

TAX REDUCTIONS IN ARIZONA: EFFECTS ON ECONOMIC GROWTH AND GOVERNMENT REVENUE, 2023 UPDATE

A Report from the Office of the University Economist

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SUMMARY

Since the early 1990s, the Arizona Legislature has repeatedly reduced tax rates and narrowed tax bases of revenue sources used by state government — particularly of those sources providing revenue to the general fund. The tax reductions usually were passed with the justification that the cuts would be good for the economy. However, empirical evidence indicates that economic performance in Arizona has not been stronger since the tax cuts went into effect.

When some of the tax cuts were passed, a contention — based on supply-side economic theory — was made that the initial loss of government revenue from the tax reduction would quickly be made up by new revenue brought in by an increase in economic activity. However, empirical evidence indicates that general fund revenue relative to the size of the economy has been significantly lower since the tax reductions were implemented.

Based on estimates by the Arizona Joint Legislative Budget Committee of the effect on general fund revenue of each tax law change implemented since fiscal year 1993, the tax reductions lowered revenue to the state government general fund by \$8.2 billion in fiscal year 2023, a reduction of 34 percent. The overall per capita state and local government tax burden in Arizona relative to the national average dropped from 4 percent below average in the early 1990s to 26 percent below average in fiscal year 2021, the latest year of data. To reach the national average, an additional \$11.4 billion in state and local government tax revenue would have been needed.

The lack of supply-side effects from the tax reductions implemented since the early 1990s in Arizona does not invalidate supply-side theory or the “Laffer Curve.” Instead, the conditions that must be present for reductions in taxes to result in gains in economic activity and increased government revenue were not in place in Arizona.

Supply-side benefits have not been realized in Arizona for several reasons:

- Even in the early 1990s when the tax reductions began, the overall state and local government tax burden in Arizona was not higher than average. The “Laffer Curve” indicates that benefits will occur only if the tax reduction is made to a tax rate that is higher than the revenue-maximizing rate.
- Individual taxes have been disproportionately reduced. Significant reductions in business taxes did not occur until the 2010s. The relationship between taxes and economic growth is much stronger for business taxes than for individual taxes.
- State and local government taxes are a relatively small expense to businesses, and only the minority of businesses engaged in traded activities can boost a region’s economic growth. Thus, only a small supply-side effect should be expected even if relatively high state and local government taxes are reduced to the revenue-maximizing rate.
- The tax cuts in Arizona have been accompanied by spending reductions for public programs valued by businesses, such as education and transportation. The state’s business climate has suffered due to these expenditure cuts.
- Even if all of the other conditions are met, in a state such as Arizona that typically has a low unemployment rate and low commercial real estate vacancy rates, a *net* benefit to government finance will not be realized. Workers would need to be imported from outside the state to accommodate the increase in economic activity, meaning that government expenditures would rise to serve the new residents and businesses.

CONCEPTUAL BACKGROUND

Nearly any position on the relationship between state and local government tax burdens and economic performance is supported in the published literature. However, the bulk of the modern literature indicates that state and local government taxes have only a small effect on economic growth.

The impact is small because state and local government taxes are not that significant an expense to either households or businesses — in contrast to federal government taxes. For example, the National Bureau of Economic Research (NBER) estimated that the average marginal state individual income tax rate on wages was 3.31 percent in 2014 in Arizona, while the federal rate was 6.5 times higher at 21.61 percent.¹

Further, taxes merely represent the price paid for government services consumed, with many state and local government services — such as education, road construction and maintenance, and public safety — of high value to individuals and businesses alike.

State and local government tax burdens must be far out of line with competitor regions before much of an effect on the economy can be measured. For a state, a tax cut will have little effect on the economy unless the tax burden is comparatively quite high (especially versus competing states) and the tax reduction is very large. In general, tax policy is an inefficient way to stimulate the economy. Investments in infrastructure and education have been shown to have greater effects on economic performance.

Taxes as an Expense

Despite the attention given to taxes, state and local government tax payments are a small expense for most businesses. The *Almanac of Business and Industrial Financial Ratios* is based on information that is released by the Internal Revenue Service and derived from federal tax returns filed by businesses. It indicates that federal, state and local taxes combined — except for the federal income tax — typically account for only a little more than 2 percent of the operating income of the average business. Since this average includes some federal taxes, state and local government taxes are less than 2 percent of business operating income for the average business.

For perspective, the compensation of company officers is a larger expense than state and local government taxes for the average company. Therefore, the difference in effective state and local government tax rates between states would have to be very large to have a noticeable effect on a company's balance sheet.

The importance of state and local government taxes to a business depends on the nature of the business. The market area of most businesses, such as retailers and barber shops, is local, ranging from a neighborhood up to a metropolitan area. Proximity to their customers is important to such businesses. State government taxes do not have a competitive effect on these companies since

¹ The NBER used microdata from the Internal Revenue Service to calculate the sum of the income tax liabilities owed by all taxpayers in a state in a year. They then increased income by 1 percent for each taxpayer and recalculated the tax — the 3.31 percent for the state individual income tax in Arizona in 2014 is the ratio of the additional tax to the additional income; see <http://users.nber.org/~taxsim/state-marginal/>.

their competitors are subject to the same taxes. As with other business costs, the taxes paid by these population-serving businesses are passed on to consumers in the price of the company's goods and services.

In contrast, based on employment, about one-third of the U.S. economy is classified as being in “traded clusters.”² Companies in traded clusters sell their products to customers over a large geographic area, typically operating in a national or international market. With the exception of traded companies tied to a specific physical location, such as a mine, traded companies are mobile. They have considerable freedom in choosing the location for their facilities. Thus, the state and local government tax burden is a location factor for most traded companies, but ranks well down the list of site location factors. The most important of the factors that determine the location of a traded operation are labor force issues — including cost, quality, and availability — and the availability and quality of the physical infrastructure.

To entice a company to locate in their community, many state and local governments grant tax incentives, tax credits, and tax exemptions to businesses. A rational profit-seeking business will avail itself of such opportunities, even if the magnitude of the cost savings is small. However, in site location decisions, such tax breaks can be a deciding factor only if two or more locations are viewed essentially equally on all other factors.

The Laffer Curve and Supply-Side Economics

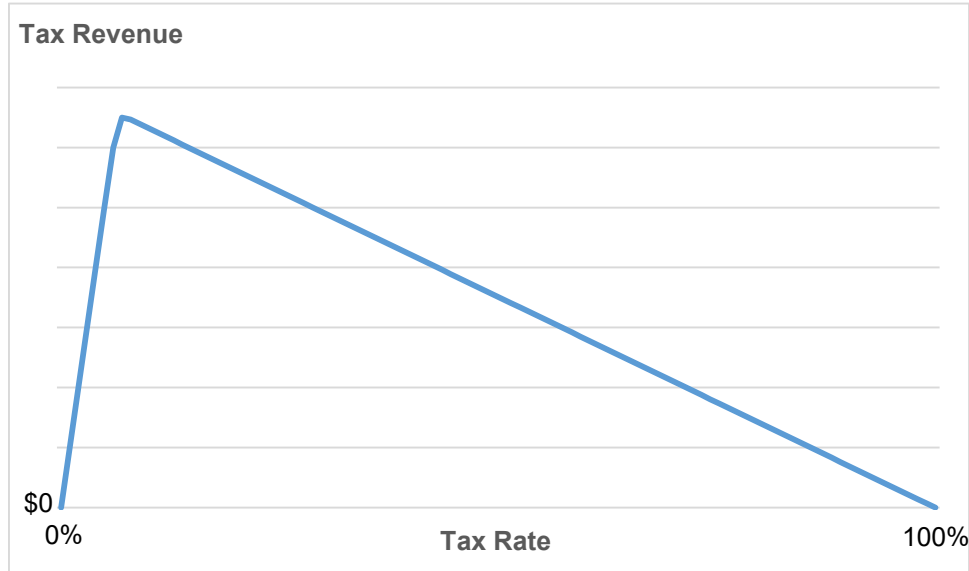
Supply-side economics is based on the concept that tax reductions stimulate economic growth, with the stimulus so great that government revenue rises despite the lower tax rates. The economist Arthur Laffer brought this relationship into the popular literature in the 1970s. Initially, his focus was national, particularly the federal income tax, which had very high tax rates in the 1970s. However, the “Laffer Curve” conceptually applies to state and local government tax rates as well. In reality, the Laffer Curve is a mathematical relationship (Rolle's Theorem), the analytical foundations of which were established centuries ago.

The concept is simple. A single tax rate produces the greatest government revenue. Setting rates below this revenue-maximizing point leaves governments with less revenue but setting rates higher than the revenue-maximizing point has a negative impact on economic activity, which results in lower tax collections despite the higher tax rate. The relationship between tax rates and revenue collected follows a curve. The exact shape of the curve is unknown and may vary over time and by place. However, the end points always are the same. A tax rate of zero results in no public revenue while a 100 percent tax rate would cause all legal economic activity to cease and therefore result in no public revenue.

An example of a Laffer Curve is shown in Chart 1. This example is based on state government corporate income tax rates. The median top rate among the states in 2023 is 6.75 percent; this is assumed to be the revenue-maximizing rate. The tax revenues to the left of the revenue-maximizing rate are straightforward, being directly proportional to the tax rate. The values to the right of the revenue-maximizing rate are speculative. In this example, the amount of revenue

² See “Regional Economic Competitiveness, Part 2: Economic Clusters in Arizona,” May 2023, <https://ccpr.wpcarey.asu.edu/sites/default/files/2023-05/reglcompb05-23.pdf>.

**CHART 1
ILLUSTRATIVE LAFFER CURVE**



Source: Authors' illustration.

collected is assumed to decline on a steady basis as the tax rate rises from 6.75 percent to 100 percent.

While the general concept of supply-side economics and the Laffer Curve is simple and based on a mathematical relationship, it has a number of limitations:

- In real-world application, it is impossible to identify the tax rate that constitutes the revenue-maximizing point and to describe the exact shape of the Laffer Curve.
- The relationship may not hold when considering the effective rate of one type of tax. For example, if a region's overall tax burden is relatively high, lowering the effective tax rate on one type of tax from higher than to equal to the revenue-maximizing rate may not generate much of an economic effect if the overall tax burden remains relatively high.
- The relationship between taxes and economic growth/government revenues is much stronger for business taxes than for individual taxes.
- Since state and local government tax payments are small relative to federal tax payments and to other expenses, a decrease in a state or local tax rate that is higher than the revenue-maximizing rate will have a relatively small supply-side effect. For example, Arizona's personal income tax rate is 2.5 percent. Nationally, the top rate is 37 percent. The federal rate was as high as 90 percent in the 1960s.
- If a regional economy is at full capacity (low unemployment rate and low business and industrial building vacancy rates), then a boost to the economy from a reduction in taxes will not have a *net* positive effect on government finances. To accommodate the increase in economic growth, more people will have to move to the region to fill the new jobs created. Thus, while government revenues may increase, public expenditures will increase as well in order to serve the new residents and businesses.

The Laffer Curve demonstrates that when an effective tax rate is higher than the revenue-maximizing rate, a tax reduction can result in increased government revenue. If an effective tax rate is at or less than the revenue-maximizing rate, however, a tax reduction will result in a decrease in government revenue. This distinction has been lost in many discussions of taxation. Some proponents of limited government erroneously argue that tax rates are always higher than optimal and that reduced taxation always is beneficial.

Apart from the Laffer Curve, some proponents of tax cuts argue that any income tax cut will reduce the disincentive of an individual to work, thereby boosting productivity and economic growth. While this argument may be valid if the federal income tax rate is very high, it is difficult to imagine that there is a disincentive to work caused by state income tax rates that typically are substantially less than 10 percent.

Application to State and Local Economies

States compete for traded economic activity that is mobile. Capital and labor can move easily throughout the country. Under these conditions, the revenue-maximizing rate for state and local government taxes might be considered to be the average among the states. If the rate is higher than average, a state could lose traded economic activities to other states. If the rate is lower than average, any additional economic activity gained will not offset the lower tax collections from all existing individuals and/or businesses subject to the tax.

While tax rates may influence capital and labor mobility across the states and give rise to Laffer-type effects, capital and labor move for a host of reasons. The amount and quality of public infrastructure (such as airports, roads, and schools) available in a region — amenities supported by state and local government tax revenue — are among the factors strongly influencing economic growth. So, an alternative definition of the optimal tax rate in a state is the rate that allows sufficient investment in public amenities that foster economic growth without imposing tax burdens that negatively affect the economy.

For a state or local government tax reduction to result in much of a positive effect on economic growth and government revenue, the prior tax rate must have been very high and the new tax burden must be near the revenue-maximizing point. A much greater economic impact is likely from a reduction in business taxes meeting these criteria than in a reduction in personal taxes. One business decision (for example, in site selection) can affect many workers but few individuals would decide to start a traded business that would employ many workers based on a reduction in individual taxes. Instead, a tax reduction to individuals primarily results in an increase in consumer spending, whose positive effect on the local economy is negated by the offsetting reduction in government expenditures.

Further, for a *net* positive effect to accrue to government finance from a state or local government tax cut, the state must have underutilized resources. For example, if a state with relatively high tax rates also has high unemployment and high commercial and industrial vacancy rates, then a reduction in taxes to near the revenue-maximizing point might stimulate economic growth, putting more residents to work and more highly utilizing existing facilities. Since labor to support the faster economic growth would not have to be imported to the state, population growth would not accelerate. Thus, the increase in government revenue would not be

offset by the need to increase public spending to support new residents. The need for government expenditures would fall as unemployed people find jobs and stop using public welfare programs.

