

## Some Background

DISTRIBUTION OF TAX BURDENS

How are federal taxes distributed?

**Q. How are federal taxes distributed?**

**A. Although enterprises (e.g., retailers, employers) are legally obligated to pay certain taxes, the burden of all taxes ultimately falls on households.**

Individuals, businesses, and other entities may have the legal obligation to pay certain taxes, but the economic burden (or incidence) of all taxes ultimately falls on households. Households may feel this burden through a reduction in their income or higher prices for goods and services.

The incidence of taxes has been studied for decades, and experts now broadly agree on how the burden is distributed across households. The Urban-Brookings Tax Policy Center (TPC), in preparing standard distribution tables, assumes the following about federal taxes:

### INDIVIDUAL INCOME TAX

Taxpayers (who either pay the tax directly or receive a refundable credit) bear the entire burden of the individual income tax.

### PAYROLL TAXES

Employees (or self-employed people who pay both shares of the tax) bear both the employer and the employee shares of the Social Security and Medicare payroll taxes in the form of lower take-home income.

### CORPORATE INCOME TAX

The corporate income tax reduces both wages and returns to capital. The allocation between the two is uncertain and differs in the short and long terms. TPC assumes that in the long-term, income from capital (e.g., dividends, rents, interest, and capital gains) bears four-fifths of the burden, with wages and other sources of labor income bearing the remaining fifth. TPC assumes that corporate shareholders bear the entire burden of a short-term corporate income tax change before investors have a chance to react.

### ESTATE TAX

Estate tax costs are borne entirely by decedents.

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### How are federal taxes distributed?

#### EXCISE TAXES

Excise taxes also are assumed to reduce wages and returns to capital. They also increase the relative price of taxed goods and services, so households that consume more of the taxed items bear a higher burden.

The Joint Committee on Taxation (JCT), the US Department of Treasury's Office of Tax Analysis, and the Congressional Budget Office make similar incidence assumptions in their analyses, but with a few differences. For instance, JCT assumes that the tax on individual income that represents a return to capital from noncorporate businesses, like partnerships, is borne in the same manner as the corporate income tax. Moreover, each group follows slightly different incidence assumptions for the corporate income tax, reflecting the uncertainty over its incidence.

*Updated May 2020*

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## Some Background

DISTRIBUTION OF TAX BURDENS

### Are federal taxes progressive?

#### Q. Are federal taxes progressive?

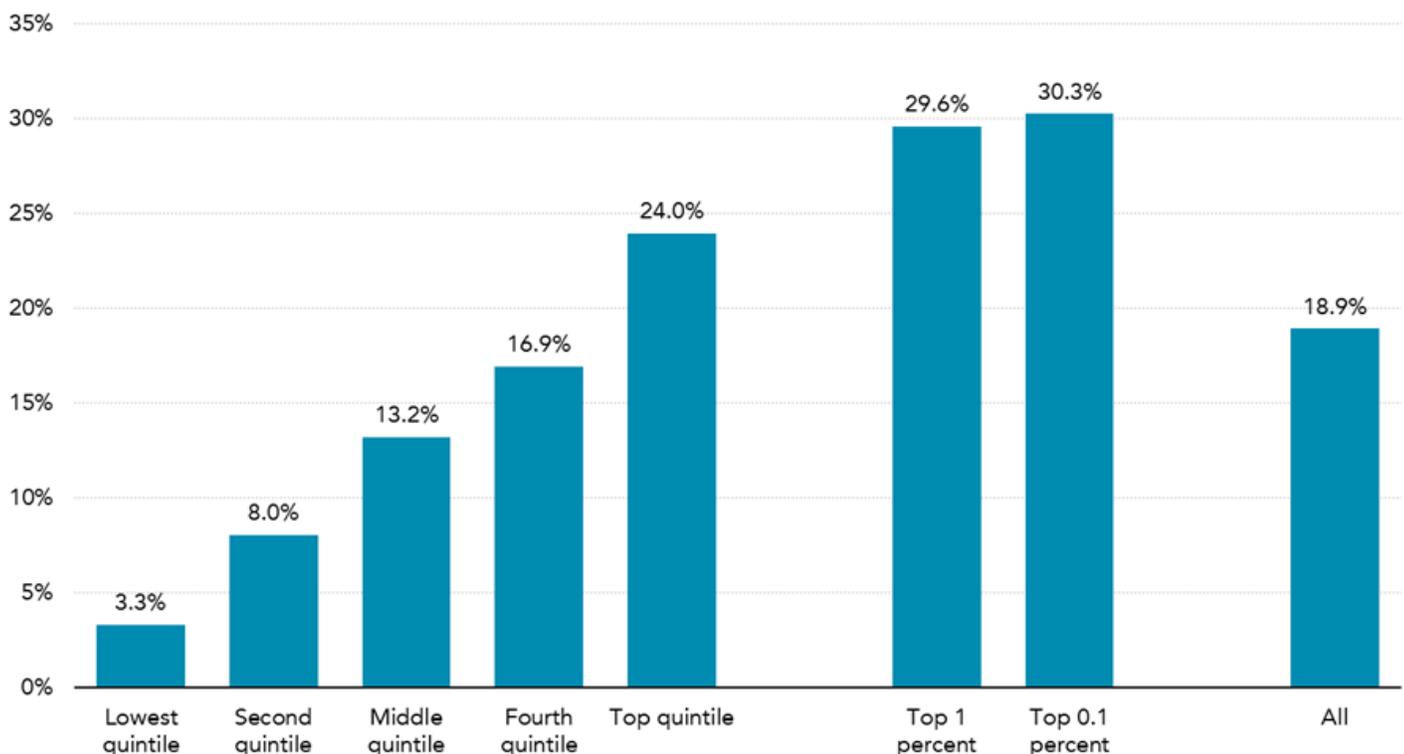
#### A. Overall, yes. But that's not the case for each tax.

The overall federal tax system is progressive, with total federal tax burdens a larger percentage of income for higher-income households than for lower-income households.

**FIGURE 1**

### Average Effective Federal Tax Rates by Income Percentile

All federal taxes, 2020<sup>a</sup>



Source: Urban-Brookings Tax Policy Center. T20-0039. "Effective Federal Tax Rates—All Tax Units, by Expanded Cash Income Percentile, 2020."

Notes: (a) Individual income, payroll, corporate income, estate, and excises taxes are included.

(b) The average effective federal tax rate is the sum of individual and corporate income tax, payroll taxes for Social Security and Medicare, the estate tax, and excise taxes as a percentage of expanded cash income. For a description of expanded cash income, see Urban-Brookings Tax Policy Center. "Income Measure Used in Distributional Analyses by the Tax Policy Center."

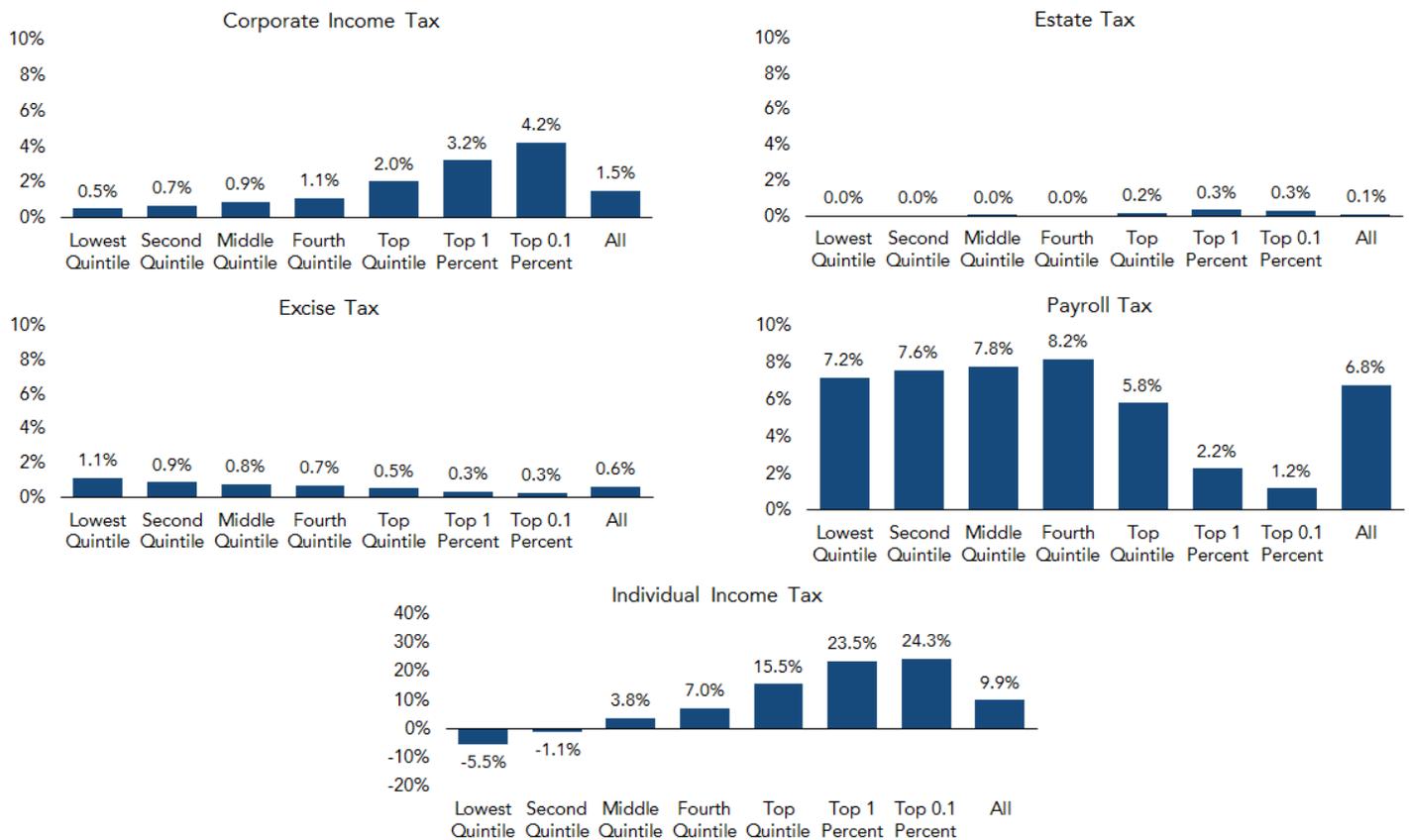
Not all taxes within the federal system are equally progressive. Some federal taxes are regressive, as they make up a larger percentage of income for lower-income than for higher-income households.

