Methodology Used to Create the Fiscally Standardized Cities Database

Working Paper WP20AL1

Adam H. Langley
Lincoln Institute of Land Policy

September 2020

The findings and conclusions of this Working Paper reflect the views of the author(s) and have not been subject to a detailed review by the staff of the Lincoln Institute of Land Policy. Contact the Lincoln Institute with questions or requests for permission to reprint this paper. help@lincolninst.edu

© 2020 Lincoln Institute of Land Policy

Abstract

This paper details the methodology used to create the fiscally standardized cities (FiSCs) database. The data are available for 212 U.S. cities for the 1977–2017 period on the Lincoln Institute of Land Policy's website. FiSCs allow for comparisons of local government finances across the nation's largest cities by accounting for differences in the structure of local government. The construction of FiSCs involves adding together revenues and expenditures for the city government plus an appropriate share from overlying counties, school districts, and special districts. The allocations are based on a city's share of county population, the percentage of students in each school district that live in the central city, and the city's share of the estimated population served by each special district. FiSCs provide a full picture of revenues raised from city residents and business and spending on their behalf, whether done by the city government or a separate overlying government.

Keywords: Local government, Public finance

About the Author

Adam H. Langley is associate director of U.S. and Canadian programs at the Lincoln Institute of Land Policy. His research focuses on state and local public finance, with dozens of publications, primarily on property tax relief programs, business tax incentives, the charitable property tax exemption, and nonprofit payments in lieu of taxes. Adam's research has been covered in hundreds of media outlets, including the *New York Times*, *Wall Street Journal*, *Washington Post*, *Boston Globe*, *The Economist*, and *Governing*. In addition, he regularly speaks to policymakers, practitioners, and researchers, with presentations to groups such as the National Conference of State Legislatures, Government Finance Officers Association, International Association of Assessing Officers, and the National Tax Association. He previously worked in the New York State Assembly. He earned a B.A. in political studies from Bard College and an M.A. in economics from Boston University.

Lincoln Institute of Land Policy
113 Brattle Street
Cambridge, MA 02138
Phone: 617-503-2117
Fax: 617-661-7235
ALangley@lincolninst.edu

Acknowledgments

The fiscally standardized cities database described in this working paper was developed jointly with Howard Chernick and Andrew Reschovsky. I greatly appreciate their comments on an earlier draft of the working paper. Joan Youngman also provided valuable comments. The creation of the FiSC public website would not have been possible without the assistance of my Lincoln Institute colleague Semida Munteanu and the excellent programming by Adam Courtemanche and Artsiom Abramchuck of iFactory. I would also like to thank Randy A. Moore, Stephen D. Owens, and Christopher Pece at the Governments Division of the U.S. Census Bureau. They helped us obtain and understand the Census Bureau's individual unit of government files, and answered our numerous data queries.

Table of Contents

Methodology Used to Create the Fiscally Standardized Cities Database

Introduction

Comparing the finances of the largest U.S. cities is critical for policymakers, researchers, and others interested in local public finance. The concept of *fiscally standardized cities* (FiSCs) was developed to make these comparisons possible. While the U.S. Census Bureau provides data on finances for individual local governments, responsibility for providing local public services is often divided among multiple governments, including the municipal government (referred to in this paper as city government) and overlying county governments, independent school districts, and special districts. Fiscal comparisons across city governments alone can thus be highly misleading.

For example, spending by city governments in Fort Wayne, Las Vegas, and San Jose accounted for less than one-quarter of all local government expenditures on behalf of residents of those cities in 2017. In contrast, because Boston, Baltimore, and Nashville have neither overlying county governments nor independent school districts, city government spending pays for almost all local government public services provided to central city residents and businesses.

The construction of FiSCs involves adding up revenues and expenditures for the city government and an appropriate share of revenues and expenditures from overlying counties, school districts, and special districts. Thus, FiSCs provide a full picture of revenues raised from city residents and businesses and spending on their behalf, whether done by the city government or separate overlying governments.

The FiSC estimates are based on data for individual local governments provided by the U.S. Census Bureau in the quinquennial Census of Government Finance and the Annual Surveys of State and Local Government Finance. The FiSC public use database includes comprehensive data on revenues, expenditures, debt, and assets[1] for over 200 of the nation's largest central cities. Annual data are currently available for the years 1977 through 2017, with additional years to be added as the underlying Census data become available. The database includes two sets of cities. The ***Core FiSC*** sample has 150 cities, including the two largest cities in each state, plus all cities with populations of 150,000+ in 1980 and 200,000+ in 2010.[2] The ***Legacy Cities*** sample has 95 cities with population declines of at least 20 percent from their peak, poverty rates exceeding the national average, and a peak population of at least 50,000. There are 33 cities in both samples, so the FiSC database has 212 cities in total. In most cases, the two samples should be analyzed separately, as there are important differences between cities in the two groups.

The methodology used to construct fiscally standardized cities (FiSCs) was developed by Howard Chernick (Hunter College, City University of New York), Adam Langley (Lincoln

[1] Throughout this paper, references to "revenues" and "expenditures" are often used as shorthand, but the allocation methodology is the same for revenues, expenditures, debt, and assets.

[2] This is a simplified explanation. The sample also includes four large state capitals and excludes cities with 1980 populations below 100,000. For details, see the section on "Selection of Cities in the FiSC Database."

Institute) and Andrew Reschovsky (University of Wisconsin–Madison and Lincoln Institute) with financial support from the Lincoln Institute of Land Policy. Adam Langley was responsible for the development of the public use FiSC database.

This paper details the methodology used to create the fiscally standardized cities dataset. The first section describes the methodology used to allocate revenues, expenditures, debt, and assets to FiSCs for county governments, school districts, and special districts. The following section describes the criteria used to select cities in the FiSC database, interpolations used to estimate fiscal variables in years when governments were not sampled in the Annual Surveys of State and Local Government Finance, and the sources used for data on city and county populations. Appendix 1 provides an overview of fiscal arrangements for the FiSCs, Appendix 2 lists all cities in the FiSC database based on their fiscal arrangements, Appendix 3 lists cities and counties excluded from the Annual Surveys in certain years, Appendix 4 provides some statistics related to the interpolations, and Appendix 5 discusses issues affecting a few specific cities.

Allocating Local Government Finances to FiSCs

To create FiSCs, revenues and expenditures for the city government are combined with a share from overlying counties, school districts, and special districts. This section details a variety of issues affecting these allocations, but the general approach is as follows. For counties, fiscal variables are allocated to the FiSC based on the city's share of the county's population. For school districts, fiscal variables are allocated based on the percentage of students in a school district who live in the central city. For special districts, a two-pronged approach was used for the FiSC estimates—we conducted a Web search to determine the rough service area for the largest special districts, while allocations for smaller districts are based on the type of special district. Intergovernmental revenues and expenditures from one local government to another are excluded from the FiSC allocations to avoid double counting.

This approach is similar to some prior studies that aimed to capture the effects of overlapping jurisdictions. For example, the U.S. Census Bureau (1974) compared fiscal and debt burdens for the central city and a single suburban municipality in five large metropolitan areas by compiling revenue and spending data from all overlapping local governments that served the residents of each of these municipalities. The FiSC methodology is a simplified version of this approach, applied to 212 cities for a 41-year period. In a comparative study of fiscal distress in U.S. cities, Bradbury (1982) addressed the need to account for differences in city government responsibilities by calculating the "combined revenue collection in city areas." To do so, she allocated to each city area all non-municipal local government revenue within each state on an equal per capita basis. The FiSC approach improves on the use of statewide averages by utilizing fiscal data for each non-municipal government that overlies each central city.