The argument that reducing the individual income tax boosts economic growth by encouraging individuals to work more has little, if any, application in Arizona, which has had a low personal income tax rate. Individual income tax cuts have invariably eroded government revenues. The loss of revenue has forced reductions in public spending to be made. With income tax revenues largely deposited to the state general fund and with public education still receiving half of the appropriations from the general fund, reductions in spending on public education have been necessary to balance the general fund. Education has a positive effect on productivity. Thus, attempts to increase productivity through tax cuts are counterproductive when the loss of revenue leads to reductions in the effort to develop requisite workforce skills.

Value of Public Services

Over time, some supply-side supporters have moved to a position that any tax cut is good for the economy and enhances public revenue — which violates the Laffer Curve. Moreover, the idea that lower taxes always are better ignores the purpose of taxation.

Taxes are the price paid for a service that is publicly provided. Particularly at the state and local level, many government services directly impact residents and businesses: road building and maintenance, police and fire protection, the judicial system, the correctional system, water provision and sewer services, collection of trash, the educational system, etc. Many public services — particularly education (prekindergarten through graduate school) and the physical infrastructure — are of key importance to traded companies. For these types of companies, the provision of public services is more important than the level of taxes. Thus, business climate benefits from investment in various public programs.

Empirical evidence exists that public infrastructure plays a role in increasing business investment, job creation, and economic growth. Similarly, tax reductions financed by cutting education, infrastructure spending, and other services valued by businesses likely will have a negative effect on economic performance.

One argument sometimes used to justify tax reductions is that taxes remove money from the economy. In reality, tax revenue is spent in much the same way as revenue received by a company: paying employees, purchasing materials from the private sector, etc. On average, a higher portion of public-sector spending is for personnel while private-sector firms spend a higher portion of their revenue on raw materials and manufactured goods, much of which must be purchased from outside the region. Because of this, public-sector expenditures stay within the state's economy to a greater extent than private-sector expenditures. In other words, the in-state multiplier effect is higher for public-sector spending than for private-sector spending.

Studies of the Effects of Taxes on Economic Growth

A report on income taxes from the Office of the University Economist included a section summarizing the literature on the relationship between taxes and economic growth.³ That review noted the lack of consensus across studies and pointed out that some of the studies have been done by advocacy groups and think tanks that have a particular position on the issue.

The approaches and methodology used in the studies vary greatly. Those studies finding a negative effect of taxes on economic growth often did not adequately address methodological issues, and/or did not adequately consider other factors that affect economic performance, and/or did not explicitly consider the benefits that result from public spending. Even if otherwise sound, those studies finding a negative relationship between taxes and economic performance that did not consider the benefits from public services need to be interpreted not as simply “high taxes decrease economic growth” but rather as “high taxes decrease economic growth, holding public services constant.” However, given the balanced-budget requirement faced by state and local governments, it is virtually impossible to lower taxes without reducing public services. Even in the situation where a relatively high tax burden is significantly lowered, the boost in revenue resulting from enhanced economic growth takes years to be fully realized.

Another limitation of the studies is that they have not adequately considered the conditions under which supply-side economics operates, such as not distinguishing between a tax reduction made in a state with a relatively low tax burden from one made in a state with a relatively high tax burden. Thus, it is no surprise that academic studies that do not differentiate between these factors have inconsistent and often inconclusive results.

³ Tim Hogan, “Arizona’s Income Taxes: A Comparison With Other States and a Policy Discussion of Potential Tax Reforms,” July 2016, starting on page 36, <https://wpcarey.asu.edu/sites/default/files/incometax07-16.pdf>.

TAX BURDEN AND TAX CHANGES IN ARIZONA

This section begins with a review of the state and local government tax burden in Arizona relative to the national average, currently and over time. Comparisons also are made to 15 states located in the West or Southeast: Arizona, California, Colorado, Florida, Georgia, Idaho, Nevada, New Mexico, North Carolina, Oregon, South Carolina, Texas, Utah, Virginia, and Washington. Then, a detailed review of the state government changes in tax policy in Arizona since the 1970s is presented.

Tax Burden in Arizona

Numerous comparisons of the state and local government tax burden by state are available, but some of the studies are incomplete or otherwise unreliable. Most studies look at the total tax burden paid by individuals and businesses combined, but a few studies focus on either individual tax burdens or business tax burdens.

Total Tax Burden

The latest state and local government finance data from the U.S. Census Bureau are for fiscal year 2021. State and local government taxes per \$1,000 of personal income were 15.6 percent less than the U.S. average in Arizona, ranking 43rd among the 50 states and the District of Columbia. Arizona ranked 12th among the 15 comparison states — the tax burden was lower in Florida, Georgia, and Texas. On a per capita basis adjusted for the cost of living — using the regional price parity estimates produced by the U.S. Bureau of Economic Analysis — Arizona ranked 48th nationally at 24.9 percent below average. Arizona ranked 14th among the comparison states; only Florida had a lower tax burden.⁴⁵

The historical record of the Census Bureau's state and local government tax data is shown in Chart 2, with the Arizona figures expressed as a percentage of the national average on each of three measures: per capita, per \$1,000 of personal income, and per capita adjusted for the cost of living.⁶ Prior to 1980, Arizona's tax burden was near the national average on a per capita basis and generally above average relative to personal income. Arizona's tax burden relative to the national average has declined significantly since then, with the bulk of the decline occurring after the early 1990s.

The Tax Foundation provides a comparison of total state and local government tax burdens by state from 1977 through 2022 using a methodology different from that of the Census Bureau.⁷ The tax measure and the income measure used by the Tax Foundation differ from those used by

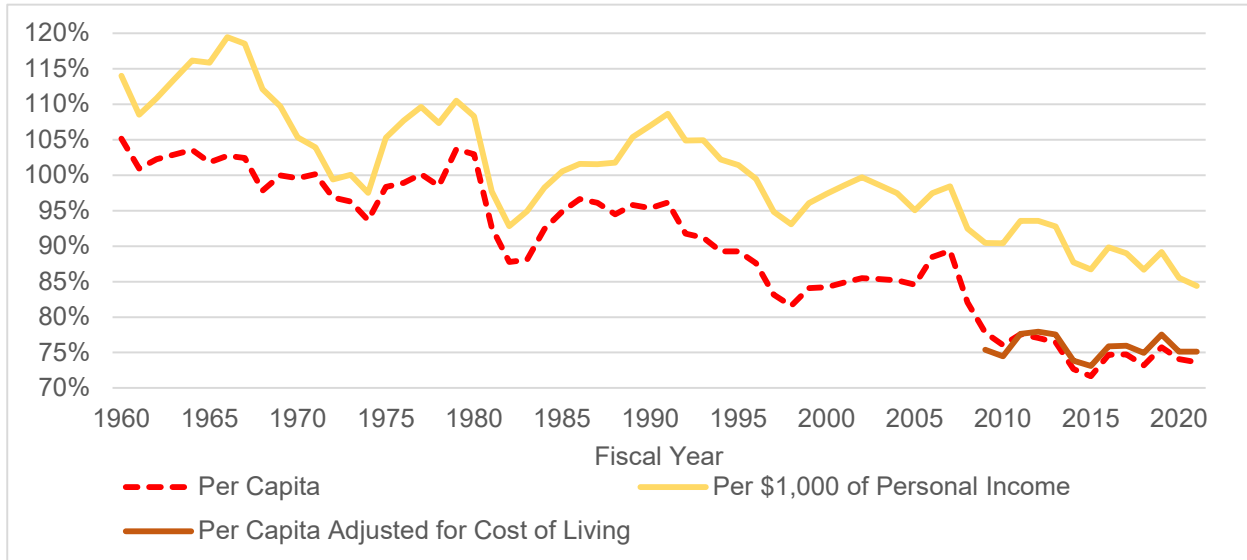
⁴ The difference in Arizona's comparison between the per capita and per \$1,000 of personal income measures is due to the low per capita personal income in Arizona. In FY 2021, per capita personal income in Arizona was 11.4 percent below the U.S. average after adjusting for the cost of living, ranking 44th nationally and 13th among 15 comparison states.

⁵ The two most common ways to analyze public finance data are per capita and per \$1,000 of personal income. The latter measure considers the "ability to pay" but has its limitations. For example, if a state with low incomes limits its revenue collection for this reason, it is unlikely to have the resources to improve the standard of living of its residents.

⁶ Regional price parity estimates begin with calendar year 2008; thus the earliest fiscal year cost-of-living estimate is for 2009.

⁷ Tax Foundation, *State and Local Tax Burdens, Calendar Year 2022*, April 2022, <https://taxfoundation.org/publications/state-local-tax-burden-rankings/>.

**CHART 2
STATE AND LOCAL GOVERNMENT TAX BURDEN IN ARIZONA
AS A PERCENTAGE OF THE U.S. AVERAGE**



Source: Calculated from U.S. Department of Commerce, Census Bureau, <https://www.census.gov/programs-surveys/gov-finances.html> (tax collections) and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income, population, and cost of living).

the Census Bureau. However, the Tax Foundation’s results are similar to those using the Census Bureau’s data. In 2022, the total amount of taxes collected in Arizona was 9.5 percent of per capita income, 15 percent less than the national average of 11.2 percent. Arizona’s figure was 15th lowest among the 50 states. Four comparison states had a lower figure: Florida, Georgia, South Carolina, and Texas.

Using the Tax Foundation’s data, Arizona’s tax burden was similar to the national average from 1977 through 1980 and from 1989 through 1991, but otherwise has been below average. The largest differential was in 2022.

Based on the Census Bureau’s data for FY 2021, Arizona’s low overall tax burden was the result of substantially below-average tax burdens for each category of tax except the general sales tax, on which Arizona ranked in the top 10 states.

Individual Tax Burden

A study of state and local government taxes paid by individuals is produced annually by the government of the District of Columbia.⁸ For a hypothetical family of three living in the largest

⁸ Government of the District of Columbia, *Tax Rates and Tax Burdens in the District of Columbia — A Nationwide Comparison, 2020*, May 2023, <https://ora-cfo.dc.gov/sites/default/files/dc/sites/ora-cfo/publication/attachments/2021%20Tax%20Rates%20and%20Tax%20Burdens%20-%20Nationwide%20Comparison.pdf>. While this study has been produced annually for a number of years, changes in methodology preclude viewing the results as a time series.

city in each state and in the District of Columbia, the amount of state and local government taxes paid are calculated based on the applicable tax laws for four types of taxes — which together account for a very high share of total tax revenue — at each of five income levels, ranging from \$25,000 to \$150,000. The latest data are for 2021, which predates the change to a single tax rate in Arizona.

In tax year 2021, Arizona employed a graduated income tax rate. For married couples filing jointly, the tax rate was 2.59 percent for incomes up to \$55,615; 3.34 percent for incomes from \$55,615 up to \$111,229; 4.17 percent for incomes from \$111,229 up to \$333,684; and 4.50 percent for higher incomes. In tax year 2022 there were just two rates: 2.55 percent for incomes up to \$57,306 and 2.98 percent for higher incomes. In tax year 2023, a single rate of 2.5 percent is in place. The result of this switch from a progressive tax rate to a single tax rate with the rate modestly below the lowest rate used in the past is a very large tax reduction overall — the Arizona Joint Legislative Budget Committee projects that revenue from the individual income tax in fiscal year 2024 will be nearly \$2.1 billion lower due to this switch to a lower, single tax rate. The tax payment will barely drop for low-income households but will fall considerably for taxpayers with high incomes.

According to the District of Columbia study, individual income tax payments in Phoenix were less than half of the median of the cities at incomes of \$50,000 or more (see Table 1). Property tax payments also were below average except at the lowest income level. By income level, the amount of sales tax paid was approximately 14-to-17 percent above average in Phoenix. Relative to the average of the 51 cities, total tax payments in Phoenix were well below average except at the \$25,000 household income level.

Individual income taxes are examined in more detail in a study done by the Minnesota Center for Fiscal Excellence that examines the tax payment at several levels of income for several types of taxpayers: single, head of household, married filing jointly, single senior, and married senior.⁹ However, the latest data for 2021 predates the change to a single tax rate in Arizona. The Minnesota Center for Fiscal Excellence study demonstrates that Arizona already was near the bottom of the states that levy an individual income tax before the switch to a single tax rate occurred. This is demonstrated in Table 2 for married couples filing jointly. Table 2 indicates that under the old system the tax burden in Arizona was considerably below average except for those at low incomes and that the tax rate increased with income.

The results from the Minnesota Center for Fiscal Excellence study are in line with those from the District of Columbia study, showing that individual income taxes in Arizona from a national perspective at incomes of \$50,000 and more were very low even before the switch to the single tax rate. This is verified by the Census Bureau's data: in FY 2021, individual income tax collections per capita adjusted for the cost of living were 44 percent less than the national average, ranking 40th.

The District of Columbia and the Minnesota Center for Fiscal Excellence studies provide data on the tax burden by income. More detail on the tax burden by income is available in a study by the

⁹ Minnesota Center for Fiscal Excellence, *Comparison of Individual Income Tax Burdens by State, 2021 Edition*, May 2021, <https://www.fiscalexcellence.org/our-studies/2021-income-tax-study.pdf>.

**TABLE 1
TAXES PAID BY HOUSEHOLDS IN PHOENIX IN 2021**

Tax Payment as a Percentage of the Average of 51 Cities and Rank Among 51 Cities Nationwide/15 Comparison Cities*

Household Income	Income Tax		Property Tax		Sales Tax		Automotive Taxes		Total	
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank
\$25,000	-%	30/10	103.3%	20/9	114.1%	19/8	90.5%	27/9	108.5%	16/7
\$50,000	37.8	40/10	93.5	25/8	115.5	18/8	119.9	16/5	90.2	32/9
\$75,000	42.7	40/10	89.3	25/8	116.4	22/6	104.0	22/6	84.9	38/10
\$100,000	47.4	40/10	87.6	26/9	116.0	18/8	106.9	19/5	83.8	39/10
\$150,000	52.1	40/10	85.1	27/10	117.5	18/8	131.9	15/6	84.1	40/11

* A rank of 1 indicates the highest tax payments.

