National Tax Journal, September 2020, 73 (3), XXX–XXX https://doi.org/10.17310/ntj.2020.3.00

THE FISCAL EFFECTS OF THE COVID-19 PANDEMIC ON CITIES: AN INITIAL ASSESSMENT

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This paper evaluates the potential fiscal effects on cities of the coronavirus-induced recession. We provide estimates of revenue shortfalls in fiscal year 2021, as compared to the trajectory prior to the recession. Our analysis is based on data for 150 fiscally standardized cities, fiscal units designed to take account of variations across central cities in governmental structure. We forecast revenues from all of the major revenue sources of cities, including property, sales and income taxes, fees and charges, and intergovernmental aid. We investigate two scenarios, "less severe" and "more severe," depending on assumptions about fiscal pressures at the state level and the elasticities of the various revenue sources. Our average predictions are for a shortfall in revenues of 5.5 percent under the less severe scenario and 9 percent under the more severe scenario. We predict wide variation across cities, depending on differences in revenue structures and the fiscal condition of states going into the recession. The hardest hit cities face revenue losses of 15 percent or more. We also compare revenue pressure to cost pressures from the coronavirus and find that a number of cities will experience large revenue shortfalls and high additional costs.

Keywords: taxation, subsidies, revenue at the state and local level, healthcare costs, government finance in urban and rural economies

JEL Codes: H71, H75, R51

I. INTRODUCTION

This paper provides an initial assessment of the fiscal impacts on U.S. cities of the COVID-19 pandemic. The virus affects city finances through its impact both on revenues and on expenditures. We provide estimates of the magnitude of the effects through the various channels of impact. Revenue impacts occur through three channels.

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The first is the decline in own-source revenues from taxes and charges resulting from the slowdown of city economies. The second channel is the (likely) decline in state aid to local governments, while the third channel is changes in federal government direct and indirect assistance to city governments. The magnitude of the reductions in local government revenues depends on the severity of the shocks to the local economy attributable to the pandemic and the mix of local taxes and fees in each city. The state channel depends on the impact of the pandemic on state government revenues, the extent to which declines in state revenues are translated into cuts in state aid to local governments, and the degree to which these local governments rely on state aid. Our analysis of the revenue effects of the COVID-19 recession, in part, will be informed by the fiscal experiences of American cities during and after the Great Recession.

While our analysis focuses primarily on the revenue side of the fiscal ledger, we draw on data on the spatial incidence across cities and metropolitan areas of COVID-19 cases and deaths to assess the potential effects of the pandemic on the expenditure needs of local governments, especially spending associated with public health and hospitals.

Our goal in this paper is to give some order of magnitude forecasts based on information that we have in the late Spring of 2020. At this point, no one knows what course the coronavirus will take. Will there be repeated spikes of cases recurring through the remainder of 2020 and perhaps beyond? Will successful treatments become widespread? When will an effective vaccine become widely available to all Americans? There are also questions about the availability of testing and contact tracing. The impacts of the coronavirus on the economy are uncertain. In addition to the medical and economic uncertainties, it is very difficult to predict future public policy responses at the federal, state, and local levels. Policies related to restrictions on the opening of businesses and the restrictions under which they must operate are uncertain and will clearly vary by state. Although the federal government, with the enactment of the Coronavirus Aid, Relief, and Economic Security (CARES) Act and previous interventions, has already provided individuals, businesses, and state and local governments with substantial financial assistance, the structure, magnitude, and timing of future federal interventions are not known.

Despite these uncertainties, we will attempt to demonstrate the range of ways in which the pandemic is likely to affect the fiscal environment of large American central cities. We will focus on 150 central cities, drawing upon the fiscal impacts of the Great Recession in those cities to inform our analysis of the likely fiscal effects of the COVID-19 pandemic. Our sample of cities includes almost all the largest central cities in the country, plus some previously large cities that have suffered large population losses over the past 40 years. Because our sample of cities includes at least two cities from each state, seven cities have 2017 populations below 50,000, the smallest of which is Rutland, Vermont.

Making fiscal comparisons across cities is complicated by the fact that the governmental structure and organization of cities varies substantially across the country. Direct comparisons across municipal governments are often highly misleading because public services provided to central city residents and businesses often come from a variety of

different governments. In a few cities, the municipal government finances and provides nearly all local government public services, while in many other cities, the responsibilities for financing and providing services are divided between the municipal government and several overlying independent governments, such as counties, school districts, and various kinds of special districts.

To deal with these variations in governmental structure, we use a unique central city database called *fiscally standardized cities*, or FiSCs. A FiSC is not an actual governmental body; rather, it combines fiscal data from a central city municipal government with a prorated share of both expenditures and revenues from all overlying governments. The results are detailed revenue and expenditure data that reflect the total revenues raised on behalf of central city residents and businesses and the public spending carried out on their behalf. For a detailed description of the methodology used to develop FiSCs, see Chernick, Langley, and Reschovsky (2015).[1] The population of the 150 central cities in our sample accounts for nearly three-quarters of the residents of the major "principal cities" in U.S. metropolitan areas.[2]

The results of our analysis suggest that in fiscal year 2021, the average FiSC will face revenue shortfalls relative to revenues if there had been no recession of between 5.5 percent and 9 percent. Not surprisingly, we find a wide variation across the country in revenue shortfalls, with the hardest hit cities facing revenue losses in excess of 15 percent. Both protecting residents against COVID-19 and dealing with the resulting recession will increase the costs faced by local governments, with some cities facing both large increases in costs and large revenue shortfalls.

In Section II, we attempt to roughly quantify the likely economic impact of the COVID-19 pandemic on the 150 central cities in our sample. We start with the latest national estimates of percentage job loss by industry sector over the three-month period from February to May 2020 (U.S. Bureau of Labor Statistics, 2020a). These national job loss estimates are translated to the county level by multiplying third-quarter 2019 data on employment and total wages by county and industry sector from the Quarterly Census on Employment and Wages (U.S. Bureau of Labor Statistics, 2020b). The county-level data are then assigned to FiSCs, and the data are used to generate estimates of the employment loss and earnings loss experienced by each city.

In Section III, we estimate the potential revenue reductions in each FiSC that can be attributed to the direct and indirect impacts of the pandemic. Although we will discuss longer-run revenue impacts, in our empirical analysis of the 150 FiSCs, we focus on the fiscal year 2021. We start with an estimate of what the general revenue of each FiSC would have been if there had not been a pandemic. Our estimates are based on the assumption that general revenues in each FiSC would have grown at the average annual rate of growth of general revenues in each FiSC between the years 2012 and

[1] For online access to the FiSC database, see https://www.lincolninst.edu/research-data/data-toolkits/fiscally-standardized-cities.

[2] This number is based on all cities with 2012 populations above 100,000. Over 98 percent of the total population of FiSCs are in cities with populations over 100,000.

2017 (the latest available year of Census data on local governments). For each source of revenue, we make two assumptions about the percentage reduction in revenue due to the pandemic. We refer to these two sets of assumptions (or scenarios) as "less severe" and "more severe."

Our estimates of the percentage reduction in general revenue in fiscal year 2021 will depend, in large part, on the relative magnitudes of the income and employment decline in each city and on the mix of revenue sources found in each FiSC. The deeper the economic losses to a state, and the greater the relative losses to a city, the greater the likely revenue losses. Cities that are more dependent on volatile revenue sources, such as sales and income taxes, as compared to property taxes, are more likely to experience a sharper short-run revenue decline than more property-tax–dependent cities. We first describe the revenue structure of FiSCs and then describe, in detail, the basis for the assumptions we make about reductions in each revenue source as a result of the pandemic.

To estimate the fiscal impacts of the pandemic on state government grants to local governments, we draw on state-specific estimates of reductions in state government revenues in fiscal years 2020 and 2021 and on data on state rainy-day funds that can be used to offset these revenue declines. Our assumptions about how reductions in state government revenues are translated into reductions in state aid are based, in part, on the fiscal behavior of state governments during the Great Recession. These state aid cuts are then allocated to the FiSCs in our sample.

We then combine our estimates of the percentage changes in revenue attributable to the COVID-19 pandemic by weighting each revenue source by its share of general revenues in each FiSC. In discussing our revenue results, we highlight the differences across cities in the impact of the COVID-19 pandemic and the consequent recession and provide examples of cities that are likely to experience both particularly small and particularly large revenue shortfalls. Predicted shortfalls for each FiSC are shown in the Appendix. We conclude Section III with a brief discussion of the relationship between the underlying fiscal health of FiSCs and the likely fiscal impacts of the pandemic.

In Section IV, we compare rates of COVID-19 incidence across cities to our calculated revenue shortfalls for FiSCs. We find substantial overlap between cities with big revenue shortfalls and high COVID-19 incidence, though there are also many cities where the two measures diverge. Section V concludes.

II. THE ECONOMIC IMPACT OF THE COVID-19 IMPACT ON CITIES

In an assessment of the economic shock created by the pandemic, Federal Reserve Chairman Jerome Powell asserted that, "In the best of times, predicting the path of the economy with any certainty is difficult. We are now experiencing a whole new level of uncertainty, as questions only the virus can answer complicate the outlook" (Smialek and Rappeport, 2020). Although no part of the country has been spared the economic impacts of the pandemic, there are distinct spatial patterns to the severity and the spread of COVID-19, with some cities hit much harder than others. Depending on industry mix

and local wage structures, the impacts of the pandemic on local economies, measured by both changes in employment and income, vary substantially across cites.

Employment in some sectors, such as leisure and hospitality and retail trade, has declined precipitously, while there have been only minor declines in other sectors, such as finance and insurance. Despite increases in unemployment compensation and the individual Economic Impact Payments included in the CARES Act, some households have suffered substantial declines in income. About a third of Americans have been able to maintain full-time employment by working from home. Others remain employed but have had their hours of work and wages reduced, while some, especially those employed in "essential services" may be working additional hours or receiving hardship pay.

Current data by city on the economic impact of the coronavirus recession are not available. To get rough estimates of the relative impact, which we will use in our revenue forecasts, we assume that national estimates of job losses for each industry sector from March through May 2020 are the same for each city. Hence, in our analysis differences in employment impact across cities depend solely on differences in industry composition, while the impact on earnings reflects both industry composition and intercity differences in average earnings by sector. The latest data on employment and wages by industry are from the third quarter of 2019 of the Quarterly Survey of Employment and Wages. Thus, Las Vegas and Orlando, both heavily dependent on travel and tourism, will be more affected than cities that are more heavily concentrated on manufacturing or finance.

