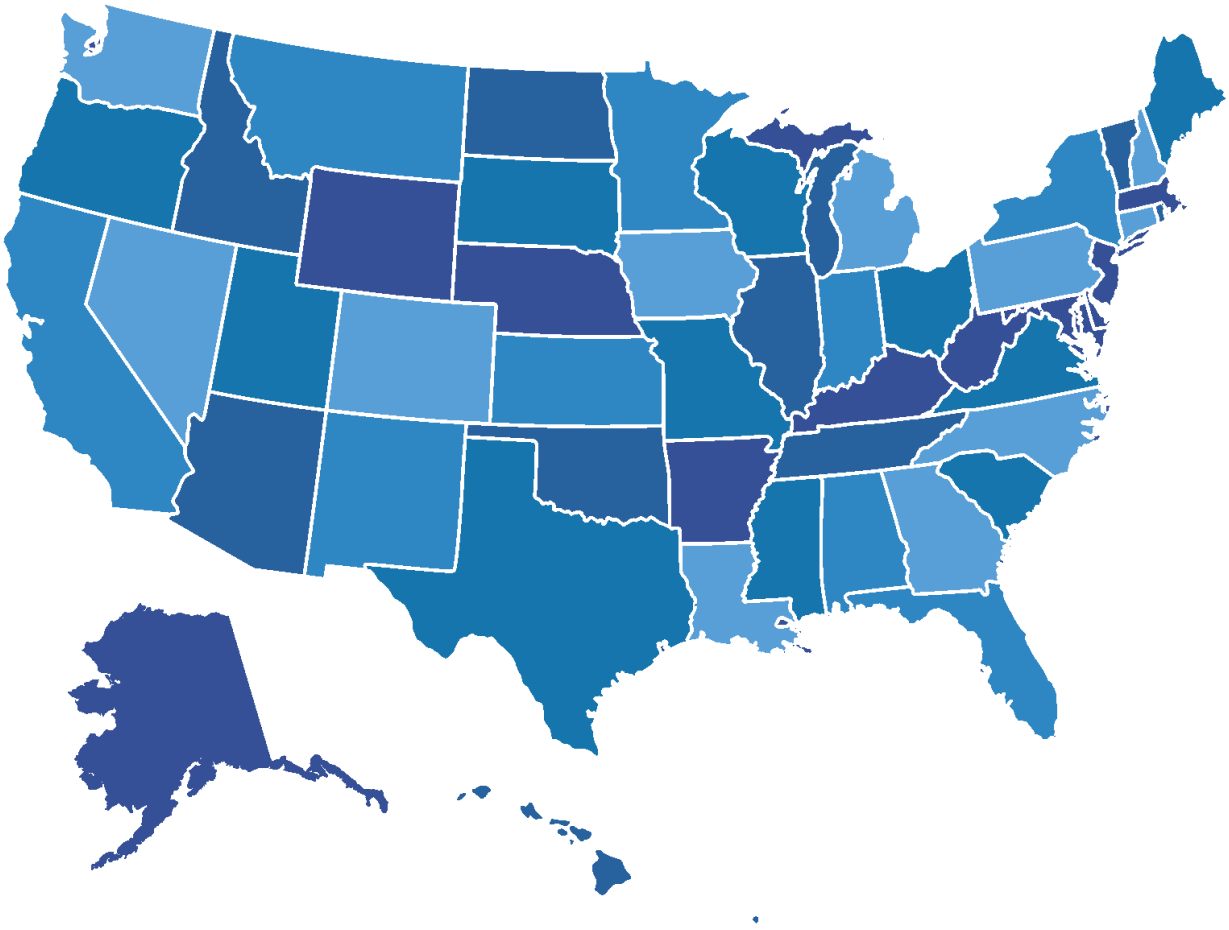
Responsiveness of

STATE TAX REVENUES

to Economic Growth



INDEPENDENT FISCAL OFFICE

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Introduction

This analysis responds to a request submitted by a member of the General Assembly to the Independent Fiscal Office (IFO). The analysis compares the growth of state tax revenues to certain economic metrics to ascertain the responsiveness of revenues to economic growth across states.[1] For this analysis, tax revenue data compiled by the U.S. Census Bureau from fiscal year (FY) 2010-11 to FY 2015-16 are used because those data represent the latest years available that also exclude the impact of a recession.

The analysis examines the tax rates and trends for the three largest state revenue sources: (1) personal income tax, (2) corporate net income tax and (3) sales and use tax. Those revenue sources are compared to three state economic metrics: (1) nominal gross domestic product (GDP), (2) personal income and (3) payroll employment.[2] A brief description of the three economic metrics is as follows:

- Gross Domestic Product (GDP) The value of all final goods and services produced by the state economy. It measures total economic output and can be used to evaluate the rate at which a state economy expands or contracts.

- Personal Income The sum of all sources of income such as wages, business income, interest, dividends, rents, royalties, employer contributions to pension and health insurance plans, unemployment compensation and transfer income (e.g., Social Security and various medical and income maintenance benefits).

- Payroll Employment The number of workers in the state economy. Excludes sole proprietors, military personnel, private household employees, unpaid volunteers, farm employees, certain partners of partnership entities and self-employed individuals.

The analysis computes average annual growth rates over the five-year time period for the three tax revenue sources and the three economic metrics. The analysis then uses the ratio of those growth rates (e.g., average sales tax growth / average GDP growth) to compute a responsiveness parameter that facilitates a simple comparison of responsiveness to economic conditions across all states that levy one of the three taxes.

Two general caveats that pertain to the analysis are noted. First, the comparisons cannot control for certain state-specific attributes or demographic characteristics. For example, states with significant tourism (e.g., Hawaii) or natural resource industries (e.g., Colorado) or states with a relatively large number of retirees (e.g., Pennsylvania) are likely to respond to economic conditions differently than states with a more diverse

[1] The analysis excludes the District of Columbia.

[2] Because state tax revenues include inflationary gains, the economic metrics used for the purpose of the analysis (gross domestic product and personal income) include the impact of inflation as well.

set of industries or age groups. Second, the results will likely be sensitive to the time period used for the analysis. While some states may have tax systems that appear to be more responsive to economic conditions during recoveries, they may appear less responsive during an economic slowdown or mild recession.

The remainder of the analysis contains three sections. Tables 1 through 3 display the state tax rates levied on personal income, corporate net income and sales and use. Tables 4 through 6 rank states based on the average annual growth rate of (1) state tax revenues generated from those sources, (2) the three economic metrics and (3) state population. Tables 7 through 9 rank states based on the ratio of the average annual growth rates of state tax revenues to the three economic metrics.