Source: Government of the District of Columbia, *Tax Rates and Tax Burdens in the District of Columbia — A Nationwide Comparison, 2021*, May 2023, <https://ora-cfo.dc.gov/sites/default/files/dc/sites/ora-cfo/publication/attachments/2021%20Tax%20Rates%20and%20Tax%20Burdens%20-%20Nationwide%20Comparison.pdf>.

**TABLE 2
INDIVIDUAL INCOME TAXES PAYABLE IN ARIZONA IN 2021,
MARRIED COUPLE FILING JOINTLY**

Income	Tax Due	Tax as Percent of U.S. Average	National Rank*	Comparison Rank**	Tax as Percent of Income
\$20,000	\$-100	***	20	10	-0.50%
\$35,000	305	^%	16	4	0.87
\$50,000	698	56.1	29	7	1.40
\$75,000	1,398	55.0	39	10	1.86
\$100,000	2,164	55.6	40	10	2.16
\$150,000	3,811	54.7	41	11	2.54
\$250,000	7,754	59.1	41	11	3.10
\$500,000	16,533	69.6	40	11	3.31
\$1,000,000	38,547	63.3	38	11	3.85

* Among 42 states that levy the tax, where a rank of 1 indicates the highest tax payments.

** Among 11 comparison states that levy the tax, where a rank of 1 indicates the highest tax payments.

*** The U.S. average also is negative.

^ The national average is only \$69.

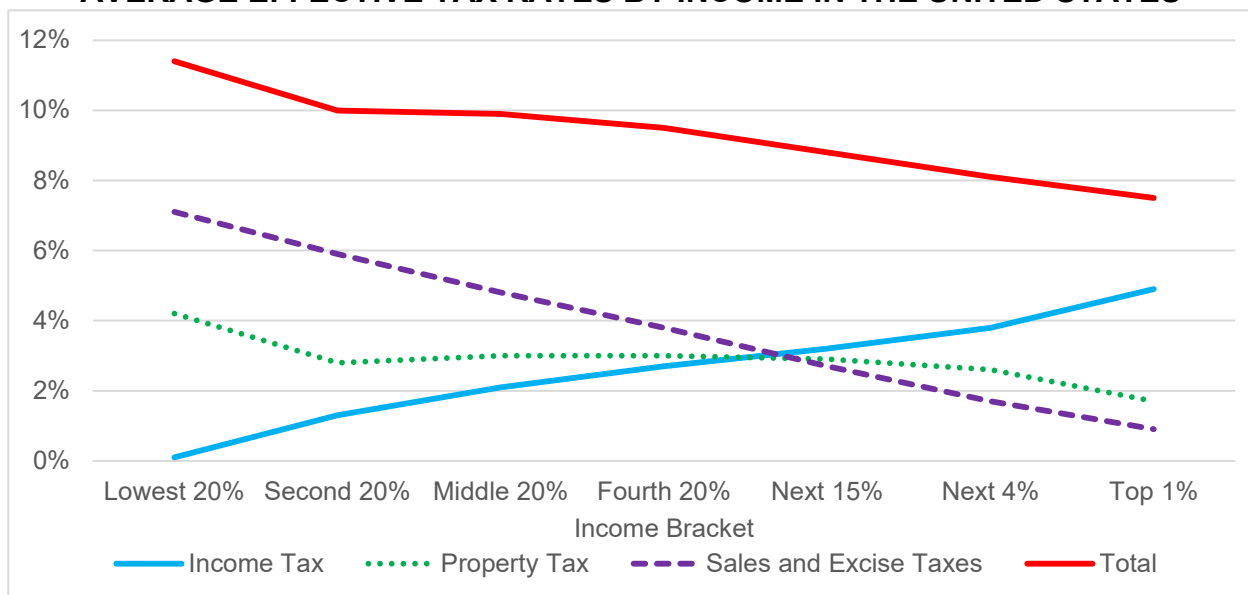
Source: Minnesota Center for Fiscal Excellence, *Comparison of Individual Income Tax Burdens by State, 2021 Edition*, May 2021, <https://www.fiscalexcellence.org/our-studies/2021-income-tax-study.pdf>.

Institute on Taxation & Economic Policy (ITEP).¹⁰ As seen in Chart 3, the overall individual state and local government tax burden in the United States is regressive: low-income individuals pay a higher share of their income in taxes than do high-income individuals. This largely is due to high reliance on very regressive sales and excise taxes — lower-income households spend a much higher proportion of their income on taxable goods than do high-income households. The property tax is somewhat regressive; renters, who disproportionately have lower incomes, pay a higher share of their income on property taxes than do homeowners. In most states, the individual income tax is designed to be progressive, helping to offset the regressivity of the other taxes. However, a growing number of states, including Arizona, have shifted to some form of a flat income tax.

At the time of the latest ITEP study in 2018, the tax system in Arizona was the 11th-most regressive among the states. Four of the comparison states — Florida, Nevada, Texas, and Washington — had a more regressive system, largely due to the absence of an individual income tax. The switch to a single income tax rate will substantially worsen Arizona’s tax regressivity.

Property taxes are examined in more detail in a study done by the Lincoln Institute of Land Policy in conjunction with the Minnesota Center for Fiscal Excellence.¹¹ The study includes residential, commercial, industrial, and apartment property taxes by city — for the largest city in

CHART 3
AVERAGE EFFECTIVE TAX RATES BY INCOME IN THE UNITED STATES



Source: Institute on Taxation & Economic Policy, *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*, October 2018, <http://www.itep.org/whopays/>.

¹⁰ Institute on Taxation & Economic Policy, *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*, October 2018, <http://www.itep.org/whopays/>.

¹¹ Minnesota Center for Fiscal Excellence and the Lincoln Institute of Land Policy, *50-State Property Tax Comparison Study*, July 2022, <https://www.lincolninst.edu/publications/other/50-state-property-tax-comparison-study-2021>.

each state¹² and for the 50 largest cities in the nation. However, even within a city, the property tax varies with the boundaries of school districts and special districts.

Residential property taxes were calculated in four ways in the Lincoln Institute of Land Policy report: for a home worth \$150,000, a home worth \$300,000, the median-valued home in each city, and the median-valued home after applying assessment limits. In some states or cities, including Arizona, growth in the assessed value of a property is limited for the term of ownership by one owner. Thus, the tax payment of two equally assessed homes varies based on the length of ownership.

As seen in Table 3, residential property taxes were somewhat below the national average in Phoenix in 2021 for properties valued at \$150,000 and \$300,000, though the tax was higher than the middle of the cities in the 15 comparison states. The tax payment was at the national average for the median-priced home (\$290,041 in Phoenix), but considerably below average for those homeowners benefiting from an assessment limit.

In addition to the comparison of Phoenix to the largest city in each state, the Lincoln Institute study includes Mesa, Phoenix, and Tucson in its analysis of the nation’s 50 largest cities.

**TABLE 3
PROPERTY TAXES PAYABLE IN PHOENIX IN 2021**

Category and Value	Ratio to National Average	National Rank*	Comparison Rank**
Residence, \$150,000	93.3%	26	4
Residence, \$300,000	89.9	30	5
Residence, Median Value	99.7	22	7
Residence, Median Value***	72.8	37	13
Commercial, \$100,000	122.4	15	3
Commercial, \$1 Million	118.2	17	3
Commercial, \$25 Million	139.8	11	1
Industrial, \$100,000, 50% Personal Property	101.1	24	6
Industrial, \$1 Million, 50% Personal Property	138.5	10	4
Industrial, \$25 Million, 50% Personal Property	155.2	8	3
Industrial, \$100,000, 60% Personal Property	89.5	29	7
Industrial, \$1 Million, 60% Personal Property	149.2	11	4
Industrial, \$25 Million, 60% Personal Property	163.4	7	3
Apartment, \$600,000	80.4	34	7

* Among 53 large cities nationwide, where a rank of 1 indicates the highest tax payments.

** Among 15 large cities in comparison states, where a rank of 1 indicates the highest tax payments.

*** Considering assessment limits

Source: Minnesota Center for Fiscal Excellence and the Lincoln Institute of Land Policy, *50-State Property Tax Comparison Study*, July 2022, <https://www.lincolnst.edu/publications/other/50-state-property-tax-comparison-study-2021>.

¹² The list includes 53 cities: the largest city in each state, Washington, D.C., and a second city in Illinois and New York.

Residential property taxes in Phoenix were further below the average of these 50 cities than the average of the largest city in each state. In Mesa and Tucson, residential property taxes were lower than in Phoenix, considerably below the average of the 50 largest cities.

The Lincoln Institute results generally are consistent with those of the District of Columbia tax study, each reporting that residential property taxes in Phoenix were below average (except at the lowest income level in the District of Columbia study, at which households are assumed to be renters). Residential property taxes for homeowners in Phoenix are a little below average for those not eligible for the assessment limit and considerably below average for those qualifying for the assessment limit.

Business Tax Burden

All taxes paid by businesses are included in a study produced by Ernst & Young for the Council on State Taxation.¹³ The study identifies seven categories of business taxes: property, sales, excise (such as the motor fuel tax), corporate income, individual income when used for pass-through business income, unemployment insurance, and license and other taxes (such as severance taxes). The amount of taxes paid by businesses during fiscal year 2021 was determined through a combination of detailed data collection and modeling. To compare states, the total amount of business taxes paid is expressed as a percentage of private-sector gross domestic product.

As seen in Table 4, the overall business tax burden in Arizona in FY 2021 was substantially less than the national average. Only sales taxes paid by businesses were higher than the national average. Property taxes, the largest category, were 14 percent below average in Arizona, while the tax burden for each of the other business tax categories was at least 24 percent below average. Relative to the rest of the nation, the business tax burden in Arizona has fallen substantially from above to be low average over the last decade.

The Census Bureau's figures for FY 2021 for the corporate income tax — the per capita tax adjusted by the cost of living was 57 percent below the national average, ranking 43rd — are very much in line with Ernst & Young's findings.

The business share of all state government taxes in Arizona was below the national average in FY 2021, but the business share of local government taxes was slightly above average. In addition, the Ernst & Young study looks at the issue of the amount of business taxes paid versus the benefits businesses receive from state and local government services. A number of assumptions must be made in pursuing such an analysis. Ernst & Young conclude that business taxes nationally are high relative to the services received. In Arizona, the business tax burden relative to the value of the public services received is not as high.

The study done by the Lincoln Institute of Land Policy and the Minnesota Center for Fiscal Excellence provides more detail on business property taxes. It measures commercial property taxes — limited to office buildings and other properties without inventory on site — at three

¹³ Ernst & Young, *Total State and Local Business Taxes: State-by-State Estimates for Fiscal Year 2021*, December 2022, https://www.cost.org/globalassets/cost/state-tax-resources-pdf-pages/cost-studies-articles-reports/2209-4097478_50-state-tax-2022-final-e-file.pdf.

TABLE 4
TAXES PAID BY BUSINESSES IN ARIZONA IN FISCAL YEAR 2021

Tax	Business Taxes as a Share of Private-Sector Gross Domestic Product			Share of Business Taxes	
	Ratio To			United States	Arizona
	U.S. Average	National Rank*	Comparison Rank**		
TOTAL	81.7%	45	12	100%	100%
Property	86.1	31	8	39	41
Sales	121.1	16	6	20	30
Excise	70.8	45	14	11	10
Corporate Income	44.4	47	14	12	6
Individual Income	46.3	40	10	6	4
Unemployment Insurance	75.9	37	7	4	3
License/Other	59.6	42	12	8	6

* Rank among 51 “states,” where a rank of 1 indicates the highest tax payments.

** Rank among 15 comparison states, where a rank of 1 indicates the highest tax payments.

Source: Ernst & Young, *Total State and Local Business Taxes: State-by-State Estimates for Fiscal Year 2021*, December 2022, https://www.cost.org/globalassets/cost/state-tax-resources-pdf-pages/cost-studies-articles-reports/2209-4097478_50-state-tax-2022-final-e-file.pdf.

values of assessed real property. It assumes that personal property in the form of fixtures is worth 20 percent of the value of the real property. As seen in Table 3, commercial property taxes in Phoenix in 2021 were considerably above the national average.

Industrial property taxes also were measured at three values of real property. The industrial properties are assumed to be manufacturing facilities with machinery and equipment and inventories on site. The value of the personal property is assumed to account for either 50 percent or 60 percent of the total value of real and personal property. Industrial property taxes in Phoenix in 2021 were near the national average at low values, but considerably above average at high values.

Apartment property taxes were estimated at only a value of \$600,000, with an additional \$30,000 in personal property. Phoenix was below the national average in 2021 in apartment property taxes.

Phoenix compared somewhat more favorably, especially for industrial properties, against the average of the 50 largest cities than the average of the largest city in each state. Compared to Phoenix, business property taxes were somewhat lower in Tucson and considerably lower in Mesa.

It is difficult to compare the results of the Lincoln Institute study to those of the Ernst & Young study since the latter study is done at the state level and all business property taxes are placed into one category. The Lincoln Institute study is done only for three Arizona cities and does not provide a measure of overall business property taxes.

Tax Changes in Arizona

This subsection concentrates on changes in state government tax policy since the 1970s but data also are provided for combined state and local government taxes. Three measures of Arizona taxes are examined in this subsection:

- State government general fund tax revenue reported by Arizona's Joint Legislative Budget Committee (JLBC) for fiscal years 1971 through 2023, expressed per \$1,000 of personal income. The fiscal year runs from July 1 through June 30.
- The JLBC has estimated the revenue impact to the state government general fund of every state government tax law change passed since 1989, expressed in unadjusted dollars.
- Total state and local government tax revenue reported by the U.S. Census Bureau for fiscal years 1960 through 2021, expressed per \$1,000 of personal income. The figures for Arizona can be compared to the national average and to other states.