III. THE REVENUE IMPACT OF COVID-19 ON FISCALLY STANDARDIZED CITIES

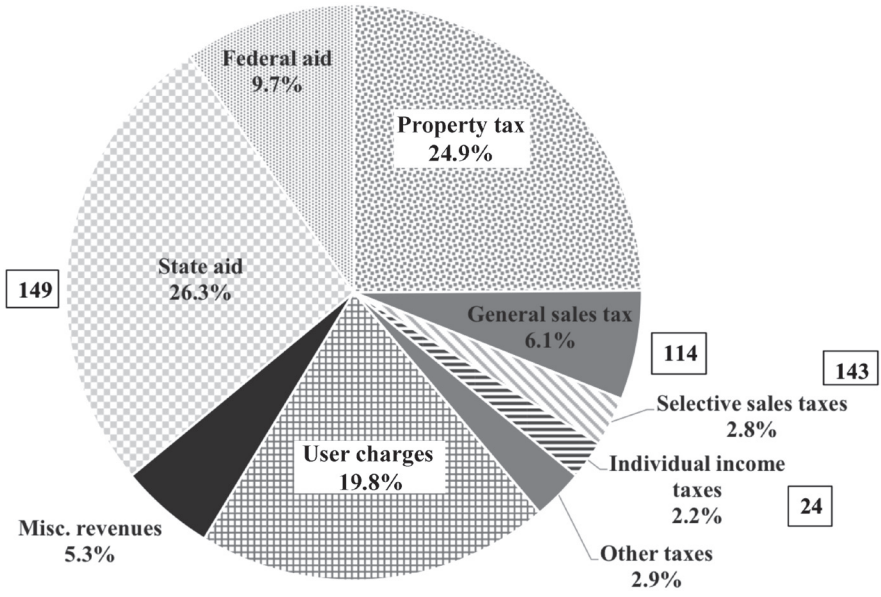
To understand the impact of the COVID-19 pandemic on the revenue of FiSCs, it is necessary to know the sources of revenue and how the mix of revenue sources varies across cities. The pie chart in Figure 1 displays the average per capita revenues by source in fiscal year 2017 as a percentage of the FiSC average per capita general revenue. In the average FiSC, a quarter of total revenue is raised from the property tax and an additional 14 percent from other taxes. About 25 percent of revenue comes from user charges and miscellaneous own-source revenues, while state and federal grants, on average, account for an additional 36 percent of general revenue.

The property tax, which is used in all FiSCs, accounts for a quarter of general revenue, but nearly two-thirds of tax revenue in the average FiSC. The general sales tax is used in 114 of the 150 FiSCs but the individual income tax in only 24. In 2017, fully 58 percent of total income tax revenue raised by FiSCs came from New York City.

These averages hide a great deal of variation in revenue sources across FiSCs. For example, while on average two-thirds of tax revenue comes from the property tax, in eight FiSCs, including Philadelphia, St. Louis, and Washington, DC, the property tax provides less than 35 percent of tax revenue. In contrast, in 20 FiSCs, including nearly all FiSCs in New England, the property tax share exceeds 90 percent of tax revenue. While 36 FiSCs raise no revenue from a local general sales tax, in a dozen FiSCs, including Baton Rouge, AL, Ft. Smith, AR, and La Cruces, NM, the sales tax contributes more than 40 percent of tax revenue.

Figure 1

Revenue by Source and Number of Cities Using Each Source, FY 2017 150 Fiscally Standardized Cities



Note: Numbers in boxes indicate number of FiSCs using specified revenue source.
All 150 FiSCs use revenue source when no number appears.

The importance of user fees and state and federal grants also varies substantially across FiSCs. User fees and charges account for under 10 percent of general revenue in 14 FiSCs, but over 40 percent of revenue in 4 FiSCs, including Flint, MI. While intergovernmental revenues account for under 20 percent of the general revenue of FiSCs in 10 cities, including Austin, Salt Lake City, and Atlanta, they contribute over half of total revenue in 19 FiSCs. Cities that rely most heavily on state and federal aid include Rochester, NY, New Haven, CT, Springfield, MA, and Santa Ana, CA.

A. Property Tax Revenue

During most past recessions, property tax revenues have been more stable than revenues from income and consumption taxes. Tax revenue is the product of a tax rate applied to a tax base. Property taxes differ from other commonly used local government taxes in that local officials are able to raise or lower the tax rate on an annual basis and may have some degree of influence over the property tax base. Although many states provide their local governments the option to levy a local sales or income tax, maximum

tax rates and tax bases are generally determined by state statute.[3] The ability of local governments to offset declines or increases in property values by changing nominal rates is the most important reason why property tax revenue has historically been more stable over business cycles than revenue from sales and income taxes.

Some commentators have speculated that the coronavirus pandemic, and perhaps more importantly the fear of future pandemics, may fundamentally influence locational preferences in ways that will significantly depress property values in cities. A Harris Poll conducted in April 2020 reported that 39 percent of urban residents were considering moving to a location that was less crowded (Hart, 2020).[4] The experience of working from home that was widespread in the Spring of 2020 appears to be influencing attitudes toward remote working of both employers and employees. Some employers, notably Twitter, Square, and Shopify, have already announced that employees will be given the option to permanently work remotely. Many employees are expressing a preference for working from home, particularly since it allows them to avoid commuting, especially on mass transit (Kotkin, 2020). If remote working becomes the new norm, the demand for urban office space will presumably plummet. Stanford economist Nicholas Bloom was quoted as saying, "I could easily see downtown skyscrapers in the center of big cities falling in value by 60, 70 percent" (Solman, 2020). While demand for urban office space may decline, some observers have suggested that many office buildings could be converted to residential use, thereby preventing sharp declines in city property values.[5]

To understand the relationship between changes in property values and property tax revenue, it is important to take account of how the property tax is administered. Property tax rates are applied to administratively determined *assessed value*s. Most states employ an annual to every five-year reassessment schedule (Higginbottom, 2010). Upon reassessment, the new values serve as the basis for tax calculations in the following year. Thus, even in cities where all reassessments occur on an annual cycle, the lag between changes in market values and potential changes in property tax revenue is at least two years.

Figure 2 illustrates the percentage change relative to 2007 of real per capita revenue by source in the average FiSC. The figure shows that property tax revenues continued to rise until 2009, three years after the peak in housing prices and two years after the beginning of the Great Recession. In a property tax revenue model estimated using FiSC data from 2000 through 2014, Chernick, Reschovsky, and Newman (2020) found a three-year lag between changes in housing prices and changes in property tax revenues.[6] Their models implied a property tax revenue elasticity with respect to housing prices centering at 0.25.

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[3] For a full discussion of local government tax autonomy in the United States, see Dougherty, Harding, and Reschovsky (2019).

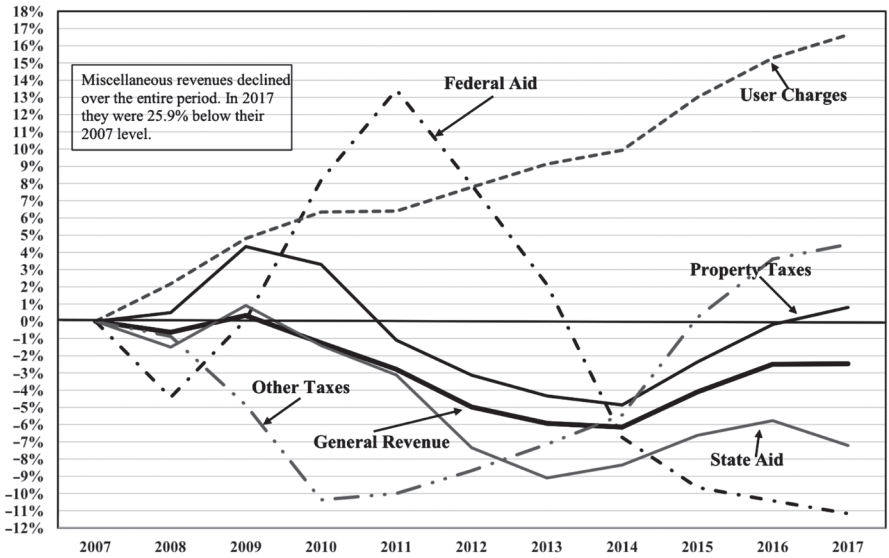
[4] If an aversion to density outlives the coronavirus pandemic, one can imagine a decline in demand for urban amenities such as theatre, sporting events, and concerts.

[5] The conversion of office building to residential use is most likely in cities with housing shortages, such as San Francisco. In other cities, for example, Detroit, with an ample housing supply, conversion of office building is much less likely.

[6] Similar lags are reported by Lutz, Molloy, and Shan (2011), Lutz (2008), Alm, Buschman, and Sjoquist (2011), Chernick, Langley, and Reschovsky (2012), and Goodman (2018).

Figure 2

Real Per Capita Revenue by Source, Percentage Change Relative to 2007 150 Fiscally Standardized Cities



The direct implication of the assessment lag is that property tax revenues of FiSCs are unlikely to decline over at least the next two years. Given our estimated property tax revenue elasticity and the fact that, at the national level, housing prices have been rising since 2012 at an average annual rate of nearly 6 percent (S&P Dow Jones Indices, 2020), we anticipate that, on average, property tax revenue in 2020 and 2021 will grow in the average FiSC by about 1.5 percent annually. As this growth in property tax revenues is reflected in the estimated growth in general revenue, our less severe assumption for fiscal year 2021 is that the pandemic will have no negative impact on property tax revenues.[7]

One reason this estimate may be somewhat optimistic is the possible increase in the rate of property tax delinquency. Although some local governments have delayed property tax due dates or temporarily waived interest charges on delinquent taxes, in most cities, property tax collection policy has not been changed despite the financial hardships

[7] The stability of the property tax implies that in the short run tax liabilities do not adjust to reflect short-run changes in the economic circumstances of residential and commercial property owners. Hayashi (2020) argues that this feature makes the property tax pro-cyclical, shifting the fiscal risks from recessions from governments to individuals. While this feature of the property tax may impose temporary hardship on some property owners, in some states circuit breakers mitigate the economic hardship for taxpayers whose income are most severely affected by the recession. Over time assessments do adjust. Hence, unless completely offset by increases in nominal property tax rates, over the longer term at least some of the fiscal risk from invariant property tax bills is transferred back to the local government.

some property owners are facing due to the COVID-19 pandemic (Collins, 2020). With the notable exception of Detroit, which, in the aftermath of the Great Recession and the city's bankruptcy, had a property tax delinquency rate of nearly 50 percent and a rate of uncollected taxes of 20 percent (Alm et al., 2015), available evidence suggests that in most cities property tax collection rates were only slightly reduced during and immediately after the Great Recession. Although property tax delinquency rates will probably rise, our best judgement is that the overall impact on property tax revenues will be relatively small. Thus, for our most severe scenario, we assume a 0.5 percent decline in the property tax revenues of FiSCs in fiscal year 2021.