The FiSC dataset improves upon an earlier version of this dataset referred to as *constructed cities*, most notably by adding special districts. This earlier dataset was used in a number of prior studies, including research looking at the impact of the "Great Recession" and housing crisis on cities' fiscal health (Chernick, Langley, and Reschovsky 2012) and the relationship between

revenue diversification and the level of revenues for cities (Chernick, Langley, and Reschovsky 2011).

County Allocations

County allocations to FiSCs are based on the city's share of the county's population. So, if a city accounts for 20 percent of the county's population, then 20 percent of revenues and expenditures for the county government will be allocated to the FiSC. This means that the FiSC estimates use per capita revenues and expenditures for the county as a whole. County allocations are more complicated for 23 cities in the database that are in multiple counties, and for six cities where the city government and county government have largely merged into a single consolidated government but there are a few remaining independent municipalities within the county. The techniques used to address these issues are described below.

For the 23 cities with borders that extend into more than one county, fiscal variables for each overlying county are allocated to the FiSC in the same manner as other cities: based on the city's share of county population. This means that for these 23 cities the number of city residents in each overlying county is divided by each county's population to allocate fiscal variables for each overlying county separately. For example, in Atlanta in 2010, 391,700 city residents lived in Fulton County (population 920,581), and 28,292 city residents lived in DeKalb County (population 691,893). Thus, 42.5 percent of revenues for Fulton County were allocated to the Atlanta FiSC, plus 4.1 percent of DeKalb County revenues. Data on the number of city residents in each overlying county are only available for Census years, and we use linear interpolations to estimate annual data between decennial Censuses.[3] Information on the 23 cities is provided in table 1 on the next page.

[3] Population for 1990–2010 from 2010 Census Documents, CPH-2, Population and Housing Unit Counts, United States Summary, Table 54 (https://www2.census.gov/library/publications/decennial/2010/cph-2/cph-2-1.pdf).
Population for 1970–1990 from 1990 Census of Population, Vol. 1, Characteristics of the Population, United States Summary, Table 45 (https://www.census.gov/prod/cen1990/cph2/cph-2-1-1.pdf).
Census counts for the number of city residents in each overlying county are unavailable for Columbus, OH and Oklahoma City, OK for 1970–1980. Thus, we extrapolate data for the 1970–1989 period based on trends in the percentage of city residents in each county for the 1990–2010 period.

Table 1: Cities in Multiple Counties (2010)				
City	**State**	**Percent City Pop. in Principal County**	**Principal County**	**Other Counties**
Birmingham	AL	99.2%	Jefferson	Shelby
Aurora	CO	87.7%	Arapahoe	Adams, Douglas
Atlanta	GA	93.3%	Fulton	DeKalb
Aurora	IL	66.2%	Kane	DuPage, Will, Kendall
Jackson	MS	99.6%	Hinds	Madison
Kansas City	MO	65.8%	Jackson	Clay, Platte, Cass
Columbus	OH	97.9%	Franklin	Delaware, Fairfield
Youngstown	OH	100.0%	Mahoning	Trumbull
Oklahoma City	OK	81.3%	Oklahoma	Cleveland, Canadian, Pottawatomie
Portland	OR	99.6%	Multnomah	Clackamas, Washington
Salem	OR	84.3%	Marion	Polk
Charleston	SC	93.3%	Charleston	Berkeley
Columbia	SC	99.6%	Richland	Lexington
Sioux Falls	SD	86.3%	Minnehaha	Lincoln
Austin	TX	95.5%	Travis	Williamson
Dallas	TX	93.9%	Dallas	Collin, Denton, Rockwall
Fort Worth	TX	98.9%	Tarrant	Denton
Garland	TX	99.9%	Dallas	Collin
Houston	TX	98.0%	Harris	Fort Bend, Montgomery
San Antonio	TX	100.0%	Bexar	Medina
Huntington	WV	92.0%	Cabell	Wayne
Wheeling	WV	99.0%	Ohio	Marshall

Source: 2010 Census Documents, CPH-2, Population and Housing Unit Counts, Table 54.

For the six cities where the city government and county government have largely merged into a single consolidated government, revenues and expenditures for the few remaining independent municipalities are added to fiscal variables for the consolidated governments. This treats the six FiSCs as if the city and county have completely merged as is the case for the other 34 consolidated governments in the FiSC database.

This approach is necessary because there is no way to subtract revenues collected by the consolidated government from residents of the independent cities. Including consolidated government revenues collected from these people while using a population estimate for the county that excludes them (referred to as the "remainder" by the Census Bureau) would overestimate per capita revenues for the FiSC, because it would include revenues used to provide county services for the independent municipalities. Conversely, using population for the entire county with total revenues for the consolidated government would underestimate per capita revenues for the FiSC, because it would exclude revenues for the independent cities while including the population for these independent municipalities.

Table 2 provides information on the six partially consolidated governments. Note that revenues and expenditures for the independent municipalities are reported as "county" government fiscal variables in the FiSC dataset.

Table 2: Partially Consolidated City-County Governments

City	State	County	City Population as Pct. County Population (2010)	Consolidated Govt's Share of Total Revenue for all Cities and Towns in County (2007)	No. Independent Municipalities (2007)
Jacksonville	FL	Duval County	94.4%	95.1%	4
Indianapolis	IN	Marion County	90.9%	94.7%	14 (Plus 9 towns)
Kansas City	KS	Wyandotte County	93.0%	97.3%	2
Louisville	KY	Jefferson County	80.6%	94.4%	83
Baton Rouge	LA	East Baton Rouge Parish	54.9%	97.3%	2
Nashville	TN	Davidson County	95.7%	99.3%	6

School District Allocations

The allocation of school revenues to each FiSC depends on the type of school district(s) serving each city and whether school district boundaries match city boundaries. An overview of the methodology used to allocate school district revenues and expenditures is shown in table 3.

Table 3: Overview of School District Allocations to FiSCs (2017)

Type of School District(s) Serving City	No. Cities	How School Revenues are Allocated to FiSC
City-dependent school district	35	None—No independent school districts
County-dependent school district	8	None—No independent school districts
City-wide independent school district	42	100 percent of school district revenues
County-wide independent school district	21	Based on the percentage of K–12 public school students in the county that live in central city
One or more independent school districts whose boundaries extend beyond city boundaries	106	Use GIS analysis to estimate percentage of students in each school district that live in each central city

There is no need to allocate revenue for the 43 dependent school districts, because it is already included in the finances for the city or county government that controls the school district. It is straightforward to allocate 100 percent of school revenues for the 42 cities served by a single city-wide independent school district with boundaries coterminous with city boundaries. For the 21 cities served by county-wide independent school districts, data were collected from the 1980–2000 decennial Censuses and the 2006–2010 American Community Survey on the percentage of students in each county enrolled in K–12 public schools who live in the central city. For example, if 25 percent of all K–12 students in the county live in the central city, then 25 percent of revenues for the county-wide school district would be allocated to the FiSC.

