

Background

How should progressivity be measured?

DISTRIBUTION OF TAX BURDENS

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Q. How should progressivity be measured?

A. A broad definition of 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
2018



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	\$14,703	\$440	0.7%	3.0%	-\$7	-1.5%	0.0	0.0	0.1%
Second quintile	\$37,736	\$2,876	3.5%	7.6%	-\$89	-3.1%	0.0	-0.2	0.3%
Middle quintile	\$68,140	\$8,415	9.4%	12.4%	-\$296	-3.5%	-0.1	-0.4	0.5%
Fourth quintile	\$119,310	\$18,715	17.7%	15.7%	-\$674	-3.6%	-0.1	-0.6	0.7%
Top quintile	\$370,357	\$86,643	68.5%	23.4%	-\$2,280	-2.6%	0.2	-0.6	0.8%
All	\$98,272	\$17,879	100.0%	18.2%	-\$517	-2.9%	0.0	-0.5	0.6%
Addendum									
80–90	\$193,663	\$36,222	14.7%	18.7%	-\$1,229	-3.4%	-0.1	-0.6	0.8%
90–95	\$276,551	\$55,749	11.0%	20.2%	-\$1,805	-3.2%	0.0	-0.7	0.8%
95–99	\$474,518	\$107,309	16.1%	22.6%	-\$3,114	-2.9%	0.0	-0.7	0.9%
Top 1 percent	\$2,405,950	\$726,654	26.7%	30.2%	-\$13,051	-1.8%	0.3	-0.5	0.8%
Top 0.1 percent	\$11,814,173	\$3,699,217	13.8%	31.3%	-\$51,852	-1.4%	0.2	-0.4	0.6%

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0718-1).

Notes: 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.

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

- 1. The average change in tax burden (column 5, figure 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, figure 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, figure 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, figure 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, figure 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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FIGURE 1
Proposal to Reduce All Federal Individual Income Tax Rates by One Percentage Point



Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0718-1).

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Data Source

Urban-Brookings Tax Policy Center. "Microsimulation Model, version 0718-1."

Further Reading

Burman, Leonard E. 2007. "[Fairness in Tax Policy](#)." Testimony before the Subcommittee on Financial Services and General Government, House Appropriations Committee, Washington, DC, March 5.

Cronin, Julie-Anne. 1999. "[US Treasury Distributional Analysis Methodology](#)." OTA paper 85. Washington, DC: US Department of the Treasury.

Joint Committee on Taxation. 1993. [Methodology and Issues in Measuring Changes in the Distribution of Tax Burdens](#). JCS-7-93. Washington, DC: Joint Committee on Taxation.

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