The longer-run effects of the pandemic on property tax revenues are unclear. The multiyear administrative lag between changes in market values and changes in tax revenues suggests that cities will not face significant declines in property tax revenues until 2022 or 2023. The magnitude of these revenue declines will depend on the extent to which the pandemic leads to reductions in demand for urban residential locations and in the demand for office space. The elasticity estimate cited above suggests that any decline in property value will be offset, in part, by increases in property tax rates.

B. Sales Tax Revenue

After falling by 8.7 percent in March 2020 and 14.7 percent in April, retail sales in the United States rose by 17.7 percent in May (U.S. Census Bureau, 2020b). The May increase clearly reflected the reopening of many parts of the retail economy. Sales for the March–May period, however, were 10.5 percent below the same period in 2019. The key question in predicting local sales tax revenues through fiscal year 2021 is when personal income and consumption will return to prerecession levels. Most macroeconomic forecasts suggest that consumption growth will remain sluggish for several years, implying that sales tax revenues will remain below prerecession levels through at least fiscal year 2021. By contrast, the decrease in retail sales during the Great Recession was much more gradual than the initial decrease in the COVID-19 recession, with retail sales declining by 1.3 percent between 2007 and 2008, and by 7.3 in 2009.

FiSCs that rely more heavily on the sales tax are obviously more exposed to revenue declines. In 2017, 114 FiSCs raised an average of $444 per capita (8.3 percent of general revenue) from the general sales tax. While in 14 FiSCs the sales tax accounted for under 3 percent of revenue, in 10 other FiSCs, the sales tax contributed over 20 percent of general revenue.

State-level monthly tax revenue data compiled by the Urban Institute (2020a) showed that state general sales tax revenues fell by 30 percent from January through April 2020. Compared to April 2019, state sales tax revenue in April 2020 was 16 percent lower. This sharp initial drop in revenue reflects a strong supply-side effect as well as a demand-side effect. Retail establishments were widely shuttered between March and May, and only in June did state and local governments in some states allow retail establishments to reopen, although often with restrictions. The sharp decline in aggregate personal consumption reflects these supply-side shocks. At the same time, individuals in much of the country were required to stay home, with many experiencing unemployment or furloughs. The resulting reduction in consumer demand was

reinforced by the supply-side shock. These shocks are reflected in aggregate data on personal consumption, which fell by 6.9 percent in March 2020 and by 13.6 in April (U.S. Bureau of Economic Analysis, 2020).[8]

To estimate FiSC-specific estimates of the percentage reduction in general sales tax revenues due to the COVID-19 pandemic, we start by estimating state-specific sales tax revenue elasticities. To estimate these elasticities, we use actual changes in state sales tax revenues from April 2019 to April 2020 compiled by the Urban Institute (2020b) and our estimates of the average change in wages over the same period across the FiSCs in each state. We expect elasticities to vary across states because of differences in the comprehensiveness of state sales tax bases. We obtain predictions for 2021 by applying our state-specific elasticities to national estimates of the change in personal income. Table 1 summarizes the steps we follow to develop city-specific estimates of the decline in sales tax revenues due to the pandemic.

Across the 114 FiSCs that use the local general sales tax, our assumptions generate an average sales tax reduction of 6.8 percent under our less severe scenario and 11.7 percent under our more severe scenario. Under the latter scenario, 15 FiSCs will experience sales tax reductions in excess of 20 percent; 47 FiSCs, reductions between 10 percent and 20 percent; and 44 FiSCs, reductions smaller than 10 percent. In eight FiSCs, we project small increases in sales tax revenues.

The longer-run, post-2021, prospects for sales tax revenues depend on whether changes in consumption during the pandemic will persist. The longer it takes to develop and implement effective vaccination against COVID-19, the more likely that changes in patterns of food consumption, entertainment, travel, and places of work will become permanent. For example, because in most states food that is prepared at home is not subject to the sales tax, the substitution of home cooking for purchases of prepared food, something that has been accelerated by restaurant closings, fear of infection, and the increase in working from home, has led to a reduction in sales tax revenues. If changes in preferences for the location of activities such as food preparation, remote work, and recreation continue post-pandemic, reductions in sales tax revenues will be long lasting.

C. Individual Income Tax

In 2017, 23 of the 150 FiSCs collected revenue using the individual income tax. The average per capita amount was $781. Because accurate information on state-specific changes in income tax revenues is unavailable, we use national estimates of the predicted percentage change in personal income through 2021 and adjust this national percentage by the relative change in wages in each FiSC between March and May 2020.[9] To

[8] The great uncertainties about the spread of the coronavirus and changing policies to combat it make sales tax revenue forecasting particularly perilous. For example, many parts of the country that had low rates of COVID-19 cases during the Spring and had largely reopened their economies, faced large surges in caseloads in July, forcing state and local officials to re-implement business closures. While demand for automobiles and other consumer durables is likely to rebound as the economy opens up, steps to ensure that factory workers are able to maintain social distance may slow production and lead to supply shortages.

[9] We are unable to use changes in income tax revenues in the first quarter of 2020, because the income tax filing deadline was shifted to July, making comparisons unreliable.

Table 1

Calculating Percentage Changes by FiSC in Sales Tax Revenues due to the Pandemic

Step 1: For each state *i*, calculate the population-weighted average of the March–May percentage changes in county-level wages of each FiSC *j* in state *i*.

$$(1) \quad \overline{\%\Delta w_i} = \sum_j (n_{ij} \times \%\Delta w_{ij})$$

where $\overline{\%\Delta w_i}$ = Average percentage change in wages in all FiSCs in state *i*.
$\%\Delta w_{ij}$ = March–May percentage change in wages in FiSC_{ij} in state *i*.
n_{ij} = Population in $\text{FiSC}_{ij} / \sum_j \text{population}_{ij}$.

Step 2: Calculate the sales tax elasticity state *i* as the percentage change in sales tax revenue in state *i* between April 2019 and April 2020 divided by the average percentage change in wages in state *i* (from Step 1).

$$(2) \quad \varepsilon_{s,i} = \%\Delta R_{s,i} / \overline{\%\Delta w_i}$$

where $\varepsilon_{s,i}$ = Sales tax elasticity with respect to wage earnings in state *i*.
$\%\Delta R_{s,i}$ = Percentage change in sales tax revenue in state *i*.

Step 3: Calculate the percentage change in income in each FiSC by adjusting a projected change in income through 2021 at the national level by the ratio of the changes in wages in each FiSC relative to the average change in wages across all FiSCs.

$$(3) \quad \%\Delta Y_{ij} = \%\Delta Y_{US} \times (\%\Delta w_{ij} / \overline{\%\Delta w_{ij}})$$

where $\%\Delta Y_{ij}$ = Percentage change in income in FiSC *j*.
$\%\Delta Y_{US}$ = Percentage change in income in the United States (from CBO projections).
$\overline{\%\Delta w_{ij}}$ = Percentage change in wages in the average FiSC.

Step 4: Calculate the percentage change in sales tax revenues in each FiSC due to the pandemic by multiplying the sales tax elasticity in each state (step 2) by the percentage change in income in each FiSC (step 3).

$$(4) \quad \%\Delta R_{s,ij} = \varepsilon_{s,i} \times \%\Delta Y_{ij}$$

where $\%\Delta R_{s,ij}$ = Percentage change in sales tax revenue due to the pandemic in FiSC_{ij}.

Notes: These four steps produce our more severe percentage change estimates. Our less severe estimates are 42 percent lower, reflecting the fact that the April 2019–April 2020 reduction in state sales tax revenues may overstate sales tax reductions in subsequent months. The less severe estimate also draws on a sales tax elasticity estimated for the Great Recession period that was substantially lower than the elasticity implied by our more severe estimate.

obtain predicted drops in income tax revenue by FiSC, we consider two scenarios by applying two different income elasticities to the predicted changes in personal income. A less severe estimate is obtained by regressing the change in state income tax revenue by state against the change in personal income for the years 2007 and 2008, covering the beginning of the Great Recession. This exercise yielded an elasticity of 1.[10] For our more severe estimate, we started with an elasticity of 1.5 used by Clemens and Veuger (2020, this issue) to estimate state income tax revenues.[11] We lowered our elasticity to 1.25 to reflect the fact that most local government income taxes have a flat rate structure and some use a restricted tax base.

For our national income estimates, we use the Congressional Budget Office (2020) interim projections (May 2020). They estimate that personal income will decline 1.12 percent by 2021, relative to 2019. This compares to their pre–COVID-19 forecast of 8.3 percent growth. Combining these two numbers implies a 9.4 percent decline in income. Applying our less severe elasticity of 1 to this income drop yields a predicted national decline in local income tax revenues of 9.4 percent, and applying our more severe elasticity of 1.25 implies a predicted revenue decline of 11.75 percent.

D. Other Own-Source Revenue

Included in this group are user fees and charges, selective sales taxes, other taxes, and miscellaneous revenues. Charges and fees account for nearly 20 percent of general revenue in the average FiSC, while collectively, the other revenue sources, on average, contribute 11 percent of FiSC revenue.

1. User Fees and Charges

User fees and charges are an important component of local government finance. In terms of revenue, the largest amount of money is raised through hospital charges.[12] However, the pattern is uneven across FiSCs; only 67 FiSCs had hospital charge revenue in 2017. The most widely used charge is for sewage services. Charges for parks and recreation are also widely used. Over time, revenue from user charges has increased in most FiSCs. Figure 2 highlights their steady growth since 2007.

Given this pattern of revenue growth, we assume that if the COVID-19 pandemic had not occurred, revenues from charges would have increased in the period from 2017 to 2021 at the average annual rate observed in the 150 FiSCs between 2012 and 2017.

[10] Expanding the sample period to 2009 increased the estimated income tax elasticity to 1.8, which is a reflection of the income tax surcharges imposed by a number of states in 2009.

[11] In May 2020, the New York City Independent Budget Office (2020b) revised its estimates of income tax revenue and personal income growth through 2021. It estimated that personal income would decline by 9.9 percent and individual income tax revenue by 13.4 percent, both relative to pre–COVID-19 estimates. These declines imply an income tax elasticity of 1.35 with respect to personal income.