State Tax Rates

Table 1 displays personal income tax rates for 43 states: Alaska, Florida, Nevada, South Dakota, Texas, Washington and Wyoming do not impose a tax on personal income. The first three columns of the table display the marginal tax rate for a single filer at (1) the lowest tax bracket, (2) at $75,000 and (3) the highest tax bracket.[3] The fourth column displays the marginal effective tax rate for a couple that earns $75,000, files a joint return, claims two exemptions and a standard deduction (if applicable). The final column denotes if a state provides personal exemptions or a standard deduction. Data are from the Tax Foundation for calendar year (CY) 2017.

As shown in the table, states may levy progressive or flat personal income taxes to varying degrees. A progressive personal income tax levies a higher average tax rate as income rises, while a flat personal income tax levies the same average tax rate regardless of income. Some states impose highly-progressive personal income taxes (e.g., California and New York) compared to other states. The allowance of a personal exemption or standard deduction can make an income tax more progressive or introduce some progressivity to a flat tax. Pennsylvania levies a flat tax rate (3.07 percent) and does not allow personal exemptions or a standard deduction.

[3] The marginal tax rate is the tax rate imposed on the last dollar of income earned.

Table 1
2017 State Personal Income Tax Rates

State	Lowest Rate[1]	Rate at $75,000[1]	Highest Rate[1]	Effective Rate[2,3]	Exemption/ Deduction
Alabama	2.00%	5.00%	5.00%	5.00%	Both
Arizona	2.59%	3.36%	4.54%	3.36%	Both
Arkansas	0.90%	6.90%	6.90%	6.90%	Both
California	1.00%	6.00%	13.30%	6.00%	Both
Colorado	4.63%	4.63%	4.63%	4.63%	Neither
Connecticut	3.00%	5.00%	6.99%	5.00%	Exemption
Delaware	2.20%	6.60%	6.60%	6.60%	Both
Georgia	1.00%	6.00%	6.00%	6.00%	Both
Hawaii	1.40%	7.90%	8.25%	7.60%	Both
Idaho	1.60%	7.40%	7.40%	7.40%	Both
Illinois	4.95%	4.95%	4.95%	3.75%	Exemption
Indiana	3.23%	3.23%	3.23%	3.23%	Exemption
Iowa	0.36%	8.98%	8.98%	7.92%	Both
Kansas	2.90%	5.20%	5.20%	4.60%	Both
Kentucky	2.00%	5.80%	6.00%	5.80%	Both
Louisiana	2.00%	4.00%	6.00%	4.00%	Exemption
Maine	5.80%	7.15%	7.15%	6.75%	Both
Maryland	2.00%	4.75%	5.75%	4.75%	Both
Massachusetts	5.10%	5.10%	5.10%	5.10%	Exemption
Michigan	4.25%	4.25%	4.25%	4.25%	Exemption
Minnesota	5.35%	7.05%	9.85%	7.05%	Both
Mississippi	3.00%	5.00%	5.00%	5.00%	Both
Missouri	1.50%	6.00%	6.00%	6.00%	Both
Montana	1.00%	6.90%	6.90%	6.90%	Both
Nebraska	2.46%	6.84%	6.84%	6.84%	Both
New Hampshire	5.00%	5.00%	5.00%	5.00%	Exemption
New Jersey	1.40%	3.50%	8.97%	3.50%	Exemption
New Mexico	1.70%	4.90%	4.90%	4.90%	Both
New York	4.00%	6.45%	8.82%	6.45%	Deduction
North Carolina	5.49%	5.49%	5.49%	5.50%	Deduction
North Dakota	1.10%	2.04%	2.90%	1.10%	Both
Ohio	0.49%	3.46%	4.99%	3.47%	Exemption
Oklahoma	0.50%	5.00%	5.00%	5.00%	Both
Oregon	5.00%	9.00%	9.90%	9.00%	Both
Pennsylvania	3.07%	3.07%	3.07%	3.07%	Neither
Rhode Island	3.75%	4.75%	5.99%	3.75%	Both
South Carolina	0.00%	7.00%	7.00%	7.00%	Both
Tennessee	5.00%	5.00%	5.00%	5.00%	Exemption
Utah	5.00%	5.00%	5.00%	5.00%	Both
Vermont	3.55%	6.80%	8.95%	3.55%	Both
Virginia	2.00%	5.75%	5.75%	5.75%	Both
West Virginia	3.00%	6.50%	6.50%	6.50%	Exemption
Wisconsin	4.00%	6.27%	7.65%	6.27%	Both

Notes:
[1] Lowest rate, rate at $75,000, and highest rate represents the marginal tax rate for a single filer.
[2] Marginal effective rate represents the tax rate for a couple that earns $75,000, files a joint return, claims two exemptions, and a standard deduction (if applicable).
[3] A relatively flat or flat tax rate structure can be identified if the marginal effective rate is similar to one or more of the other rate categories.

Sources: Tax Foundation and State and Local Taxes: A Comparison Across States, IFO (May 2017).

Table 2 displays corporate net income tax rates for 44 states: South Dakota and Wyoming do not impose this tax, while Nevada, Ohio, Texas and Washington impose a gross receipts tax on corporate sales in lieu of a corporate net income tax. Those states are not included in the analysis. Pennsylvania levies the second highest tax rate (9.99 percent) after Iowa (12.00 percent). Data are from the Tax Foundation for CY 2017.

Table 2
2017 State Corporate Net Income Tax Rates

State	Rate	State	Rate
Alabama	6.50%	Minnesota	9.80%
Alaska	9.40%	Mississippi	5.00%
Arizona	4.90%	Missouri	6.25%
Arkansas	6.50%	Montana	6.75%
California	8.84%	Nebraska	7.81%
Colorado	4.63%	New Hampshire	8.20%
Connecticut	7.50%	New Jersey	9.00%
Delaware	8.70%	New Mexico	6.20%
Florida	5.50%	New York	6.50%
Georgia	6.00%	North Carolina	3.00%
Hawaii	6.40%	North Dakota	4.31%
Idaho	7.40%	Oklahoma	6.00%
Illinois	7.75%	Oregon	7.60%
Indiana	6.25%	Pennsylvania	9.99%
Iowa	12.00%	Rhode Island	7.00%
Kansas	4.00%	South Carolina	5.00%
Kentucky	6.00%	Tennessee	6.50%
Louisiana	8.00%	Utah	5.00%
Maine	8.93%	Vermont	8.50%
Maryland	8.25%	Virginia	6.00%
Massachusetts	8.00%	West Virginia	6.50%
Michigan	6.00%	Wisconsin	7.90%

Note: Rate is the highest tax rate levied.

