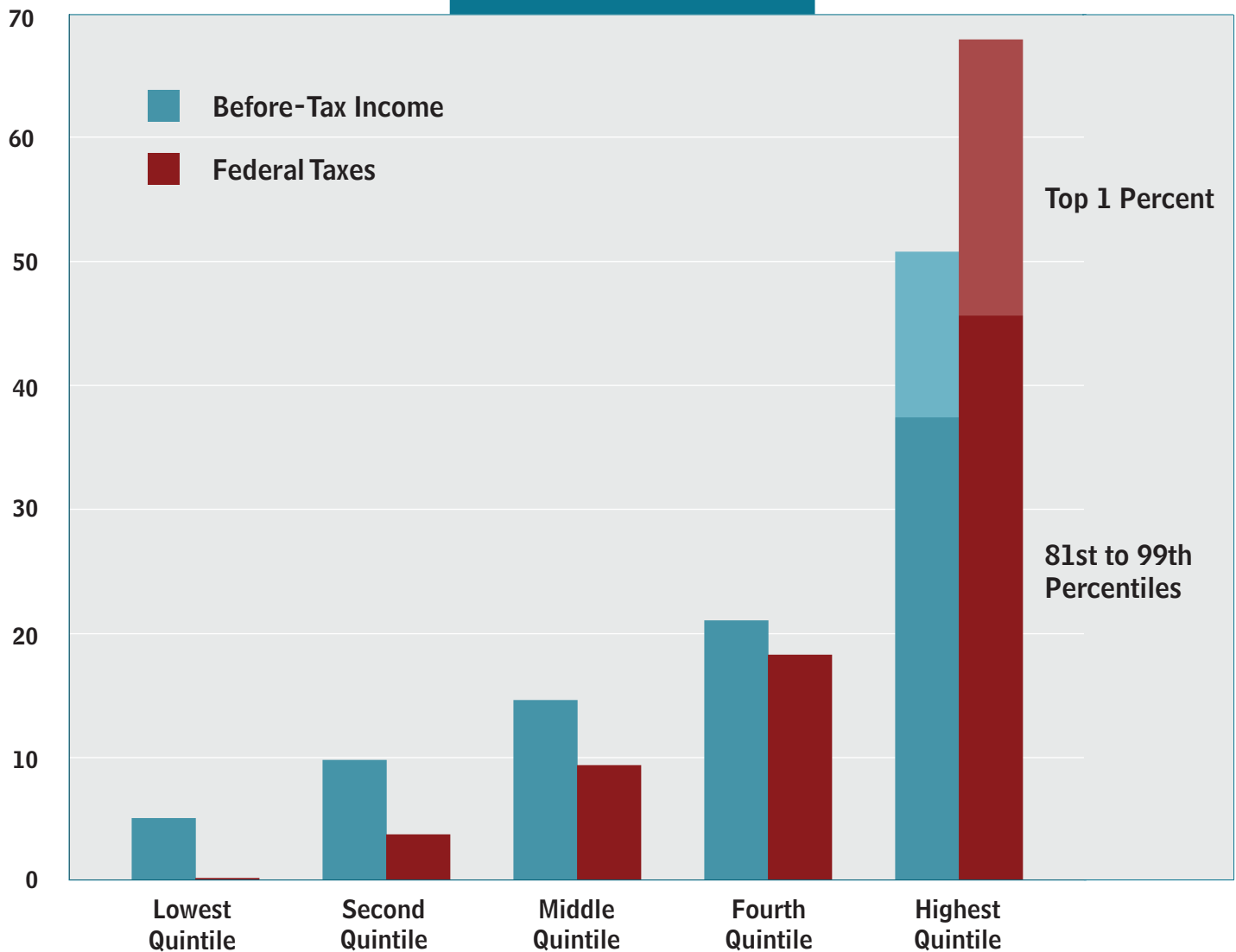


# CBO

## The Distribution of Household Income and Federal Taxes, 2008 and 2009

Percent



Shares of Before-Tax Income and Federal Taxes, by Income Group, 2009

JULY 2012

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## Notes and Definitions

Numbers in the text, tables, and figures may not add up to totals because of rounding.