[12] Hospital charges include payments from private insurance, individuals, and government programs such as Medicare, but not Medicaid.

Because of the importance of user charge revenues related to hospital reimbursement and to sewer and waste management services, we assume that the COVID-19 recession will have a relatively modest impact on revenues from charges. Specifically, we assume that the recession will reduce 2021 forecasted charges by 5 percent under the less severe scenario and by 10 percent under the more severe scenario.

2. Selective Sales Taxes, Other Taxes, and Miscellaneous Revenues

Between 2012 and 2017, FiSC revenue from selective sales taxes grew at an average annual rate of 0.7 percent. Other taxes, which include corporation income taxes and motor vehicle taxes, grew at an average rate of 4.8 percent, while miscellaneous revenues declined over the 2012–2017 period. We assume that because of the COVID-19 pandemic, each of these three sources of revenue will grow at a rate 15 percent lower than the actual rate of growth between 2012 and 2017 under our less severe scenario and at a rate 25 percent lower under our more severe scenario.

E. State Aid

As shown in Figure 1, in 2017, state aid provides over 26 percent of the revenue of the average FiSC, although state government aid varies from under 10 percent of general revenue in a few cities to around 60 percent. The experience of the Great Recession demonstrated clearly that state aid to local governments is at risk during economic downturns. Figure 2 shows that in real per capita terms, state aid in the average FiSC declined for four years after the official end of the recession, and in 2017, a decade after the beginning of the recession, state aid was 7 percent below its 2007 value. A series of reports from the Center on Budget and Policy Priorities have traced the pattern of state aid to public education in the years after the Great Recession. Leachman, Masterson, and Figueroa (2017) report that in 2015, six years after the end of the Great Recession, in 29 states, real state education aid per student remained below 2008 levels. In 17 of those states, aid remains 10 percent or more lower than it was in 2008.

In 2018, in over half of the states, intergovernmental spending made up at least 25 percent of the total general expenditures of state governments (U.S. Census Bureau, 2020a). Thus, it is not surprising that when states are facing the combination of large reductions in tax revenue and unprecedented expenditure needs associated with combatting the coronavirus, substantial reductions in state government transfers to local governments are likely.

Estimating the fiscal year 2021 reductions in state aid to FiSCs requires several assumptions. First, we need a measure of the fiscal pressure state governments will face in fiscal year 2021 due to a combination of reduced tax revenues and increased expenditure needs related to the health threats generated by the coronavirus. Next, we need to make assumptions about whether states will respond to fiscal pressures by cutting spending or raising revenues, and assumptions about whether cuts in state aid to local governments will be larger or smaller than cuts in states' direct expenditure programs.

Finally, we need to make assumptions about the mechanism state governments will follow in allocating reductions in state aid among their local governments.

In this paper, we use estimates of state government revenues and Medicaid spending needs through the end of fiscal year 2021 developed by economists at Moody's Analytics (White, Crane, and Seitz, 2020). The Moody's analysis provides estimates of the tax revenue shortfall and Medicaid spending increases in each state under two scenarios.[13,14] Their less severe scenario results in a fiscal shock across all states of $158 billion, while the fiscal impact of their more severe scenario totals $203 billion.[15] The Moody's analysis emphasizes that their state-specific estimates do not include extra state government spending in fiscal years 2020 and 2021 directly related to fighting COVID-19. They estimate that across all states, these expenditures are likely to total at least $150 billion, an amount that exceeds the total money the federal government has allocated to state governments for pandemic-related expenses through the CARES Act.

Based on economic projections from the Federal Reserve Board and the Congressional Budget Office, the Center for Budget and Policy Priorities (CBPP) estimated state government budget shortfalls of $120 billion in fiscal year 2020 and $315 billion in fiscal year 2021 (McNichol and Leachman, 2020). The sum of Moody's estimates of revenue shortfalls, increases in Medicaid spending, and state government direct COVID-19–related expenditures is similar in magnitude to the CBPP budget shortfall estimates.

Using data from the National Association of State Budget Officials (NASBO) (2019) on state General Fund revenues in fiscal years 2019 and 2020, we apply state-specific 2019–2020 growth rates to project General Fund revenues for fiscal year 2021 under the assumption of no recession. Using these data, we calculate that across all states, the fiscal shocks in fiscal year 2021 total 17.9 percent of General Fund revenue under the less severe assumptions and 23.1 percent under the more severe assumptions.

Compared with the Great Recession, many states are much better prepared to address budget shortfalls.[16] According to NASBO (2019), state government rainy-day funds at the end of 2019 totaled $78.2 billion, an amount equal to 7.8 percent of projected fiscal year 2021 General Fund budgets. Preparedness, however, varies by state. Wyoming's rainy-day fund balance substantially exceeded the size of its 2021 budget, while Illinois and Kansas had zero balances in their rainy-day funds.

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[13] Medicaid spending will increase because of the extra costs of treating the Medicaid eligible for the coronavirus and because the economic downturn will increase the number of individuals eligible for Medicaid coverage.

[14] Recent federal legislation, the Families First Coronavirus Response Act, authorizes a 6.2 percentage point increase in federal Medicaid matching funds to help states respond to the COVID-19 pandemic. The additional funds are available to states from January 1, 2020 through the quarter in which the public health emergency period ends. However, pressure on Medicaid is likely to outlast the terms of this relief, particularly if unemployment remains high.

[15] Moody's less severe scenario is based on the assumption of a peak unemployment rate of 13 percent and a peak-to-trough real gross domestic product (GDP) decline of 10 percent. Their more severe scenario is based on the assumption of a peak jobless rate of 17 percent and a peak-to-trough real GDP decline of 14 percent.

[16] NASBO data indicate that state rainy-day fund balances in late 2019 were 75 percent larger as a percentage of state General Fund spending than they had been in 2007, at the beginning of the Great Recession.

Many states impose limits on the use of their rainy-day funds, and given the severity of the current recession, it is unlikely that states will choose to use up all their rainy-day funds in fiscal year 2021. For the purpose of this exercise, we assume that states will use 75 percent of their rainy-day funds in 2021 to help balance their budgets. As a result, under our less severe assumptions, four states — Alaska, New Mexico, North Dakota, and Wyoming — will be able to completely eliminate the budget shortfall caused by the pandemic.[17] However, net of spending rainy-day funds, 11 states will have budget gaps that exceed 15 percent of their General Fund budgets. Under the more severe assumptions, 16 states will have budget gaps exceeding 15 percent of their budgets.

States face balanced budget requirements. Thus, aside from a bit of fudging on the margins, gaps between available revenues and budgeted expenditures must be filled by either raising revenues or cutting expenditures. By the end of June 2020, state governments had already began cutting spending by reducing the number of state employees by a seasonally-adjusted 5.5 percent from their February (pre-pandemic) levels (U.S. Bureau of Labor Statistics, 2020a). Although it is impossible to predict policy responses in individual states, history suggests that in the initial response to a recession, most state governments close budget gaps by relying mainly on spending reductions rather than revenue increases. During 2007, at the beginning of the Great Recession, state governments enacted $2.1 billion in revenue reductions. In 2008 and 2009, through the end of the recession, state governments enacted revenue increases of a mere $6 billion, less than 1 percent of state General Fund revenues (NASBO, 2019).[18] Given these precedents, and given that we have no way of predicting how individual states will respond to budgetary stress, we will assume that in fiscal year 2021, all states will balance their budgets by cutting spending rather than raising revenues.

We are not aware of any studies or comprehensive data on the composition of state cuts in expenditures. Therefore, we will assume that a state that reduces spending by any given percentage will reduce state aid to its local governments by a similar percentage.[19] The fact that states will probably be unable to avoid increasing Medicaid spending in fiscal year 2021 suggests that our assumption of equal percentage cuts may be overly optimistic from the perspective of local governments.

In cutting state aid to their local governments, state legislatures must decide how they will structure state aid reductions. While the pattern across local governments could be completely ad hoc, it is more likely that states will follow a straightforward allocation rule. For example, state aid could be reduced by equal per capita amounts in all local

[17] Although these states will face very large budget shortfalls due, in large part, to the pandemic-related sharp decline in energy prices, they entered the recession with very large rainy-day funds so that, on net, they are well positioned to get through at least fiscal year 2021 without budget cuts.

[18] These enacted aggregate revenue changes hide the variety of state responses. During the Great Recession nine states raised their income tax rates, while seven states decreased their rates. Twelve states raised their general sales tax rate, while none decreased their rate (Chernick and Reimers, 2019).

[19] While on average state aid cuts were proportional to the loss in tax revenue during the Great Recession, there was considerable variation around the mean with some states protecting state aid and other states cutting state aid by more than the 2007-2009 decline in tax revenues.

governments or by equal percentage amounts. Alternatively, if state aid, especially aid to schools, is explicitly equalizing, state aid reductions could be smaller in high-need, low-resource communities as a means of maintaining equalization. Proponents of each of these approaches will argue that their approach is fair.

In a paper on grant-in-aid cutbacks, Reschovsky and Schwartz (1991) suggest that states with an equalizing system of state aid, which provides larger per capita or per student state aid to needy local governments, will be most likely to implement a system of equal percentage aid cutbacks. Their argument is that state legislators will prefer the aid cutback plan that generates the smallest aid reduction for the local governments the legislators represent. In a simulation of aid cutback plans in Massachusetts, the authors demonstrated that the equal percentage of aid cutback plan generated the most legislative support.

In estimating the percentage reduction in state aid in each FiSC, we apply the percentage reduction in state aid in each state to all FiSCs in that state. Aid reductions are assigned to FiSCs under both our less severe and more severe scenarios. State aid is reduced in the average FiSC by 9.6 percent in the less severe case and by 13.8 percent in the more severe case. Our estimates indicate that state aid will be reduced by 15 or more percent in 33 FiSCs in the less severe scenario and in 44 FiSCs in the more severe scenario.

The consensus among economists appears to be that personal consumption will not begin returning to prerecession levels until after a vaccine against COVID-19 is widely available. Under the best of circumstances, this will not occur until the end of fiscal year 2021. Returning to full employment will only take longer. The experience from the recovery after the Great Recession suggests that the fiscal conditions of states will improve slowly and levels of state aid are likely to remain below prerecession trends for at least a few years. Although a number of state governments raised taxes immediately after the end of the Great Recession, the revenue increases were insufficient to finance substantial increases in state aid. As illustrated in Figure 2, a decade after the beginning of the Great Recession, real per capita state and federal aid to FiSCs remained substantially lower than their prerecessionary levels.