Source: Tax Foundation.

Table 3 displays sales and use tax rates for 45 states: Alaska, Delaware, Montana, New Hampshire and Oregon do not impose a general state sales tax. The table includes the statutory tax rate as well as a computed effective tax rate. The computed effective tax rate is equal to the ratio of sales tax collections (FY 2015-16) to state personal income (CY 2015) and reflects the relative breadth of the tax base. The differential between the statutory tax rate and effective tax rate can suggest a narrow (a large differential) or

broad (a smaller differential) tax base.[4] A narrow tax base provides exemptions (e.g., food and clothing) and does not tax services, while a broad tax base allows few exemptions. Pennsylvania levies a statutory tax rate of 6.00 percent and has an effective tax rate of 1.62 percent. The large differential for Pennsylvania results from exemptions for food, clothing and most services. Data are from the Tax Foundation for CY 2017, the U.S. Bureau of Economic Analysis and the Internal Revenue Service.

Table 3
2017 State Sales and Use Tax Rates

State	Statutory Rate	Effective Rate[1]	State	Statutory Rate	Effective Rate[1]
Alabama	4.00%	1.42%	Nebraska	5.50%	1.95%
Arizona	5.60%	2.44%	Nevada	6.85%	3.40%
Arkansas	6.50%	2.92%	New Jersey	6.88%	1.74%
California	7.25%	1.85%	New Mexico	5.13%	2.63%
Colorado	2.90%	0.99%	New York	4.00%	1.17%
Connecticut	6.35%	1.52%	North Carolina	4.75%	1.75%
Florida	6.00%	2.34%	North Dakota	5.00%	2.52%
Georgia	4.00%	1.34%	Ohio	5.75%	2.42%
Hawaii	4.00%	4.80%	Oklahoma	4.50%	1.47%
Idaho	6.00%	2.42%	Pennsylvania	6.00%	1.62%
Illinois	6.25%	1.73%	Rhode Island	7.00%	1.88%
Indiana	7.00%	2.67%	South Carolina	6.00%	1.72%
Iowa	6.00%	2.28%	South Dakota	4.50%	2.40%
Kansas	6.50%	2.43%	Tennessee	7.00%	2.54%
Kentucky	6.00%	2.06%	Texas	6.25%	2.54%
Louisiana	5.00%	1.64%	Utah	5.95%	1.80%
Maine	5.50%	2.40%	Vermont	6.00%	1.23%
Maryland	6.00%	1.37%	Virginia	5.30%	0.92%
Massachusetts	6.25%	1.43%	Washington	6.50%	3.54%
Michigan	6.00%	2.13%	West Virginia	6.00%	1.93%
Minnesota	6.88%	2.00%	Wisconsin	5.00%	1.93%
Mississippi	7.00%	3.21%	Wyoming	4.00%	1.95%
Missouri	4.23%	1.39%			

Note:
[1] Effective tax rate equal to the ratio of sales tax collections (FY 2015-16) to state personal income (CY 2015). The effective tax rate reflects the relative breadth of the tax base. State personal income is adjusted by IFO. The analysis adds capital gains income, IRA withdrawals and pension distributions to state personal income. The analysis deducts employer contributions to pension and health insurance plans and imputed interest income.

Sources: Tax Foundation, the U.S. Bureau of Economic Analysis and the Internal Revenue Service.

[4] Other material factors will also motivate the size of the differential between the statutory and effective tax rates. For example, states with a larger share of residents at the higher end of the income distribution likely save a higher share of income, thereby reducing the effective tax rate.

State Comparisons

Table 4 ranks states based on the average annual growth rate of state tax revenues from FY 2010-11 to FY 2015-16. The table includes rankings for personal income, corporate net income and sales and use tax revenues. Revenue data are from the Annual Survey of State Government Tax Collections published by the U.S. Census Bureau. Because tax revenues can increase or decrease significantly due to tax law changes, adjustments are made prior to the rankings to control for such actions. Those adjustments are based on data from reports on state tax actions published by the National Conference of State Legislatures (NCSL), which compiles state tax law changes on an annual basis. Miscellaneous additional revenue adjustments were made by the IFO for certain states based on official state revenue reports. For the purpose of this analysis, only states with populations greater than two million (36 states) are included.[5]

States with a more progressive tax rate structure (e.g., California and New York) generally recorded strong growth in personal income tax collections. Other states such as Colorado and Utah recorded relatively strong growth due to population gains (see Table 6). Due to its flat rate structure and modest population gains, Pennsylvania ranked on the lower end of the scale (27th out of 31 states). It is noted that states with more progressive rate structures will also record larger relative declines during downturns and recessions.

The corporate net income tax rankings show that many natural resource/energy-producing states (e.g., Oklahoma and Louisiana) ranked low due to the collapse in energy prices beginning in 2014. Pennsylvania ranked 21st out of 32 states during this time period. It is noted that corporate net income tax growth rates are especially sensitive to the time period used for the analysis. For many states, the profitability of a relatively small number of firms can have a significant impact on average growth rates.

Due to the relationship between income and spending, the sales and use tax rankings reveal a strong correlation with the personal income rankings and many states with high (low) personal income tax ranks also rank high (low) for sales and use tax. In general, the state sales and use tax growth rates will be somewhat less than the comparable personal income tax growth rate. This relation also holds for Pennsylvania as average sales and use tax revenue growth (2.7 percent per annum) was roughly 1.2 percentage points lower than average personal income tax revenue growth (3.9 percent). For sales and use tax, Pennsylvania ranked 24th out of 35 states.

[5] The 14 excluded states are Alaska, Delaware, Hawaii, Idaho, Maine, Montana, Nebraska, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, West Virginia and Wyoming. For many of these states, state revenue trends are highly dependent on energy prices and the results may not be relevant for other states. In addition, the relatively small size of the state economy implies that relatively modest swings in revenues can have a disproportionate impact on average growth rates compared to larger states.

