

# Tax Delinquency, Housing Distress, and U.S. City Budgets during the Great Depression

James Siodla<sup>a</sup>

5245 Mayflower Hill, Waterville, ME 04901

<sup>a</sup>Department of Economics, Colby College

---

## Abstract

During the 1920s, city governments relied heavily on property taxes and special assessment fees as sources of revenue. Special assessment fees—often one-time charges—relied on new construction, while property tax collections relied on the value of local tax bases and prompt payments. Focusing on the roles of housing markets and tax delinquencies, this paper studies why fluctuations in revenue and spending varied across 94 large U.S. cities between 1923 and 1936. While budgets grew most during the 1920s in cities where house prices and residential construction increased the most, they were relatively stable in the face of the housing distress that plagued many cities during the Great Depression. Nevertheless, most municipal budgets contracted during the 1930s, due principally to rising tax delinquency: a one-standard-deviation increase in the delinquency rate was associated with a 4 percent decline in total revenue and a 3 percent decline in current (non-capital) expenditures. High delinquency was specifically associated with decreased spending on community protection, sanitation, and health. These results not only provide insight into the variation in city budgetary experiences during the 1920s and 1930s, but also into the policy responses of local governments during the downturn.

*Keywords:* Great Depression, housing, municipal finances, property taxes, Roaring Twenties, tax delinquency

*JEL:* N92, R51

---

## 1. Introduction

The property tax was the most important source of revenue for cities in the early twentieth century. During the 1920s, building booms increased the value of local tax bases and led to an expansion of city services. However, as the economy began to worsen in 1929, many cities faced falling house prices and construction activity, as well as greater property tax delinquency as taxpayers suffered from high unemployment and declining incomes. Because the property tax operates *ad valorem* and its collection relies on taxpayer

---

*Email address:* [jrsiodla@colby.edu](mailto:jrsiodla@colby.edu) (James Siodla)

*URL:* <https://jamesiodla.com> (James Siodla)

payments, declines in house prices and growing delinquencies during the Great Depression may have had significant budgetary consequences for cities. The same is true for the falloff in construction activity, since special assessment fees tied to new construction made up a considerable portion of municipal revenue during the 1920s. This paper aims to determine whether cities that faced severe housing distress or high tax delinquency rates during the 1930s experienced the largest revenue and spending contractions, which would then have impacted municipal employees, residents, and even creditors. Since a city's budget reflects both its provision of local public goods and its means of financing them, the results of this study yield insight into the principal fiscal challenges and policy responses of municipal governments during the Great Depression.

This study relies on annual financial data for 94 large U.S. cities between 1923 and 1936, as compiled from the *Financial Statistics of Cities* reports produced by the U.S. Census Bureau.<sup>1</sup> To highlight the trends in these data, Figure 1 shows the paths of average real per capita revenue and spending during this time. The 1920s were a period of fairly steady growth in revenue and spending for the average city. However, revenue shortfalls emerged in the midst of the Great Depression, driven largely by the decline in property taxes. Between 1932 and 1933, property taxes declined by nearly 5 percent, while total revenue fell by 2 percent. The average city also cut total spending by 14 percent between 1932 and 1935 and current (non-capital) expenditures by over 7 percent between 1931 and 1934.<sup>2</sup> While these declines are small relative to the drop in national income, they hide important information about the different financial experiences of cities during the Great Depression.

Figure 2 shows the fraction of cities in which real property taxes and current expenditures declined between 1931 and 1936. Most cities experienced growth in revenue and spending in the early years of the Depression. However, at the depth of the downturn in 1933, roughly 70 percent of city governments experienced a decline in total revenue, property taxes, and current expenditures, while 85 percent of cities reduced total spending. It was not until 1936 that city finances mostly began to recover. Furthermore, between 1931 and 1936, all but two large cities experienced real revenue and spending declines in at least one year, while roughly half of cities saw revenue or spending contract in at least three years.<sup>3</sup> Additionally, as this paper shows, cities varied in how much their budgets suffered during the 1930s. Overall, municipal budgets did not shrink in the same years, for the same duration, nor to the same degree. While the downturn's impact on the national economy was widespread, the paths of city finances were anything but uniform, which suggests that the municipal budgetary contractions of the Depression were due more to changes in city-level factors than to broad changes in the economy.

It is not immediately clear what explains the variation in city budgetary distress during the Great

---

<sup>1</sup>These data are described in Section 3.

<sup>2</sup>These calculations are based on data shown in Figure 1 and given in Table A4.

<sup>3</sup>See Table A2 in the appendix for these calculations.

Depression. For instance, housing market and tax delinquency experiences also varied considerably across cities during the 1930s. Observers at the time even emphasized different factors (Gilbert, 1940; Bird, 1936a; Upson, 1935). Furthermore, local governments could counteract revenue declines with a variety of policy actions. If, for example, falling house values led to reductions in assessed values, without a countervailing hike in property tax rates, municipal budgets could have suffered (Gilbert, 1940).<sup>4</sup> Likewise, a falloff in the special assessment fees attached to new construction could have stressed municipal budgets, especially if city governments could not raise revenues through other taxes. According to this view, busts in local house prices and construction activity explain the municipal budgetary contractions of the 1930s. On the other hand, if city governments could not meet revenue shortfalls created by tax delinquency through borrowing or other means, then this would have also pinched budgets.<sup>5</sup> In this view, the behavior of local taxpayers accounts for the city budgetary stress of the period. The relative importance of these different factors is still unknown, as previous studies offer conflicting views of the primary revenue challenge that cities faced during the Depression. Neither is it clear which city services may have suffered as a result.

The Great Depression was one of the largest economic downturns in U.S. history, during which some urban governments and communities suffered more than others. Understanding why has implications for how we view the variation in municipal experiences during the crisis. This period also marks the beginning of a system dominated by state and federal expenditures rather than local government spending.<sup>6</sup> The provisions of the federal New Deal programs, beginning in 1933, influenced the decline of local government expenditures relative to state and federal spending (Wallis, 1984).<sup>7</sup> Cities began to receive more revenue from state and federal grants, thus diversifying their revenue streams. But before this institutional change, cities struggled to provide essential services for their communities in the worst years of the Depression. Indeed, the shift toward a new municipal–federal alignment may have roots in the urban financial crisis itself as tired and desperate mayors began to lobby for federal assistance (Gelfand, 1975). The results of this paper thus

---

<sup>4</sup>Recent studies have focused on the relationship between house prices and city revenue around the time of the Great Recession in 2008–09. The findings indicate that, while city revenue generally rose with increases in house prices up to 2006, it changed little (if at all) when house prices fell after 2006 (Alm et al., 2011; Doerner and Ihlanfeldt, 2011; Lutz et al., 2011; Ross et al., 2015). These results are not specific to the recession. For local governments between 1985 and 2005, Lutz (2008) finds that the elasticity of property tax revenue with respect to house prices in local U.S. governments is positive for house price increases but nearly nonexistent for house price declines. In the period between 1993 and 2007, Vlaicu and Whalley (2011) find a positive and symmetric relationship between house price changes and property tax revenue in California (perhaps due to the special rules imposed by Prop. 13). Although reasons vary for the overall stability of property taxes in the face of slumps in house prices, they are often due to increases in property tax rates, lags in property re-assessment, and under-assessments that allow cities to maintain assessed values as house prices fall.

<sup>5</sup>Recent work focusing on localized shocks—such as mass foreclosures that drive house prices downward and fiscal mismanagement—finds that they lead not only to revenue shortfalls for local governments (Alm et al., 2014; Alm and Leguizamón, 2018), but also to spending cuts (Cromwell and Ihlanfeldt, 2015; Ihlanfeldt and Mayock, 2015; Skidmore and Scorsone, 2011; Thompson, 2016, 2017).

<sup>6</sup>Municipal expenditures were a large source of government activity in this era. Legler et al. (1988) show that local government revenues in the U.S. exceeded state and federal revenues beginning in the 1890s. Before the New Deal, local spending made up over half of total government spending in the U.S. (Wallis, 1984, Fig. 2). After 1932, New Deal grants helped stimulate local economies (Fishback et al., 2005). At least some of this grant spending replaced the relief spending that was administered by local governments before the shift towards greater federal spending.

<sup>7</sup>Tax delinquency itself spurred the rise of general sales taxes administered at the state level (Coen-Pirani and Wooley, 2018).

shed light on how city governments responded to the fiscal stress of the 1930s just as the federal government began to assume a larger role in local affairs.

This study combines revenue and spending data from the *Financial Statistics of Cities* reports with data from census building reports on housing construction and costs, as well as delinquency rates gathered from a report issued by Dun and Bradstreet, Inc. in 1938. These data have not before been used together to test hypotheses regarding the determinants of city budgets during the Great Depression. The results show that, while city finances were highly sensitive to changes in house prices (as proxied by construction costs) and residential construction activity in the 1920s, budgets did not contract during the Depression due to housing market distress. Instead, a principal factor pinching city finances in the early 1930s was the rise in unpaid property taxes. Budgets in cities that experienced the highest rates of tax delinquency suffered the most: a one-standard-deviation increase in this rate was associated with a 4 percent decline in real per capita total revenue and a 3 percent decline in current (non-capital) expenditures during the Great Depression. High delinquency was primarily associated with decreased spending on police and fire protection, sanitation, and health. Thus, the behavior of local taxpayers had important implications for the many employees and residents who relied on these city services during the downturn.

## 2. Historical Background

### 2.1. Regional Variation in City Finances

There was substantial variation in the municipal budgetary experiences of the 1920s and 1930s. Table 1 contains information on the distribution of the ratios of city revenue and spending across census regions in various years relative to the peak revenue year of 1932.<sup>8</sup> Growth in finances was greatest in the Northeast in the 1920s, where old and established cities grew even more. City revenue in the Midwest and West suffered the most during the Depression, even though it grew the least in these regions during the 1920s. Except for cities in the Northeast, recovery in property taxes still had not occurred by 1936, although total revenue had recovered in all regions by then. Southern cities decreased spending the most in 1933, and no regions had recovered their 1932 spending levels by 1936.

Aside from the differences across regions, there was also substantial variation within regions. In the 1920s, the newer cities of the West exhibited much variation in revenue growth, while cities in the Midwest and the South experienced the greatest variation during the Depression. Revenue and spending in the older cities of the Northeast were generally less variable during the 1920s and 1930s. Additionally, cities in regions that exhibited the most variation in budgetary changes during the 1920s did not always exhibit the most

---

<sup>8</sup>The analysis focuses on real per capita financial variables. Throughout the remainder of the study, I often exclude the ‘real per capita’ adjectives in describing all revenue and spending categories.

variation during the Depression (e.g., revenue in western cities). Overall, municipal budgetary experiences during the 1920s and 1930s varied substantially across cities, regions, and time.

## *2.2. Housing Markets and Tax Delinquency*

Most cities experienced booms in house prices and construction activity during the 1920s, aided by financial innovations that helped provide ample credit to homebuyers (Snowden, 2010).<sup>9</sup> Municipal governments also benefited from the expansion of credit (Bird, 1936b); investment in roads and schools—often funded with debt—fueled more than half the growth in local government spending during the 1920s (Wallis, 2001). Swelling housing markets enabled growth in property taxes, which increased with more properties valued at ever-higher levels, as well as growth in special assessments, which were often one-time fees levied on new construction projects to help defray the costs of infrastructure. Together, property taxes and special assessments made up over 70 percent of total city revenue received during the 1920s (see Tables A3 and A4 in the appendix), with housing itself accounting for the largest portion of any city’s assessment roll.<sup>10</sup> House price appreciation and growth in residential construction in the 1920s fueled local budgets by expanding tax bases and bolstering special fee collections.

A slowdown in housing came late in the 1920s. Residential construction began to decline in 1925 and fell consistently thereafter; furthermore, cities that saw bigger construction booms in the 1920s experienced bigger busts in the 1930s (Brocker and Hanes, 2014).<sup>11</sup> House-building suffered more than other construction projects; across 257 surveyed cities, residential permits represented nearly 60 percent of total building permit value in 1925 but only 20 percent in 1934 (U.S. Bureau of Labor Statistics, 1938, Table A1). House prices took their largest tumble beginning in 1929, although in real terms they fell later in the Depression, peaking at some point in the early 1930s (Fishback and Kollman, 2014).<sup>12</sup> Nevertheless, some urban real estate markets suffered greatly. For instance, in Manhattan between 1929 and 1933, real estate prices overall—commercial plus residential—fell at least 36 percent in nominal terms and 15 percent in real terms (Nicholas and Scherbina, 2013, Tables A1 and A2, pp. 306–309).

---

<sup>9</sup>These financial innovations included private mortgage insurance, high leverage, affordable mortgage loans, and early forms of securitization.

<sup>10</sup>While there is variation in the makeup of assessment rolls across cities and time, one example is Chicago, a city known for its commercial prowess. Real estate in Chicago covered two-thirds of the assessment roll in 1931, with the other third in personal property (Heer, 1936, p. 24). Dwellings made up one-third of the assessment roll, with owner-occupied housing accounting for 14 percent and rented housing for 19 percent. The next-largest category in real estate included commercial office buildings, hotels, department stores, and mercantile buildings, which covered 15 percent of the assessment roll. Compared to Chicago, commercial real estate likely comprised a larger portion of the assessment roll in cities like New York, and a smaller portion in cities with less commercial presence.

<sup>11</sup>This point is related to the credit-boom view of business cycles, which asserts that periods of excessive credit expansion can lead to large subsequent slumps. Although this view does not explain everything about the business cycle of the 1920s and 1930s, there is evidence that credit expansion and contraction played an important role. See, for example, Eichengreen and Mitchener (2004) for a study of the Great Depression period and Schularick and Taylor (2012) for a long-run view.

<sup>12</sup>Other studies that document the changes in house prices during this period include Brocker and Hanes (2014), Field (2014), and White (2014).

Another urban challenge during the 1930s were property tax delinquencies. Cities planned budgets around the stable receipt of property taxes and other revenue streams, but delinquencies led to unplanned shortfalls in revenue. Using data collected from a report issued in 1938 (Bird, 1938), Table 2 shows average tax delinquency rates by region, as well as standard deviations that represent the variation within regions.<sup>13</sup> A city's delinquency rate is defined as the proportion of taxes levied on all property—real and personal—within a city's jurisdiction that are unpaid in a given fiscal year. Across the country, tax delinquencies increased considerably in 1932 and peaked in 1933, when the average city's rate of unpaid taxes was over 26 percent. This timing is closely aligned with the beginning of the fall in revenue and spending depicted in Figures 1 and 2. Delinquency rates peaked in each region in 1933. However, while rising tax delinquency was a national problem, there was substantial variation across regions and cities. For instance, the increase was greatest in the Midwest than it was elsewhere, even as the variation within the region was smaller than that in other regions. Furthermore, delinquency rates were generally smaller in the West. Much of this variation may be due to different experiences in real estate speculation or the regulation of subdivision development during the 1920s (Bird, 1936a, pp. 345–346). Speculative and scattered development—as builders subdivided outlying parcels of land in the hope of selling them off for great profit—left many cities with thousands of vacant lots in the downturn (Field, 1992). In a 1938 tax sale in Detroit, the first in the city since 1932 (when they were suspended), 65 percent of all subdivided lots in the metropolitan area were advertised (Michigan Planning Commission, 1939). Owners of these lots—which did not generate income—had little incentive to pay taxes when house prices and construction were plummeting. At a municipal finance conference in the summer of 1933, city officials and professors even laid the blame for high rates of unpaid taxes on real estate subdividers and the bankers who facilitated their efforts (New York Times, 1933b).

The fallout from real estate speculation does not explain all of the delinquency experience across cities, however. The rise in delinquency rates between 1930 and 1933 was nearly universal, even if land booms in the 1920s were not.<sup>14</sup> For instance, many residents not directly involved in the speculative subdivision of vacant land were also delinquent in paying their taxes. In a survey of 57 large cities in 1933, the average delinquency rate for vacant lots was 31 percent, while the rate among residential properties was between 23 and 30 percent, depending on the type of structure (Putney, 1935).<sup>15</sup> Several factors may explain this finding, not least among which is the fall in income and loss of jobs that came with the Great Depression, leading to an inability to pay taxes.<sup>16</sup> A substantial portion of tax delinquency may also be attributed

---

<sup>13</sup>Tax delinquency rates are available for 85 of the 94 large U.S. cities represented in the financial data. See Section 3 for more information about the data.

<sup>14</sup>All cities but one (Fall River, MA) experienced a rise in the rate of unpaid taxes between 1930 and 1933.

<sup>15</sup>Delinquency rates among commercial properties were about half compared to those of vacant lots and residential properties, ranging from 12 percent for industrial properties to 20 percent for garages and gas stations. Hotels and rooming houses exhibited an average delinquency rate of 27 percent.

<sup>16</sup>Augmenting this problem was the fact that lenders did not collect and pay taxes on behalf of borrowers during this time, thus making homeowners directly responsible for paying their tax bills (Fishback et al., 2013).

to different collection procedures or rules at the local government level (Bird, 1936a, 1938). For instance, efficient tax collection often eluded local governments that were prone to over-assessing properties, perhaps due partially to infrequent (state-imposed) assessment cycles (Fairchild et al., 1932). Popularly-elected tax collectors, by focusing on the desires of their electorate rather than the needs of the government, also may have contributed to inefficient tax collection (Fairchild, 1934; Fairchild et al., 1932). Local governments often sufficed with poor procedures in the 1920s; indeed, delinquency began to rise in many cities even before 1929 (Fairchild, 1934). The Depression exposed and exacerbated these inefficiencies.<sup>17</sup>

Rising property tax delinquency forced local governments to cut spending in critical areas. Detroit, which saw its delinquency rate rise nearly twice as much as the average city between 1930 and 1933, provides an interesting case. Frank Murphy was elected as the city's mayor in the fall of 1930 on the promise of providing relief, only to find that the expenses for such a program during the Depression were too great in the face of strained revenues. Within a year of taking office, in addition to curtailing public works projects and relief expenditures, Murphy had cut health and recreational services, as well as police and fire budgets (Judd and Swanstrom, 2002, p. 124; Gelfand, 1975, p. 33). Murphy singled out tax delinquencies as a major source of strain and retrenchment in 1932: "The increasing tax delinquencies...have presented a perplexing problem, but one we have met thus far and will continue to meet by recourse to uncompromising economy" (New York Times, 1932). As a result, the city cut pay for all city workers by 10 percent and laid off 5,000 employees (Kelsey, 1932). This outcome was not uncommon in cities that experienced large increases in tax delinquency rates. Citing difficulties associated with mounting tax delinquencies, city commissioners in Jersey City ordered 40-percent pay cuts for 3,500 employees in 1933 (New York Times, 1933a). In New Orleans, revenue problems forced the city to not only cut wages, but also to reduce services and the number of employees (Heleniak, 1969, p. 303).<sup>18</sup> A prominent expert at the Institute of Public Administration made clear that "the city with no taxes paid completed the circle of misfortune by being unable to pay its employes [sic] and thus curtailing police, fire and sanitary service for all residents" (New York Times, 1933b). Rising property tax delinquency was a source of strain and retrenchment for municipal governments.