For the 106 cities served by independent school district(s) whose boundaries extend beyond city boundaries, spatial data on the percentage of students in each school district who live in the central city is used to allocate revenues from independent school districts to each FiSC. For example, if 30 percent of a school district's students live in the central city, then 30 percent of revenues and expenditures for that district would be allocated to the FiSC. The number of students in each school district who live in the central city was estimated using geographical information system (GIS) analysis, with information on the boundaries of cities and school districts from Census TIGER shapefiles and data on school district enrollment at the Census block group or tract level for the 1980–2010 period.

Because the percentage of students that live in the central city changed significantly over the 1977–2017 period for some school districts, this percentage is estimated at four points in time (1980, 1990, 2000, and 2010). However, data available for these estimates varied, as is shown in table 4 on the next page.

Table 4: Overview of GIS Analysis Used for School District Allocations					
Year Used for Allocation in FiSC Dataset	Year for School Enrollment	Year for Boundaries		Level of Analysis	No. Independent School Districts in FiSC Database
		Cities	Schools		
1980	1980	1980	1995	Tracts	397
1990	1990	1990	1995	Block Groups	489
2000	2000	2000	2000	Block Groups	501
2010	2006–2010	2010	2010	Tracts	487

Annual estimates of the percentage of students in each school district who live in each central city were made using linear interpolations between the decennial Censuses. For example, if 30 percent of a school district's students lived in the central city in 1990 and 40 percent did in 2000, then 31 percent of the school district's revenues would be allocated to the FiSC in 1991, 32 percent in 1992, and so on.[4]

For the six partially consolidated governments shown in table 2, school district revenues are allocated based on student enrollment in the whole county, not just the part of each county without independent municipalities. This is the same approach that is taken to allocate county government revenues and treats the six FiSCs as if the city and county have completely merged. Four of the cities are served by county-wide school districts, and 100 percent of revenues from these districts are allocated to the FiSCs (Jacksonville, Louisville, Baton Rouge, and Nashville). The two other cities have multiple independent school districts, and revenue from each school district is allocated to the FiSCs based on the percent of students in each district that live in the county.

Appendix 5 discusses how issues affecting school district allocations in a few specific cities were addressed.

[4] A similar approach was taken to deal with independent school districts that served central cities for part of the panel, but not all four years used for GIS analysis. For example, in the Core FiSC sample, there are 57 school districts that were identified as serving part of the central cities in the 1990, 2000, and 2010 GIS analyses, but not the 1980 GIS analysis. For these districts, we simply assume that 0% of the students in each school district lived in the central city in 1980, and then interpolate between 0% and the estimated percentage from the 1990 GIS analyses. It is possible that many of these school districts actually served very small parts of central cities in 1980, but they were not picked up by the tract-level analysis used in 1980 (which is less precise than the block-level analysis used in 1990). Of the 57 school districts, 34 served less than 1% of their central cities' students in 1990 and the largest share of a city's students served by one of these districts in 1990 was 5.9%. While we may be allocating too little in revenues from these 57 districts to the FiSCs in the 1980s, we would be allocating too much in revenues from other districts in the affected cities, and these two types of errors in allocations should be very close to offsetting.

Special District Allocations

Allocating revenues and expenditures from special districts to FiSCs is challenging. Census TIGER shapefiles do not exist for special districts, so it is not possible to use GIS analysis similar to the approach taken for school districts. In addition, special districts are identified at the county-level in the Census of Governments based mainly on where they are headquartered, but they may serve an area much larger or smaller than the county.

A two-pronged approach was used for the special district allocations. First, we used a Web search to determine the rough service area for 531 of the largest special districts, with revenues allocated to the FiSC based on the city's share of population in that area. Typically, the service areas used for these special districts were a city, county, or metropolitan area, but when necessary more precise service areas were used.[5] In addition, 160 of the special districts we investigated did not serve any cities in the FiSC database and thus had no revenues allocated to the FiSCs. The 531 districts account for about 90 percent of direct expenditures for special districts that are allocated to the FiSCs even though they are only about 10 percent of the districts that are assumed to serve FiSCs. While these estimates are not as precise as those for school districts, great care was taken to make them as accurate as is possible.

The 531 special districts that had their service area determined include 341 districts with total revenues or expenditures above $100 million (in 2007 dollars) in at least one of the quinquennial Censuses of Governments. To inform decisions for the second prong of the special district allocations, we wanted a sense of the typical service area for all types of special districts, so we investigated an additional 69 smaller districts for types of special districts that did not have at least ten districts that exceeded the $100 million threshold. Finally, we determined the service area for housing authorities in all cities. This was done because the service area of housing authorities is easy to determine since almost all of them serve an area coterminous with city or county boundaries, and housing and community development is the second largest category of general expenditures for special districts.

The second prong of the special district allocations was to apportion revenues and expenditures for smaller special districts based on the type of special district. Each special district was categorized based on its primary expenditure (excluding interest payments). For example, if a special district devoted most of its expenditures to fire protection, it was categorized as a fire district. This way of classifying special districts works well since most are created to perform a single function.[6] The categories used to classify types of special districts are shown in table 5.

The geographic area served by special districts tends to be fairly consistent for each type of special district. For example, airports, seaports, and transit utilities typically serve an entire metropolitan area. Hospital districts, library districts, and park districts typically serve a county or smaller geographic area. Fire districts typically serve smaller municipalities or unincorporated areas and do not provide services to any of the cities in the FiSC database. Most special districts

[5] In some cases, service area populations were estimated for two or more counties but not a whole metro area, several cities and/or counties if the special district serves specific members, or an area larger than a metro area.

[6] In 2007, 87 percent of special districts located in a metro area with a FiSC were single-purpose districts, with all of their expenditures falling in a single category in the Census of Governments.

that provide electric utilities, water utilities, or commercial activities (which is mainly insurance) provide their services to member cities and counties. However, the cities and towns served by these types of special districts usually do not include any central cities in the FiSC database.

Revenues for smaller special districts are allocated to each FiSC based on the city's share of population in the typical service area for each type of special district. For example, for types of special districts that typically serve a county area, revenues are allocated to each FiSC based on the city's share of the county population. For special districts that typically serve an entire metropolitan area, revenues are allocated to the FiSCs based on the city's share of the metro area population. No revenues are allocated to FiSCs from types of special district that typically do not serve central cities.[7] Essentially the two-pronged approach provides an estimate of per capita revenues for all smaller special districts in a given county or metro area, but uses more accurate estimates for larger districts. Table 5 shows the service area for each type of special district that is used to allocate fiscal variables for smaller special districts to each FiSC.

Table 5: Service Area Used to Allocate Fiscal Variables for Smaller Special Districts

County	Metropolitan Area (CBSA)	None
Education	Airports	Commercial Activities
Health	Highways	Corrections
Hospitals	Seaports	Electric Utilities
Libraries	Sewerage	Fire Protection
Parking	Transit Utilities	Gas Utilities
Parks and Recreation		Housing & Community Dev't[2]
Police Protection		Natural Resources
Public Welfare		Water Utilities
Solid Waste Management		
Other General Expenditures[1]		

Note: Several categories of spending in the Census of Governments were not a primary spending category for any special districts in 2012 (government administration, inspection and regulation, liquor stores, and employee retirement trusts).

[1] This includes special districts that devote all of their direct expenditures to interest payments and thus are not included in one of the other categories in table 5 based on the type of service they provide. These districts provide financing for a variety of purposes (housing, hospitals, water and electric utilities, economic development, etc.), in many cases by issuing tax-exempt bonds.