Table 4
State Revenue Ranking

Personal Income Tax			Corporate Net Income Tax			Sales and Use Tax		
State	Rank	AAGR	State	Rank	AAGR	State	Rank	AAGR
California	1	9.60%	Colorado	1	8.54%	Texas	1	6.20%
Utah	2	7.99%	Maryland	2	8.02%	Colorado	2	6.00%
Colorado	3	7.41%	Georgia	3	7.97%	Nevada	3	5.46%
Arizona	4	7.27%	Kansas	4	7.95%	Arizona	4	5.45%
Oregon	5	7.11%	Mississippi	5	7.91%	California	5	5.20%
Georgia	6	6.92%	Arizona	6	7.44%	Washington	6	5.03%
Minnesota	7	6.62%	Tennessee	7	7.21%	Minnesota	7	4.64%
South Carolina	8	6.38%	Indiana	8	6.98%	Kansas	8	4.55%
New York	9	6.28%	North Carolina	9	6.63%	Ohio	9	4.44%
North Carolina	10	6.09%	Wisconsin	10	6.26%	Arkansas	10	4.35%
Missouri	11	5.84%	Iowa	11	5.93%	Florida	11	4.31%
Iowa	12	5.64%	Minnesota	12	5.60%	Wisconsin	12	4.26%
Illinois	13	5.41%	Florida	13	5.34%	Massachusetts	13	3.89%
Oklahoma	14	5.40%	South Carolina	14	4.84%	Iowa	14	3.88%
Ohio	15	5.25%	Utah	15	4.71%	North Carolina	15	3.88%
Mississippi	16	5.20%	Oregon	16	4.11%	Alabama	16	3.74%
New Mexico	17	5.15%	New York	17	3.82%	New York	17	3.64%
Wisconsin	18	5.06%	Arkansas	18	3.65%	Kentucky	18	3.58%
Virginia	19	5.02%	Kentucky	19	3.39%	Missouri	19	3.53%
New Jersey	20	4.83%	Alabama	20	3.32%	Illinois	20	3.24%
Arkansas	21	4.80%	Pennsylvania	21	3.15%	Indiana	21	3.19%
Maryland	22	4.79%	Massachusetts	22	3.11%	South Carolina	22	2.80%
Alabama	23	4.79%	Michigan	23	2.56%	Michigan	23	2.73%
Kentucky	24	4.79%	Illinois	24	1.65%	Pennsylvania	24	2.70%
Massachusetts	25	4.64%	New Jersey	25	0.47%	Tennessee	25	2.62%
Michigan	26	4.35%	California	26	-0.12%	Oklahoma	26	2.56%
Pennsylvania	27	3.92%	Missouri	27	-0.24%	New Jersey	27	2.56%
Indiana	28	3.31%	Virginia	28	-1.38%	Georgia	28	2.56%
Louisiana	29	3.28%	Connecticut	29	-1.73%	Maryland	29	2.44%
Kansas	30	2.26%	Oklahoma	30	-2.45%	Utah	30	2.37%
Connecticut	31	1.37%	Louisiana	31	-2.46%	Mississippi	31	2.24%
			New Mexico	32	-6.80%	Virginia	32	2.22%
						Louisiana	33	1.81%
						New Mexico	34	1.60%
						Connecticut	35	0.79%

Note: Rankings reflect average annual growth rates (AAGR) from FY 2010-11 to FY 2015-16.

Sources: U.S. Census Bureau, National Conference of State Legislatures (NCSL), Center on Budget and Policy Priorities, California Legislative Analyst's Office, Indiana Department of Revenue, Louisiana Department of Revenue, Illinois Department of Revenue, South Carolina Department of Revenue, South Carolina Revenue and Fiscal Affairs Office, Iowa Department of Revenue, Ohio Department of Taxation and Virginia Department of Taxation.

Table 5 ranks states based on the average annual growth rate of (1) nominal GDP, (2) personal income and (3) payroll employment from CY 2010 to CY 2015.[6] The economic rankings from Table 5 show that energy-producing and western states (e.g., North Dakota and California) recorded strong growth while older and eastern states (e.g., West Virginia, Maine and Connecticut) recorded much slower growth. Pennsylvania has a relatively low rank for payroll employment (45th) because there is very modest growth of the labor force due to demographic trends. Pennsylvania ranks higher for GDP (29th) and personal income (37th) because retirees and elderly residents receive incomes or spend prior savings, and thus generate economic activity. Data for nominal GDP and personal income are from the U.S. Bureau of Economic Analysis. Data for payroll employment are from the U.S. Bureau of Labor Statistics.

[6] For the economic metrics, the data span from calendar year 2010 to 2015, as opposed to a fiscal year convention. Due to payment rules, there will be greater overlap between calendar year economic activity (e.g., 2010) and fiscal year revenues (e.g., FY 2010-11) for corporate net income tax and the non-withholding portion of personal income tax, which is the more volatile part of that revenue source. For sales-use tax, a fiscal year convention provides a good match, but there is typically a delay before income gains translate into higher spending. Using a fiscal year convention for the economic metrics would not alter the general results of the analysis.