### *2.3. Studies of City Finances during the Great Depression*

City finances caught the attention of several researchers in the wake of the Great Depression. Spengler (1937) studies the ten largest municipalities and finds that, while there is some variation across cities, nominal revenues and current expenditures rose in total between 1925 and 1934. There was an attempt at economy in

---

<sup>17</sup>Delinquency may have also been a politically-motivated response of tax resistance on the part of taxpayers (Beito, 1989; Mencken, 1933). Fairchild et al. (1932) and Fairchild (1934) suggest that delinquency may have been driven by taxpayer perceptions of inefficient government spending or excessive tax burdens, but these authors still see it as primarily a problem of tax collection rather than tax resistance.

<sup>18</sup>Between 1930 and 1933, delinquency rates increased 16 percentage points in Jersey City and 36 percentage points in New Orleans. Both are higher than the average increase during this time, which was 13 percentage points.

expenditures during the Depression, which lagged declines in private income and property values. However, the decline in spending was small, which implies an increase in real terms given the substantial deflation of the early 1930s. These large cities maintained relatively stable expenditures by counteracting any fall in assessed valuations with higher property tax rates and tapping other sources of revenue, such as license taxes and grants. For instance, while special assessment revenue collected from new capital improvements collapsed as house-building slowed, it was balanced by the rise in state and county grants after 1930 and federal grants beginning in 1933. Overall, the stable upward trend in nominal revenues and expenditures between 1925 and 1934 suggests that the budgets in these ten cities were not highly sensitive to declines in local housing markets and rising tax delinquency rates, perhaps due to countervailing policy actions and counter-cyclical revenue flows (e.g., grants). However, these results are based on a very small sample and are thus subject to selection bias.

Studying financial cycles in a more representative sample of 15 cities, Gilbert (1940) finds that nominal per capita revenue and spending were subject to long and moderate cycles on average between 1902 and 1931, with both series falling below trend beginning in 1930.<sup>19</sup> He emphasizes the roles of local population, land values, and construction activity in driving these cycles, although cycles in municipal finances are generally less extreme than the patterns in these other factors or the general business cycle.<sup>20</sup> Building cycles were substantial in some cities, especially where builders found cooperative city governments who helped build the necessary infrastructure during boom years. Subdivision development in Detroit, for example, was substantial in the 1920s, but led to a stockpile of vacant lots when the housing market slowed with the Depression (Michigan Planning Commission, 1939). Cities in Florida also experienced substantial housing booms in the 1920s, leading to large busts in the 1930s. These are special cases, since not all cities experienced housing cycles of these magnitudes. Nevertheless, according to Gilbert (1940), “Great land booms are the principal sources of municipal financial cycles” (p. 198).<sup>21</sup> Much of this assertion stems from the high variability of special assessment revenue and capital outlays, both of which were related to local housing development. While this study emphasizes the importance of local factors in driving city finances during the early twentieth century, it ends its analysis in 1931, thus missing the worst years of the Depression for municipal budgets.

Spengler (1937), showing stable finances in the largest ten cities, does not view tax delinquency in the

---

<sup>19</sup>The cities represent various population sizes, geographical areas, economic structures, and institutional characteristics. They range in population from Elmira, NY (47,397 people) to Los Angeles, CA (1,230,048 people).

<sup>20</sup>City financial cycles are more moderate because some budget categories, such as special assessment revenue and capital outlays, are pro-cyclical, while other categories, such as relief spending, are counter-cyclical. Gilbert (1933) finds that, for three cities between 1830 and 1930, municipal expenditures often moved with business cycles, responding most severely to deep downturns.

<sup>21</sup>Gilbert (1940) appeals to studies of the national building cycle by Riggleman (1933) and Newman (1935), each of which use building permit data to characterize the construction cycle. The peaks and troughs of the national building cycle seem to line up well with those of the 15 city budget cycles studied.



early 1930s as a major problem for city budgets.<sup>22</sup> Gilbert (1940), ending his study in 1931, gives scant attention to the epidemic of property tax delinquency that had reached its peak in 1933.<sup>23</sup> But other observers at the time, through largely qualitative studies, viewed these tax-raising problems as a significant headwind that forced city governments to make important real-time budget decisions. Bird (1936a) asserts that the general property tax, while usually reliable and stable, suffered greatly in many cities in the 1930s due to rising property tax delinquency. Upson (1935) also attributes a primary role to unpaid property taxes, suggesting that they caused a revenue crisis that led to a reduction in city services and salaries and even debt defaults later in the 1930s. Furthermore, he asserts that tax delinquency played a larger role in pinching city coffers than the downturn in real estate markets, arguing that cities raised tax rates during the Depression to help offset declines in property assessments.<sup>24</sup> While informative, these studies on tax delinquency ignore the roles of other potential factors, such as distress in local housing markets. They also lack evidence that the rise in unpaid taxes was associated with spending cuts in local public services.

While several researchers in the 1930s studied the fluctuations in city finances around the Great Depression, they each emphasized different determinants without accounting for the influence of other factors. Thus, it is still unclear whether the revenue contractions during the Great Depression were associated with distress in housing markets, rising tax delinquency, or both, and whether spending on essential public services suffered as a result. This paper aims to fill these gaps.

### 3. Data Description and Summary

#### 3.1. Data Description

In response to the progressive urban reform movement in the early twentieth century, government agencies began to collect statistics on city finances through personal contact with local municipal officers. Aiming to provide a uniform collection of data that spanned all large cities, the U.S. Census Bureau compiled these data into annual reports called the *Financial Statistics of Cities*. Multiple tables in these reports provide the financial data for this study. Table 3 provides descriptions of the study’s financial variables, which include nine revenue categories and twelve areas of spending—capital outlays and eleven areas under current expenditures. Annual data exist for the 94 largest cities—each with a population of more than 100,000

---

<sup>22</sup>While Spengler (1937) mentions that delinquencies “assumed major proportions” in the early 1930s, he asserts that these arrears would only serve to swell property tax collections in the future as back taxes rolled in.

<sup>23</sup>Gilbert (1940) mentions delinquencies only once, but does acknowledge that, in combination with decreased assessed valuations and unbalanced budgets, unpaid taxes may lead to retrenchment (p. 198).

<sup>24</sup>These hikes may have even encouraged taxpayers to agitate for state legislation that limited property tax rates (Beito, 1989). Mencken (1933) further suggests that these revolts forced cities to curtail spending. According to Upson (1935), many state legislatures passed tax-limiting laws in response. Also passed in 22 states were laws regarding tax exemptions for varying amounts and classes of property (Leland, 1936). But these are much less emphasized in the literature than the tax rate limitations passed during this time.

people—across all of the years between 1923 and 1936 except Miami, which has data starting in 1926. These cities make up roughly 30% of the total U.S. population in 1930 and comprise the sample used in this paper.<sup>25</sup>

The reports give information for each city’s fiscal year (FY). Although beginning and end dates for FYs varied by city, most began in January and ended in December. I focus on the years between FY1923 and FY1936, which isolates the Great Depression (1929–33) between the severe 1920–21 recession and the recession that began in 1937.<sup>26</sup> Cities also varied in the number and structure of independent districts within their jurisdictions. For instance, school systems were sometimes governed by independent districts rather than city corporations themselves. The data at the city level include the services provided by all relevant districts within each city’s jurisdiction. This feature makes comparisons across cities feasible.

The available data on house prices in the 1920s and 1930s feature a relatively small number of cities. Building permit values, compiled from reports by the Bureau of Labor Statistics (e.g., U.S. Bureau of Labor Statistics, 1925), provide the most representative house price information. For nearly all city-years, the reports show the number of housing units on the permits that were issued for both single-family and multi-family housing, as well as the total value (i.e., construction cost) of these permits.<sup>27</sup> With this information, the average cost per family housing unit was calculated for each city and an index constructed where 1930 is the base year. I refer to this index as the permit value index (PVI). From these same reports, I measure residential construction activity as the number of single-family and multi-family housing units for which permits were issued, thus capturing much of the real estate market. Although permit issues do not reflect actual housing starts, they are the best available measure of residential construction at the city level.<sup>28</sup>

The PVI is not a perfect measure of house prices since it does not include lot values. Furthermore, if permit fees were based on construction costs reported by builders, these costs might have been under-reported, thus leading to downward bias in the index. While the PVI is flawed in these ways, Fishback and Kollman (2014) show that the movements in the permit value series are similar to those in other (small-sample) house price series during the 1920s and 1930s.<sup>29</sup> Additionally, land values accounted for only 20 percent of U.S. house prices during this time, with the remainder in building values (Knoll et al., 2017). The PVI is thus a useful proxy for house prices in a period for which such data are scarce.

Annual data on tax delinquency rates (i.e., proportions of city-year levies that are unpaid) between 1930

---

<sup>25</sup>See Table A1 for a list of the sample cities.

<sup>26</sup>The NBER dates the Great Depression from August 1929 to March 1933. A list of business cycle dates can be found at <http://www.nber.org/cycles/cyclesmain.html>.

<sup>27</sup>Price Fishback provided these data.

<sup>28</sup>Price Fishback and Kenneth Snowden both provided the permit count data. Brocker and Hanes (2014) use these data (as provided by Kenneth Snowden) in their study showing the relationship between boom and bust in city housing markets in the 1920s and 1930s. Kimbrough and Snowden (2007) use these data at the city level to study the relationship between residential construction in the 1920s and construction in the 1930s.

<sup>29</sup>Fishback and Kollman (2014) evaluate house price series that rely on a small number of cities. Using these data would lead to even smaller samples in the present study, since many cities that were surveyed by government agencies in the 1930s had small populations. Since the financial reports only give data for the biggest cities, there are not many matches. See the appendix for various robustness checks using one of these measures of house prices.

and 1936 were gathered from Bird (1938, Table 1). Some cities did not report delinquency rates in certain years, or even at all. Nevertheless, of the 94 cities featured in the financial reports, 85 have delinquency rates in at least one year between 1930 and 1936 and 80 have rates in every year. It is important to note that variation across cities in how taxes were levied and collected (mostly due to fixed institutional factors) can sometimes make cross-city comparisons of delinquency rates problematic.<sup>30</sup> However, the data nonetheless provide a good picture of the dynamics of delinquency within cities.

Other data used in the study include city population, per capita state income, and census region indicators. City population sizes were gathered from Gibson (1998) and linearly interpolated between census years to arrive at a population estimate for each city in each year.<sup>31</sup> These data are used as controls and also to express the city financial variables in per capita terms. Per capita state income is based on the data provided in Martin (1939).<sup>32</sup> I use census region indicators—Midwest, Northeast, South, and West—to account for the differential effects of the Depression across the country.<sup>33</sup>

Several states passed blanket property tax rate limitations in the midst of the Depression. These limitations served to restrict the aggregate tax rate—imposed at the city, county, and state levels—that could be levied on any particular property. Of the states that are represented in the paper’s sample, Michigan, Washington, and Indiana introduced blanket property tax limitations in 1932 and Oklahoma did so in 1933 (Suiter, 1936, Table XI, p. 338).<sup>34</sup> Since these laws may have impacted municipal revenue and spending, I account for them in the analysis with an indicator for every year after the legislation was passed.

The final dataset is a slightly unbalanced panel. One reason is that the financial surveys do not report data for Miami in the years before 1926.<sup>35</sup> Another reason is that data on building permits and costs are missing for some city-year observations, as are delinquency data. Rather than dropping cities that are

---

<sup>30</sup>For various reasons, Bird (1938) suggests that three cities have “misleading” data in comparison to those given for other cities: New Orleans (Louisiana), Oklahoma City (Oklahoma), and Richmond (Virginia). In an effort to maintain sample size, I include these cities in the analysis. Similar (and often stronger) results are obtained when these cities are excluded from the sample.

<sup>31</sup>The financial reports also give the census population figures, but only for 1920 and 1930 since the last report used in this study is for 1936. The figures in the reports for 1920 and 1930 are exactly those reported in Gibson (1998). Also, the reports provide population estimates for most cities in non-census years, which were arrived at using at least two different methods, depending on the year. City populations in earlier years were estimated using interpolation methods, while in later years they were estimated based on birth, death, immigration, and emigration data given at the national level. To remain consistent, I use linear interpolation to estimate population figures in non-census years. While accounting for annexations is more problematic when using this method, the reports’ figures are not without error given the inconsistent methods used to estimate them. Furthermore, annexations are likely only a problem in the 1920s when they were more prevalent. The results for the 1930s are thus less subject to this error.

<sup>32</sup>These data were used in Thomasson and Fishback (2014) and provided by Price Fishback.

<sup>33</sup>Legler et al. (1988) show that U.S. city finances exhibited variation across these four regions between 1850 and 1902.

<sup>34</sup>Ohio also passed limitation data in 1933 that reduced the allowable property tax rate, but the state had blanket property tax limitations in place since 1911 (Suiter, 1936, Table XI, footnote (k), p. 338). Oklahoma’s original constitution had a blanket property tax limitation, but it was too high to be effective Suiter (1936, Table XI, footnote (n), p. 338). Pennsylvania adopted a levy limit in 1933, but this measure was repealed in part before returning in 1943 (Paquin, 2015). Controlling for Pennsylvania’s levy limit does not change the results.

<sup>35</sup>Also worth noting is that a tax strike occurred in Chicago in 1929 and 1930 that caused revenues to drop (Spengler, 1937). The results are very similar whether Chicago is included in, or dropped from, the analysis. I elect to include it.

missing data at some point in the study period, I aim to maintain statistical power by analyzing a larger, unbalanced sample. Because data are seldom missing in the sample, I do not suspect that the reliability of the results will be impacted by using an unbalanced dataset.<sup>36</sup>

### 3.2. Data Summary

Table 4 shows summary statistics for the entire panel, as well as information about the variation in experiences during the Great Depression.<sup>37</sup> Revenue, spending, and state income values are in real per capita terms, and the PVI is in real terms. Real values are in 1967 dollars and are calculated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135). While the data are pooled across years, there are some key takeaways. Cities relied mostly on property taxes to generate revenue. Aside from public enterprise earnings, cities also relied heavily on government grants, special assessments, and other taxes. On the expenditure side, key areas of spending included capital outlays, education, protection, and interest payments.

The table also shows summary information on the percent changes in key variables between 1930 and 1933.<sup>38</sup> Total revenue and property taxes grew on average by 8 and 7 percent. Government grants grew the most on the revenue side. This area was greatly impacted by relief problems that prompted state and county governments to distribute more grants to cities after 1930 (Spengler, 1937). The largest decline occurred in special assessments, a revenue stream that dried up with the fall in house-building and the corresponding drop in public improvement projects. On the other side of the budget, the average decline in spending was 6 percent, driven largely by the drop in capital outlays, although spending on highways, sanitation, and recreation also declined. Current expenditures rose 19 percent on average between 1930 and 1933, driven partially by the increase in charitable spending due to relief demands, which in turn often depended upon the receipt of grants (Spengler, 1937). Also note the average rise in real interest payments; debt had not only grown during the building boom of the 1920s, but had also swelled during the early years of the Depression as cities took out loans to help meet relief expenses (Spengler, 1937). This borrowing led to fixed nominal debt obligations in the face of falling prices during the Depression, which added stress to city budgets. It was not until they began to receive federal grants in 1933 that city governments experienced relief of their own.

The revenue and spending changes between 1930 and 1933 do not suggest a crisis in city finances. However, as Figure 1 shows, the worst period for city budgets began in 1932. To highlight this period, Table 4 also shows information for the percent changes between 1932 and 1933. The picture changes considerably.

---

<sup>36</sup>Across all samples used in the paper, missing data exist in no more than 4 percent of possible city-year observations.

<sup>37</sup>See Tables A3 and A4 for means of the financial variables by year in nominal and real terms.

<sup>38</sup>I focus on the 1930-33 period since delinquency data begin in 1930. The general results are similar when analyzing the 1929-33 period.

Between 1932 and 1933, total revenue declined by 2 percent on average and property taxes fell by 4 percent. Shortfalls in real revenue created challenges for city leaders, especially in funding essential city services (i.e., current expenditures). Spending declined by 10 percent on average, with current expenditures falling by 3 percent. Capital outlays, which were largely fueled by debt financing, fell over 40 percent. Every category of spending fell between 1932 and 1933 except interest payments, charities, and miscellaneous spending.<sup>39</sup>

Real house prices, as proxied by the PVI, rose slightly on average between 1930 and 1933. This moderate rise is seen across many other indexes, as shown in Fishback and Kollman (2014). On the other hand, residential construction fell almost 80 percent between 1930 and 1933. Between 1932 and 1933, residential permits fell 26 percent, and while the PVI grew on average, this result is skewed by outliers.<sup>40</sup> For instance, Figure 3 depicts the trend in the median PVI value, which declines between 1931 and 1933. The figure also shows for the average city the trend in permitted housing units, which peaked in 1925. The average delinquency rate across cities and years was 20 percent, so that one out of every five property tax dollars levied was not collected in the year intended during this time. On average, cities saw delinquency rates rise over 13 percentage points between 1930 and 1933 and 4 percentage points between 1932 and 1933.

On average, real per capita state income fell nearly 22 percent between 1930 and 1933—on par with the national decline in real GDP during this time. State income thus provides a good measure of the impact of the downturn across states. The average city over the period was of considerable size at roughly 364,000 people, and each of the regions in the U.S. are well-represented in the sample. Blanket tax rate limitations encumbered only 4 percent of city-year observations but are nonetheless an important control variable.