F. Federal Aid

In 2017, the average FiSC received just under 10 percent of its general revenues from the federal government. Federal funds support a wide range of local government activities in the areas of education, health care, housing and community development, social services, and transportation. The federal government role varies widely across states. In 10 FiSCs, federal grants made up less than 5 percent of general revenues, while in 11 FiSCs, the federal share exceeded 15 percent. Cities that benefited from relatively large shares of federal funding tended to be concentrated in the Northeast. However, there was no geographic pattern among cities receiving relatively small shares of federal funding.

In response to the coronavirus, as of the end of June 2020, Congress passed four rounds of legislation designed to provide individuals, businesses, and state and local

governments with assistance in dealing with the direct consequences of COVID-19 and the pandemic-related recession. Most of the assistance to local governments came in the CARES Act, which was signed into law on March 27, 2020. It established the Coronavirus Relief Fund (CRF) and the Education Stabilization Fund, both of which provide funding to state and local governments. The CRF can be used in support of not previously budgeted expenditures related to the coronavirus that are incurred between March 1 and December 30, 2020 (Driessen, 2020).

In Section IV of this paper, we will discuss the costs that local governments will incur because of the coronavirus pandemic. These include direct health care costs related to treating COVID-19 and reducing its spread (testing and contact tracing); increases in the costs of public services, especially in the areas of education, transportation, and public health, to assure that these services can be delivered in a safe manner; and the costs of providing additional public services to city residents affected by the pandemic-related economic downturn. These extra costs are likely to be most significant in the area of housing (homelessness and rental assistance), food assistance, and public health. Most of the additional federal funding enacted in 2020 will be used directly by local governments to assist in financing these additional pandemic-related costs.

Because the federal funding that is part of the CARES Act will be devoted to funding additional costs, it will, for the most part, not be available to replace the revenue shortfalls that FiSCs will face as a result of the pandemic. For this reason, we will assume that the flow of federal funds to local governments from existing federal programs will be unaffected by the pandemic. Thus, we assume a 0-percentage change for federal grants in both our less severe and more severe scenarios.

G. Aggregate Revenue Shortfalls in FiSCs

Separately for our less severe and more severe sets of assumptions, we calculate a weighted sum of the assumed or estimated percentage changes in revenue attributable to the COVID-19 pandemic and recession for each source of general revenue, where the weights are the percentages of each source in the general revenue of each FiSC. We refer to the resulting totals as the percentage general revenue shortfalls of each FiSC. The revenue shortfalls for each FiSC are listed in the Appendix. To calculate the dollar magnitude of the shortfalls, we multiply each percentage shortfall by projected fiscal year 2021 general revenue for each FiSC in a world where the pandemic had not occurred. The results of these calculations for the 150 central cities in our sample are summarized in Table 2.

The average percentage general revenue shortfall is 5.5 percent under our less severe assumptions and 9 percent under our more severe assumptions. As expected, there are substantial differences in the sizes of the shortfalls across cities. The coefficients of variation are 0.39 and 0.32 under our two scenarios.[20] Under our less severe assump-

[20] The differences in estimated revenue shortfalls among FiSCs would undoubtedly have been larger if we had been able to make FiSC-specific estimates for property taxes and user charges, two important sources of revenue in many cities.

Table 2

Estimated Shortfalls in General Revenue in Fiscal Year 2021 Due to the COVID-19 Pandemic: 150 Fiscally Standardized Cities

	Less Severe Scenario	More Severe Scenario
Percentage general revenue shortfalls		
Average	5.5%	9.0%
Standard deviation	2.2%	2.9%
Coefficient of variation	0.394	0.319
Minimum	1.3%	3.2%
10th percentile	3.1%	5.5%
90th percentile	8.1%	12.5%
Maximum	13.8%	19.9%
Number of FiSCs with Shortfalls		
Less than 5%	66	12
5%–10%	79	91
10%–15%	5	42
Greater than 15%	0	5
Aggregate Shortfall — 150 FiSCs	$34,227,127,388	$55,295,487,241

Source: Authors' calculations. See text for details.

tions, the 10th percentile shortfall is 3.1 percent and the 90th percentile shortfall is 8.1 percent. The corresponding percentages under the more severe scenario are 5.5 and 12.5 percent. In dollar terms, we project that, collectively, the 150 FiSCs will face general revenue shortfalls of $34.2 billion and $55.3 billion in fiscal year 2021 under our less and more severe scenarios, respectively.

Among the cities facing the largest percentage shortfalls are the five FiSCs in New York State. Buffalo, Rochester, and Syracuse will be particularly hard hit, facing shortfalls of around 13 percent in our less severe scenario and around 19 percent in our more severe scenario. Other FiSCs that will experience relatively large revenue shortfalls are Detroit, Kansas City, Philadelphia, and various cities in Louisiana and Florida.

Although no FiSCs will escape pandemic-related revenue shortfalls, these shortfalls will be relatively modest in FiSCs in the states of Massachusetts, Connecticut, and South Dakota. Under our less severe assumption, FiSCs that can expect average revenue shortfalls include Washington, DC, San Francisco, and Tucson. Sacramento, CA, Aurora, CO, and Lewiston, ME will experience average shortfalls under our more severe assumptions.

To understand the reasons for the variations in the size of projected shortfalls across FiSCs, it is necessary to study the details of the revenue shortfall calculations. There are

two main reasons why Buffalo and Rochester, NY face large estimated revenue shortfalls. First, in both cities, state aid makes up about half of general revenue, a reliance on state aid that is nearly double state aid's share of general revenue in the average FiSC. This heavy reliance on state aid is important because we estimate that the percentage reduction in state aid in New York will be about double the percentage reduction in the average state.[21] Second, Buffalo and Rochester rely more heavily on revenue from local sales taxes than the average FiSC — 13.1 percent and 12.2 percent, respectively, compared to an average of 8.3 percent in the FiSCs that use local sales taxes. This heavier than average reliance on sales tax revenues is important because our calculations, summarized in Table 2, of percentage reductions in sales tax revenue indicate reductions of nearly 15 percent in these two cities under our less severe assumptions and 25 percent under our more severe assumptions. These sales tax revenue declines are driven, in large part, by the large April 2019–April 2020 decline in sales tax revenues in New York State and are more than double our predicted average sales tax reductions in all FiSCs benefiting from local sales tax revenue.

Boston provides a good example of a FiSC that we predict will face a relatively small revenue shortfall, 2.2 percent and 4.2 percent under our two scenarios. State aid provides a relatively small share of general revenue in Boston (14.6 percent), and we project a relatively small reduction in state aid in Massachusetts relative to state aid reductions in the average state. The second reason Boston will suffer from a relatively modest revenue shortfall is its heavy reliance on the property tax. Slightly over half of the general revenue of the Boston FiSC comes from the property tax, a share that is nearly double the average among all FiSCs. Because we predict that at least through fiscal year 2021, property tax revenues will not be reduced (less severe assumption), or will be reduced by only 0.5 percent (more severe assumption), a large share of Boston's revenue will not be impacted by the pandemic. The fact that Boston and most FiSCs in New England receive no revenue from local sales or income taxes results in our predicted relative stability of their general revenues.

H. Revenue Shortfalls and the Fiscal Health of Cities

The ability of central cities to continue to provide a full range of public services during the COVID-19 pandemic and throughout the period of the economic fallout from the pandemic will depend on size of revenue shortfalls they face, increases in costs associated with the pandemic (to be discussed in Section IV), and to some extent the underlying fiscal health of each FiSC going into the current crisis.[22] As emphasized by

[21] We estimate a large reduction in state aid in New York state because Moody's Analytics predicts an above-average revenue shortfall in the state, and because New York State has a relative low balance in its rainy-day fund.

[22] It goes without saying that FiSCs whose component governments had substantial reserve funds at the beginning of the pandemic will be in a stronger position to respond to the resulting effects of reduced revenues and higher costs than FiSCs with low levels of fiscal reserves. Unfortunately, comprehensive data on local government cash reserves do not exist.

Bird (2015), assessing the fiscal health of cities depends on the question one wants to answer. Concerns about default risk, inadequate infrastructure investments, or poor public service provision all call for different measures of fiscal health. In this paper, we draw upon previously completed estimates of the fiscal conditions of cities based on a measure of the ability of cities to provide their residents with a standard mix of public services at reasonable rates of taxation (Chernick and Reschovsky, 2020). This approach to measurement of city fiscal conditions is built on the well-known concept of the *fiscal gap* between each city's *expenditure needs* and its *revenue-raising capacity.* Cities in the weakest fiscal health are those with the largest positive gaps. Here, we draw on fiscal gaps calculated using revenue capacity and intergovernmental grant data from 2014 and estimated expenditure needs based on data from 2000 through 2014. Gaps are calculated for 148 FiSCs.

The percentage revenue shortfalls summarized in Table 2 occur because of changes in pandemic-induced changes in income, employment, and consumption. None of these changes are necessarily related to the underlying fiscal health of FiSCs. Thus, it is no surprise that although positive, simple correlations between fiscal gaps and our two measures of revenue shortfalls are close to zero. In Table 3, we list two groups of cities. Both groups consist of cities that are among the 20 percent of FiSCs for which we predict the largest percentage revenue shortfall under our most severe scenario. The first group contains eight FiSCs that are among the quintile of FiSCs that are in the weakest fiscal health. The second group lists five cities that come from the quintile of FiSCs that are in the strongest fiscal health.

Local government officials in all cities facing large revenue shortfalls will have to make difficult decisions about how best to continue to provide core public services to their residents and businesses. This task will be particularly challenging for cities in the

Table 3

Large Pandemic-Related Revenue Shortfalls and FiSC Fiscal Health

Weak Fiscal Health	Strong Fiscal Health
Hialeah, FL	Orlando, FL
Detroit, MI	Tallahassee, FL
Flint, MI	Charleston, SC
Warren, MI	New York, NY
Kansas City, KS	Seattle, WA
Baton Rouge, LA	
Shreveport, LA	
Huntington, WV	

Source: Fiscal health calculations come from Chernick and Reschovsky (2020).

weakest fiscal health. By definition, they have inadequate tax bases or intergovernmental aid to meet their most basic public service delivery responsibilities. Although residents of all FiSCs are likely to feel the impacts of the COVID-19 recession, residents of the cities in the left-hand column of Table 3, many of whom already must cope with inadequate public services, will be under the greatest risk.

