spikes in assessed valuation are associated with these events.

Finally, paired with data on territorial and state public expenditures (which also exist in numerous archives), this dataset could be used to examine whether changes in the tax base influenced patterns of public spending. For instance, did counties contributing a larger share of assessed valuation, such as urban, Front Range counties, have more influence over the Legislature’s public spending decisions than more agricultural areas?

Chapter 2

The “Crowding Out” Effects of Special Districts: Evidence from Colorado’s Metropolitan Districts

2.1 Introduction

Special district governments have a long history of use in the United States. Like other forms of local government, special districts provide specific services to specific populations – fire protection or water conservation, for example. They have the ability to levy taxes on property within their boundaries and, like local governments, have systems in place for the governance of the district. In recent decades, new special districts have mostly taken the form of residential-community development districts (often referred to as “developer districts”). These districts are relatively understudied despite their considerable impact on both property owners and higher-order governments with which they share a tax base. In Colorado, these developer districts – known in the state as Metropolitan Districts (or simply ‘metro districts’) – have multiplied rapidly. While the Census confirms there was one metro district in 1952, there were over 2,100 as of 2022 (Davis, 2025; United States Census Bureau, 1954, 2022).

According to Colorado law, metro districts are a specific form of special district that provides two or more governmental functions (or services). For example, they may provide snow removal and mosquito abatement services, or parks and recreation services alongside trash and recycling. In essence though, metro districts are formed long before services are provided, in locations that are, for the most part, lacking the infrastructure necessary for residential communities to exist. Private real estate developers use metro districts to generate the necessary revenue to ‘build out.’ If developers wish to build and sell property in an unincorporated part of a county, for example,

I am grateful to Thomas Young and Victor Chen at the Colorado Department of Local Affairs for early assistance with data access; to Phylis Resnick, Kristi Pollard, Kathy White, Chris Stiffler, and Stephan Weiler for helpful discussions related to special district governance; and to Tim Komarek for financially supporting this project by purchasing the Cotality data and for the many hours of discussion regarding methods and metrics. Any errors are my own.

that county would normally have to provide water, electricity, and sewerage infrastructure to that development. But because financing this type of infrastructure has to be approved by all voters in the surrounding local government (i.e., county) under Colorado’s Taxpayer Bill of Rights (or ‘TABOR’), voters often reject such proposals.²⁴ A workaround to this problem is the metro district, which real estate developers form, elect themselves the board of directors of, then issue their own metro district bonds to finance the cost of that initial infrastructure build-out. Once the properties have been built and purchased, residents pay back that debt through a property tax charged by the metro district. This tax also finances the services provided once the residential development is operating (i.e., snow removal, landscaping, trash removal, etc).²⁵ For these reasons, metro districts are best understood as ‘developer districts.’

The growth in metro districts has been well-documented and highly criticized in the local press. In 2019, the Denver Post published a widely-read article, “Colorado metro districts and developers create billions in debt, leaving homeowners with soaring tax bills” (Migoya, 2019). This piece was highly critical of a legally-sanctioned system of real-estate development which “operates without the usual oversight of voters, without the usual restrictions on conflicts of interest, and without the usual checks and balances to ensure communities won’t spiral into insolvency” (Migoya, 2019). The confusion around metro districts has resulted in numerous realtor videos online warning potential homebuyers to be wary. One real estate developer in the Fort Collins area even advertises ‘No Metro Taxes!’ on its billboards, a reference to the much higher property taxes associated with metro district properties. The extensive use of metro districts for new residential development has come to the attention of local officials too – some of whom are beginning to recognize the potential vertical externality imposed on local governments. As one Town Manager described to a local reporter in 2022, “When we get the comment about ‘wouldn’t we like to be able to raise the

²⁴As one practitioner mentioned to the author, “If I live on the South side of town, why would I want to pay to have water lines brought to a fancy development on the North side of town?”

²⁵Importantly, metro districts do not necessarily replace HOA’s. In fact, many properties within metro districts also belong to HOA’s.

town's property tax mill levy,' when you see what the metro districts impose, that just serves as an artificial buffer on our ability to ask voters for a higher property tax" (Harford, 2022).

In this work, we study one under-examined component of the growth in this form of local government – the potential for crowding out other governments (in their ability to generate revenues and provide services to the broader public). To do so, I explore the explosive growth of metro districts in Colorado using data from the Colorado Department of Local Affairs (DOLA) and the information provider Cotality (Cotality, 2025). Empirically, I test whether the ability to raise local taxes is constrained ('crowded out') by the presence of metro districts who themselves impose high property taxes. Our core hypothesis is that the presence and intensity of metro district taxation limits the ability of general-purpose governments (cities and counties) and school districts to raise specific voter-approved mill levies. These mill levies – which must be approved by voters under TABOR – include additional levies for capital projects which are not debt-financed (capital mills) and for those that are (bond mills). When voters are asked to approve a bond request on their ballot, for example, they are being asked if their district may take on additional debt and raise property taxes to pay off that debt. Counties, cities, and school districts all have the authority to ask their voters to issue bonded debt. In addition, school districts in Colorado may ask voters to approve override levies, which can be used to pay for operating costs beyond their state-mandated limit.

In economic terms, I am testing whether there is a relationship between metro district tax burdens and non-metro district voter-approved property tax mill rates. Our empirical results suggest that there is some degree of crowding out in Colorado. In particular, counties with a high proportion of residential properties belonging to metro districts have significantly lower capital and bond mill levies than counties that are not so exposed to metro districts. This effect on capital mill levies is similar for municipalities, but only in cities with extreme reliance on metro districts (i.e., cities in the top decile). Contrary to expectations, I find no evidence of crowding out in school districts.

2.2 Historical Background and The Colorado Experience

Social scientists have long been interested in local government formation. Heckart and Klemmedsen (1933) criticized Colorado for having what they viewed as too many counties – 63 at the time, just one fewer than today. They argued that many of Colorado’s counties lacked the population and wealth to provide essential services, noting that “there are more county seats than trade centers, more taxing units than trade and resource areas” (p. 5). Despite their calls for county consolidation, their advice was largely ignored. Over the next 90 years, the number of county governments in the U.S. remained relatively stable, even increasing slightly.

Growth in subnational governments other than counties has varied much more throughout U.S. history. In the 19th century, population movements westward spurred the creation of new governments, particularly as cities incorporated with rising populations. In the case of Colorado, special district governments actually preceded the organization of the state itself. One of the first forms of local government in Colorado were special mining districts – set up to manage mining claims, boundaries, and water rights in the 1860’s and 1870’s (Serra, 2019). With almost no federal presence in the area, mining camps turned to local self-government in issues pertaining to property – its protection and transfer. When Congress established the Territory of Colorado in 1861, the first territorial legislature created seventeen counties, fixed the county seats, and upheld the mining laws of local mining districts (Henderson, 1926).

In the 20th century, new governance forms were introduced, creating greater complexity around who could tax, how they could tax, and how much they could tax. In 1942, the U.S. had 155,067 local governments, including counties, townships, municipalities, school districts, and special-purpose entities (Smaldone & Wright, 2024). This figure dropped significantly due to the consolidation of independent school districts, falling below 80,000 by 1972. However, over the last four decades, local government growth has surged once again. As of 2022, there were 90,837 local governments—roughly one government for every 3,647 people living in the U.S. Special districts account for roughly 44 percent of local governments in operation, but their use is highly variable

across the country, as shown in Figure 2.1. Colorado now has the second highest number of special districts in the country ($n = 3,201$), closely behind Illinois ($n = 3,218$).

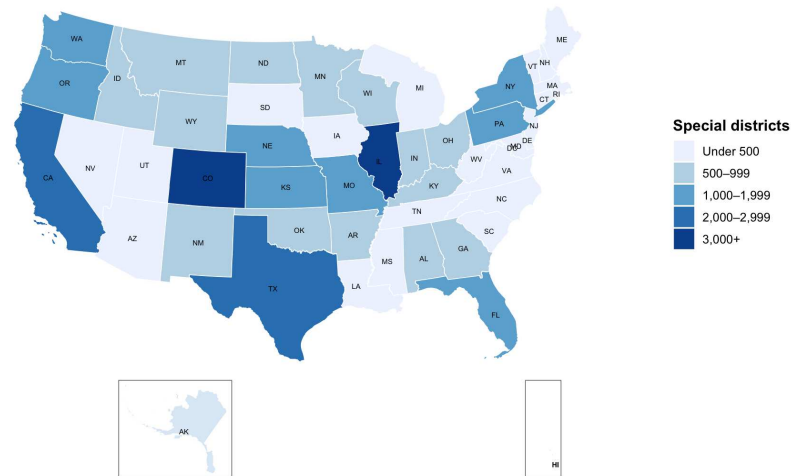


Figure 2.1: Number of Special Districts by State, 2022

The causes and consequences of this growth have taken up considerable space in the urban/regional, public administration, and tax policy literatures. Across disciplines, scholars agree that the increase in local governments has been driven, especially in recent decades, by special district governments. Special districts are organized local entities (other than counties, municipalities, townships, or school districts) authorized by state law to provide only one or a limited number of designated functions, and with sufficient administrative and fiscal autonomy to qualify as separate governments (United States Census Bureau, 2019). Special district formation has been a concern for many decades. In fact, in the 1960s, the number of special districts had grown so significantly in such a short amount of time that Congress tasked the Advisory Commission on Intergovernmental Relations (ACIR) with studying their rapid growth and their “effects on the structure and political responsiveness of local government” (Advisory Commission on Intergovernmental Relations, 1964). Writing as early as 1957, Bollens (1978) described the growth in special districts – be that in number, geographical extent, finance, or personnel – as “symptomatic of weaknesses in other governments” (p.5). His comprehensive study of special districts aimed to explain the causes of

this symptom, with explanations ranging from “unsuitability of other local units”, to “unadorned self interest” (p. 7-15).

In Colorado, while special districts became commonplace in mining and later agriculture (particularly soil conservation, drainage, or water conservation districts), their legal structure came via an authorizing act of the Colorado General Assembly in 1949, codifying them as a form of local government created to provide services in unincorporated or rural areas of the state (Novak, 1968). In 1981, following over three decades of highly public indictments of the confusing regulatory nature of special districts and repeated failures by the Legislature to pass bills aimed at reigning in their growth, the statutory provisions relating to special districts were recodified in the Special District Act (Weinman, 2017).²⁶ The Act is the general source of most of the statutory authorization, and constitutes Article 1 of Title 32 of the Colorado Revised Statutes (Colorado General Assembly, 2024b). According to the enabling legislation, special districts are defined as quasi-municipal corporations and state recognized political subdivisions which provide a specified municipal service or services. A metropolitan district means a special district that provides for the inhabitants thereof any two or more of the following services: fire protection, mosquito control, parks and recreation, safety protection, sanitation, solid waste disposal facilities or collection and transportation of solid waste, street improvement, television relay and translation, transportation, and water.

Special district powers vary across the U.S. but there are three common attributes across states: the power to tax and charge fees; the power to issue debt; and the power to appropriate private land for public use (Burns, 1994). While their common attributes are well established, the literature is not in agreement as to the reasons why special districts come into being. There are a number of works examining the history of special districts in the U.S. – questioning how they became so common and highlighting their many impacts. Burns (1994) presents a detailed look at the impact of new local governments, highlighting how special districts serve private interests – businesses, developers, investors, and wealthy homeowners. Burns finds that although special districts may

²⁶Weinman (2017) provides an extensive history of public disapproval and judicial involvement in the area of special districts in Colorado in the 20th century.

provide services that a city does not (or services that a city previously provided), they are frequently used as a tool for racial exclusion. This monumental work followed that of Piven and Friedland (1984), who showed that special districts further the agenda of real estate elites. Kevin Weinman's *Invisible Suburbs: Privatized Growth in Suburban Metropolitan Denver, 1950-2000*, provides a historical overview of the uncoordinated growth in special districts in the Denver metro area. He argues that corporate real estate developers privatized much of the process of suburban growth given legislative inaction at the state and local level.

A common hypothesis for the creation of special districts is referred to as the 'service provision' hypothesis: as population (and the wealthier populations specifically) increases, residents demand more services. McCabe (2000) finds support for this hypothesis, finding that special districts are more likely to form in states with rapidly expanding populations or increasingly affluent residents. Counter to classic arguments in the vein of Tiebout (1956) – which suggest that local government formation is simply a natural and technocratic outcome of citizen preference – other works consider growth in local government formation an inefficiency. C. Berry (2008) has described the growth in special districts as a vertical layering of jurisdictions (on top of one another), “rather than the horizontal positioning of territory into competing units” (p. 1). He argues that when the number of overlapping jurisdictions increases, this represents an “overfishing” of the common pool (shared tax base), ultimately leading to an inflation in the size of the local public sector. Extending on that work, Goodman (2018) finds that the additional tax revenues aren't spent on local government employees, indicating the presence of an inefficiency not found in areas with no overlapping entities.²⁷

Scholars have also suggested that local government proliferation hinders orderly responses to regional challenges (see Advisory Commission on Intergovernmental Relations (1964), Bollens (1978), Foster (1997), C. R. Berry (2009)). The legal scholar Kellen Zale has argued recently that local government formation and boundary change law has a “powerful and often underappreciated

²⁷For additional related work on overlapping government jurisdictions and fiscal fragmentation, see Martell (2007); Billings and Thibodeau (2009); Greer (2014); Goodman (2013); Goodman and Carroll (2024), and Brien (2017).

impact on the ability of local governments to engage in efforts to promote local resiliency” (Zale, 2018, p. 106). Given recent climate events (including flooding and fires), understanding the possible constraints posed by multiple overlapping government jurisdictions has taken on new levels of importance.²⁸ Beyond resiliency, scholars are beginning to distinguish developer district from special districts more generally. Carter et al. (2019) has suggested that developer districts are in fact substitutes – that is, “substituting private development interests in place of citizen constituency” – with all the governance challenges this can pose.

Another line of empirical work aimed at understanding why growth in special districts has occurred in the U.S. points to constraints placed on local government autonomy, but results are very mixed.²⁹ The general hypothesis in this line of work is that when state governments impose limits on local governments – such as the ability to increase property taxes or increase local debt – special districts are a way around those limits. This would be especially likely if fiscal powers were restricted at both the city and county level. As McCabe (2000) puts it, “the more severely a state constrains its cities’ and counties’ powers to tax, spend, or borrow, the more likely it is that new special districts will be formed in the state” (p. 122). Carr (2006) suggests that certain state restrictions on local government autonomy are associated with higher reliance on special district governments. Specifically, tax and expenditure limitations (TELs) are the only such restriction, and “only when both municipal and county governments were both strongly restricted”. Similarly, McCabe (2000) finds that the more TELs states impose on their cities and counties, the more likely special districts will be formed. More recently, Zhang (2018) confirms this result, finding that TELs “motivate local general-purpose governments to create new special districts as an institutional strategy to evade fiscal constraints imposed by the state” (p. 21). Shi (2016) however, finds little evidence to support the notion that “special districts are formed by general-purpose governments to circumvent fiscal restrictions, such as debt limits and tax and expenditure limitations” (p. 99).

²⁸With over 5,000 local governments, Colorado provides a particularly interesting case study.

²⁹For a survey of the literature on the effects of tax and expenditure limitations, see Stallmann et al. (2017).

While that debate is ongoing, left unsettled is perhaps a more important question: has the proliferation of special districts adversely affected governments with which they share fiscal boundaries? Regardless of the reasons they are formed, do special districts impact the taxing capabilities of general purpose governments or school districts, and do specific types of special districts – like Colorado’s metro districts – have a more pronounced effect? Before answering this question, I next describe the most important institutional variable impacting public finance in Colorado: the Taxpayer Bill of Rights (TABOR).

2.2.1 Colorado’s TABOR: Limitations on local governments

After multiple failed attempts, Colorado’s Taxpayer Bill of Rights (TABOR) was approved by 54 percent of voters in 1992, fundamentally reshaping the capacity of the state and its local governments to manage their fiscal affairs through two primary provisions. Firstly, TABOR created a strict cap limiting revenue growth to population growth plus inflation (for the state government), inflation plus growth in student enrollment (for school districts), and inflation plus the net growth in taxable property due to construction (for all other local governments, including counties) ((Eliaison & Lutz, 2018), p. 117). Any revenue over the ‘TABOR cap’ must be sent back to taxpayers, but the legislature has discretion as to how this occurs (checks to taxpayers vs. tax cuts, for example). Importantly, many local governments have eliminated spending caps. According to the Bell Policy Center (2019), 51 out of 64 counties, 230 out of 274 municipalities, and 177 out of 178 school districts have done so, in a process known as “debrucing” (named after Douglas Bruce, the legislator responsible for authoring TABOR). Secondly, TABOR requires voter approval for any tax increase – whether rates on sales or income taxes, mill levies, assessment ratios, extension of expiring taxes, the creation of new taxes, or any tax policy change that results in a net increase in revenue.³⁰

³⁰Another complicating factor influencing tax policy in the state was the Gallagher Amendment of 1982, which limited property tax increases by ensuring the amount collected from residential properties was always less than the amount collected from commercial and other property types. Voters repealed this constitutional amendment in 2020. See Kenney (2024) for local reporting or Propheter (2023) for an examination of how partisanship predicts support for Gallagher’s repeal.

While TABOR has been widely discussed and researched as part of the general literature on tax and expenditure limitations (or ‘TELs’), there is less work examining the institutional responses it may induce, such as the creation of alternative forms of government and the emergence of vertical fiscal externalities. Since the passage of TABOR, a number of taxing authorities have cropped up across the state, including Public Improvement Districts (County), General Improvement Districts (Municipal), Library Districts, Park and Recreation Districts, and Urban Renewal Authorities. Importantly, though, each of the above taxing authorities is created only after a majority of voters in the proposed area agree to its formation. Metro districts on the other hand, while approved by higher levels of government (county or city, if any), are formed by private real estate developers long before a population of voters exists within the district.

2.2.2 The Process of Forming a Metropolitan District

In 2023, the Governor of Colorado signed HB23-1105, creating a task force to study metro districts – their levying authority and practices, governance policies, and other issues. The Metro District Task Force was also tasked with producing a report, which provides useful information on residential metro districts (Colorado Division of Real Estate, Department of Regulatory Agencies, 2024). Much of the following is based on that report.

In order to finance the infrastructure necessary for constructing a residential development, a developer would generally need to borrow money, most usually from a commercial entity. While this necessarily means a cost to the developer (interest), this is standard protocol in most of the country. In Colorado, developers can bypass some of the need for commercial lending by establishing a metro district, which authorizes them to tax and (most importantly) issue tax-exempt debt. Metro districts only come into existence once their service plan has been approved by the county or municipality in which the district is located. These service plans act as a framework for the metro district, including “requirements for how it operates, maximum debt limits and mill levies” and “may enable a metro district to enforce covenants and provide design review services” (Colorado Division of Real Estate, Department of Regulatory Agencies, 2024, p. 6). As explained in a report

by the Colorado State Auditor, once service plans are approved, a petition for district formation is submitted to the appropriate District Court, of which no less than 30% of the proposed district's taxpaying electors must sign. A public hearing must be held so that any individual in the proposed district can request to be excluded. If the petition is approved, at least five electors in the proposed district vote on whether to go ahead with the district. There are, however, rarely any electors in the district at the time of this vote, so the property owner will "convey small parcels of property to other individuals who then become qualified electors of the district" (Colorado State Auditor, 2006, p. 12). The Colorado State Auditor then describes what happens next:

These electors then can vote to approve the creation of the district, elect themselves as board members of the district, and approve the authorization of debt and the property tax amount required to repay the annual debt service of the authorized debt. As noted above, after the district receives authorization from voters at the initial election to issue a certain amount of debt and collect a certain amount of taxes, no future issuances of the authorized debt require a vote of eligible electors living within the district, even if the mill levy must be increased to finance debt service payments. Because of the speculative nature of developer districts, taxpayers in these districts may be more at risk of experiencing unanticipated tax increases than those in other types of special districts that have been in place for a long period.