[2] Excluded from FiSC allocations since all housing authorities that serve FiSCs were identified as part of the first stage of the special district allocations that used a Web search to determine service areas. Thus, all other housing authorities in the Census of Governments serve smaller cities and towns.

[7] Unfortunately, for the smaller special districts it is not possible to use city as the typical service area for any type of special district since they are only identified at the county level in the Census of Governments.

Other Issues Affecting the FiSC Database

Selection of Cities in the FiSC Database

The FiSC database includes two sets of cities. The samples were selected separately and should usually be analyzed separately, as there are important differences between cities in the two samples. The database includes a total of 212 cities, with 33 cities in both samples.

The ***Core FiSC sample*** has 150 cities, including the two most populous cities for each state in 2010. It also includes all cities with 2010 populations over 200,000 except those with 1980 populations below 100,000 **and** all cities with 1980 populations over 150,000 even if their 2010 population was below 200,000. These criteria were used so the sample had adequate representation of cities with slow or declining populations that would have missed the 200,000 cutoff in 2010. In addition, cities with 1980 populations below 100,000 were excluded because we do not believe that these previously small and mid-sized cities are comparable to the rest of the sample of large cities. Finally, to bring the FiSC sample to an even 150 cities, we added the four largest state capitals that would not have otherwise been in the FiSC sample (Hartford, CT; Salem, OR; Tallahassee, FL; and Topeka, KS). Note that it was not possible to include the largest cities in Hawaii and New Jersey, because those cities have state-administered school districts, which make it impossible to disentangle revenues and expenditures that should be allocated to the FiSC from the rest of the state's budget.[8]

The ***Legacy Cities*** sample has 95 cities with population declines of at least 20 percent from their peak, poverty rates exceeding the national average, and a peak population of at least 50,000.[9]

Data Imputations for Governments Missing from Annual Surveys

One challenge with allocating local government revenues to FiSCs is dealing with governments that were not included in the Annual Surveys of State and Local Government Finance. In years without a Census of Government, the U.S. Census Bureau collects data on only a sample of local governments. Fortunately, their sample selection considers the size of local governments, so data are available each year for almost all of the large governments that serve residents of cities in the FiSC database. For those governments that are missing from the Annual Surveys, linear interpolations were used to estimate fiscal variables by using available data from adjacent years.[10]

[8] Hawaii has a statewide school district. In New Jersey, the Census of Government Finances dataset does not include school districts for Jersey City or Newark, because the state government directly funds a large share of these districts' budgets as a result of the *Abbott* court decisions. The Census dataset does include school districts for four smaller cities in New Jersey that are in the Legacy Cities sample, even though some of them are *Abbott* school districts.

[9] Highland Park (MI) also met these criteria, but is excluded from the FiSC database, because it is not possible to allocate school spending to the FiSC. Starting in 2015, Highland Park Schools was no longer in the Census of Government Finances dataset. At that time, Highland Park Schools stopped directly operating any schools, with a PK-8 charter school run by the Leona Group and high school students assigned to Detroit Public Schools.

[10] Details on the governments interpolated for each FiSC are available from the author.

For the Core FiSC sample, the most significant omissions from the Annual Surveys include a few city governments and principal counties missing during 2001-2006 and 2013. However, we were able to use imputed values provided by the U.S. Census Bureau for 18 of the missing city governments and 12 principal counties.[11] Imputed data were unavailable for 14 city governments and one principal county that were missing from both the 2001 and 2003 Annual Surveys.[12] For these governments, linear interpolations were used to fill in the missing values. Appendix 3 lists the cities and principal counties that were missing from the Annual Surveys for the FiSC database.

For the smaller legacy cities[13] in the FiSC database, there are a larger number of city and county governments missing from the Annual Surveys, but it is not a significant problem for most FiSCs. We received imputed values from the U.S. Census Bureau for 13 of the missing city governments and used linear interpolations to estimate values for the remaining missing observations. The 2000–2008 period accounted for most of the city governments missing from the Annual Surveys, with an especially large number missing in 2001 and 2003. Of the 62 smaller legacy cities, 25 FiSCs had complete city government data, 20 were missing data just for 2001 and 2003, 13 were missing data for 3–7 years mainly during the 2000–2008 period, and 4 were missing data for 8–14 years.[14] Other than Rock Island (IL), there are no city governments with interpolated values after 2008. There are a smaller number of county governments missing from the Annual Surveys. Of the 62 smaller legacy cities, 53 FiSCs had complete county government data, 8 FiSCs were missing data for 1–3 years, and St. Joseph (MO) was missing data for Buchanan County for 13 years.

Appendix 4 has information on interpolated school districts and special districts. It shows that in the 1980s, about 5 percent of all independent school districts that served cities in the Core FiSC sample were missing in years without a Census of Government, and about 30 percent were missing during the 1993–1996 period. However, the missing school districts generally accounted for a very small share of spending allocated to FiSCs from independent school districts—less than half a percent in the 1980s; just over three percent in 1993, 1995, and 1996; and about 20 percent in 1994. These missing school districts did not serve a large share of students in any individual city, with a few exceptions during 1993–1996. The Legacy Cities sample had a smaller share of school districts missing during the 1980s, and a higher share during the 1993–1996 period. There have been almost no missing school districts since 1997.

A much larger share of special districts serving FiSCs need to have data interpolated because they were excluded from the Annual Surveys, but these special districts were generally small and account for a small share of total revenues and expenditures allocated to FiSCs from special districts. Appendix 4 shows that up until 1991 the Annual Surveys typically excluded about 60 percent of all special districts that served FiSCs, but these districts only accounted for 2 to 4 percent of total spending allocated to FiSCs from special districts. From 1993-2006, the Annual Surveys excluded about 75 percent of special districts that served FiSCs, but these districts that

[11] Imputed values for these governments were downloaded from the Government Finance Database (Pierson, Hand, and Thompson 2015): http://www.willamette.edu/mba/research_impact/public_datasets/.
[12] In addition, Rutland County, VT was missing from all Annual Surveys from 1989 to 1999.
[13] "Smaller legacy cities" refers to 62 cities in the Legacy Cities sample, but not in the Core FiSC sample.
[14] These counts exclude 15 cities where we received imputed values from the U.S. Census Bureau.

are interpolated only account for about 8 to 10 percent of total special district expenditures allocated to FiSCs. Since 2009, about two-thirds of special districts that serve FiSCs have been excluded from the Annual Surveys, with these districts accounting for less than five percent of total special district expenditures allocated to FiSCs.

Finally, a few counties where small shares of some cities' residents live (see table 1) are also missing from the Annual Surveys. This is mainly an issue for the 1989–2003 Annual Surveys where four to seven secondary counties were excluded each year, but with a few exceptions[15] the city residents living in these counties never accounted for more than 1 percent of their cities' populations. In addition, since 1993 independent municipalities for the six partially consolidated governments have rarely been included in the Annual Surveys, but as shown in table 2, these municipalities account for a very small share of spending in these six counties compared to the primary consolidated governments.

Population Estimates for Cities and Counties

Since the FiSC dataset provides per capita estimates of fiscal variables, it is critical that the population estimates for cities and counties be accurate. Census population estimates are for July 1 for each year. Since the fiscal year for most local governments begins on July 1, we use population estimates for each calendar year for the following fiscal year (i.e. July 1, 2006 population used for FY2007). For variables measured in real dollars, the FiSC database uses the consumer price index for all urban consumers to adjust for inflation. The data sources and methodology used for the population estimates are described below.