IV. PUBLIC SECTOR COSTS ASSOCIATED WITH THE COVID-19 PANDEMIC

The COVID-19 pandemic and the resulting recession have increased costs to local governments throughout the nation. These additional costs are not limited to health-related spending for hospitalizations and other aspects of health care directly associated with the COVID-19 pandemic. They include higher costs required to adapt all public services, especially education, to operate in a world of social distancing and additional costs for delivering a range of social services to those adversely impacted by the recession, a population that is abnormally large due to the far-reaching implications of the pandemic. In this section, we provide basic comparisons across FiSCs in terms of expected increases in costs and a brief discussion of federal government efforts to date to finance these cost increases.

Ascertaining the direct health costs associated with the pandemic requires knowledge of the number of COVID-19–related hospitalizations, the cost per hospitalization, the cost of other health services, and the extent to which these costs are borne by the local public sector, versus private hospitals, private insurance, and Medicaid.[23]

While we have no data on hospitalization rates and differences in average costs in public and private hospitals, the FiSC data do allow us to compare public sector responsibilities for hospital and health spending across cities. In 2017, 60 out of 150 FiSCs had positive hospital expenditures (greater than $100 per capita), with average expenditures of $810 per capita. FiSCs with public hospital spending tend to be larger, with an average population of 731,000. This contrasts to FiSCs with no hospital spending, which had an average population size of 280,000. As a result, 40 percent of FiSCs serve 63 percent of the total population of FiSCs. Hospital costs will almost certainly rise in these FiSCs.

In addition to the costs resulting from hospitalizations, cities are very likely to incur additional public health costs for items such as the purchase of personal protective equipment for city employees and the implementation of widespread testing, as well as social service costs for those directly or indirectly affected by the virus. For example, the costs to cities of dealing with homelessness are likely to increase because of the need to quarantine infected homeless persons and the risks of transmission in homeless shelters. Though we have no dollar figures, we expect that these additional costs will be roughly proportional to COVID-19 caseloads and death rates. Costs of providing

[23] A recent estimate is that a single symptomatic COVID-19 infection would cost a median of $3,045 in direct medical costs incurred only during the course of the infection, while one hospitalized case would cost a median of $14,366 when including only costs during the course of the infection (Mensik, 2020).

education are also likely to grow because of the need to reduce class sizes to preserve social distancing, to support and facilitate remote learning, and to provide additional protective equipment for teachers and staff.[24]

To address the potential costs of COVID-19 hospitalizations, we draw on county-level data on the cumulative number of COVID-19 cases and deaths per 100,000 persons. These data are compiled on a daily basis by Wheeler (2020) from a *New York Times* database. Countywide totals are assigned to FiSCs. In this paper, we use the cumulative totals as of June 3, 2020 to create an index of relative COVID-19 health care costs. For each FiSC, an index value was calculated as the sum of the number of COVID-19 cases per 100,000 persons multiplied by a weight of 0.25 and the number of deaths per 100,000 persons multiplied by 0.75. Although this weighting scheme is somewhat arbitrary, it is based on the assumption that COVID-19 cases that result in deaths generate higher health care costs than cases in which patients recover. We note that index values and the ranking of FiSCs are sensitive to the date that the data were extracted. In the time since our June 3rd data extraction date, there have been large surges in the number of cases and deaths in cities that previously had few COVID-19 cases.

The first panel of Table 4 displays averages by quintile of the COVID-19 cost index relative to its mean. The first column is for FiSCs with positive hospital spending, while the second column is for all FiSCs. Among FiSCs with positive hospital spending, the top quintile of potential cost impact is more than six times as high as the bottom quintile. The substantial differences in COVID-19 incidence across U.S cities are suggestive of wide ranges in associated public health costs.

The second panel of Table 4 compares the COVID-19 index to our calculated revenue shortfalls, to examine whether some FiSCs with large revenue shortfalls are also subject to potentially high COVID-19–related costs. The first section shows that of the five FiSCs with the largest revenue shortfalls, all are in the top or the fourth quintile of COVID-19 costs. The lower section shows that of the five FiSCs with the smallest revenue shortfalls, three of the cities (Sioux Falls, Worcester, and Springfield) are in the top quintile of COVID-19 impact, while the other two FiSCs have both small revenue shortfalls and (to date) low COVID-19 rates.

Although not shown in the table, the five cities with the highest values of the COVID-19 index (Yonkers, New York City, Boston, New Orleans, and Chicago) are all relatively dense urban places. Four of these cities are also in the highest quintile of revenue shortfalls, thus facing both relatively severe fiscal problems and high costs of dealing with the virus. Boston is an exception, with high cumulative rates of COVID-19 but a relatively small revenue shortfall. The post-June surge in cases in cities that had low incidences of the coronavirus through the beginning of June means that our rankings of cities by their potential costs of the virus are likely to have changed substantially.

[24] Burnett (2020) reports an estimate of a 5 percent increase in education costs for remote learning, expanding food service, and making up for lost school days.

Table 4

COVID-19 Index Values* and Revenue Shortfalls

	Average COVID-19 Index Relative to Mean Value of Index	
Quintile	FiSCs with Hospital Spending	All FiSCs
Top	3.4	2.7
Fourth	1.3	1.1
Middle	0.7	0.6
Second	0.3	0.4
Bottom	0.4	0.2
Five FiSCs with Largest % Revenue Shortfall	COVID-19 Index Quintile	
Rochester, NY	4	
Buffalo, NY	4	
Syracuse, NY	4	
Shreveport, LA	5	
Yonkers, NY	5	
Five FiSCs with Smallest % Revenue Shortfall	COVID-19 Index Quintile	
Casper, WY	1	
Rapid City, SD	2	
Sioux Falls, SD	5	
Worcester, MA	5	
Springfield, MA	5	

*Index value = 0.75 × [deaths per 100,000 of pop] + 0.25 × [cases per 100,000 of pop].

A. Federal Assistance to Cities

In assessing federal aid within our overall framework of studying the fiscal impact of the coronavirus on cities, our approach is to assume that in the absence of the pandemic-related recession, federal aid to cities would have been essentially unchanged. All of the additional federal aid that Congress has enacted since the beginning of the pandemic is implicitly treated as assisting cities in paying for the additional costs they may incur as a result of the pandemic. In the next paragraphs, we provide a brief description of federal aid.

Federal aid to cities is authorized under various acts. By far the largest allocation of financial assistance is through the CARES Act, which provides $150 billion for aid to state and local governments. Federal funds can only be used to cover the additional costs associated with the pandemic. Cities with populations greater than 500,000 in 2019 get their share of the state allocation of these funds directly, based on their share of the state's population. The next largest allocation to local governments under the

CARES Act is $30.75 billion through the Educational Stabilization Fund. Of this amount, $13.75 billion is allocated to local school districts based on their share of the number of children in poverty in a state.[25] The education funds can be used to replace budgeted increases in state aid, but states must maintain the average amounts of aid in the preceding year. Neither of these funding streams are directly linked to the incidence of COVID-19 in a city or state. In addition to these major funding streams, there are a number of other programs to help cities cover other additional costs such as testing, care for the homeless, rental assistance, social services, and child care.[26]

A major concern is that almost all of the pandemic-related federal funding is either limited to the period of the health emergency or expires at the end of 2020. However, in many cities, costs related to the virus are likely to remain elevated well beyond 2020. If this is the case, unless COVID-19–related aid is extended into 2021, many cities will face not only revenue shortfalls but also increased costs of providing basic services.

V. CONCLUSION

This paper is an exercise in forecasting under uncertainty. Our goal is to estimate the potential impact of the COVID-19 pandemic and economic recession on city finances. Our framework is to simulate potential changes in city revenue in fiscal year 2021, as compared to projected revenues in that year if there were no recession. To make fiscal comparisons across cities, it is necessary to account for differences in governmental structure and organization. To deal with these differences, we use a unique central city database called *fiscally standardized cities*, or FiSCs. A FiSC combines fiscal data from a central city municipal government with a prorated share of both expenditures and revenues from all overlying school districts, counties, and special districts.

The fiscal effects of the recession on cities depend on their economic base and the responsiveness of the various revenue sources to the economic damage. To quantify the relative magnitudes of the recession across cities, we used the most recently available national data on changes in employment and wages by industrial sector and applied these changes to each city by adjusting for differences across cities in industry composition. This exercise yielded an average reduction in earnings of 10.25 percent, with relatively little variation across cities. The lack of variation is a reflection of the broad national decline in employment across most sectors in the initial stages of the recession and similarities among many cities in terms of industry composition.

We consider two scenarios in terms of economic impact, which we refer to as "less severe" and "more severe." These two scenarios are based on different assumptions

[25] Gordon and Reber (2020, this issue) provide a detailed discussion of the formulas used to distribute federal education dollars.

[26] An estimate by the New York City Independent Budget Office (2020a) is that New York City will receive $2.2 billion under the two largest federal programs and an additional $2.1 billion under a variety of other federal programs. While these figures are likely to be very different and probably considerably lower in other cities, they do indicate significant federal compensation for coronavirus costs in one of the hardest hit cities in the country.

about the severity of the recession measured in terms of income and employment and on different assumptions about the responsiveness of revenues from different sources to economic changes. Because state aid is an important source of revenue for cities, particularly for school finance, the impact of the pandemic on a state's economy and, hence, on its ability to provide state aid, is also important.

Our average predictions across all 150 FiSCs in our sample under the two scenarios are declines in general revenue in 2021 of 5.5 percent and 9 percent, respectively. Under the more severe scenario, 47 FiSCs would experience revenue reductions of 10 percent or more. In dollar terms, these percentages generate revenue shortfalls of $34.2 and $55.3 billion, respectively. These are substantial cuts, which would lead to significant declines in government employment and public service provision. Expanding these estimates to all local governments in the U.S. yields aggregate revenue shortfalls of $102.9 and $165.2 billion.[27]

To put these revenue shortfalls in perspective, we estimate that in 2008 and 2009, in the midst of the 2007-09 Great Recession, the 150 FiSCs experienced revenue shortfalls of 1.9 and 7.3 percent, respectively.[28] To the extent that 2008, the first full year of the Great Recession, is equivalent to 2021, the initial fiscal impacts of the COVID-19 recession will be much more severe. Because of the large role that the collapse of the housing market played in the Great Recession, the largest fiscal impacts occurred in the years after the official end of the recession. If an effective vaccine for the coronavirus is widely available early in 2021, the long-run impact of the COVID-19 recession on the fiscal health of cities may be less severe than the long tail of the Great Recession.