Under §32-1-1101(2) of the Colorado Revised Statutes, this debt incurred by a metro district is secured by property taxes for a period not to exceed 20 years. The proceeds from bond sales are then available to the metro district for the purpose of building out public infrastructure. In this sense, the common refrain is that this process enables for development to "pay its own way." As the Task Force report indicates, "Bond authorization elections are typically held before residents begin to purchase property and become eligible electors as well" (p. 6).

Colorado has increased the transparency requirements pertaining to metro districts, and purchasers of property must sign a disclosure form indicating that the property they are purchasing is located within a metro district, which could entail higher property taxes. Indeed, for homeowners

living within a metro district, annual property taxes are vastly higher than those living outside of one. Consider the following real example in the Denver MSA of two properties within one block of each other. Property A sits within a metro district, Property B does not. Despite the two properties being just a few hundred feet from one another, the differential in property tax bills is enormous.

Table 2.1: Property comparison

	Property A	Property B
Number of bedrooms	3	3
Number of bathrooms	3	3
Square footage	1373	2496
Market value	\$566,000	\$660,900
Annual property tax	\$7600	\$3200

Despite a difference in market value of roughly \$100,000, the larger, more expensive property has an annual tax bill of less than half of its neighbor. This is because Property A belongs to a metro district, while Property B does not. For Property A, 62 percent (roughly 134 mills) of their entire property tax (214 mills) goes to the metro district to pay back the debt incurred for the cost of developing the property and for any future services the metro district might provide. Property 2 on the other hand, pays a tax only to the city, county, school district, and a very small mill to an urban drainage and flood control district. This dramatic difference in tax bills between otherwise similar properties motivates the central hypothesis of this study. As a growing share of properties within a city, county, or school district become subject to metro district taxation, local governments and school districts may face greater difficulty securing voter approval for additional property tax increases, creating a potential crowding-out effect.

2.3 Methods

2.3.1 Empirical model, data, and measures

In the existing academic literature on special districts, many studies choose the state as the unit of analysis. While useful to understand variation across the country, they do not provide much insight as to cross-local government variation. But even those studies which instead focus on the county are open to criticism. As detailed in Zhang (2018), in county-level studies, the unit of analysis is not always equal to the behavioral unit. For example, there could be multiple municipalities within a county, each of which makes different decisions regarding the use of metro districts. By averaging or ‘summing up’ to the county, this variation is neutralized. Thus, for our purposes, it is important to identify the appropriate layer of government that is implicated in metro district formation. This study uses the county, municipality, and school district as the unit of analysis, and this is only possible due to the detailed parcel-level data from Cotality. While existing public data can provide the proportion of a county’s assessed value that comes from properties within metro districts, it does not provide the counts of such properties (in general or by property type and attribute), nor is this information available for each city and school district in the state. The proprietary data from Cotality offers a useful advancement in studying special district governments and the dynamics of the property tax.

I filter the data to include only single family residences, condominiums, duplexes, and apartments, and remove any of those which were taxed as commercial property and not residential. After cleaning, I have a parcel-level dataset with roughly 20 million observations spanning 2009 to 2023. Early and recent years have considerable missing data, so our final dataset provides information for one decade only, 2010 to 2020. Table 2.2 provides annual counts of the total number of properties in each year, as well as the number of properties belonging to a city, any special district, and metro districts in particular. Because every property in the state belongs to one county and one school district, Total Residential Properties represents the totals for counties and school districts. While the number of residential properties has increased by 37% from 2010 to 2020, the number

of those belonging to a metro district has increased much more, by 54%.³¹ As of the last year of our dataset, roughly 1 in 5 residential properties sits within a metro district.

Table 2.2: Residential properties: 2010 vs. 2020

	2010	2020	Percent change
Total Residential Properties	1,361,562	1,860,587	37%
In City	1,009,282	1,336,490	32%
In Any Special District	1,208,217	1,695,176	40%
In Metro District	256,639	395,383	54%

In Colorado, the mill levy charged by a local government is a function of a handful of variables. The first is the tax base itself, the gross assessed value (AV) of all property within the local government's boundary. This data is provided by the Colorado Department of Local Affairs (DOLA) for each individual taxing authority in the state. An additional useful variable is the value of tax increment financing (TIF) for each government, which Colorado law allows for redevelopment projects. According to the Colorado Legislative Council Staff, urban renewal authorities (URA), downtown development authorities (DDA), and county revitalization authorities (CRA) are authorized to use this type of tax incentive. The TIF amount represents the portion of AV that lies within a TIF area and is above the area's base value. Hence, the taxes generated on that amount (the "increment") flow into a special fund for the URA, DDA, or CRA to pay debt service and other costs associated with the redevelopment. By using only the gross AV in our analysis, I may overstate local fiscal capacity if TIF capture is large. I thus use net AV (gross AV minus TIF value) to align with the tax base that actually funds the general operations of the government unit I am interested in.

³¹Importantly, only 27.8% of the total increase in residential properties over this decade comes from properties built in metro districts. This is counter to the claim of Migoya (2019) that metro districts have "virtually become the exclusive mechanism by which all new development occurs in Colorado today."

An important source of variation in the use of metro districts could be the cost and demand for public services, which would also influence tax rates. I include the total AV of residential property, median household income, the number of housing units, and the share of housing units that are owner-occupied as controls. A location with more housing units could be more likely to establish metro districts because that may be indicative of a location “in demand.” This and the total AV of residential property are thus both proxies for larger counties, cities, and school districts. On the other hand, a location with more housing units could be less likely to establish metro districts, as it might have less available or more expensive land on which to build.

The dependent variables in this work take a few forms. The ‘general fund’ or ‘general mill levy’ of a county, city, or school district represents the baseline tax rate supporting local government ongoing operations. It is set following the certification of the total AV of all property within the boundaries of that government or district. As such, I do not expect metro district presence to meaningfully influence this rate and therefore do not estimate the effect of metro districts on general fund mill levies. Instead, I focus on other mill levies that must be approved by voters.

Each of our units of analysis (county, city, school district) have the ability to levy a mill for the repayment of voter-approved debt. This ‘bond levy’ allows the government or school district to take on more debt, usually to build new buildings and facilities, or to make major repairs to existing infrastructure. I expect a negative coefficient for the bond levy, as voters in places with a high proportion of metro districts may be less likely to support bond initiatives that further increase their already (in comparison) high property taxes. For counties and cities, I also test the effect of the presence of metro districts on the ‘capital levy,’ a separate mill levied specifically for capital projects that does not require issuing debt.³² Finally, for school districts, I examine the ‘override levy,’ another voter-approved mill levy that allows a district to approve a mill beyond their baseline state-mandated limit. When a school district wants to collect more revenue above their baseline to pay for operating costs, including new programs or to increase teacher pay, they opt for a mill

³²As defined in statute, this levy may only fund a capital expenditure, “made by a taxing entity for long-term additions or betterments” and “is not properly chargeable as an expense of operation and maintenance.” See Colorado General Assembly (2024a).

override because the funds are not restricted. With a bond levy, the revenue can only be used for one-time expenses, generally related to construction or maintenance needs. I expect metro district presence to be negatively associated with each voter-approved levy I am testing – bond, capital, and override.

I use boundary shapefiles from DOLA and the latitude/longitude of each residential property in the Cotality dataset to determine which governments and schools district each property sits within. This allows us to calculate a measure of metro district ‘presence’ for each jurisdiction in each year. For each city, county, and school district, I calculate the share of residential properties that belong to a metro district as well as the metro district share of total residential AV. I refer to this as the “metro share.” The shapefiles also allow for a visual representation of the increase in the use of metropolitan districts over time. Consider the example of the town of Castle Rock in 2010 and 2020. As shown in Figure 2.2, the number of residential parcels (shown in black) that belong to a metro district has grown over the decade. Thus, both the count and total AV of metro district properties – the “metro share” – has increased.

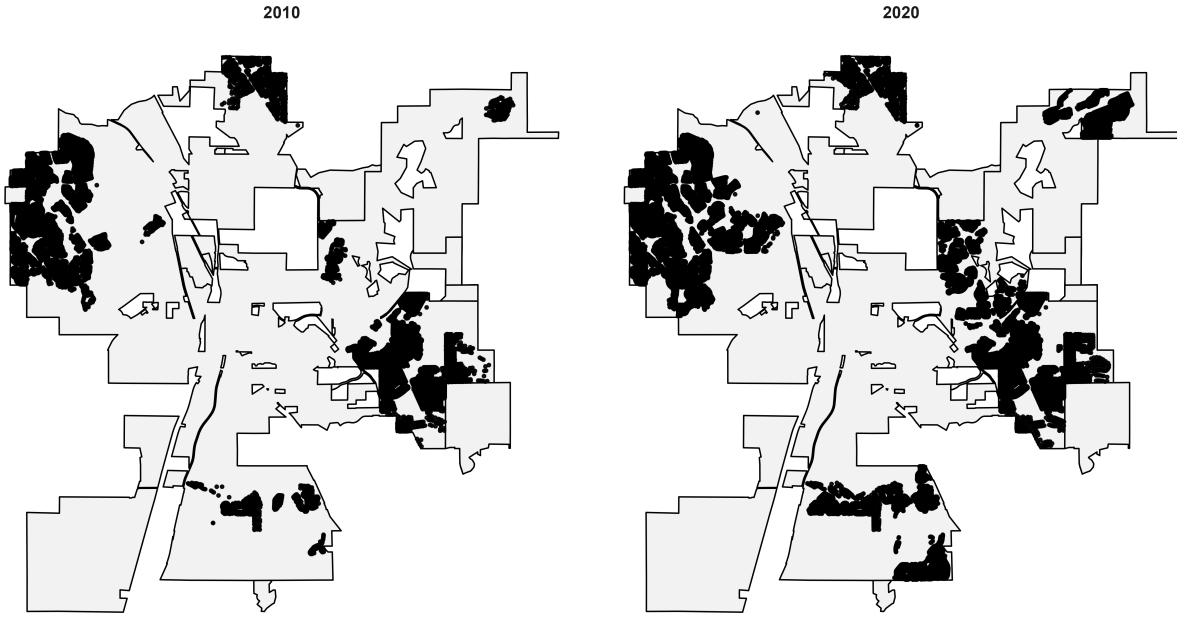


Figure 2.2: Residential Parcels (shown in black) located within Metro Districts in Castle Rock, 2010 v. 2020

2.3.2 Regression Specifications

Panel Model at the Government-Year Level

I estimate a two-way fixed effects (TWFE) panel model that provides the average effect of metro district presence on local millage rates:

$$\log(1 + Y_{gt}) = \beta_0 + \beta_1 \text{MetroShare}_{gt} + \Gamma' Z_{gt} + \gamma_g + \delta_t + \varepsilon_{gt}, \quad (2.1)$$

where Y_{gt} denotes the mill levy of government g in year t . I estimate this specification separately for general, bond, capital, and override mill levies, the latter three of which are typically voter-approved.

Here, MetroShare_{gt} is the share of residential parcels (or AV) in metro districts, Z_{gt} is a vector of controls, and γ_g and δ_t are government and year fixed effects. Standard errors are clustered at the g (government or school district) level.

Because some mill levies take a value of zero, I use the transformation $\log(1 + Y_{gt})$ for all outcomes, which allows us to retain observations with zero levies. The coefficient β_1 can therefore be interpreted as a semi-elasticity: a change in MetroShare_{gt} affects the percentage change in $(1 + Y_{gt})$. For jurisdictions with positive and sufficiently large levies, this closely approximates a percent change in Y_{gt} itself. For jurisdictions with very small or zero levies, the transformation is more sensitive to changes near zero. In these cases, the estimates should be interpreted as reflecting changes in overall levy activity rather than strictly proportional changes in the level of the levy.

If metro district share increases by Δ , then

$$\frac{1 + Y_{gt}^{\text{new}}}{1 + Y_{gt}^{\text{old}}} = \exp(\beta_1 \Delta),$$

so that a 10 percentage-point increase in metro district share corresponds to a change of

$$100[\exp(0.10 \beta_1) - 1] \text{ percent.}$$

To better understand the mechanisms underlying the combined effect in equation (2.1), I decompose changes in mill levies into extensive and intensive margins. Let $D_{gt} = \mathbf{1}\{Y_{gt} > 0\}$ indicate whether government g adopts a positive levy in year t . Then the outcome can be written as:

$$Y_{gt} = D_{gt} \cdot Y_{gt}^+,$$

where Y_{gt}^+ denotes the value of the levy conditional on being positive.

I estimate separate specifications for each margin. The extensive margin is given by:

$$D_{gt} = \alpha_0 + \alpha_1 \text{MetroShare}_{gt} + \Lambda' Z_{gt} + \gamma_g + \delta_t + u_{gt}, \quad (2.2)$$

which captures how metro district presence affects the likelihood that a levy is adopted. The intensive margin is estimated on the subsample of positive levies:

$$\log(Y_{gt}) = \theta_0 + \theta_1 \text{MetroShare}_{gt} + \Pi' Z_{gt} + \gamma_g + \delta_t + \eta_{gt}, \quad \text{for } Y_{gt} > 0, \quad (2.3)$$

which captures how metro district presence affects levy levels conditional on adoption.

Taken together, these two margins provide a decomposition of the mechanisms underlying the overall relationship in equation (2.1), with the combined effect reflecting changes in both the likelihood that a levy is used (extensive) and the level of the levy when it is positive (intensive).

Estimating Treatment Effects with Propensity Scores

For a number of reasons, I am limited in the causal empirical approaches I can take. Defining a government as “treated” with metro districts – regardless of the specific treatment threshold – is difficult because most governments are either always treated or never treated over the ten years of our sample. Metro district proliferation took off in the 1990s and early 2000s, so for the sample period (2010-2020), relatively few counties, cities, or school districts “switch on” into treatment. This limited within-unit variation weakens the case for a standard difference-in-differences design, since identification would rely on a small number of switching units and the parallel trends assumption would be difficult to assess. In addition, governments that make heavy use of metro districts may differ systematically from those that do not in ways that are related to the outcome variables of interest.

Given these limitations, I supplement the baseline panel regressions with inverse-probability weighting based on estimated propensity scores (Imbens & Rubin, 2015; Rosenbaum & Rubin, 1983). The goal is to improve comparability between high-exposure and low-exposure governments by reweighting observations so that treated and untreated government-years are balanced on observed characteristics. Under conditional unconfoundedness and overlap, this approach identifies average treatment effects after adjusting for observable differences between treated and control units.

Because treatment varies over time, propensity scores are estimated at the government-year level rather than from a single baseline cross-section. In other words, the propensity score model asks: given a government's observed characteristics in year t , what is the probability that it is highly exposed to metro districts in that same year? This approach differs from methods that reweight only the control group, such as the average treatment effect on the treated (ATT). Instead, all units are reweighted according to their estimated treatment probabilities. This allows treatment probabilities to vary with changes in population, housing, income, and AV over the sample period.

To estimate the effects of substantial metro-district presence using propensity scores, I define a binary treatment indicator based on whether a government falls above a year-specific MetroShare threshold:

$$D_{gt}(\tau) = \mathbf{1}\{\text{MetroShare}_{gt} \geq \tau\},$$

where τ is set either to the 75th percentile or the 90th percentile of MetroShare among governments of the same type in year t . Thus, a county, city, or school district is treated when it falls in the top quartile or top decile of its own government type in a given year.

Table 2.3 reports the year-specific MetroShare cutoffs corresponding to these treatment definitions. For example, in 2020 a county is classified as treated under the 75th-percentile definition if at least 16.5% of its residential properties are located within a metro district, and under the 90th-percentile definition if that figure reaches 56.2%.

Table 2.3: Metro-share percentile cutoffs by year and government type

Year	75th percentile cutoff			90th percentile cutoff		
	County	City	School District	County	City	School District
2010	0.166	0.006	0.071	0.564	0.300	0.241
2011	0.163	0.006	0.061	0.596	0.269	0.208
2012	0.121	0.007	0.061	0.594	0.301	0.231
2013	0.123	0.005	0.050	0.580	0.277	0.223
2014	0.121	0.004	0.050	0.565	0.268	0.216
2015	0.136	0.008	0.066	0.601	0.349	0.348
2016	0.144	0.007	0.083	0.594	0.321	0.343
2017	0.120	0.002	0.057	0.578	0.275	0.279
2018	0.142	0.007	0.076	0.568	0.325	0.339
2019	0.136	0.010	0.076	0.568	0.369	0.343
2020	0.165	0.021	0.090	0.562	0.370	0.348

The distribution of MetroShare is especially skewed for cities. In most years, the 75th-percentile threshold is below one percent, indicating that most cities have little or no metro-district presence while a small subset exhibit much higher exposure. Appendix Tables B.1 and B.2 report the number and share of treated governments in each year under both treatment definitions.

I then estimate the propensity score

$$\hat{p}_{gt} = \Pr(D_{gt}(\tau) = 1 \mid X_{gt}),$$

where X_{gt} denotes time-varying observed covariates. I focus on variables likely to be associated with metro district use: population, the number of families, total housing units, the share of housing units that are owner-occupied, median household income, total net AV of all property, and the general levy. These estimated propensity scores are then used to construct inverse probability weights (IPW), which are applied in the outcome regressions.

Using stabilized weights,

$$w_{gt} = \frac{\Pr(D = 1)}{\hat{p}_{gt}} D_{gt} + \frac{\Pr(D = 0)}{1 - \hat{p}_{gt}} (1 - D_{gt}),$$

I estimate the weighted regression

$$\log(1 + Y_{gt}) = \alpha + \beta D_{gt}(\tau) + \Gamma' Z_{gt} + \gamma_g + \delta_t + u_{gt},$$

by weighted least squares, with standard errors clustered at the g level.

This specification mirrors the baseline model in Equation 2.1, but replaces the continuous MetroShare variable with a binary treatment indicator and applies inverse probability weights. Because the dependent variable remains $\log(1 + Y_{gt})$, the resulting treatment effect should be interpreted as a combined effect on overall levy activity, reflecting both changes in the likelihood that a levy is used and changes in the levy level conditional on use. Under the assumptions of conditional unconfoundedness and overlap, this reweighted specification can be interpreted as identifying an average treatment effect on the outcome.³³ The coefficient β therefore captures the average difference in overall levy activity between high-exposure and low-exposure jurisdictions, after reweighting to balance observed covariates.

2.4 Results

Table 2.4 shows the regression coefficients for the first specification, where metro district presence is measured by the share of residential properties belonging to metro districts (Panel A) or the metro district share of total residential AV (Panel B) at the county, city, or school district level. Covariates for all specifications include the number of housing units, median household income, the share of housing that is owner-occupied, net AV of all property, and the general levy imposed by the government or school district. At the county-level there is a negative relationship between metro district presence and our outcome variables of interest (capital and bond mills), but none of these relationships are significant.