The table also provides information about the variation of experiences across cities during the Great Depression. As the standard deviations show, city finances, the PVI, housing permits, and tax delinquency all exhibit substantial variation in the changes experienced between 1930 and 1933 and between 1932 and 1933. To highlight a key variable in the analysis, Figure 4 shows histograms of the changes in property tax delinquency rates during the 1930–33 and 1930–36 periods. While there is much variation, nearly all cities saw rising rates between 1930 and 1933. Over the 1930–36 period, many cities had recovered, but there were still many more with higher delinquency rates in 1936 than in 1930. The bulk of the following analysis is focused on establishing whether the revenue and spending changes experienced during the 1930s were associated with housing distress, rising tax delinquencies, or both, while accounting for other sources of variation.

---

<sup>39</sup>In the average city, interest payments, charities, and miscellaneous spending each peak and decline at some point during the 1930s. See Table A4 in the appendix.

<sup>40</sup>Between 1931 and 1932, the average change in the PVI was  $-2.39$  percent, with a standard deviation of 28.39.

## 4. Models and Results

### 4.1. Housing Cycles and Municipal Budgets

This section aims to establish a baseline relationship between city finances and housing cycles between 1923 and 1936. While changes in house prices and construction activity primarily impact property taxes and the special assessment fees associated with new construction, they may also influence other revenue streams, either directly or indirectly. Sales and license taxes, for instance, could be impacted by a wealth effect driven by changing house values, and permit fees, which bear a direct relationship with building permits, may rise and fall with construction cycles. Of course, revenue determines spending, and many expenditures are tied to cycles in construction. Thus, I also estimate the sensitivity of spending to housing cycles during the 1920s and 1930s. The following model estimates these relationships while controlling for other relevant factors:

$$\ln(y_{cit}) = \alpha + \sum_{j=1}^3 \beta_j \ln(\text{PVI}_{i,t-j}) + \sum_{j=1}^3 \delta_j \ln(\text{permits}_{i,t-j}) + \gamma \mathbf{X} + \text{year}_t + \text{city}_i + \epsilon_{it}, \quad (1)$$

where  $y_{cit}$  is real revenue or spending per capita in category  $c$  for city  $i$  in year  $t$ , PVI is the permit value index (in real terms),  $\text{permits}$  represents the number of permitted family housing units,  $\mathbf{X}$  is a vector containing various controls,  $\text{year}_t$  is a set of year fixed effects, and  $\text{city}_i$  are city fixed effects.<sup>41</sup> Included in  $\mathbf{X}$  are three lags of city population and real per capita state income, an indicator for state-level blanket property tax rate limitations imposed during the Depression, and region-year dummies. State income and region-year dummies control for economic differences across regions and states as well as changes in these conditions that could drive both municipal finances and outcomes in the housing market.<sup>42</sup> Population controls for changes in city sizes. An indicator for blanket property tax rate limits accounts for the impact of these state-level regulations on city budgets. Fixed institutional and political factors that may impact municipal finances are absorbed in the city fixed effects, while year dummies capture changes common to all cities.<sup>43</sup> All continuous variables are expressed in natural logs; these coefficients are thus interpreted as elasticities.<sup>44</sup> Standard errors are clustered at the city level, which allows for any form of error correlation within cities.

Changes in property tax revenue lag house price changes due to lags in property reassessment. States

---

<sup>41</sup>Equation (1) could allow for asymmetric effects of house prices and housing permits. In most cases, there are no statistically significant asymmetric responses of city finances to house prices or housing permits, although there are some differences between the 1920s and 1930s as depicted in Table A5. Another specification could include a national time trend and state-specific time trends in order to account for price trends that occurred over time at the national and state levels. Estimating such a model (both with and without region-year indicators) yields nearly identical cumulative house price and housing permit coefficients and standard errors as those reported in Table 5.

<sup>42</sup>House prices and housing permits may be capturing trends in nonresidential property markets. However, to the extent that trends in nonresidential real estate followed general economic trends, these effects are captured in the state income and region-year coefficients.

<sup>43</sup>Note that year dummies capture economy-wide changes in the price level over time. Thus, all of the model's coefficients except the year indicators remain the same whether the regressions are estimated in nominal or real terms.

<sup>44</sup>For the rare cases when the financial reports show that certain cities did not spend money in particular financial categories, the natural logarithm cannot be taken. Thus, these observations are not included in the analysis.

set rules regarding the frequency of reassessment of city property for tax purposes. On real property, the vast majority of states required assessment every year, many required it every other year, and several had assessment cycles of four years or greater (Jensen, 1931, p. 332, Table 82). Having legal obligations to maintain accurate assessments, many cities also made adjustments between assessment years (Jensen, 1931, p. 337; Noonan, 1936, p. 26). To account for the variety of assessment practices across cities, I include three lags of house prices. The use of three lags is also consistent with current literature that finds the largest cumulative house-price response for property taxes at the third-year lag (Lutz, 2008). Robustness checks using different lag structures (e.g., one, two, or four) are consistent with the results shown here.<sup>45</sup> I present cumulative elasticities that are the sum of the lagged coefficients, which depict a more complete response of city finances to changes in housing markets than any single coefficient. Housing permits, state income, and city population also have three lags to allow for local adjustments to changes in these factors.<sup>46</sup>

Table 5 presents estimates of the relationships between housing market indicators and total revenue, property tax revenue, total spending, and current expenditures. First, consider the cumulative impact of residential construction activity. Cities that experienced larger cycles in residential building experienced larger swings in revenue and spending between 1923 and 1936, with the largest elasticity on total spending. This large spending elasticity is perhaps due to the investment in infrastructure and services necessary to support new communities. Revenue and spending were also impacted—in similar magnitudes—by the blanket tax rate limitations passed by several states during the Depression.

City revenue and spending were also positively and significantly associated with changes in house prices. House prices influenced total revenue largely through their influence on property taxes. The results suggest that, between 1923 and 1936, a 10 percent rise (fall) in house prices led to a 1 percent rise (fall) in total revenue and a slightly smaller change in property taxes.<sup>47</sup> On the spending side, a 10 percent rise (fall) in house prices led to a 0.8 percent rise (fall) in total spending and a smaller change in current expenditures. While statistically similar, larger PVI and housing permit elasticities for total revenue than for property taxes, and for total spending than for current expenditures, suggest that housing cycles may have impacted other revenue and spending categories as well. Table 6 summarizes the results from testing for these relationships.

Panel A of Table 6 shows the elasticities for municipal revenue. Besides property taxes, the only other

---

<sup>45</sup>The three-lag model also gives lower Akaike Information Criterion (AIC) values than models with one, two, or four lags. One could also argue that there are contemporaneous wealth effects due to a change in house prices. For example, consumption may fall contemporaneously with house prices and thus lead to a fall in sales tax revenue. Estimates from models with both contemporaneous and lagged variables show small contemporaneous effects in some financial categories, but the cumulative effects are essentially the same. In order to maintain consistency and simplicity in presenting the data, I only show the lagged-model results.

<sup>46</sup>Although permits have a contemporaneous effect on certain categories, such as revenue generated from permit fees, these areas are not very important sources of revenue for cities. Nonetheless, specifications with contemporaneous permit effects yield similar cumulative effects as reported here.

<sup>47</sup>This differential effect across total revenue and property taxes is similar to the experience in Florida's cities between 1994 and 2008 (Doerner and Ihlanfeldt, 2011).

revenue channel through which house prices impacted city revenue was government grants.<sup>48</sup> Grants to cities were over four times more sensitive to changes in house prices than were property taxes.<sup>49</sup> All but three revenue streams—public enterprise earnings, government grants, and donations and contributions—were significantly associated with residential building cycles between 1923 and 1936. Aside from property taxes whereby new construction added to local tax bases, at least two of these streams can be directly tied to cycles in building activity. Included in other taxes, for example, are building permit fees, which rise and fall with construction activity. Also clear is the considerable impact on special assessments, which shows the largest elasticity (0.24) and a positive association consistent with Gilbert (1940), who posited that these fees were sensitive to building cycles.

Panel B of Table 6 shows the elasticities for municipal spending. Overall, current expenditures were positively associated with house price changes, with charitable spending and general government expenses being the primary drivers. Charitable spending—which included not only relief expenditures but also spending on hospitals and correctional institutions—was the category most sensitive to changes in house prices (with an elasticity of 0.41). As house prices rose and fell, so too did this spending.<sup>50</sup> All areas of spending were positively associated with residential permit activity except interest payments, public enterprises, and miscellaneous general spending, which exhibit no association. Of the remaining areas, the largest elasticity (0.39) was for capital outlays, which were often for new infrastructure. This outcome is consistent with Gilbert (1940), who suggested that capital outlays were highly sensitive to real estate booms and busts.

Overall, fluctuations in municipal finances were highly correlated with cycles in house prices and residential construction in the 1920s and 1930s. Specific areas positively associated with house prices include property taxes and government grants, as well as spending on general government and charity. Residential construction activity impacted nearly every city revenue and spending category, with special assessments and capital outlays being the most sensitive to building cycles in this era of immense housing investment and subsequent decline. While the analysis thus far has focused on housing cycles between 1923 and 1936, one of the factors that makes the early 1930s unique is the spread of property tax delinquencies at the local level. The next sections thus focus on estimating the relationship between city finances and unpaid taxes between 1930 and 1936.

---

<sup>48</sup>The null effect on other taxes for the period overall is masking differential tax policy behavior between the 1920s and 1930s. Table A5 in the appendix shows that other taxes were positively related to house prices in the 1920s but negatively related to house prices in the 1930s—suggesting that, as house prices tumbled in the Depression years, city governments sought to raise funds through taxes on bases other than property.

<sup>49</sup>In the context of modern data in Florida, Doerner and Ihlanfeldt (2011) also find federal grants to be a significant pathway through which house prices impact total revenue. The authors suggest that this should be an area of further research.

<sup>50</sup>Gilbert (1940) found charitable expenditures to be one of the most variable forms of spending in the 15 cities he studied.



#### 4.2. Property Taxes during the Great Depression

A city's property tax revenue depends on many factors, including the tax rate, the value of its tax base, the rate of tax payment, and the receipt of back taxes. To see these relationships, consider the following equation, which breaks property taxes into its components. For a given year, let  $P$  be property tax revenue, so that

$$P = \tau B(1 - D) + T, \tag{2}$$

where  $\tau$  is the property tax rate,  $B$  is the assessed value of the property tax base,  $D$  is the property tax delinquency rate (measured as the proportion of the total property tax levy that is delinquent), and  $T$  represents collections of taxes that were imposed in any previous period (i.e., back taxes).<sup>51</sup> A city's levy is  $\tau B$ , which is the amount of property taxes that city governments aim to collect in a given year.

Table 7 shows the variables depicted in equation (2) for the average city between 1930 and 1936, given in real per capita terms. These data were collected and compiled from the *Financial Statistics of Cities* reports.<sup>52</sup> Since the delinquency data only allow rates to be computed for the average city, and not the rate across all cities, the focus is on average levels. For the average city, property taxes peaked in 1932, fell, then began to rise in 1934. Levies also peaked in 1932, but fell until 1936. Most of the changes in levies were due to changes in assessed valuations; except between 1932 and 1934, tax rates were fairly stable during this period. Thus, on average, tax rates were not used to completely offset changes in assessed valuations.<sup>53</sup> Back taxes rose in every year through 1934, and thus helped bolster property tax revenue even in years in which assessed valuations declined. Lastly, property tax collections fell short of levies through 1934 as delinquency rates climbed, after which time collections began to exceed levies.

How does the impact on property taxes of a rise in tax delinquency rates compare to the impact of changes in other factors shown in equation (2)? Table 7 shows the results of a decomposition exercise that aims to answer this question.<sup>54</sup> First notice that, while real property taxes rose up to 1932, and generally increased during the 1930s, delinquency strongly blunted any gains. For the average city, 81 percent of the property tax decline in 1933—the worst year for property taxes—was due to rising delinquency, and the remaining 19 percent was due to changes in other factors. After 1933, falling delinquency rates helped property tax

---

<sup>51</sup>As Lutz (2008) notes, the effective property tax rate differs from the statutory rate (i.e., millage or levy rate) since policy makers can alter the way in which taxable property is assessed. The effective tax rate also accounts for tax delinquency and defaults, which are outside the scope of government control (see Wallis, 2003). However, the current setting separately accounts for the delinquency rate and the statutory tax rate.

<sup>52</sup>The reports do not give assessed valuations at the city level. A city's assessed valuation is thus calculated by dividing the property tax levy by the levy rate and multiplying by 1,000 (since levy rates are given as the amount paid per \$1,000 of assessed valuation).

<sup>53</sup>These results present a different picture from that provided by Upson (1935, p. 504), who argues that, even though assessed valuations fell during the Depression, the amount of taxes levied was steady because increases in tax rates offset the declines.

<sup>54</sup>The decomposition was conducted using the following formula based on equation (2):  $P_t - P_{t-1} = (((1 - D)_t - (1 - D)_{t-1}) \times \tau_t B_t) + ((1 - D)_{t-1} \times (\tau_t B_t - \tau_{t-1} B_{t-1})) + (T_t - T_{t-1})$ . The first term captures the change in property tax collections due to changes in the delinquency rate, while the remaining terms account for changes in other factors. The role of delinquency is isolated by holding constant other factors such as changes in the tax levy and back taxes.

collections recover even as levies were falling. Although property taxes grew in real terms during the Great Depression, tax delinquency was a barrier to even higher gains and a substantial driver of the largest decline in revenue that occurred in 1933.

#### *4.3. Tax Delinquency and Municipal Finances*

As an important determinant of property tax revenue in the 1930s, changes in tax delinquency likely influenced other areas of city budgets during this period. To motivate the analysis, Figure 5 shows the paths in total revenue and current expenditures in cities that experienced large increases in delinquency rates between 1930 and 1933 relative to the paths in cities that experienced small increases in delinquency rates during this period. During the 1920s, cities in each of these bins experienced similar trends in revenue and spending, which suggests that they shared similar budgetary determinants and procedures prior to the rise in tax delinquency. By 1933, the peak year for delinquency, revenue in cities that experienced the largest increases in delinquency rates had fallen off considerably from that in less distressed cities. The same is true for current expenditures. Cities in which tax delinquency had increased the most during the Great Depression were ultimately worse off.<sup>55</sup>

To characterize the relationship between tax delinquency and municipal finances, I use a model similar to equation (1) that incorporates the delinquency rate as an additional variable of interest and which thus focuses on the years between 1930 and 1936. This model accounts for changes in house prices and residential construction activity, thus helping to isolate the effect of delinquency rates from the effects of housing market activity. Most categories of revenue and spending are expected to be negatively associated with tax delinquency. Identifying the true impact of delinquency requires unbiased estimation of its coefficient. Bias can arise in this context in several ways. As discussed in Section 2, cities varied in their speculative development, experiences in the downturn, tax collection procedures, and assessment practices, all of which may have influenced both delinquency rates and municipal finances. House prices and housing permits capture speculative activities, and state income and region-year effects account for broad economic trends, but local institutional factors such as tax collection procedures and assessment practices are difficult to measure. However, many of the factors argued to have contributed to delinquency—e.g., popularly-elected tax collectors or infrequent assessment (Fairchild et al., 1932; Fairchild, 1934)—are time-invariant and thus absorbed in the city fixed effects. Bias might also arise if cities that received and spent more money per capita experienced more delinquency because taxpayers began to resist the inefficiencies and largesse of local government or otherwise felt burdened by the extent of taxation (Beito, 1989; Fairchild, 1934; Fairchild et al., 1932; Mencken, 1933). Tax delinquency could thus reflect tax resistance, leading to upward bias in

---

<sup>55</sup>Between 1930 and 1932, cities were often able to rely on short-term debt financing to meet expenses, and so current expenditures generally rose in the early years of the downturn as depicted in Figure 5.

the delinquency coefficient.<sup>56</sup> To the extent that this occurred, the negative effect of unpaid taxes is underestimated. While simultaneity bias may be a concern, qualitative evidence presented in Section 2 suggests that high tax delinquency led to unplanned revenue gaps and spending cuts in specific areas during the Depression.

Table 8 shows the results of estimating the relationship between delinquency rates and city revenue. First consider the results in column 1, which focus on total revenue for the 1930–36 period. Municipal budgets were negatively related to delinquency rates: a one-standard-deviation (0.11) increase in the delinquency rate was associated with a 4 percent decline in total revenue, enough to finance the average city’s health department and more.<sup>57</sup> This finding implies that cities did not completely offset the declines in property taxes associated with delinquency through other means, such as increases in other taxes. Also note that changes in house prices and housing permits did not significantly impact total revenue in this period. These outcomes are in contrast to the results in column 1 of Table 5, which suggest that, on average, total revenue ebbed and flowed with housing variables between 1923 and 1936. On the other hand, column 2 shows evidence that property taxes were influenced by changes in house prices during the 1930s.<sup>58</sup> Comparing the results in columns 1 and 2 to those shown in Table A5 for the 1930s reveals that adding delinquency rates to the model does not greatly impact the cumulative elasticities for the PVI and housing permits, thus suggesting that housing cycles and tax delinquency acted independently on city finances during this period. It further suggests that the exclusion of cities with missing delinquency data from the sample does not greatly impact the results.

Equation (2) suggests that, conditional on delinquency, house prices could have influenced property taxes through two policy-related channels: 1) the tax rate and 2) the property tax base by way of an adjustment to assessed valuations. Columns 3 and 4 of Table 8 show the results of testing for the impact of house prices on per capita assessed valuations and property tax rates during the 1930s.<sup>59</sup> Rather than through assessed valuations ( $B$ ), house prices impacted property taxes between 1930 and 1936 through their influence on

---

<sup>56</sup>Note that the politically-charged delinquency theory is not as highly emphasized in the contemporary or historical literature as factors such as the economic downturn or tax collection procedures. Additionally, if the efficiency with which local governments raise and spend funds are important factors in determining urban quality of life (Gyourko and Tracy, 1991), then people would have sorted across cities even prior to the crisis.