Though all cities are likely to face declines in revenue, our analysis reveals very different magnitudes, depending on tax and other local revenue structures, and the importance of state aid. Paradoxically, cities that are less reliant on state aid, and have less diversified revenue structures, will be the most insulated from severe cuts, at least in the short run.

Several assumptions are key to our results. The most important is that through 2021, property tax revenues will be quite stable, ranging from no change under our less severe scenario assumption to a 0.5 percent cut under the more severe one. Hence, cities such as Boston that rely particularly heavily on the property tax will have smaller predicted revenue declines than cities that rely more on other taxes. This stability assumption is based on the observed lag between changes in the market value of property and associated changes in property tax revenues. However, over a longer period, property taxes may be subject to considerable downward pressure. This was the case in the Great Recession, when property taxes increased for two years after the onset of the recession and then, under the pressure of housing price declines and increased foreclosures, began a long

[27] Because property tax revenues provide a larger share of general revenue in non-FiSC local governments, we assume lower percentage reductions in revenue--5.0 percent and 8.0 percent under our two scenarios—in our revenue shortfall forecasts for those governments.

[28] These percentages come from comparing *no-recession* estimates of 2008 and 2009 general revenues to actual revenues in those two years. The no-recession estimates come from assuming that growth rates in nominal general revenue in the 2007 to 2009 period would have been identical to the average annual growth rate in general revenue in each FiSC between 2000 and 2007.

period of decline. In the current recession, downward pressure on commercial property prices and on rental residential property has already been reported in several cities. This pressure could translate into reduced assessments and revenues by 2022 or 2023. Such a development would, of course, lead to greater revenue reductions in property-tax–dependent FiSCs. Over the longer run, if the pandemic induces fundamental changes in the desirability of cities as locations for residence and firms, then the property tax would be at even greater risk.

A second key assumption is that the decline in state aid induced by fiscal pressure at the state level will be proportional to the cuts in state government revenue and that state aid will be cut by equal percentages across all local jurisdictions. While we view this as the most likely scenario, we recognize that some states may choose to reduce state aid by more or less, and in some cases, they might choose to protect cities or school districts that are the most dependent on state aid.

Another important assumption is that states will draw on at least 75 percent of their rainy-day fund balances to reduce the need for cuts in state spending. States with large fund balances, such as Wyoming, will be able to minimize reductions in state aid in 2021, while states with low balances, such as New York, will be forced to rely on cuts to state aid and state programs to address their revenue shortfalls.

We also try to address the question of whether cities that are likely to be hit hardest fiscally by the pandemic were also in the weakest fiscal health prior to the recession. To do this, we compare our estimates of revenue shortfalls to our previous ranking of cities in terms of their overall fiscal health. We find a number of cities that were in poor fiscal health and face large COVID-19–related revenue shortfalls but also many cities where the two measures are essentially uncorrelated.

There are significant unknowns in attempting to forecast the future fiscal condition of cities. The recession may be more or less severe than predicted, with a shorter or longer duration. City revenues and state aid will be heavily dependent on the severity of the economic downturn. On the cost side, the COVID-19 pandemic may change the modes and costs of service delivery, particularly for education and social services. Remote learning, social distancing, and the need for more protective measures will all affect the cost of services. Many of these costs depend on the future course of the pandemic and the timeline for development of effective vaccines.

States and larger cities have received significant compensation for COVID-19–related costs under the CARES Act, though most of this aid is time limited and not particularly well targeted to those cities and counties with the highest incidence of COVID-19 cases. As of this writing, the highest incidence has been in the denser cities and counties, while the major programs of additional aid have been distributed primarily on an equal per capita basis — or, in the case of education support, issued in proportion to school-age poverty incidence.

Perhaps the most important unknown is what, if any, additional federal aid will be forthcoming. As many economists and state and local government officials have argued, the biggest lacunae for cities is the decrease in revenue caused by the COVID-19–related recession. Unless the federal government replaces a substantial proportion of the current

and forecasted drop in revenues, cities will be forced to expand the already substantial scope of public service and public employment cuts. The consequences will be clearly deleterious for city residents and for local and national economies.

ACKNOWLEDGMENTS

The authors thank Lucy Dadayan at the Urban Institute for helpful discussions and for providing us with data on state sales tax revenues, Adam Langley at the Lincoln Institute of Land Policy for advice and for sharing with us updated data from the Fiscally Standardized Cities database, and William Gentry for very helpful comments.

DISCLOSURE

The authors have no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper.

REFERENCES

Alm, James, Robert D. Buschman, and David L. Sjoquist, 2011. "Rethinking Local Government Reliance on the Property Tax." *Regional Science and Urban Economics* 41 (4), 320–331.

Alm, James, Timothy R. Hodge, Gary Sands, and Mark Skidmore, 2015. "Detroit Property Tax Delinquency—Social Contract in Crisis." Tulane University Economics Working Paper 1508. Tulane University, New Orleans, LA.

Bird, Richard M., 2015. "Reflections on Measuring Urban Fiscal Health." In Bird, Richard M. and Enid Slack (eds.), *Is Your City Healthy? Measuring Urban Fiscal Health*, 11–42. Institute on Municipal Finance and Governance, Toronto, ON, Canada.

Burnett, Daarel II, 2020. "How COVID-19 Will Balloon District Costs This Coming School Year." *Education Week*, https://www.edweek.org/ew/articles/2020/05/18/how-covid-19-will-balloon-district-costs-this.html.

Chernick, Howard, Adam Langley, and Andrew Reschovsky, 2012. "Predicting the Impact of the U.S. Housing Crisis and 'Great Recession' on Central City Revenues." *Publius: Journal of Federalism* 42 (3), 467–493.

Chernick, Howard, Adam H. Langley, and Andrew Reschovsky, 2015. "Comparing Central City Finances Using Fiscally Standardized Cities." *Journal of Comparative Policy Analysis: Research and Practice* 17 (4), 430–440.

Chernick, Howard, and Cordelia Reimers, 2019. "Consumption Taxes, Income Taxes, and Revenue Sensitivity: States and the Great Recession." *Public Finance Review* 49 (2), 349–381.

Chernick, Howard, and Andrew Reschovsky, 2020. "Measuring the Fiscal Health of U.S. Cities." Working Paper No. WP20HC1. Lincoln Institute of Land Policy, Cambridge, MA.

Chernick, Howard, Andrew Reschovsky, and Sandra Newman, 2020. "The Effect of the Housing Crisis on the Finances of Central Cities." La Follette School Working Paper 2020-001. La Follette School of Public Affairs, University of Wisconsin–Madison, Madison, WI.

Clemens, Jeffrey, and Stan Veuger, 2020. "Implications of the COVID-19 Pandemic for State Government Tax Revenues." *National Tax Journal* 73 (3), 000–000.

Collins, Catherine, 2020. "Property Taxes and COVID-19." Lincoln Institute Report: Property Tax Trends 2019 and 2020. Lincoln Institute of Land Policy, Cambridge, MA.

Congressional Budget Office, 2020. "Interim Economic Projections for 2020 and 2021," CBO Report. CBO, Washington, DC.

Dougherty, Sean, Michelle Harding, and Andrew Reschovsky, 2019. "Twenty Years of Tax Autonomy across Levels of Government: Measurement and Applications." OECD Working Paper on Fiscal Federalism No. 29. Organisation of Economic Cooperation and Development, Paris, France.

Driessen, Grant A., 2020. "The Coronavirus Relief Fund (CARES Act, Title V): Background and State and Local Allocations." R46298-Version 3. Congressional Research Service, Washington, DC, April 14, updated.

Goodman, Christopher B., 2018. "House Prices and Property Tax Revenues during the Boom and Bust: Evidence from Small-Area Estimates." *Growth and Change* 49 (4), 636–656.

Gordon, Nora, and Sarah Reber, 2020. "Federal Aid to School Districts during the COVID-19 Recession." *National Tax Journal* 73 (3), 000–000.

Hart, Kim, 2020. "Coronavirus May Prompt Migration out of American Cities." The Harris Poll, https://theharrispoll.com/coronavirus-may-prompt-migration-out-of-american-cities/.

Hayashi, Andrew T., 2020. "Countercyclical Property Taxes," Law and Economics Research Paper Series 2020-04, University of Virginia School of Law, Charlottesville, March.

Higginbottom, Justin, 2010. "State Provisions for Property Reassessment." Fiscal Fact No. 223. Tax Foundation, Washington, DC.

Kotkin, Joel, 2020. "The New Geography of America, Post-Coronavirus." Joel Kotkin blog post, http://joelkotkin.com/the-new-geography-of-america-post-coronavirus/.

Leachman, Michael, Kathleen Masterson, and Eric Figueroa, 2017. "A Punishing Decade for School Funding." CBPP Report. Center on Budget and Policy Priorities, Washington, DC.

Lutz, Byron F., 2008. "The Connection between House Price Appreciation and Property Tax Revenues." *National Tax Journal* 61 (3), 555–572.

Lutz, Byron F., Raven Molloy, and Hui Shan, 2011. "The Housing Crisis and State and Local Government Tax Revenue: Five Channels." *Regional Science and Urban Economics* 41 (4), 306–319.

❶ Sally: Insert page numbers when known.

McNichol, Elizabeth, and Michael Leachman, 2020. "States Continue to Face Large Shortfalls Due to COVID-19 Effects." CBPP Report. Center on Budget and Policy Priorities, Washington, DC.

Mensik, Hailey, 2020. "Inpatient COVID-19 Cases Estimated to Cost $14K per Patient," *Health Care Dive*, https://www.healthcaredive.com/news/health-affairs-covid-treatment-cost-predictions/576693/.

National Association of State Budget Officials, 2019. "The Fiscal Survey of States." NASBO Report. NASBO, Washington, DC, Fall.

New York City Independent Budget Office, 2020a. "How Much 'CARE' for NYC? An Estimate of Federal Coronavirus Emergency Relief Act Funding to the City Budget." *Fiscal Brief*, https://ibo.nyc.ny.us/iboreports/how-much-CARE-for-nyc-an-estimate-of-federal-coronavirus-emergency-relief-act-funding-to-the-city-budget-may-2020.pdf.

New York City Independent Budget Office, 2020b. "Tumbling Tax Revenues, Shrinking Reserves, Growing Budget Gaps: New York City Faces Substantial Fiscal Challenges in the Weeks and Months Ahead." *Focus On: The Executive Budget*, https://ibo.nyc.ny.us/iboreports/tumbling-tax-revenues-shrinking-reserves-growing-budget-gaps-new-york-city-faces-substantial-fiscal-challenges-in-the-weeks-and-months-ahead-may-2020.pdf.