Unless otherwise indicated, all years referred to in this study are calendar years.

Some of the figures have white vertical bars that indicate the duration of recessions. (A recession extends from the peak of a business cycle to its trough.)

**Before-tax income** is the sum of market income and government transfers.

**Market income** is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income.

**Government transfers** are cash payments and in-kind benefits from social insurance and other government assistance programs.

**After-tax income** is the sum of market income and government transfers, minus federal tax liabilities.

**Federal tax liabilities** are the amount of federal taxes a household owes based on income earned in a year, regardless of when the taxes are paid. In assessments of the impact of various taxes, individual income taxes are allocated directly to households paying those taxes. Social insurance, or payroll, taxes are allocated to households paying those taxes directly or paying them indirectly through their employers. Corporate income taxes are allocated to households according to their shares of capital and labor income. Excise taxes are allocated to households according to their consumption of the taxed good or service.

**Average federal tax rates** are calculated by dividing federal tax liabilities by before-tax income. Negative average tax rates result when refundable tax credits, such as the earned income and child tax credits, exceed the tax owed by people in an income group. (Refundable tax credits are not limited to the amount of income tax owed before they are applied.)

**Income categories** are defined by ranking all people by their income adjusted for household size—that is, divided by the square root of a household's size. (A household consists of the people who share a housing unit, regardless of their relationships.) Quintiles, or fifths, contain equal numbers of people, as do percentiles, or hundredths. Households with negative income (business or investment losses larger than other income) are excluded from the lowest income category but are included in totals.

Income is adjusted for inflation using the personal consumption expenditures price index, which is calculated by the Bureau of Economic Analysis.

These terms are explained in greater detail in the appendix.

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# Contents

<b>Summary</b>	i
<b>Introduction</b>	1
<b>Estimates for 2008 and 2009</b>	1
Households' Before-Tax Income	2
Federal Tax Rates	2
Distribution of Federal Taxes Across the Income Scale	3
Households' After-Tax Income	9
<b>Historical Trends</b>	10
Average Federal Tax Rates, by Source	11
Average Federal Tax Rates, by Income Group	14
<b>2010 and Beyond</b>	16
<b>Differences with Earlier Estimates</b>	16
Incidence of the Corporate Income Tax	16
Valuation of Government-Provided Health Insurance	18
Measuring Inflation	21
<b>Appendix: Methodology</b>	23
<b>Lists of Tables and Figures</b>	26
<b>About This Document</b>	27





## Summary

**T**he recent recession has had a substantial impact on income, the amount of taxes owed, and average tax rates. In this report, the Congressional Budget Office (CBO) extends its estimates of the distribution of household income and federal taxes through 2008 and 2009, the latest year for which comprehensive data are available, and compares those estimates with estimates for 2007 and for the 1979–2009 period. Major findings are as follows:

■ **Before-Tax Income.** In 2009, the share of total before-tax income (which includes government transfer payments, such as Social Security benefits) received by households in the lowest income quintile (that is, the lowest one-fifth) was 5.1 percent, the share received by households in the middle quintile was 14.7 percent, and the share received by households in the highest quintile was 50.8 percent (see Summary Table 1).<sup>1</sup>

Average before-tax income fell 12 percent from 2007 to 2009 in real (inflation-adjusted) terms. The declines in before-tax income were 5 percent or less for households in each of the four lowest income quintiles and 18 percent for households in the top quintile (including a 36 percent decline for households in the top percentile, or top 1 percent). Because income fell more rapidly for households in the top percentile than for other income groups, their share of before-tax income also fell, by 5.3 percentage points.

■ **Tax Rates.** Average tax rates depend on tax laws and economic conditions. The average federal tax rate—that is, households’ federal tax liabilities divided by their income (including transfer payments) before taxes—was 17.4 percent in 2009 for all households and ranged from 1.0 percent for households in the lowest quintile to 23.2 percent for households in the

highest quintile (and to 28.9 percent for households in the top percentile). The average federal tax rate for all households fell 2.5 percentage points from 2007 to 2009, reaching the lowest level seen in the 1979–2009 period. The largest decline was for households in the lowest income quintile. With the decline in before-tax income offset in part by the decrease in federal taxes, average after-tax income fell 10 percent in real terms.