<sup>57</sup>There are several ways to characterize the magnitude of the delinquency-revenue association. For instance, the within-city standard deviation of the delinquency rate for the panel is 0.06, which implies a 2 percent decline in total revenue from a one-standard-deviation increase in the rate of unpaid taxes. On the other hand, the average city experienced a 13.4-percentage-point rise in the delinquency rate between 1930 and 1933, which implies a 4.5 percent decline in revenue during the Depression. The overall standard deviation of 0.11 across all city-year observations thus provides a middle ground.

<sup>58</sup>One might expect that the delinquency coefficient should be nearly equal to one. There may be several reasons why it is substantially less than one in this setting, including possible bias in the coefficient and the receipt of back taxes.

<sup>59</sup>Column 2 of Table 8 shows that property tax revenue was sensitive to changes in house prices independent of delinquency. I aim to estimate the channel through which this effect operates and thus exclude delinquency from the regression models for assessed valuations and tax rates. It is also the case that assessments and property tax rates would likely have responded to delinquency with a lag; however, incorporating a lag limits the sample period. Nonetheless, including contemporaneous (or lagged) delinquency rates in these specifications leads to very similar house price coefficients and statistically insignificant delinquency coefficients.

property tax rates ( $\tau$ ). This outcome implies that governments in cities where real house prices declined during the Depression reduced property tax rates in response.<sup>60</sup> Also note the role of state-imposed blanket tax rate limitations, which reduced municipal property tax rates. While house prices played a role during the early 1930s, the results suggest that tax delinquency was the primary headwind for municipal revenue throughout the 1930s.<sup>61</sup>

Aside from impacting property taxes, tax delinquency could have influenced policy and spending decisions regarding other budget areas. Although some cities may have had reserves to tide them over, local leaders often responded in more extreme ways. For instance, many cities issued debt to meet current expenses (Fuchs, 1992, p. 40).<sup>62</sup> However, this was not a sustainable course of action over the duration of the downturn, especially as banks became less apt to lend to excessive borrowers. Other salient options for city governments were to generate revenue from sources other than property taxes, cut spending, or both. I now turn to estimating a model of the relationship between various revenue and spending categories and delinquency rates. It is likely that unpaid taxes were related to city finances both contemporaneously and with a lag. For instance, many cities operated on a pay-as-you-go basis, so that current revenue experiences determined at least some current spending (Buck, 1934). On the other hand, current-year municipal spending was based on a budget written up in the previous fiscal year, which reflects the expectations for total revenue received in that year based on past experiences.<sup>63</sup> Furthermore, tax delinquency may have influenced various revenue streams at different lags, to which cities could have responded with new policies to help curb revenue shortfalls. To account for differences in budgetary impacts and procedures, I estimate equation (1) with both the current-year delinquency rate and a one-year lag. Since the delinquency data begin in 1930, including a one-year lag limits the sample period to 1931–36. Cumulative coefficients are shown for the PVI, housing permits, and the delinquency rate.

Panel A of Table 9 shows the results of estimating the relationship between tax delinquency and municipal revenue. Note that the delinquency coefficients for total revenue and property tax revenue are cumulative effects for 1931–36 to be consistent with the other revenue streams reported in the table. First, consider the results for housing. Local changes in house prices led to changes in the opposite direction in other taxes (elasticity of  $-0.29$ ) and general department earnings (elasticity of  $-0.19$ ) during the Depression. Thus, governments in cities where house prices fell raised more revenue in these ways. As in the 1923–36 period,

---

<sup>60</sup>It is possible that assessments adjusted downward to declines in house prices in particularly bad years for property taxes, such as 1933. However, the biggest fall in assessed valuations occurred in the years between 1934 and 1936. Meanwhile, property tax rates fell the most in 1933, one year after the PVI first registered a decline in the median city.

<sup>61</sup>Although blanket tax rate limitations also played a role in reducing revenue, only 13 cities in the 85-city delinquency sample were hit with such a limitation during the Depression.

<sup>62</sup>Cities sometimes issued bonds for purposes other than funding capital projects or filling revenue gaps. New Orleans issued a \$750,000 bond in 1932 to fund a welfare committee that provided relief for those in need (Heleniak, 1969).

<sup>63</sup>The budget model in Dallas was singled out as exceptional due to its planning for delinquency based on recent past experiences (Buck, 1934, pp. 46-47).

other taxes and property and asset revenue were positively associated with housing permits during the 1930s. But a key difference compared to the 1923–36 period is that, during the 1930s, government grants rose as housing permits fell, which suggests that cities with greater lapses in residential construction activity received more grants. Another result worth noting is the lack of a relationship between special assessment revenue and housing permits in the 1930s, which means that the positive relationship shown in Table 6 was driven by the building activity of the 1920s.<sup>64</sup> Compared to the booming 1920s, revenue was less sensitive to house prices during the 1930s when many cities saw real declines in the price of housing. This outcome is similar to findings using modern data which suggest that city revenue is often stable in the face of falling house prices (Alm et al., 2011; Doerner and Ihlanfeldt, 2011; Lutz, 2008; Lutz et al., 2011; Ross et al., 2015).

Unpaid taxes played a unique role in determining city revenue during the 1930s. Aside from reducing total revenue and property taxes, delinquency was also negatively associated with public enterprise earnings (coefficient of  $-0.61$ ), property and asset revenue (coefficient of  $-1.17$ ), and fines (coefficient of  $-1.73$ ). Each of these areas was closely linked to real estate markets. For instance, public enterprise earnings and property revenue acted as taxes on real estate. Cities received fees for providing public services (i.e., water, electricity, and gas), and also earned rent for the use of city-owned property. These payments for public services fell as the economy suffered and tax delinquency rose. In the case of fines, revenues from sales of tax-delinquent properties made up a substantial portion of the stream. Tax sales slowed down with the Depression. In Detroit, for example, they were halted altogether between 1932 and 1938 (Michigan Planning Commission, 1939). Furthermore, before the Depression, private companies often purchased tax titles from city governments, which entitled them to collect penalty payments from delinquent property owners. This market broke down when real estate values fell and an excess supply of delinquent tax titles emerged (Beito, 1989, p. 8). High-delinquency cities thus received less revenue from fines.

Panel B shows the results for spending. Consider first the role of the housing market. While total spending was not sensitive to house price changes during the Depression, interest payments and spending on sanitation were (with cumulative elasticities over 0.1). The results suggest that interest payments were reduced—possibly through debt restructuring—in cities where house prices fell during the 1930s.<sup>65</sup> Reductions in interest payments gave cities more budgetary flexibility than otherwise, likely leading to smaller cuts in other budget categories. Current expenditures were positively associated with residential construction activity in this period, the most substantial of which was charitable spending with an elasticity of 0.27. Other areas that cycled with housing construction include spending on sanitation and miscellaneous services. Overall, as Table A5 confirms, the strongly positive results for the relationship between total spending and housing

---

<sup>64</sup>These results are largely confirmed in Table A5 in the appendix, which compares elasticities in the 1920s to those in the 1930s using the 94-city sample.

<sup>65</sup>Although hidden in the averages in Table 4, real house price declines were fairly common during the 1930s. Between 1930 and 1935, 60 percent of cities in the sample experienced a decline in real house prices in at least three years.

cycles in the 1923–36 period was due to the activity of the 1920s; cities that experienced bigger housing booms spent more money during the 1920s, but housing market slowdowns did not lead to cuts in total spending in the 1930s. This outcome mirrors the effects of housing cycles on revenues discussed above.

The slowdown in housing construction meant cities could reduce spending on new roads, schools, and other infrastructure supporting new development. While this trend would not force cities to roll back the provision of existing city services, rising tax delinquency would. Results in Table 9 suggest that current expenditures were indeed sensitive to changes in delinquency: a one-standard-deviation increase in the delinquency rate was associated with a 3 percent decline in this spending. The primary categories affected include community protection, sanitation, and health: in each area, a one-standard-deviation rise in the delinquency rate was associated with a spending cut of roughly 5 percent.<sup>66</sup> These results are consistent with the delinquency-spending hypothesis advanced by Upson (1935), which asserts that cities facing high delinquency rates were forced to reduce spending. Furthermore, the results align with the evidence—discussed in Section 2—that some city mayors and leaders cut spending on police and fire protection, sanitation, and health due to mounting tax delinquencies during the Depression. Another result worth noting is the insignificant relationship between interest payments and delinquency rates. This outcome suggests that tax delinquency played an independent role from debt obligations in determining city spending during the 1930s.

Tax delinquency was associated with less spending in protection, sanitation, and health, but was this spending important for cities in the 1930s? Police protection was arguably important at a time with little available work and greater temptations to resort to criminal behavior.<sup>67</sup> City spending on sanitation reduced waterborne disease rates in the U.S. between 1902 and 1929 (Cain and Rotella, 2001), and spending on child health programs helped reduce fertility between 1923 and 1932, possibly through a decrease in child mortality (Fox and Myrskylä, 2015). Additionally, relief spending through New Deal grants, which replaced some of the health spending of local governments, saved lives and reduced infant mortality (Fishback et al., 2007). Thus, maintaining adequate pay, employment, and services in these areas was important for urban communities during the Great Depression.

#### *4.4. Assessment Cycles and Property Taxes*

Section 4.1 discussed the reason for the lag structure in equation (1), which is due to the variety of assessment practices across cities. Rules governing the frequency of assessment were often established at

---

<sup>66</sup>Including a national time trend and state-specific time trends (both with and without region-year dummies) yields nearly identical delinquency coefficients and the exact same significance levels as those reported in Table 9. And although the results are not shown, a high current-year delinquency rate was related to spending cuts in police and fire protection and highway operation and maintenance. These areas appear to have been the most adaptable to contemporaneous changes in financial circumstances. Charitable spending, on the other hand, rose with delinquency initially but fell at the one-year lag. Cities spent more on relief when current-year delinquency rose, but then adjusted this spending downward in subsequent years.

<sup>67</sup>Fishback et al. (2010) show that welfare spending during the Great Depression reduced property crime, which suggests such a link is plausible.

the state level, which leaves plausible exogenous variation in assessment practices to exploit to understand the channels through which house prices impacted property tax revenue. If state-level assessment intervals were binding, then cities in states with short assessment cycles should have seen larger property-tax changes from house price movements at more recent lags than cities in states with long cycles. This outcome would imply that house values were an important factor in determining property tax revenue through the timing of the assessment cycle. On the other hand, if cities adjusted assessed values between assessment years, then assessment cycles should play a smaller role in determining property taxes. While house values might still be important in this case, the outcome would suggest that cities made adjustments to assessed values independently of state-level rules governing reassessment.

I test these hypotheses by interacting an indicator for annual reassessment with the one-year lag on house prices. The assessment cycle data were collected from a table reported in Jensen (1931, pp. 332-333, Table 82). While this is a convenient source for this information, the author is careful to mention that many different laws and administrative rules existed across cities, and thus cycles cannot capture everything that governs local assessment procedures. Furthermore, due to special provisions, cities in some states had a “large measure of autonomy in respect to property assessment” (p. 335). Nevertheless, using these data provides insight into the process of reassessment. More than half of cities in the sample had one-year assessment cycles for real property.<sup>68</sup> Thus, if assessment cycles were important determinants of the sensitivity of property taxes to house prices, then a differential effect should be apparent in cities with annual cycles. Table 10 gives the results from specifications similar to those shown for property taxes in Tables 5 and 8. The coefficient of interest is the interaction of the annual assessment indicator with the first lag of house prices.

For the years between 1923 and 1936, property tax revenue was not any more sensitive to changes in house prices at the first lag in cities with one-year assessment cycles compared to those with longer cycles, as shown in column 1. Likewise, column 2 shows that during the 1930s, property taxes in cities with shorter assessment cycles were not more sensitive to changes in house prices than they were in cities with longer cycles. Although there is no measurable effect of annual assessment cycles on property taxes overall, such cycles could still have influenced tax bases or tax rates. Column 3 shows that, between 1930 and 1936, short assessment cycles were not any more influential in determining assessed values than long assessment cycles. This finding implies that cities on relatively long cycles adjusted assessed values between assessment years. This result is consistent with information given in Jensen (1931, p. 337), which suggests that it was necessary for cities to make adjustments between reassessment years for major changes. Noonan (1936, p. 26) also suggests that certain jurisdictions were able to make adjustments between reassessment years. Column 4 further shows that property tax rates were not influenced by assessment cycles. These results are robust to a variety of specifications (not shown), such as interacting the annual assessment indicator (or

---

<sup>68</sup>All states (and thus all cities) had one-year cycles for personal property.

a biannual assessment indicator) with the second lag of house prices rather than the first lag to allow for greater adjustment delays.

There is no strong evidence to suggest that state rules about the timing of property reassessment were influential determinants of property taxes during the 1920s and 1930s. Of course, other factors may have led to this result. One possibility is data-related. If the indicator variable for annual assessment cycles is capturing other state-level rules and characteristics that are correlated with assessments, then the result would not cleanly capture the effect of annual cycles. It is also possible that assessment cycles are highly correlated with delinquency or receipt of back taxes. However, the results for the specification in column 2 without delinquency as a control (not shown) are nearly identical, which suggests otherwise. On the other hand, if payment of back taxes is correlated with assessment cycles and house prices, then the assessment cycle interaction term would be biased. Another possibility is that house prices drove property tax revenue through the valuation of new construction or development, and not necessarily through revaluation of existing properties. Overall, while some of these other factors may be at work, the results are consistent with the hypothesis that cities adjusted property values independently of assessment cycles during this period.

## 5. Discussion

Given that debt payments could not easily be curtailed, cities were forced to cut expenses by reducing services, cutting wages and salaries, or reducing inefficiencies in operation, including laying off workers (Brower, 1932). Personnel costs often comprised the largest component of a city's operating expenditures. Thus, many of the spending cuts in the midst of the Depression were wage and employment reductions (Buck, 1933). According to Ridley and Nolting (1935, p. 203, Table 3), public sector workers' wages were flexible: nearly 95 percent of 252 surveyed cities had cut salaries by 1934, with a range between 3 and 50 percent among these municipalities.<sup>69</sup> Wage and salary cuts averaged 17 percent in another study of 210 cities (Public Management, 1934). Comparing these nominal cuts to the fall in prices suggests that they were real salary reductions in many cases, although not necessarily on average. Furthermore, salary cuts lasted several years: more than half of the cities that reported cutting salaries during the Depression had still not restored any portion of the salary reductions by 1935 (Ridley and Nolting, 1935, p. 203, Table 3). Aside from salary cuts, cities also "reduced the number of employees by leaving vacancies unfilled, by consolidating positions, by retiring superannuated employees, and by eliminating unnecessary positions" (Public Management, 1934, p. 103). Employees in many cities were also put on a part-time basis or had wages in arrears for months (Cline, 1934). Chicago, for instance, struggled for months to close the gap in paying its employees. In 1934, the city was still two months behind in paying its police officers, firefighters,

---

<sup>69</sup> According to one source, cities began cutting wages in 1932 (Public Management, 1934). Thus, all of the cuts were possibly made between 1932 and 1934, the worst revenue years for cities.



and other workers (The Washington Post, 1934). Aside from cutting personnel, Dallas put many of its employees on a “staggered-time” employment basis (Upson, 1933, p. 142). Employees in many cities were also paid in *scrip*, which was promised to be redeemable for cash in the future and was often accepted at a discount by local merchants (Abbott, 2007). Overall, there is much evidence to suggest that municipal spending cuts in the 1930s came through a combination of cutting wages and salaries, laying off workers, and reducing hours worked. It is difficult to imagine that city services were not reduced by such large and sweeping actions regarding personnel.

Early on, many local welfare offices had partnered with private charities to provide jobs and relief to unemployed workers (Abbott, 2007). Cities initially felt it was the duty of local governments and organizations to provide unemployment relief.<sup>70</sup> One example is Philadelphia, which formed a bureau for unemployment relief within the city’s welfare department in 1931 and distributed \$3 million in city funds for food, fuel, and clothing. Millions more were raised by other sources, but the money had dried up by the summer of 1932. Private citizens also did their part by forming local associations aimed at providing help for unemployed workers. Ultimately, these efforts did not provide the amount of help and relief that was required during the depths of the Depression. Adding to the stress were the actions of state governments, which focused on balancing budgets rather than helping the unemployed and destitute (Judd and Swanstrom, 2002, p. 125). These pressures forced dozens of officials from large cities to organize a conference in 1932—led by Mayor Frank Murphy of Detroit—the result of which was a formal plea for help from the federal government. President Hoover responded by providing \$300 million in loans to local governments through the Reconstruction Finance Corporation, marking a turning point at which cities and the federal government developed a closer relationship (Judd and Swanstrom, 2002; Gelfand, 1975).

The loans provided for local relief were not enough to shore up city budgets. The Great Depression was a time of major financial stress and disruption in the national economy, with many local governments defaulting on debt payments (Bernanke, 1983). Did the revenue disruptions of the 1930s also contribute to the wave of municipal defaults during the Depression? There is some evidence to suggest so. Two-thirds of cities with excessively high delinquency rates during the Depression had defaulted on debt (Bird, 1936a, p. 344). A regression analysis of 45 cities and towns in Michigan shows that those with higher tax delinquency rates were more likely to default (Hempel, 1973).<sup>71</sup> As of March 1934, 37 cities across the U.S. were in default (Hillhouse, 1936).<sup>72</sup> Cities simply could not keep up with their obligations as taxes went unpaid. Another indication of delinquency’s role in the default crisis is the passage of the 1934 Municipal Bankruptcy Act,

---

<sup>70</sup>This feeling is apparent in city manager conference proceedings from 1931. Much attention was given to methods and strategies for addressing the unemployment problem at the local level. See Ridley and Nolting (1932, pp. 52–98).

<sup>71</sup>Using a logit model, Joffe (2013) shows that cities that experienced bigger revenue declines and carried more burdensome debt obligations were more likely to default during the Depression.