Counties

Annual population estimates for 1977–2010 for counties that are part of the FiSC allocations are from the intercensal population estimates for counties, which are available at https://www.census.gov/programs-surveys/popest/data/data-sets.html.

County population estimates are also used for consolidated governments since intercensal estimates are not available for cities until the 2000s.[16] For 2011 and future years, annual

[15] The following counties were excluded from the Annual Surveys: Lincoln County, SD in 2002, 2003, and 2005 (accounted for 6 to 9 percent of Sioux Fall's population in those years); Platte County, MO in 1993-2003 (accounted for 6 to 8 percent of Kansas City's population); Polk County, OR in 1978 and 1988 (accounted for 11 to 12 percent of Salem's population); and Wayne County, WV in 1978, 2000-03, and 2006 (accounted for 8 percent of Huntington's population). Note that imputed values provided by the Census were used for Lincoln County, SD and for Wayne County, WV.

[16] Description of the difference between intercensal and postcensal population estimates from the U.S. Census: "Intercensal estimates are produced each decade by adjusting the existing time series of postcensal estimates for a decade to smooth the transition from one decennial census count to the next. They differ from the postcensal estimates that are released annually because they rely on a formula that redistributes the difference between the April 1 postcensal estimate and April 1 census count for the end of the decade across the estimates for that decade. Meanwhile, the postcensal estimates incorporate current data on births, deaths, and migration to produce each new vintage of estimates, and to revise estimates for years back to the last census." U.S. Census Bureau, Population Estimates, Intercensal Estimates (http://www.census.gov/popest/data/intercensal/).

population estimates are taken from the most recent vintage available from the U.S. Census Bureau's Population Estimates Program.

Cities

For 2011 and future years, annual population estimates for cities are taken from the most recent vintage available from the U.S. Census Bureau's Population Estimates Program. For 2000–2010, annual population estimates for cities are from the intercensal population estimates for places. For 1990–1999, annual population estimates for cities are from postcensal population estimates for places, with an adjustment made to redistribute the difference between the postcensal estimate for April 1, 2000 and the decennial Census count on April 1, 2000. The difference is evenly distributed throughout the decade, so if there is a 10,000 difference then the 1991 postcensal estimate is adjusted up by 1,000, the 1992 postcensal estimate is increased by 2,000, and so on. For 1977–1989, annual population estimates for cities are based on the decennial counts for the cities and intercensal population estimates for overlying counties.
For example, the 1982 population estimate for a city would be calculated as:

[(0.8) x (1980 City Pop.) x (1982 Pop. for Overlying County as % 1980 County Pop.)]
+ [(0.2) x (1990 City Pop.) x (1982 Pop. for Overlying County as % 1990 County Pop.)]

This formula distributes 10-year population changes for each city, so that annual population changes for each city follow the same pattern as for the overlying county.

References

Bradbury, Katharine L. 1982. Fiscal distress in large U.S. cities. *New England Economic Review* (January/February): 33–44.

Chernick, Howard, Adam Langley, and Andrew Reschovsky. 2011. Revenue diversification and the financing of large American central cities. *Public Finance and Management* 11(2): 138–159.

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: The Journal of Federalism* 42(3): 467–493.

Pierson, Kawika, Michael L. Hand, and Fred Thompson. 2015. The government finance database: a common resource for quantitative research in public financial analysis. PLoS ONE 10(6): e0130119. doi: 10.1371/journal.pone.0130119

U.S. Census Bureau. 1974. *Composite Finances in Selected City Areas*, A Special Survey Sponsored by the U.S. Department of Housing and Urban Development. Washington, DC: Governments Division, Bureau of the Census. August.

Appendix 1: Background Information on Fiscally Standardized Cities

Appendix 1a: Number of Cities by Fiscal Arrangements (FY2017)

Core FiSC Sample

	No Overlying County	Has Overlying County	Total
City-dependent school district	17	9	26
County-dependent school district	0	8	8
City-wide independent school district	7	16	23
County-wide independent school district	3	15	18
One or more independent school districts whose boundaries extend beyond city boundaries	2	73	75
Total	29	121	150

Note: There have been some changes in cities' fiscal arrangements over time. Kansas City, KS and Wyandotte County merged in 1998. Hampden County (Springfield, MA) and Worcester County (Worcester, MA) ceased to exist as separate governments in 1999. Louisville, KY and Jefferson County merged in 2003. Some cities with independent school districts in 2017 previously had city-dependent school districts, including Detroit, MI (1999-2005); Madison, WI (1977-82); and Wilmington, DE (1977-78). Grand Rapids, MI and Seattle, WA had city-wide independent school districts in 2017, but had additional school districts that served very small shares of city residents for the 1981–2009 period; this change is likely because Census tracts were used for GIS analysis in 1980 and 2010 whereas more precise Census block groups were used in 1990 and 2000.

Legacy Cities Sample

	No Overlying County	Has Overlying County	Total
City-dependent school district	14	8	22
County-dependent school district	0	0	0
City-wide independent school district	3	24	27
County-wide independent school district	0	4	4
One or more independent school districts whose boundaries extend beyond city boundaries	0	42	42
Total	17	78	95

Note: There have been some changes in cities' fiscal arrangements over time. Between 1997 and 2000, Massachusetts eliminated many of its county governments, including Berkshire County (which had served Pittsfield), Essex County (Lawrence and Lynn), Hampden County (Holyoke), and Worcester County (Worcester). Two cities with independent school districts in 2017 previously had city-dependent school districts: Wilmington, DE (1977-78) and Atlantic City, NJ (1977-1985). Conversely, two cities with city-dependent school districts in 2017 previously had independent school districts: Bayonne, NJ (1977-81) and Trenton, NJ (1977-85).

All Cities in FiSC Database

	No Overlying County	Has Overlying County	Total
City-dependent school district	22	13	35
County-dependent school district	0	8	8
City-wide independent school district	7	35	42
County-wide independent school district	3	18	21
One or more independent school districts whose boundaries extend beyond city boundaries	2	104	106
Total	34	178	212

Appendix 1b: Average Per Capita General Expenditures for City Governments (Top) and Fiscally Standardized Cities (Bottom) (FY2017)

This table shows how spending for city governments alone differs from spending for FiSCs, and how this difference varies based on the type of fiscal arrangements. For the Core FiSC sample, cities with no overlying county and no independent school districts (top left) have average spending for the city government alone ($5,295) that is almost as high as FiSC spending ($5,714), with the small difference due to the addition of special districts. In contrast, cities that do have an overlying county and one or more independent school districts that extend beyond city boundaries (bottom right) have average spending for the city government alone ($1,841) that is much less than FiSC spending ($4,855), with the large difference due to accounting for spending by overlying counties, independent school districts, and special districts.

Core FiSC Sample

	No Overlying County	Has Overlying County	Total
City-dependent school district	$5,295 5,714	$4,543 6,202	$5,024 5,890
County-dependent school district		1,529 5,022	1,529 5,022
City-wide independent school district	4,247 6,310	2,527 5,910	3,050 6,032
County-wide independent school district	1,941 3,701	1,894 5,488	1,902 5,190
One or more independent school districts whose boundaries extend beyond city boundaries	2,507 4,851	1,841 4,855	1,859 4,855
Total	4,474 5,585	2,118 5,184	2,561 5,259

Note: Excludes Washington, DC; Table shows unweighted average of cities in each category.