Table 5
State Economic Ranking

Nominal GDP			Personal Income			Payroll Employment		
State	Rank	AAGR	State	Rank	AAGR	State	Rank	AAGR
North Dakota	1	9.28%	North Dakota	1	7.36%	North Dakota	1	3.82%
Texas	2	5.28%	Colorado	2	7.00%	Utah	2	3.11%
California	3	4.97%	Utah	3	6.19%	Texas	3	2.73%
Iowa	4	4.95%	Texas	4	6.07%	Colorado	4	2.72%
Oklahoma	5	4.87%	Washington	5	5.96%	Florida	5	2.48%
Utah	6	4.84%	California	6	5.70%	Nevada	6	2.40%
Washington	7	4.67%	Oregon	7	5.43%	California	7	2.40%
Tennessee	8	4.64%	Idaho	8	5.20%	Idaho	8	2.18%
Nebraska	9	4.64%	Wyoming	9	5.17%	Oregon	9	2.15%
Colorado	10	4.46%	South Carolina	10	4.95%	Washington	10	2.10%
South Dakota	11	4.40%	Oklahoma	11	4.94%	South Carolina	11	2.06%
South Carolina	12	4.32%	Nebraska	12	4.83%	Tennessee	12	2.04%
Georgia	13	4.18%	Florida	13	4.79%	Arizona	13	2.02%
Michigan	14	4.17%	Arizona	14	4.68%	Georgia	14	2.00%
Ohio	15	4.17%	Minnesota	15	4.62%	Michigan	15	1.89%
Minnesota	16	4.00%	Arkansas	16	4.58%	North Carolina	16	1.84%
Massachusetts	17	3.97%	Nevada	17	4.55%	Hawaii	17	1.70%
New York	18	3.91%	Montana	18	4.53%	Massachusetts	18	1.68%
Delaware	19	3.90%	Georgia	19	4.45%	Indiana	19	1.65%
Florida	20	3.87%	New York	20	4.35%	New York	20	1.62%
North Carolina	21	3.82%	Iowa	21	4.29%	Delaware	21	1.61%
Wisconsin	22	3.80%	North Carolina	22	4.22%	Minnesota	22	1.60%
Hawaii	23	3.68%	Michigan	23	4.20%	Montana	23	1.52%
Montana	24	3.63%	Tennessee	24	4.16%	Ohio	24	1.50%
Idaho	25	3.59%	Massachusetts	25	4.13%	Oklahoma	25	1.40%
Arizona	26	3.58%	Hawaii	26	4.12%	Kentucky	26	1.39%
Indiana	27	3.53%	South Dakota	27	4.06%	Nebraska	27	1.26%
Illinois	28	3.53%	Illinois	28	4.04%	Illinois	28	1.24%
Pennsylvania	29	3.48%	Kansas	29	4.04%	Iowa	29	1.22%
Kansas	30	3.32%	Indiana	30	3.98%	South Dakota	30	1.22%
Maryland	31	3.14%	Ohio	31	3.91%	Wisconsin	31	1.19%
New Hampshire	32	3.12%	Wisconsin	32	3.83%	Rhode Island	32	1.16%
Nevada	33	3.03%	Delaware	33	3.75%	Virginia	33	1.14%
Arkansas	34	3.00%	Alaska	34	3.74%	Maryland	34	1.13%
Kentucky	35	2.95%	Virginia	35	3.71%	Louisiana	35	1.13%
New Jersey	36	2.83%	Vermont	36	3.62%	Kansas	36	1.07%
Alabama	37	2.78%	Pennsylvania	37	3.60%	New Hampshire	37	1.02%
Missouri	38	2.77%	New Jersey	38	3.56%	Missouri	38	1.02%
Virginia	39	2.73%	Kentucky	39	3.46%	Vermont	39	0.93%
Vermont	40	2.65%	Louisiana	40	3.41%	Alaska	40	0.86%
Oregon	41	2.65%	Missouri	41	3.18%	New Jersey	41	0.84%
Rhode Island	42	2.63%	New Hampshire	42	3.16%	Alabama	42	0.82%
Maine	43	2.18%	Maryland	43	3.15%	Connecticut	43	0.81%
Mississippi	44	2.10%	Rhode Island	44	3.13%	Arkansas	44	0.77%
Connecticut	45	1.73%	New Mexico	45	2.93%	Pennsylvania	45	0.75%
West Virginia	46	1.67%	Alabama	46	2.84%	Mississippi	46	0.74%
New Mexico	47	1.56%	Mississippi	47	2.73%	Wyoming	47	0.69%
Louisiana	48	0.68%	Maine	48	2.70%	New Mexico	48	0.61%
Wyoming	49	0.09%	West Virginia	49	2.49%	Maine	49	0.59%
Alaska	50	-0.31%	Connecticut	50	1.95%	West Virginia	50	0.24%

Note: Rankings reflect average annual growth rates (AAGR) from CY 2010 to CY 2015.

Sources: U.S. Bureau of Economic Analysis and U.S. Bureau of Labor Statistics.

Table 6 ranks states based on the average annual growth rate of state population from CY 2010 to CY 2015. Similar to the economic rankings, the population rankings reveal slow growth for older and northeastern states (e.g., Pennsylvania and Vermont) compared to energy-producing and western states (e.g., Texas and Utah). Domestic migration patterns cause much of this trend as residents depart northeastern states and move to western and southern states for reasons related to jobs, homes, family and climate. Younger demographic profiles and higher birth rates also contribute to the growth rate disparity. Data are from the U.S. Bureau of Economic Analysis.

Table 6
State Population Ranking

State	Rank	AAGR	State	Rank	AAGR
North Dakota	1	2.27%	Massachusetts	26	0.66%
Texas	2	1.67%	Minnesota	27	0.64%
Colorado	3	1.54%	Louisiana	28	0.55%
Utah	4	1.52%	Iowa	29	0.46%
Florida	5	1.43%	Arkansas	30	0.38%
Nevada	6	1.30%	Indiana	31	0.38%
Arizona	7	1.25%	Kentucky	32	0.36%
Washington	8	1.21%	New York	33	0.35%
South Carolina	9	1.10%	Kansas	34	0.34%
Idaho	10	1.04%	New Jersey	35	0.30%
South Dakota	11	1.01%	Alabama	36	0.29%
North Carolina	12	0.98%	Missouri	37	0.27%
Georgia	13	0.98%	Wisconsin	38	0.27%
Delaware	14	0.96%	New Hampshire	39	0.21%
Oregon	15	0.96%	New Mexico	40	0.17%
Hawaii	16	0.88%	Mississippi	41	0.13%
California	17	0.87%	Pennsylvania	42	0.12%
Virginia	18	0.84%	Ohio	43	0.11%
Montana	19	0.82%	Michigan	44	0.08%
Oklahoma	20	0.77%	Rhode Island	45	0.05%
Wyoming	21	0.75%	Connecticut	46	0.03%
Tennessee	22	0.74%	Maine	47	0.03%
Maryland	23	0.70%	Vermont	48	0.00%
Nebraska	24	0.69%	Illinois	49	0.00%
Alaska	25	0.69%	West Virginia	50	-0.14%

Note: AAGR is average annual growth rate for CY 2010 to CY 2015.
Source: U.S. Bureau of Economic Analysis.

State Tax Ratios

Tables 7 through 9 rank states based on the ratio of the average annual growth rate of state tax revenues to the three economic metrics. This ratio provides a simple parameter that can be used to compare the responsiveness of tax revenues to economic conditions across states. A computed ratio of 1.0 implies that state tax revenues grew at the same rate as economic conditions, while a ratio above (below) 1.0 implies that state tax revenues grew faster (slower) than economic conditions. The ratios alone are not meaningful because they disregard many other factors that are important for policymakers to consider in their deliberations regarding state tax structures. A high or low ratio may or may not be desirable depending on policy objectives.

Table 7 displays the responsiveness of state personal income tax revenues to economic conditions. For GDP and personal income, Pennsylvania ranks 26th and 24th (out of 31 states), respectively. For those economic metrics, New Mexico, Alabama, Mississippi, Arizona, Missouri and California rank highest. States that levy a progressive personal income tax (e.g., California) are generally more responsive to economic conditions (at any point in the economic cycle) than states with a flat tax structure. For example, during economic expansions, business profits will generally expand faster than other income sources and those profits will flow disproportionately to upper-income taxpayers, who are subject to higher tax rates. Hence, state tax revenues will appear more responsive to economic conditions than a flat rate state. However, revenues will also decline more rapidly during slowdowns and recessions.