# Some Background

## Are federal taxes progressive?

The individual and corporate income taxes and the estate tax are all progressive. By contrast, excise taxes are regressive, as are payroll taxes for Social Security and Medicare. Regressivity can be seen over some range of income (figure 2).

**FIGURE 2**  
Average Effective Tax Rates by Type of Federal Tax  
By income percentile, 2020



**Source:** Urban-Brookings Tax Policy Center. T20-0039. “Effective Federal Tax Rates—All Tax Units, by Expanded Cash Income Percentile, 2020.”  
**Note:** For a description of expanded cash income, see Urban-Brookings Tax Policy Center. “Income Measure Used in Distributional Analyses by the Tax Policy Center.”

### INDIVIDUAL INCOME TAX

The individual income tax is progressive, thanks to the impact of refundable credits for lower-income households (average tax rates are negative for the two lowest income quintiles), the standard deduction (which exempts a minimum level of income from the tax), and a graduated rate structure (rates on ordinary income rise from 10 to 37 percent, with an additional 3.8 percent marginal tax on certain investment income of high-income households).

### CORPORATE INCOME TAX

The corporate income tax is progressive because most of its burden falls on income from dividends, capital gains, and other forms of capital income disproportionately received by high-income households.

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DISTRIBUTION OF TAX BURDENS

### Are federal taxes progressive?

#### ESTATE TAX

The estate tax is only imposed on households with high levels of wealth. Only wealth above an exemption amount is subject to the tax—that amount for those who die in 2019 is \$11.4 million, and it is effectively double for married couples. High wealth is almost always commensurate with high income, so, when households are classified by income, virtually the entire estate tax burden falls on the very highest income households.

#### PAYROLL TAXES

The regressive nature of payroll taxes stems from two factors. First, the Social Security portion of payroll taxes is subject to a cap: in 2019, individuals will pay the tax on only their first \$132,900 in earnings. Second, compared with lower-income households, higher-income households receive more of their income from sources other than wages, such as capital gains and dividends, which are not subject to the payroll tax. However, because wages rise as a share of income over the first four quintiles of the distribution, payroll taxes are slightly progressive until high income levels are reached.

#### EXCISE TAXES

An excise tax increases the price of the taxed good or service relative to the prices of other goods and services. So households that consume more of the taxed good or service as a share of their total consumption face more of the tax burden from this change in relative prices. The regressivity of excise taxes is primarily the result of this relative price effect, because, on average, alcohol and tobacco represent a declining share of consumption as household income rises.

*Updated May 2020*

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#### Data Sources

Urban-Brookings Tax Policy Center. [T20-0038. "Average Effective Federal Tax Rates—All Tax Units, by Expanded Cash Income Level, 2020";](#) and [T20-0039. "Effective Federal Tax Rates—All Tax Units, by Expanded Cash Income Percentile, 2020."](#)

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### How should tax progressivity be measured?

Q. How should tax progressivity be measured?

A. A broad definition of tax progressivity, that tax burdens rise with household income, masks a host of ambiguities in measuring the effect of a tax change. The percentage change in after-tax income is the most reliable measure of the progressivity of such a change.

A tax is progressive if, on average, household tax burdens rise with incomes. This definition is generally considered too broad because “tax burden” can be defined in various ways. Table 1 helps illustrate the problem by analyzing a hypothetical proposal to reduce all individual income tax rates by 1 percentage point.

TABLE 1

Proposal to Reduce All Federal Individual Income Tax Rates by One Percentage Point  
2019



Expanded cash income percentile	Baseline Distribution of Income and Federal Taxes				Measures of Change Due to Proposal				
	Average pretax income (dollars)	Average federal tax burden (dollars)	Share of total federal tax burden (percentage)	Average federal tax rate (percentage)	Average change in federal tax burden (dollars)	Change in federal tax burden (percentage)	Change in share of federal taxes (percentage points)	Change in average federal tax rate (percentage points)	Change in after-tax income (percentage)
Lowest quintile	\$14,230	\$450	0.6%	3.2%	-\$10	-1.3%	0.0	0.0	0.0%
Second quintile	\$37,040	\$2,910	3.4%	7.9%	-\$80	-2.9%	0.0	-0.2	0.3%
Middle quintile	\$68,690	\$8,930	9.7%	13.0%	-\$300	-3.4%	-0.1	-0.4	0.5%
Fourth quintile	\$122,090	\$20,490	18.4%	16.8%	-\$700	-3.4%	-0.1	-0.6	0.7%
Top quintile	\$376,170	\$89,790	67.7%	23.9%	-\$2,240	-2.5%	0.2	-0.6	0.8%
All	\$99,280	\$18,690	100.0%	18.8%	-\$510	-2.8%	0.0	-0.5	0.6%
Addendum									
80-90	\$195,480	\$38,330	14.9%	19.6%	-\$1,220	-3.2%	-0.1	-0.6	0.8%
90-95	\$281,420	\$60,460	11.2%	21.5%	-\$1,820	-3.0%	0.0	-0.7	0.8%
95-99	\$473,040	\$110,120	15.9%	23.3%	-\$3,020	-2.7%	0.0	-0.6	0.8%
Top 1 percent	\$2,460,110	\$725,150	25.6%	29.5%	-\$12,380	-1.7%	0.3	-0.5	0.7%
Top 0.1 percent	\$11,474,060	\$3,452,210	12.5%	30.1%	-\$45,270	-1.3%	0.2	-0.4	0.6%

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0319-2).

Notes: The baseline is the law in place for 2019 as of March 16, 2020. The proposal would reduce statutory individual income tax rates from 10, 12, 22, 24, 32, 35, and 37 percent to 9, 11, 21, 23, 31, 34, and 36 percent. The preferential rates on capital gains and dividends and the rates under the Alternative Minimum Tax would not be changed.

In this example, five possible measures of change in tax burdens might be used:

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### How should tax progressivity be measured?

- 1. The average change in tax burden (column 5, table 1).** This is the change in the average dollar amount of the taxes borne by households in each income group. Because tax reductions increase with income, the proposal would seem to *reduce* progressivity. But higher-income groups have higher tax burdens before the change, which means that they are not disproportionately better off than lower-income groups, even though they receive larger tax cuts under the proposal. Therefore, the average change in tax burden is an ambiguous measure of progressivity.
- 2. The percentage change in tax burden (column 6, table 1).** This is the percentage change in the average dollar amount of the taxes borne by households in each income group. The lowest and highest income groups have the smallest percentage reduction in average tax burdens, implying that the proposal reduces progressivity at the low-income end and increases progressivity at the high-income end. But the burden that any dollar amount of taxes imposes on a household depends on the household's income; certainly, the burden of paying \$100 of tax is much greater on a household with \$10,000 of income than it is on a household with \$1 million. Therefore, the percentage change in tax burden is an inadequate measure of progressivity.
- 3. The change in share of federal taxes (column 7, table 1).** This is the change in the percentage distribution of tax burdens across income groups. The change is zero for the "All" income group, because the percentage distributions under baseline (current) law and under the proposal both must add to 100 percent. For the proposal, this measure shows that the share of taxes paid by the top 1 percent of households would increase, while the share would decrease or remain unchanged for all other income groups, indicating that the proposal increases progressivity. But an increase in the share of tax burdens for high-income households does not necessarily indicate that high-income households have suffered disproportionately. Therefore, the change in percent of tax burden is not an unambiguous measure of progressivity, either.
- 4. The change in average tax rate (column 8, table 1).** Changing tax burdens as a percentage of *pretax* income reduces average tax rates the least for the bottom three income quintiles and even more for the top two quintiles. This suggests that the proposal somewhat reduces progressivity, at least at lower income levels. But relative changes in pretax income do not indicate how much households' relative well-being—their ability to consume currently or in the future (using savings)—is affected. Therefore, the change in average tax rate is an inadequate indicator of progressivity.
- 5. The percentage change in after-tax income (column 9, table 1).** This measure is the change in tax burdens as a percent of *after-tax* income (i.e., pretax income less current tax burdens). The proposal generally increases after-tax incomes by increasing percentages as income increases up to the top 1 percent of households (with the largest percentage increase for the 95th–99th percentiles), implying that the proposal reduces progressivity except at the very top of the income distribution. Because households' current and future consumption from current income can only be made from the amount left after paying taxes, the percentage change in after-tax income provides a direct measure of the effect of a tax proposal on households' welfare. It is therefore the most useful measure of progressivity.

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## How should tax progressivity be measured?

**FIGURE 1**  
**Proposal to Reduce All Federal Individual Income Tax Rates by One Percentage Point**  
 2019



Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0319-2).

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### Data Sources

Urban-Brookings Tax Policy Center. "Microsimulation Model, version 0319-2."

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### How should tax progressivity be measured?

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What is the difference between marginal and average tax rates?

**Q. What is the difference between marginal and average tax rates?**

**A. Average tax rates measure tax burden, while marginal tax rates measure the impact of taxes on incentives to earn, save, invest, or spend.**

The average tax rate is the total amount of tax divided by total income. For example, if a household has a total income of \$100,000 and pays taxes of \$15,000, the household's average tax rate is 15 percent. The marginal tax rate is the incremental tax paid on incremental income. If a household were to earn an additional \$10,000 in wages on which they paid \$1,530 of payroll tax and \$1,500 of income tax, the household's marginal tax rate would be 30.3 percent.

Average tax rates are a measure of a household's tax burden; that is, how taxes affect the household's ability to consume today or (through saving) in the future. Marginal rates measure the degree to which taxes affect household (or business) economic incentives such as whether to work more, save more, accept more risk in investment portfolios, or change what they buy. Higher marginal rates reduce incentives to engage in a particular activity (such as work) or (in the case of sales taxes) consume a particular item.