Legacy Cities Sample

	No Overlying County	Has Overlying County	Total
City-dependent school district	$5,014 5,480	$5,088 6,403	$5,042 5,831
County-dependent school district			
City-wide independent school district	3,619 5,298	2,246 6,054	2,399 5,970
County-wide independent school district		2,562 5,688	2,562 5,688
One or more independent school districts whose boundaries extend beyond city boundaries		1,856 5,070	1,856 5,070
Total	4,752 5,446	2,344 5,541	2,754 5,525

Note: Excludes Washington, DC; Table shows unweighted average of cities in each category.

Appendix 2: List of Cities by Fiscal Arrangements (2017)

Core FiSC Sample

	No County Gov't	Has Overlying County	Total
City-dependent school district	Anchorage (AK) Bridgeport (CT) *Hartford (CT)* *New Haven (CT)* *Washington (DC)* *Boston (MA)* Springfield (MA) *Worcester (MA)* *Baltimore (MD)* New York (NY) *Providence (RI)* Warwick (RI) Nashville (TN) Chesapeake (VA) *Norfolk (VA)* *Richmond (VA)* Virginia Beach(VA)	Lewiston (ME) *Portland (ME)* Manchester (NH) Nashua (NH) *Buffalo (NY)* *Rochester (NY)* *Syracuse (NY)* Yonkers (NY) Memphis (TN)	26
County-dependent school district		Fairbanks (AK) Frederick (MD) Charlotte (NC), Durham (NC), Greensboro (NC), Raleigh (NC) Chattanooga (TN), Knoxville (TN)	8
City-wide independent school district	San Francisco (CA) Denver (CO) Columbus (GA) Lexington (KY) *New Orleans (LA)* *St. Louis (MO)* *Philadelphia (PA)*	*Birmingham (AL)*, Fremont (CA), Oakland (CA), *Atlanta (GA)*, *Chicago (IL), Detroit (MI),* Grand Rapids (MI), *Minneapolis (MN),* St. Paul (MN), Lincoln (NE), Provo (UT), Salt Lake City (UT), Burlington (VT), Rutland (VT), Seattle (WA), Milwaukee (WI)	23
County-wide independent school district	Jacksonville (FL) Louisville (KY) Baton Rouge (LA)	Mobile (AL), Montgomery (AL), Fort Lauderdale (FL), Hialeah (FL), Miami (FL), Orlando (FL), St. Petersburg (FL), Tallahassee (FL), Tampa (FL), Shreveport (LA), Las Vegas (NV), Reno (NV), *Charleston (WV)*, Casper (WY), Cheyenne (WY)	18
One or more independent school districts whose boundaries extend beyond city boundaries	Indianapolis (IN) Kansas City (KS)	Ft. Smith (AR), Little Rock (AR), Mesa (AZ), Phoenix (AZ), Tucson (AZ), Anaheim (CA), Bakersfield (CA), Fresno (CA), Huntington Beach (CA), Long Beach (CA), Los Angeles (CA), Modesto (CA), Riverside (CA), Sacramento (CA), San Diego (CA), San Jose (CA), Santa Ana (CA), Stockton (CA), Aurora (CO), Colorado Springs (CO), Dover (DE), *Wilmington (DE)*, Cedar Rapids (IA), Des Moines (IA), Boise (ID), Nampa (ID), Aurora (IL), Fort Wayne (IN), *Gary (IN)*, Topeka (KS), Wichita (KS), *Flint (MI), Warren (MI)*, Kansas City (MO), Gulfport (MS), Jackson (MS), Billings (MT), Missoula (MT), Bismarck (ND), Fargo (ND), Omaha (NE), Albuquerque (NM), Las Cruces (NM), *Akron (OH), Cincinnati (OH), Cleveland (OH),* Columbus (OH), *Dayton (OH), Toledo (OH),* Oklahoma City (OK), Tulsa (OK), Eugene (OR), Portland (OR), Salem (OR), *Pittsburgh (PA),* Charleston (SC), Columbia (SC), Rapid City (SD), Sioux Falls (SD), Arlington (TX), Austin (TX), Corpus Christi (TX), Dallas (TX), El Paso (TX), Fort Worth (TX), Garland (TX), Houston (TX), Lubbock (TX), San Antonio (TX), Spokane (WA), Tacoma (WA), Madison (WI), *Huntington (WV)*	75
Total	29	121	26

Note: Cities in italics are also in the Legacy Cities sample.

Legacy Cities Sample

	No County Gov't	Has Overlying County	Total
City-dependent school district	*Hartford (CT)* *New Haven (CT)* *Washington (DC)* *Boston (MA)* Holyoke (MA) Lawrence (MA) Lynn (MA) Pittsfield (MA) *Worcester (MA)* *Baltimore (MD)* *Providence (RI)* Danville (VA) *Norfolk (VA)* *Richmond (VA)*	Fall River (MA) New Bedford (MA) *Portland (ME)* Bayonne (NJ) Trenton (NJ) *Buffalo (NY)* *Rochester (NY)* *Syracuse (NY)*	22
County-dependent school district			0
City-wide independent school district	*New Orleans (LA)* *St. Louis (MO)* *Philadelphia (PA)*	*Birmingham (AL)*, Gadsden (AL), *Atlanta (GA)*, *Chicago (IL),* East Chicago (IN), Hammond (IN), *Detroit (MI),* Hamtramck (MI), Lincoln Park (MI), *Minneapolis (MN),* University City (MO), Atlantic City (NJ), Camden (NJ), Albany (NY), Binghamton (NY), Niagara Falls (NY), Schenectady (NY), Utica (NY), Euclid (OH), Erie (PA), Harrisburg (PA), Reading (PA), Scranton (PA), York (PA)	27
County-wide independent school district		Savannah (GA), Terre Haute (IN), *Charleston (WV)*, Wheeling (WV)	4
One or more independent school districts whose boundaries extend beyond city boundaries		Pine Bluff (AR), *Wilmington (DE)*, Decatur (IL), East St. Louis (IL), Rock Island (IL), Anderson (IN), *Gary (IN)*, South Bend (IN), Covington (KY), Bay City (MI), Dearborn (MI), Dearborn Heights (MI), *Flint (MI)*, Jackson (MI), Pontiac (MI), Roseville (MI), Saginaw (MI), Taylor (MI), *Warren (MI)*, Duluth (MN), St. Joseph (MO), Rome (NY), Troy (NY), *Akron (OH)*, Canton (OH), *Cincinnati (OH),* *Cleveland (OH)*, Cleveland Heights (OH), *Dayton (OH)*, Lima (OH), Springfield (OH), *Toledo (OH)*, Warren (OH), Youngstown (OH), Altoona (PA), Chester (PA), Johnstown (PA), McKeesport (PA), *Pittsburgh (PA)*, Wilkes-Barre (PA), Galveston (TX), *Huntington (WV)*	42
Total	17	78	95

Note: Cities in italics are also in the Core FiSCs sample.