Turning to cities, there are strong effects in both directions. Metro district presence is negatively associated with the capital levy, but positively associated with the bond levy. Counter to

³³Covariate balance tables before and after weighting, for each jurisdiction type and by each treatment indicator are available in Appendix C.1.

my hypothesis, I did not expect a positive relationship for any levy with respect to the share of properties belonging to metro districts or the metro district share of total residential AV. One interpretation is that cities with more metro district development are issuing more voter-approved GO debt to fund complementary city infrastructure that metro districts might not provide, including nearby bridges or sewer system upgrades, for example. Cities that allow the formation of metro districts may also be experiencing growth pains, and are thus more likely to issue debt to meet a number of needs imposed by a growing population. That said, TABOR makes debt issuance particularly difficult for general purpose governments. An increase to the capital mill would be much less costly to cities in the long run, as it doesn't require the payment of interest (unlike issuing bonds). As for the interpretation of these coefficients, consider the coefficients of "% of Resid. Properties in Metro Districts" and "Metro District Share of Total Resid. AV." The estimated coefficient on metro district share in the capital levy specification ranges from -1.588 to -1.598 . Keeping in mind the log transformation, this implies that a 10 percentage-point increase in metro district presence is associated with an approximately 14.7–14.8% decline in the capital mill levy, indicating a substantial reduction in municipal capital levies in cities that have made greater use of metro districts. For the bond mill levy, the estimated coefficients range from 0.915 to 0.978. This implies that a 10 percentage-point increase in metro district presence is associated with an approximately 9.6–10.3 percent increase in the bond mill levy, on average.

For school districts, the estimated coefficients for both the bond and override levies are negative, indicating that higher metro district presence is associated with lower school district mill levies. However, statistical significance is limited: only one specification, for the override levy, yields a marginally significant estimate. In that case, the coefficient on "Metro District Share of Total Residential Assessed Value" is -0.603 . This implies that a 10 percentage-point increase in metro district share is associated with a roughly 5.9 percent decline in the override mill levy, on average.

Table 2.4: TWFE Estimates of Metro District Presence on Voter-Approved Mill Levies

	County		City		School District	
	Capital	Bond	Capital	Bond	Override	Bond
<i>Panel A: Metro district presence measured as % of residential properties in metro districts</i>						
% of Resid. Properties in Metro Districts	-0.093 (0.511)	-0.372 (0.274)	-1.598*** (0.463)	0.915** (0.451)	-0.413 (0.277)	-0.258 (0.412)
Num.Obs.	573	573	2356	2356	1631	1631
RMSE	0.19	0.20	0.17	0.25	0.37	0.54
Std.Errors	County	County	City	City	District	District
<i>Panel B: Metro district presence measured as metro district share of total residential AV</i>						
Metro District Share of Total Resid. AV	0.033 (0.658)	-0.186 (0.494)	-1.588*** (0.466)	0.978** (0.399)	-0.603* (0.328)	-0.059 (0.393)
Num.Obs.	573	573	2356	2356	1631	1631
RMSE	0.19	0.20	0.17	0.25	0.37	0.54
Std.Errors	County	County	City	City	District	District

Notes: Each panel reports coefficients from a separate regression specification. All models include jurisdiction and year fixed effects; dependent variables are log-transformed. Covariates include housing units, median household income, the owner-occupied share of housing, net AV of all property, and the general levy.

* p < 0.1, ** p < 0.05, *** p < 0.01

Considering only the results from Panel A, I next decompose the relationship between metro district presence and local mill levies into extensive and intensive margin responses. I find no evidence that metro district exposure affects county capital levies overall (see the Combined column). Decomposing this relationship shows imprecise and offsetting effects on both the probability of levy adoption (extensive margin) and levy levels conditional on use (intensive margin). I find no statistically significant relationship between metro district exposure and either the probability of issuing bonds or overall bond levy levels. The intensive margin cannot be meaningfully estimated due to the rarity of positive observations (county bond levies are extremely infrequent).

In contrast, the results for cities show a more obvious structure. The large negative combined effect for capital levies is driven almost entirely by the extensive margin, indicating that greater metro district presence primarily reduces the likelihood that cities adopt capital levies at all, rather than lowering levy rates conditional on adoption. More specifically, a 10 percentage-point increase in metro district share is associated with a 5.6 percentage-point decrease in the probability that a city adopts a positive capital levy. For bond levies, the positive combined effect likewise appears to operate through the extensive margin, suggesting that cities in areas with greater metro district exposure are more likely to issue bonds, even though there is no evidence of higher bond levies conditional on issuing.

For school districts, the coefficients lack statistical significance. The decomposition of both the override and bond levy provides little evidence of adjustment along either the extensive or intensive margin, suggesting that metro district presence is not systematically associated with changes in voter-approved school district financing behavior.

Table 2.5: Metro District Exposure and Levy Margins

	County		City		School District	
	Capital	Bond	Capital	Bond	Override	Bond
<i>Panel A: Combined effect</i>						
% of Resid. Properties in Metro Districts	-0.093 (0.511)	-0.372 (0.274)	-1.598*** (0.463)	0.915** (0.451)	-0.413 (0.277)	-0.258 (0.412)
Num.Obs.	573	573	2356	2356	1631	1631
RMSE	0.19	0.20	0.17	0.25	0.37	0.54
<i>Panel B: Intensive margin</i>						
% of Resid. Properties in Metro Districts	-0.693 (1.563)	NA	-0.018 (0.055)	-0.963 (0.960)	-0.364 (0.632)	0.005 (0.253)
Num.Obs.	62		114	255	1085	1320
RMSE	0.49		0.09	0.38	0.31	0.29
<i>Panel C: Extensive margin</i>						
% of Resid. Properties in Metro Districts	0.419 (0.267)	-0.191 (0.173)	-0.555*** (0.178)	0.265 (0.226)	-0.151 (0.135)	-0.067 (0.152)
Num.Obs.	573	573	2356	2356	1631	1631
RMSE	0.22	0.14	0.10	0.14	0.18	0.23

Notes: Each panel reports the coefficient on `pct_props_in_metro`. Standard errors are reported in parentheses on the line below. All models include jurisdiction and year fixed effects with standard errors clustered at the jurisdiction level. The combined models use $\log(1 + Y)$, the intensive-margin models use $\log(Y)$ conditional on $Y > 0$, and the extensive-margin models use an indicator for whether the levy is positive.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Tables 2.4 and 2.5 provide descriptive evidence that is helpful, but to isolate causal effects requires further identification strategies. Table 2.6 shows the results of the models using propensity score weighting. Our treatment variable in these specifications – whether or not the jurisdictions’ metro-share is above the within-year 75th (or 90th) percentile – indicates a high (or very high) metro district presence for that jurisdiction type in a given year. For the number of treated and control counties, cities, and school districts in each year, see Table B.1 in the appendix.

Panel A shows the effects of metro district presence on voter-approved levies when treatment is whether or not the jurisdiction's metro-share is above the within-year 75th percentile. At the county level, there is a negative and significant effect for the capital levy only. Moving from at/below the 75th percentile to above it is associated with a 9.7% lower county capital levy. For municipalities, there is no effect of heavy metro district presence on the mill levies charged by those cities. While the bond levy remains positive for cities, it is no longer significant (compared to the TWFE models shown in Table 2.4). All other levies are negatively associated with high metro district presence, but statistically insignificant. Similarly, there is no effect of metro district treatment on school districts. Effect sizes are small and insignificant.

When the treatment is instead defined as an indicator for whether a jurisdiction's metro share exceeds the within-year 90th percentile for its jurisdiction type, I am capturing the effects of a very heavy reliance on metro districts for a given local government or school district. Results for this specification are shown in Panel B. For counties, effect sizes are much smaller and the negative effect remains for all mill types. The only significant effect that remains is for the capital mill levy (-0.082). Keeping in mind the log transformation, this implies that moving from at/below the 90th percentile to above it is associated with a 7.8% lower capital mill levy for counties. This negative effect on capital mill levies extends to municipalities. For cities, moving from at or below the 90th percentile to above it is associated with a 4.5% lower capital mill levy. In contrast to the previous specification, the effect on bond mill levies becomes negative, albeit an insignificant effect. For school districts, effect sizes are quite large, but mostly insignificant. However, the effect on the override levy is marginally significant – moving from at/below the 90th percentile to above it is associated with a nearly 29% lower override levy.

Table 2.6: IPW Estimates of Metro District Treatment on Voter-Approved Mill Levies

	County		City		School District	
	Capital	Bond	Capital	Bond	Override	Bond
<i>Panel A: Treatment defined as metro district share above the within-year 75th percentile</i>						
Metro District Treatment ($P > 75\%$)	-0.102*	-0.071	-0.022	0.010	-0.071	0.009
	(0.056)	(0.074)	(0.027)	(0.070)	(0.179)	(0.133)
Num.Obs.	573	573	2459	2459	1631	1631
RMSE	0.39	0.42	0.41	0.67	1.23	1.17
Std.Errors	County	County	City	City	District	District
<i>Panel B: Treatment defined as metro district share above the within-year 90th percentile</i>						
Metro District Treatment ($P > 90\%$)	-0.082**	-0.056	-0.046**	-0.040	-0.342*	0.152
	(0.032)	(0.038)	(0.018)	(0.060)	(0.201)	(0.130)
Num.Obs.	573	573	2459	2459	1631	1631
RMSE	0.32	0.31	0.40	0.64	1.20	1.12
Std.Errors	County	County	City	City	District	District

Notes: Each panel reports the coefficient on the treatment indicator only. Treatment is defined as whether metro district share is above the within-year 75th or 90th percentile for that government type. All models include year fixed effects and are estimated using inverse probability weighting. Covariates in both the propensity score model and outcome regressions include population, families, housing units, the owner-occupied share, median household income, net AV, and the general levy imposed.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

I implement the same decomposition as in Table 2.5 using IPW estimators. The extensive margin is estimated using a binary indicator for whether a jurisdiction adopts a positive levy. The intensive margin is estimated on the subsample of jurisdictions with positive levies, capturing changes in levy levels conditional on adoption. Because the intensive specification conditions on a post-treatment outcome, these estimates should be interpreted as describing behavior among adopting jurisdictions rather than a fully unconditional causal effect.

Panels B and C show the decomposition for the first specification, when treatment is a jurisdictions inclusion in the top quartile. There is no clear pattern across either the extensive or intensive margins, suggesting that any adjustment in levy use at this threshold is weak, diffuse, and not concentrated in either adoption or rate-setting behavior. Given the insignificant effects from Panel A, this is unsurprising.

Turning to very high levels of metro district penetration (90th percentile), local governments are significantly less likely to adopt voter-approved capital levies, with similar though weaker evidence for bond levies, and school districts are less likely to adopt override levies. This extensive-margin reduction (Panel F) drives the overall decline in levy use (Panel D), which is statistically significant for county and city capital levies and school district override levies. Among jurisdictions with positive levies (the intensive margin), there is little evidence of systematic reductions in levy levels.

In the case of city capital levies, however, levy rates actually increase substantially conditional on adoption (Panel E). Together, these results suggest that heavy metro district use reduces the likelihood of adopting these levies, while cities that continue to adopt capital levies tend to set higher rates.

Table 2.7: IPW Estimates of Metro District Treatment on Voter-Approved Mill Levies

	County		City		School District	
	Capital	Bond	Capital	Bond	Override	Bond
<i>Panel A: 75th percentile treatment, combined effect</i>						
Treatment: Above 75th Percentile	-0.102*	-0.071	-0.022	0.010	-0.071	0.009
	(0.056)	(0.074)	(0.027)	(0.070)	(0.179)	(0.133)
Num.Obs.	573	573	2459	2459	1631	1631
RMSE	0.39	0.42	0.41	0.67	1.23	1.17
<i>Panel B: 75th percentile treatment, intensive margin</i>						
Treatment: Above 75th Percentile	-1.661	-0.601	0.123	-0.085	0.018	-0.004
	(0.985)	(0.821)	(0.389)	(0.223)	(0.120)	(0.083)
Num.Obs.	62	22	114	255	1085	1320
RMSE	1.25	1.30	0.76	1.09	1.06	0.71
<i>Panel C: 75th percentile treatment, extensive margin</i>						
Treatment: Above 75th Percentile	-0.068	0.005	-0.005	0.008	-0.012	0.007
	(0.043)	(0.047)	(0.027)	(0.044)	(0.071)	(0.060)
Num.Obs.	573	573	2459	2459	1631	1631
RMSE	0.37	0.28	0.28	0.42	0.56	0.49
<i>Panel D: 90th percentile treatment, combined effect</i>						
Treatment: Above 90th Percentile	-0.082**	-0.056	-0.046**	-0.040	-0.342*	0.152
	(0.032)	(0.038)	(0.018)	(0.060)	(0.201)	(0.130)
Num.Obs.	573	573	2459	2459	1631	1631
RMSE	0.32	0.31	0.40	0.64	1.20	1.12
<i>Panel E: 90th percentile treatment, intensive margin</i>						
Treatment: Above 90th Percentile	-0.159	NA	1.026***	0.306	-0.119	0.069
	(1.958)		(0.197)	(0.337)	(0.164)	(0.084)
Num.Obs.	62		114	255	1085	1320
RMSE	1.19		0.59	0.98	1.03	0.70
<i>Panel F: 90th percentile treatment, extensive margin</i>						
Treatment: Above 90th Percentile	-0.076***	-0.043*	-0.034***	-0.035	-0.099	0.036
	(0.028)	(0.022)	(0.013)	(0.039)	(0.083)	(0.057)
Num.Obs.	573	573	2459	2459	1631	1631
RMSE	0.35	0.20	0.23	0.38	0.54	0.46

Notes: Panels A–C report results for treatment defined as metro district share above the within-year 75th percentile; Panels D–F report the analogous results for the 90th percentile. Within each treatment definition, the combined models use $\log(1 + Y)$, the intensive-margin models use $\log(Y)$ conditional on $Y > 0$, and the extensive-margin models use a binary indicator for whether the levy is positive. Reported coefficients are for the treatment indicator equal to one when a jurisdiction is above the relevant within-year threshold. All models include year fixed effects and use inverse probability weights.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2.5 Discussion and Conclusion

Colorado’s unique fiscal landscape and highly stringent tax and expenditure limitation (TABOR) has made it more difficult for local government officials to issue debt without voter approval. At the same time, private real estate developers have jumped on the opportunity to access bond markets on their own – through establishing metro districts. These developer districts have sprouted up across the state and pushed property tax rates up for those living within the districts’ boundaries. Outside of their impact on homeowners themselves, metro districts are relatively understudied and their effects remain unclear. This paper investigates whether the growth of metro districts influences the mill levies charged by higher-level governments, including school districts, cities, and counties. By pairing valuation and tax data on every local government in the state with parcel-level data on residential properties, my empirical approach tests the impacts of metro district proliferation on voter-approved mill levies charged by local governments and school districts.

Whether the growth in metro districts has improved the provision of public goods remains to be seen. It is clear, however, that they complicate the local governance system. While current law requires metro districts be approved by municipalities and/or counties before their formation (including service plans), no such approval is required of school districts, who may be negatively impacted by their existence. Further, while I did not test the effects of metro districts on other forms of special districts who may share much of the same tax base, it is possible that crowding out occurs here as well. Future research should examine the effects of metro district proliferation on fire protection districts, water conservation districts, and library districts, to name a few.

Carter et al. (2019) has noted that “Local governments rarely oppose development district formation because it enables municipal growth with minimal political risk and virtually no financial investment – at least in the short term” (p. 59). Because the costs of metro districts are borne largely by future homeowners rather than current residents, local governments face little immediate pressure to intervene at the time of formation, precisely when such intervention would be most consequential. And while metro districts might “pay their own way” – financing the necessary development infrastructure from bond proceeds – counties, cities, and school districts must still

provide services to the new population. Roads, parks, and schools are all used by metro district residents, including those roads, parks, and schools outside of metro district boundaries. If metro district homeowners feel their property taxes are high – something I have shown to be the case in this paper – they may be less likely to vote in favor of property tax increases put to the ballot by higher levels of government.

There are two key reasons why further research on metro districts is needed. First, the proliferation of developer districts may prove no more than an expression of private development interests formalized as public institutions, as Carter et al. (2019) have suggested. Private development interests have proven themselves inadequate in addressing local issues as complicated as segregation and the equitable provision of public goods. They have also often contributed to those very same issues. Clarke and Hansmann (2025) have suggested that developer districts address “the costs of collective decision-making, not just by homogenizing the characteristics of the facilities and services that they offer, but also by constructing an electorate with homogeneous preferences.” Assuring that communities remain highly homogeneous may help protect long-term property values, but it can also reinforce fiscal fragmentation and, in doing so, crowd out the taxing capacity of overlapping local governments.

The data used in this study are uniquely positioned to dig into these dynamics. In particular, future work should investigate the formation of metro districts just outside municipal boundaries. When new development occurs outside city limits, the associated tax base is unavailable to the municipality; if these developments are relatively high-wealth, this may reduce the city’s capacity to finance services in higher-need areas. Conversely, because municipalities are nested within counties, municipal approval of metro districts within city boundaries may generate spillovers that affect county fiscal capacity, even though counties have little control over their formation.

Second, a growing literature in fiscal federalism and the fiscal sociology of place shows that fragmented and decentralized fiscal structures are associated with greater spatial inequality in the

economic mobility of low-income children (O'Brien et al., 2025).³⁴ Related work by Manduca et al. (2025) highlights how overlapping jurisdictional boundaries can map onto patterns of economic segregation to generate interjurisdictional fiscal inequalities. If developer districts further fragment counties, cities, and school districts, they may not only reshape local fiscal capacity but also exacerbate inequality in individual economic outcomes.

³⁴In another interesting study, Killian (2020) argues that reliance on special districts for public service provision may erode social cohesion and increase marginalization, which in turn may contribute to higher rates of male incarceration.

Chapter 3

School Finance Reform and Local Property Tax

Setting: Evidence from Michigan’s ‘Proposal A’

3.1 Introduction

After years of funding inequities among school districts in Michigan, voters approved Proposal A (commonly referred to as Prop A) in 1994, a major reform which decreased the gap between high- and low-spending school districts. As part of this reform, local school district millage rates fell sharply, substantially reducing property tax liabilities for Michigan residents.³⁴ Statewide, average millage rates declined from 56.6 mills in 1993 to 38.9 mills in 1995, a 31.4% decline (Michigan Department of Treasury, 2002a). These changes generated large and plausibly exogenous variation in property tax rates across jurisdictions, creating a setting well-suited to studying how local governments respond to changes in shared (overlapping) tax bases.³⁵

This paper studies how local governments responded to these state-imposed reductions in school property rates and subsequently taxes. Specifically, we ask: do local governments offset reductions in school property tax rates by increasing their own property tax rates, and how does this response vary across jurisdictions? Understanding this response is important for evaluating the broader effects of school finance reforms (SFRs), which have primarily been studied through their impacts on school districts and student outcomes, rather than on local governments who may share some of the same tax base as the impacted school districts. If local governments offset reductions

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³⁴Millage rates or mills are a common way to determine the amount of property tax payable per dollar value of a property. Specifically, 1 mill = \$1 per \$1,000 of assessed value.

³⁵See Bayer et al. (2020) for a useful discussion of why school finance reforms are a potential source of exogenous variation in taxes.

in school taxes, then the fiscal effects of SFRs may be partially undone and the incidence of the reforms may differ from their intended design and across localities.