TABLE 1

Effective Federal Tax Rates - All Tax Units, by Expanded Cash Income Percentile, 2019



Expanded Cash Income Percentile <sup>2,3</sup>	Tax Units		As a Percentage of Expanded Cash Income					All Federal Tax <sup>6</sup>
	Number (thousands)	Percent of Total	Individual Income Tax <sup>4</sup>	Payroll Tax <sup>5</sup>	Corporate Income Tax	Estate Tax	Excise Tax	
Lowest quintile	45,510	26.1	-5.6	7.2	0.5	0.0	1.1	3.2
Second quintile	38,660	22.1	-1.3	7.6	0.7	0.0	0.8	7.9
Middle quintile	35,420	20.3	3.6	7.8	0.9	0.0	0.7	13.0
Fourth quintile	29,260	16.8	6.9	8.2	1.1	0.0	0.6	16.8
Top quintile	24,600	14.1	15.4	5.7	2.1	0.1	0.5	23.9
All	174,690	100.0	9.9	6.8	1.6	0.1	0.6	18.8
Addendum								
80-90	12,660	7.3	9.4	8.4	1.3	0.0	0.6	19.6
90-95	6,070	3.5	11.8	7.7	1.5	0.1	0.5	21.5
95-99	4,720	2.7	14.9	5.9	1.9	0.1	0.5	23.3
Top 1 percent	1,160	0.7	23.3	2.2	3.3	0.3	0.3	29.4
Top 0.1 percent	120	0.1	24.1	1.1	4.4	0.3	0.2	30.1

Source: Urban-Brookings Tax Policy center Microsimulation Model (version 0319-2).

Notes: (1) Calendar year. Baseline is current law as of 12/24/2019. For more information on TPC's baseline definitions, see: <http://www.taxpolicycenter.org/taxtopics/Baseline-Definitions.cfm>.

(2) Includes both filing and non-filing units but excludes those that are dependents of other tax units. Tax units with negative adjusted gross income are excluded from their respective income class but are included in the totals. For a description of expanded cash income, see: <http://www.taxpolicycenter.org/TaxModel/income.cfm>

(3) The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The breaks are (in 2019 dollars): 20% \$25,300; 40% \$50,700; 60% \$91,200; 80% \$163,600; 90% \$239,600; 95% \$339,200; 99% \$818,700; 99.9% \$3,803,800.

(4) After tax credits (including refundable portion of earned income and child tax credits).

(5) Includes both the employee and employer portion of Social Security and Medicare tax.

(6) Excludes customs duties.

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### What is the difference between marginal and average tax rates?

TABLE 2

#### Effective Marginal Tax Rates on Wages, Salaries and Capital Income By expanded cash income percentile, 2019<sup>1</sup>



Expanded Cash Income Percentile <sup>2,3</sup>	Tax Units (thousands)	Individual Income Tax <sup>4</sup>				Individual Income Tax plus Payroll Tax <sup>5</sup>
		Wages and Salaries	Long-term Capital Gains	Qualified Dividends	Interest Income	Wages and Salaries
Lowest quintile	45,510	1.0	1.4	0.9	1.8	14.9
Second quintile	38,660	13.4	1.5	0.8	5.9	27.1
Middle quintile	35,420	16.4	7.6	8.2	15.2	30.0
Fourth quintile	29,260	17.9	10.6	11.1	19.2	31.3
Top quintile	24,600	27.2	21.8	21.3	32.9	34.6
All	174,690	21.5	20.5	18.8	26.1	31.9
Addendum						
80-90	12,660	22.1	13.7	14.0	22.1	32.9
90-95	6,070	24.2	15.8	15.9	25.0	32.3
95-99	4,720	28.9	19.3	19.0	30.8	34.4
Top 1 percent	1,160	36.0	22.8	23.7	36.8	39.9
Top 0.1 percent	120	35.9	22.6	23.6	36.5	39.7

**Source:** Urban-Brookings Tax Policy center Microsimulation Model (version 0319-2).

**Notes:** (1) Calendar year. Baseline is current law as of 12/24/2019. For more information on TPC's baseline definitions, see: <http://www.taxpolicycenter.org/taxtopics/Baseline-Definitions.cfm>.

(2) Includes both filing and non-filing units but excludes those that are dependents of other tax units. Tax units with negative adjusted gross income are excluded from their respective income class but are included in the totals. For a description of expanded cash income, see: <http://www.taxpolicycenter.org/TaxModel/income.cfm>

(3) The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The breaks are (in 2019 dollars): 20% \$25,300; 40% \$50,700; 60% \$91,200; 80% \$163,600; 90% \$239,600; 95% \$339,200; 99% \$818,700; 99.9% \$3,803,800.

(4) We calculate each tax unit's effective marginal individual income tax rate by adding \$1,000 to the income source and dividing the resulting tax change by that \$1,000. We then calculate the averages by weighting by the initial value of the appropriate income source.

(5) We calculate each tax unit's effective marginal individual plus payroll tax rate by adding \$1,000 to wages and salaries. We then divide the resulting change in individual income tax plus the resulting change in the employer and employee portions of payroll taxes for Social Security and Medicare by that \$1,000. We then calculate the averages by weighting by the initial value of wages and salaries. For married couples filing jointly, we assign a portion of the \$1,000 increase to each spouse based on their initial shares of the household's total wages and salaries.

Updated May 2020

#### Data Sources

Urban-Brookings Tax Policy Center. [T20-0036 - Average Effective Federal Tax Rates - All Tax Units, By Expanded Cash Income Level, 2019.](#)

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### What is the difference between marginal and average tax rates?

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## Some Background

What criticisms are levied against standard distributional analysis?

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Q. What criticisms are levied against standard distributional analysis?

A. Economists disagree on which taxes to include, how to measure tax burdens, what to assume about tax incidence, how to measure income, what period of analysis to use, and whether to include outlays in the calculations.

Distributional analyses of tax burdens across income groups play an important role in debates over the tax system and how to reform it. Differences in the conceptual framework, underlying theoretical assumptions, and empirical implementation can all significantly affect the results of these analyses.

Here are some of the criticisms that have been levied against standard distributional analyses prepared by the Urban-Brookings Tax Policy Center (TPC), the Joint Committee on Taxation (JCT), Treasury's Office of Tax Analysis (OTA) and the Congressional Budget Office (CBO).

### TAXES INCLUDED

Analyses often omit certain taxes. For example, TPC previously omitted excise taxes, and JCT and CBO omit estate and gift taxes. Many analyses make no provision for the impact of state and local taxes.

### HOW TAX BURDENS ARE MEASURED

Households may adjust their behavior to avoid some of the burden of tax changes. JCT uses actual tax payments, which reflects avoidance behavior. But this measure understates the true tax burden because it ignores welfare loss. Conversely, TPC and OTA use a "static" (no behavior) assumption, which overstates true burdens. All groups use projected tax receipts to measure the burden of current-law taxes, and these receipts reflect households' behavioral responses, so these burdens are understated. Further, the inclusion of payroll taxes for Social Security and Medicare has been criticized on the grounds that the distributional impact of the associated benefits is omitted.

### INCIDENCE ASSUMPTIONS

Uncertainty over the economic incidence of some taxes, especially the corporate income tax, leads some economists to criticize the specific assumptions made in distributional analyses.

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### What criticisms are levied against standard distributional analysis?

DISTRIBUTION OF TAX BURDENS

#### INCOME MEASURE

Income is used in distributional analyses to rank households by their “ability to pay”; it is also used to provide measures of tax burdens such as taxes as a percent of income by income group. These methods are often criticized because different definitions and measurements of income can significantly affect distributional results.

In theory, a broad definition of income may appropriately rank families and measure tax burdens, but this definition can be too far removed from common understandings of income and difficult to employ because of gaps in available data.

Conversely, even a quite broad definition of income, such as TPC’s “expanded cash income,” can be criticized as being too narrow because it omits in-kind benefits such as Medicare, Medicaid, and housing assistance, which can significantly improve recipient households’ well-being.

Some argue that consumption, rather than income, should be used to rank households and measure tax burdens. Income is either consumed currently or saved for future consumption. A household’s current consumption measures current well-being. Savings, meanwhile, are included in the measure of future well-being, when the household withdraws savings to finance consumption. Focusing on current income overstates current savers’ well-being and understates the well-being of current dissavers.

#### PERIOD OF ANALYSIS

Most distributional analyses focus on a single year, but some tax provisions have effects over multiple years. For example, contributions to a traditional individual retirement account (IRA) are deductible when made but taxable when withdrawn, and the earnings IRAs accrue are not taxed. An annual measure of tax burdens would only capture the effect of the contribution in one of these years, rather than measure the multiyear consequences of the IRA contribution. TPC and OTA use alternative annual measures for some multiyear provisions in their distributional analyses, but these measures rely on uncertain assumptions, such as when taxable withdrawals begin and the rate at which to discount taxes paid in the future.

In addition, a tax proposal may have provisions that phase in or phase out over time, or that are only temporary. Standard distribution tables have represented such temporal issues in various ways. Economists have prepared analyses for each year (or perhaps the beginning and end year) of a phase-in, phaseout, or temporary provision, or have developed methods that reflect the present value of the provision over the budget period. These approaches are all open to criticism.

All four groups use annual income measures, which can be problematic because income is volatile: some normally high-income households will be counted among low-income households in a particular year, while some normally low-income households will appear to have higher incomes. Further, income for most individuals follows a “life-cycle” pattern—generally rising through about age 50 and then declining—so in any particular year, the distribution will underestimate the welfare of the young and old and overestimate the welfare of the middle-aged.

#### TAXES VERSUS SPENDING

The federal budget counts amounts paid as refundable credits on the expenditure side of the ledger, but all standard distributional analyses classify those amounts as (negative) taxes. Similarly, all analyses effectively

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### What criticisms are levied against standard distributional analysis?

DISTRIBUTION OF TAX BURDENS

reduce tax burdens by the special exemptions, deductions, tax rates, and credits that represent “tax expenditures,” which arguably should be counted as budget outlays rather than as tax reductions. Including these outlays in the analyses understates the true burden of taxes.