Appendix 3: City Governments and Principal Counties for FiSCs Missing from Annual Surveys of State and Local Government Finances

Core FiSC Sample: City Governments Missing from Annual Surveys

City	State	Imputed Data from Census	Interpolated Values
Fairbanks	AK	2005	2001, 2003
Huntington Beach	CA	2014-15	2016
Dover	DE	2006	2001, 2003
Wilmington	DE	2006	
Nampa	ID		2001, 2003
Ft. Wayne	IN	2012	
Gary	IN	2005	
Louisville	IN	2013	
Frederick	MD		2001, 2003
Gulfport	MS		2001, 2003
Missoula	MT		2001, 2003
Las Cruces	NM		2001, 2003
Reno	NV	2006	
Akron	OH	2013	
Cincinnati	OH	2013	
Dayton	OH	2013	
Tulsa	OK	2013	
Charleston	SC		2001, 2003
Columbia	SC	2004, 2006	
Rapid City	SD		2001, 2003
Austin	TX	2006	
Lubbock	TX	2006	
Burlington	VT	2003, 2004	
Rutland	VT	2005, 2006	2001, 2003
Charleston	WV		2001, 2003
Huntington	WV		2001, 2003
Casper	WY		2001, 2003
Cheyenne	WY	2013	2001, 2003

Core FiSC Sample: Principal Counties Missing from Annual Surveys

City	State	County	Imputed Data from Census	Interpolated Values
Birmingham	AL	Jefferson	2006	
Lincoln	NE	Lancaster	2013	
Las Cruces	NM	Dona Ana	2006, 2013	
Akron	OH	Summit	2012	
Cincinnati	OH	Hamilton	2006	
Dayton	OH	Montgomery	2012	
Toledo	OH	Lucas	2013	
Oklahoma City	OK	Oklahoma	2013	
Columbia	SC	Richland	2012	
Burlington	VT	Chittenden	2013	
Rutland	VT	Rutland	2003	1989-91, 1993-96, 1998-99
Charleston	WV	Kanawha	2006	
Huntington	WV	Cabell		2001, 2003

Smaller Legacy Cities: City Governments Missing from Annual Surveys

City	State	Imputed Data from Census	Interpolated Values
Cities Missing Data for 8-14 Years			
Rock Island	IL		2001, 2003-06, 2008-11, 2013
Hamtramck	MI	2002	1980, 2000-01, 2003-06, 2008
Jackson	MI		1993-96, 1998-99, 2001, 2003
Chester	PA		1989, 1993-96, 1998-99, 2001, 2003-06, 2008
Cities with Interpolated Values for 3-7 Years			
East St. Louis	IL	2003	2004-06, 2008
Terre Haute	IN	2005	2000-01, 2003
Pontiac	MI		1993, 2001, 2003
Binghamton	NY		2000-01, 2003-06, 2008
Niagara Falls	NY		2001, 2003-06, 2008
Rome	NY		2000-01, 2003-06, 2008
Troy	NY		2004-06, 2008
Utica	NY		2000-01, 2003-06, 2008
Lima	OH		2000-01, 2003
Altoona	PA	2002	2004-06, 2008
Johnstown	PA		2001, 2003-06, 2008
McKeesport	PA		2004-06, 2008
York	PA	2002	2001, 2003-06, 2008
Cities with Interpolated Values Just for 2001 and 2003			
Galveston	TX	2005	2001, 2003
Gadsden	AL		2001, 2003
Anderson	IN		2001, 2003
East Chicago	IN		2001, 2003
Covington	KY	2004	2001, 2003
Holyoke	MA		2001, 2003
Lawrence	MA		2001, 2003
Bay City	MI		2001, 2003
Dearborn Heights	MI		2001, 2003
Lincoln Park	MI		2001, 2003
Roseville	MI		2001, 2003
Saginaw	MI	2006	2001, 2003
St. Joseph	MO		2001, 2003

City	State	Imputed Data from Census	Interpolated Values
Bayonne	NJ		2001, 2003
Cleveland Heights	OH		2001, 2003
Euclid	OH		2001, 2003
Springfield	OH		2001, 2003
Wilkes-Barre	PA	2002	2001, 2003
Danville	VA		2001, 2003
Wheeling	WV		2001, 2003
Cities with Imputed Values for 1 Year			
University City	MO	2003	
Camden	NJ	2002	
Scranton	PA	2006	

Note: "Smaller legacy cities" refers to 62 cities in the Legacy Cities sample, but not in the Core FiSC sample. Smaller legacy cities with city governments included in every Annual Survey include: Pine Bluff (AR), Savannah (GA), Decatur (IL), Hammond (IN), South Bend (IN), Fall River (MA), Lynn (MA), New Bedford (MA), Pittsfield (MA), Dearborn (MI), Taylor (MI), Duluth (MN), Atlantic City (NJ), Trenton (NJ), Albany (NY), Schenectady (NY), Canton (OH), Warren (OH), Youngstown (OH), Erie (PA), Harrisburg (PA), and Reading (PA).

Smaller Legacy Cities: Principal Counties Missing from Annual Surveys

County	State	FiSC	Imputed Data from Census	Interpolated Values
St. Joseph	IN	South Bend	2003, 2006	
Bristol	MA	Fall River, New Bedford	2003-05	
Bay	MI	Bay City		2014-16
Buchanan	MO	St. Joseph		1993-96, 1998-99, 2004-06, 2008, 2014-16
Allen	OH	Lima		2014-16
Lackawanna	PA	Scranton	2006	
Luzerne	PA	Wilkes-Barre	2006	

Appendix 4: Information on Interpolated School Districts and Special Districts

This table shows that data needed to be interpolated for a significant majority of special districts in years with an Annual Survey of State and Local Government Finances because they were not included in the sample. However, the special districts that were interpolated were generally small and thus accounted for a small share of total special district spending allocated to FiSCs. This dynamic was also true for school districts for the 1993–1996 period to a lesser extent.

Core FiSC Sample

	Independent School Districts		Special Districts	
Year	Pct. of all School Districts Serving FiSCs that are Interpolated	Pct. of Total School Spending Allocated to FiSCs from Interpolated Districts	Pct. of all Special Districts Serving FiSCs that are Interpolated	Pct. of Total Special District Spending Allocated to FiSCs from Interpolated Districts
1977	1.2	0.1		
1978	9.3	0.6	73.9	10.2
1979	1.2	0.2	62.3	2.4
1980	1.2	0.3	61.6	2.2
1981	5.6	0.6	61.8	2.2
1982			0.2	0.1
1983	4.8	0.3	53.4	1.9
1984	4.8	0.4	60.0	3.4
1985	4.8	0.4	59.6	4.0
1986	4.8	0.4	60.1	4.4
1987			1.5	0.7
1988	4.8	0.4	63.1	3.4
1989	4.6	0.2	58.7	2.3
1990			60.0	2.4
1991	4.6	0.2	60.5	2.4
1992			1.9	0.3
1993	28.5	3.1	76.6	8.7
1994	32.5	21.3	76.6	8.3
1995	28.5	3.4	76.5	10.6
1996	28.5	3.4	75.2	10.2
1997	0.5	0.0	1.1	0.3
1998			75.5	11.2
1999			75.0	11.8
2000	0.2	0.0	68.6	5.5
2001			74.0	9.0
2002			23.4	10.0
2003			79.5	16.6
2004			74.2	10.8
2005			73.1	9.3
2006			72.8	9.4
2007			1.7	0.6
2008			70.2	6.7
2009			68.7	3.4
2010			69.2	3.6
2011			69.6	3.8
2012			1.5	0.1
2013			72.5	4.8
2014			74.5	4.8
2015			74.3	5.0
2016	0.2	0.0	73.6	5.2
2017	0.2	0.9		
1977–2017	**4.2**	**0.7**	**53.1**	**5.4**
Years with Annual Survey	**5.3**	**0.8**	**69.3**	**6.6**

Note: Years with no data have no interpolated districts. Spending is total expenditures for each type of government.