Offsetting behavior might be likely for two reasons. First, local officials may respond opportunistically to reductions in school millage rate by increasing their own millage rates, particularly if taxpayers evaluate total tax burdens rather than their components. In other words, if overall tax bills are reduced for homeowners within their district, city managers/councils and township supervisors/boards may be willing to increase their own rates because pushback from homeowners would be less likely.³⁶ Second, reductions in school taxes may increase residents' disposable income, raising demand for local public services and leading to higher local taxation. Regardless of the reason for offsetting behavior, local governments may react heterogeneously, which we examine using variation in local characteristics. Specifically, we construct a panel dataset of Michigan local governments spanning the years before and after Proposal A (1994). Using administrative property tax data, we estimate first-difference models of changes in millage rates between a base of 1993 and years following the policy (e.g. 1995), controlling for demographic and public finance features.

We find evidence of partial offsetting behavior. Jurisdictions experiencing larger reductions in school millage rates tend to increase their own local millage rates, with the effect driven primarily by townships rather than municipalities. However, this response varies systematically across jurisdictions. In particular, we find weaker responses in jurisdictions with lower per capita expenditures, in cities with higher levels of debt, and in jurisdictions with a high share of owner-occupied housing in the tax base. In these cases, local governments are less likely to offset school millage rate reductions and, in some instances, reduce their own millage rates, particularly when school tax changes are large.

³⁶For example, as far as a homeowner is concerned, a 10 mill decrease in the school rate paired with a 2 mill increase in the township rate is still an 8 mill decrease overall.

3.2 Background

3.2.1 Michigan's Proposal A

Every state constitution in the U.S. guarantees public access to a free education. But in 48 states, plaintiffs have challenged the constitutionality of their respective school finance systems. In half of such cases, the courts have ruled that the existing school finance system – the methods used to fund public schools – violate the respective constitutional provision of a guarantee to education (Fujioka & Knight, 2025; Hutt et al., 2020). In reaching those outcomes, the courts usually determine that the school finance system does not provide adequate educational resources or does not distribute funds equitably. In other states, legislatures have successfully reached reforms without involving the courts. Michigan represents one such legislative pathway to school-finance reform. Rather than being compelled by the courts, Michigan's overhaul emerged from political and fiscal pressures, culminating in the adoption of Proposal A in 1994.

Prior to Proposal A, Michigan schools were primarily funded by local property taxes. According to Courant et al. (1995), in the 1990-1991 school year, Michigan ranked third in the country for the share (65.2%) of school spending financed locally. Because property values are not distributed equally across the state, wealthier districts could raise far more money for schools than poorer ones, creating significant inequities. Per pupil expenditures ranged from \$3,400 in the poorest district to \$10,000 in the richest district (E. Johnson & Walsh, 2013). These disparities helped fuel calls for school finance reform in Michigan.

Prior to the reform, Michigan had higher effective property tax rates than most of their neighbors (Feldman et al., 2003). In 1993, Michigan ranked 7th in the nation in terms of property taxes as a percent of personal income, and their property taxes as a percent of total state and local own-source revenues (41.3%) hovered 9.4 percentage points above the U.S. average (Michigan Department of Treasury, 2002a). Schools themselves were heavily reliant on the property tax. According to the Michigan Department of Treasury (2002b), in “the 1992-93 school year, approximately 61.4 percent of total local school revenues (including debt) originated from local and

intermediate sources (i.e., local property taxes)". Only three states – New Hampshire, Illinois, and Vermont – had a higher reliance on local property taxes as a source of funding for K-12 schools.

Political pressure to reduce property taxes was front and center for years leading up to Proposal A. In fact, Proposal A was necessitated by Public Act 145, which the Legislature passed in 1993, eliminating roughly \$7 billion in school operating funds without providing an alternative funding source. Governor Engler and the Legislature then presented voters with two options for replacing this revenue: Proposal A, based mostly on a sales tax increase, or the 'Statutory Plan,' which would have taken effect if Proposal A failed and replaced the lost property tax revenue with a 1.4 percentage point increase in the individual income tax rate (Michigan Department of Treasury, 2002b). While voters had rejected property tax reform ballots multiple times in the decades prior, the elimination of all local school operating taxes meant that preserving the existing system was not an option. Instead, voters had just one decision to make: replace the eliminated revenues with a sales tax or an income tax increase. In March 1994, over two-thirds of voters approved Proposal A.³⁷

In calendar year 1994, local districts collected no school operating millage, and the state took over that role, using a handful of tax increases and new taxes. This included raising the state sales and use tax from 4% to 6%, raising the tax on a pack of cigarettes from 25 to 75 cents, a new 16% tax on other tobacco products, a real estate transfer tax, and a new 6-mill statewide property tax – known as the State Education Tax (SET) – levied on all property (homestead and non-homestead).³⁸ Revenues from these new and increased taxes were earmarked to the School Aid Fund for redistribution to local schools through their foundation grants (Michigan

³⁷Importantly, Proposal A also included a reduction in Michigan's individual income tax rate from 4.6 to 4.4%. Given the sales tax tends to be less visible and more accepted by the public, the preference for Proposal A over the Statutory Plan is understandable.

³⁸State sales tax revenue grew by 25.7% in nominal terms from 1993 to 1994, and by another 26% from 1994 to 1995. In total, sales tax revenue grew from \$4.8 billion in 1993 to nearly \$7.7 billion in 1995. Adjusted for inflation, sales tax revenue grew by 60% from 1993 to 1995. While large, the sales tax increase did not fully offset the \$7 billion in lost revenues, hence the need for the additional tax increases and new taxes.

Department of Treasury, 2002a).³⁹ All major provisions of both Prop A and the Statutory Plan are shown in comparison to the existing (1993) law in Table 3.1.

Table 3.1: Michigan School Finance Reform Alternatives Presented to Voters in 1994

Revenue Source	1993 Law	Proposal A	Statutory Plan
<i>State Taxes</i>			
Sales and Use Tax	4.0%	6.0%	4.0%
Income Tax	4.6%	4.4%	6.0%
Single Business Tax	2.35%	2.35%	2.75%
Cigarette Tax	25 cents/pack	75 cents/pack	40 cents/pack
Other Tobacco Products	None	16%	16%
Real Estate Transfer Tax	None	0.75%	1.00%
Personal Exemption	\$2,100	\$2,100	\$3,000
<i>School Finance</i>			
State Ed. Tax (Homestead)	None	6 mills	None
State Ed. Tax (Nonhomestead)	None	6 mills	12 mills
Local School Operating (Homestead)	34 mills (average)	None	12 mills
Local School Operating (Nonhomestead)	34 mills (average)	18 mills	12 mills
Assessment Cap	None	Lesser of 5% or inflation	None
Enhancement Mills	None	Up to 3 mills, 3 years	Up to 3 mills, permanent

Notes: Author's reproduction of Exhibit 2, "Proposal A – Funding Alternatives for Local School Operating Levies," from Michigan Department of Treasury (2002b).

Another important provision of Proposal A was a new constitutional cap on the assessed value of properties, known from 1995 onward as the 'taxable value' (TV). Starting that year, increases to the TV of a specific property were limited to 5 percent or the rate of inflation, whichever is less

³⁹The state guaranteed a per-pupil foundation amount (set at \$5,000 per student at the time, and which slowly increased, reaching \$8,111 by 2020). As a result of Prop A, each district's funding was now based more on student count and state formulae, not on local wealth. See Wicksall and Christensen (2018) for a history of foundation allowance.

(and excluding the value of new construction). Prior to Proposal A, taxes were applied to the 'State Equalized Value' (SEV), 50 percent of the true cash value of the property. If the true cash value of a property increased by 6 percent, so would the SEV, but if the inflation rate was 5 percent or lower, the TV would only increase by that amount. Because of low inflation during the 1990s, the gap between TV and SEV widened. According to Michigan Department of Treasury (2002b), by 2002 aggregate TV was approximately \$68.7 billion (20.0 percent) lower than SEV because of the assessment cap, generating substantial long-run tax savings for existing homeowners. Although TV resets to SEV upon sale before becoming capped again, the system also produced horizontal inequities, with otherwise similar properties facing different tax liabilities depending on how long the homeowner had occupied the property.

As a result of Proposal A, the property tax burden was shifted from local school districts to the state. Overall, net taxes in the state were reduced by an estimated \$17 billion over 10 years because the new and increased taxes were not enough to offset the reductions in local school millage rates (Michigan Department of Treasury, 2002b). On average, and including the new SET, total school mills dropped from 40.8 to 22.7 between 1993 and 1995. This was easily noticeable in the tax bills sent to property owners. By way of example, consider the effect on a median-priced home (roughly \$115,000) in Traverse City, the largest city in northern Michigan. In 1993, their school mill was 41.4, resulting in a tax owed of \$2,381. Assuming the value of the property increased only by the rate of inflation between 1993 and 1995, their reduced school mill (19.5 in 1995), would have resulted in taxes of only \$1,183, a reduction of 50%.

Because this reduction – a plausibly exogenous and heterogeneous decrease in average school millage rates and taxes – occurred for all property owners in Michigan, we are able to conduct a direct test of whether or not this structural, state-mandated change impacted local government millage rates, who share part of the same tax base as school districts.

3.2.2 Relevant Literature

In federal systems like that in the United States, tax bases often overlap several different taxing authorities. This necessarily means that certain tax setting decisions are interdependent (Dahlby & Wilson, 2003; Gillis, 2025; Hoyt, 2001; Keen, 1997; Keen & Kotsogiannis, 2002, 2004; Zodrow & Mieszkowski, 1986). This frequently results in ‘tax competition,’ defined by Keen (2008) as strategic tax-setting in a non-cooperative game between government levels, where each level adjusts the parameters of its tax system in relation to the taxes set by others. The tax competition is said to be ‘vertical’ as opposed to ‘horizontal’ precisely because these governments share part of the same, immobile tax base.⁴⁰

A number of empirical papers have attempted to tease out the effects of vertical interdependence. Using the example of gasoline and cigarette taxes, Besley and Rosen (1998) show that decisions made by the federal government influence state tax-setting behavior, with states adjusting their own tax rates upward in response to federal changes in the same direction. Updating this same work a decade later, Devereux et al. (2007) find no such relationship. Examining the income base, Esteller-Moré and Solé-Ollé (2001) find that “a one point increase in the federal effective tax rate is followed by an increase of approximately 0.10 points in the state income tax rate, and 0.22 when considering income and general sales taxes together” (p. 269). Expanded to the OECD, Goodspeed (2000) finds conflicting evidence: a one percentage-point increase in the national income tax rate leads to a 0.17 percentage point decrease in the local income tax rate. A negative reaction was also found in the context of business taxes in Canada (Hayashi & Boadway, 2001). Thus, the evidence of vertical tax competition is quite mixed.

There are a handful of studies examining vertical tax competition within states. Examining the entire U.S., Agrawal (2016) found evidence of a negative relationship between own-town and county tax rates. Burge and Rogers (2011) show that a 1% increase in the county local option sales tax rate corresponds to a 2.5% decrease in the municipal tax base in Oklahoma. Choi (2022)

⁴⁰For examples of research on horizontal tax competition (between neighboring tax jurisdictions), see Afonso et al. (2024), Nelson (2002), Rork (2003), and Wu and Hendrick (2009).

analyzed vertical tax competition within Texas by examining the property tax following bond referenda. They find that when school taxes rise, overlapping cities tend to raise their own taxes as well. This result is informative for understanding potential responses in Michigan, where school tax rates declined everywhere.

A statewide school finance reform that universally reduces school property taxes may alter local governments' own tax rates beyond the year-to-year changes generally associated with assessed values and expenditure growth. Consider a jurisdiction experiencing an above-median reduction in its associated school district mill rate. Holding assessed values fixed, local officials could maintain or even increase local mill rates while still offering a lower overall property tax burden than before the reform. This creates the conditions to attract new residents and development while generating additional local revenue. In this sense, local governments may have used the reduction in school millage rates to expand fiscal capacity and finance the public services needed for a rising population.

A second possibility is that resident preferences cause changes by a responsive local government. An "income effect" posits that reductions in property tax liabilities (due to Proposal A-induced school mill reductions), effectively increase disposable income. This may raise demand for local public services, especially in jurisdictions where service provision is relatively limited. To assess this possibility, we examine heterogeneity by pre-reform local spending levels, comparing jurisdictions by their per capita expenditures.

Importantly, we expect Proposal A-induced changes to school property taxes to primarily affect local government reliance on the property tax, rather than other revenue sources. In Michigan, local governments do not levy general sales taxes, limiting their ability to adjust revenues along this margin. As shown in Table 3.2, the property tax is a primary revenue source for both cities (37.6% of own-source revenue) and townships (59.1% of own-source revenue). While cities and townships also collect a range of charges and fees (e.g., for parking, sewerage, parks and recreation, and solid waste services), these revenues are typically tied to specific services and are less easily adjusted in the short run. By contrast, property taxes are administered through a unified

system, so reductions in school millage rates may have reduced the salience of overall property tax burdens, potentially facilitating increases in local millage rates.

Table 3.2: Average Shares of Own-Source Revenue by Type and Government

	Property Tax	Charges & Misc. Revenues	Utility Revenue	All Else
Cities	37.6%	38.0%	18.5%	5.9%
Townships	59.1%	35.2%	2.5%	3.2%

Notes: Author's calculations using the 1992 Census of Governments. Values are mean revenue shares across jurisdictions within each government type.

3.3 Data and Empirical Methods

3.3.1 Data

Michigan government is broken up into county, township, city, village, and school district jurisdictions, each endowed with certain powers and responsibilities. Counties are responsible for county road maintenance, providing police protection, county-run hospitals, as well as various other public services. Township governments have the responsibility to enact and enforce ordinances, administer planning and zoning, provide police and fire protection, oversee cemeteries, and maintain parks and recreation facilities. Cities provide similar services as townships. If a location is not in a township, then it must be a part of a city. Thus, all locations in Michigan are located in either a township or a city. School districts may cross city and township borders, and city and townships may have multiple school districts. We collected data for townships and cities from a variety of sources.

The main focus of this paper is to examine how the change in school taxes brought on by Proposal A affected the tax rates of other levels of government. Since school districts can be located across multiple townships or cities, and townships or cities may have multiple school districts, the average school tax rate for each local unit (township/city) of government must be created. The

Michigan Department of Revenue produces a weighted average local unit school tax rate in their Ad Valorem Tax Levy Report which creates this tax measure, with weights assigned according to the relative size of the tax bases which fall in each school district.⁴¹ These tax rates are produced for all levels of local government in Michigan. We plot the median millage rate for schools districts, counties, and local jurisdictions (cities and townships) in Figure 3.1. The median local rate is also shown in Figure 3.2 with the interquartile range, indicating a general increase after Proposal A. Jurisdictions at the lower end (25th percentile) saw a larger increase in local mills between 1993 and 1995 than jurisdictions at the higher end (75th percentile). The general trend upwards for local governments is confirmed in Table 3.3, which shows the average millage rate for each government type in 1993 and 1995. School districts experienced a large drop in school mills (the result of Proposal A), while city and township taxes all increased, on average. County governments, however, saw a decrease over this period, on average.

⁴¹Proposal A also introduced differential taxation which resulted in business, rental and vacation home property being liable for 18 mills more than residential property.

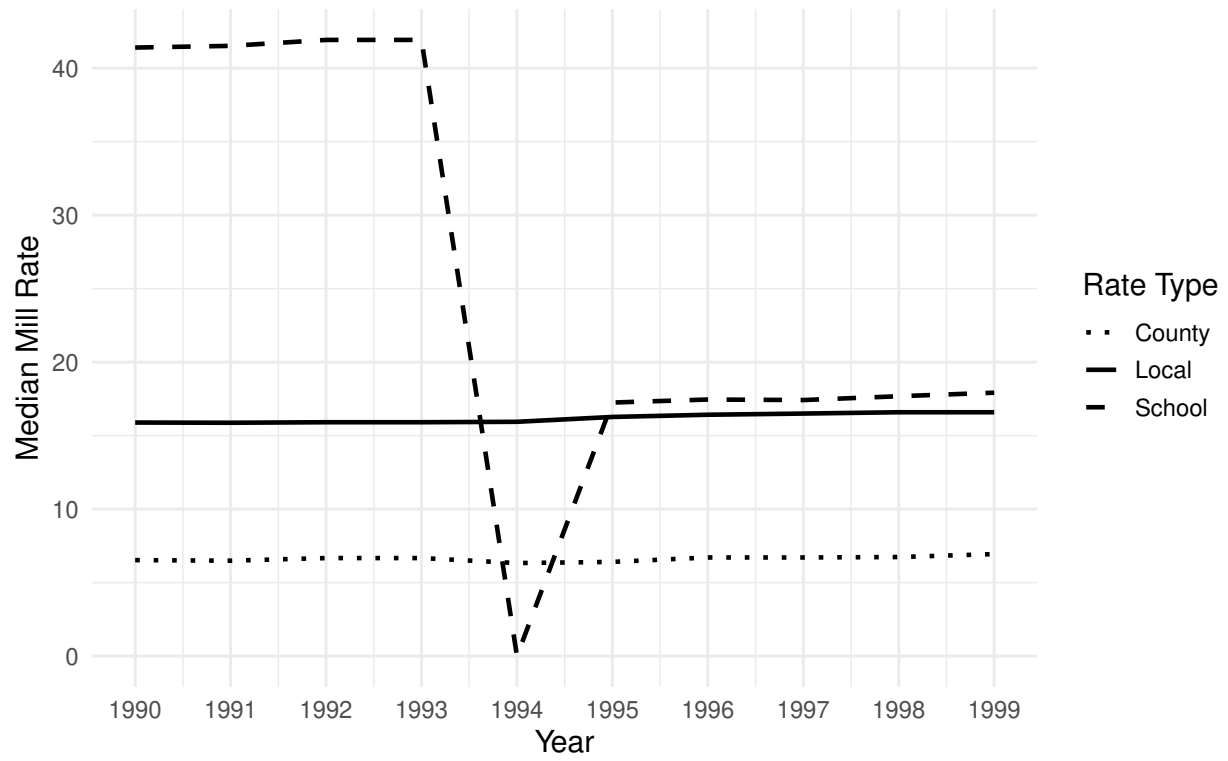


Figure 3.1: Median Millage Rate by Government Type, 1990-1999

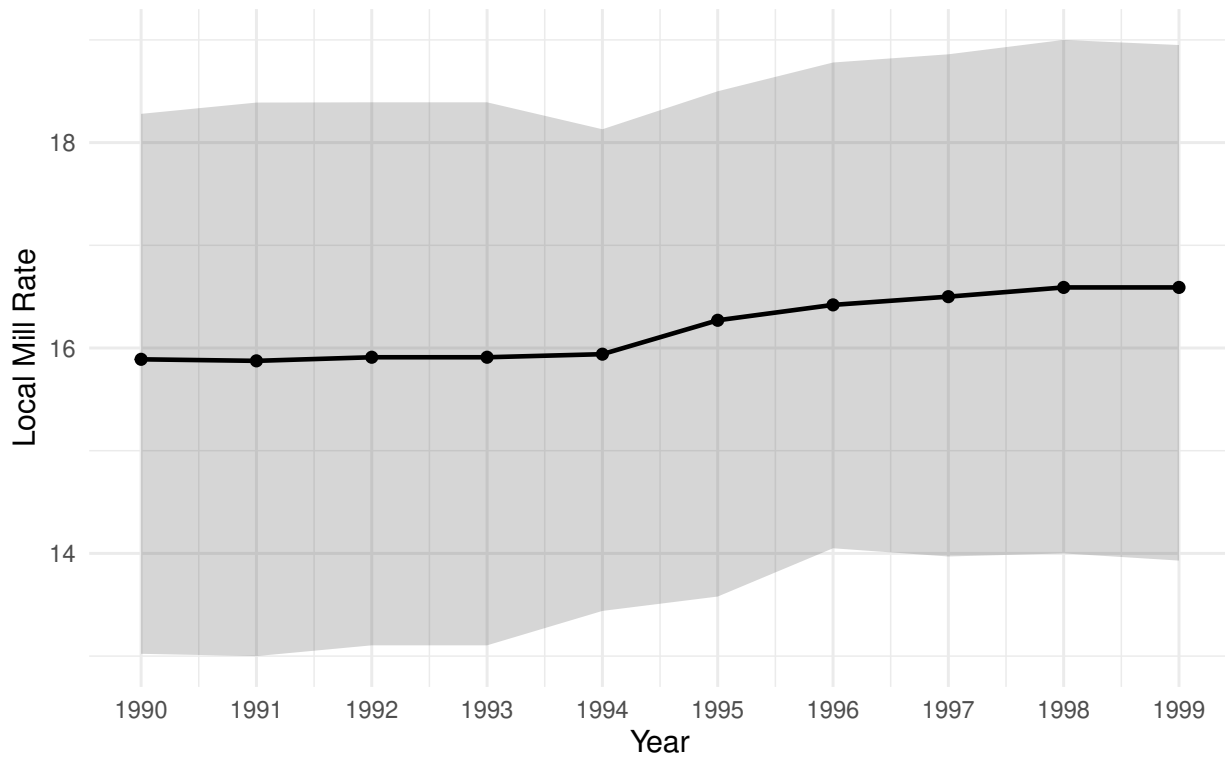


Figure 3.2: Median Local Millage Rate with Interquartile Range, 1990-1999

Reporting the median masks what were some large swings across different parts of the state. Figure 3.3 shows the change in school and local rates across the state, and Tables C.1 and C.2 in the appendix show the ten absolute largest increases and decreases in local mills from 1993 to 1995 for cities and townships. Because some cities and townships could keep their millage rate relatively low due to high property values, while others experienced the opposite, we also show proportional changes over the time period (the logged difference) in Tables C.4 and C.3. In proportional terms, Townships were much more likely to have large increases and decreases in local millage rates than cities, but their mills are considerably lower, on average, than cities.