Each of the measures express the tax changes as of the year(s) in which they become effective. Since some of the changes in tax laws have been delayed and/or phased in, the date at which the changes have been passed by the Legislature is less important than the time at which they become effective.

The first and third measures are displayed in Chart 4. Each of these data series display fluctuations over time, due to both the economic cycle and tax law changes. The higher tax collections per \$1,000 of personal income from FYs 2021 through 2023, but particularly in FY 2022, resulted from a variety of temporary factors, including federal government stimulus payments during the pandemic, a surge in capital gains realizations, the impact of inflation on sales tax collections, a surge in real estate activity, and a strong labor market in 2022 and 2023. Tax collections per \$1,000 of personal income are expected to drop back to around \$35 to \$36.

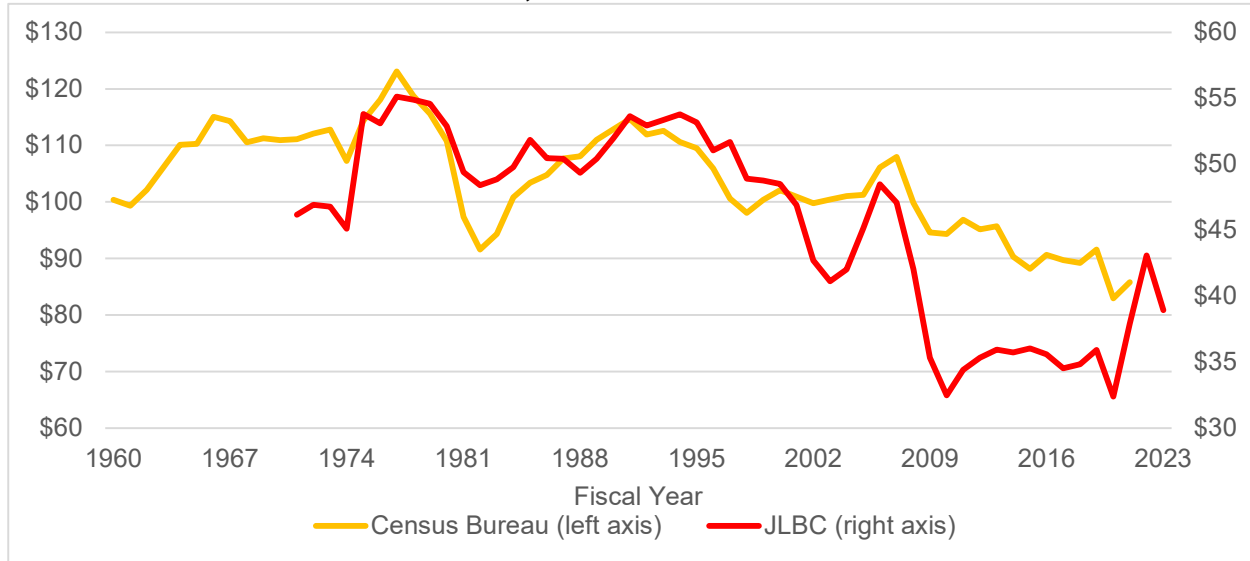
Total state and local government taxes relative to personal income have declined since the early 1990s according to the Census Bureau's time series. The more-narrow JLBC series is limited to the state's general fund; it has displayed considerably more cyclicity in recent decades. Between FY 1991 and FY 2021, the decrease in tax revenue relative to personal income was 25 percent using the Census Bureau's data and 29 percent using the JLBC's data. Most of the tax reductions in Arizona since the early 1990s have affected the state's general fund. These tax cuts have been partially offset by increases in local government taxes and voter-approved state tax increases whose revenue does not go to the general fund.

Chronology of Changes to Tax Policy

Sparked by a movement to reduce state and local government taxes (especially property taxes) that had begun in California, tax reductions were implemented from FYs 1979 through 1981 in Arizona. They were possible because of strong economic growth during the late 1970s that boosted general fund revenue. Lower property taxes were implemented in fiscal years 1979 and 1980. Effective in FY 1981, the sales tax on food to be consumed at home was eliminated.

Due to these tax cuts and a weak economy, tax revenues fell sharply through FY 1982, as seen in each measure displayed in Chart 4. In order to balance the budget, the Legislature increased the general sales tax rate, effective in FY 1984.

CHART 4
TAX COLLECTIONS PER \$1,000 OF PERSONAL INCOME IN ARIZONA



Note: The Census Bureau figures represent total tax collections; the JLBC measure is limited to tax collections deposited to the general fund.

Sources: Calculated from the Arizona Joint Legislative Budget Committee, <https://www.azjlb.gov/>; the U.S. Department of Commerce, Census Bureau, <https://www.census.gov/programs-surveys/gov-finances.html>; and the U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income).

After this tax increase, the tax burden in Arizona in the mid-to-late 1980s still was less than in the late 1960s and 1970s. Arizona’s economy slowed significantly during the late 1980s, lowering tax collections to the state’s general fund and revealing a structural deficit. The Legislature responded by both reducing spending and increasing revenue. Tax increases were implemented in Arizona from fiscal years 1989 through 1992, though predominantly from FYs 1989 through 1991.

According to the JLBC, the tax increases between FYs 1989 and 1992 summed to \$449 million (in nominal terms). A variety of taxes were increased, with the individual income tax accounting for half of the total. Adjusting for the state’s population growth, real per capita economic growth, and inflation, the tax increases are estimated to have raised tax revenues by \$494 million in FY 1992. Since tax increases occurred in many other states from FYs 1990 through 1992, Arizona’s tax burden measured on a per capita basis remained below the national average.

Reductions in taxes began to be implemented in Arizona in fiscal year 1993 but the tax cuts were insignificant until FY 1995 (see Table 5). Substantial tax decreases were implemented from FYs 1995 through 2001. According to the JLBC, the tax reductions from FYs 1993 through 2001 totaled \$1.2 billion (in nominal terms). Chart 5 compares the magnitude of the tax changes in nominal terms to the magnitude after adjustment for personal income, which reflects the state’s population growth, real per capita economic growth, and inflation. After the adjustment, the tax increases in FYs 1989 through 1992 were more than offset by FY 1998.

TABLE 5
TAX CHANGES IMPLEMENTED SINCE FISCAL YEAR 1993, ARIZONA STATE GOVERNMENT GENERAL FUND

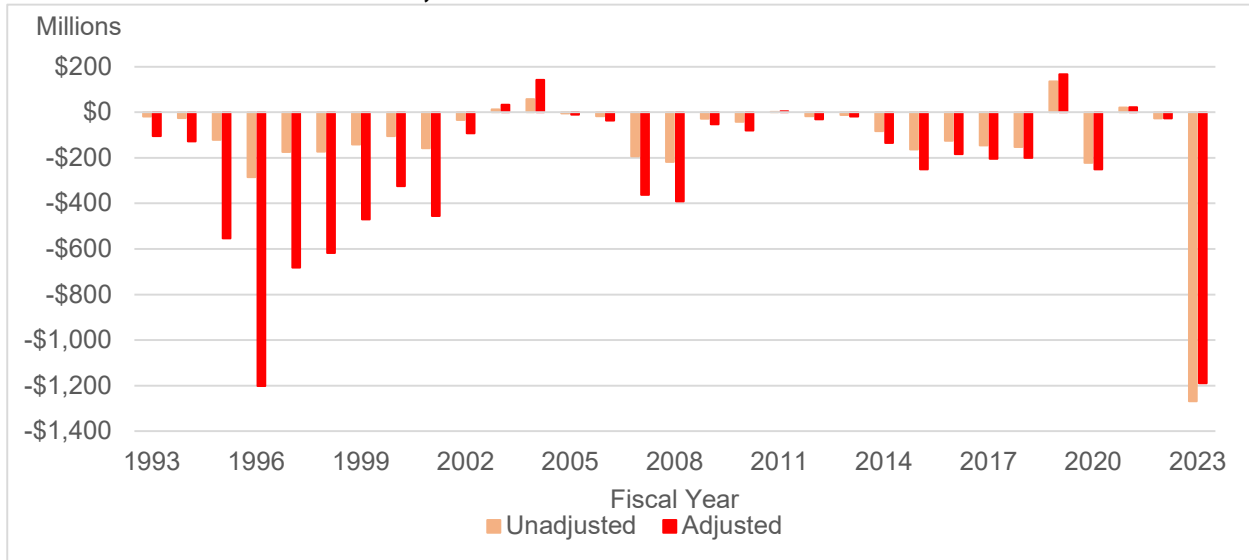
Fiscal Year	Tax Change					Actual Tax Revenue		Tax Revenue Without Tax Changes	
	Personal Income (in millions)	Nominal in Millions	Per \$1,000 of Personal Income	Cumulative per \$1,000 of Personal Income	Cumulative in Millions*	In Millions	Per \$1,000 of Personal Income	In Millions	Per \$1,000 of Personal Income
1993	\$74,370	\$-19	\$-0.26	\$-0.26	\$-19	\$3,767	\$50.65	\$3,786	\$50.91
1994	80,221	-25	-0.32	-0.58	-46	4,089	50.98	4,136	51.56
1995	88,277	-121	-1.37	-1.94	-172	4,441	50.31	4,613	52.26
1996	95,937	-285	-2.97	-4.91	-471	4,644	48.41	5,115	53.32
1997	103,657	-175	-1.68	-6.60	-684	5,014	48.37	5,698	54.97
1998	112,891	-172	-1.53	-8.12	-917	5,223	46.27	6,140	54.39
1999	121,895	-142	-1.16	-9.29	-1,132	5,659	46.43	6,791	55.71
2000	130,591	-105	-0.80	-10.09	-1,317	6,016	46.07	7,334	56.16
2001	140,224	-158	-1.13	-11.21	-1,572	6,192	44.16	7,765	55.37
2002	144,507	-33	-0.23	-11.44	-1,653	5,813	40.23	7,467	51.67
2003	151,411	12	0.08	-11.36	-1,720	5,941	39.24	7,661	50.60
2004	163,114	57	0.35	-11.01	-1,796	6,550	40.16	8,346	51.17
2005	179,216	-5	-0.03	-11.04	-1,978	7,743	43.20	9,721	54.24
2006	199,746	-18	-0.09	-11.13	-2,222	9,315	46.64	11,538	57.76
2007	216,055	-194	-0.90	-12.02	-2,598	9,737	45.07	12,335	57.09
2008	224,755	-218	-0.97	-12.99	-2,920	9,059	40.31	11,979	53.30
2009	217,847	-29	-0.13	-13.12	-2,859	7,406	34.00	10,265	47.12
2010	213,213	-42	-0.20	-13.32	-2,840	6,690	31.38	9,530	44.70
2011	222,745	2	0.01	-13.31	-2,965	7,364	33.06	10,329	46.37
2012	232,530	-18	-0.08	-13.39	-3,113	7,850	33.76	10,963	47.15
2013	240,838	-12	-0.05	-13.43	-3,235	8,296	34.45	11,532	47.88
2014	249,791	-84	-0.33	-13.77	-3,439	8,561	34.27	12,000	48.04
2015	264,688	-164	-0.62	-14.39	-3,808	9,167	34.63	12,975	49.02
2016	276,047	-126	-0.46	-14.84	-4,097	9,402	34.06	13,499	48.90
2017	290,195	-146	-0.50	-15.35	-4,454	9,602	33.09	14,056	48.44
2018	307,676	-153	-0.50	-15.84	-4,875	10,318	33.54	15,193	49.38
2019	328,635	135	0.41	-15.43	-5,072	11,271	34.30	16,343	49.73
2020	358,771	-222	-0.62	-16.05	-5,759	11,066	30.84	16,824	46.89
2021	392,949	21	0.05	-16.00	-6,286	14,346	36.51	20,632	52.51
2022	404,807	-27	-0.07	-16.06	-6,503	16,718	41.30	23,221	57.36
2023**	431,760	-1,269	-2.94	-19.00	-8,205	15,590	36.11	23,794	55.11

* Calculated as the cumulative tax change relative to personal income multiplied by personal income.

** Personal income for FY 2023 is projected.

Source: Calculated from Arizona Joint Legislative Budget Committee, <https://www.azjlb.gov/> (tax change and actual revenue) and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income).

CHART 5
ESTIMATE OF ANNUAL CHANGE IN ONGOING TAX REVENUE DUE TO STATUTORY CHANGES, ARIZONA STATE GOVERNMENT GENERAL FUND



Note: Personal income is used for the adjustment.

Source: Calculated from Arizona Joint Legislative Budget Committee, *2022 Tax Handbook*, Appendix D, <https://www.azjlbc.gov/revenues/22taxbk.pdf> (unadjusted estimates), and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income).

A variety of taxes were reduced from FYs 1993 through 2001. Half of the total impact came from individual income tax reductions — its increases from FYs 1989 through 1992 were offset by FY 1996. The tax increases were offset in FY 1995 for the sales tax, FY 1997 for the property tax, and FY 1999 for taxes other than sales, income, and property. In contrast, reductions in the corporate income tax were slow to be made — it was not until FY 2009 that the corporate income tax increases from FYs 1989 through 1992 were offset.

Table 6 summarizes the tax changes by type of tax. On a dollar basis, the individual income tax was the focus of both the tax increases from FYs 1989 through 1992 and the subsequent tax reductions. On a percentage basis, the largest tax decrease was to the property tax.

These tax changes resulted in a narrowing of the tax base used for the state’s general fund. In FY 1971, the first year of JLBC data, 65 percent of the general fund’s tax revenue came from the sales and income taxes. By FY 2001, the share was up to 89 percent; it has since remained around 90 percent. Due to the high cyclical nature of the sales tax and income tax, revenue to the state’s general fund began to swing widely with the economic cycle, dropping sharply during recessions.