<sup>72</sup>Abbott (2007, p. 46) suggests that, by the time of the presidential campaign in 1932, 600 “urban centers” had defaulted on at least one financial obligation.

approved the year after tax delinquency rates reached their peak. Prior to 1934, the adjustment of municipal debt required consent from all creditors. By instead requiring the consent of only a majority of creditors, the Act provided “...an orderly procedure of debt adjustment for defaulting municipalities and local government units” (Lehmann, 1950, p. 241).<sup>73</sup> Certainly, some of the motivation for passing the Act stems from the epidemic of delinquency and the revenue struggles it caused. It is also likely that fixed nominal debt payments incurred through immense spending during the 1920s became a burden for many cities (Lehmann, 1950).

While default was a setback for many cities, falling delinquency and the eventual payment of back taxes provided much-needed budgetary relief. Table 7 suggests that cities began to experience this relief around 1935 when property tax revenue exceeded the levy in the average city. Certainly improvements in the economy were important, but another factor aiding in this rebound was the adoption of better tax collection procedures by municipal governments (Bird, 1936a). These procedures included the implementation of quarterly tax payments, earlier billing in the fiscal year, the remission of back taxes for prompt payers of current taxes, stiffer penalties, and more frequent tax sales (Bird, 1936a). State legislation passed in the early years of recovery, rather than improvements made by individual cities, was the source of most of these procedural changes. Nearly every state passed some form of tax assistance legislation in the mid-1930s aimed at curbing delinquency (Leland, 1936).<sup>74</sup> National pay-your-taxes campaigns also helped, for which Michigan was a front-runner (Leland, 1936).

The Home Owners Loan Corporation (HOLC) also likely aided in the recovery of property taxes toward the end of the Depression. Supported by both real estate interests and local governments, the HOLC began in the summer of 1933 as part of President Roosevelt’s New Deal. The agency aimed to stem foreclosures. The HOLC purchased loans from private lenders, modified them, and reissued them to borrowers with better terms and interest rates. In the process, any remaining property debts or back taxes were either expunged or wrapped into the new loan’s principal. The HOLC thus protected itself from losing property claims through nonpayment of taxes (Fishback et al., 2013). In this way, the agency also helped resolve the tax delinquency crisis that cities were facing and provided an impetus for the payment of back taxes that helped boost collections.

There were many consequences arising from the municipal budgetary challenges of the 1930s. City governments struggled to meet obligations, whether in the form of wages and salaries for employees, services to local communities, or debt payments to creditors. In response to these difficulties, cities made a concerted plea for help, eventually getting assistance from new bankruptcy legislation. Combined with improvements in

---

<sup>73</sup>The 1934 Act was deemed unconstitutional two years later. But seeing that defaults had not subsided, Congress passed a second Municipal Bankruptcy Act in 1937. See Lehmann (1950) for more details.

<sup>74</sup>In the delinquency sample, 75 out of 85 cities were in states that passed some form of legislation described here. Controlling for the impact of this legislation with an indicator variable equal to one for cities in these states does not change the results. Since these laws were passed in a short period of time, and nearly every city was impacted, the year indicators generally capture the effects of the legislation.

tax collection procedures and help from HOLC, city budgets began to rebound just as the national economy was doing the same. However, not all cities experienced such distress during the Great Depression. San Francisco, for instance, was in better financial shape than many other cities. One commentator attributed this fact to “the small number of property tax delinquencies and the steadiness of real estate values in boom years. No crash occurred in the local real estate market, just as no boom had been staged” (The Pacific Coast Wall Street Journal, 1932). The city’s tax delinquency rate was remarkably low during the 1930s (never more than 5.4 percent) and increased by only 3.9 percentage points between 1930 and 1933 (Bird, 1938). Meanwhile, the city cut its salaries by only 3–20 percent (Ridley and Nolting, 1935, p. 204, Table 3), paid its debt payments, and reduced its current expenditures by only 2 percent between 1932 and 1935, compared to a 7 percent decrease in the average city.<sup>75</sup> While it did not completely escape the crisis, compared to most other cities, San Francisco was better able to meet its established obligations to employees, residents, and creditors during the worst years of the downturn.

## 6. Conclusion

Municipal budgets were highly sensitive to changes in house prices and residential construction activity during the 1920s, but relatively stable in the face of the housing distress that plagued many cities during the 1930s. The results of this study suggest that rising tax delinquency, which was associated with reduced total revenue and current expenditures, was a stronger headwind for city budgets during the 1930s. High delinquency was primarily associated with reduced spending in such critical areas as community protection, sanitation, and health. While there is more to learn about the determinants of delinquency and the behavior of property owners and local governments during this time, it is clear that city governments would have been in better financial shape to weather the economic storm of the early 1930s had property taxes not gone unpaid.

The budgetary experiences of municipal governments during the Great Depression were complex and multi-faceted. Cities responded dynamically to the downturn by adjusting the level and composition of spending, and the mechanisms behind the slowdown in revenues were partly to blame. Municipal budget policy may indeed have had larger implications for the severity and duration of the Depression experienced in urban areas, especially at a time when the share of local government expenditures exceeded that of federal or state governments. Furthermore, city budgets were influenced by policies and programs implemented during the New Deal beginning in 1933. Much changed for cities in the tumultuous years of the early 1930s, and it is likely that experiences in this decade had long-term implications for municipal budgets and fiscal

---

<sup>75</sup>Combing information from the *Bond Buyer* and *Moody’s Government Securities Manual*, Holian and Joffe (2013) assert that the default crisis was confined to smaller cities in California during the Great Depression. Only special assessment districts in Los Angeles, San Diego, and Oakland defaulted during the 1930s.

practices, which is an area worthy of further study.

## Acknowledgements

I am grateful for helpful comments by three anonymous referees and the editor of this journal. I thank Alex Berardo and Jean Guo for their research assistance, and Price Fishback and Kenneth Snowden for providing data. Nic Duquette, Jason Taylor, and numerous EBHS and WEAI conference participants provided helpful comments on early (and different) versions of this project. I thank Samara Gunter for providing valuable comments on later versions. I gratefully acknowledge research support from Colby College.

## Appendix

### 6.1. Sample Cities and Regions

Table A1 gives the list of sample cities used in the analysis by census region.

Table A1: Sample cities by census region

Midwest	Northeast	South	West
Akron, OH	Albany, NY	Atlanta, GA	Denver, CO
Canton, OH	Boston, MA	Baltimore, MD	Long Beach, CA
Chicago, IL	Bridgeport, CT	Birmingham, AL	Los Angeles, CA
Cincinnati, OH	Buffalo, NY	Chattanooga, TN	Oakland, CA
Cleveland, OH	Cambridge, MA	Dallas, TX	Portland, OR
Columbus, OH	Camden, NJ	El Paso, TX	Salt Lake City, UT
Dayton, OH	Elizabeth, NJ	Fort Worth, TX	San Diego, CA
Des Moines, IA	Erie, PA	Houston, TX	San Francisco, CA
Detroit, MI	Fall River, MA	Jacksonville, FL	Seattle, WA
Duluth, MN	Hartford, CT	Knoxville, TN	Spokane, WA
Evansville, IN	Jersey City, NJ	Louisville, KY	Tacoma, WA
Flint, MI	Lowell, MA	Memphis, TN	
Fort Wayne, IN	Lynn, MA	Miami, FL	
Gary, IN	New Bedford, MA	Nashville, TN	
Grand Rapids, MI	New Haven, CT	New Orleans, LA	
Indianapolis, IN	New York, NY	Norfolk, VA	
Kansas City, KS	Newark, NJ	Oklahoma City, OK	
Kansas City, MO	Paterson, NJ	Richmond, VA	
Milwaukee, WI	Philadelphia, PA	San Antonio, TX	
Minneapolis, MN	Pittsburgh, PA	Tampa, FL	
Omaha, NE	Providence, RI	Tulsa, OK	
Peoria, IL	Reading, PA	Washington, DC	
South Bend, IN	Rochester, NY	Wilmington, DE	
St. Louis, MO	Scranton, PA		
St. Paul, MN	Somerville, MA		
Toledo, OH	Springfield, MA		
Wichita, KS	Syracuse, NY		
Youngstown, OH	Trenton, NJ		
	Utica, NY		
	Waterbury, CT		
	Worcester, MA		
	Yonkers, NY		

### 6.2. Municipal Budget Declines

Table A2 shows the number of cities that experienced a decline in real per capita total revenue, property taxes, total spending, and current expenditures by duration between 1930 and 1936.

Table A2: Number of cities experiencing decline by duration between 1930 and 1936

	Years of decline between 1930 and 1936						
	Zero	One	Two	Three	Four	Five	Six
Total revenue	2	8	39	34	7	3	1
Property taxes	2	11	31	27	17	5	1
Total spending	0	3	22	44	19	6	0
Current expenditures	0	6	38	40	10	0	0

### 6.3. Nominal and Real Per Capita Financial Data

Table A3 shows the average per capita revenue and spending data between 1923 and 1936 in nominal terms. Table A4 shows the average per capita revenue and spending data between 1923 and 1936 in real terms. Real values are in 1967 dollars and calculated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135).

### 6.4. Housing Cycles and Municipal Budgets, 1920s vs. 1930s

Table A5 shows the results of estimating equation (1) separately for the 1920s and the 1930s. The 1920s were a period of generally rising house prices and residential construction, while the 1930s were a period of slowing (or falling) housing markets. The table also shows results for tests of equality of coefficients across the two time periods.

### 6.5. Analysis Using a Different Measure of House Prices

Perhaps the most widely-used source of house price data for the early twentieth century is Wickens (1937), a report that gives enough information to build a picture of the behavior of single-family house prices for 22 cities. This report has been tapped by economists for an indication of house price behavior across a subset of cities (see, for example, Fishback and Kollman, 2014; Shiller, 2005). Fishback and Kollman (2014) were able to expand this sample after finding more survey results used by Wickens. Overall, of the 94 cities in this paper's sample, 23 have house price data from this expanded sample. These data were calculated using the method of Grebler et al. (1956). The survey used to generate the data in Wickens (1937) asked participants to give the value of their home at the time of acquisition, as well as the estimated value in 1934. An index value was calculated for each city in each year by dividing the average purchase price of houses bought in a given year by the average home value reported in January 1934, with a base year of 1930 and a correction for an annual compound depreciation rate of  $1\frac{3}{8}$  percent. In each year, this calculation was performed on the same group of homes, thus mimicking a repeat sales index (except without a sale in 1934). I use this depreciation-corrected index (called the House Price Index, or HPI) in the following robustness checks. Like the PVI used in the main analysis, the HPI is likely biased. For instance, it only measures the value of houses that were not foreclosed upon in the worst years of the Depression (i.e., those for which homeowners were available for an interview in 1934). Insofar as foreclosures occurred, the index overstates house prices, as it does not measure the potentially depressed values of these houses.

Table A3: Nominal per capita revenue and spending, 1923–1936

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
<i>Municipal revenue</i>														
Total revenue	48.98	52.88	55.14	58.45	61.62	63.09	62.81	64.25	62.37	57.74	53.56	56.33	58.11	60.07
Property taxes	31.36	33.50	34.59	36.87	39.17	39.83	39.69	41.43	40.78	38.11	34.42	35.82	36.60	37.28
Public enterprise earnings	5.52	5.83	6.24	6.58	6.72	6.71	6.98	7.04	6.95	6.38	6.13	6.47	6.60	7.24
Government grants	2.49	2.59	2.58	2.63	2.68	2.93	3.01	3.15	3.46	3.90	5.35	5.78	6.60	7.10
Special assessments	3.52	4.17	4.75	4.73	5.34	5.81	5.10	4.43	3.37	2.25	1.45	1.56	1.27	1.13
Other taxes	2.27	2.63	2.75	3.15	3.16	3.23	3.30	3.45	3.16	2.74	2.41	2.79	3.10	3.49
Property and asset revenue	1.72	1.90	1.90	1.94	2.02	2.01	2.08	2.07	1.93	1.67	1.55	1.51	1.44	1.45
General department earnings	1.39	1.44	1.50	1.61	1.57	1.62	1.70	1.79	1.76	1.73	1.54	1.65	1.72	1.50
Donations and contributions	0.28	0.36	0.38	0.39	0.46	0.49	0.52	0.51	0.65	0.73	0.55	0.54	0.55	0.59
Fines, forfeits, and escheats	0.42	0.46	0.46	0.56	0.49	0.46	0.44	0.38	0.30	0.22	0.16	0.20	0.23	0.29
<i>Municipal spending</i>														
Total spending	56.39	61.80	64.13	67.35	71.30	69.52	69.59	72.35	69.28	61.07	52.26	52.12	53.95	56.98
Current expenditures	38.59	40.65	42.32	45.11	47.26	47.97	49.17	50.42	52.00	50.90	47.04	46.86	47.50	48.41
Education	12.75	13.47	13.84	14.53	15.23	15.52	15.88	16.21	16.63	15.78	13.81	13.49	13.83	14.51
Protection to person and property	6.33	6.59	6.91	7.26	7.61	7.70	7.83	7.94	7.98	7.42	6.60	6.57	6.70	6.90
Interest payments	4.81	5.11	5.50	5.99	6.39	6.63	6.90	7.14	7.27	7.49	7.23	7.33	7.00	6.89
Charities, hospitals, and corrections	1.46	1.54	1.65	1.81	1.99	2.05	2.14	2.47	3.40	4.86	5.66	5.49	5.51	5.35
Public enterprises	3.27	3.40	3.50	3.66	3.73	3.72	3.67	3.65	3.61	3.19	2.84	2.96	3.12	3.50
Highways	2.85	2.99	3.03	3.45	3.39	3.27	3.39	3.37	3.41	2.94	2.49	2.67	2.68	2.68
General government	2.19	2.25	2.35	2.46	2.58	2.65	2.69	2.79	2.82	2.63	2.40	2.41	2.46	2.59
Sanitation	2.13	2.22	2.30	2.46	2.61	2.54	2.60	2.60	2.54	2.29	1.93	1.89	1.90	2.00
Miscellaneous	0.99	1.16	1.20	1.28	1.44	1.53	1.60	1.69	1.80	2.00	2.07	2.08	2.23	1.84
Recreation	1.03	1.10	1.16	1.28	1.32	1.35	1.43	1.50	1.48	1.31	1.12	1.08	1.14	1.17
Conservation of health	0.76	0.82	0.88	0.93	0.98	1.00	1.03	1.05	1.07	1.00	0.88	0.89	0.93	0.97
Capital outlays	17.81	21.15	21.80	22.24	24.04	21.55	20.42	21.93	17.27	10.16	5.22	5.26	6.45	8.57

*Note:* Average per capita values are given for the period between 1923 and 1936 for all revenue and spending variables across the 94-city sample (except for Miami, which does not have data for the years between 1923 and 1925). All variables are in nominal terms. See Table 3 for descriptions.

Table A4: Real per capita revenue and spending, 1923–1936

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
<i>Municipal revenue</i>														
Total revenue	95.86	103.28	105.02	110.28	118.49	122.98	122.43	128.51	136.77	141.17	138.05	140.47	141.39	144.75
Property taxes	61.38	65.42	65.89	69.56	75.34	77.64	77.36	82.86	89.43	93.18	88.72	89.34	89.05	89.84
Public enterprise earnings	10.81	11.40	11.88	12.41	12.92	13.08	13.60	14.08	15.24	15.61	15.81	16.13	16.05	17.44
Government grants	4.87	5.05	4.92	4.96	5.16	5.71	5.86	6.30	7.58	9.53	13.79	14.42	16.06	17.11
Special assessments	6.90	8.15	9.04	8.93	10.27	11.33	9.94	8.86	7.38	5.50	3.74	3.88	3.10	2.73
Other taxes	4.44	5.13	5.23	5.94	6.08	6.29	6.44	6.90	6.93	6.70	6.22	6.96	7.55	8.40
Property and asset revenue	3.37	3.70	3.62	3.65	3.88	3.93	4.06	4.15	4.24	4.09	3.99	3.77	3.50	3.48
General department earnings	2.72	2.81	2.85	3.04	3.02	3.16	3.31	3.59	3.87	4.22	3.97	4.10	4.19	3.61
Donations and contributions	0.54	0.70	0.73	0.73	0.88	0.96	1.01	1.01	1.43	1.80	1.43	1.35	1.33	1.43
Fines, forfeits, and escheats	0.83	0.91	0.87	1.05	0.95	0.89	0.86	0.75	0.66	0.55	0.40	0.51	0.55	0.70
<i>Municipal spending</i>														
Total spending	110.36	120.71	122.14	127.08	137.11	135.51	135.66	144.70	151.92	149.30	134.68	129.98	131.26	137.30
Current expenditures	75.51	79.39	80.62	85.11	90.88	93.51	95.85	100.84	114.04	124.46	121.24	116.86	115.56	116.66
Education	24.95	26.31	26.37	27.42	29.29	30.25	30.96	32.43	36.46	38.58	35.60	33.64	33.65	34.97
Protection to person and property	12.40	12.87	13.16	13.70	14.64	15.01	15.27	15.87	17.51	18.15	17.00	16.39	16.30	16.64
Interest payments	9.41	9.97	10.48	11.31	12.28	12.92	13.45	14.28	15.94	18.31	18.64	18.28	17.03	16.60
Charities, hospitals, and corrections	2.86	3.01	3.14	3.42	3.83	3.99	4.16	4.93	7.45	11.88	14.60	13.68	13.40	12.90
Public enterprises	6.41	6.64	6.67	6.90	7.18	7.26	7.16	7.31	7.91	7.80	7.31	7.39	7.59	8.44
Highways	5.57	5.84	5.77	6.52	6.51	6.38	6.61	6.74	7.49	7.20	6.42	6.65	6.53	6.46
General government	4.29	4.40	4.48	4.63	4.95	5.17	5.24	5.58	6.19	6.42	6.20	6.02	5.98	6.24
Sanitation	4.17	4.34	4.38	4.64	5.01	4.95	5.07	5.21	5.57	5.59	4.97	4.71	4.63	4.83
Miscellaneous	1.94	2.26	2.28	2.42	2.77	2.99	3.12	3.39	3.94	4.90	5.34	5.19	5.44	4.42
Recreation	2.02	2.14	2.21	2.41	2.54	2.64	2.78	3.00	3.26	3.20	2.89	2.68	2.78	2.81
Conservation of health	1.50	1.61	1.68	1.75	1.88	1.95	2.01	2.10	2.34	2.43	2.28	2.23	2.25	2.34
Capital outlays	34.85	41.32	41.53	41.97	46.23	42.00	39.81	43.86	37.88	24.84	13.45	13.12	15.69	20.64

Note: Average per capita values are given for the period between 1923 and 1936 for all revenue and spending variables across the 94-city sample (except for Miami, which does not have data for the years between 1923 and 1925). All variables are in real terms (1967 dollars) and calculated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135). See Table 3 for descriptions.