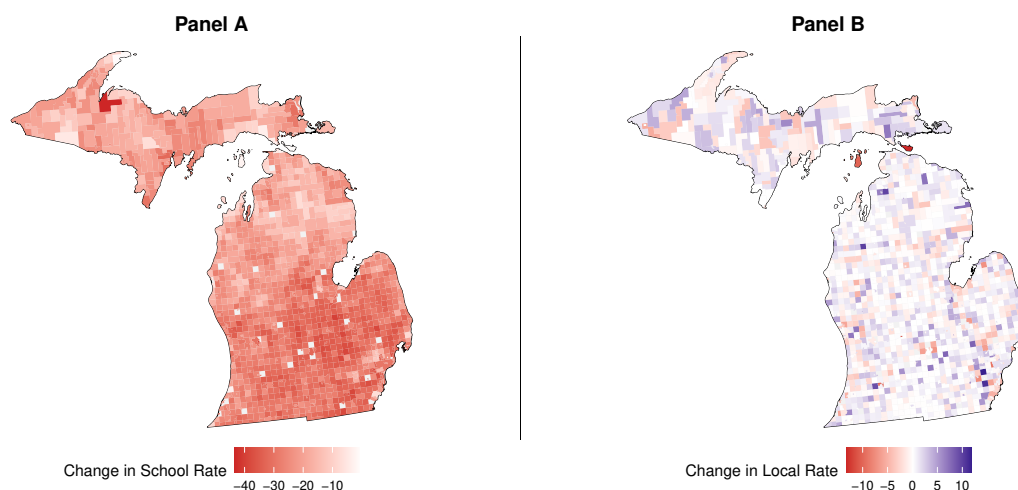


Figure 3.3: Change in School (Panel A) and Local (Panel B) Millage Rates, 1993–1995

Note: School millage rate changes in Panel A are measured at the city or township level and reflect the average change in the associated school district millage rate for each jurisdiction. Because school district boundaries do not align with local government boundaries, the map does not depict school districts themselves, but rather assigns each city or township the change in its corresponding school district’s millage rate.

As discussed in Section 3.2.1, prior to Proposal A the effective property tax base for Michigan local governments was the SEV, which represented 50% of the true cash value of all property as determined through the assessment process. Beginning in 1995, however, the relevant tax base shifted to TV, which incorporated Proposal A’s assessment cap. Over time, the gap between SEV and TV widened as capped taxable values diverged from market assessments. Unfortunately, our data contain only SEV measures for local jurisdictions. Nevertheless, because our analysis focuses on short-run changes immediately following Proposal A, we do not believe this poses a major concern. To the extent that taxation affects property values through capitalization or tax-base mobility, those effects should still be reflected in SEV. At the same time, changes in SEV remain an imperfect measure of capitalization effects because of both Proposal A’s assessment limits and the broader challenges associated with property assessment.⁴²

⁴²See Netzer (2001) for a detailed discussion of the difficulties in accurately assessing property.

SEV is not available by property type, so we are unable to calculate the relative importance of specific forms of property within specific local boundaries (i.e., residential, industrial or commercial). However, the census provides the aggregate value of owner-occupied housing. While this would not include renter-occupied housing, it can be used alongside total SEV to better understand the relative importance of owner-occupied housing in a jurisdiction. Specifically, we can calculate $\text{Aggregate Value}_{1990} / (2 \times SEV_{1993})$, which gives us a rough idea of how much property in a jurisdiction is housing as opposed to commercial, industrial, etc.⁴³

In addition to the tax rates and SEV information, demographic data from the 1990 Decennial Census for each local unit is included (Manson et al., 2024). The demographic data includes total population, age, race, and education controls, rural population, median rent, and the median and aggregate value of owner-occupied housing for each city and township in Michigan. We also use local public finance data from the 1992 Census of Governments, State and Local Government Finance for information on the revenues, expenditures, and debt of each city and township (Pierson et al., 2015). Finally, in one specification we include the 1992 County democratic presidential vote share (the percent of total county voters who cast their ballot for Clinton) (CQ Press, 2026). Tables 3.3 and 3.4 provide summary statistics for the full, combined, dataset (i.e., summary statistics for all cities and townships). Tables C.5, C.6, C.7, and C.8 in the appendix show summary statistics broken out by cities and townships, independently.

⁴³One concern with this back-of-the-envelope measure is that Aggregate Value is measured in 1990, while SEV is measured in 1993, so changes in the composition of the tax base between these years could introduce measurement error. We believe such changes are unlikely to be large over this short interval, and because the same construction is applied uniformly across all jurisdictions, any measurement error is unlikely to bias comparisons across jurisdictions.

Table 3.3: Summary Statistics: Public Finance Variables

Variable	Mean	Std. Dev.	Min	Max
City Rate, 1993	16.2	4.91	1.92	34.16
City Rate, 1995	16.47	4.9	2.3	36.67
Township Rate, 1993	2.27	1.76	0	14.4
Township Rate, 1995	2.47	1.93	0	14.8
School Rate, 1993	39.56	6.14	5.44	57.6
School Rate, 1995	14.94	4.12	4.04	34.77
County Rate, 1993	7.03	1.59	4.45	12.8
County Rate, 1995	6.86	1.52	4.76	12.62
SEV, 1993 (\$mil.)	101.12	304.26	0.73	5672.06
SEV, 1995 (\$mil.)	119.73	338.32	1.08	5844.87
Median Home Value (\$000s)	54.33	30.28	15.6	495
Aggregate Value (\$mil.)	93.37	305.33	0.11	4870.37
Percent Vacant	0.22	0.22	0.01	0.9
Total Expend. p.c., 1992	328.12	572.31	0	11913.46
Interest on Debt p.c., 1992	10.77	100.75	0	3580.34
Debt Outstanding p.c., 1992	184.2	1554.04	0	56124.76
Fire Protection Expend. p.c., 1992	21.32	23.11	0	225.93
Highways Expend. p.c., 1992	41.68	54.04	0	510
Housing & Community Expend. p.c., 1992	0.96	9.8	0	274.17
Central Staff Expend. p.c., 1992	23.22	20.54	0	200.79
Parks & Recreation Expend. p.c., 1992	9.86	34.34	0	834.65
Police Protection Expend. p.c., 1992	24.49	55.71	0	862.32
Sewerage Expend. p.c., 1992	32.54	217.77	0	7567.31
Utilities Expend. p.c., 1992	44.72	192.96	0	4432.84
Own-Source Operating Ratio, 1992	0.95	2.51	0.02	95.55
Intergovernmental Revenue Share, 1992	0.41	0.19	0	0.98

Table 3.4: Summary Statistics: Demographic Variables

Variable	Mean	Std. Dev.	Min	Max
Population	6133.43	29682.14	21	1027974
Families	1607.52	7170.93	6	244327
Percent Age < 24	0.36	0.05	0.05	0.7
Percent Age 24–64	0.51	0.04	0.22	0.67
Percent Age 65+	0.14	0.06	0.02	0.49
Percent White	0.96	0.08	0.06	1
Percent Black	0.02	0.07	0	0.93
Percent HS or Less	0.64	0.13	0.1	0.93
Percent Bachelor+	0.12	0.09	0	0.71
Percent HH No Income	0.27	0.11	0	0.81
Percent Rural	0.81	0.37	0	1
Percent Owner Occupied	0.63	0.19	0.08	0.97
Median Rent	287.63	94.45	0	972
County Democratic Presidential Vote Share (1992)	0.4	0.07	0.23	0.6

3.3.2 Empirical Specifications

Following E. Johnson and Walsh (2013), we estimate a series of first-difference regressions that model changes in city and township millage rates between the base year of 1993 and years following the policy such as 1995. The main explanatory variable is the change in the school millage rate over the same period. We include a quadratic term of this change in school millage rates to allow for nonlinear responses by local jurisdictions. This permits the effect of school mill change on local rates to vary by the magnitude of the change, capturing the possibility that local governments respond differently to small vs. large fiscal shocks. Time-invariant covariates, including demographic and local public finance characteristics, are measured at baseline using the 1990 Census and the 1992 Census of Local Governments (Manson et al., 2024; Pierson et al., 2015). Importantly, we also control for the state equalized value (SEV) in 1993 as well as the change in SEV from 1993 to 1995, which could influence the size and direction of local millage rate changes. For example, A decline in SEV may have increased pressure on local governments

to raise millage rates in order to maintain revenues. If a large company with a high assessed value closed in 1994, the city may have needed to increase the local rate to make up the lost revenue from that firm closure.

The baseline specification is:

$$\Delta\tau_{ic}^{\text{Local}} = \beta_1\Delta\tau_{ic}^{\text{School}} + \beta_2\left(\Delta\tau_{ic}^{\text{School}}\right)^2 + \beta_3\Delta\tau_{ic}^{\text{County}} + \beta_4SEV_{ic,1993} + \beta_5\Delta SEV_{ic} + X'_{ic}\beta + \gamma_c + \varepsilon_{ic} \quad (3.1)$$

where $\Delta\tau_{ic}^{\text{Local}}$ is the change in the local millage rate (e.g. between 1993 and 1995) and $\Delta\tau_{ic}^{\text{School}}$ is the corresponding change in the school millage rate. Following Wu and Hendrick (2009) we also include $\Delta\tau_{ic}^{\text{County}}$, the change in the property tax rate levied by each jurisdictions county over the same period for. $SEV_{ic,1993}$ denotes baseline state equalized value in 1993, and ΔSEV_{ic} is the change in state equalized value between 1993 and 1995. The term $\left(\Delta\tau_{ic}^{\text{School}}\right)^2$ allows the response of local millage rates to vary with the magnitude of the school mill change, capturing potential nonlinearities in fiscal responses.⁴⁴ The vector X_i includes baseline demographic and local public finance covariates measured in 1990 or 1992, respectively. These include racial composition, age structure, educational attainment, housing tenure, and baseline per capita expenditures and debt measures. The term γ_c denotes fixed effects at the county or commuting-zone level, depending on the specification.

Using our preferred specification – all controls, commuting zone fixed effects, and standard errors clustered at the county level – we then estimate extended models that measure the change in local millage rates from 1993 to other outyears (1996-1999). In these models, we are estimating whether the effect persists into the years following Proposal A.

⁴⁴When a regression includes both x and x^2 , the coefficient on x does not by itself represent the full effect of x on the outcome. Instead, the marginal effect is $\partial y/\partial x = \beta_1 + 2\beta_2x$. Thus, if both the level term and squared term have negative coefficients, increases (decreases) in x are associated with lower (higher) values of the dependent variable, and this negative effect becomes larger in magnitude as x increases. In other words, the relationship is concave and downward sloping over the relevant range of the data.

We also examine heterogeneity across Michigan jurisdictions by interacting the change in school millage rates with an indicator for whether a jurisdiction falls into a particular group. Each group is based on the distribution of key local public finance or demographic/real estate variables.

$$\begin{aligned}\Delta\tau_{ic}^{\text{Local}} = & \beta_1\Delta\tau_{ic}^{\text{School}} + \beta_2\left(\Delta\tau_{ic}^{\text{School}}\right)^2 + \delta_1\left(\Delta\tau_{ic}^{\text{School}} \times D_i\right) + \delta_2\left[\left(\Delta\tau_{ic}^{\text{School}}\right)^2 \times D_i\right] \\ & + \beta_3SEV_{ic,1993} + \beta_4\Delta SEV_{ic} + X_i'\beta + \gamma_c + \varepsilon_{ic}\end{aligned}\quad (3.2)$$

where D_i is an indicator equal to one for jurisdictions in the relevant subgroup, such as those in the top quartile of local per capita debt outstanding. The different types of heterogeneity and mechanisms are explained in Section 3.4.2. The coefficients δ_1 and δ_2 capture whether the linear and nonlinear responses to school millage rate changes differ for jurisdictions in that subgroup.

3.4 Results

We split our results into two main sections. Section 3.4.1 presents the baseline models, examining how local millage rates respond to Proposal A–induced reductions in school mills. Section 3.4.2 then explores heterogeneity across local governments. Specifically, we consider seven potential types of mechanisms and heterogeneity: per capita local expenditures, own-source operating ratios, per capita local debt, intergovernmental revenue (IGR) dependence, the share of the tax base derived from owner-occupied housing, political (party) preferences, and the rural population share.

3.4.1 Baseline Results

Results from our baseline regressions are shown in Table 3.5. Moving from Column 1 to Column 5 adds additional controls to each model. Column 1 presents results with no demographic or public finance controls, no fixed effects, and reports standard errors under the assumption of independently and identically distributed (IID) errors. Column 2 introduces demographic controls,

while Column 3 adds baseline public finance controls.⁴⁵ Column 4 reports standard errors clustered at the county level, and Column 5 further incorporates commuting-zone fixed effects. Across all specifications, the estimated effect of changes in school millage rates on local millage rates is negative and statistically significant, with coefficients ranging from approximately -0.17 to -0.23 . This stability suggests that the relationship is not driven by observable demographic or fiscal differences across jurisdictions, nor by regional heterogeneity captured by commuting-zone fixed effects.

Our preferred specification is the model shown in Column 5. The coefficient of -0.188 implies that a one-mill decrease in the school rate is associated with an approximately 0.19 mill increase in the local rate. In other words, local governments offset about 19 percent of the school millage reduction by increasing their own millage rates. The magnitude of the estimates is small but economically meaningful. For a jurisdiction with an SEV of approximately \$120 million, this corresponds to an increase in local revenue of roughly \$22,000. For a homeowner with a median-valued home (approximately \$54,000, implying an assessed value of about \$27,000), this corresponds to an increase in annual property taxes of roughly \$5. Thus, the per-homeowner effect is very small, but aggregated across many properties, the effect is much larger. Because school mill reductions were often substantially larger than one mill, the implied local fiscal response is correspondingly larger in magnitude.

⁴⁵Demographic controls include total population; the shares of the population that are Black, under age 24, age 65 and older, rural, and college educated; the share of housing units that are owner occupied; the share of households with no income; and median rent. Public finance controls include median owner-occupied housing value, aggregate owner-occupied housing value, the own-source operating ratio, the intergovernmental revenue share, and per capita expenditures on utilities, sewerage, housing and community development, police protection, fire protection, parks and recreation, highways, total expenditures, interest on debt, and debt outstanding. Descriptive statistics of these variables for the full sample can be found in Tables 3.3 and 3.4 and in Tables C.5, C.6, C.7, and C.8 for cities and townships independently.

Table 3.5: Effect of School Millage Changes on Local Property Tax Rates (1993–1995)

	(1)	(2)	(3)	(4)	(5)
Change in School Rate	−0.167*** (0.042)	−0.174*** (0.044)	−0.179*** (0.045)	−0.231** (0.090)	−0.188** (0.080)
Change in School Rate Sq.	−0.003*** (0.001)	−0.004*** (0.001)	−0.004*** (0.001)	−0.005*** (0.002)	−0.004** (0.002)
Demographic Controls	No	Yes	Yes	Yes	Yes
Public Finance Controls	No	No	Yes	Yes	Yes
Std. Errors	IID	IID	IID	County	County
Fixed Effects	No	No	No	County	CZ

All specifications include baseline SEV (1993), the change in SEV (1993–1995), the change in County Mill Rates (1993–1995), and a quadratic term in the change in school rates. Demographic and public finance controls are listed in Footnote 45.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We extend our preferred specification to longer time horizons beyond 1995, as shown in Table 3.6. All specifications include demographic and public finance controls, commuting-zone fixed effects, and standard errors clustered at the county level. Figure 3.4 plots these estimates across the available time horizons. The results indicate that the response of local millage rates was concentrated in the immediate period following the reform. The estimated effect is largest in the 1993–1995 window and declines in magnitude and significance in subsequent years. This pattern suggests that local governments adjusted their millage rates quickly in response to reductions in school district taxation, with little additional adjustment in later years.