Changes in tax policy implemented from FYs 2002 through 2006 were minor. Despite this, the effect of the cumulative tax cuts since FY 1993 had grown to \$2.2 billion in FY 2006 after adjusting for the state’s population growth, real per capita economic growth, and inflation. Each data series in Chart 4 shows an increase in tax revenues from FYs 2003 through 2007, but these

**TABLE 6
TAX INCREASES AND DECREASES BY TYPE OF TAX IN ARIZONA**

Type of Tax	Share of Tax Change			FY 2023 Actual Versus Without Tax Changes	
	Increases, FYs 1989-92	Net Change, FYs 1989-2023	Decreases, FYs 1993-2023	Changes, FYs 1989-2023	Changes, FYs 1993-2023
Sales	6.0%	11.7%	9.6%	-7.3%	-9.3%
Individual Income	50.0	66.2	60.1	-39.3	-48.5
Corporate Income	13.6	17.0	15.7	-32.6	-41.7
Property	22.4	0.9	9.0	-68.7	-97.2
Other	8.0	4.2	5.6	-20.7	-35.6
TOTAL	100.0	100.0	100.0	-24.7	-34.5

Source: Calculated from Arizona Joint Legislative Budget Committee.

increases were due to cyclical factors. In particular, the real estate boom led to a surge in capital gains.

Significant additional tax reductions occurred in FYs 2007 and 2008, with much lesser reductions implemented in FYs 2009 and 2010. According to the JLBC, the tax reductions over these four years summed to \$483 million (in nominal dollars). Chart 4 shows a sharp decline in revenue between FYs 2008 and 2010, due to the deep recession and the tax cuts implemented from FYs 2007 through 2010.

Limited tax law changes were implemented during FYs 2011 through 2013. However, significant tax law changes were passed by the Arizona Legislature during this period. Statutory changes made during the second special legislative session of 2011 were phased in from FYs 2012 through 2018, with most of the effects occurring from FYs 2015 through 2018. The corporate income tax accounted for 64 percent of the estimated reduction in nominal tax revenue of \$672 million from FYs 2014 through 2018, with most of the remainder from the individual income tax.

Another sizable decrease in the individual income tax took effect in FY 2020. This was followed in FY 2023 by the largest nominal tax cut of any year, due to the reduction in the income tax rates and the switch to a single tax rate. As seen in Chart 5, the FY 2023 tax cut was about equal to that of FY 1996 relative to personal income.

Taking all of the tax changes since FY 1993 into account and adjusting the nominal figures to reflect conditions in FY 2023, general fund revenue was \$8.2 billion less in FY 2023 than it would have been had no tax changes been implemented. This is a 34 percent reduction in general fund revenue.

Of the \$8.2 billion in lost general fund revenue in FY 2023 resulting from tax changes implemented since FY 1993, 60 percent (\$4.9 billion) came from the individual income tax, through rate reductions, new tax credits, etc. Revenue from the corporate income tax was cut

\$1.3 billion, accounting for 16 percent of the total. Revenue reductions totaled \$788 million from the sales tax, \$736 million from the property tax, and \$463 million from other taxes.

Using the Census Bureau's data, total state and local government tax revenue in FY 2021 in Arizona needed to be nearly \$7.5 billion higher for per capita tax revenue adjusted for the cost of living in Arizona to reach a rank of 26th among the states. In order to reach the national average for per capita tax revenue adjusted for the cost of living, an additional \$11.4 billion was needed. Note that these figures do not include the huge tax reduction tied to switching the individual income tax to a single rate.

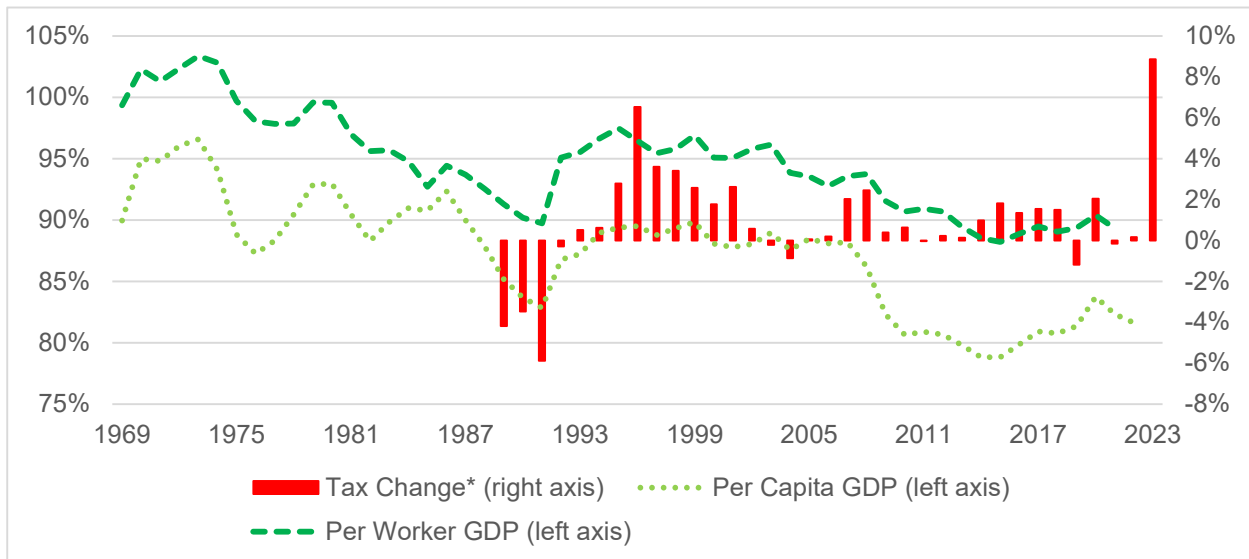
THE EFFECTS OF TAX CHANGES ON ECONOMIC GROWTH AND PUBLIC REVENUE IN ARIZONA

Each of the measures of Arizona taxes discussed in the previous section indicate that significant reductions in Arizona’s tax burden have been implemented since FY 1993, following a period of net tax reductions in the 1970s and 1980s. The question is whether these tax reductions stimulated economic growth and thereby boosted government revenues.

Tax Changes and Economic Growth

The ultimate goal of economic development is not to increase aggregate economic growth — it is to improve productivity and prosperity. Arizona’s highest levels on these measures relative to the national average occurred in the early 1970s, at a time when the tax burden in Arizona was about equal to the U.S. average — considerably higher than the tax burden of the last 25 years. This is seen in Chart 6, using the per employee and per capita versions of the broadest measure of the economy: gross state product. Since the early 1970s, a downward trend is seen in per employee GDP, with a greater decline in per capita GDP. Significant relative decreases in these measures had occurred before the tax increases of the 1989-to-1991 period and significant declines have continued since taxes were reduced.

CHART 6
PER CAPITA AND PER WORKER GROSS DOMESTIC PRODUCT IN ARIZONA AS A PERCENTAGE OF THE U.S. AVERAGE COMPARED TO TAX CHANGES



* The tax change is expressed as a percentage of state government general fund revenue. The sign on the tax change has been reversed to facilitate comparison to the two lines representing GDP.

Note: GDP is expressed on a calendar year basis; tax changes are by fiscal year.

Source: Calculated from Arizona Joint Legislative Budget Committee, *2022 Tax Handbook*, Appendix D, <https://www.azjlb.gov/revenues/22taxbk.pdf> (tax change), and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (GDP, population, and employment).

Note that following the tax increases of the 1989-to-1991 period, per capita GDP and per employee GDP each rose relative to the national average from 1992 through 1995. The downward slide resumed as the first large tax cuts were implemented. This observation does not imply causation, only that at first glance there appears to be no relationship between the change in tax burdens and subsequent economic performance in Arizona.

The empirical relationship between changes in tax laws and economic performance is examined in more detail in three ways:

- Correlations between the tax changes as estimated by the JLBC and economic growth are examined.
- Annual average economic growth by economic cycle is examined for the last six complete economic cycles, going back to 1969, and for the current cycle.
- A trendline analysis of various indicators of economic performance is conducted, differentiating between the periods before and after the tax law changes began in the early 1990s.

Correlations Between Economic Growth and Tax Changes

Various measures of economic performance can be compared to the changes in tax revenue resulting from the tax law changes. Two economic indicators — gross domestic product and earnings — measured as the inflation-adjusted annual percent change were used in the correlations with tax changes. The economic measures are reported by calendar year, while the tax changes are by fiscal year.

The real percent changes in earnings and GDP were measured in four ways:

- Aggregate for Arizona.
- Aggregate, difference between Arizona and the national average.
- Per capita for Arizona.
- Per capita, difference between Arizona and the national average.

Conceptually, the difference in the percent change between the state and the national average should be the superior measure for determining the relationship with tax changes, since the cyclical ups and downs in economic growth that equally affect the nation and Arizona are accounted for in this way.

The tax change was measured in two ways:

- Dollars adjusted by personal income.
- As a share of actual revenue in the year in which the tax change was implemented.

In the correlation analysis, the implementation date of the tax changes is used. If the tax changes caused economic conditions to change (for example, if tax reductions improved subsequent economic conditions), one would expect the change in economic conditions to lag behind the tax changes. In contrast, if the tax changes were made in response to economic conditions that caused either a deficit or surplus in the general fund budget, one would expect that economic conditions would lead the tax changes.

Timing is an issue in doing this correlation analysis in three ways. First, the calendar year economic indicators run six months behind the fiscal year tax changes. Second, most of the tax

changes that took effect during the 1990s and 2000s were passed during the regular legislative session, generally during the spring, with the tax changes taking effect in the next fiscal year beginning in July. However, in some cases tax changes were phased in over a longer period. Third, any economic impacts from tax law changes would not be complete for some time after the implementation of the tax changes, but the lag time is not known a priori.

In order to provide an indication of possible causal relationship, multiple sets of correlations were produced with the real percent change in earnings and GDP leading or lagging the change in taxes by a varying number of years. The time period of the correlation analysis covers the tax changes implemented from FY 1989 through FY 2023, a 35-year period. However, in the correlations in which economic growth lags behind the tax changes, of necessity the time period is shorter; the latest annual economic data are for 2022 or 2021.

As conceptually expected, correlations between tax changes and economic growth are higher when economic growth is measured as the difference between Arizona and the national average. Not much difference was found between the correlations based on the aggregate measures of earnings/GDP and those on a per capita basis. Similarly, there was little difference in the correlations between tax changes expressed as a dollar value adjusted by personal income and tax changes expressed as a share of total revenue.

In the correlation analysis, if a tax increase reduces economic performance, or a tax reduction improves performance, the correlation coefficient will be negative since a tax reduction is recorded as a negative value. If tax changes have an effect on subsequent economic performance, one would expect the highest negative correlations to be between tax changes in one year and economic growth in a subsequent year. However, no such relationship was found, as seen in Table 7. Instead, the highest negative correlations occur when the real percent change in earnings/GDP *leads* the tax change by two years.

**TABLE 7
CORRELATION COEFFICIENTS BETWEEN TAX LAW CHANGES IN ARIZONA
AND INFLATION-ADJUSTED ECONOMIC PERFORMANCE
MEASURED AS ARIZONA MINUS THE U.S. AVERAGE**

	Lead/Lag Time in Years*					
	-4	-2	-1	0	2	4
Aggregate Earnings	-0.08	-0.45**	-0.39*	-0.16	0.20	0.22
Per Capita Earnings	-0.20	-0.45**	-0.32	-0.09	0.18	0.08

* For example, -2 indicates that the real percent change in the economic measure leads the tax change — measured as the dollar change adjusted by personal income — by two years (e.g. the economic percent change in calendar year 1987 is linked to the tax change in fiscal year 1989).

*Significant at 95 percent level of confidence

** Significant at 99 percent level of confidence.

Calculated from Arizona Joint Legislative Budget Committee, <https://www.azjlb.com/> (tax change) and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income and real earnings).

An example illustrates the correlation. Strong economic growth in calendar year 2018 (and in prior years) boosted tax collections, resulting in a surplus in the state government's general fund. The Arizona Legislature in the spring of 2019 passed legislation to reduce the individual income tax. The tax cut became effective in fiscal year 2020 (July 2019 through June 2020).

The results of the correlation analysis indicate that most of the tax changes implemented since the early 1990s were in response to economic growth that boosted general fund revenue. When the economy is strong, surpluses in the general fund are realized, allowing taxes to be cut while still balancing the budget in the short term as required by the Arizona Constitution. When the economy is weak, budget deficits occur — either the Legislature has restricted near-term tax cuts or tax increases have occurred. Thus, there is no indication that the tax increases from FYs 1989 through 1992 harmed the economy, nor is there any evidence that the tax reductions since FY 1993 have benefited the economy.

Average Economic Growth by Economic Cycle

The Arizona and national economies are cyclical, with periods of strong economic gains interspersed with periods of contractions (economic recessions). The Arizona economy is substantially more cyclical than the national economy. Comparing annual average economic growth over entire economic cycles is one way to adjust for these cyclical variations. The year in which a recession begins was designated as the first year of an economic cycle.¹⁴

Three types of economic measures were examined: aggregate, per capita (gauges of prosperity), and per worker (proxies for productivity). The annual average percent change by economic cycle was calculated for each of multiple economic measures within each category. The primary focus was the difference in the average cyclical growth rates between Arizona and the nation, though the average growth rates for Arizona also were considered. All of the data, including population and total employment used to calculate the per capita and per worker measures, came from the U.S. Bureau of Economic Analysis.