Table A5: Housing and municipal finances: 1920s vs. 1930s

	PVI						Housing permits					
	1923-29			1930-36			1923-29			1930-36		
	Cumulative elasticity	Std. err.	p-value	Cumulative elasticity	Std. err.	p-value	Cumulative elasticity	Std. err.	p-value	Cumulative elasticity	Std. err.	p-value
<i>Panel A: Municipal revenue</i>												
Total revenue	0.109**	0.052	0.030	0.045	0.037	0.286	0.096***	0.021	0.016	0.017	0.003	
Property taxes	0.084	0.068	0.037	0.065*	0.037	0.806	0.065***	0.024	0.010	0.026	0.012	
Public enterprise earnings	0.121	0.178	0.112	0.167	0.112	0.797	-0.014	0.087	0.086	0.054	0.329	
Government grants	0.039	0.138	0.247	0.355	0.247	0.264	0.007	0.068	-0.277*	0.146	0.078	
Special assessments	0.351	0.252	0.346	-0.311	0.346	0.122	0.528**	0.224	0.082	0.099	0.069	
Other taxes	0.232**	0.114	0.123	-0.295**	0.123	0.002	0.183***	0.062	0.076*	0.044	0.159	
Property and asset revenue	0.210	0.172	0.150	0.051	0.150	0.486	0.063	0.042	0.141**	0.067	0.324	
General department earnings	0.091	0.140	0.081	-0.076	0.081	0.302	0.175***	0.048	0.060	0.045	0.080	
Donations and contributions	-0.517	0.327	0.191	0.002	0.191	0.171	0.225***	0.106	-0.151	0.130	0.025	
Fines, forfeits, and escheats	0.004	0.202	0.153	0.091	0.153	0.732	0.200***	0.070	0.108*	0.062	0.325	
<i>Panel B: Municipal spending</i>												
Total spending	0.178**	0.081	0.049	-0.006	0.049	0.052	0.167***	0.032	0.047**	0.018	0.001	
Current expenditures	0.019	0.034	0.036	0.051	0.036	0.518	0.059***	0.013	0.031**	0.014	0.143	
Education	-0.024	0.035	0.030	0.002	0.030	0.573	0.068***	0.015	0.024*	0.013	0.027	
Protection to person and property	0.007	0.043	0.038	-0.001	0.038	0.889	0.047***	0.015	0.027	0.019	0.409	
Interest payments	0.407	0.389	0.049	0.124**	0.049	0.470	-0.049	0.087	0.018	0.017	0.450	
Charities, hospitals, and corrections	0.176	0.201	0.319	0.325	0.319	0.693	0.132	0.081	0.233**	0.109	0.457	
Public enterprises	0.006	0.153	0.124	0.110	0.124	0.597	-0.002	0.070	0.083	0.058	0.350	
Highways	0.056	0.122	0.075	-0.032	0.075	0.539	0.085**	0.034	0.014	0.032	0.128	
General government	0.034	0.071	0.055	0.058	0.055	0.789	0.064***	0.022	0.030	0.022	0.274	
Sanitation	0.044	0.060	0.056	0.118**	0.056	0.367	0.120***	0.027	0.085***	0.031	0.395	
Miscellaneous	-0.061	0.187	0.098	-0.040	0.098	0.921	-0.060	0.056	0.047	0.033	0.010	
Recreation	0.075	0.088	0.067	0.076	0.067	0.993	0.051	0.061	0.060*	0.036	0.899	
Conservation of health	0.057	0.112	0.065	-0.027	0.065	0.516	0.067	0.047	0.017	0.032	0.379	
Capital outlays	0.506**	0.244	0.236	-0.065	0.236	0.093	0.436***	0.101	0.230***	0.085	0.119	

\*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Note: All financial variables are in natural logs in period  $t$  and expressed in real per capita terms. The coefficients for the PVI and housing permits are cumulative elasticities based on three lags. All regressions are full specifications based on equation (1), estimated separately for the 1923-29 and 1930-36 periods.  $p$ -values are given for two-tailed  $z$ -tests of the differences between the 1920s and 1930s coefficients; underlined  $p$ -values indicate statistically significant differences at the 10 percent level. Controls include city fixed effects, year fixed effects, region-year interactions, a tax rate limit indicator, and three lags of city population and real per capita state income. Standard errors are clustered at the city level. All regressions include a constant.



Overall, the coefficients for the HPI are larger than those for the PVI, likely due to measurement biases (i.e., upward bias in the HPI and downward bias in the PVI). But the results across the samples largely correspond. For example, using the HPI, the cumulative elasticities for total revenue, property taxes, total spending, and current expenditures are 0.746 (standard error: 0.246), 0.595 (standard error: 0.189), 0.726 (standard error: 0.385), and 0.397 (standard error: 0.155). See Table 5 for comparison. In relation to Table 6, the results using the HPI show significant house price elasticities only for total revenue and property taxes. While the elasticity for government grants is positive and large, it is statistically insignificant. For spending, the results using the HPI show positive and significant elasticities for sanitation and charitable spending. The HPI elasticity for general government is positive but small and imprecisely measured.

## References

- Abbott, C., 2007. *Urban America in the Modern Age: 1920 to the Present*, 2nd Edition. Harlan Davidson Inc.
- Alm, J., Buschman, R. D., Sjoquist, D. L., 2011. Rethinking local government reliance on the property tax. *Regional Science and Urban Economics* 41, 320–331.
- Alm, J., Buschman, R. D., Sjoquist, D. L., 2014. Foreclosures and local government revenues from the property tax: The case of Georgia school districts. *Regional Science and Urban Economics* 46, 1–11.
- Alm, J., Leguizamon, S., 2018. The housing crisis, foreclosures, and local tax revenues. *Regional Science and Urban Economics* 70, 300–311.
- Beito, D. T., 1989. *Taxpayers in Revolt: Tax Resistance during the Great Depression*. University of North Carolina Press.
- Bernanke, B., 1983. Nonmonetary effects of the financial crisis in the propagation of the Great Depression. *American Economic Review* 73 (3), 257–276.
- Bird, F. L., 1936a. Extent and distribution of urban tax delinquency. *Law and Contemporary Problems* 3, 337–346.
- Bird, F. L., 1936b. Cities and their debt burdens. *National Municipal Review*, 12–19.
- Bird, F. L., 1938. *The trend of tax delinquency, 1930–1937: Cities over 50,000 population*. Report, Dun and Bradstreet, Inc., New York City.
- Brockner, M., Hanes, C., 2014. The 1920s American real estate boom and the downturn of the Great Depression: Evidence from city cross-sections. In: White, E. N., Snowden, K., Fishback, P. (Eds.), *Housing Markets in Historical Perspective*. University of Chicago Press, Chicago and London, Ch. 5, pp. 161–201.
- Brower, I., 1932. Reducing expenditures by reorganizing departments. In: Ridley, C. E., Nolting, O. F. (Eds.), *City Manager Yearbook 1932*. The International City Managers' Association, Chicago, pp. 99–101.
- Buck, A., 1933. Municipal budgeting. In: Ridley, C. E., Nolting, O. F. (Eds.), *City Manager Yearbook 1933*. The International City Managers' Association, Chicago, pp. 3–5.
- Buck, A. E., 1934. Municipal budgeting. In: Ridley, C. E., Nolting, O. F. (Eds.), *The Municipal Year Book 1934: An Authoritative Résumé of Activities and Statistical Data of American Cities*. The International City Managers' Association, Chicago, pp. 45–47.

- Cain, L., Rotella, E., 2001. Death and spending: Urban mortality and municipal expenditure on sanitation. *Annales de Démographie Historique* 1, 139–154.
- Cline, D. C., 1934. Economic recovery and the public employee. *National Civic Review* 23 (9), 471–476.
- Coen-Pirani, D., Wooley, M., 2018. Fiscal centralization: Theory and evidence from the Great Depression. *American Economic Journal: Economic Policy* 10 (2), 39–61.
- Cromwell, E., Ihlanfeldt, K., 2015. Local government responses to exogenous shocks in revenue sources: Evidence from Florida. *National Tax Journal* 68 (2), 339–376.
- Doerner, W. M., Ihlanfeldt, K. R., 2011. House prices and city revenues. *Regional Science and Urban Economics* 41, 332–342.
- Eichengreen, B., Mitchener, K. J., 2004. The Great Depression as a credit boom gone wrong. In: Wolcott, S., Hanes, C. (Eds.), *Research in Economic History*. Vol. 22. Emerald Group Publishing Limited, pp. 183–237.
- Fairchild, F. R., 1934. The problem of tax delinquency. *American Economic Review* 24 (1), 140–150.
- Fairchild, F. R., Adams, T. S., Blough, J. R., Chatters, C. H., Compton, R. T., Englund, E., Kennan, K. K., Morrison, F. W., Powell, H. M., Wager, P. W., 1932. Preliminary report of the committee of the National Tax Association on tax delinquency. *Proceedings of the Annual Conference on Taxation under the Auspices of the National Tax Association* 25, 292–331.
- Field, A. J., 1992. Uncontrolled land development and the duration of the Depression in the United States. *Journal of Economic History* 52 (4), 785–805.
- Field, A. J., 2014. The interwar housing cycle in the light of 2001–2012: A comparative historical perspective. In: White, E. N., Snowden, K., Fishback, P. (Eds.), *Housing Markets in Historical Perspective*. University of Chicago Press, Chicago and London, Ch. 2, pp. 39–80.
- Fishback, P., Kollman, T., 2014. New multicity estimates of the changes in home values, 1920–1940. In: White, E. N., Snowden, K., Fishback, P. (Eds.), *Housing Markets in Historical Perspective*. University of Chicago Press, Chicago and London, Ch. 6, pp. 203–244.
- Fishback, P., Rose, J., Snowden, K., 2013. *Well Worth Saving: How the New Deal Safeguarded Homeownership*. The University of Chicago Press.
- Fishback, P. V., Haines, M. R., Kantor, S., 2007. Births, deaths, and New Deal relief during the Great Depression. *The Review of Economics and Statistics* 89 (1), 1–14.

- Fishback, P. V., Horrace, W. C., Kantor, S., 2005. Did New Deal grant programs stimulate local economies? A study of federal grants and retail sales during the Great Depression. *Journal of Economic History* 65 (1), 36–71.
- Fishback, P. V., Johnson, R. S., Kantor, S., 2010. Striking at the roots of crime: The impact of welfare spending on crime during the Great Depression. *Journal of Law and Economics* 53, 715–740.
- Fox, J., Myrskylä, M., 2015. Urban fertility responses to local government programs: Evidence from the 1923–32 U.S. *Demographic Research* 32 (16), 487–532.
- Fuchs, E. R., 1992. *Mayors and Money: Fiscal Policy in New York and Chicago*. Chicago: University of Chicago Press.
- Gelfand, M. I., 1975. *A Nation of Cities: The Federal Government and Urban America, 1933–1965*. New York, NY: Oxford University Press.
- Gibson, C., 1998. Population of the 100 largest cities and other urban places in the United States: 1790 to 1990. U.S. Bureau of the Census: Population Division Working Paper No. 27.
- Gilbert, D. W., 1933. Business cycles and municipal expenditures. *The Review of Economics and Statistics* 15 (3), 135–144.
- Gilbert, D. W., 1940. Cycles in municipal finance. *The Review of Economics and Statistics* 22 (4), 190–202.
- Grebler, L., Blank, D. M., Winnick, L., 1956. *Capital Formation in Residential Real Estate: Trends and Prospects*. New York: Princeton University Press.
- Gyourko, J., Tracy, J., 1991. The structure of local public finance and the quality of life. *Journal of Political Economy* 99 (4), 774–806.
- Heer, C., 1936. Who benefits from tax limitations? In: Leet, G., Paige, R. M. (Eds.), *Property Tax Limitation Laws: The Evidence and the Arguments for and against Them by Twenty-Four Authorities*. Public Administration Service, Chicago, pp. 21–25.
- Heleniak, R., 1969. Local reaction to the Great Depression in New Orleans, 1929–1933. *Louisiana History: The Journal of the Louisiana Historical Association* 10 (4), 289–306.
- Hempel, G. H., 1973. Quantitative borrower characteristics associated with defaults on municipal general obligations. *The Journal of Finance* 28 (2), 523–530.
- Hillhouse, A. M., 1936. *Municipal Bonds: A Century of Experience*. New York: Prentice Hall.

- Holian, M., Joffe, M., 2013. Assessing municipal bond default probabilities. Working paper: accessed at <https://mpra.ub.uni-muenchen.de>.
- Ihlanfeldt, K., Mayock, T., 2015. Foreclosures and local government budgets. *Regional Science and Urban Economics* 53, 135–147.
- Jensen, J. P., 1931. *Property Taxation in the United States*. Chicago: The University of Chicago Press.
- Joffe, M. D., 2013. Drivers of municipal bond defaults. Master's thesis: accessed at <https://papers.ssrn.com>.
- Judd, D. R., Swanstrom, T., 2002. *City Politics: Private Power and Public Policy*, 3rd Edition. Addison-Wesley Educational Publishers Inc.
- Kelsey, G. H., Feb 14 1932. Detroit gets loan to tide over slump. *New York Times*.
- Kimbrough, G., Snowden, K., 2007. The spatial character of housing depression in the 1930s. Working paper.
- Knoll, K., Schularick, M., Steger, T., 2017. No price like home: Global house prices, 1870–2012. *American Economic Review* 107 (2), 331–353.
- Legler, J. B., Sylla, R., Wallis, J. J., 1988. U.S. city finances and the growth of government, 1850–1902. *The Journal of Economic History* 48 (2), 347–356.
- Lehmann, H. W., 1950. The federal Municipal Bankruptcy Act. *The Journal of Finance* 5 (3), 241–256.
- Leland, S. E., 1936. Municipal revenues. In: Ridley, C. E., Nolting, O. F. (Eds.), *The Municipal Year Book 1936: An Authoritative Résumé of Activities and Statistical Data of American Cities*. The International City Managers' Association, Chicago, pp. 28–38.
- Lutz, B., Molloy, R., Shan, H., 2011. The housing crisis and state and local government tax revenue: Five channels. *Regional Science and Urban Economics* 41, 306–319.
- Lutz, B. F., 2008. The connection between house price appreciation and property tax revenues. *National Tax Journal* 61 (3), 555–572.
- Martin, R. F., 1939. National income and its distribution, 1919–1938. Tech. rep., The Conference Economic Record.
- Mencken, H., November 1933. What is going on in the world. *The American Mercury* 30 (119), 257–262.
- Michigan Planning Commission, 1939. A study of subdivision development in the Detroit metropolitan area. Report, Lansing, Michigan.

New York Times, Mar 30 1932. Detroit presses economy: Mayor says city will balance the budget and pay all debts. ProQuest Historical Newspapers: 1923-Current file.

New York Times, Jul 11 1933a. Jersey city cuts its payroll 40%. ProQuest Historical Newspapers: 1923-Current file.

New York Times, Jul 23 1933b. Tax troubles laid to land gambling. ProQuest Historical Newspapers: 1923-Current file.

Newman, W. H., 1935. *The Building Industry and Business Cycles*. Chicago: University of Chicago Press.

Nicholas, T., Scherbina, A., 2013. Real estate prices during the Roaring Twenties and the Great Depression. *Real Estate Economics* 41 (2), 278–309.

Noonan, A. W., 1936. Assessment administration. In: Ridley, C. E., Nolting, O. F. (Eds.), *The Municipal Year Book 1936: An Authoritative Résumé of Activities and Statistical Data of American Cities*. The International City Managers' Association, Chicago, pp. 20–27.

Paquin, B. P., 2015. Chronicle of the 161-year history of state-imposed property tax limitations. Lincoln Institute of Land Policy Working Paper WP15BP1.

Public Management, 1934. Municipal salary cuts and restorations. *Public Management* 16, 103–110.

Putney, B., 1935. Tax delinquency in the United States. CQ Press Editorial Research Reports 2.

Ridley, C. E., Nolting, O. F., 1932. *City Manager Yearbook 1932*. Chicago: The International City Managers' Association.

Ridley, C. E., Nolting, O. F., 1935. Municipal personnel data. In: Ridley, C. E., Nolting, O. F. (Eds.), *The Municipal Year Book 1935: An Authoritative Résumé of Activities and Statistical Data of American Cities*. The International City Managers' Association, Chicago, pp. 201–209.

Riggleman, J. R., 1933. Building cycles in the United States, 1875–1932. *Journal of the American Statistical Association* 28 (182), 174–183.

Ross, J., Yan, W., Johnson, C., 2015. The public financing of America's largest cities: A study of city financial records in the wake of the Great Recession. *Journal of Regional Science* 55 (1), 113–138.

Schularick, M., Taylor, A. M., 2012. Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870–2008. *The American Economic Review* 102 (2), 1029–1061.

Shiller, R., 2005. *Irrational Exuberance*. Princeton, NJ: Princeton University Press.