Table 3.6: Effect of School Millage Changes on Local Property Tax Rates Across Time Horizons

	1995	1996	1997	1998	1999
Change in School Rate	-0.188**	-0.066	-0.043*	-0.047*	-0.028
	(0.080)	(0.040)	(0.025)	(0.025)	(0.033)

All specifications include baseline SEV (1993), the change in SEV (1993-199X), a quadratic term in the change in school rates, demographic controls, and public finance controls.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

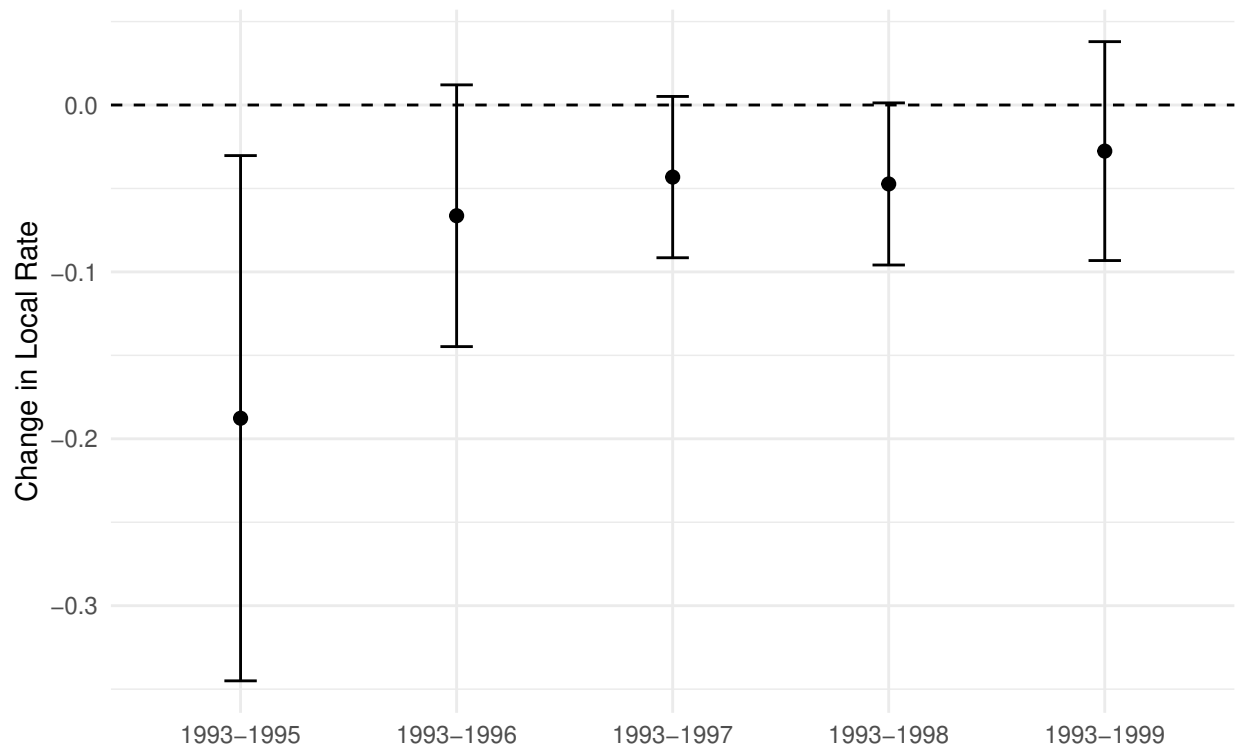


Figure 3.4: Change in Local Rate per 1-Mill Change in School Rate, by Time Horizon

Note: Points represent coefficient estimates. Because the change in school rates was negative for every jurisdiction, negative coefficients should be interpreted as an increase in local mills. Error bars denote 95% confidence intervals.

Given the size and responsibility differentials between township and city governments, we also run the same models individually for each jurisdiction type. The results of our baseline (1993-

1995) model are shown in Tables 3.7 (for cities) and 3.9 (for townships). With the preferred specification, we again test the effect of school mill changes on additional time horizons, the results of which are shown in Tables 3.8 and 3.10 and in Figures 3.5 and 3.6. For cities, the immediate impact on city millage rates is negative, and statistically significant at the 10% level. Over the outyears, the coefficient becomes positive, indicating that a decrease in school rates is associated with a decrease in city millage rates. However, the standard errors are imprecisely estimated, so we cannot confidently say that there is any effect of school mill reductions on city mills, in either the positive or negative direction. For townships though, the effect is consistent throughout the entire period, with coefficients ranging from -0.155 to -0.057. This suggests that, while the effect was strongest in the immediate aftermath of Proposal A, it remained through 1999. A Proposal-A-induced decrease in school mills is associated with an increase in township rates when comparing any outyear to the base year of 1993 (pre-Prop A).

Table 3.7: Effect of School Millage Changes on Local Property Tax Rates (1993–1995), Cities

	(1)	(2)	(3)	(4)	(5)
Change in School Rate	-0.069 (0.091)	-0.108 (0.100)	-0.174 (0.111)	-0.214*** (0.079)	-0.169* (0.085)
Change in School Rate Sq.	-0.001 (0.002)	-0.002 (0.002)	-0.003 (0.002)	-0.004** (0.002)	-0.003* (0.002)
Demographic Controls	No	Yes	Yes	Yes	Yes
Public Finance Controls	No	No	Yes	Yes	Yes
Std. Errors	IID	IID	IID	County	County
Fixed Effects	No	No	No	County	CZ

All specifications include baseline SEV (1993), the change in SEV (1993-1995), the change in County Mill Rates (1993-1995), and a quadratic term in the change in school rates. Demographic and public finance controls are listed in Footnote 45.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.8: Effect of School Millage Changes on Local Property Tax Rates Across Time Horizons, Cities

	1993-1995	1993-1996	1993-1997	1993-1998	1993-1999
Change in School Rate	-0.169*	-0.130	-0.025	0.015	0.085
	(0.085)	(0.138)	(0.113)	(0.112)	(0.156)

All specifications include baseline SEV (1993), the change in SEV (1993-199X), the change in County Mill Rates (1993-199X), a quadratic term in the change in school rates, demographic controls, and public finance controls.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

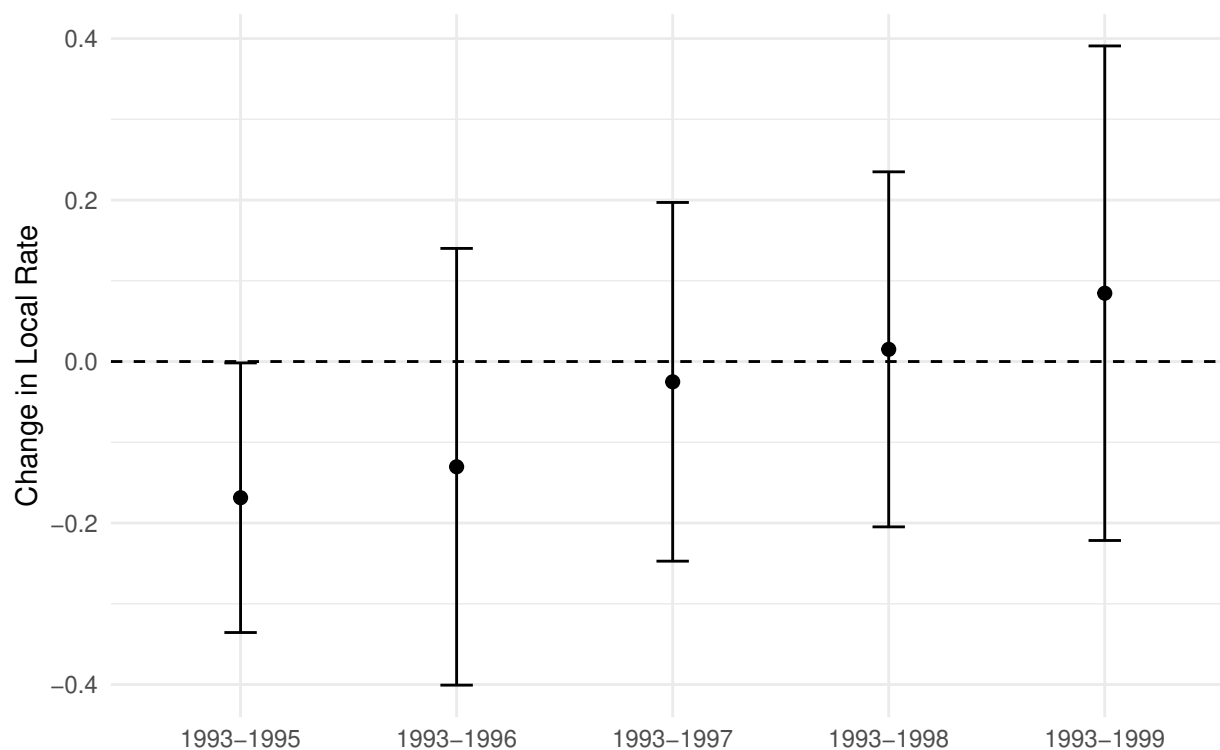


Figure 3.5: Change in City Rate per 1-Mill Change in School Rate, by Time Horizon

Note: Points represent coefficient estimates. Because the change in school rates was negative for every jurisdiction, negative coefficients should be interpreted as an increase in local mills. Error bars denote 95% confidence intervals.

Table 3.9: Effect of School Millage Changes on Local Property Tax Rates (1993–1995), Townships

	(1)	(2)	(3)	(4)	(5)
Change in School Rate	–0.175*** (0.047)	–0.191*** (0.048)	–0.156*** (0.050)	–0.171* (0.091)	–0.157* (0.086)
Change in School Rate Sq.	–0.003*** (0.001)	–0.004*** (0.001)	–0.003*** (0.001)	–0.004** (0.002)	–0.003** (0.002)
Demographic Controls	No	Yes	Yes	Yes	Yes
Public Finance Controls	No	No	Yes	Yes	Yes
Std. Errors	IID	IID	IID	County	County
Fixed Effects	No	No	No	County	CZ

All specifications include baseline SEV (1993), the change in SEV (1993–1995), and a quadratic term in the change in school rates. Demographic and public finance controls are listed in Footnote 45.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.10: Effect of School Millage Changes on Local Property Tax Rates Across Time Horizons, Townships

	1995	1996	1997	1998	1999
Change in School Rate	–0.157* (0.086)	–0.068** (0.028)	–0.057** (0.027)	–0.075** (0.029)	–0.064** (0.031)

All specifications include baseline SEV (1993), the change in SEV (1993–199X), a quadratic term in the change in school rates, demographic controls, and public finance controls.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

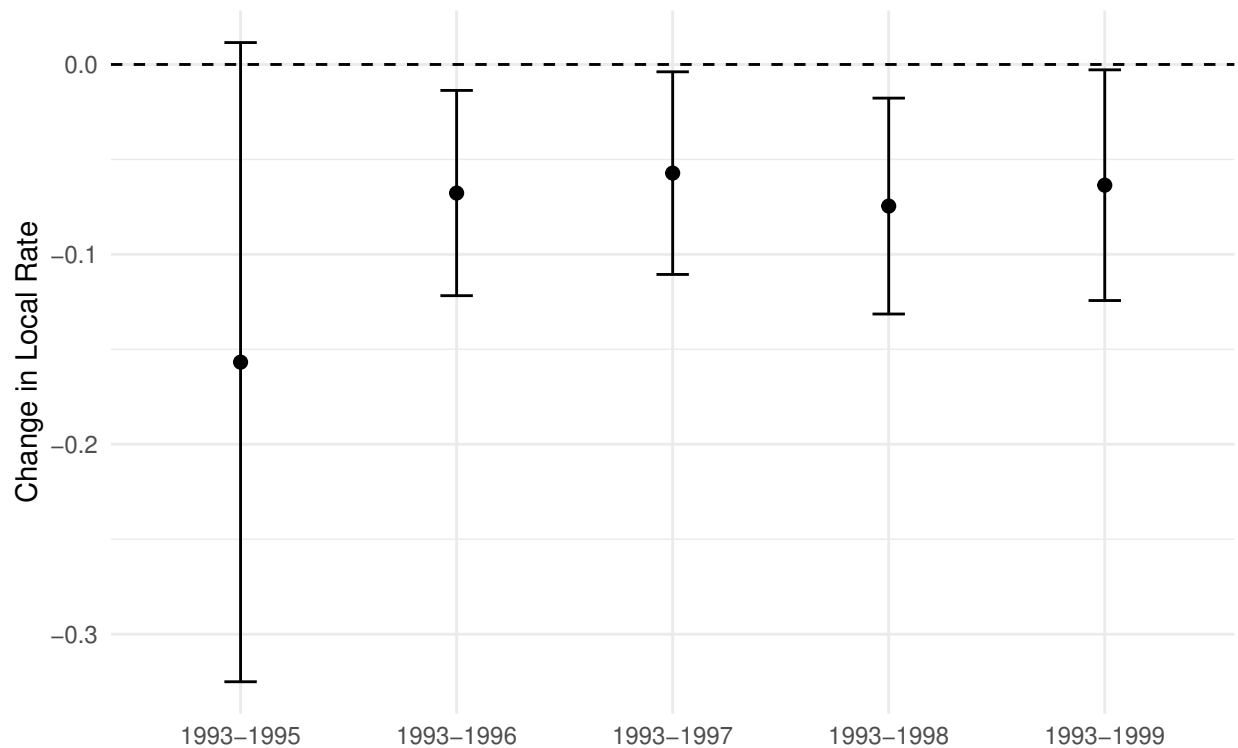


Figure 3.6: Change in Township Rate per 1-Mill Change in School Rate, by Time Horizon

Note: Points represent coefficient estimates. Because the change in school rates was negative for every jurisdiction, negative coefficients should be interpreted as an increase in local mills. Error bars denote 95% confidence intervals.

3.4.2 Heterogeneity

We next examine seven potential sources of heterogeneity, broken into public finance and demographic/real estate categories, respectively. For each mechanism, we estimate specifications that interact the change in school millage rates with an indicator for whether a jurisdiction falls into a particular group. The literature has not reached a consensus on what encapsulates municipal financial health (Brusca et al., 2015; Clark, 2015; Gorina et al., 2018; Wang et al., 2007). Thus, we examine a number of variables that help differentiate local governments in terms of local public finances.

For these public finance mechanisms, we consider: (1) jurisdictions in the bottom quartile of per capita local expenditures, (2) jurisdictions in the bottom quartile of own-source operating

ratios, (3) jurisdictions in the top quartile of per capita local debt, and (4) jurisdictions in the top quartile of intergovernmental revenue (IGR) dependence, measured as the share of total revenue derived from intergovernmental transfers. For the demographic and real estate mechanisms, we consider: (5) jurisdictions in the top quartile of the share of the tax base accounted for by owner-occupied housing, (6) jurisdictions in the top quartile of Democratic presidential vote share, and (7) jurisdictions in the top quartile of rural population share.

Given the importance of nonlinear responses in the baseline results (Section 3.4.1), we also interact the squared change in school millage rates with each mechanism. Additionally, all specifications follow the preferred baseline model from Section 3.4.1, including commuting-zone fixed effects and standard errors clustered at the county level. Each mechanism is discussed briefly below, with the corresponding specification indicated in parentheses. The full set of results is reported in Tables 3.11 and 3.12, with Township and City-specific results reported separately in Appendix Tables C.11, C.12, C.13 and C.14.

Public Finance Mechanisms

Per Capita Local Expenditures (1)

Recent empirical work has suggested that local governments compete not only on tax rates, but on the types of public services offered (Jong et al., 2025). If this was occurring in Michigan localities, we might expect results to be driven by the expenditure side. Local governments in Michigan have a wide range of spending levels, both in total and on specific types, as evidenced in Tables 3.3, C.5, and C.6. Total expenditures per capita range from roughly \$732 to \$7,891 for cities, and roughly \$384 to \$11,913 for townships. One possibility is that low-spending jurisdictions – defined as those in the bottom quartile of per capita 1992 expenditures – sought to ‘catch up’ to higher-spending peers in the years immediately following Proposal A. The results from our study suggest otherwise. The interaction terms on the change in school millage rates and its square are both positive and statistically significant at conventional levels (0.210 and 0.004), indicating that jurisdictions with lower pre-reform spending levels exhibited substantially weaker offsetting

behavior. In other words, while higher-spending jurisdictions tended to raise local millage rates in response to school mill reductions, low-spending jurisdictions responded less strongly.

Own-source Operating Ratios (2)

We examine heterogeneity by fiscal capacity using the own-source operating ratio, which measures the share of operating expenditures financed through local revenue sources. This measure is closely related to indicators commonly used in the public finance and public administration literatures to assess local government fiscal health, fiscal flexibility, and dependence on intergovernmental aid (Maher & Deller, 2011; McDonald, 2017, 2018).⁴⁶ Jurisdictions in the bottom quartile of this distribution may be expected to face tighter fiscal constraints and thus respond differently to school finance reform. However, the results provide little evidence of meaningful heterogeneity. While the interaction terms on the change in school millage rates and its square are positive, they are not statistically significant at conventional levels, indicating that jurisdictions with lower own-source capacity do not respond systematically differently from other jurisdictions.

Per Capita Debt Outstanding (3)

The amount of debt outstanding incurred by a local government can also influence the millage rates they charge. High debt jurisdictions may have reacted to Proposal A by increasing local mills in an effort to pay down debt. We find no evidence that local debt shaped responses to Proposal A. Although local governments increased millage rates in response to school mill reductions, the interaction terms are not statistically significant at conventional levels. High-debt jurisdictions exhibit responses that are similar to those of other local governments, suggesting that existing local debt burdens did not impact a jurisdictions response to Proposal A. Importantly, our sample in this specification includes both townships and cities. When estimated using only a sample of cities only, the effect becomes large and significant (see Table C.13 for coefficients).

⁴⁶This ratio is also referred to as a ‘coverage ratio.’

IGR Share (4)

We next examine heterogeneity by reliance on intergovernmental revenue, measured as the share of total revenue derived from intergovernmental transfers. Jurisdictions in the top quartile of this distribution may be expected to respond differently to Proposal A due to their greater dependence on external funding sources, in either direction. The results provide no evidence of meaningful heterogeneity along this dimension. The interaction terms on the change in school millage rates and its square are small and not statistically significant at conventional levels, indicating that jurisdictions with a larger fraction of revenue coming from intergovernmental transfers responded similarly to other jurisdictions.

Demographic/Real Estate Mechanisms

Share of Tax Base from Owner-Occupied Housing (5)

We next examine whether the composition of the local property tax base affects fiscal responses. Specifically, we construct a measure of the share of each jurisdiction's tax base derived from owner-occupied housing by dividing the market value of owner-occupied housing by twice the State Equalized Value (SEV) – which is itself a measure of the total market value of property within each jurisdiction. This gives us a rough idea of the share of properties deemed 'homestead.' Jurisdictions are then classified based on the distribution of this measure. We find strong evidence of heterogeneity along this dimension. In the baseline group, the coefficients on the change in school millage rates and its square are negative (-0.227 and -0.005), indicating that reductions in school millage rates are offset by increases in local millage rates, with larger school rate cuts leading to stronger offsetting responses. In contrast, the interaction terms for jurisdictions with a high share of property coming from owner-occupied housing are positive and statistically significant at the 1% level (0.395 and 0.008). This suggests that jurisdictions with lower owner-occupied shares exhibit offsetting behavior – raising local millage rates in response to school mill reductions – while jurisdictions in the top quartile of the owner-occupied share of the tax base respond much less strongly. For sufficiently large school mill reductions, the implied marginal effect of school

rates on local rates becomes positive in high-owner-occupied jurisdictions, indicating that local millage rates may move in the same direction as school rates rather than offsetting them.

Democratic Vote Share (6)

To assess whether political preferences shape local fiscal responses, we interact changes in school millage rates with an indicator for jurisdictions located in counties in the top quartile of Democratic vote share in the 1992 presidential election (Clinton v. Bush v. Perot). Quartiles are constructed at the county level and assigned to all jurisdictions within each county. The results provide no evidence of political heterogeneity. While the estimated interaction term is negative (-0.014), suggesting a slightly larger offsetting response in more Democratic counties, the estimate is small and imprecisely measured. This indicates that fiscal responses are broadly similar across jurisdictions with differing political compositions.

Rural Population Share (7)

Finally, we assess whether more rural jurisdictions respond differently by interacting school mill changes with an indicator for jurisdictions in the top quartile of the rural population share. The estimated interaction term is small and statistically insignificant, suggesting no evidence that more rural jurisdictions responded differently to school mill reductions. Overall, fiscal responses appear similar across more and less rural areas.