Some states that have a relatively flat rate structure (e.g., New Mexico and Alabama) may rank higher than states with a more progressive rate structure. That outcome is due to relatively strong wage growth in those states compared to GDP and personal income, which both contain many items that have no implications for personal income tax revenues.[7]

For payroll employment, Pennsylvania ranks higher (7th out of 31 states) due to its relatively low growth for that economic metric coupled with modest growth in personal income tax collections. Personal income tax collections appear to be responsive to employment growth because residents not working still receive income and purchase goods and services, which becomes (taxable) income for the recipients.

[7] Wages typically comprise 70 to 80 percent of the personal income tax base, but slightly less than one half of state GDP or personal income.

Table 7
Personal Income Tax Ratios

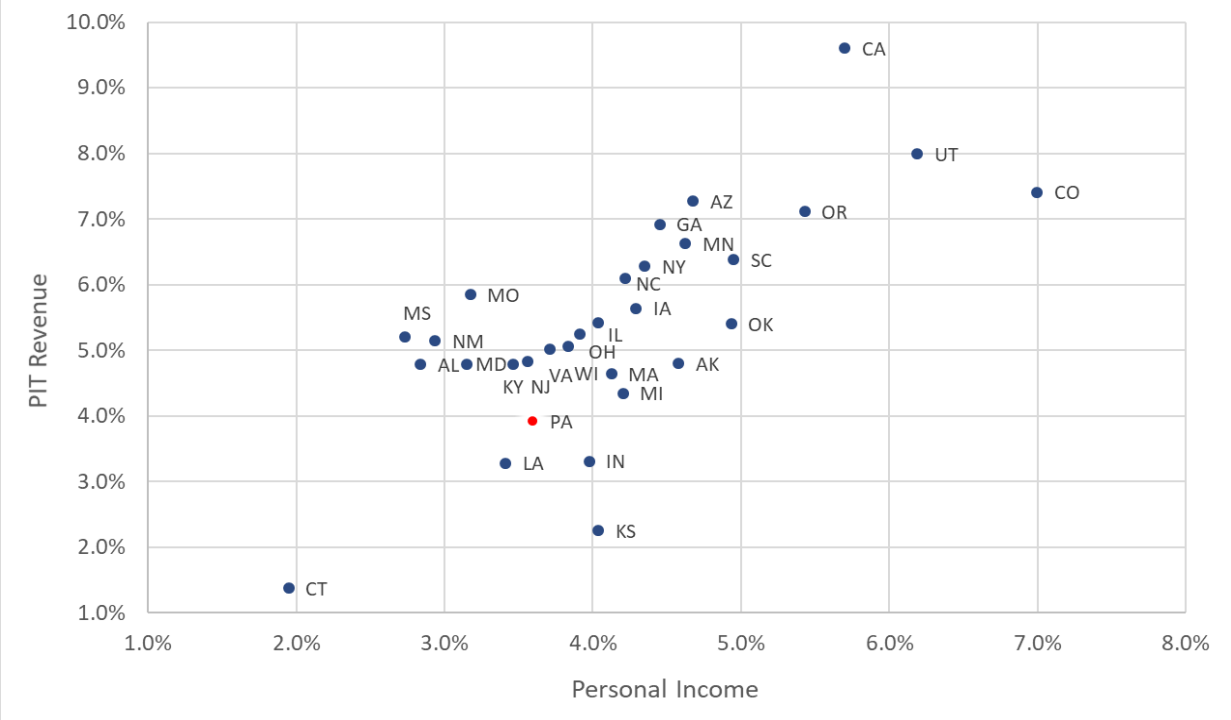
Nominal GDP			Personal Income			Payroll Employment		
State	Rank	Ratio	State	Rank	Ratio	State	Rank	Ratio
Louisiana	1	4.79	Mississippi	1	1.90	New Mexico	1	8.44
New Mexico	2	3.29	Missouri	2	1.84	Mississippi	2	7.03
Oregon	3	2.68	New Mexico	3	1.75	Arkansas	3	6.20
Mississippi	4	2.48	Alabama	4	1.69	Alabama	4	5.84
Missouri	5	2.11	California	5	1.68	New Jersey	5	5.77
Arizona	6	2.03	Georgia	6	1.55	Missouri	6	5.74
California	7	1.93	Arizona	7	1.55	Pennsylvania	7	5.25
Virginia	8	1.84	Maryland	8	1.52	Iowa	8	4.62
Alabama	9	1.72	North Carolina	9	1.44	Virginia	9	4.42
New Jersey	10	1.70	New York	10	1.44	Illinois	10	4.36
Colorado	11	1.66	Minnesota	11	1.43	Wisconsin	11	4.25
Minnesota	12	1.66	Kentucky	12	1.38	Maryland	12	4.24
Georgia	13	1.65	New Jersey	13	1.36	Minnesota	13	4.13
Utah	14	1.65	Virginia	14	1.35	California	14	4.00
Kentucky	15	1.62	Ohio	15	1.34	New York	15	3.88
New York	16	1.60	Illinois	16	1.34	Oklahoma	16	3.85
Arkansas	17	1.60	Wisconsin	17	1.32	Arizona	17	3.59
North Carolina	18	1.60	Iowa	18	1.31	Ohio	18	3.51
Illinois	19	1.53	Oregon	19	1.31	Georgia	19	3.47
Maryland	20	1.52	Utah	20	1.29	Kentucky	20	3.44
South Carolina	21	1.48	South Carolina	21	1.29	Oregon	21	3.32
Wisconsin	22	1.33	Massachusetts	22	1.12	North Carolina	22	3.31
Ohio	23	1.26	Oklahoma	23	1.09	South Carolina	23	3.09
Massachusetts	24	1.17	Pennsylvania	24	1.09	Louisiana	24	2.90
Iowa	25	1.14	Colorado	25	1.06	Massachusetts	25	2.77
Pennsylvania	26	1.13	Arkansas	26	1.05	Colorado	26	2.72
Oklahoma	27	1.11	Michigan	27	1.03	Utah	27	2.57
Michigan	28	1.04	Louisiana	28	0.96	Michigan	28	2.30
Indiana	29	0.94	Indiana	29	0.83	Kansas	29	2.12
Connecticut	30	0.79	Connecticut	30	0.70	Indiana	30	2.01
Kansas	31	0.68	Kansas	31	0.56	Connecticut	31	1.70
Tennessee[1]		n.a.	Tennessee[1]		n.a.	Tennessee[1]		n.a.

Note: Figures represent the ratio of growth rates for personal income tax and the relevant economic metric. For example, 1.13 for Pennsylvania represents the personal income tax growth rate divided by the nominal GDP growth rate.
[1]Tennessee is designated n.a. since only dividend and interest income are taxed.