Moreover, because standard distributional analyses omit the benefits from most government spending programs, these analyses do not reflect the overall effect of the federal budget on the well-being of households.

#### EFFECTS ON THE DEFICIT AND SPENDING

All four groups ignore the effects of financing a tax cut, be it through reductions in current outlays, higher deficits, or higher debt (which eventually will require future tax increases or reductions in spending to repay). They also omit the opposite effects of a tax increase.

#### MACROECONOMIC EFFECTS

All four groups assume for purposes of distributional analyses that any tax change leaves economic aggregates (gross domestic product, employment, the price level, etc.) unchanged. Critics argue that tax reform could improve economic performance and thereby raise revenues while improving the well-being of many (if not all) households.

#### OTHER DIMENSIONS OF TAX POLICY

A frequent criticism of distributional analyses is that they focus on only one dimension of tax policy: vertical equity (fairness across income groups). Less attention is therefore paid to horizontal equity (fairness within income groups), simplification, economic efficiency, and how the tax system may finance worthy federal spending.

*Updated May 2020*

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## Some Background

### What criticisms are levied against standard distributional analysis?

DISTRIBUTION OF TAX BURDENS

Urban-Brookings Tax Policy Center.

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## Some Background

DISTRIBUTION OF TAX BURDENS

### How should distributional tables be interpreted?

**Q. How should distributional tables be interpreted?**

**A. Distributional tables provide important and useful information, but keep six key questions in mind to correctly interpret the results.**

- 1. What taxes or tax changes does the analysis include?** If the table covers taxes under current law, note which taxes are included and which aren't. If the table shows the distributional impact of a tax change, particularly an extensive reform proposal, be sure to note which provisions are included or omitted.
- 2. What is the baseline for a tax change?** Ordinarily, the baseline is current law, but not always. With the current temporary provisions of the 2017 Tax Cuts and Jobs Act, economists are uncertain about what "current law" will look like in the future. As a result, some distribution tables use a "current policy" baseline, which assumes that Congress will extend certain tax provisions that are scheduled to expire (or sunset) under current law.
- 3. What is the income measure?** Income is used in distributional tables to rank households by their "ability to pay"; it is also used to measure tax burdens, such as taxes as a percentage of income by income group. Definitions and measurements of income can significantly affect distributional results, so be sure to note which income measure the table uses. Also, income used to rank households may be adjusted for family size to better compare ability to pay across households.
- 4. What are the household units?** Note whether the table includes households that do not file income tax returns. Some distributional tables that rank by quintiles of income typically place a fifth of all taxpaying households in each quintile. But some tables—including those produced by the Urban-Brookings Tax Policy Center—place a fifth of the *population* in each quintile, altering the count of household units in each quintile.
- 5. What period is covered?** Standard distribution tables cover a single year. But some policy changes may have effects over multiple years, and some may be phased in or phased out over multiple years, or be only temporary. Note how the table represents any phase-ins, phaseouts, and temporary provisions.
- 6. What measures of tax burdens are included?** Distribution tables typically show alternative measures of "tax burdens." However, only the percentage change in after-tax income directly measures the effect of a tax proposal on households' well-being and therefore is a reliable measure of progressivity.

*Updated May 2020*

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DISTRIBUTION OF TAX BURDENS

### How should distributional tables be interpreted?

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## Some Background

DISTRIBUTION OF TAX BURDENS

### Who bears the burden of the corporate income tax?

#### Q. Who bears the burden of the corporate income tax?

#### A. The burden is shared among stockholders and, unintuitively, among a broader group of workers and investors.

Shareholders bear some of the corporate income tax burden, but they aren't the only ones. Over time, others bear some of the burden because of a chain reaction that begins with the shareholders.

The corporate income tax reduces shareholders' after-tax returns, causing them to shift some of their investments out of the corporate sector. Shareholders will shift some investments to noncorporate ("pass-through") businesses and some to foreign businesses not subject to the US corporate income tax. The shift to these other sectors lowers the after-tax return on investments in these sectors. The shifting of investment out of the corporate sector continues until after-tax returns—adjusted for risk—are equalized in the corporate and noncorporate sectors. Thus, the corporate income tax reduces investment returns in all sectors.

Shifting investments to foreign businesses also reduces the amount of capital (machines, equipment, structures, etc.) complementing US workers, so their productivity, and therefore their wages and other compensation, fall.

In calculating distributional effects, the Urban-Brookings Tax Policy Center (TPC) assumes investment returns (dividends, interest, capital gains, etc.) bear 80 percent of the burden, with wages and other labor income carrying the remaining 20 percent. These assumptions reflect the full, long-term economic consequences of investors responding to changes in the corporate income tax, such as rate changes.

When analyzing the distributional effects of a short-term corporate income tax change before investors have a chance to react, TPC assumes that shareholders bear the entire burden. When analyzing corporate income tax changes that affect only the timing of payments, such as a change in depreciation allowances, TPC assumes that half the burden is on investment returns and half on wages and other labor income. The Joint Committee on Taxation, the US Department of the Treasury's Office of Tax Analysis, and the Congressional Budget Office use similar incidence assumptions.

*Updated May 2020*

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DISTRIBUTION OF TAX BURDENS

### Who bears the burden of the corporate income tax?

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## Some Background

DISTRIBUTION OF TAX BURDENS

### Who bears the burden of federal excise taxes?

**Q. Who bears the burden of federal excise taxes?**

**A. Workers, owners of capital, and households that consume a disproportionate amount of taxed items all bear the burden of federal excise taxes.**

Excise taxes create a wedge between the price the final consumer pays and what the producer receives. An excise can either raise the total price (inclusive of the excise tax) consumers pay or reduce the business revenue available to compensate workers and investors.

The burden of an excise can be separated into two pieces: (1) the reduction in real household income, which equals the gross revenue generated by the excise tax and (2) the increase in the price of the taxed good or service relative to the prices of other goods and services, which depends on the mix of consumption by each household and equals zero across all households. Importantly, the decline in real income is the same regardless of whether nominal incomes fall (holding the price level constant) or whether the price level rises (holding nominal incomes constant).

#### REDUCTION IN REAL INCOME

The reduction in real income is spread across wages, profits, and other returns to labor and capital. The reduction in wages, in turn, reduces both individual income taxes and payroll taxes. Likewise, the reduction in profits reduces corporate income taxes and individual income taxes on the profits of pass-through business (like partnerships) and other returns to capital. These “excise tax offsets” amount to about 22 percent of excise tax revenues and are considered in distributional analyses.

#### CHANGE IN RELATIVE PRICES

An excise tax also increases the price of the taxed good or service relative to the prices of all other goods and services. While the price of the taxed item rises, the prices of all other items may either remain unchanged as the overall price level rises or fall slightly if the price level remains unchanged.

Either way, this change in relative prices burdens households that consume a larger-than-average share of the taxed item. However, households that consume a smaller-than-average share of the taxed item, or do not consume it at all, benefit from this change in relative prices.

#### TIMING OF THE TAX BURDEN

This still leaves open the *timing* of the tax burden—that is, whether the burden is assigned when income is earned or when it is consumed. Some distributional analyses follow the latter approach and distribute excise

## Some Background

DISTRIBUTION OF TAX BURDENS

### Who bears the burden of federal excise taxes?

taxes in proportion to current levels of consumption. Alternative analyses assign the burden based on current income. Under the income-based approach, one can think of excise taxes as a reduction in purchasing power at the point income is earned. Of course, if all households fully consumed their income in each year, the two methods would yield identical results.

The Urban-Brookings Tax Policy Center distributes the burden of an excise tax when income is earned, taking into account the “offset” and the relative price effect. The US Department of the Treasury’s Office of Tax Analysis, as described in Cronin (1999), distributes excise taxes in the same manner. The Joint Committee on Taxation and the Congressional Budget Office, however, distribute the entire burden of excises in proportion to consumption of the taxed goods and services.

### DISTRIBUTION OF FEDERAL EXCISE TAXES

While the share of federal excise tax paid rises with income, federal excises are regressive. That is, the average federal excise tax rate (the excise tax burden as a percentage of pretax income) declines as income rises. The average excise tax rate falls from 1.1 percent in the bottom quintile to 0.5 in highest quintile, and to 0.3 percent of income in the top 1 percent (table 1). (Each quintile contains 20 percent of the population, ranked by income.)

**TABLE 1**

### Distribution of Federal Excise Taxes, 2019



Expanded Cash Income Percentile	Share of Total Excise Tax Burden (%)	Average Federal Excise Tax Rate (%)	Average Total Federal Tax Rate (%)
Lowest quintile	7.1%	1.1%	3.2%
Second quintile	11.6%	0.8%	7.9%
Middle quintile	16.5%	0.7%	13.0%
Fourth quintile	22.3%	0.6%	16.8%
Top quintile	42.1%	0.5%	23.9%
All	100.0%	0.6%	18.8%
Addendum			
80-90	14.2%	0.6%	19.6%
90-95	8.9%	0.5%	21.5%
95-99	10.4%	0.5%	23.3%
Top 1 percent	8.6%	0.3%	29.4%
Top 0.1 percent	3.3%	0.2%	30.1%

**Source:** Urban-Brookings Tax Policy Center. “TPC Microsimulation Model, version 0319-2.”

## Some Background

DISTRIBUTION OF TAX BURDENS

### Who bears the burden of federal excise taxes?

Federal excise taxes also account for a larger share of the total federal tax burden (including individual and corporate income taxes, payroll taxes, the estate tax, and excise taxes) for lower-income groups than for higher-income groups. In the bottom two quintiles, excise taxes are the second-largest source of the total federal tax burden, well behind payroll taxes. Those income groups have negative average income tax rates resulting from refundable income tax credits.

Federal excise tax revenues will total about \$98.5 billion in fiscal year 2019, or 3 percent of federal tax revenues. Five categories of excise taxes—highway, tobacco, air travel, health, and alcohol—account for about 95 percent of total excise tax receipts.