Based on an aggregate economic indicators, economic growth in Arizona historically was much stronger than the nation during economic expansions, but recessions in Arizona were on average as deep as the national average. For the entire cycle, the average growth rate in the various aggregate measures was considerably higher than the U.S. average. On a per capita basis, gains in Arizona were greater than the U.S. average in some years during expansions, but declines during recessions were deeper than the U.S. average. For the entire cycle, the average per capita gain typically was close to the U.S. average, ranging from higher to lower. After the 1969-to-1973 cycle, Arizona has underperformed the nation on average on a per capita basis. Annual changes in the per employee measures have been less closely linked to the economic cycle. Like the per capita measures, the average growth rate by cycle in the per employee measures has ranged from a little above to a little below the U.S. average, but Arizona has underperformed the nation on average since the early 1970s.

In Table 8, the annual average percent change in the current incomplete economic cycle is compared to the annual average of each of the six prior cycles for the broadest indicators in each

¹⁴ Alternatively, the first full year of an economic expansion could be designated as the first year of a cycle.

TABLE 8
ECONOMIC GROWTH RATES BY ECONOMIC CYCLE:
INFLATION-ADJUSTED ANNUAL AVERAGE PERCENT CHANGE

Economic Cycle	Aggregate			Per Worker		Per Capita			
	GDP*	Personal Income	Earnings POW**	Employment	GDP*	Earnings POW**	GDP*	Personal Income	Earnings POR**
ARIZONA									
1969-73		9.2	8.9	6.8		2.0		3.8	3.1
1974-81		5.2	4.2	4.5		-0.3		1.6	0.4
1982-90	4.1	4.9	4.5	4.2	-0.1	0.3	1.0	1.8	1.2
1991-2000	7.0	5.7	6.4	4.0	2.9	2.3	3.4	2.2	2.9
2001-07	4.5	4.6	4.2	3.1	1.4	1.1	1.9	2.0	1.6
2008-19	1.2	2.0	1.4	1.1	0.1	0.3	0.0	0.9	0.2
2020-22^	3.1	2.7	2.3	NA	NA	NA	1.7	1.3	1.6
ARIZONA LESS U.S. AVERAGE									
1969-73		5.0	5.2	4.8		0.3		0.9	1.1
1974-81		2.5	2.3	2.5		-0.2		-0.1	-0.2
1982-90	0.6	1.3	1.0	2.1	-1.4	-1.1	-1.5	-0.9	-1.2
1991-2000	3.5	2.0	2.5	2.2	1.3	0.2	1.2	-0.3	0.2
2001-07	2.0	2.3	2.4	1.9	0.0	0.5	0.3	0.7	0.8
2008-19	-0.5	-0.1	-0.2	0.1	-0.6	-0.3	-0.9	-0.4	-0.6
2020-22^	1.4	1.5	1.4	NA	NA	NA	0.3	0.4	0.3

* Gross domestic product: Inflation-adjusted figures are not available prior to 1977.

** POW: by place of work. POR: by place of residence.

^ The 2020-22 cycle is incomplete.

NA: not yet available.

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm>.

of the three categories. Any positive economic response to the tax reductions would take time to be realized. If the tax reductions of the 1990s boosted economic performance, the effect might not begin to be seen until the 2001-to-2007 economic cycle. A greater effect would be expected after that, resulting from the tax reductions during the 1990s and the additional cuts since then.

However, the strongest annual average aggregate economic growth — measured both for Arizona and as the difference between Arizona and the national average — occurred during the 1969-to-1973 economic cycle, prior to any significant tax cutting. The weakest growth occurred during the 2008-to-2019 economic cycle, years after the tax cuts of the 1990s and also after the significant cuts implemented in FYs 2007 and 2008.

On the per capita indicators, measured both as the Arizona growth rate and the difference between Arizona and the national average, annual average growth rates by economic cycle was strongest during the 1969-to-1973 economic cycle. Arizona's average growth rate was lowest during the 2008-to-2019 cycle. On the per worker indicators, measured both as the Arizona growth rate and the difference between Arizona and the national average, annual average growth rates by economic cycle have varied without any trend.

In summary, despite the significant decline in Arizona's tax burden relative to other states since the early 1990s, economic growth since then in Arizona and relative to the nation has not been stronger than the historical figures. As with the correlation analysis, there is no evidence that the tax reductions have had any positive effect on economic growth.

Trendline Analysis

The trendline analysis examines the annual change in Arizona, and the difference between Arizona and the U.S. average, for various economic indicators over two time periods: the period preceding the start of the tax reductions in FY 1993 and the period since then. For each indicator, growth rates were either flat or trending down prior to 1993 and have trended down since then.

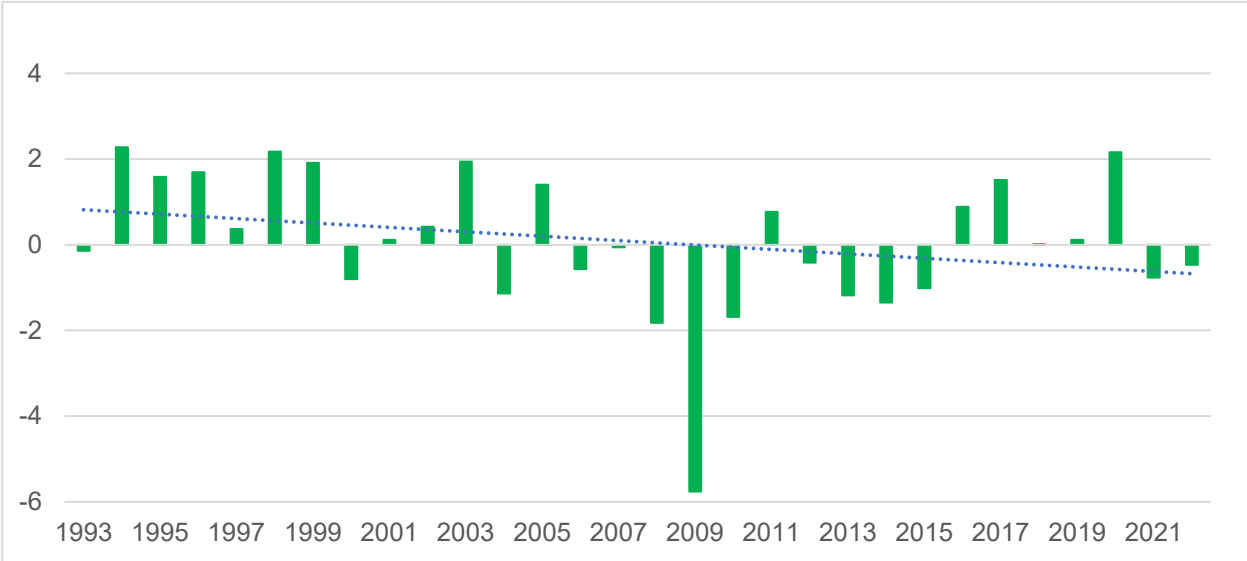
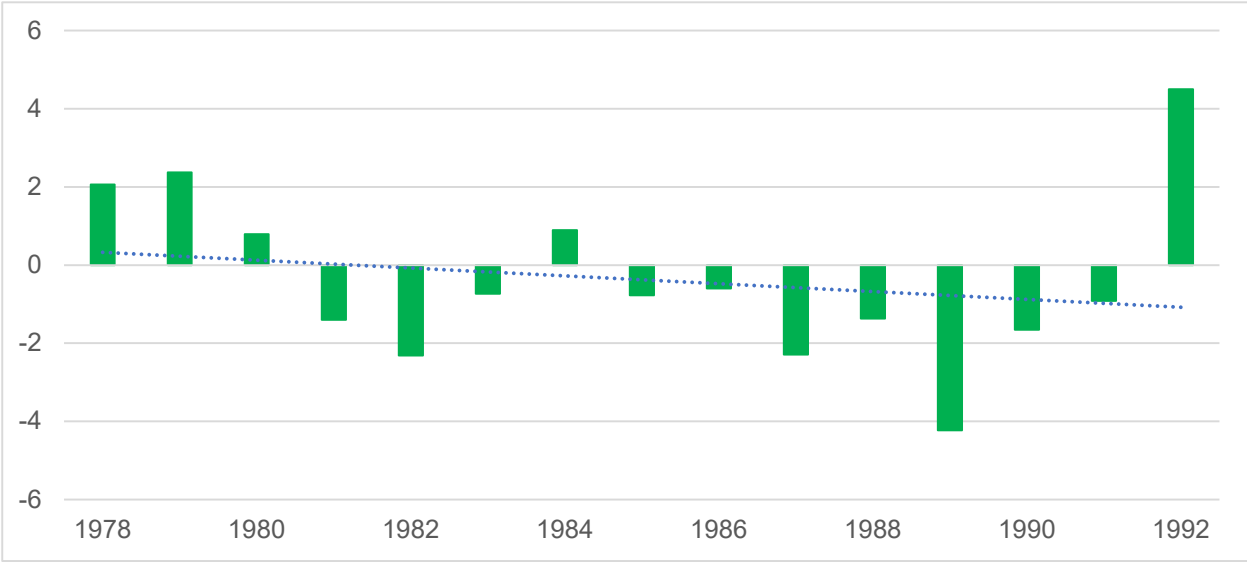
Charts 7 through 9 display the trendlines for three economic indicators: per capita GDP, expressed as the difference in the real percent change between Arizona and the nation; employment expressed as the difference in the percent change between Arizona and the nation; and employment expressed as the numeric change in Arizona. As with the correlation analysis and the cyclical analysis, there is no evidence that the tax changes have had any effect on the state's economic performance.

Tax Changes and State Government Tax Revenue

The declines in actual Arizona state government general fund revenues since the early 1990s are easily seen in Chart 10, which standardizes revenue over time by dividing it by personal income. The fluctuations in the "actual" line in Chart 10 reflect both changes in tax policy and the economic cycle, which has a substantial effect on government revenues, even after adjusting for personal income. The fluctuations in the "without tax changes" line reflect only the economic cycle.

In the late 1970s, Arizona state general fund tax revenue exceeded \$50 per \$1,000 of personal income (alternatively, revenue was greater than 5 percent of personal income). The tax

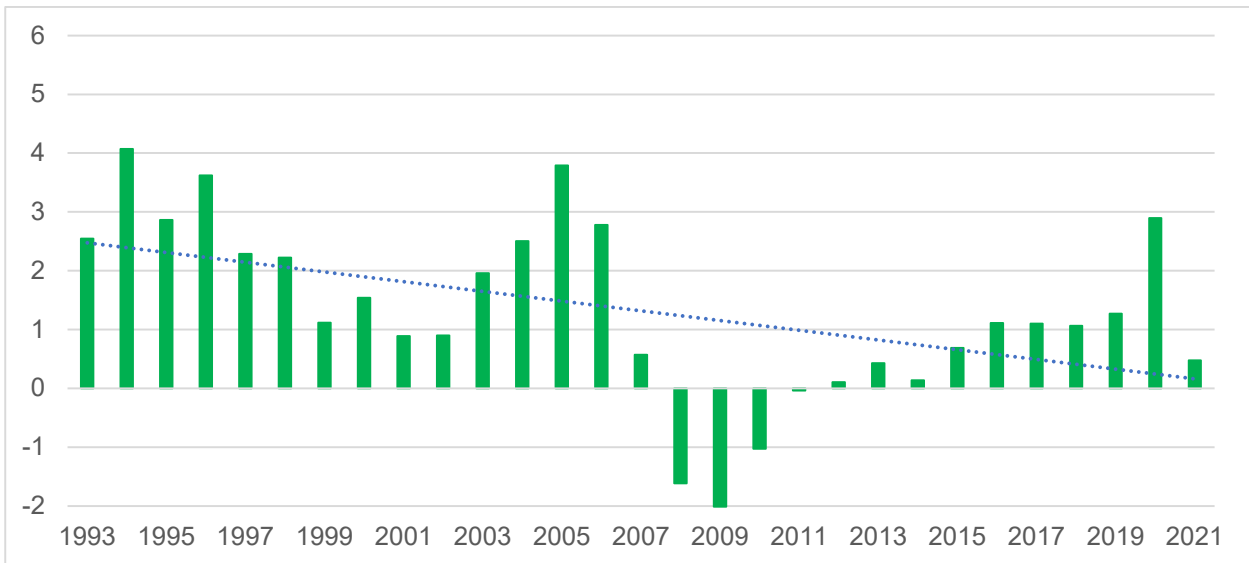
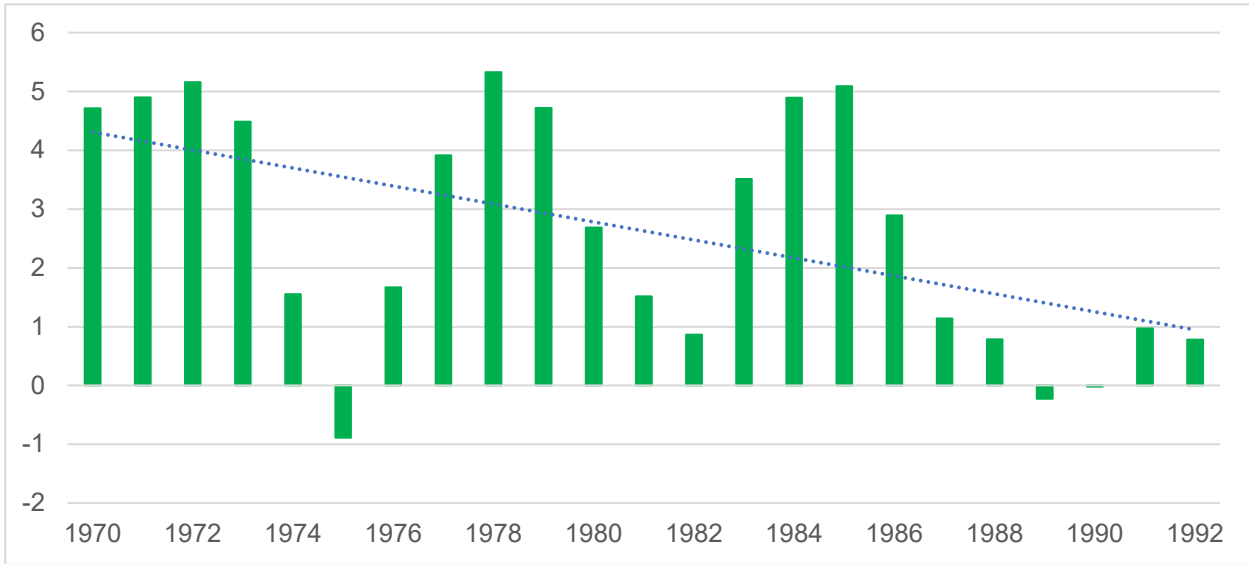
CHART 7
PER CAPITA GROSS DOMESTIC PRODUCT, PERCENTAGE-POINT DIFFERENCE
IN ANNUAL REAL PERCENT CHANGE, ARIZONA MINUS U.S. AVERAGE



Note: The dotted line is the trendline.