Sources: U.S. Census Bureau, U.S. Bureau of Economic Analysis and U.S. Bureau of Labor Statistics.

Figure 1 shows the relationship between the growth rate for personal income tax revenues and personal income. The points on the figure provide a graphical depiction of certain data contained in Table 7.

Figure 1
Growth Rates: Personal Income Tax versus Personal Income



Note: Points represent the average annual growth rate from FY 2010-11 to FY 2015-16.
Sources: U.S. Census Bureau and U.S. Bureau of Economic Analysis.

Table 8 displays the responsiveness of state corporate net income tax revenues to economic conditions. The growth of tax revenues will be sensitive to the specific firms and industries that are located in the state and are incorporated as C corporations. The taxable profits that motivate corporate net income tax revenues may have very limited relation to overall state economic activity because (1) the profits (or losses) of multistate corporations that are apportioned to the state may be attributable to out-of-state activity, (2) the apportionment factors used to determine the tax base may not provide an accurate representation of a firm's business activity within the state and (3) corporations can carry losses forward from prior tax years to reduce current payments. Hence, it is not possible to make general observations regarding the responsiveness of state corporate net income tax revenues to contemporaneous economic conditions. This fact is especially relevant for states that recorded a reduction in corporate net income tax revenues, despite the modest economic expansion (bottom of Table 8).

Table 8
Corporate Net Income Tax Ratios

Nominal GDP			Personal Income			Payroll Employment		
State	Rank	Ratio	State	Rank	Ratio	State	Rank	Ratio
Mississippi	1	3.77	Mississippi	1	2.89	Mississippi	1	10.69
Maryland	2	2.55	Maryland	2	2.54	Kansas	2	7.47
Kansas	3	2.40	Kansas	3	1.97	Maryland	3	7.09
Arizona	4	2.08	Georgia	4	1.79	Wisconsin	4	5.26
Indiana	5	1.98	Indiana	5	1.76	Iowa	5	4.86
Colorado	6	1.91	Tennessee	6	1.73	Arkansas	6	4.71
Georgia	7	1.90	Wisconsin	7	1.63	Indiana	7	4.25
North Carolina	8	1.74	Arizona	8	1.59	Pennsylvania	8	4.22
Wisconsin	9	1.65	North Carolina	9	1.57	Alabama	9	4.05
Tennessee	10	1.55	Iowa	10	1.38	Georgia	10	3.99
Oregon	11	1.55	Colorado	11	1.22	Arizona	11	3.68
Minnesota	12	1.40	Minnesota	12	1.21	North Carolina	12	3.61
Florida	13	1.38	Alabama	13	1.17	Tennessee	13	3.54
Arkansas	14	1.22	Florida	14	1.11	Minnesota	14	3.49
Iowa	15	1.20	South Carolina	15	0.98	Colorado	15	3.14
Alabama	16	1.19	Kentucky	16	0.98	Kentucky	16	2.44
Kentucky	17	1.15	New York	17	0.88	New York	17	2.36
South Carolina	18	1.12	Pennsylvania	18	0.88	South Carolina	18	2.35
New York	19	0.98	Arkansas	19	0.80	Florida	19	2.16
Utah	20	0.97	Utah	20	0.76	Oregon	20	1.92
Pennsylvania	21	0.90	Oregon	21	0.76	Massachusetts	21	1.85
Massachusetts	22	0.78	Massachusetts	22	0.75	Utah	22	1.52
Michigan	23	0.61	Michigan	23	0.61	Michigan	23	1.36
Illinois	24	0.47	Illinois	24	0.41	Illinois	24	1.32
New Jersey	25	0.17	New Jersey	25	0.13	New Jersey	25	0.57
California		negative	California		negative	California		negative
Missouri		negative	Missouri		negative	Missouri		negative
Virginia		negative	Virginia		negative	Virginia		negative
Oklahoma		negative	Oklahoma		negative	Oklahoma		negative
Connecticut		negative	Connecticut		negative	Connecticut		negative
Louisiana		negative	Louisiana		negative	Louisiana		negative
New Mexico		negative	New Mexico		negative	New Mexico		negative

Note: Figures represent the ratio of growth rates for corporate net income tax and the relevant economic metric. For example, 0.90 for Pennsylvania represents the corporate net income tax growth rate divided by the nominal GDP growth rate. States that have a negative designation recorded a decline in corporate net income tax revenues, which is not representative of long-term trends.

Sources: U.S. Census Bureau, U.S. Bureau of Economic Analysis and U.S. Bureau of Labor Statistics.

Table 9 displays the responsiveness of state sales and use tax revenues to economic conditions. Out of 35 states, Pennsylvania ranks 28th for GDP, 24th for personal income and 4th for payroll employment. Similar to Table 7, the high ranking for payroll employment is due to Pennsylvania's relatively low growth for that economic metric coupled with modest growth in sales and use tax collections.

Overall, there is a weak positive correlation between states with relatively broad sales tax bases and responsiveness to economic conditions. Also, certain states with younger demographic profiles and relatively fewer residents entering retirement generally rank higher relative to other states. All else equal, those factors make revenues more responsive to economic conditions, because consumer expenditure data show that older residents spend a considerably lower share of their income on items subject to sales tax.

