State Government Revenue Vulnerability Index (SGRVI) and Local Government Revenue Vulnerability Index (LGRVI)

Measuring trends in state and local government finances

National Economic Research and Resilience Center
Decision and Infrastructure Sciences Division

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Measuring trends in state and local government finances

prepared by

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Executive Summary

What are the State Government Revenue Vulnerability Index (SGRVI) and Local Government Revenue Vulnerability Index (LGRVI)?

Disruptive events, including pandemics and other disasters, can have lasting impacts on national and local economies. Reduced economic activity also impacts state, local, tribal and territorial government budgets which limit their ability to respond to the needs of community members. Argonne National Laboratory (Argonne) developed the State Government Revenue Vulnerability Index (SGRVI) and Local Government Vulnerability Index (LGRVI) to help track likely government revenue patterns in state and local governments, respectively, and to identify states and counties where revenues may be most impacted by disruptive events and other economic downturns.

What Do the SGRVI and LGRVI Measure?

The SGRVI and LGRVI measure the vulnerability of government revenues by estimating monthly changes relative to a defined base month period since January 2017. Revenues included in both indices include: taxes on products and sales, transportation and housing revenues, individual income taxes, severance taxes and royalties, and property taxes. Local government revenues also include a local revenue from state revenue sharing component. In addition, the main index for the LGRVI for county-level governments includes revenue estimates for sub-county government units, including municipalities, school districts, and special districts. This revenue data is aggregated to produce the indices.

Why Are the SGRVI and LGRVI Important?

These indices provide up-to-date estimates of which state and local governments are likely to be experiencing the greatest revenue losses, which can in turn help identify state and local governments most in need of assistance.

How Can I Use the SGRVI and LGRVI?

The indices may be used as a first step in identifying state and local government financial vulnerabilities by indicating which governments rely on revenue streams that are likely to have gone up or down relative to a base period defined by the user. The state and county scores produced by the SGRVI and LGRVI reflect the estimated impacts on revenues collected by each state or county relative to a defined base period. A government with an SGRVI or LGRVI score of 96% for a given month, for example, is expected to collect 96% as much revenue from economic activity that occurred in that month as it collected from activity during the base period. When interpreting index scores for both the SGRVI and LGRVI, lower scores reflect higher revenue vulnerability, and higher scores reflect lower revenue vulnerability.

Both indices provide important context for understanding the combined and relative impacts of the vulnerability of various revenue sources on state and local economies. There are several limitations, however, that should be considered when using these indices. First and foremost, as noted above, the SGRVI and LGRVI are estimates of revenue impacts based on proxies, rather than on government revenue reporting. The indices do not account for differences between states and local governments in policy and behavioral responses, timing of revenue collection, fund balances or debt levels, or changes in government expenditures. It is also important to note that if the indices are used to measure impacts of an event, such as the COVID pandemic,

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Page ii

they may understate the impacts since they do not measure expected revenue growth that would have occurred in the absence of the event.

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Page iii

Introduction

Disruptive events, including pandemics and other disasters, can have lasting impacts on national and local economies. Reduced economic activity also impacts state, local, tribal and territorial government budgets, which can limit their ability to respond to the needs of community members. An up-to-date estimate of which communities are likely to be experiencing the greatest revenue losses could help identify state and local governments in the most need of assistance.

This whitepaper introduces Argonne National Laboratory's (Argonne) State Government Revenue Vulnerability Index (SGRVI) and Local Government Revenue Vulnerability Index (LGRVI). The goal of these indices is to provide up-to-date estimates of which state and local governments are likely to be experiencing revenue losses, which can in turn help identify state and local governments most in need of assistance. These indices are adaptations of earlier versions that Argonne designed specifically to track impacts of the COVID pandemic. These updated versions can be used to evaluate the evolution of government revenues based on changing economic trends, as well as track impacts of different types of disruptive activities. To increase the flexibility of this index, Argonne has implemented a flexible feature that allows users to select a base period and define the specific period of analysis.