- Skidmore, M., Scorsone, E., 2011. Causes and consequences of fiscal stress in Michigan cities. *Regional Science and Urban Economics* 41, 360–371.
- Snowden, K. A., 2010. The anatomy of a residential mortgage crisis: A look back at the 1930s. In: Mitchell, L. E., Arthur E. Wilmarth, J. (Eds.), *The Panic of 2008: Causes, Consequences and Implications for Reform*. Edward Elgar Publishing, Cheltenham, UK, pp. 51–76.
- Spengler, E. H., 1937. Are municipal finances conditioned by cyclical fluctuations. *The Bulletin of the National Tax Association* 22 (7), 194–202.
- Suiter, W. O., 1936. State limits on local property taxes. In: Ridley, C. E., Nolting, O. F. (Eds.), *The Municipal Year Book 1936: An Authoritative Résumé of Activities and Statistical Data of American Cities*. The International City Managers' Association, Chicago, pp. 328–339.
- The Pacific Coast Wall Street Journal, Dec 19 1932. Municipals: San Francisco finances sound. ProQuest Historical Newspapers: 1923-Current file.
- The Washington Post, Apr 22 1934. Chicago is now only two months behind in pay: \$8,000,000 separates city from punctuality in paying workers. ProQuest Historical Newspapers: The Washington Post.
- Thomasson, M. A., Fishback, P. V., 2014. Hard times in the land of plenty: The effect on income and disability later in life for people born during the Great Depression. *Explorations in Economic History* 54, 64–78.
- Thompson, P. N., 2016. School district and housing price responses to fiscal stress labels: Evidence from Ohio. *Journal of Urban Economics* 94, 54–72.
- Thompson, P. N., 2017. Effects of fiscal stress labels on municipal government finances, housing prices, and the quality of public services: Evidence from Ohio. *Regional Science and Urban Economics* 64, 98–116.
- Upson, L. D., 1933. Observations on the trend of municipal financial practices. In: Ridley, C. E., Nolting, O. F. (Eds.), *City Manager Yearbook 1933*. The International City Managers' Association, Chicago, pp. 129–145.
- Upson, L. D., 1935. Local government finance in the Depression. *National Municipal Review*, 503–511.
- U.S. Bureau of Labor Statistics, 1925. Building permits in the principal cities of the United States in 1923. Bulletin 368. Report, Washington, D.C.: GPO.
- U.S. Bureau of Labor Statistics, 1938. Statistics of building construction, 1920 to 1937. Bulletin 650. Report, Washington, D.C.: GPO.

U.S. Census Bureau, 1923. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1925.

U.S. Census Bureau, 1924. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1926.

U.S. Census Bureau, 1925. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1927.

U.S. Census Bureau, 1926. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1928.

U.S. Census Bureau, 1927. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1929.

U.S. Census Bureau, 1928. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1931.

U.S. Census Bureau, 1929. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1932.

U.S. Census Bureau, 1930. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1932.

U.S. Census Bureau, 1931. Financial statistics of cities having a population of over 30,000. Annual report, Washington, D.C.: 1934.

U.S. Census Bureau, 1932. Financial statistics of cities having a population of over 100,000. Annual report, Washington, D.C.: 1934.

U.S. Census Bureau, 1933. Financial statistics of cities having a population of over 100,000. Annual report, Washington, D.C.: 1935.

U.S. Census Bureau, 1934. Financial statistics of cities having a population of over 100,000. Annual report, Washington, D.C.: 1936.

U.S. Census Bureau, 1935. Financial statistics of cities having a population of over 100,000. Annual report, Washington, D.C.: 1937.

U.S. Census Bureau, 1936. Financial statistics of cities having a population of over 100,000. Annual report, Washington, D.C.: 1938.



- U.S. Census Bureau, 1975. Historical statistics of the United States: Colonial times to 1970. Report, Washington, D.C.: GPO.
- Vlaicu, R., Whalley, A., 2011. Do housing bubbles generate fiscal bubbles? Evidence from California cities. *Public Choice* 149, 89–108.
- Wallis, J. J., 1984. The birth of the old federalism: Financing the New Deal, 1932-1940. *Journal of Economic History* 44 (1), 139–159.
- Wallis, J. J., 2001. A history of the property tax in America. In: Oates, W. E. (Ed.), *Property Taxation and Local Government Finance*. Lincoln Institute of Land Policy, Cambridge, pp. 123–147.
- Wallis, J. J., 2003. The property tax as a coordinating device: Financing Indiana’s mammoth internal improvement system, 1935–1842. *Explorations in Economic History* 40, 223–250.
- White, E. N., 2014. Lessons from the great American real estate boom and bust of the 1920s. In: White, E. N., Snowden, K., Fishback, P. (Eds.), *Housing Markets in Historical Perspective*. University of Chicago Press, Chicago and London, Ch. 4, pp. 115–158.
- Wickens, D. L., 1937. Financial survey of urban housing: Statistics on financial aspects of urban housing. Report, Washington, D.C.: United States Department of Commerce, GPO.

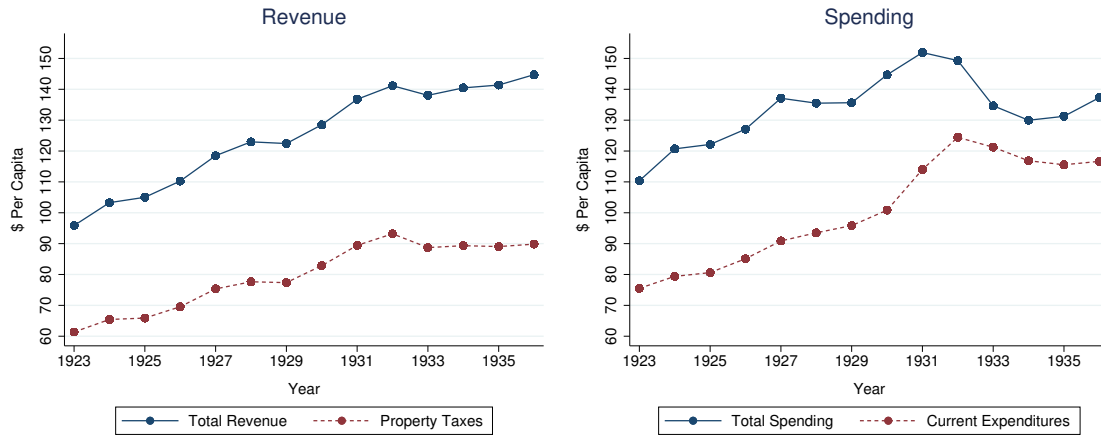


Figure 1: Real per capita revenue and spending, 1923–1936

*Note:* The figure shows average per capita total revenue, property taxes receipts, total spending, and current expenditures for 94 large U.S. cities. Due to lack of data, Miami is not included before 1926. All values are in real terms (1967 dollars).

*Source:* Author's calculations based on data from the *Financial Statistics of Cities* reports. To calculate per capita values, census population data were linearly interpolated between census years. Nominal values are deflated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135). See text for details on data construction and Table 3 for descriptions of revenue and spending variables.

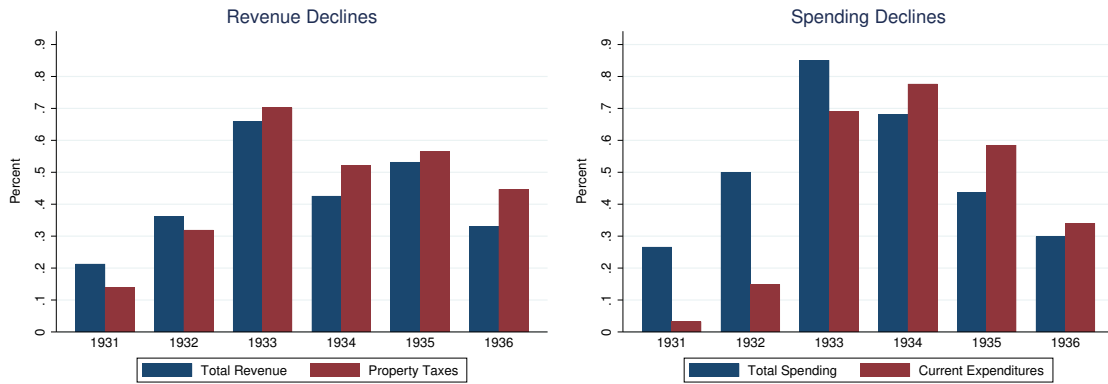


Figure 2: Fraction of cities experiencing declines in real per capita revenue and spending by year, 1931–1936

*Note:* The height of the bars represents the fraction of cities that experienced declines in real per capita total revenue, property taxes, total spending, and current expenditures in a given year.

*Source:* Author’s calculations based on data from the *Financial Statistics of Cities* reports. To calculate per capita values, census population data were linearly interpolated between census years. Nominal values are deflated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135). See text for details on data construction and Table 3 for descriptions of revenue and spending variables.

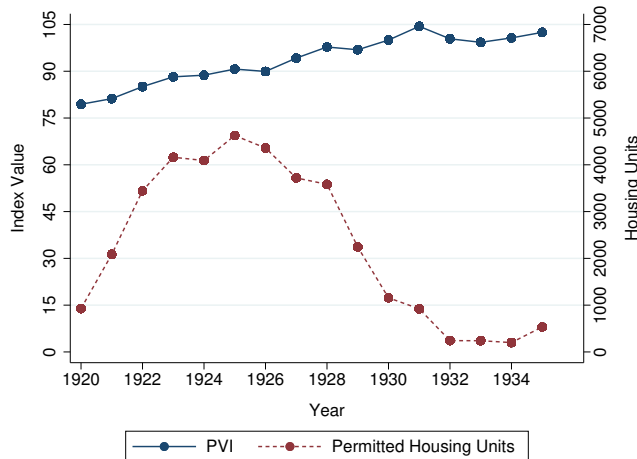


Figure 3: PVI and permitted housing units, 1920–1935

*Note:* The figure shows median index values for the PVI (1930=100) and the average number of new family housing units permitted in 94 large U.S. cities between 1920 and 1935. The PVI is deflated by the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135).

*Source:* Author’s calculations from reports compiled by the Bureau of Labor Statistics (see text).

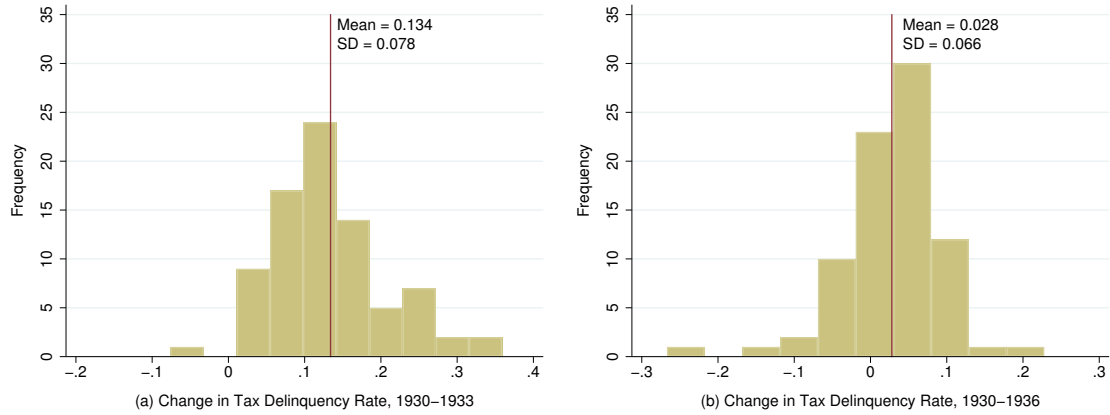


Figure 4: Distribution of the changes in the tax delinquency rate by city, 1930–1933 and 1930–1936

*Note:* The sample consists of 81 cities for which delinquency data are available in the years considered. The mean and standard deviation (SD) of the changes are as shown, with the solid vertical line representing the mean change.

*Source:* Author’s calculations from data given in Bird (1938).

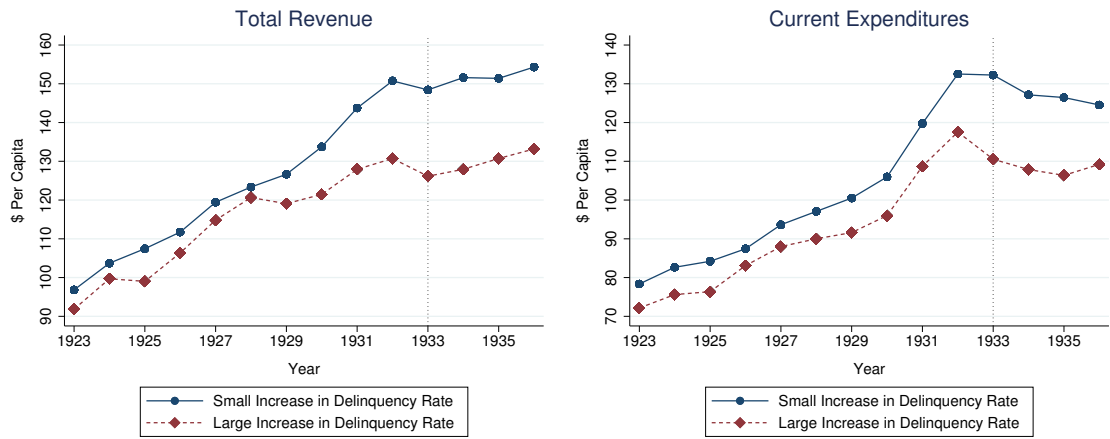


Figure 5: Total revenue and current expenditures in cities by the size of the increase in the delinquency rate between 1930 and 1933

*Note:* The figure shows average per capita total revenue and current expenditures for 94 large U.S. cities above and below the median change in delinquency rates between 1930 and 1933. The dotted line at 1933 represents the peak year in the average delinquency rate. Due to lack of data, Miami is not included before 1926. All values are in real terms (1967 dollars).

*Source:* Author’s calculations based on data from the *Financial Statistics of Cities* reports. To calculate per capita values, census population data were linearly interpolated between census years. Nominal values were deflated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135). See text for details on data construction and Table 3 for descriptions of revenue and spending variables.

Table 1: Ratios of per capita municipal finances in 1923, 1933, and 1936 to 1932

Region	1923		1933		1936		No. of cities
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
<i>Total revenue</i>							
Midwest	0.782	0.108	0.968	0.117	1.011	0.140	28
Northeast	0.607	0.114	0.988	0.086	1.033	0.090	32
South	0.694	0.147	1.010	0.161	1.051	0.142	23
without Oklahoma City, OK	0.676	0.122	0.991	0.136	1.036	0.127	
West	0.770	0.180	0.951	0.092	1.038	0.132	11
United States	0.700	0.148	0.983	0.118	1.031	0.124	94
<i>Property taxes</i>							
Midwest	0.750	0.096	0.919	0.142	0.893	0.147	28
Northeast	0.608	0.113	0.975	0.097	1.045	0.158	32
South	0.683	0.174	1.000	0.261	0.954	0.162	23
without Oklahoma City, OK	0.655	0.116	0.955	0.147	0.936	0.140	
West	0.721	0.208	0.920	0.103	0.920	0.133	11
United States	0.682	0.149	0.958	0.165	0.963	0.164	94
<i>Total spending</i>							
Midwest	0.892	0.187	0.917	0.086	0.936	0.168	28
Northeast	0.641	0.143	0.929	0.077	0.917	0.103	32
South	0.886	0.286	0.865	0.105	0.976	0.187	23
West	0.734	0.129	0.868	0.071	0.905	0.148	11
United States	0.785	0.226	0.903	0.090	0.936	0.152	94
<i>Current expenditures</i>							
Midwest	0.683	0.086	0.979	0.074	0.936	0.115	28
Northeast	0.550	0.092	0.992	0.065	0.946	0.097	32
South	0.672	0.120	0.937	0.092	0.928	0.071	23
West	0.631	0.111	0.961	0.064	0.918	0.077	11
United States	0.628	0.115	0.971	0.077	0.935	0.095	94

*Note:* The peak year in revenue for the average city was 1932. Due to lack of data, Miami is not included in the calculations for 1923. Oklahoma City experienced a large fall in property taxes in 1932, which skews the revenue ratios for the South; the spending ratios are similar with and without Oklahoma City. All values are in real terms (1967 dollars). See Table 3 for descriptions of revenue and spending variables. *Source:* Author's calculations based on data from the *Financial Statistics of Cities* reports. To calculate per capita values, census population data were linearly interpolated between census years. Nominal values are deflated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135).

Table 2: Property tax delinquency rates by region, 1930–1936

Region	Year								No. of cities
	1930	1931	1932	1933	1934	1935	1936	All	
Midwest	0.066 (0.030)	0.100 (0.051)	0.180 (0.079)	0.232 (0.101)	0.218 (0.090)	0.181 (0.074)	0.135 (0.055)	0.161 (0.091)	20
Northeast	0.175 (0.107)	0.201 (0.101)	0.258 (0.122)	0.292 (0.122)	0.267 (0.108)	0.218 (0.097)	0.184 (0.092)	0.228 (0.114)	32
South	0.141 (0.089)	0.176 (0.104)	0.241 (0.127)	0.286 (0.142)	0.244 (0.114)	0.199 (0.092)	0.164 (0.089)	0.208 (0.118)	22
West	0.079 (0.058)	0.108 (0.080)	0.157 (0.104)	0.195 (0.109)	0.168 (0.098)	0.140 (0.087)	0.106 (0.078)	0.136 (0.094)	11
United States	0.130 (0.095)	0.161 (0.099)	0.223 (0.118)	0.264 (0.125)	0.237 (0.108)	0.194 (0.092)	0.157 (0.085)	0.196 (0.113)	85

*Note:* The delinquency rate is the proportion of tax levies on all property—real and personal—within a city’s jurisdiction that are unpaid in a given fiscal year. The mean for each region is given, with standard deviations in parentheses. The sample is slightly unbalanced as not all cities have delinquency data for every year. See Section 3.1 for more information. *Source:* Author’s calculations from data given in Bird (1938).