The distributional burden varies somewhat across the different categories of excise taxes (table 2). The most noticeable is the tobacco excise tax, for which the share of tax paid varies the least across income quintiles. The bottom quintile pays 16 percent of tobacco taxes and 18 percent of penalties under the Affordable Care Act (ACA) (compared to 4 to 5 percent of other excises), while the top quintile pays 27 percent of tobacco taxes and 25 percent of ACA penalties (compared to about 45 to 50 percent of other excises). Tobacco taxes and ACA penalties are the most regressive of the major federal excise taxes. The remaining categories vary only modestly from each other. Excise taxes on air travel are tilted the most toward higher-income households, with 52 percent paid by households in the top income quintile.

TABLE 2

#### Distribution of Federal Excise Taxes and Aggregate Revenue by category of excise tax, 2019



Expanded Cash Income Percentile	Share of Total Excise Tax Burden (%)						
	Highway	Tobacco	Air Travel	Health	ACA Penalties	Alcohol	Other
Lowest quintile	4.2%	15.9%	4.5%	3.4%	18.4%	3.5%	4.1%
Second quintile	10.5%	18.3%	7.0%	10.2%	20.1%	8.6%	9.3%
Middle quintile	17.1%	18.1%	14.1%	16.8%	15.8%	17.2%	15.7%
Fourth quintile	23.4%	20.1%	21.6%	23.7%	20.3%	23.9%	22.7%
Top quintile	44.4%	27.3%	52.4%	45.6%	25.3%	46.7%	47.9%
All	100.0%	100%	100%	100%	100%	100%	100%
Addendum							
80-90	14.8%	9.3%	16.2%	14.9%	12.2%	15.2%	15.3%
90-95	9.1%	4.6%	12.0%	9.6%	7.0%	10.4%	10.2%
95-99	11.0%	6.2%	13.8%	11.4%	4.9%	12.0%	12.1%
Top 1 percent	9.5%	7.1%	10.4%	9.7%	1.1%	9.1%	10.3%
Top 0.1 percent	3.7%	3.2%	3.8%	3.8%	0.1%	3.5%	4.0%
Aggregate revenue (\$ billions)	\$41.7	\$13.1	\$17.3	\$2.8	\$9.4	\$8.8	\$5.1

Source: Urban-Brookings Tax Policy Center. "TPC Microsimulation Model, version 0319-2."

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## Some Background

DISTRIBUTION OF TAX BURDENS

### Who bears the burden of federal excise taxes?

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## Some Background

How do financing methods affect the distributional analyses of <sup>DISTRIBUTION OF TAX BURDENS</sup> tax cuts?

**Q. How do financing methods affect the distributional analyses of tax cuts?**

**A. Tax cuts are financed through reductions in current outlays or higher government debt that will eventually have to be repaid. Distributional analyses omit this information as well as the effects of tax increases on current outlays and debt.**

Distributional analyses omit the ways tax cuts and tax increases affect other government finances—through either lower (or higher) spending or higher (or lower) debt. These omissions implicitly assume that lost revenue from tax cuts is never paid and that additional revenue from tax increases simply disappears. No one believes these assumptions are realistic, but there is no generally accepted way to include these financing effects. Gale (2018) and Gale, Khitatrakun, and Krupkin (2017) show that the distributional effects of the 2017 Tax Cuts and Jobs Act tax cuts are significantly altered if alternative financing effects are considered.

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## Some Background

DISTRIBUTION OF TAX BURDENS

How do taxes affect income inequality?

Q. How do taxes affect income inequality?

A. Because high-income households pay a larger share of their income in total federal taxes than low-income households, federal taxes reduce income inequality. But federal taxes have done little to offset increasing income inequality over the past 40 years.

### INCREASING INCOME INEQUALITY

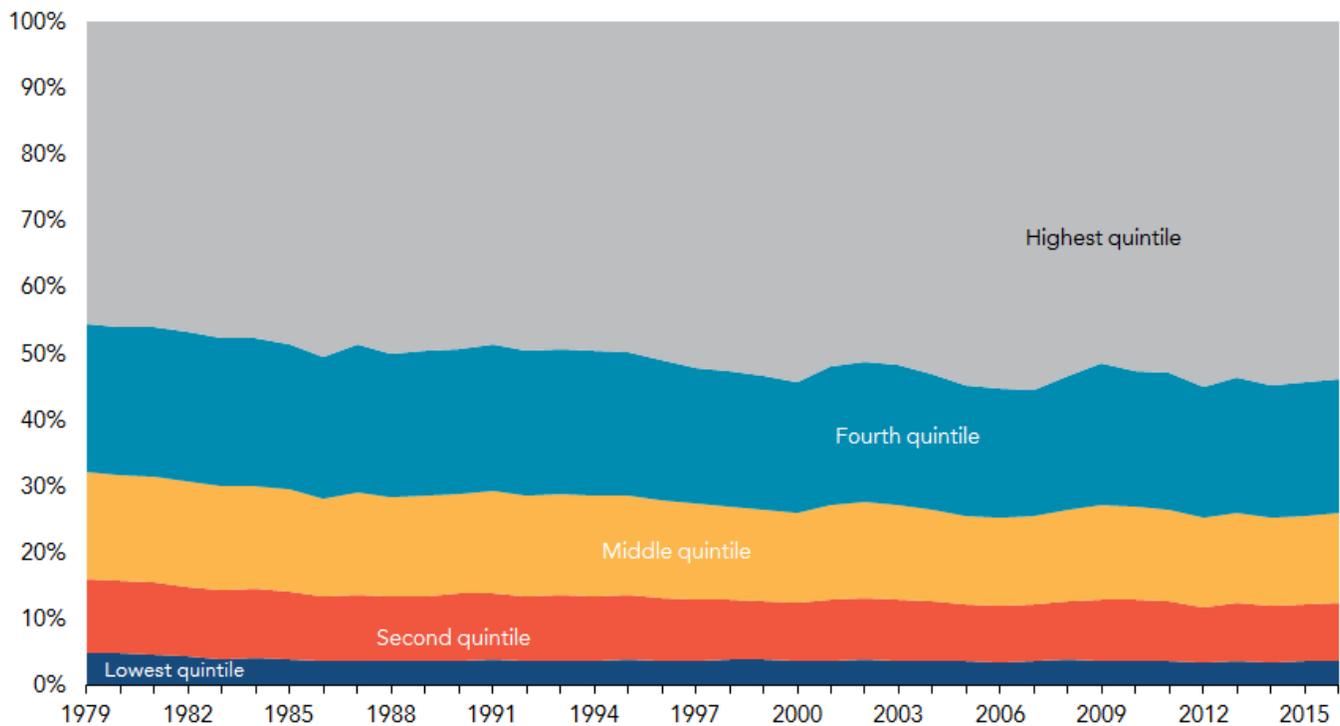
Income inequality has increased sharply over the past 40 years. A simple way to measure inequality is by looking at the share of income received by the highest-income people. Using a broad measure that includes labor, business, and capital income; and government social insurance benefits (such as Social Security, Medicare, and unemployment insurance), the Congressional Budget Office finds that the fifth of the population with the highest income saw their share rise from 46 to 54 percent between 1979 and 2016 (figure 1). This increase in income inequality came about despite the growth in Social Security and Medicare, which boost before-tax income for low- and middle-income households.

## Some Background

DISTRIBUTION OF TAX BURDENS

How do taxes affect income inequality?

FIGURE 1

Share of Before-Tax Income by Income Quintile  
1979–2016

**Source:** Congressional Budget Office (CBO), *The Distribution of Household Income and Federal Taxes, 2016* (Washington, DC: CBO, 2019), supplemental data.

**Notes:** In 2019, the Congressional Budget Office changed their methodology for calculating income before taxes by excluding means-test transfers (such as the benefits from Medicaid, SNAP, and SSI). Thus, the numbers in this figure are not directly comparable to those in versions of our briefing book published prior to 2019.

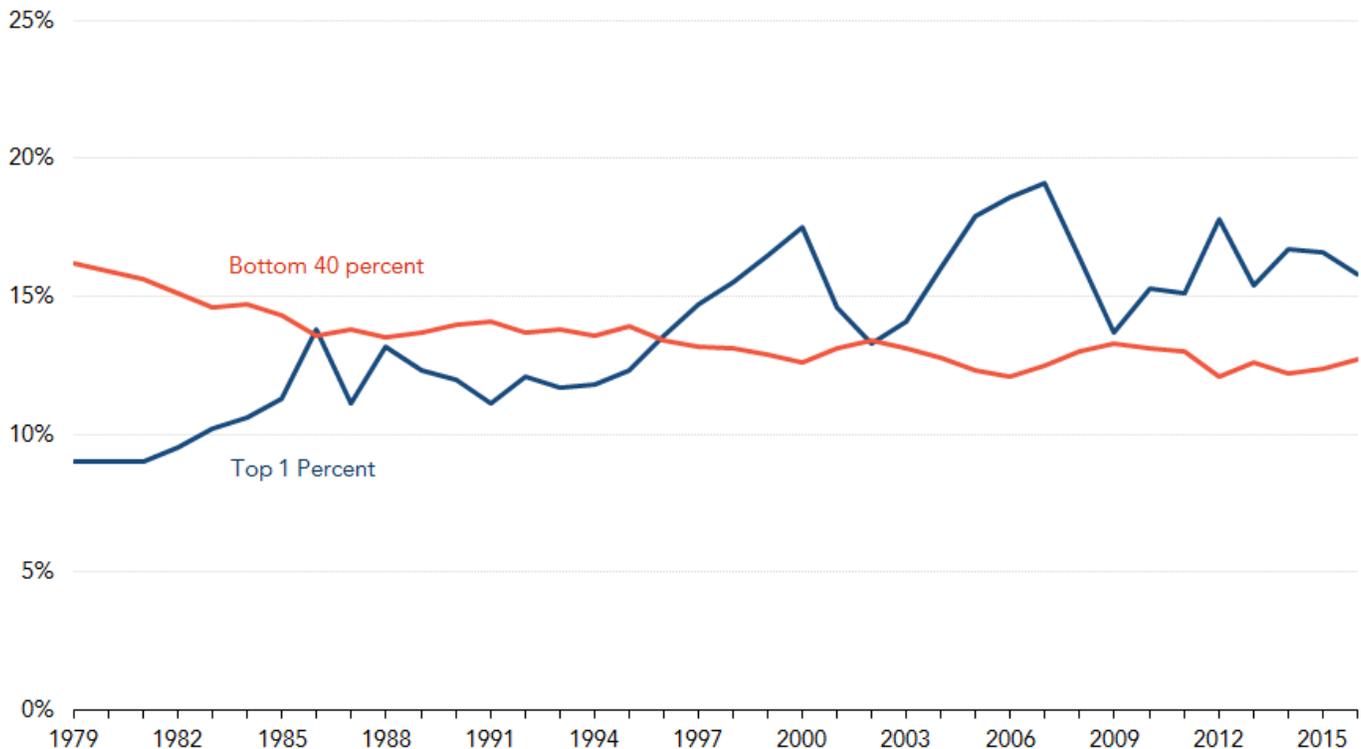
Much of the gain in the top income share went to the top 1 percent of the population. In 1979, they received 9 percent of all income. By 2016, their share grew to 16 percent, more than all the income received by the bottom 40 percent (figure 2). The income measure used in figures 1 and 2 includes realized capital gains, which are sensitive to business cycle fluctuations and to changes in tax rates. Because realized capital gains are a significant component of income for the top 1 percent, their income share is more volatile than that of other groups.