The SGRVI and LGRVI can be used as a first step in identifying government financial vulnerabilities by identifying which state- and county-level governments rely on revenue streams that are likely to be decreasing. These indices are not intended to provide exact information on actual revenue impacts in each state and county, which may vary from these estimates. Detailed accounting of actual revenue losses can be obtained directly from specific state or local governments, or from publicly available audit reports as they become available. Additional information on economic impacts and population vulnerability in each state can also be used in conjunction with these indices to provide a more complete picture of the socioeconomic impacts of the pandemic.

Methodology

The SGRVI is calculated for state governments, and the LGRVI is calculated for different types of local governments within each county, including counties, municipalities, school districts, and special districts. The SGRVI and LGRVI are calculated for each month relative to a selected pre-event base period with the first potential base period being January 2017. Changes in monthly revenue from the base period to the current period are estimated using different methods as appropriate to the varying types of revenue. The total expected change in revenues for each state and each type of government in each county, respectively, is estimated by aggregating the expected changes in revenues for different revenue sources. For the SGRVI, revenue shares are derived using data from the 2019 Annual Survey of State Government Finances. For the LGRVI, revenue shares are derived using data from the 2017 Census of Governments.

To allow users to select their own base period for any month since January 2017, the research team used open-source R programming to conduct data processing runs on Argonne's high-performance computing resources.

Revenues Included

The revenues covered in the indices include fees such as for utility services and transportation, taxes such as income, property and sales taxes, transfers from federal governments and pension premiums. For each revenue stream, Argonne identifies it as low risk, moderate risk, elevated risk, high risk, or very high risk. Monthly estimates for key revenue sources are derived by tying the revenue rate to a monthly publicly available data source; for example, retail sales data are used to estimate impacts on sales taxes and unemployment, and wage data are used to estimate impacts on income taxes. When these data sources are unavailable, the selected trajectory over time is modeled to match the average trajectory of other revenue sources with the same risk rating. The methodology for determining the risk rating is described below in the Revenue Estimates Based on Risk Ratings section of this white paper. All revenues described are included in both the SGRVI and the LGRVI except where noted.

Appendix B provides the full list of government revenues analyzed, the risk ratings of each, and whether monthly revenues are tied to a data source.

Sales Taxes Tied to Spending Data

There are several types of sales taxes that each state or local government may collect. Reliance on sales tax, and different types of sales tax collected can vary greatly between the state and local governments modeled.

General sales or gross receipts taxes for the U.S. are based on seasonally adjusted U.S. Census retail sales data for restaurants, $S_{US,r}$, retail sales with groceries, $S_{US,rg}$, and retail sales without groceries, $S_{US,rng}$. The groceries tax rate, gtr_s, which is expressed as a percentage of the general sales tax rate, is taken from the [Tax Foundation](). It has values of 0 if groceries are not subject to sales taxes in a state, and 1 if groceries are subject to the same sales tax as other goods. The total sales rate for a state, $S_{s,gen,m}$ is the sum of the different types.

$$S_{s,gen,m} = S_{US,r} + gtr_s \cdot S_{US,rg} + (1 - gtr_s)S_{US,rng}$$

The tax category "Other Selective Sales Tax" includes taxes on items such as lodging, meals, contractors, lubricating oil, non-motor fuels, soft drinks and margarine.[1] There is not reliable data on the portion of the tax that is of different types. However, because lodging is likely to be the largest contributor, and other taxes in this group, such as meals taxes, are also similarly risky, Argonne ties this revenue source to personal consumption expenditure on hotels, $S_{US,h}$.

All other sales taxes listed below are tied to seasonally adjusted U.S. spending data as specified in the chart below. An adjustment is made for motor fuels sales taxes to divide by the

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[1] United States Census Bureau. Government Finance and Employment Classification Manual. https://www2.census.gov/govs/pubs/classification/2006_classification_manual.pdf?

consumer price index for motor fuels, since motor fuels taxes are generally on a per gallon basis.