Table 3: Financial variable descriptions

Variable	Description
<i>Municipal revenue</i>	
Property taxes	<i>Ad valorem</i> taxes on property
Public enterprise earnings	Fees and charges for public services such as water, electricity, and gas
Government grants	Grants from county, state, and federal governments
Special assessments	Charges levied on specific properties benefiting from capital projects; compulsory fees levied on specific properties for operation and maintenance of existing public improvements
Other taxes	Business license taxes; special taxes on corporations; inheritance taxes; taxes on animals; poll taxes; dog licenses; motor vehicle licenses; marriage licenses; building permits
Property and asset revenue	Interest on funds; fees received for privilege of using streets in provision of public services (e.g., subways) and extending private property onto public property (e.g., awnings); rent from city-owned real property (held for investment purposes)
General department earnings	Fees and charges for services performed by municipal administration
Donations and contributions	Private contributions; retirement dues received by or for government employees
Fines, forfeits, and escheats	Court fines and penalties; fees exacted from unfulfilled contracts; revenues received from sale of property seized by city governments
<i>Municipal spending</i>	
Current expenditures	Short-term (non-capital) spending on education; protection to person and property; interest payments; charities, hospitals, and corrections; public enterprises; highways; general government; sanitation; miscellaneous; recreation; conservation of health
Education	Schools; libraries
Protection to person and property	Police and fire departments; inspection services
Interest payments	Interest costs incurred on short-term and long-term debt
Charities, hospitals, and corrections	Care of poor and children; operation and maintenance of hospitals; correctional services
Public enterprises	Water-supply systems; electric light and power systems; docks, wharves, and landings; cemeteries and crematories
Highways	Maintenance of roadways and waterways; snow and ice removal; street lighting
General government	Judicial courts and services; executive administration; legislative services; elections
Sanitation	Refuse collection; sewer maintenance and sewage disposal; street cleaning
Miscellaneous	Pensions; special aid; administration of public trust funds and investments; other general spending
Recreation	Parks and trees; educational; general recreation
Conservation of health	Prevention and treatment of communicable diseases; vital statistics; food regulation
Capital outlays	Costs of land, properties, and public improvements that are more or less permanent

*Note:* Descriptions are based on those given in the *Financial Statistics of Cities* report for 1930 (U.S. Census Bureau, 1930); they are consistent across time. Categories are listed in order of their relative weight in the average city's budget across the years between 1923 and 1936 (see Table 4). The largest revenue and spending subcategories in 1930 are listed first in the descriptions.

Table 4: Summary statistics

	Cities	Periods	Mean	Std. dev.	% change: 1930–33		% change: 1932–33	
					Mean	Std. dev.	Mean	Std. dev.
<i>Municipal revenue (per capita)</i>								
Total revenue	94	14	125.01	43.34	8.10	18.25	-1.68	11.76
Property taxes	94	14	79.68	28.75	7.06	21.70	-4.20	16.54
Public enterprise earnings	94	14	14.04	13.14	109.02	812.41	1.24	13.46
Government grants	94	14	8.68	10.58	1508.44	6164.25	139.47	391.85
Special assessments	94	14	7.12	8.68	-47.67	41.84	-28.72	41.22
Other taxes	94	14	6.38	6.03	19.68	66.84	13.66	62.45
Property and asset revenue	94	14	3.82	4.13	-9.45	36.40	-4.35	34.12
General department earnings	94	14	3.46	2.16	15.59	57.04	-5.91	22.30
Donations and contributions	94	14	1.10	1.23	239.70	1482.23	43.01	427.01
Fines, forfeits, and escheats	94	14	0.75	0.76	-26.52	116.23	-13.69	66.61
<i>Municipal spending (per capita)</i>								
Total spending	94	14	133.44	47.94	-5.94	18.67	-9.72	8.96
Current expenditures	94	14	100.80	36.98	19.21	16.30	-2.90	7.68
Education	94	14	31.50	8.97	9.93	13.44	-7.68	7.90
Protection to person and property	94	14	15.36	5.56	6.87	13.92	-5.92	9.34
Interest payments	94	14	14.22	7.67	33.56	25.44	2.72	13.93
Charities, hospitals, and corrections	94	14	7.39	10.11	461.10	1531.51	60.33	234.65
Public enterprises	94	14	7.28	7.34	93.21	712.30	-5.66	16.89
Highways	94	14	6.48	3.09	-2.25	29.87	-7.62	27.72
General government	94	14	5.42	3.16	12.74	31.63	-2.48	19.77
Sanitation	94	14	4.86	2.65	-5.14	23.87	-11.63	14.98
Miscellaneous	94	14	3.60	3.27	56.52	65.16	13.81	42.14
Recreation	94	14	2.67	1.54	-0.33	47.37	-4.33	52.70
Conservation of health	94	14	2.03	1.28	7.54	24.68	-6.97	14.09
Capital outlays	94	14	32.64	25.44	-65.41	27.18	-42.91	32.54
<i>Housing and tax delinquency</i>								
Permit value index (PVI)	94	16	96.94	41.88	0.84	35.78	5.06	28.49
Housing permits	94	16	2296.69	8601.90	-78.37	18.10	-26.10	44.89
Delinquency rate	85	7	0.20	0.11	0.13 <sup>†</sup>	0.08	0.04 <sup>†</sup>	0.04
<i>Controls</i>								
State income per capita	94	16	1263.80	410.75	-21.80	5.82	-1.52	4.47
Population	94	16	364080.71	762263.02	1.40	2.96	0.44	0.92
Tax rate limit	94	14	0.04	0.19				
Midwest	94	14	0.30	0.46				
Northeast	94	14	0.34	0.47				
South	94	14	0.24	0.43				
West	94	14	0.12	0.32				

<sup>†</sup> percentage-point change.

*Note:* Summary data are given for the period between 1923 and 1936 for all revenue and spending variables across the 94-city sample. Financial variables and state income are given in per capita terms. Financial values, state income, and the PVI (1930=100) are deflated using the CPI (U.S. Census Bureau, 1975, pp. 210-211, Series E-135). To match their periods of use in the analysis (which uses lags of most variables), the PVI, housing permits, population, and state income data encompass the years between 1920 and 1935. The delinquency data run from 1930 through 1936. Summary data are given for percent changes from 1930–33 and 1932–33. The peak year in revenue and many spending categories for the average city was 1932 (see Table A4 in the appendix). See Table 3 for financial variable descriptions and text for description of other variables.



Table 5: Housing and municipal finances, 1923–1936

	Total revenue (1)	Property taxes (2)	Total spending (3)	Current expenditures (4)
$\ln(\text{PVI}_{t-1})$	0.038** (0.017)	0.022 (0.019)	0.043** (0.021)	0.033** (0.013)
$\ln(\text{PVI}_{t-2})$	0.042** (0.017)	0.026 (0.019)	0.028 (0.018)	0.015 (0.012)
$\ln(\text{PVI}_{t-3})$	0.023 (0.015)	0.034* (0.018)	0.010 (0.021)	0.015 (0.015)
$\ln(\text{Housing permits}_{t-1})$	0.014 (0.010)	-0.003 (0.011)	0.041*** (0.011)	0.012* (0.007)
$\ln(\text{Housing permits}_{t-2})$	0.018** (0.008)	0.007 (0.008)	0.028*** (0.010)	0.008 (0.005)
$\ln(\text{Housing permits}_{t-3})$	0.042*** (0.010)	0.044*** (0.013)	0.046*** (0.012)	0.036*** (0.010)
Tax rate limit <sub><i>t</i></sub>	-0.096** (0.042)	-0.084* (0.046)	-0.106*** (0.036)	-0.052 (0.033)
Cumulative elasticities: PVI	0.103*** (0.032)	0.082** (0.032)	0.081* (0.044)	0.063** (0.029)
Housing permits	0.074*** (0.017)	0.049** (0.021)	0.115*** (0.020)	0.056*** (0.015)
City fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Region × year effects	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Observations	1290	1290	1290	1290
Cities	94	94	94	94
<i>R</i> <sup>2</sup>	0.674	0.598	0.493	0.818

\*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

*Note:* Column headings are dependent variables, which are in natural logs in period  $t$  and expressed in real per capita terms. The PVI is an index based on the average cost to build a family housing unit (in real terms). Cumulative elasticities are the sum of the three lags shown in the table. Variables included in ‘other controls’ are three lags each of city population and real per capita state income. Standard errors are clustered at the city level and reported in parentheses. All regressions include a constant.

Table 6: Housing and other financial categories, 1923–1936

	PVI		Housing permits	
	Cumulative elasticity	Std. err.	Cumulative elasticity	Std. err.
<i>Panel A: Municipal revenue</i>				
Total revenue	0.103***	0.032	0.074***	0.017
Property taxes	0.082**	0.032	0.049**	0.021
Public enterprise earnings	-0.037	0.087	0.068	0.051
Government grants	0.341*	0.204	-0.097	0.107
Special assessments	0.281	0.347	0.242**	0.114
Other taxes	-0.121	0.088	0.149***	0.040
Property and asset revenue	0.106	0.145	0.148***	0.052
General department earnings	0.112	0.081	0.145***	0.035
Donations and contributions	-0.059	0.161	0.068	0.070
Fines, forfeits, and escheats	0.061	0.156	0.157***	0.056
<i>Panel B: Municipal spending</i>				
Total spending	0.081*	0.044	0.115***	0.020
Current expenditures	0.063**	0.029	0.056***	0.015
Education	-0.014	0.028	0.054***	0.014
Protection to person and property	0.021	0.038	0.058***	0.016
Interest payments	0.130	0.105	0.007	0.036
Charities, hospitals, and corrections	0.409**	0.192	0.154*	0.079
Public enterprises	-0.061	0.101	0.076	0.054
Highways	0.047	0.070	0.063**	0.030
General government	0.079*	0.047	0.065***	0.021
Sanitation	0.074	0.056	0.116***	0.025
Miscellaneous	0.012	0.093	0.025	0.037
Recreation	0.101	0.083	0.095**	0.039
Conservation of health	0.052	0.052	0.053*	0.028
Capital outlays	0.197	0.168	0.391***	0.073

\*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

*Note:* Revenue and spending variables are in natural logs in period  $t$  and expressed in real per capita terms. The coefficients for the PVI (an index based on the average cost to build a family housing unit) and housing permits are cumulative elasticities based on three lags. All regressions are full specifications based on equation (1), estimated for the years between 1923 and 1936. Controls include city fixed effects, year fixed effects, region-year interactions, a tax rate limit indicator, and three lags of city population and real per capita state income. Standard errors are clustered at the city level. All regressions include a constant.

Table 7: Property taxes during the Great Depression

Year	Property taxes ( $P$ )	Property tax rate ( $\tau$ )	Assessed valuation ( $B$ )	Property tax levy ( $\frac{\tau B}{1000}$ )	Delinquency rate ( $D$ )	Back taxes ( $T$ )	Percent change in property taxes	Fraction of the change in property taxes accounted for by the change in:	
								Delinquency rate	All other factors
1930	82.56	28.98	3136.22	86.41	0.128	7.21		-0.45	1.45
1931	89.12	29.14	3401.08	94.40	0.159	9.73	7.9	-1.39	2.39
1932	93.47	29.39	3541.38	100.57	0.219	14.92	4.9	0.81	0.19
1933	88.80	28.30	3476.62	94.74	0.259	18.60	-5.0	5.13	-4.13
1934	89.28	29.34	3214.80	91.15	0.232	19.28	0.5	5.16	-4.16
1935	89.93	29.10	3116.83	88.23	0.194	18.82	0.7	5.40	-4.40
1936	90.54	29.61	3085.69	88.95	0.157	15.56	0.7	-1.99	2.99
1930-1933							7.6	-0.32	1.32
1930-1936							9.7		

*Note:* The decomposition analysis is based on the experience of the average city in the balanced sample of 80 cities for which delinquency data are available in each year between 1930 and 1936. All variables are in real per capita terms except the tax rate and delinquency rate. The mean property tax levy differs from the product of the average property tax rate and average assessed valuation due to the generally negative correlation between these two factors. Back taxes are calculated using equation (2) and average values for property taxes, the property tax levy, and the delinquency rate. See Section 4.2 and corresponding footnote for a description of the data and decomposition exercise.

Table 8: Tax delinquency and municipal revenue, 1930–1936

	Total revenue (1)	Property taxes (2)	Assessed valuation (3)	Property tax rate (4)
$\ln(\text{PVI}_{t-1})$	0.014 (0.016)	0.011 (0.018)	0.010 (0.016)	0.005 (0.013)
$\ln(\text{PVI}_{t-2})$	0.008 (0.013)	0.006 (0.017)	0.005 (0.014)	0.026* (0.013)
$\ln(\text{PVI}_{t-3})$	0.017 (0.015)	0.047** (0.019)	0.017 (0.011)	0.032* (0.017)
$\ln(\text{Housing permits}_{t-1})$	0.008 (0.008)	0.002 (0.011)	0.012 (0.009)	-0.003 (0.010)
$\ln(\text{Housing permits}_{t-2})$	0.001 (0.008)	-0.008 (0.010)	0.008 (0.009)	0.000 (0.009)
$\ln(\text{Housing permits}_{t-3})$	0.010 (0.009)	0.022** (0.010)	0.018** (0.009)	0.004 (0.009)
Tax rate limit <sub>t</sub>	-0.064* (0.034)	-0.104*** (0.034)	-0.020 (0.033)	-0.068** (0.031)
Delinquency rate <sub>t</sub>	-0.335*** (0.127)	-0.388*** (0.134)		
Cumulative elasticities: PVI	0.039 (0.032)	0.065* (0.036)	0.031 (0.030)	0.063* (0.032)
Housing permits	0.020 (0.014)	0.017 (0.016)	0.039* (0.020)	0.001 (0.019)
City fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Region × year effects	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Observations	574	574	574	574
Cities	85	85	85	85
R <sup>2</sup>	0.445	0.457	0.585	0.177

\*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

*Note:* Column headings are dependent variables, which are in natural logs in period  $t$ . All variables except the property tax rate are expressed in real per capita terms. The PVI is an index based on the average cost to build a family housing unit. Cumulative elasticities are the sum of the three lags shown in the table. Variables included in ‘other controls’ are three lags each of city population and real per capita state income. The mean of real per capita assessed valuation between 1930 and 1936 is 3283.21 (standard deviation: 1219.15); the mean of the property tax rate between 1930 and 1936 is 29.36 (standard deviation: 10.15). See Table 4 for summary statistics of other variables. Standard errors are clustered at the city level and reported in parentheses. All regressions include a constant.

Table 9: Tax delinquency and other financial categories, 1931–1936

	PVI		Housing permits		Delinquency rate	
	Cumulative elasticity	Std. err.	Cumulative elasticity	Std. err.	Cumulative coefficient	Std. err.
<i>Panel A: Municipal revenue</i>						
Total revenue	0.004	0.032	0.009	0.014	-0.342**	0.148
Property taxes	0.043	0.043	0.017	0.017	-0.403**	0.160
Public enterprise earnings	0.021	0.096	0.042	0.041	-0.606**	0.303
Government grants	0.040	0.208	-0.210*	0.117	1.071	1.208
Special assessments	-0.446	0.366	0.074	0.118	0.199	1.478
Other taxes	-0.292**	0.139	0.099*	0.051	0.480	0.489
Property and asset revenue	0.030	0.170	0.122*	0.070	-1.174*	0.697
General department earnings	-0.185*	0.097	0.054	0.060	-0.003	0.516
Donations and contributions	-0.139	0.248	-0.289	0.213	0.504	0.960
Fines, forfeits, and escheats	-0.065	0.158	0.020	0.067	-1.725*	0.894
<i>Panel B: Municipal spending</i>						
Total spending	-0.014	0.051	0.030	0.020	-0.123	0.217
Current expenditures	0.042	0.033	0.029*	0.015	-0.308*	0.171
Education	-0.022	0.037	0.022	0.017	-0.235	0.156
Protection to person and property	-0.010	0.030	0.006	0.019	-0.510**	0.195
Interest payments	0.161***	0.054	0.021	0.019	0.105	0.440
Charities, hospitals, and corrections	0.355	0.243	0.267**	0.115	-0.341	0.999
Public enterprises	-0.041	0.110	0.063	0.060	0.057	0.379
Highways	-0.053	0.073	-0.005	0.034	-0.526	0.355
General government	0.043	0.055	0.027	0.027	-0.331	0.274
Sanitation	0.128*	0.073	0.072**	0.032	-0.562**	0.263
Miscellaneous	-0.029	0.092	0.083**	0.034	0.057	0.469
Recreation	-0.010	0.068	0.035	0.041	-0.463	0.433
Conservation of health	-0.001	0.051	0.020	0.034	-0.469*	0.264
Capital outlays	-0.168	0.269	0.139	0.100	-0.604	1.018

\*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

*Note:* Revenue and spending variables are in natural logs in period  $t$  and expressed in real per capita terms. The coefficients for the PVI (an index based on the average cost to build a family housing unit) and housing permits are cumulative elasticities based on three lags. Delinquency rate coefficients are cumulative effects based on contemporaneous and lagged delinquency (one year). Total revenue and property taxes show cumulative effects in order to be consistent with other revenue sources shown here (note that the cumulative delinquency results for total revenue and property taxes are very similar to the contemporaneous delinquency results shown in Table 8). All regressions are full specifications estimated for the years between 1931 and 1936 (the one-year delinquency lags remove observations from 1930). Controls include city fixed effects, year fixed effects, region-year interactions, a tax rate limit indicator, and three lags of city population and real per capita state income. Standard errors are clustered at the city level. All regressions include a constant.

Table 10: Assessment cycles and property tax revenue

	Property taxes (1)	Property taxes (2)	Assessed valuation (3)	Property tax rate (4)
Annual assessment $\times \ln(\text{PVI}_{t-1})$	0.044 (0.042)	0.017 (0.031)	-0.034 (0.025)	0.040 (0.028)
$\ln(\text{PVI}_{t-1})$	0.000 (0.026)	0.002 (0.022)	0.028 (0.025)	-0.017 (0.021)
$\ln(\text{PVI}_{t-2})$	0.026 (0.019)	0.005 (0.017)	0.007 (0.014)	0.023* (0.013)
$\ln(\text{PVI}_{t-3})$	0.035* (0.018)	0.048** (0.019)	0.015 (0.011)	0.034** (0.016)
Tax rate limit <sub>t</sub>	-0.083* (0.046)	-0.103*** (0.034)	-0.022 (0.033)	-0.066** (0.031)
Delinquency rate <sub>t</sub>		-0.391*** (0.134)		
Time period	1923-36	1930-36	1930-36	1930-36
City fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Region $\times$ year effects	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Observations	1290	574	574	574
Cities	94	85	85	85
$R^2$	0.599	0.457	0.587	0.181

\*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

*Note:* Column headings are dependent variables, which are in natural logs in period  $t$ . All variables except the property tax rate are expressed in real per capita terms. The PVI is an index based on the average cost to build a family housing unit. Variables included in 'other controls' are three lags each of city population and real per capita state income. The mean of real per capita assessed valuation between 1930 and 1936 is 3283.21 (standard deviation: 1219.15); the mean of the property tax rate between 1930 and 1936 is 29.36 (standard deviation: 10.15). See Table 4 for summary statistics of other variables. Standard errors are clustered at the city level and reported in parentheses. All regressions include a constant.