## Some Background

DISTRIBUTION OF TAX BURDENS

How do taxes affect income inequality?

FIGURE 2

Share of Before-Tax Income for the Top 1 and Bottom 40 Percent  
1979–2016

**Source:** Congressional Budget Office (CBO), *The Distribution of Household Income and Federal Taxes, 2016* (Washington, DC: CBO, 2019), supplemental data.

**Notes:** In 2019, the Congressional Budget Office changed their methodology for calculating income before taxes by excluding means-test transfers (such as the benefits from Medicaid, SNAP, and SSI). Thus, the numbers in this figure are not directly comparable to those in versions of our briefing book published prior to 2019.

Top income shares have not reached these levels since the 1920s (figure 3). After falling precipitously during the Great Depression and World War II, the income share of the top 1 percent leveled off during the next three decades. It began climbing again in the 1980s, interrupted only by the 2001 and 2008–09 recessions. Since the stock market rebound, income shares for the top 1 percent have increased again.

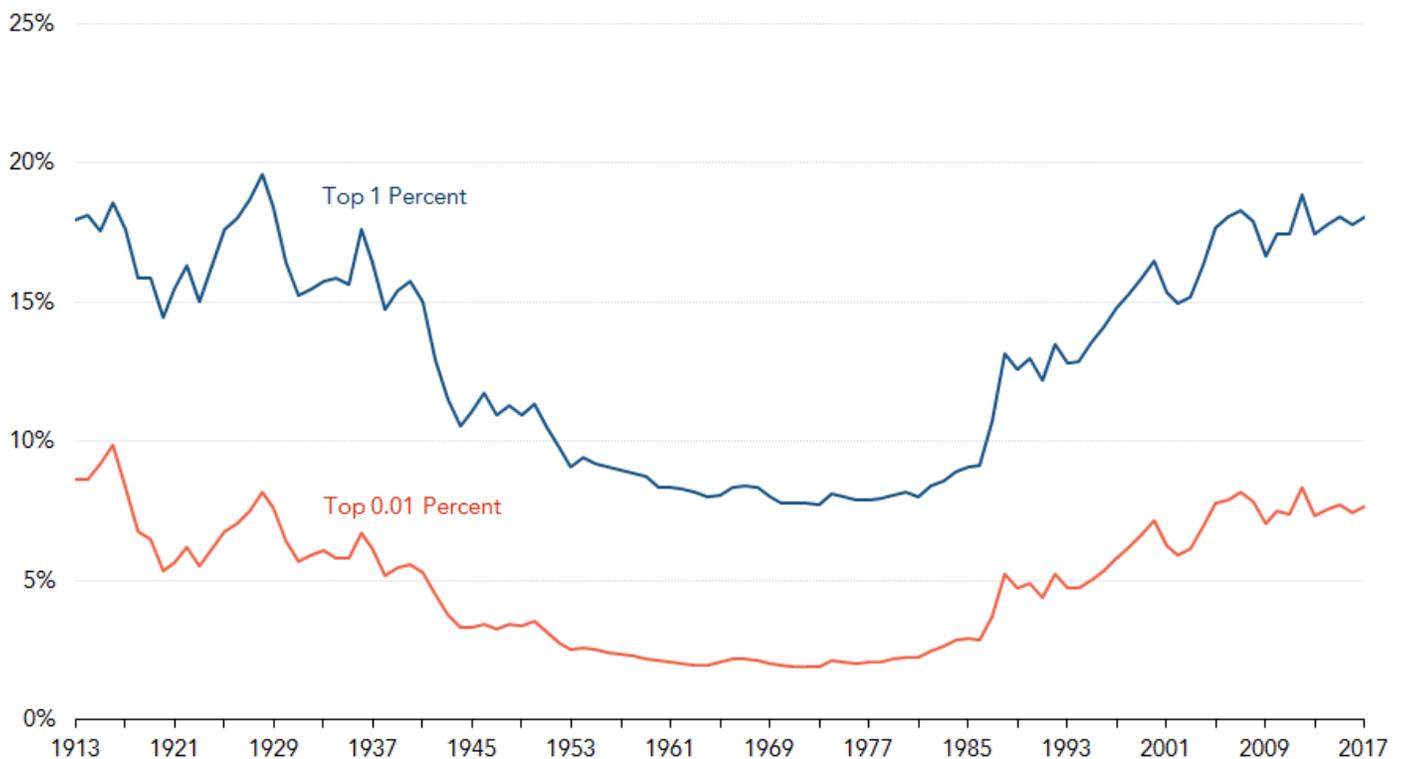
## Some Background

DISTRIBUTION OF TAX BURDENS

### How do taxes affect income inequality?

FIGURE 3

#### Top Income Shares in the United States 1913–2017



**Source:** Emmanuel Saez, "Striking It Richer: The Evolution of Top Incomes in the United States (Updated with 2017 final estimates)" (Berkeley: University of California, Berkeley, 2019).

**Note:** Income is annual gross income reported on individual tax returns, excluding capital gains and government transfers (such as Social Security, unemployment benefits, and welfare payments) and before individual income taxes and employees' payroll taxes.

### A WORLDWIDE PHENOMENON

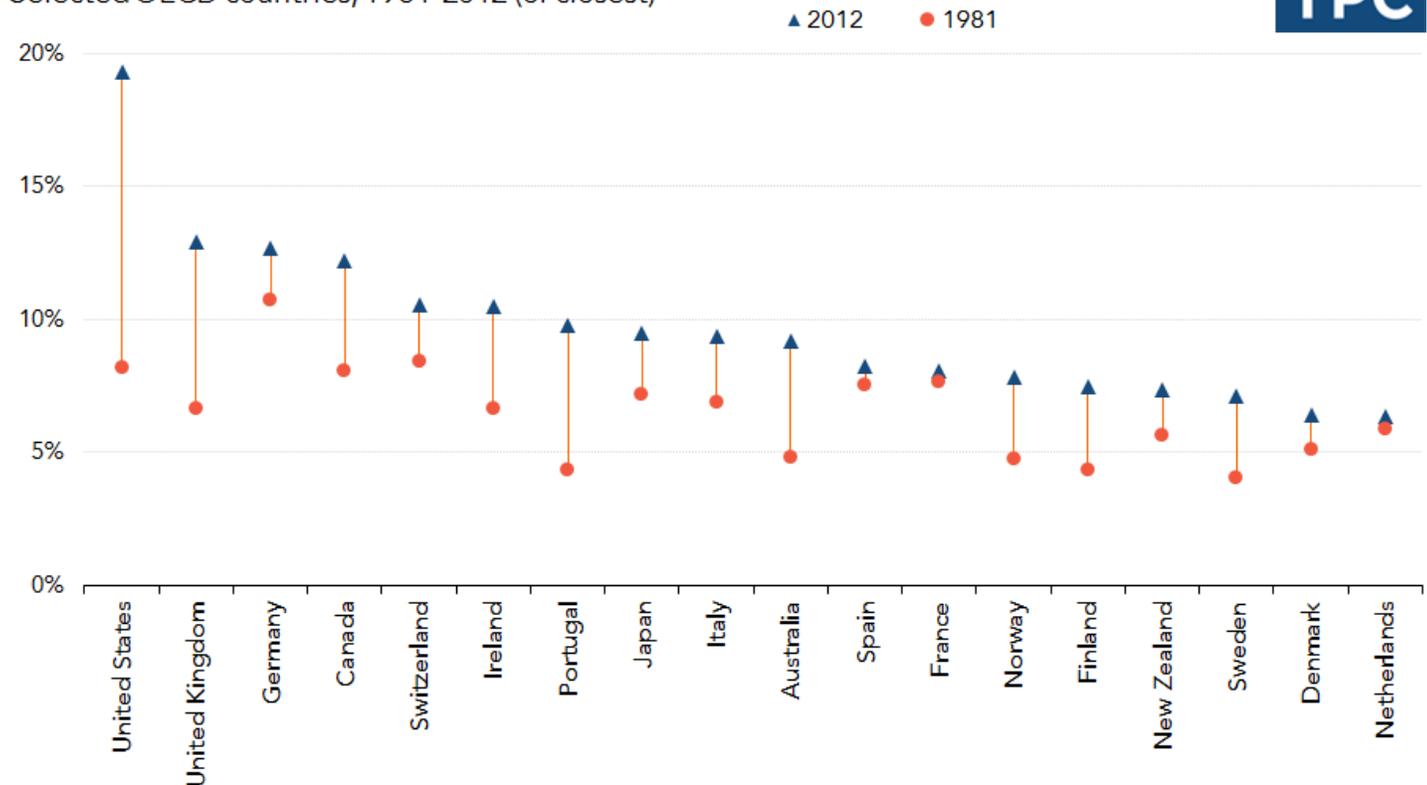
The United States is not the only country with increasing income inequality. Most member countries of the Organisation for Economic Co-operation and Development have experienced the same phenomenon, though to a lesser degree than the United States (figure 4).