The chart below identifies the type of sales tax, a short description, and the data source used to model impacts on that type of sales tax. Seasonally adjusted spending data is used.

Table 1: Sales Tax Data

Sales Tax Type	Description of Data Used	Data Source
General Sales/Gross Receipts	Sum of all retail sales, partially including groceries (see text for details)	Census Retail Sales (RS) data
Motor Fuels Sale	Gasoline and other motor fuel spending divided by motor fuel price	Bureau of Economic Analysis (BEA) Personal Consumption Expenditure (PCE) data, Consumer Price Index (CPI) data
Insurance Premium Sales	Insurance Expenditures	PCE data
Pari Mutuel Sales	Pari Mutuel Net Receipts	PCE data
Public Utilities Sales	Household Utilities Data	PCE data
Alcoholic Beverage Sales	Off-premises consumption data	PCE data
Tobacco Product Sales	Tobacco sales data	PCE data
Lottery revenues	Lottery spending data	PCE data
Other Selective Sales Taxes	Hotel spending data	RS data

The expected change of revenues ($\%\Delta R$) in state s or county c for a sales tax of type i in month m is calculated as the percentage change from the base month to month m in total sales S of products p covered by sales tax i.

$$\%\Delta R_{c,r\_sales\_i,m} = \%\Delta R_{US,r\_sales\_i,m} = \frac{\sum_{p \in P(r\_sales\_i)} S_{US,p,m}}{\sum_{p \in P(r\_sales\_i)} S_{US,p,\widehat{base}}} - 1$$

Transportation and Housing Revenues

Revenues from airport fees and transit utilities are tied to transit ridership data from the Bureau of Transportation Statistics. Air ridership numbers are reported later than other data sources used. To fill in the last month of data, the impacts of the pandemic are assumed to be reduced relative to the previous month by the same amount as transit ridership.

Revenues from highway charges are tied to vehicle fuel usage, which is estimated by dividing seasonally adjusted motor fuels consumption data from BEA by the consumer price index for motor fuels.

Documentary & Stock Transfer Taxes are tied to home sales data from Redfin. Seasonal adjustments are made by dividing home sales for each month by an average of the previous three years of home sales for the same month.

State Revenue Sharing and Federal Aid

For the LGRVI, changes in local revenue from state revenue sharing are assumed to be the same as changes in revenues collected by state governments, except for state transfers to local schools, which are assumed not to change. State government revenue loss estimates are calculated back to 2017 and forward to the present day based on revenues collected in 2019. There is assumed to be no change over time in federal aid.

Individual Income Taxes

Percent changes in revenue, $\%\Delta R$, for income taxes are estimated by first calculating US national average percent change in seasonally adjusted employment by industry i from the base month to the current month m.

$$\%\Delta Emp_{US,i,m} = \frac{Emp_{US,i,m} - Emp_{US,i,\widehat{base}}}{Emp_{US,i,\widehat{base}}}$$

These are multiplied by total wages (W) by industry in each state or county and aggregated for all industries in the state or county. The percent change in income tax revenues are assumed to follow the estimated percent change in wages for each state or county based on national unemployment rates by industry and the composition of wages by industry in each state or county. For the SGRVI, average wages by industry in each state s are used.

$$\%\Delta R_{s,r\_income,m} = \frac{\sum_i \left(W_{s,i,base} \cdot (1 + \%\Delta Emp_{US,i,m}) \right)}{\sum_i W_{s,i,base}} - 1$$

The calculation is the same for the LGRVI, except that wages by industry are broken down by county, c, instead of by state.

$$\%\Delta R_{c,r\_income,m} = \frac{\sum_i \left(W_{c,i,base} \cdot (1 + \%\Delta Emp_{US,i,m}) \right)}{\sum_i W_{c,i,base}} - 1$$