Reschovsky, Andrew, and Amy Ellen Schwartz, 1991. "The Impact of Grant-in-Aid on Fiscal Disparities among Recipient Governments." In Prud'homme, Rémy (ed.), *Public Finance with Several Levels of Government*, *Proceedings of the 46th Congress of the International Institute of Public Finance*, Brussels, 1990, 235–248. Foundation Journal Public Finance, The Hague, Netherlands.

S&P Dow Jones Indices LLC, 2020. "S&P/Case-Shiller U.S. National Home Price Index." Series CSUSHPINSA. Retrieved from FRED, St. Louis Federal Reserve Bank, St. Louis, MO.

Smialek, Jeanna, and Allan Rappeport, 2020. "Fed Chair Warns This Is a 'Downturn without a Modern Precedent.'" *New York Times*, May 22, A11.

Solman, Paul, 2020. "American Skyscrapers Face an Uncertain Future Amid Coronavirus." *PBS NewsHour*, June 4.

U.S. Bureau of Economic Analysis, 2020. "News Release, Personal Income and Outlays: April 2020," https://www.bea.gov/news/2020/personal-income-and-outlays-april-2020.

U.S. Bureau of Labor Statistics, 2020a. "Current Employment Statistics—CES (National)." Establishment Data, Table B-1a: Employees on Nonfarm Payrolls by Industry Sector and Selected Industry Details, Seasonally Adjusted, https://www.bls.gov/web/empsit/ceseeb1a.htm.

U.S. Bureau of Labor Statistics, 2020b. "Quarterly Census of Employment and Wages." Tables, All Counties, One Industry, https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.

U.S. Census Bureau, 2020a. "2018 Annual Survey of State Government Finances," State Government Finance Table, https://www.census.gov/data/tables/2018/econ/state/historical-tables.html.

U.S. Census Bureau, 2020b. "Advance Monthly Sales for Retail and Food Services, May 2020," Release Number: CB20-85, June 16, https://www.census.gov/retail/marts/www/marts_current.pdf.

Urban Institute. 2020a. *Monthly State Revenue Highlights*, May, https://www.urban.org/sites/default/files/monthlystrh_may2020.pdf.

Urban Institute, 2020b. "State Government Monthly Tax Revenue." Data file provided by Lucy Dadayan. Tax Policy Center, The Urban Institute, Washington, DC, June.

Wheeler, David, 2020. "US Counties Cases & US Counties Deaths," *Global Ecowatch—Coming Soon*, http://www.globalecowatch.org//wp-content//uploads//2019//01//US_Counties _Cases.html and http://www.globalecowatch.org//wp-content//uploads//2019//01//US_ Counties_Deaths.html.

White, Dan, Sarah Crane, and Colin Seitz, 2020. "Stress-Testing States: COVID-19." Analysis. Moody's Analytics, April 14.

APPENDIX

Projected General Revenue Shortfalls in FY 2021
150 Fiscally Standardized Cities

City	State	Less Severe Scenario	More Severe Scenario
Anchorage	AK	2.0%	3.6%
Fairbanks	AK	2.3%	4.1%
Birmingham	AL	4.8%	8.0%
Mobile	AL	4.4%	7.7%
Montgomery	AL	4.8%	8.8%
Ft. Smith	AR	7.0%	9.4%
Little Rock	AR	6.4%	9.1%
Mesa	AZ	6.1%	9.2%
Phoenix	AZ	5.6%	8.6%
Tucson	AZ	5.5%	8.4%
Anaheim	CA	5.1%	9.1%
Bakersfield	CA	4.5%	7.9%
Fremont	CA	4.6%	8.2%
Fresno	CA	4.8%	8.5%
Huntington Beach	CA	4.5%	8.0%
Long Beach	CA	4.5%	8.2%
Los Angeles	CA	4.7%	8.5%
Modesto	CA	5.0%	8.9%
Oakland	CA	4.3%	7.8%
Riverside	CA	4.9%	8.8%
Sacramento	CA	5.1%	9.0%
San Diego	CA	4.6%	8.2%
San Francisco	CA	5.5%	9.7%
San Jose	CA	4.4%	8.1%
Santa Ana	CA	4.6%	8.1%
Stockton	CA	4.8%	8.6%
Aurora	CO	5.3%	9.0%
Colorado Springs	CO	6.2%	10.4%
Denver	CO	5.8%	10.3%
Bridgeport	CT	2.1%	4.3%
Hartford	CT	2.8%	5.6%
New Haven	CT	2.5%	4.9%
Washington	DC	5.6%	8.8%
Dover	DE	5.7%	9.6%
Wilmington	DE	5.7%	9.8%
Ft. Lauderdale	FL	7.1%	11.7%
Hialeah	FL	6.8%	11.0%
Jacksonville	FL	8.4%	12.6%
Miami	FL	6.6%	10.9%

Projected General Revenue Shortfalls in FY 2021
150 Fiscally Standardized Cities (Continued)

City	State	Less Severe Scenario	More Severe Scenario
Orlando	FL	8.3%	13.1%
St. Petersburg	FL	6.6%	10.4%
Tallahassee	FL	8.3%	13.0%
Tampa	FL	6.8%	10.3%
Atlanta	GA	4.3%	7.9%
Columbus	GA	3.9%	7.3%
Cedar Rapids	IA	4.0%	7.1%
Des Moines	IA	4.3%	7.5%
Boise	ID	5.7%	8.9%
Nampa	ID	6.7%	9.9%
Aurora	IL	6.9%	10.0%
Chicago	IL	7.3%	11.5%
Ft. Wayne	IN	6.7%	10.6%
Gary	IN	5.6%	9.5%
Indianapolis	IN	6.6%	11.3%
Kansas City	KS	8.9%	13.2%
Topeka	KS	6.9%	10.5%
Wichita	KS	9.3%	13.9%
Lexington	KY	6.8%	10.4%
Louisville	KY	7.2%	10.9%
Baton Rouge	LA	8.3%	12.5%
New Orleans	LA	7.7%	12.3%
Shreveport	LA	11.1%	16.0%
Boston	MA	2.2%	4.2%
Springfield	MA	1.3%	3.2%
Worcester	MA	1.4%	3.2%
Baltimore	MD	4.6%	7.3%
Frederick	MD	4.7%	7.4%
Lewiston	ME	5.9%	9.0%
Portland	ME	3.1%	5.5%
Detroit	MI	9.5%	14.2%
Flint	MI	8.6%	13.5%
Grand Rapids	MI	8.2%	12.0%
Warren	MI	8.3%	12.3%
Minneapolis	MN	3.9%	7.5%
St. Paul	MN	3.4%	6.6%
Kansas City	MO	7.1%	11.3%
St. Louis	MO	6.3%	10.0%
Gulfport	MS	5.4%	9.6%
Jackson	MS	5.1%	7.6%

Projected General Revenue Shortfalls in FY 2021
150 Fiscally Standardized Cities (Continued)

City	State	Less Severe Scenario	More Severe Scenario
Billings	MT	6.0%	9.3%
Missoula	MT	5.8%	8.5%
Charlotte	NC	5.3%	9.3%
Durham	NC	4.0%	6.6%
Greensboro	NC	5.0%	8.0%
Raleigh	NC	5.1%	8.3%
Bismarck	ND	3.5%	8.3%
Fargo	ND	3.3%	8.3%
Lincoln	NE	4.5%	7.5%
Omaha	NE	4.7%	7.8%
Manchester	NH	3.2%	5.4%
Nashua	NH	2.6%	4.5%
Albuquerque	NM	3.1%	5.5%
Las Cruces	NM	4.1%	7.3%
Las Vegas	NV	7.1%	11.5%
Reno	NV	6.5%	10.5%
Buffalo	NY	13.7%	19.7%
New York	NY	9.4%	13.9%
Rochester	NY	13.8%	19.9%
Syracuse	NY	13.5%	19.3%
Yonkers	NY	10.1%	15.3%
Akron	OH	6.4%	10.0%
Cincinnati	OH	6.2%	9.5%
Cleveland	OH	6.4%	10.4%
Columbus	OH	5.6%	8.8%
Dayton	OH	6.3%	10.0%
Toledo	OH	6.5%	10.3%
Oklahoma	OK	7.1%	11.1%
Tulsa	OK	6.1%	9.9%
Eugene	OR	3.5%	7.1%
Portland	OR	4.2%	8.2%
Salem	OR	3.1%	7.0%
Philadelphia	PA	8.0%	12.0%
Pittsburgh	PA	7.0%	10.6%
Providence	RI	6.1%	8.1%
Warwick	RI	3.2%	4.8%
Charleston	SC	7.6%	12.6%
Columbia	SC	5.5%	9.0%
Rapid City	SD	2.1%	3.9%
Sioux Falls	SD	2.1%	3.9%

Projected General Revenue Shortfalls in FY 2021
150 Fiscally Standardized Cities (Continued)

City	State	Less Severe Scenario	More Severe Scenario
Chattanooga	TN	4.9%	8.6%
Knoxville	TN	4.9%	8.1%
Memphis	TN	5.1%	8.5%
Nashville	TN	4.9%	8.1%
Arlington	TX	3.8%	7.5%
Austin	TX	3.2%	6.3%
Corpus Christi	TX	3.3%	6.7%
Dallas	TX	3.3%	6.6%
El Paso	TX	3.2%	6.9%
Ft. Worth	TX	3.6%	7.2%
Garland	TX	3.0%	6.5%
Houston	TX	3.4%	6.6%
Lubbock	TX	3.9%	7.9%
San Antonio	TX	3.5%	7.0%
Provo	UT	3.6%	6.4%
Salt Lake City	UT	3.8%	7.1%
Chesapeake	VA	5.8%	8.6%
Norfolk	VA	6.1%	9.4%
Richmond	VA	5.4%	8.3%
Virginia Beach	VA	5.8%	8.8%
Burlington	VT	5.6%	8.9%
Rutland	VT	5.8%	8.3%
Seattle	WA	6.7%	11.5%
Spokane	WA	6.3%	10.3%
Tacoma	WA	6.3%	10.6%
Madison	WI	4.2%	6.6%
Milwaukee	WI	5.7%	8.8%
Charleston	WV	7.2%	12.4%
Huntington	WV	6.4%	11.1%
Casper	WY	2.2%	3.9%
Cheyenne	WY	3.2%	6.3%