## Some Background

DISTRIBUTION OF TAX BURDENS

How do taxes affect income inequality?

FIGURE 4

Share of Before-Tax Income for Top 1 Percent Income Group  
Selected OECD countries, 1981-2012 (or closest)

**Source:** Organisation for Economic Co-operation and Development (OECD), "Focus on Top Income and Taxation in OECD Countries: Was the crisis a game changer?" (Paris: OECD, 2014).

**Notes:** Incomes refer to pretax incomes, excluding capital gains, except in Germany (which includes capital gains). Latest year refers to 2012 for the Netherlands, Sweden, and the United States; 2011 for Norway and the United Kingdom; 2009 for Finland, France, Italy, and Switzerland; 2007 for Germany; 2005 for Portugal; and 2010 for Australia, Canada, Ireland, Japan, New Zealand, and Spain.

## THE ROLE OF TAXES

The figures so far only consider income before taxes. What happens after we account for taxes?

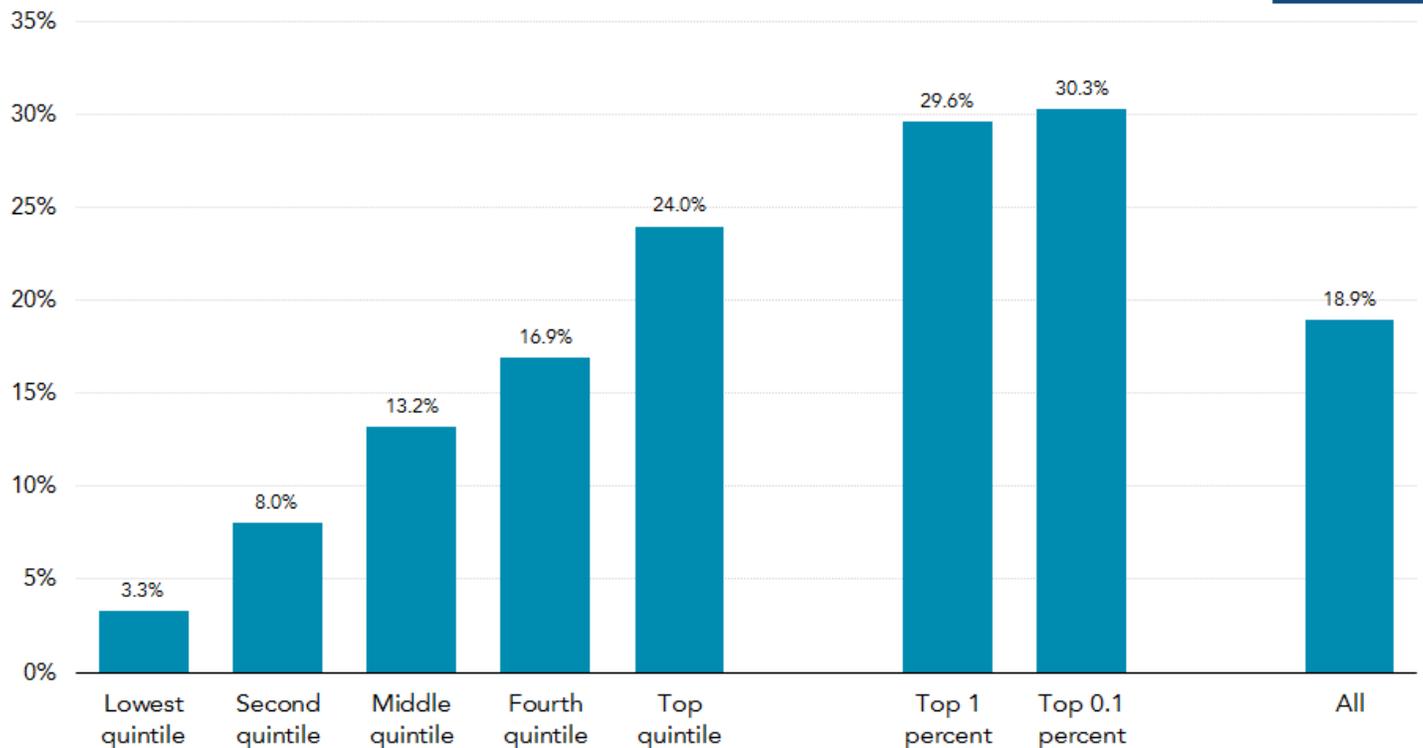
The US federal tax system is progressive. High-income households pay a larger share of their income in total federal taxes than low-income households (figure 5). State and local taxes, which are not included in this analysis, are much less progressive and some, such as sales taxes, are regressive (low-income households pay a higher share of their income in sales taxes than high-income households).

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How do taxes affect income inequality?

FIGURE 5

Average Effective Federal Tax Rates by Income Percentile  
2020

**Source:** Urban-Brookings Tax Policy Center. 2020. T20-0039. "Average Effective Federal Tax Rates—All Tax Units, by Expanded Cash Income Percentile, 2020."

**Notes:** The average effective federal tax rate is the sum of individual and corporate income tax, payroll taxes for Social Security and Medicare, the estate tax, and excise taxes as a percentage of expanded cash income. For a description of expanded cash income, see Urban-Brookings Tax Policy Center. "Income Measure Used in Distributional Analyses by the Tax Policy Center."

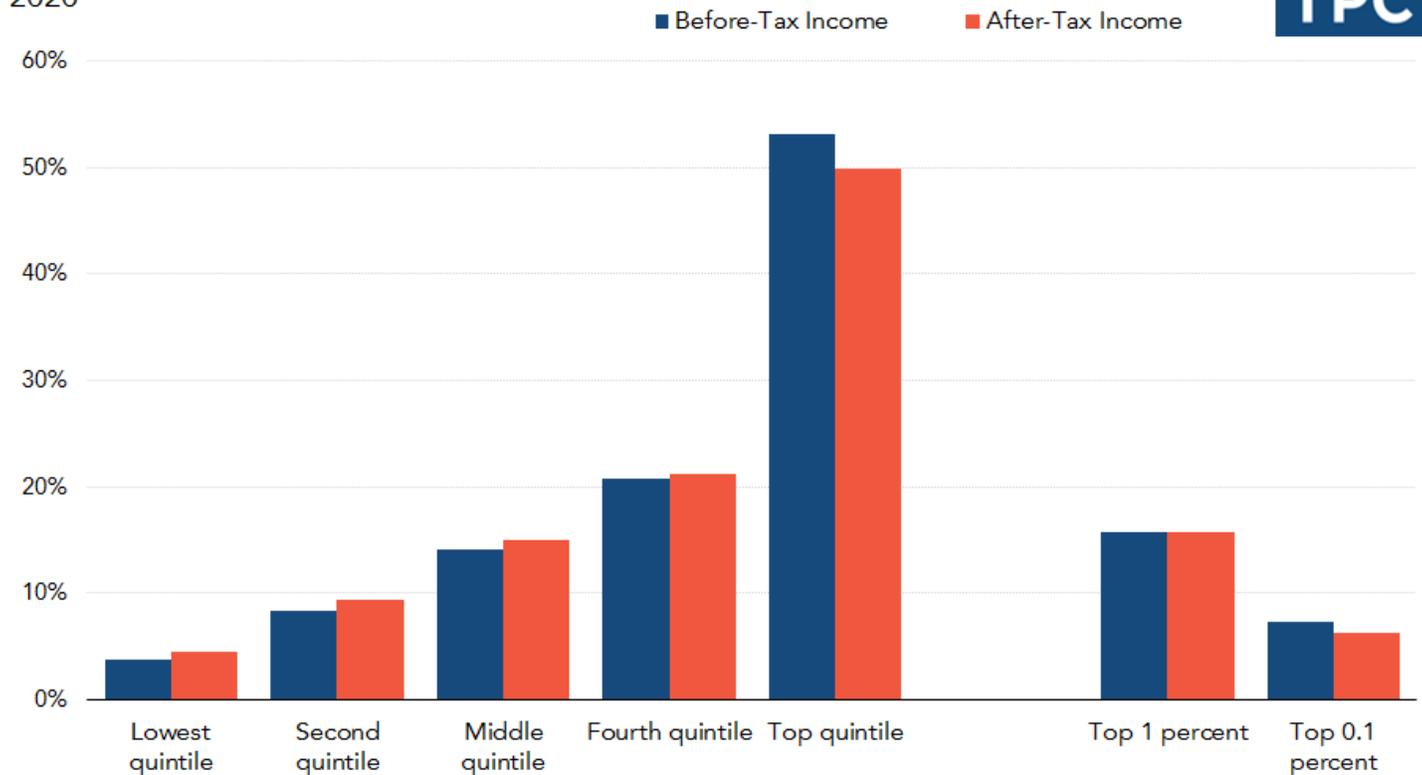
Because federal taxes are progressive, the distribution of after-tax income is more equal than income before taxes. High-income households have a slightly smaller share of total income after taxes than their share of income before taxes, while the reverse is true for other income groups (figure 6).

## Some Background

DISTRIBUTION OF TAX BURDENS

How do taxes affect income inequality?

FIGURE 6

Shares of Before-Tax and After-Tax Income by Income Percentile  
2020

**Source:** Urban-Brookings Tax Policy Center. 2020. T20-0017. "Baseline Distribution of Income and Federal Taxes, All Tax Units, by Expanded Cash Income Percentile, 2020."

**Notes:** Before-tax income is measured as expanded cash income. For a description of expanded cash income, see Urban-Brookings Tax Policy Center. "Income Measure Used in Distributional Analyses by the Tax Policy Center." After-tax income is expanded cash income less individual income tax net of refundable credits, corporate income tax, payroll taxes (Social Security and Medicare), the estate tax, and excise taxes.

Federal taxes are more progressive than they were 35 years ago. Although the average tax rate for high-income households has varied, it is now just below its peaks in 1979 and 1995. Meanwhile, the average tax rate for middle- and low-income groups dropped incrementally from the early 1980s through 2007 and then fell dramatically from 2007 through 2009 because of temporary tax cuts enacted in response to the Great Recession. Average rates rebounded as those tax cuts expired but, by 2016, rates remained well below their 1979 values for those groups (figure 7).