Severance Taxes and Royalties

Reductions in revenues from severance taxes and royalties are estimated based on changes in production and prices of fossil fuels using data from DOE's Energy Information Administration (EIA). For each of crude oil, natural gas and coal, production for each state s is estimated based on a combination of state-level data and more recently updated national data. For months m where state-level estimates were not available directly, production is calculated for each state s and fossil fuel ff based on US production in the current month and the state share of production in the most recent month when data was available.

$$Prod_{s,ff,m} = Prod_{US,ff,m} \frac{Prod_{s,ff,m\_recent}}{Prod_{US,ff,m\_recent}}$$

Weekly data series are aggregated into monthly estimates based on the portion of each week that lies in a given month. Cushing spot prices for crude oil and Henry Hub spot prices for natural gas are used. Separate prices for coal are used for Powder River, Northern Appalachian, Central Appalachian, Illinois and Uinta Basins. The estimated percent change in revenue is then calculated based on the change in the combined value, calculated as price times production, of the fossil fuels produced in each state.

$$Val_{s,ff,m} = Price_{s,ff,m} \cdot Prod_{s,ff,m}$$

$$\%\Delta R_{c,r\_severance,m} = \%\Delta R_{s,r\_severance,m} = \frac{\sum_{ff} Val_{s,ff,m}}{\sum_{ff} Val_{s,ff,\widehat{base}}}$$

Severance taxes are assumed to cover all fossil fuel production in a state at the same tax rate, and no other materials are taxed.

Revenue Estimates Based on Risk Ratings

For revenue sources that are not tied to a specific data source, Argonne estimates revenue impacts over time by comparing them to other revenue sources with the same risk rating. Risk ratings for different revenue sources are assigned using a variety of methods, depending on what information is available. Revenue sources that are tied to data sources are assigned risk ratings by calculating a risk metric that begins with a revenue volatility measure following the approach used by Rueben and Randall, 2017: the variance of changes in yearly average historical values from 1993-2022, or as many years as was available. This is averaged with a measure of pro-cyclicality because the overall risk level of an entity's revenues depends not only on the volatility of individual sources, but also on whether different revenue sources are affected by the same economic trends or not. To measure the pro-cyclicality of a revenue stream, we use the covariance between the change in its yearly average values and the change in yearly average values for total sales. The values are grouped into risk levels of low, moderate, elevated, high and very high as shown in the table below.

Calculating Risk Ratings from Historical Data

Revenue sources that are not tied to a data source were assigned risk ratings either by using ratings issued by S&P or the Tax Foundation, or by evaluating the detailed descriptions of revenue sources in each category and determining to which other revenue sources they were most similar. Argonne also incorporated subject matter expert feedback from staff at the U.S. Census Bureau during the original development of this index. Estimated changes in revenues from the base period for each risk rating are calculated using a simple average of the monthly impacts for the revenue streams with the same risk rating that is tied to a data source. The ratings assigned to each revenue source are summarized in Appendix B.

Table 2: Risk Ratings and Data Sources

Source Data	Years Covered	Risk Metric	Risk Rating
Total retail sales	1993-2022	0.014	Elevated
Alcoholic beverage sales	1993-2022	0.004	Low
Insurance sales	1993-2022	0.007	Moderate
Pari-mutuel net receipts	1993-2022	0.010	Elevated
Household utility expenditure	1993-2022	0.008	Moderate
Tobacco sales	1993-2022	0.001	Low
Lottery sales	1993-2022	0.006	Moderate
Hotel Spending	1993-2022	0.215	Very high
Home sales	2012-2022	0.004	Low
Air ridership	2017-2021	0.122	Not enough data
Transit ridership	2002-2021	0.012	Elevated
Gasoline consumption	1993-2021	0.002	Low
Oil revenues (proxy for fossil fuel production and prices)	1993-2022	0.518	Very high