Legacy Cities Sample

Year	Independent School Districts		Special Districts	
	Pct. of all School Districts Serving FiSCs that are Interpolated	Pct. of Total School Spending Allocated to FiSCs from Interpolated Districts	Pct. of all Special Districts Serving FiSCs that are Interpolated	Pct. of Total Special District Spending Allocated to FiSCs from Interpolated Districts
1977	3.6	0.3		
1978	5.4	0.8	63.9	11.5
1979	3.6	0.6	53.3	2.6
1980	3.6	0.7	52.9	2.4
1981	6.3	0.9	53.9	2.4
1982			0.4	0.0
1983	3.1	0.1	45.1	1.0
1984	0.8	0.0	55.3	2.1
1985	0.8	0.1	54.4	2.2
1986	0.8	0.1	54.8	2.3
1987	0.8	0.2	1.5	1.5
1988	1.6	0.2	55.1	3.3
1989	0.8	0.2	55.2	2.4
1990	0.8	0.2	55.0	2.3
1991	1.6	0.2	55.3	1.9
1992	0.8	0.2	2.8	0.1
1993	34.1	5.8	75.3	6.0
1994	39.5	34.9	75.9	6.3
1995	33.8	5.9	75.9	6.4
1996	34.6	5.9	73.0	6.4
1997			2.7	0.2
1998			74.9	8.1
1999			75.0	8.8
2000			76.0	6.8
2001			80.2	8.4
2002			25.8	14.7
2003			83.5	14.6
2004			81.1	11.6
2005			80.3	12.3
2006			78.9	14.0
2007			2.6	1.1
2008			75.5	8.3
2009			72.5	4.9
2010			73.0	5.2
2011	0.8	0.4	73.1	5.6
2012			0.8	0.0
2013			75.1	5.4
2014			76.7	5.6
2015			76.7	5.8
2016	0.9	0.0	76.6	5.5
2017	0.9	3.3		
1977–2017	**4.5**	**1.3**	**53.4**	**5.9**
Years with Annual Survey	**5.6**	**1.5**	**68.7**	**6.8**

Note: Years with no data have no interpolated districts. Spending is total expenditures for each type of government.

Appendix 5: Issues Affecting Specific Fiscally Standardized Cities

Nine Cities with Multiple Independent Elementary Schools Feeding Into Single Unified High Schools

Phoenix, Arizona, and eight cities in California (Anaheim, Bakersfield, Fresno, Huntington Beach, Modesto, Sacramento, San Diego, and San Jose) have multiple independent elementary schools that feed into single unified high schools. This presents a problem because 1990 school enrollment data combines enrollment for all independent elementary schools that feed into a single unified high school, which is less accurate than the 1980, 2000, and 2010 datasets which present enrollment for all school districts separately.[17]

For example, Huntington Beach, California, is served by a single independent high school and four independent elementary schools that all feed into Huntington Beach Union High. In 2000, GIS analysis estimated that the percentage of students who lived in Huntington Beach was 53.5 percent for Huntington Beach Union High, 30.7 percent for Fountain Valley Elementary, 96.4 percent for Huntington Beach Elementary, 88.9 percent for Ocean View Elementary, and 10.0 percent for Westminster Elementary. In 1990, GIS analysis simply estimated that the percentage of students who lived in Huntington Beach was 56.2 percent for all five districts combined.

In the eight California cities, there are 57 school districts affected by this problem in 1990. For these districts, the percentage of students who lived in the city in 1990 is estimated by interpolating between 1980 and 2000. There are 23 school districts affected by this problem in Phoenix in 1990 (See note below).

Mesa, AZ and Phoenix AZ

Tract-level data on school enrollment is not available for Mesa or Phoenix in 1980, because they are not listed as Census places that year. For Mesa and four unified K–12 school districts in Phoenix, 1980 estimates of the percentage of students in each school district that live in the cities of Mesa and Phoenix are estimated by extrapolating from changes in this percentage between 1990 and 2000, with the restriction that it must fall between 0 percent and 100 percent.

However, in 1990 Phoenix had 19 independent elementary school districts that fed into 4 independent High Schools, and for these 23 school districts the data on school enrollment in 1990 combines enrollment for all independent elementary schools that feed into each unified High School. Thus, for these 23 school districts, 1980 and 1990 estimates of the percentage of students in each school district who live in Phoenix are estimated by extrapolating from changes in this percentage between 2000 and 2010, with the restriction that it must fall between 0 percent and 100 percent. Extrapolating for 20 years could be problematic, although the percentage of students living in Phoenix for each school district was very stable between 2000 and 2010, which suggests that the extrapolations may be fairly accurate.

[17] The same problem also affects Billings and Missoula, Montana because they have separate elementary and high school districts that have different school boundaries.

School Mergers

For school districts that merged during the 1977–2012 panel, adjustments are made to the annual estimates of the percentage of students in each school district that live in each central city. Whereas annual estimates for most school districts use a linear interpolation of the decennial estimates, the adjustments allow for a one-year change in this percentage due to these mergers.

Modesto, CA: Modesto High School and Modesto Elementary School merged to form the Modesto School District in 1990.

Oklahoma City, OK: Midwest School District absorbed Schwartz School District in 1993.

Tulsa, OK: Tulsa Independent School District absorbed Mingo School District in 1993.

Dallas, TX: Dallas Independent School District absorbed Wilmer-Hutchins School District in 2007.

Sacramento, CA: Grant Joint Union High, North Sacramento Elementary, Del Paso Heights Elementary, and Rio Linda Union Elementary merged to form Twin Rivers Unified starting in 2009.

Fresno, CA: West Fresno Elementary School District and Washington Union High School District merged to form Washington Unified School District starting in 2011.

Houston, TX: North Forest Independent School District absorbed into Houston Independent School District starting in 2014.

Washington, DC

Note that Washington, DC should not be compared to the other FiSCs because the city is responsible for providing services typically provided by state governments. For example, in 2017 per capita direct expenditures for the Washington, DC FiSC was $21,042 compared to an average of $6,263 for the other 149 Core FiSCs. Also, Washington, DC is the only government in the FiSC dataset with an unemployment compensation trust fund, which is not listed as a separate revenue or spending category in the FiSC database but is included in total revenues and expenditures for the city. For these reasons, the average and median for cities reported in the FiSC database exclude Washington, DC.

Louisville, KY

Note that when the City of Louisville and Jefferson County consolidated in 2003, per capita direct expenditures for the Louisville FiSC fell 35 percent ($4,148 to $2,681). Before consolidation, Louisville's population was only 36 percent of Jefferson County's population. The large drop in spending shows that prior to consolidation combined city-county per capita spending was significantly higher in the City of Louisville than in the surrounding municipalities in Jefferson County. There were no similar drops in spending for the seven other cities in the

FiSC database that consolidated during the panel. Kansas City, KS accounted for 93 percent of Wyandotte County's population prior to consolidation. Hampden County (Springfield, MA) and Worcester County (Worcester, MA) provided very few services prior to when they ceased to exist as separate governments, with per capita direct expenditures in 1998 of $31 and $73 respectively.

New Orleans, LA

Note that per capita direct expenditures for the New Orleans FiSC increased 55 percent from FY2005 to FY2007 ($4,137 to $6,429). This is because the city's population declined by 53 percent after Hurricane Katrina, while total direct expenditures for the FiSC declined by only 28 percent.