

How should progressivity be measured?

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 there are various ways to define “tax burden.” Table 1 helps illustrate the problem by analyzing a hypothetical proposal to reduce all individual income tax rates by 1 percentage point.

TABLE 1
Measures of Changes in Federal Tax Burdens due to Proposals to Reduce All Federal Individual Income Tax Rates by One Percentage Point^a



Expanded cash income percentile	Baseline Distribution of Income and Federal Taxes				Measures of Change in Federal Tax Burden Due to Proposal				
	Average pre-tax income (dollars)	Average federal tax burden (dollars)	Percent of federal tax burden	Average federal tax rate (percent)	Average change in tax burden (dollars)	Percentage change in tax burden	Change in percent of burden	Change in average tax rate (% points)	Percentage change in after-tax income
Lowest Quintile	13,336	568	0.9	4.3	-7	-1.2	0.0	-0.1	0.1
Second Quintile	33,359	2,782	3.4	8.3	-71	-2.6	0.0	-0.2	0.2
Middle Quintile	61,542	8,456	9.4	13.7	-242	-2.9	-0.1	-0.4	0.5
Fourth Quintile	107,903	18,784	17.4	17.4	-555	-3.0	-0.2	-0.5	0.6
Top Quintile	336,456	88,524	68.7	26.3	-1,486	-1.7	0.3	-0.4	0.6
All	86,987	17,747	100.0	20.4	-361	-2.0	0.0	-0.4	0.5
Addendum									
80-90	173,085	35,184	14.1	20.3	-963	-2.7	-0.1	-0.6	0.7
90-95	248,145	55,136	10.7	22.2	-1,174	-2.1	0.0	-0.5	0.6
95-99	420,979	108,599	15.8	25.8	-675	-0.6	0.2	-0.2	0.2
Top 1 Percent	2,239,143	763,369	28.1	34.1	-11,997	-1.6	0.1	-0.5	0.8
Top 0.1 Percent	10,045,915	3,579,846	13.5	35.6	-49,060	-1.4	0.1	-0.5	0.8

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-1).
(a) The Proposal would reduce statutory individual income tax rates from 10, 15, 25, 28, 33, 35, and 39.6 percent to 9, 14, 24, 27, 32, 34, and 38.6 percent. The preferential rates on capital gains and dividends and the rates under the Alternative Minimum Tax (AMT) would not be changed.

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

(1) The average change in tax burden (figure 1.1). 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 seems an ambiguous measure of progressivity.

(2) The percentage change in tax burden (figure 1.2). 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 percent of tax burden (figure 1.3). 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 5 percent of

households would increase, while the share would decrease or remain unchanged for all lower-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 (figure 1.4). Changing tax burdens as a percent of *pre-tax* income reduces average tax rates the least for the bottom two income quintiles and by roughly the same amount for the top three quintiles. This suggests that the proposal somewhat reduces progressivity, at least at lower income levels. But relative changes in pre-tax 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 (figure 1.5). This measure is the change in tax burdens as a percent of *after-tax* income (i.e., pre-tax income less current tax burdens). Here, the proposal generally increases after-tax incomes by increasing percentages as income increase (with the largest percentage increases for the top 1 percent and top 0.1 percent of households), implying that the proposal reduces progressivity. 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.

FIGURE 1

Measures of Changes in Federal Tax Burdens due to Proposals to Reduce All Federal Individual Income Tax Rates by One Percentage Point^a



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DATA SOURCES

Urban-Brookings Tax Policy Center. [Table T15-0093. "Decrease All Statutory Individual Income Tax Rates by One Percentage Point, Baseline: Current Law, Distribution of Federal Tax Change by Expanded Cash Income Percentile, 2016."](#)

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FURTHER READING

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