Creating the Aggregate State Government Revenue Vulnerability Index

Estimated lost revenues LR for each type of revenue r in each state s are based on 2019 revenues times the % change in revenues for that type of revenue source and state.

$$LR_{s,r,m} = R_{s,r,base} \cdot \%\Delta R_{s,r,m}$$

The monthly index measures estimated lost revenues from taxes in each month relative to the selected base period starting in 2017.

$$Index_{s,m} = \frac{\sum_r LR_{s,r,m}}{\sum_r R_{s,r,base}}$$

The cumulative index measures estimated lost or gained revenues from taxes from the base period through current period as a percentage of the cumulative number of months M of revenues at baseline rates. Values less than one indicate an expected loss of revenues relative to the base month, with lower values indicating greater losses. Values greater than one indicate an expected increase in revenues.

$$Index_{s,cum} = \frac{\sum_{m \in \{1,...,M\}} \frac{\sum_r LR_{s,r,m}}{M}}{\sum_r R_{s,r,base}}$$

Creating the Aggregate Local Government Revenue Vulnerability Index (LGRVI)

Estimated lost or gained revenues LR for each type of revenue r are calculated for each county c and government type gt to be the baseline 2017 revenues times the % change in revenues for that type of revenue source and county.

$$LR_{c,gt,r,m} = R_{c,gt,r,base} \cdot \%\Delta R_{c,r,m}$$

The monthly index measures estimated lost revenues from taxes in each month relative to the selected base period.

$$Index_{c,gt,m} = \frac{\sum_r LR_{c,gt,r,m}}{\sum_r R_{c,gt,r,base}}$$

The cumulative index measures estimated lost or gained revenues from taxes from the base period through current period as a percentage of the cumulative number of months M of revenues at baseline rates. Values less than one indicate an expected loss of revenues relative to the base month, with lower values indicating greater losses. Values greater than one indicate an expected increase in revenues.

$$Index_{c,gt,cum} = \frac{\sum_{m \in \{1,...,M\}} \frac{\sum_r LR_{c,gt,r,m}}{M}}{\sum_r R_{c,gt,r,base}}$$

$$Index_{c,tot,cum} = \sum_{gt} Index_{c,gt,cum}$$

Data Sources

Table 3, below, shows the data sources for the SGRVI and LGRVI. Argonne conducts regular updates to the indices to ensure they use the most recent available data sources.

Table 3: Data Sources

Index Data	Data Source	Frequency
Revenues by state ($R_{s,t,base}$)	Census, Annual Survey of State Government Finances	Annual, 2019
Revenues by county ($R_{c,t,base}$)	Census, Census of Governments data	Annual, 2017
Total annual wages by state and industry ($AW_{s,i,base}$)	Bureau of Labor Statistics (BLS), Quarterly Census of Employment and Wages (QCEW)	Annual, 2019
Current Employment by Industry, US Total ($Emp_{US,i,m}$)	BLS, Current Employment Statistics (CES): Employment and Earnings Table B-1a: Employees on nonfarm payrolls by industry sector and selected industry detail, seasonally adjusted	Monthly, Jan 2017- current
Personal Consumption Expenditure ($S_{US,p,m}$)	BEA, Personal Consumption Expenditures (PCE)	Monthly, Jan 2017- current
Retail Sales ($S_{US,p,m}$)	Census, Retail Sales (RS)	Monthly, Jan 2017- current
Natural Gas Gross Withdrawals and Production	Energy Information Administration (EIA)	Monthly, Jan 2017-current
Natural Gas Weekly Update	IHS Markit via EIA	Weekly, Jan 2017-current
Natural Gas Henry Hub Spot Price	Markets Insider	Weekly, Jan 2017-current
Average Weekly Coal Commodity Spot Prices	S&P Global via EIA	First week of each month, Jan 2017-current
Monthly Coal Production Estimates	EIA	Monthly, Jan 2017– current
Weekly Crude Oil Supply Estimates	EIA	Weekly, Jan 2017-current
Crude Oil Production	EIA	Monthly, Jan 2017-current
WTI, Cushing Spot Prices	EIA	Weekly, Jan 2017-current
U.S. Consumer Price Index, Motor Fuels	Bureau of Labor Statistics (BLS)	Monthly, Jan 2017-current
Transit ridership (Fixed route bus + urban rail + other)	Bureau of Transportation Statistics (BTS)	Monthly, Jan 2017-current