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm>.

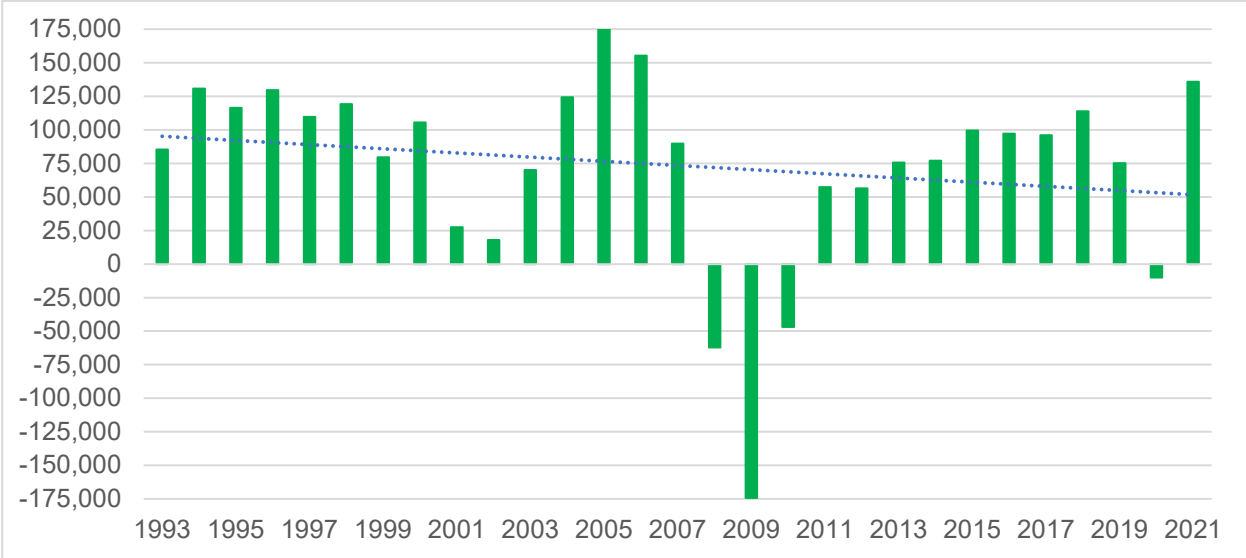
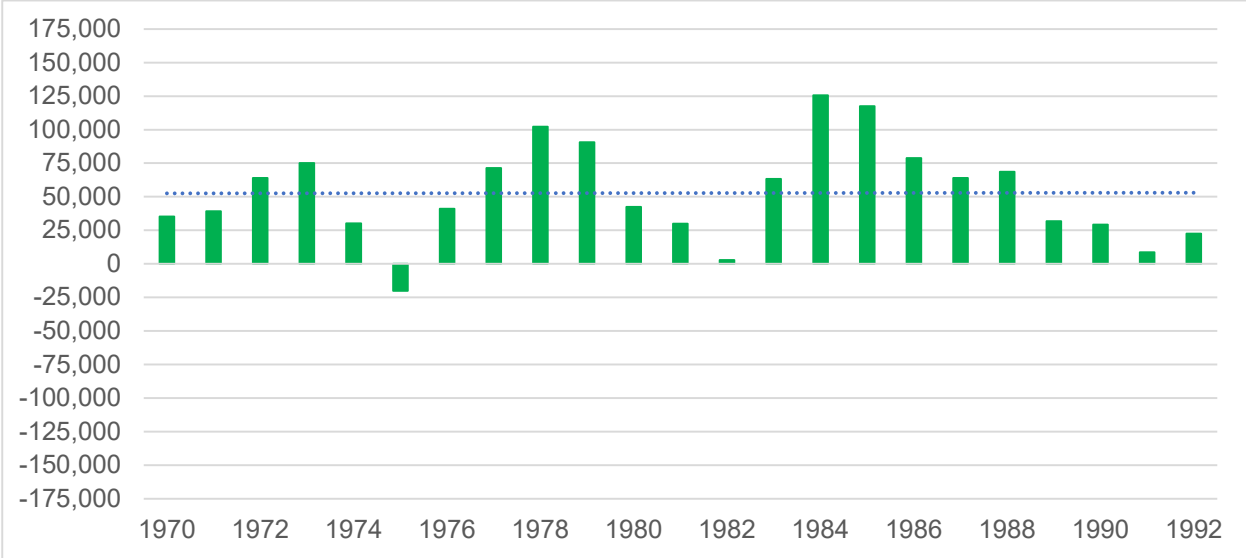
CHART 8
TOTAL EMPLOYMENT, PERCENTAGE-POINT DIFFERENCE IN ANNUAL
PERCENT CHANGE, ARIZONA MINUS U.S. AVERAGE



Note: The dotted line is the trendline.

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis,
<http://bea.gov/regional/index.htm>.

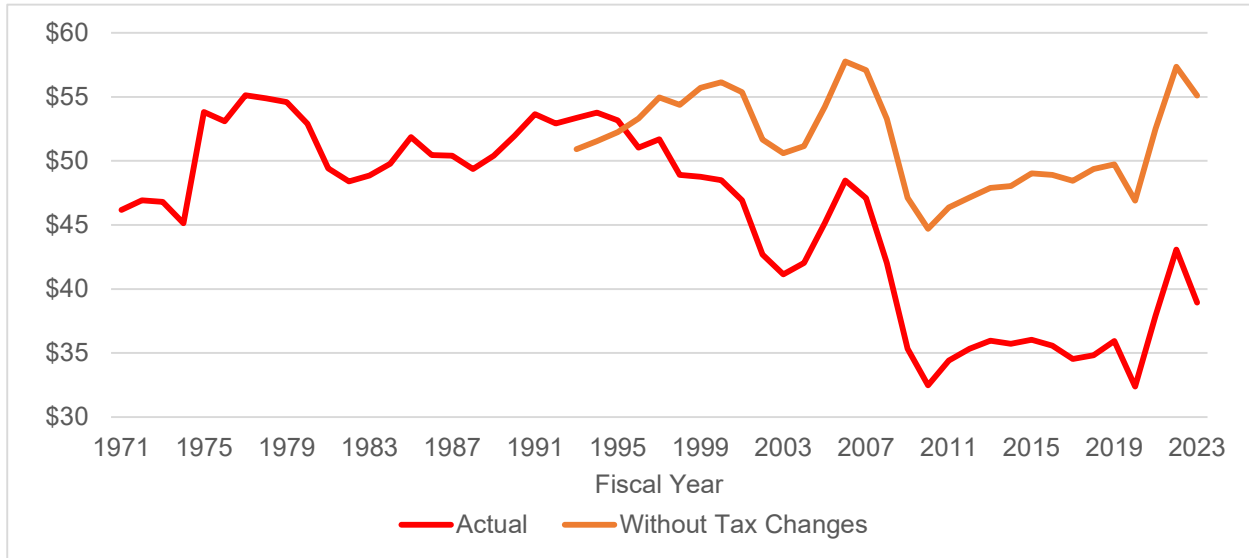
**CHART 9
TOTAL EMPLOYMENT, ANNUAL NUMERIC CHANGE IN ARIZONA**



Note: The dotted line is the trendline.

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm>.

**CHART 10
ONGOING TAX REVENUE PER \$1,000 OF PERSONAL INCOME,
ARIZONA STATE GOVERNMENT GENERAL FUND**



Note: Ongoing tax revenue is expressed prior to the subtraction for urban revenue sharing.

Note: The general fund tax revenue without tax changes is based on estimates of what general fund tax revenue would have been had no changes to tax laws been made since FY 1993.

Source: Calculated from Arizona Joint Legislative Budget Committee, <https://www.azjlb.gov/> (actual general fund revenue and estimated impact of tax changes), and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income).

reductions of the FY 1979-to-1981 period, combined with an economic recession, lowered the figure to \$48 in FY 1982. The tax increase of FY 1984 and an improving economy pushed the figure up to around \$50. Despite a weakening economy, the tax increases from FYs 1989 through 1992 pushed revenue relative to personal income up to close to what it had been in the late 1970s. As the substantial tax reductions were implemented during the 1990s, the figure fell below \$50. Most of the variation in the early-to-mid-2000s was due to the economic cycle. Even with an economic boom in the mid-2000s, the value remained below \$50.

After FY 2007, tax revenue per \$1,000 of personal income plunged, due to a combination of the large tax reductions implemented in FYs 2007 and 2008 and a deep and long recession. Despite an improving economy, tax revenue per \$1,000 of personal income peaked at only \$36 during the economic expansion of the 2010s, as further tax cuts eroded revenue further.

As discussed earlier, the higher tax collections per \$1,000 of personal income from FYs 2021 through 2023, but particularly in FY 2022, resulted from a variety of temporary factors. Still, the FY 2023 figure of \$39 was well below the historical norm of a little more than \$50. Tax collections per \$1,000 of personal income are expected to drop back to around \$35 to \$36.

Using the JLBC's estimates of the effect on general fund revenue of the various tax increases and reductions implemented since FY 1989 (adjusted for inflation, population growth, and real per

capita economic growth), general fund revenues that would have occurred had no tax law changes been made also are plotted in Chart 10. Had no tax changes affected the general fund, tax revenue per \$1,000 of personal income would have been higher than the actual figure in each year since FY 1996, with the differential between the two figures growing over time. In FY 2023, the actual figure was 70.7 percent of what it would have been without any tax changes. Had no tax code changes been made after FY 1992, total revenue would have been \$8.2 billion higher in FY 2023.

Each of the lines demonstrate the severe cyclicity of general fund revenue that has occurred since the late 1990s. While this in part was the result of the real estate boom of the mid-2000s ending in the worst economic recession since the Great Depression, the narrowing of the general fund's tax base that resulted from the tax reductions also contributed.

The empirical evidence is that tax increases have raised general fund revenue and tax cuts have reduced revenue. No evidence exists of a supply-side boost in revenue resulting from the tax cuts.

Why the Tax Reductions in Arizona Have Not Boosted Economic Growth or Government Revenue

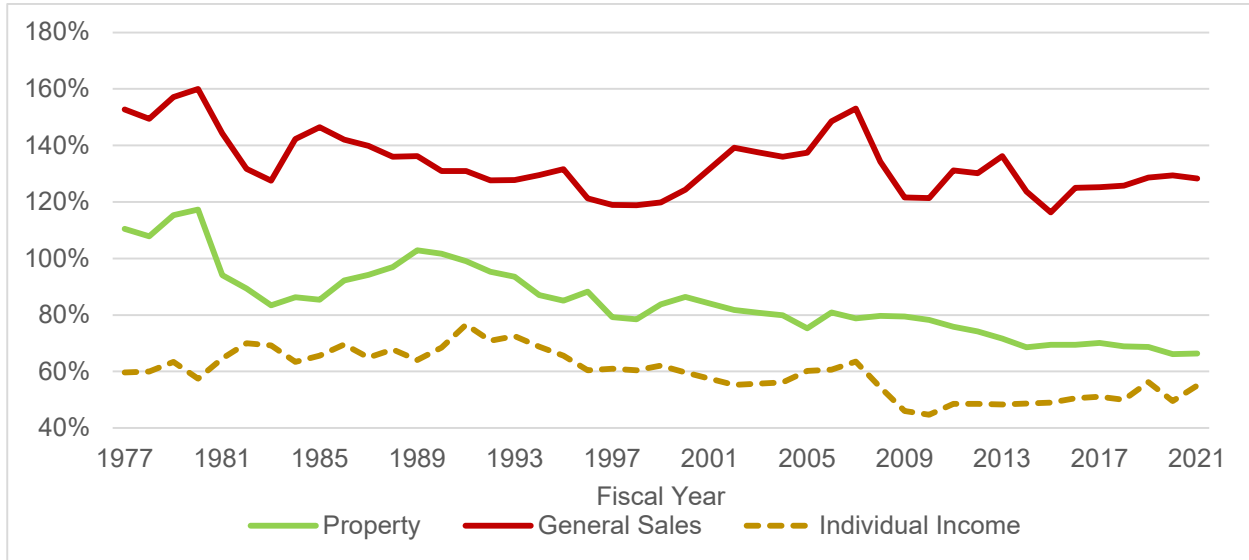
The empirical evidence of no apparent supply-side effect on either economic performance or government revenue is consistent with the conceptual analysis presented earlier in this paper. First, looking at the overall state and local government tax burden (see Chart 2), Arizona's tax burden in the early 1990s after the tax increases were implemented was still less than the national average on a per capita basis. Though somewhat above average per \$1,000 of personal income, the tax burden was not as far above average as in various years of the 1960s and 1970s. Assuming the revenue-maximizing tax rate on the Laffer Curve is equal to the national average, this proximity to the national average of Arizona's tax burden suggests that the tax reductions in Arizona should have had little if any effect on economic growth and should have reduced government revenues by about the amount of the tax reductions estimated by the JLBC.