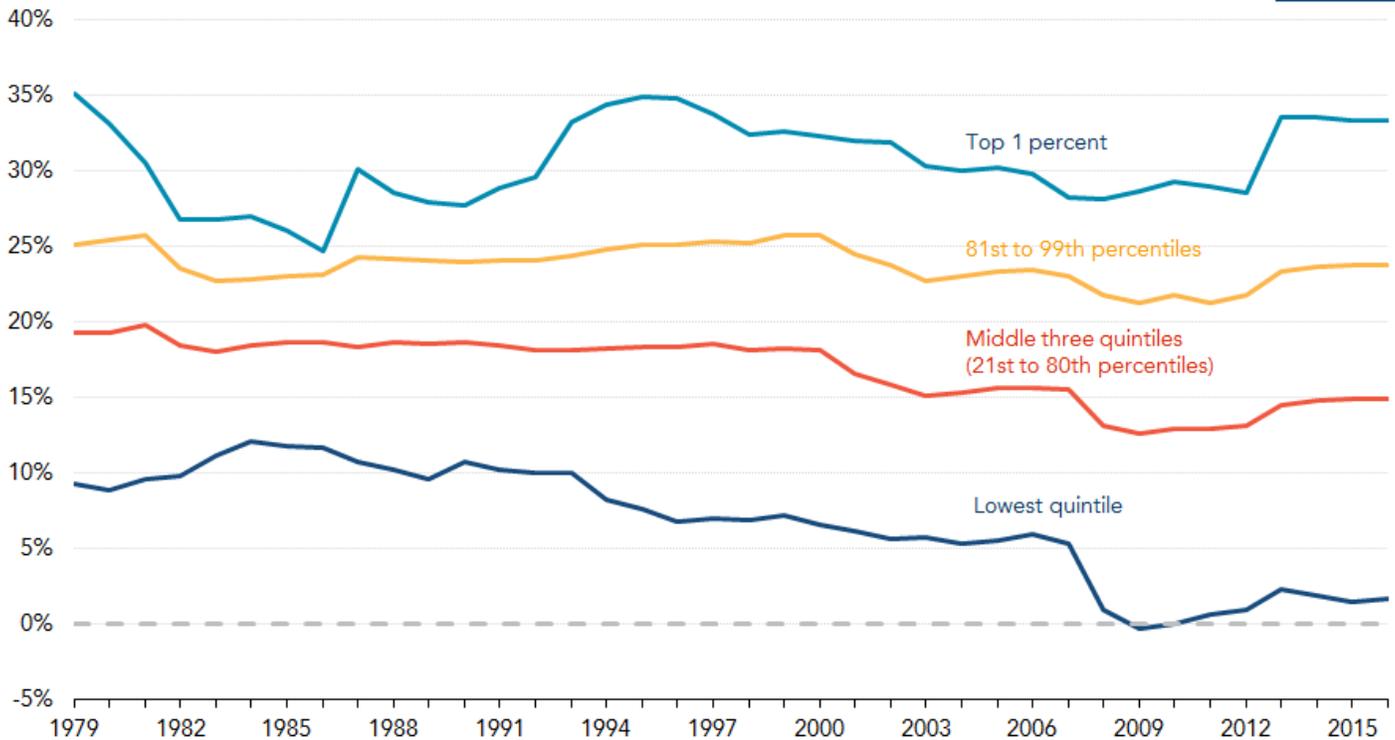
## Some Background

DISTRIBUTION OF TAX BURDENS

### How do taxes affect income inequality?

FIGURE 7

#### Average Federal Tax Rates by Income Group 1979-2016



**Source:** Congressional Budget Office (CBO), *The Distribution of Household Income and Federal Taxes, 2016* (Washington, DC: CBO, 2019), supplemental data.

**Notes:** In 2019, the Congressional Budget Office changed their methodology for calculating income before taxes by excluding means-test transfers (such as the benefits from Medicaid, SNAP, and SSI). Thus, the numbers in this figure are not directly comparable to those in versions of our briefing book published prior to 2019.

### EFFECT OF TAXES ON INCOME INEQUALITY

A more progressive tax system would reduce income inequality if nothing else changes. But while federal taxes have become more progressive, they also began shrinking in 2001 relative to before-tax income, thanks to tax cuts during the George W. Bush and Barack Obama administrations. A lower average tax rate offset the equalizing effect of increased tax progressivity, leaving the effect of federal taxes on income inequality little changed.

A widely-used measure of income inequality is the Gini index. The index has a value of zero when income is distributed equally across all income groups and a value of one when the highest income group receives all the income. By this measure, inequality has been consistently lower for after-tax income than for before-tax income (figure 8).

## Some Background

DISTRIBUTION OF TAX BURDENS

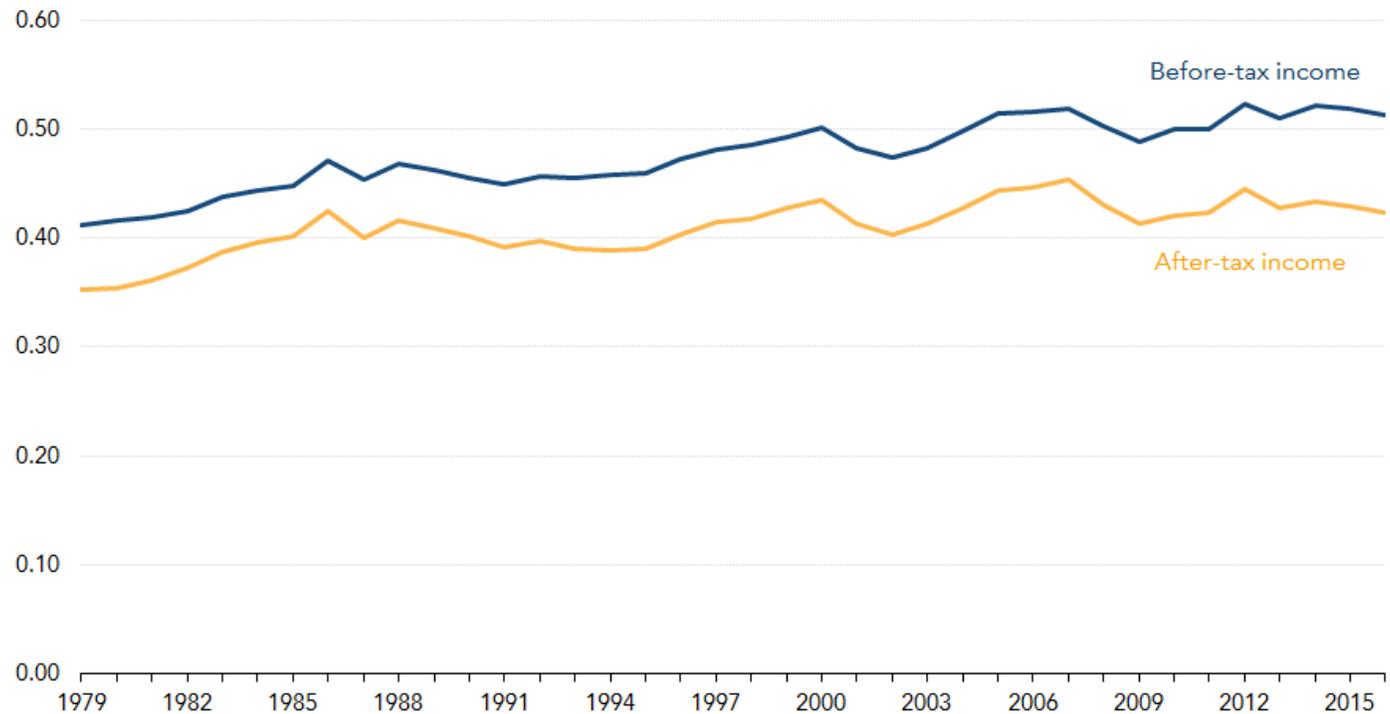
### How do taxes affect income inequality?

FIGURE 8

#### Inequality Index for Before-Tax and After-Tax Income 1979-2016



Gini coefficient



**Source:** Congressional Budget Office (CBO), *The Distribution of Household Income and Federal Taxes, 2016* (Washington, DC: CBO, 2019), supplemental data.

**Note:** The Gini index is a summary measure of income inequality based on the relationship between shares of income and shares of the population. It ranges in value from zero to one, with zero indicating complete equality (for example, if each fifth of the population received one-fifth of the income) and one indicating complete inequality (for example, if one household received all of the income).

The gap between the index for before-tax and after-tax incomes measures how much taxes reduce inequality. The bigger the difference, the more taxes equalize income. The gap narrowed during the 1980s as taxes relative to income fell more for high-income households than for low-income groups. But as federal taxes became more progressive starting in the 1990s, the gap between before-tax and after-tax income inequality widened. In percentage terms, it remains today at roughly the pre-1980 value.

The bottom line is that before-tax income inequality has risen since the 1970s, despite an increase in government transfer payments. Because high-income people pay higher average tax rates than others, federal taxes reduce inequality. But the mitigating effect of taxes is about the same today as before 1980. Thus, after-tax income inequality has increased about as much as before-tax inequality. Taxes have not exacerbated increasing income inequality, but have not done much to offset it.

Updated May 2020

## Some Background

DISTRIBUTION OF TAX BURDENS

### How do taxes affect income inequality?

Urban-Brookings Tax Policy Center. [T20-0017. "Baseline Distribution of Income and Federal Taxes, All Tax Units, by Expanded Cash Income Percentile, 2020"](#); and [T20-0039. "Average Effective Federal Tax Rates—All Tax Units, by Expanded Cash Income Percentile, 2020."](#)

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Organisation for Economic Co-operation and Development. 2014. "FOCUS on Top Income and Taxation in OECD Countries: Was the Crisis a Game Changer?" Paris: OECD.

Saez, Emmanuel. 2019. "Striking It Richer: The Evolution of Top Incomes in the United States." Updated with 2017 final estimates. Berkeley: University of California, Berkeley.

Urban-Brookings Tax Policy Center. ["Income Measure Used in Distributional Analyses by the Tax Policy Center."](#)

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