Index Data	Data Source	Frequency
U.S. Air Traffic	BTS	Monthly, Jan 2017-current
Home sales	Redfin	Monthly Jan 2017-current

Additional Notes and Limitations

- This analysis focuses on the risk to government finances primarily due to the riskiness of the sources of tax revenues in each state or county. It also accounts for the industries in each county or state when assessing the potential income tax impacts, and on fossil fuel production in each state when assessing variations in severance taxes. It does not account for other differences between states or counties that could lead to different tax trajectories in different states.

- The indices do not account for the timing of revenue collection. It should be interpreted as the expected effect on annual finances based on economic impacts that have occurred up to a given point in time, not the effect on revenues collected up to that point.

- The indices do not account for fund balances, such as rainy-day funds, or debt levels.

- The indices do not account for changes in government tax policy since the base year used for revenue data (2019 for the SGRVI or 2017 for the LGRVI).

- While most of the underlying economic data used are seasonally adjusted, fossil fuel production data used in estimating severance tax revenue trajectories are not seasonally adjusted.

- New York City counties are combined into one (New York County) and are matched to county wage data for Manhattan only.

- The census of governments data used to construct the LGRVI is missing survey responses for some governments and uses estimates based on growth rates or per capita values for similar government to impute missing data.

- Some local governments may span multiple counties. These governments are generally assigned in the Census of Governments data to the county where the majority of the population lives, or in some cases to the county where the district is headquartered.

- Income taxes are assumed to track wages and unemployment and do not account for changes in capital gains tax collections that may be driven by stock market performance and housing prices rather than wages.

- Alcoholic beverage taxes are assumed to follow liquor store sales. Any alcohol taxes that may exist that also cover sales in restaurants and bars are not accounted for.

Appendix A – Data Dictionary for SGRVI

This appendix details the fields or columns found in the companion data table for the SGRVI and provides a plain language description.

Column Name	Description
Estimated Cumulative Impact on Revenues <Latest Month>	The cumulative State Government Revenue Vulnerability Index (SGRVI), which estimates cumulative loss of revenue based on economic activity through the specified month relative to what revenues would have been if activity had stayed at baseline levels.
Estimated Revenue Impact <Month>	The estimated percent loss of revenues due to economic activity in each month relative to a selected base period.
Rainy Day Funds (thousands of $)	Estimated balance of rainy-day funds, in thousands of $, at the end of 2019 for most states. For some states, 2018 or 2017 values are used due to data availability.
Rainy Day Funds as % of total revenues	The ratio of rainy-day funds to 2019 revenues.
Total Revenues, 2019, thousands of $	Total 2019 revenues in thousands of $.
Property Tax as % of total, 2019	The percentage of 2019 revenues that came from property taxes.
Utility Fees as % of total, 2019	The percentage of 2019 revenues that came from utility fees, including electric, gas, water, sewerage, and solid waste.
Other Fees as % of total, 2019	The percentage of 2019 revenues that came from other fees besides utilities and transportation.
Sales Tax as % of total, 2019	The percentage of 2019 revenues that came from sales taxes.
Pension Premiums as % of total, 2019	The percentage of 2019 revenues that came from pension premiums.
Federal Aid as % of total, 2019	The percentage of 2019 revenues that came from federal aid.
Public Utility, Alcoholic, Other Taxes as % of total, 2019	The percentage of 2019 revenues that came from public utility, alcoholic beverage, and other taxes.
Transportation Fees as % of total, 2019	The percentage of 2019 revenues that came from transportation fees, including airport, highway, parking, port, and transit.
Income Tax as % of total, 2019	The percentage of 2019 revenues that came from income taxes.
Licenses (i.e., Business, Alcohol, etc.) as % of total, 2019	The percentage of 2019 revenues that came from licenses, including business or alcohol licenses, among others.
Non-capital grants and donations as % of total, 2019	The percentage of 2019 revenues that came from non-capital grants and donations.