Table 9
Sales and Use Tax Ratios

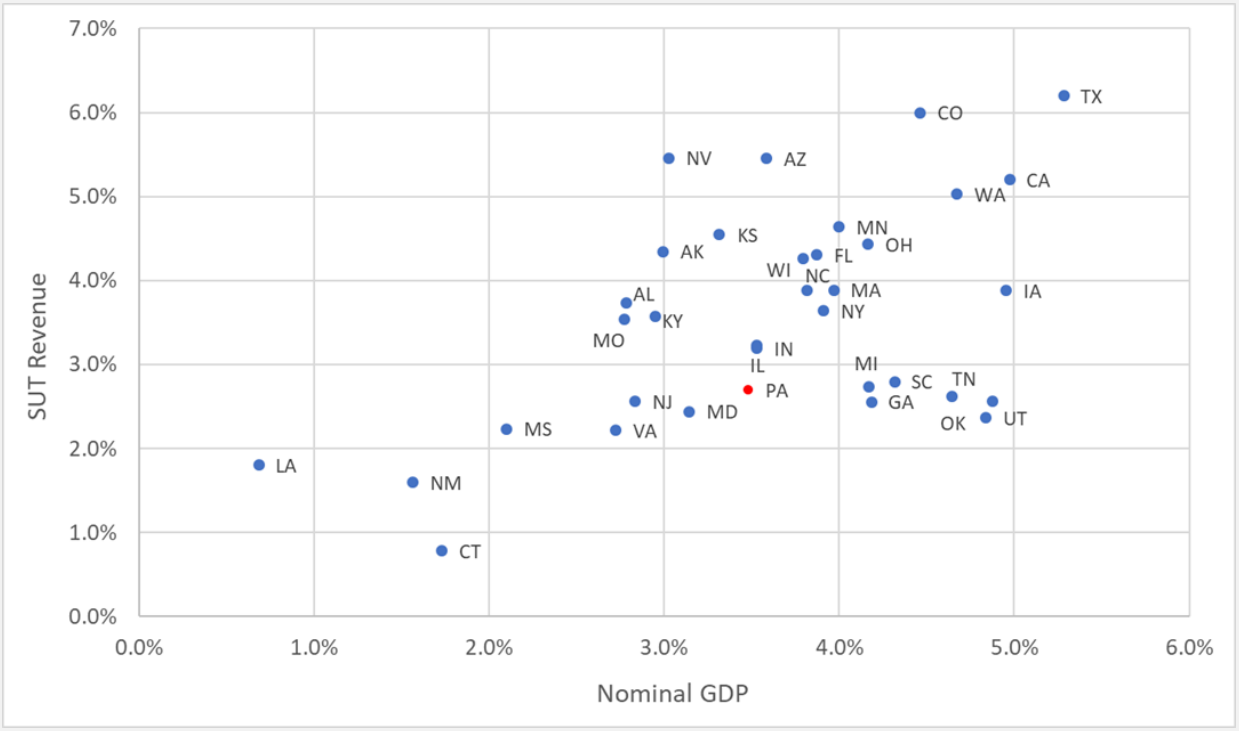
Nominal GDP			Personal Income			Payroll Employment		
State	Rank	Ratio	State	Rank	Ratio	State	Rank	Ratio
Louisiana	1	2.64	Alabama	1	1.32	Arkansas	1	5.61
Nevada	2	1.80	Nevada	2	1.20	Alabama	2	4.56
Arizona	3	1.52	Arizona	3	1.17	Kansas	3	4.27
Arkansas	4	1.45	Ohio	4	1.13	Pennsylvania	4	3.62
Kansas	5	1.37	Kansas	5	1.13	Wisconsin	5	3.58
Colorado	6	1.34	Missouri	6	1.11	Missouri	6	3.47
Alabama	7	1.34	Wisconsin	7	1.11	Iowa	7	3.18
Missouri	8	1.27	Kentucky	8	1.03	New Jersey	8	3.06
Kentucky	9	1.21	Texas	9	1.02	Mississippi	9	3.02
Texas	10	1.17	Minnesota	10	1.00	Ohio	10	2.96
Minnesota	11	1.16	Arkansas	11	0.95	Minnesota	11	2.89
Wisconsin	12	1.12	Massachusetts	12	0.94	Arizona	12	2.70
Florida	13	1.11	North Carolina	13	0.92	New Mexico	13	2.62
Washington	14	1.08	California	14	0.91	Illinois	14	2.60
Ohio	15	1.07	Iowa	15	0.90	Kentucky	15	2.57
Mississippi	16	1.06	Florida	16	0.90	Washington	16	2.39
California	17	1.05	Colorado	17	0.86	Massachusetts	17	2.32
New Mexico	18	1.02	Washington	18	0.84	Nevada	18	2.27
North Carolina	19	1.02	New York	19	0.84	Texas	19	2.27
Massachusetts	20	0.98	Mississippi	20	0.82	New York	20	2.25
New York	21	0.93	Indiana	21	0.80	Colorado	21	2.20
Illinois	22	0.92	Illinois	22	0.80	California	22	2.17
Indiana	23	0.90	Maryland	23	0.77	Maryland	23	2.16
New Jersey	24	0.90	Pennsylvania	24	0.75	North Carolina	24	2.11
Virginia	25	0.82	New Jersey	25	0.72	Virginia	25	1.96
Iowa	26	0.78	Michigan	26	0.65	Indiana	26	1.94
Maryland	27	0.78	Tennessee	27	0.63	Oklahoma	27	1.83
Pennsylvania	28	0.78	Virginia	28	0.60	Florida	28	1.74
Michigan	29	0.66	Georgia	29	0.57	Louisiana	29	1.60
South Carolina	30	0.65	South Carolina	30	0.57	Michigan	30	1.45
Georgia	31	0.61	New Mexico	31	0.55	South Carolina	31	1.36
Tennessee	32	0.57	Louisiana	32	0.53	Tennessee	32	1.29
Oklahoma	33	0.53	Oklahoma	33	0.52	Georgia	33	1.28
Utah	34	0.49	Connecticut	34	0.40	Connecticut	34	0.97
Connecticut	35	0.46	Utah	35	0.38	Utah	35	0.76

Note: Figures represent the ratio of growth rates for sales and use tax and the relevant economic metric. For example, 0.78 for Pennsylvania represents the sales and use tax growth rate divided by the nominal GDP growth rate.

Sources: U.S. Census Bureau, U.S. Bureau of Economic Analysis and U.S. Bureau of Labor Statistics.

Figure 2 shows the relationship between the growth rate of sales and use tax revenues and nominal GDP. The points on the figure provide a graphical depiction of certain data contained in Table 9.

Figure 2
Growth Rates: Sales and Use Tax versus Nominal GDP



Note: Points represent the average annual growth rate from FY 2010-11 to FY 2015-16.
Sources: U.S. Census Bureau and U.S. Bureau of Economic Analysis.

Conclusion

The IFO received a request to examine the responsiveness of state tax revenues to economic conditions. The analysis compared the responsiveness of (1) personal income tax, (2) corporate net income tax and (3) sales and use tax to three common state economic metrics. The analysis examined states with a population of two million or greater for FY 2010-11 to FY 2015-16. Due to various technical issues, the data do not provide a reliable measure to evaluate the responsiveness of state tax revenues to economic conditions. However, some common factors that may cause states to appear more responsive to economic conditions than others include (1) a progressive tax rate structure, (2) a broad tax base, (3) solid wage growth and (4) a diversified economy.

An unusual macroeconomic factor may have also contributed to the results of this analysis. The time period examined was characterized by very low levels of inflation. During such times, wage earners generally fare better than periods of high inflation because wages paid to workers typically do not keep pace with higher levels of inflation. By extension, states that are wage intensive, and generally have flatter income structures and flatter tax structures, may appear to be more responsive to economic conditions compared to times when inflation is stronger. Higher inflation generally benefits (i.e., tax revenues grow faster than the economy) states with more non-wage income and progressive tax rate structures.