Second, it also is useful to examine the specific tax reductions and whether the tax burdens of specific taxes were higher than the revenue-maximizing rate before the tax reductions began. As seen in Chart 11, the individual income tax burden was less than the national average, even based on the personal income measure, when the tax reductions began in the 1990s. The property tax burden in Arizona was below average per capita and only a little above average per \$1,000 of personal income. Each tax burden has fallen further below average since the tax reductions began. In contrast, the general sales tax burden was above average in the early 1990s, but significant reductions in the general sales tax did not occur. Its tax burden relative to the U.S. average is similar today to the historical norm.

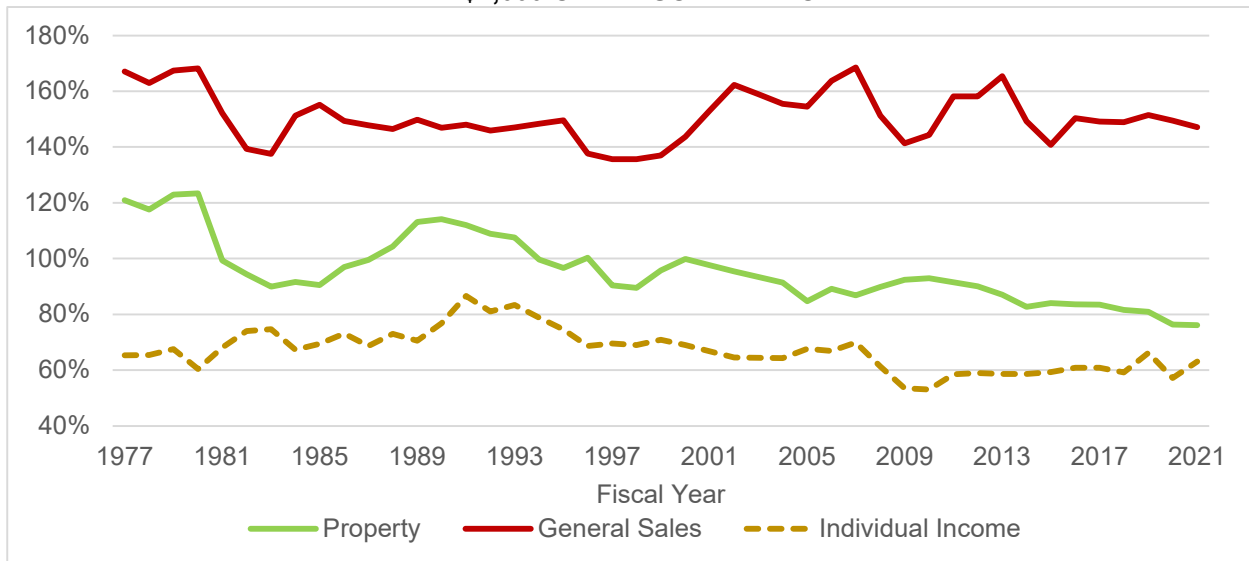
Of particular importance is that relatively few of the tax reductions passed prior to 2010 were targeted to businesses, though some of the reductions applied to businesses as well as to individuals. The disproportionate emphasis on individual taxes caused the individual tax burden in Arizona to fall far below average. According to the District of Columbia tax study, the tax burden of individuals was more than 10 percent below average by the late 1990s except at the

**CHART 11
TAX BURDEN OF SPECIFIC TAXES,
ARIZONA AS A PERCENTAGE OF THE U.S. AVERAGE**

PER CAPITA



PER \$1,000 OF PERSONAL INCOME



Source: Calculated from U.S. Department of Commerce, Census Bureau, <https://www.census.gov/programs-surveys/gov-finances.html> (tax collections) and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (personal income and population).

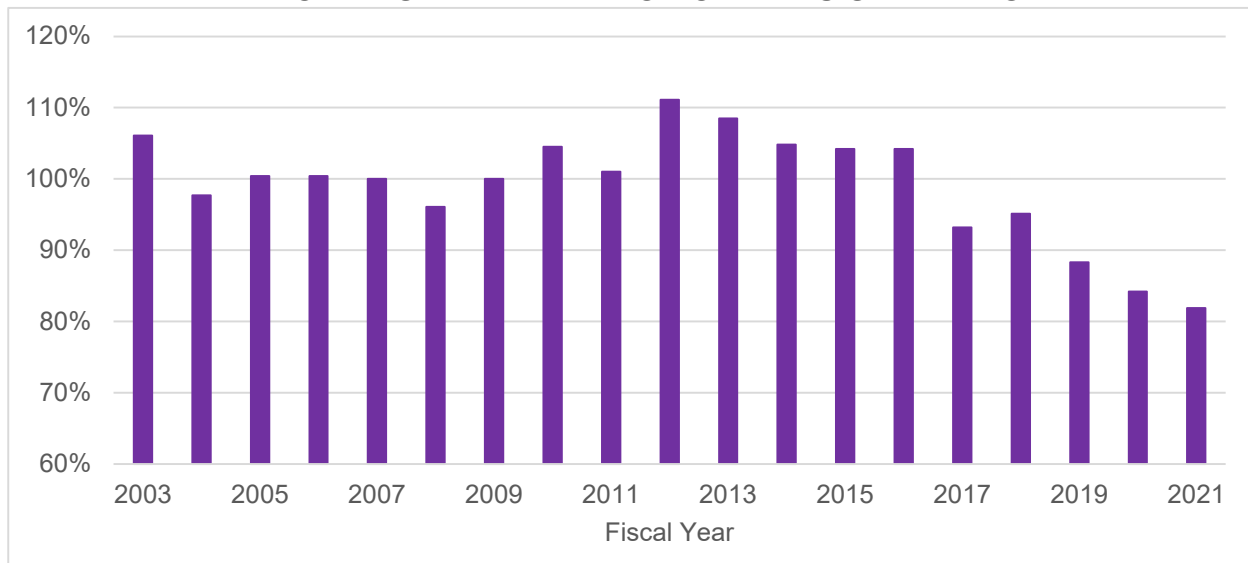
lowest income level. In contrast, the business tax burden remained near or above the national average through fiscal year 2016 (see Chart 12). Much of the decline in the business tax burden after the peak in FY 2012 was the result of significant reductions to the corporate income tax passed in 2011 and 2012 that were phased in through FY 2019.

Conceptually, the favoring of tax cuts aimed at individuals rather than businesses until the 2010s minimized any possible supply-side effects. The more recent reductions to business taxes may now be having a small positive effect on economic growth.

Another factor limiting any benefit from the individual income tax reductions is that these tax cuts did not result in a boost in productivity by raising the workforce participation rate, as seen in Chart 13.

While the reductions to the business taxes might be generating a Laffer Curve effect, the magnitude of any benefit conceptually should be small. These taxes were not much above the U.S. average when the tax cuts began and the tax cuts represent only a tiny portion of all business expenses. Further, any economic stimulus created by the cuts will result in an increase in the importation of labor to the state given the state's historically low unemployment rate. Therefore, a rise in government expenditures to serve the new businesses and workers will offset any gains in public revenues.

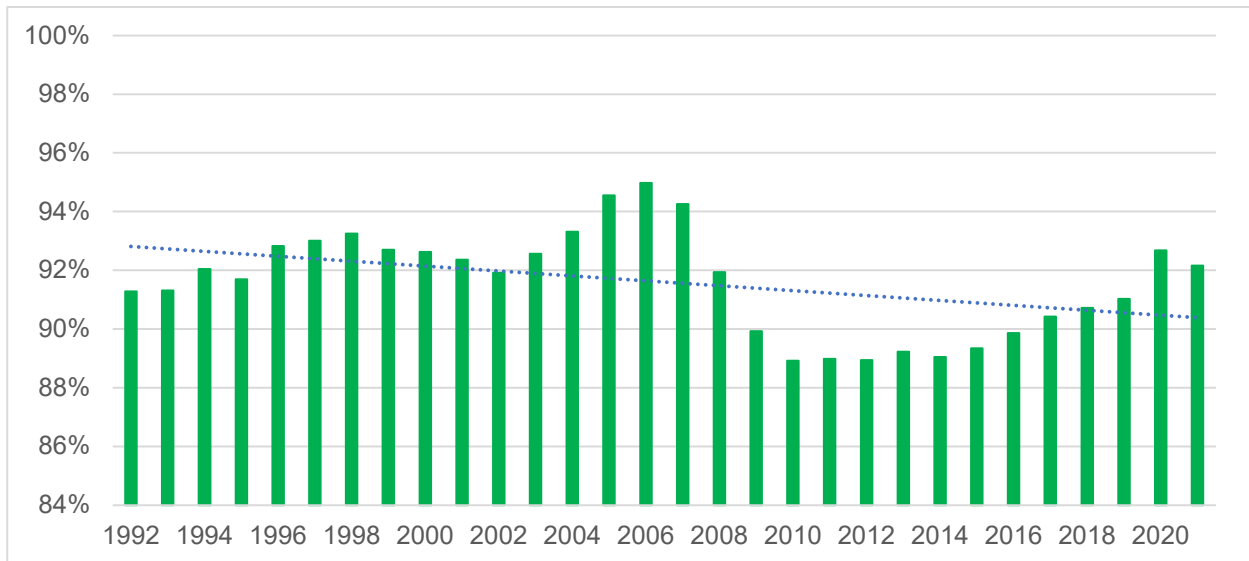
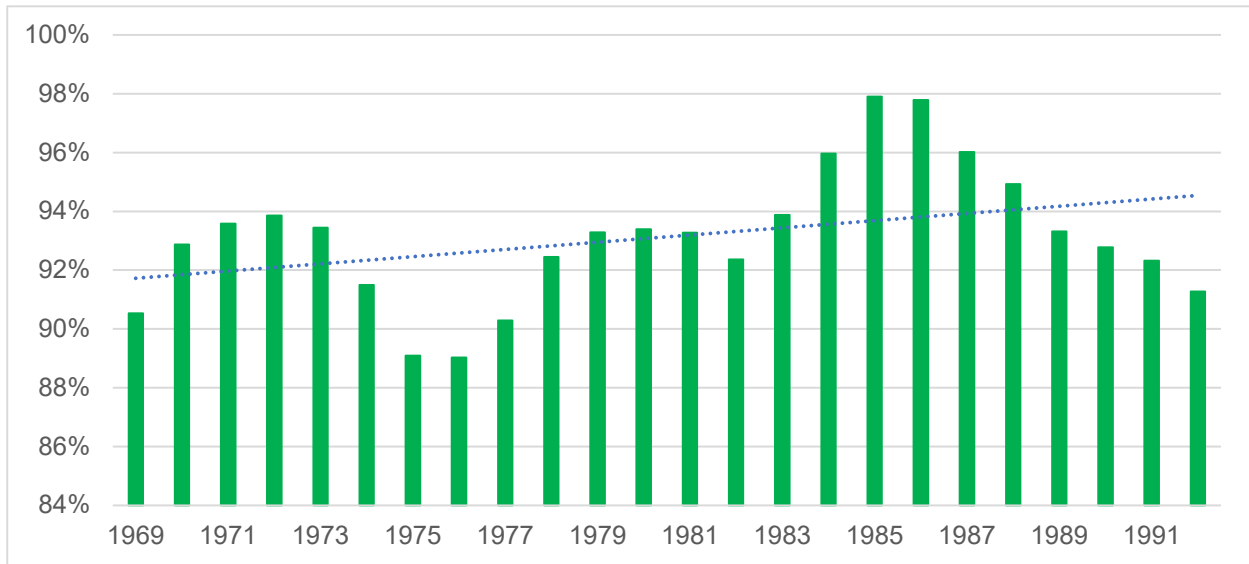
**CHART 12
BUSINESS TAX BURDEN,
ARIZONA AS A PERCENTAGE OF THE U.S. AVERAGE**



Note: The tax burden is measured as the amount of business taxes paid as a share of private-sector gross domestic product.

Source: Calculated from Ernst & Young, *Total State and Local Business Taxes: State-by-State Estimates*, <https://www.cost.org/state-tax-resources/cost-studies-articles-and-reports/> (business taxes paid), and U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm> (private-sector gross domestic product).

**CHART 13
EMPLOYMENT-TO-POPULATION RATIO,
ARIZONA AS A PERCENTAGE OF THE U.S. AVERAGE**



Note: The dotted line is the trendline.

Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis, <http://bea.gov/regional/index.htm>.

One additional conceptual reason for not expecting the tax reductions to have had an effect on the economy or on government revenue is that as a result of the tax reductions, significant decreases in public spending have been implemented by the Arizona Legislature. Significant reductions have been made to programs valued by businesses, including K-12 education, higher education, and the Arizona Department of Transportation. The labor force and physical infrastructure rank at the top of the business location factors, while the tax burden ranks lower. In particular, Arizona does not compare favorably on labor force issues. Thus, since the tax reductions had to be accompanied by spending reductions, the state's business climate evaluations have suffered; Arizona ranks among the middle of the states in the most reliable studies.¹⁵

Therefore, the size, nature, and timing of the tax cuts in Arizona, combined with the conceptual basis for supply-side economics, suggest that little positive effect either on economic growth or on government revenue should have occurred as a result of the tax reductions implemented since the early 1990s.

¹⁵ See the Office of the University Economist report "Regional Economic Competitiveness, Part 3: Business Location Factors and an Assessment of Arizona's Competitiveness," May 2023, <https://ccpr.wpcarey.asu.edu/sites/default/files/2023-05/reglcompc05-23.pdf>.