Column Name	Description
Pari-mutuel/Leisure/Hospitality/Gas Taxes as % of total, 2019	The percentage of 2019 revenues that came from pari-mutuel, leisure, hospitality, or gas taxes.
Severance Taxes and Royalties as % of total, 2019	The percentage of 2019 revenues that came from severance taxes or royalties.

Appendix B – Data Dictionary for LGRVI

This appendix details the fields or columns found in the companion data table for the LGRVI and provides a plain language description.

Column Name	Description
Estimated Cumulative Impact on Revenues <Latest Month>	The cumulative Local Government Revenue Vulnerability Index (LGRVI), which estimates cumulative loss of revenue based on economic activity through the specified month relative to what revenues would have been if activity had stayed at baseline levels.
Estimated Revenue Impact <Month>	The estimated percent loss of revenues due to economic activity in each month relative to a selected base period.
Total Revenues, 2017, thousands of $	Total 2017 revenues in thousands of $.
State Revenue Sharing as % of total, 2017	The percentage of 2017 revenues that came from state revenue sharing.
Property Tax as % of total, 2017	The percentage of 2017 revenues that came from property taxes.
Utility Fees as % of total, 2017	The percentage of 2017 revenues that came from utility fees, including electric, gas, water, sewerage and solid waste.
Other Fees as % of total, 2017	The percentage of 2017 revenues that came from other fees besides utilities and transportation.
Sales Tax as % of total, 2017	The percentage of 2017 revenues that came from sales taxes.
Pension Premiums as % of total, 2017	The percentage of 2017 revenues that came from pension premiums.
Federal Aid as % of total, 2017	The percentage of 2017 revenues that came from federal aid.
Public Utility, Alcoholic, Other Taxes as % of total, 2017	The percentage of 2017 revenues that came from public utility, alcoholic beverage and other taxes.
Transportation Fees as % of total, 2017	The percentage of 2017 revenues that came from transportation fees, including airport, highway, parking, port and transit.
Income Tax as % of total, 2017	The percentage of 2017 revenues that came from income taxes.
Licenses (i.e., Business, Alcohol, etc.) as % of total, 2017	The percentage of 2017 revenues that came from licenses, including business or alcohol licenses, among others.
Non-capital grants and donations as % of total, 2017	The percentage of 2017 revenues that came from non-capital grants and donations.
Pari-mutuel/Leisure/Hospitality/Gas Taxes as % of total, 2017	The percentage of 2017 revenues that came from pari-mutuel, leisure, hospitality, or gas taxes.

Column Name	Description
Severance Taxes and Royalties as % of total, 2017	The percentage of 2017 revenues that came from severance taxes or royalties.

Appendix C – Revenue Sources and Risk Ratings

This appendix details the revenue sources analyzed, the risk ratings for each, and the source of data for monthly updates to risk calculations, if such data exists.

Revenue Source	Risk Classification	Source Data for Revenue Estimate
Federal IG Air Transportation	no effect	
Federal IG Education	no effect	
Federal IG Emp Security Admin 1/	no effect	
Federal IG General Support	no effect	
Federal IG Health & Hospitals	no effect	
Federal IG Highways	no effect	
Fed IG Housing & Comm Dev	no effect	
Fed IG Other Natural Resources	no effect	
Fed IG Public Welfare	no effect	
Federal IG Sewerage	no effect	
Federal IG Other	no effect	
Federal IG Water Utilities	no effect	
Federal IG Electric Utilities	no effect	
Federal IG Gas Utilities	no effect	
Federal IG Transit Utilities	no effect	
Air Transportation Charges	high risk	air ridership
Regular Highway Charges	low risk	vehicle travel
Toll highway Charges	low risk	vehicle travel
Nat Resources NEC Charges	elevated risk	
Parking Facility Charges	low risk	
Parks & Recreation Charges	elevated risk	