Table 3.11: Heterogeneity in Local Fiscal Responses: Public Finance Mechanisms

	(1)	(2)	(3)	(4)
Change in School Rate	−0.227** (0.091)	−0.211** (0.091)	−0.216** (0.105)	−0.192** (0.085)
Change in School Rate ²	−0.005*** (0.002)	−0.004** (0.002)	−0.005** (0.002)	−0.004** (0.002)
× Low Expenditures	0.210** (0.092)			
× Low Expenditures [sq.]	0.004** (0.002)			
× Low Own-Source Operating Ratio		0.109 (0.115)		
× Low Own-Source Operating Ratio [sq.]		0.003 (0.002)		
× High Debt			0.134 (0.132)	
× High Debt [sq.]			0.003 (0.003)	
× High IGR Dependence				0.030 (0.122)
× High IGR Dependence [sq.]				0.001 (0.003)
Demographic Controls	Yes	Yes	Yes	Yes
Public Finance Controls	Yes	Yes	Yes	Yes
Std. Errors	County	County	County	County
Fixed Effects	CZ	CZ	CZ	CZ

Each column reports a separate regression interacting the change in school millage rates and its squared term with an indicator for the specified public finance mechanism.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.12: Heterogeneity in Local Fiscal Responses: Demographic and Real Estate Mechanisms

	(5)	(6)	(7)
Change in School Rate	−0.227** (0.088)	−0.222** (0.094)	−0.191 (0.118)
Change in School Rate ²	−0.005*** (0.002)	−0.005*** (0.002)	−0.004* (0.002)
× High Owner-Occupied Tax Base	0.395*** (0.143)		
× High Owner-Occupied Tax Base [sq.]	0.008** (0.003)		
× High Democratic Vote		0.135 (0.115)	
× High Democratic Vote [sq.]		0.003 (0.002)	
× High Rural			0.001 (0.130)
× High Rural [sq.]			−0.000 (0.003)
Demographic Controls	Yes	Yes	Yes
Public Finance Controls	Yes	Yes	Yes
Std. Errors	County	County	County
Fixed Effects	CZ	CZ	CZ

Each column reports a separate regression interacting the change in school millage rates and its squared term with an indicator for the specified demographic or real estate mechanism.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3.5 Discussion and Conclusion

School finance reforms provide a useful setting for studying vertical tax competition. In Michigan, Proposal A generated large reductions in school property tax rates across all districts, allowing for a clean examination of local responses. In contrast, reforms in other states often produce more heterogeneous changes, making these dynamics more difficult to isolate.

What can we say conclusively about Proposal A's impact on local property taxes? Our baseline results and subsequent heterogeneity analysis confirm that local governments responded to Proposal A-induced school mill reductions by increasing their own local rates. On average, a one mill decrease in the school rate is associated with a one-fifth of a mill increase in the local rate. This effect was immediate and was driven largely by townships as opposed to cities. Three factors appear to shape these responses: per capita local expenditures, local debt, and the share of owner-occupied housing in the tax base.

Per capita local expenditures play an important role in shaping responses. Higher-spending jurisdictions were more likely to offset school mill reductions with increases in local mill rates, while jurisdictions in the bottom quartile of per capita expenditures exhibited much weaker responses. These differences are driven primarily by townships; for cities, pre-reform expenditure levels do not appear to matter (see Tables C.11 and C.13). Notably, fiscal structure itself does not appear to play a role. Variation in reliance on intergovernmental revenue does not meaningfully affect responses. A final public finance factor that did matter, at least for cities, was pre-reform levels of local debt. Cities in the top quartile of long-term debt outstanding do not offset school mill reductions. Instead, their local millage rates tend to move in the same direction as school rates. When restricting the sample to cities, debt is the only factor that consistently shapes responses to Proposal A.

Turning to demographic and real estate characteristics, only one measure appears to matter. Jurisdictions where owner-occupied housing constitutes a larger share of the property tax base were significantly less likely to offset school mill reductions, and in some cases reduced local millage rates, particularly when school tax changes were large. This effect is concentrated among townships (see Tables C.12 and C.14), a pattern consistent with the view that homeowners are sensitive to property tax changes, and may be less supportive of tax increases. This effect is driven by townships, with no clear effect for cities (see Tables C.12 and C.14).

These results do not support an opportunistic tax-setting story. Jurisdictions where residential real estate make up the bulk of assessed value (as opposed to commercial property, etc.) do not

take advantage of lower school taxes to raise their own rates; if anything, they respond less. Similarly, we expected stronger offsetting behavior in low-expenditure jurisdictions, but instead find the opposite. This suggests that these jurisdictions may face constraints in expanding local taxation, rather than lower demand for public services. This interpretation aligns with Choi (2022), who argues that differences in fiscal capacity can generate unequal influence across local governments. Jurisdictions differ in their ability to adjust tax rates, and these differences appear to shape how they respond to changes in overlapping tax policies. Future work should explore not only total expenditures, but also the composition of those expenditures, which may play an important role in attracting residents (Jong et al., 2025).

We did not explicitly account for horizontal tax competition in this work. While we control for changes in county tax rates, local governments may also respond to the policies of nearby jurisdictions (Yang et al., 2025). Incorporating spatial relationships—such as identifying neighboring jurisdictions using geographic data—would allow for a more direct test of horizontal interactions. Wu and Hendrick (2009) provide one such approach, finding evidence of both vertical and horizontal tax competition in Florida municipalities.

Finally, our analysis does not directly account for capitalization effects. As Lutz (2008) shows, housing prices are an important determinant of property tax revenues. Changes in school taxation may affect housing values, which in turn influence local tax bases. Ruggieri (2025) shows that school spending shocks are capitalized into housing prices and affect the fiscal behavior of overlapping jurisdictions. If Proposal A altered housing values in a heterogeneous way, this may have influenced local tax responses through changes in assessed value. While we control for SEV, this does not capture how Proposal A affected property values themselves, especially the property of homeowners.

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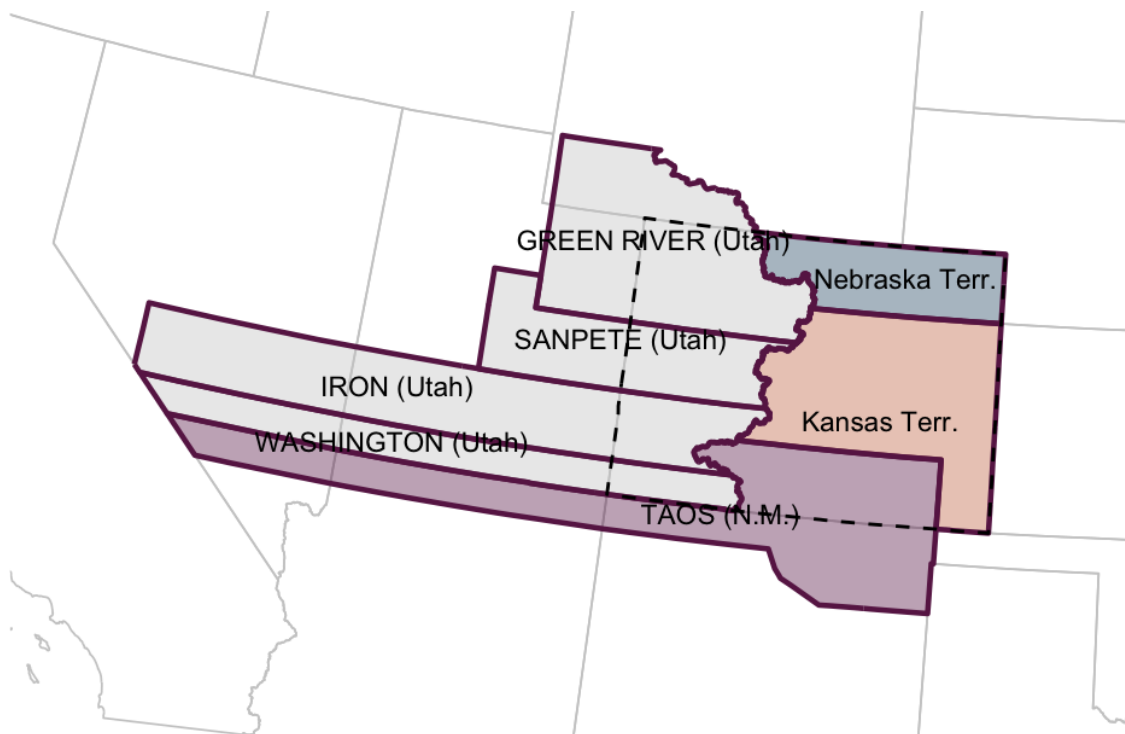
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A.1 Appendix A

A.1.1 Pre-Colorado Boundaries

This appendix shows the evolution of state government boundaries in Colorado using data from Will et al. (2010). Figure A.1 shows the territorial apportionment of the region prior to the creation of Colorado Territory. Overlaying Colorado's 1861 boundary onto the pre-1861 territorial map reveals that the territory was formed from portions of Nebraska, Kansas, New Mexico, and Utah.

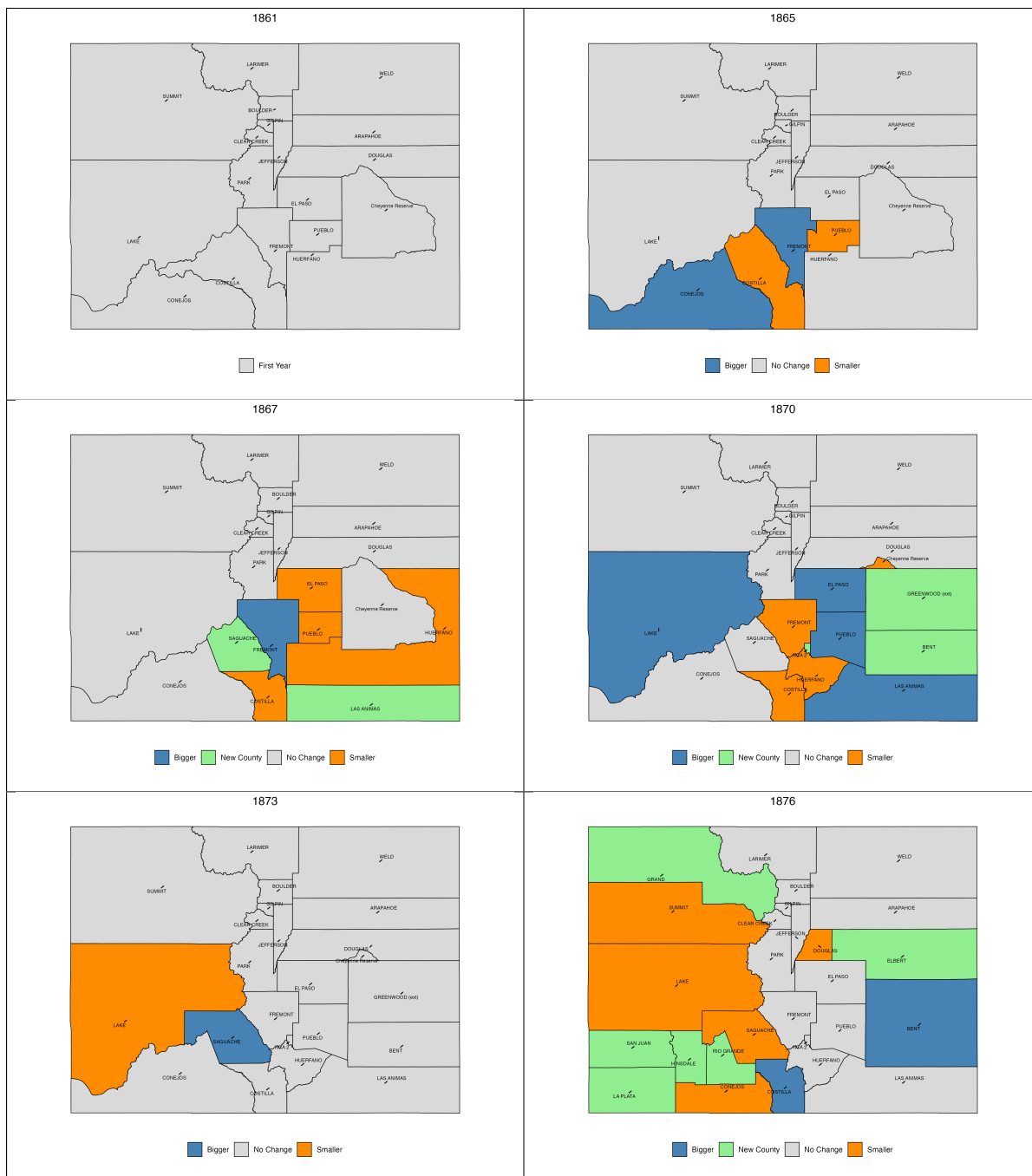


Source: Atlas of Historical County Boundaries. See Will et al. (2010).

Figure A.1: Present-day Colorado with 1854 boundaries

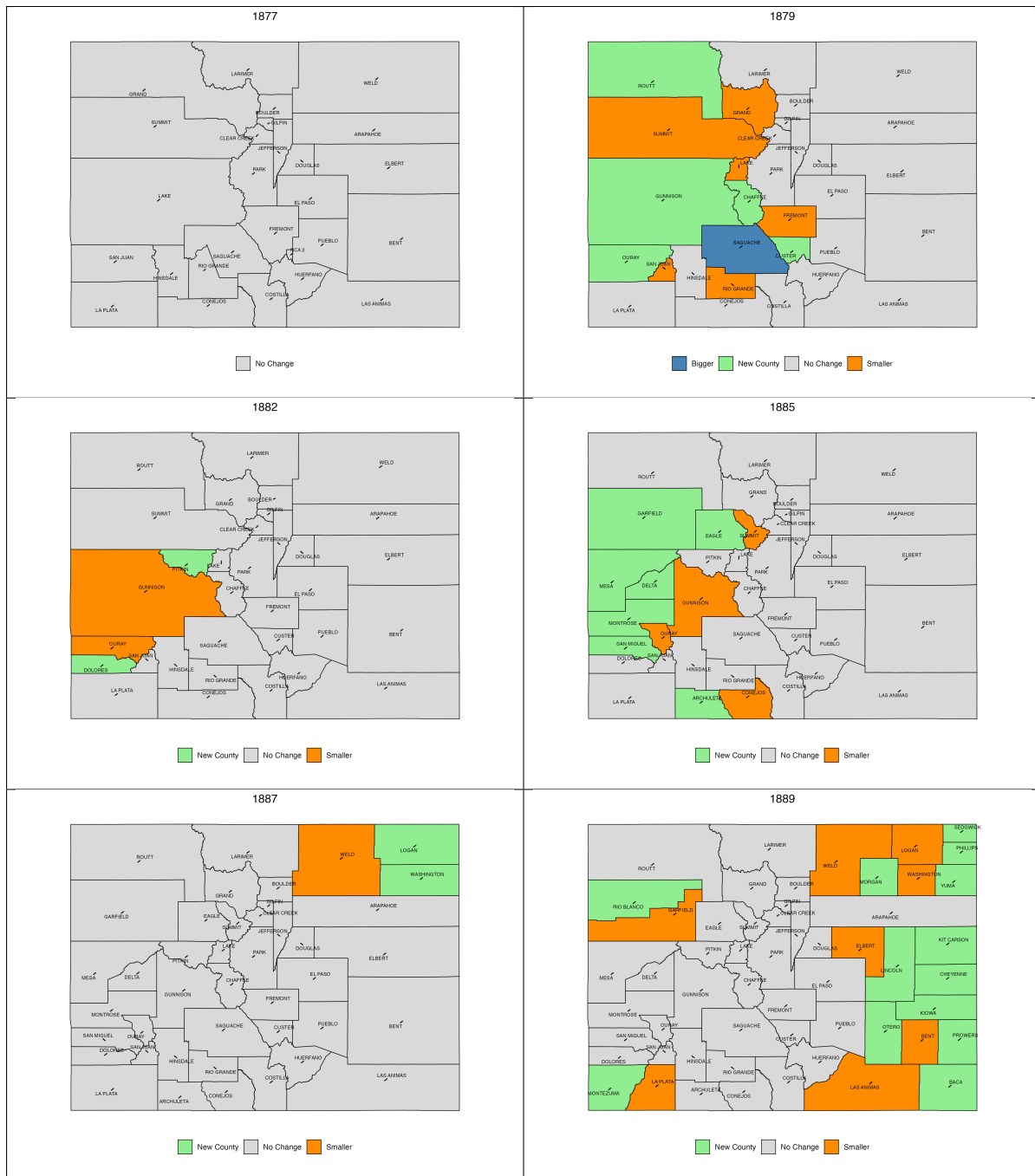
A.1.2 Changes in Colorado County Boundaries, 1861–1889

The Colorado Territory was established on February 28, 1861 – organized by an act of Congress and signed into law by President James Buchanan. Each panel in Figures A.2 and A.3 show county boundaries for the indicated year. Shading denotes whether a county's area increased, decreased, did not change, or appeared as a new county relative to the preceding year.



Source: Atlas of Historical County Boundaries. See Will et al. (2010).

Figure A.2: Changes in Colorado county boundaries, 1861–1876



Source: Atlas of Historical County Boundaries. See Will et al. (2010).

Figure A.3: Changes in Colorado county boundaries, 1877–1889

B.1 Appendix B

B.1.1 Treatment Counts

Tables B.1 and B.2 report the number and share of treated governments in each year under both treatment definitions (i.e., belonging to the top quartile or decile of like-jurisdictions in the share of residential properties belonging to metro districts.

Table B.1: Treatment counts by year: 75th percentile cutoff

Year	Counties			Cities			School districts		
	Control	Treated	Share	Control	Treated	Share	Control	Treated	Share
2010	31	11	0.262	145	49	0.253	92	31	0.252
2011	35	12	0.255	160	54	0.252	105	35	0.250
2012	35	12	0.255	155	52	0.251	102	34	0.250
2013	37	12	0.245	163	55	0.252	107	36	0.252
2014	38	13	0.255	168	56	0.250	109	37	0.253
2015	40	14	0.259	172	58	0.252	112	38	0.253
2016	41	14	0.255	179	60	0.251	113	38	0.252
2017	44	15	0.254	187	62	0.249	122	41	0.252
2018	46	15	0.246	192	64	0.250	123	41	0.250
2019	45	15	0.250	191	64	0.251	124	41	0.248
2020	46	15	0.246	193	64	0.249	124	42	0.253

Table B.2: Treatment counts by year: 90th percentile cutoff

Year	Counties			Cities			School districts		
	Control	Treated	Share	Control	Treated	Share	Control	Treated	Share
2010	37	5	0.119	174	20	0.103	110	13	0.106
2011	42	5	0.106	192	22	0.103	126	14	0.100
2012	42	5	0.106	186	21	0.101	122	14	0.103
2013	44	5	0.102	196	22	0.101	128	15	0.105
2014	46	5	0.098	201	23	0.103	131	15	0.103
2015	48	6	0.111	207	23	0.100	135	15	0.100
2016	49	6	0.109	215	24	0.100	136	15	0.099
2017	53	6	0.102	224	25	0.100	146	17	0.104
2018	55	6	0.098	230	26	0.102	147	17	0.104
2019	54	6	0.100	229	26	0.102	148	17	0.103
2020	55	6	0.098	231	26	0.101	149	17	0.102

B.1.2 Covariate Balance Tables

Tables B.3 through B.14 report covariate balance for counties, cities, and school districts before and after weighting under both treatment definitions.