Revenue Source	Risk Classification	Source Data for Revenue Estimate
Sewerage charges	elevated risk	
Solid Waste Charges	elevated risk	
Water Trans & Terminal Charges	elevated risk	
All other NEC charges	moderate risk	
Liquor Store Revenue	low risk	alcoholic beverage sales
Water utilities revenue	elevated risk	
Electric utilities revenue	elevated risk	
Gas Utilities Revenue	elevated risk	
Transit Utilities Revenue	elevated risk	transit ridership
Sale of Property	moderate risk	
Fines & Forfeits	moderate risk	
Rents	elevated risk	
Royalties	very high risk	fossil fuel production and prices
Individual Income Tax	elevated risk	unemployment and wage data
Alcoholic Beverage License Tax	moderate risk	
Amusement License Tax	high risk	
Corporation License Tax	elevated risk	
Hunting & Fishing License Tax	no effect	
Motor Vehicle License Tax	moderate risk	
Motor Vehicle Operators Licenses	moderate risk	
Public Utility License Tax	moderate risk	
Occupational & Business License, NEC	moderate risk	
Misc. General Revenue NEC	elevated risk	
Housing & Comm Dev Charges	elevated risk	

Revenue Source	Risk Classification	Source Data for Revenue Estimate
Donations from Private Sources	elevated risk	
Net Lottery Revenue	moderate risk	lottery sales
Emp Ret-Loc Emp Contribution	moderate risk	
Employee Retirement - State Employee Contribution	moderate risk	
Employee Retirement - From Other Govt	moderate risk	
Employee Retirement - Earnings on investments (calculated)	moderate risk	
Property Tax	moderate risk	
Alcoholic Beverage Sales Tax	low risk	alcoholic beverage sales
Amusement Tax	very high risk	
Insurance Premium Tax	moderate risk	insurance sales
Motor Fuels Sales Tax	low risk	gasoline consumption
Parimutuels Tax	elevated risk	pari-mutuel net receipts
Public Utilities Tax	moderate risk	household utility expenditure
Tobacco Sales Tax	low risk	tobacco sales
Other Selective Sales Taxes	very high risk	hotel spending
Other License Tax	moderate risk	
Corporation Net Income Tax	very high risk	
Death & Gift Tax	moderate risk	
Documentary & Stock Trans Tax	low risk	home sales
Severance Tax	very high risk	fossil fuel production and prices
Taxes, NEC	elevated risk	
Total General Sales Taxes	elevated risk	total retail sales
State IG Education	no effect	

Revenue Source	Risk Classification	Source Data for Revenue Estimate
State IG Other General Support	elevated risk	state government revenues
State IG Health & Hospitals	elevated risk	state government revenues
State IG Highways	elevated risk	state government revenues
State IG Housing & Comm Dev	elevated risk	state government revenues
State IG Public Welfare	elevated risk	state government revenues
State IG Sewerage	elevated risk	state government revenues
State IG Other	elevated risk	state government revenues
State IG Water Utilities	elevated risk	state government revenues
State IG Electric Utilities	elevated risk	state government revenues
State IG Gas Utilities	elevated risk	state government revenues
State IG Transit Utilities	elevated risk	state government revenues
School Intergovernmental – Interschool System	elevated risk	state government revenues
Unemployment-Contribution	elevated risk	state government revenues
Unemployment-Interest Revenue	elevated risk	state government revenues
Workers Comp-Other Contributions	elevated risk	state government revenues
Workers Comp-Interest Earnings	elevated risk	state government revenues

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