Table B.3: Covariate balance before weighting (Counties; treatment = $T_above_p75_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	428	145	77,786	175,314	0.504
Families	428	145	18,717	44,149	0.534
Housing units	428	145	34,253	71,432	0.485
Owner-occupied share	428	145	0.7	0.7	-0.377
Median household income (adj.)	428	145	69,208	79,612	0.446
Net assessed value (adj., billions)	428	145	1.86	3.47	0.467
General levy	428	145	21.7	16.0	-0.689

Table B.4: Covariate balance after IPW (Counties; treatment = $T_above_p75_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	428	145	171,925	98,261	-0.345
Families	428	145	42,157	24,762	-0.330
Housing units	428	145	72,428	40,393	-0.372
Owner-occupied share	428	145	0.7	0.7	0.065
Median household income (adj.)	428	145	70,178	63,864	-0.261
Net assessed value (adj., billions)	428	145	3.18	1.97	-0.327
General levy	428	145	18.9	18.6	-0.040

Table B.5: Covariate balance before weighting (Cities; treatment = $T_above_p75_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	1,905	638	6,155	37,372	0.546
Families	1,905	638	1,411	9,340	0.566
Housing units	1,905	638	2,718	15,055	0.535
Owner-occupied share	1,905	638	0.67	0.70	0.207
Median household income (adj.)	1,905	638	64,200	94,741	0.856
Net assessed value (adj., billions)	1,905	638	0.12	0.64	0.661
General levy	1,905	638	13.55	7.65	-0.757

Table B.6: Covariate balance after IPW (Cities; treatment = $T_above_p75_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	1,832	627	13,159	13,155	-0.000
Families	1,832	627	2,958	3,261	0.033
Housing units	1,832	627	5,696	5,449	-0.016
Owner-occupied share	1,832	627	0.67	0.62	-0.336
Median household income (adj.)	1,832	627	69,014	67,413	-0.048
Net assessed value (adj., billions)	1,832	627	0.26	0.23	-0.045
General levy	1,832	627	12.49	9.94	-0.344

Table B.7: Covariate balance before weighting (School districts; treatment = $T_above_p75_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	1,233	414	16,687	90,397	0.671
Families	1,233	414	4,038	22,357	0.705
Housing units	1,233	414	7,346	37,984	0.652
Owner-occupied share	1,233	414	0.73	0.7	-0.152
Median household income (adj.)	1,233	414	66,777	86,248	0.929
Net assessed value (adj., billions)	1,233	414	0.38	2.00	0.701
General levy	1,233	414	19.77	19.8	0.012

Table B.8: Covariate balance after IPW (School districts; treatment = $T_above_p75_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	1,226	405	34,981	34,378	-0.007
Families	1,226	405	8,432	8,508	0.004
Housing units	1,226	405	15,240	14,719	-0.015
Owner-occupied share	1,226	405	0.72	0.72	-0.061
Median household income (adj.)	1,226	405	70,449	68,263	-0.103
Net assessed value (adj., billions)	1,226	405	0.77	0.80	0.018
General levy	1,226	405	19.88	21.30	0.201

Table B.9: Covariate balance before weighting (Counties; treatment = $T_above_p90_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	513	60	102,464	102,478	0.000
Families	513	60	24,890	27,397	0.063
Housing units	513	60	43,899	41,625	-0.036
Owner-occupied share	513	60	0.7	0.7	0.018
Median household income (adj.)	513	60	71,712	72,946	0.044
Net assessed value (adj., billions)	513	60	2.26	2.29	0.009
General levy	513	60	20.7	16.4	-0.557

Table B.10: Covariate balance after IPW (Counties; treatment = $T_above_p90_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	513	60	110,386	115,107	0.028
Families	513	60	26,961	31,215	0.097
Housing units	513	60	46,821	44,874	-0.029
Owner-occupied share	513	60	0.7	0.7	-0.167
Median household income (adj.)	513	60	71,374	78,216	0.215
Net assessed value (adj., billions)	513	60	2.36	2.48	0.034
General levy	513	60	20.2	19.3	-0.127

Table B.11: Covariate balance before weighting (Cities; treatment = $T_above_p90_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	2,285	258	13,669	17,008	0.093
Families	2,285	258	3,308	4,276	0.110
Housing units	2,285	258	5,749	6,460	0.049
Owner-occupied share	2,285	258	0.67	0.70	0.175
Median household income (adj.)	2,285	258	69,653	92,721	0.607
Net assessed value (adj., billions)	2,285	258	0.24	0.33	0.155
General levy	2,285	258	12.69	6.69	-0.820

Table B.12: Covariate balance after IPW (Cities; treatment = $T_above_p90_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	2,201	258	16,553	7,235	-0.242
Families	2,201	258	4,020	1,779	-0.238
Housing units	2,201	258	6,885	3,031	-0.248
Owner-occupied share	2,201	258	0.67	0.62	-0.359
Median household income (adj.)	2,201	258	71,221	63,835	-0.220
Net assessed value (adj., billions)	2,201	258	0.28	0.14	-0.257
General levy	2,201	258	12.30	9.77	-0.355

Table B.13: Covariate balance before weighting (School districts; treatment = $T_above_p90_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	1,478	169	30,531	74,175	0.474
Families	1,478	169	7,345	19,492	0.520
Housing units	1,478	169	13,282	29,659	0.439
Owner-occupied share	1,478	169	0.73	0.72	-0.100
Median household income (adj.)	1,478	169	70,492	81,455	0.466
Net assessed value (adj., billions)	1,478	169	0.69	1.65	0.492
General levy	1,478	169	19.63	21.18	0.208

Table B.14: Covariate balance after IPW (School districts; treatment = $T_above_p90_y$).

Variable	Control N	Treated N	Control Mean	Treated Mean	SMD
Population	1,463	168	39,335	28,122	-0.135
Families	1,463	168	9,543	7,201	-0.115
Housing units	1,463	168	16,926	12,127	-0.137
Owner-occupied share	1,463	168	0.73	0.70	-0.240
Median household income (adj.)	1,463	168	71,361	67,681	-0.169
Net assessed value (adj., billions)	1,463	168	0.84	0.80	-0.021
General levy	1,463	168	19.69	22.33	0.366

C.1 Appendix C

C.1.1 Summary Statistics

Table C.1: Largest Absolute Mill Increases, 1993–1995

Cities		Townships	
Name	Δ Mill Rate	Name	Δ Mill Rate
Hartford	9.12	Canton	11.70
Durand	7.75	Grosse Pointe	11.70
Saginaw	6.37	Sumpter	10.80
Saline	5.99	Antioch	9.96
Ecorse	4.93	Wilson	9.66
Gaylord	4.18	Oshtemo	9.08
Tecumseh	3.86	Rose	7.98
Zilwaukee	3.61	Carrollton	7.95
Plainwell	3.14	Leroy	7.77
Auburn	3.02	Alcona	7.32

Table C.2: Largest Absolute Mill Decreases, 1993–1995

Cities		Townships	
Name	Δ Mill Rate	Name	Δ Mill Rate
Ionia	-11.8	Bois Blanc	-13.30
Benton Harbor	-5.16	Pte Aux Barques	-10.80
Ludington	-4.04	Peaine	-10.20
Bay City	-3.85	Kalamazoo	-9.98
Frankfort	-3.52	Redford	-9.06
Muskegon	-3.31	Ypsilanti	-7.61
Leslie	-2.89	St James	-7.43
Corunna	-2.74	Chandler	-7.25
Negaunee	-2.70	Meridian	-6.97
River Rouge	-2.47	Mt Morris	-6.77

Table C.3: Largest Proportional Mill Increases, 1993–1995 (log-diff)

Cities		Townships	
Name	Log-diff	Name	Log-diff
Stephenson	0.693	Grosse Pointe	2.85
Hartford	0.565	Southfield	2.24
Saginaw	0.429	Leroy	2.21
Saline	0.408	Carrollton	2.19
Durand	0.385	Sheridan	2.19
Tecumseh	0.299	Allis	2.13
Gaylord	0.283	Rogers	2.08
Auburn	0.264	Crockery	2.06
Roosevelt Park	0.254	Onondaga	2.03
Zilwaukee	0.249	Berrien	2.01

Table C.4: Largest Proportional Mill Decreases, 1993–1995 (log-diff)

Cities		Townships	
Name	Log-diff	Name	Log-diff
Ionia	-1.07	Bois Blanc	-2.70
Muskegon	-0.283	Peaine	-2.56
Ludington	-0.230	Summerfield	-2.30
Harbor Springs	-0.208	Meridian	-2.12
Frankfort	-0.200	Baroda	-2.11
Corunna	-0.182	Genesee	-2.07
Benton Harbor	-0.164	Chandler	-2.07
Bay City	-0.148	Lansing	-2.03
Hudson	-0.147	Delta	-2.00
Grand Rapids	-0.142	Lake	-1.98

Table C.5: Summary Statistics: Public Finance Variables, Cities

Variable	Mean	Std. Dev.	Min	Max
Local Rate, 1993	16.2	4.91	1.92	34.16
Local Rate, 1995	16.47	4.9	2.3	36.76
School Rate, 1993	41.57	6.14	9.34	55.44
School Rate, 1995	17.15	4.01	8.04	33.33
County Rate, 1993	6.82	1.47	4.45	10.85
County Rate, 1995	6.66	1.41	4.76	10.17
SEV, 1993 (\$mil.)	288.56	618.75	1.64	5672.06
SEV, 1995 (\$mil.)	326.65	677.56	1.75	5844.87
Median Home Value (\$000s)	62.35	49.34	19.5	495
Aggregate Value (\$mil.)	268.77	574.11	2.65	4870.37
Percent Vacant	0.08	0.07	0.01	0.72
Total Expend. p.c., 1992	1031.06	732.22	198.14	7891.26
Interest on Debt p.c., 1992	33.66	60.91	0	484.81
Debt Outstanding p.c., 1992	603.86	884.46	0	7909.97
Fire Protection Expend. p.c., 1992	39.07	34.56	0	225.93
Highways Expend. p.c., 1992	114.18	63.96	9.15	441.1
Housing & Community Expend. p.c., 1992	5.14	22.52	0	274.17
Central Staff Expend. p.c., 1992	34.74	23.18	0	160.24
Parks & Recreation Expend. p.c., 1992	34.94	45.49	0	427.07
Police Protection Expend. p.c., 1992	112.27	82.21	0	862.32
Sewerage Expend. p.c., 1992	110.58	195.21	0	2046.3
Utilities Expend. p.c., 1992	206.03	402.21	0	4432.84
Own-Source Operating Ratio, 1992	1.02	0.34	0.18	3.9
Intergovernmental Revenue Share, 1992	0.24	0.12	0.04	0.89

Table C.6: Summary Statistics: Public Finance Variables, Townships

Variable	Mean	Std. Dev.	Min	Max
Local Rate, 1993	2.27	1.76	0	14.4
Local Rate, 1995	2.47	1.93	0	14.8
School Rate, 1993	39.11	6.05	5.44	57.6
School Rate, 1995	14.45	3.99	4.04	34.77
County Rate, 1993	7.08	1.61	4.45	12.8
County Rate, 1995	6.9	1.54	4.76	12.62
SEV, 1993 (\$mil.)	59.67	137.67	0.73	1985.64
SEV, 1995 (\$mil.)	73.81	163.3	1.08	2251.12
Median Home Value (\$000s)	52.56	23.74	15.6	340.7
Aggregate Value (\$mil.)	54.54	180.6	0.11	3295.23
Percent Vacant	0.25	0.23	0.01	0.9
Total Expend. p.c., 1992	172.49	384.44	0	11913.46
Interest on Debt p.c., 1992	5.7	106.94	0	3580.34
Debt Outstanding p.c., 1992	91.29	1652	0	56124.76
Fire Protection Expend. p.c., 1992	17.39	17.39	0	179.13
Highways Expend. p.c., 1992	25.63	35.21	0	510
Housing & Community Expend. p.c., 1992	0.03	0.65	0	21.26
Central Staff Expend. p.c., 1992	20.67	18.99	0	200.79
Parks & Recreation Expend. p.c., 1992	4.31	28.5	0	834.65
Police Protection Expend. p.c., 1992	5.05	14.51	0	143.08
Sewerage Expend. p.c., 1992	15.26	218.74	0	7567.31
Utilities Expend. p.c., 1992	9.01	51.41	0	1265.9
Own-Source Operating Ratio, 1992	0.94	2.77	0.02	95.55
Intergovernmental Revenue Share, 1992	0.45	0.18	0	0.98

Table C.7: Summary Statistics: Demographic Variables, Cities

Variable	Mean	Std. Dev.	Min	Max
Population	19110.06	67000.51	328	1027974
Families	4815.09	16084.36	102	244327
Percent Age < 24	0.36	0.06	0.22	0.7
Percent Age 24–64	0.48	0.05	0.22	0.6
Percent Age 65+	0.15	0.05	0.04	0.36
Percent White	0.93	0.13	0.06	1
Percent Black	0.04	0.13	0	0.93
Percent HS or Less	0.57	0.15	0.1	0.83
Percent Bachelor+	0.17	0.13	0.03	0.71
Percent HH No Income	0.27	0.09	0.07	0.53
Percent Rural	0.26	0.44	0	1
Percent Owner Occupied	0.61	0.12	0.15	0.97
Median Rent	346.98	131.33	163	972
County Democratic Presidential Vote Share (1992)	0.42	0.09	0.23	0.6

Table C.8: Summary Statistics: Demographic Variables, Townships

Variable	Mean	Std. Dev.	Min	Max
Population	3260.42	6105.42	21	85866
Families	897.37	1667.94	6	23523
Percent Age < 24	0.36	0.05	0.05	0.59
Percent Age 24–64	0.51	0.03	0.35	0.67
Percent Age 65+	0.13	0.06	0.02	0.49
Percent White	0.97	0.06	0.31	1
Percent Black	0.01	0.05	0	0.68
Percent HS or Less	0.65	0.12	0.1	0.93
Percent Bachelor+	0.11	0.08	0	0.7
Percent HH No Income	0.27	0.11	0	0.81
Percent Rural	0.93	0.21	0	1
Percent Owner Occupied	0.63	0.2	0.08	0.96
Median Rent	274.49	78.28	0	875
County Democratic Presidential Vote Share (1992)	0.39	0.06	0.23	0.6

C.1.2 Robustness to Alternative Jurisdiction Sizes

In the following table, we show the baseline results for alternative jurisdiction sizes. As is evident moving from left to right in C.9, the effect sizes change dramatically when reducing our sample to smaller and smaller city and township sizes. Table C.10 shows the counts of cities and townships included in each sample. When restricted to jurisdictions with less than 500 persons, there are only 6 cities and 135 townships remaining. With such a small n-size, we do not run additional regressions on even smaller population samples.

Table C.9: Robustness to Population Restrictions

	< 10,000	< 5,000	< 2,500	< 1,000	< 500
Change in School Rate	-0.184** (0.087)	-0.183** (0.089)	-0.250** (0.102)	-0.470*** (0.154)	-0.836** (0.315)
Change in School Rate Sq.	-0.004** (0.002)	-0.004** (0.002)	-0.006*** (0.002)	-0.012*** (0.004)	-0.021*** (0.008)
Demographic Controls	Yes	Yes	Yes	Yes	Yes
Public Finance Controls	Yes	Yes	Yes	Yes	Yes
Std. Errors	County	County	County	County	County
Fixed Effects	CZ	CZ	CZ	CZ	CZ

All specifications use the preferred baseline specification from 3.4.1, estimated on progressively smaller population subsamples. Each column restricts the sample to jurisdictions with 1992 population below the listed threshold. All specifications include baseline SEV (1993), the change in SEV (1993–1995), the change in county mill rates (1993–1995), demographic controls, public finance controls, a quadratic term in the change in school rates, and commuting-zone fixed effects. Standard errors are clustered by county.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table C.10: Number of Jurisdictions by Population Threshold

	< 10,000	< 5,000	< 2,500	< 1,000	< 500
Cities	181	130	74	14	6
Townships	1,144	1,058	807	354	135

C.1.3 Heterogeneity by Government Type

Table C.11: Heterogeneity in Local Fiscal Responses: Public Finance Mechanisms (Townships)

	(1)	(2)	(3)	(4)
Change in School Rate	−0.193*	−0.177*	Not Estimated	−0.160*
	(0.099)	(0.098)	—	(0.094)
Change in School Rate ²	−0.004**	−0.004**	—	−0.004*
	(0.002)	(0.002)	—	(0.002)
× Low Expenditures	0.187*			
	(0.111)			
× Low Expenditures [sq.]	0.004*			
	(0.002)			
× Low Own-Source Operating Ratio		0.121		
		(0.126)		
× Low Own-Source Operating Ratio [sq.]		0.002		
		(0.003)		
× High IGR Dependence				0.109
				(0.177)
× High IGR Dependence [sq.]				0.002
				(0.004)
Demographic Controls	Yes	Yes	—	Yes
Public Finance Controls	Yes	Yes	—	Yes
Std. Errors	County	County	—	County
Fixed Effects	CZ	CZ	—	CZ

Township-only sample. The debt-based specification is not estimated for townships due to insufficient cross-sectional variation in per capita debt. The distribution is highly concentrated near zero, leaving too few observations with meaningful debt levels to define a high-debt group.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table C.12: Heterogeneity in Local Fiscal Responses: Demographic and Real Estate Mechanisms (Townships)

	(1)	(2)	(3)
Change in School Rate	-0.224** (0.088)	-0.208** (0.100)	0.078 (0.280)
Change in School Rate ²	-0.005*** (0.002)	-0.005** (0.002)	0.002 (0.005)
× High Owner-Occupied Tax Base	0.629*** (0.224)		
× High Owner-Occupied Tax Base [sq.]	0.012*** (0.004)		
× High Democratic Vote		0.235 (0.142)	
× High Democratic Vote [sq.]		0.005* (0.003)	
× High Rural			-0.256 (0.293)
× High Rural [sq.]			-0.006 (0.006)
Demographic Controls	Yes	Yes	Yes
Public Finance Controls	Yes	Yes	Yes
Std. Errors	County	County	County
Fixed Effects	CZ	CZ	CZ

Township-only sample.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table C.13: Heterogeneity in Local Fiscal Responses: Public Finance Mechanisms (Cities)

	(1)	(2)	(3)	(4)
Change in School Rate	−0.145 (0.102)	−0.094 (0.090)	−0.349*** (0.128)	−0.141* (0.080)
Change in School Rate ²	−0.002 (0.002)	−0.002 (0.002)	−0.007*** (0.003)	−0.003* (0.002)
× Low Expenditures	0.048 (0.285)			
× Low Expenditures [sq.]	−0.001 (0.005)			
× Low Own-Source Operating Ratio		−0.419 (0.313)		
× Low Own-Source Operating Ratio [sq.]		−0.007 (0.006)		
× High Debt			0.630** (0.252)	
× High Debt [sq.]			0.013** (0.005)	
× High IGR Dependence				0.010 (0.179)
× High IGR Dependence [sq.]				0.001 (0.004)
Demographic Controls	Yes	Yes	Yes	Yes
Public Finance Controls	Yes	Yes	Yes	Yes
Std. Errors	County	County	County	County
Fixed Effects	CZ	CZ	CZ	CZ

City-only sample.

* p < 0.1, ** p < 0.05, *** p < 0.01

Table C.14: Heterogeneity in Local Fiscal Responses: Demographic and Real Estate Mechanisms (Cities)

	(1)	(2)	(3)
Change in School Rate	−0.050 (0.110)	−0.171 (0.104)	−0.204 (0.134)
Change in School Rate ²	−0.000 (0.002)	−0.004 (0.002)	−0.004 (0.003)
× High Owner-Occupied Tax Base	−0.248 (0.224)		
× High Owner-Occupied Tax Base [sq.]	−0.006 (0.004)		
× High Democratic Vote		−0.014 (0.152)	
× High Democratic Vote [sq.]		0.000 (0.003)	
× High Rural			0.060 (0.157)
× High Rural [sq.]			0.001 (0.003)
Demographic Controls	Yes	Yes	Yes
Public Finance Controls	Yes	Yes	Yes
Std. Errors	County	County	County
Fixed Effects	CZ	CZ	CZ

City-only sample.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$