■ **Share of Tax Liabilities.** In 2009, the share of federal taxes owed was 0.3 percent for households in the lowest income quintile, 9.4 percent for households in the middle quintile, and 67.9 percent for those in the highest quintile. Declines in before-tax income among households in the top income percentile lowered their share of federal tax liabilities from 26.7 percent to 22.3 percent between 2007 and 2009.

Although the detailed data that form the basis of CBO’s estimates in this report are available only through 2009, other data can provide some insight into changes in the distribution of income and federal taxes in 2010 and 2011. Those data suggest that overall income continued to grow slowly in 2010 and 2011 and that income for households toward the higher end of the distribution increased more rapidly than income for households elsewhere in the income distribution in 2010. Average federal tax rates probably remained near their post-1979 low levels in both 2010 and 2011.

The analysis in this report reflects two significant changes CBO has made to the methodology it uses to derive estimates of before-tax income and federal tax liability. Specifically, the agency has revised its assumptions about the incidence of the corporate income tax and its method for valuing government-provided health insurance. Those changes are discussed later in the report. CBO has also changed the index it uses to measure inflation; it now uses the personal consumption expenditures (PCE) price index, also referred to as the PCE deflator.

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1. For information on definitions of income, the allocation of taxes, and the ranking of households, see “Notes and Definitions” at the front of this report.

**Summary Table 1.**

**Distribution of Federal Taxes and Household Income, by Income Group, 2007 and 2009**

	Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	All Quintiles	81st to 90th Percentiles	91st to 95th Percentiles	96th to 99th Percentiles	Top 1 Percent
<b>2009</b>										
All Federal Taxes (Percent)										
Average federal tax rate	1.0	6.8	11.1	15.1	23.2	17.4	18.8	21.1	24.1	28.9
Share of tax liabilities	0.3	3.8	9.4	18.3	67.9	100.0	16.1	12.2	17.3	22.3
Income										
Average (2009 dollars)										
Before-tax	23,500	43,400	64,300	93,800	223,500	88,400	131,700	175,800	271,800	1,219,700
After-tax	23,300	40,500	57,100	79,600	171,600	73,100	107,000	138,700	206,200	866,700
Share (Percent)										
Before-tax	5.1	9.8	14.7	21.1	50.8	100.0	14.9	10.1	12.5	13.4
After-tax	6.2	11.1	15.8	21.6	47.2	100.0	14.6	9.6	11.4	11.5
<b>2007</b>										
All Federal Taxes (Percent)										
Average federal tax rate	5.1	10.3	14.0	17.5	24.7	19.9	20.6	22.5	25.4	28.3
Share of tax liabilities	1.2	4.7	9.4	16.8	67.8	100.0	14.2	10.7	16.2	26.7
Income										
Average (2009 dollars)										
Before-tax	23,900	45,600	67,600	98,400	273,000	101,000	138,000	187,300	315,800	1,917,200
After-tax	22,700	40,800	58,100	81,200	205,600	80,900	109,600	145,200	235,700	1,373,700
Share (Percent)										
Before-tax	4.8	9.0	13.3	19.1	54.6	100.0	13.7	9.5	12.7	18.7
After-tax	5.6	10.0	14.3	19.6	51.4	100.0	13.6	9.2	11.8	16.7
<b>Change from 2007 to 2009</b>										
Change in All Federal Taxes (Percentage points)										
Average federal tax rate	-4.1	-3.5	-2.9	-2.4	-1.5	-2.5	-1.8	-1.4	-1.3	0.6
Share of tax liabilities	-0.9	-0.9	*	1.5	0.1	0	1.9	1.5	1.1	-4.4
Change in Income										
Average (2009 dollars)										
Before-tax	-400	-2,200	-3,300	-4,600	-49,500	-12,600	-6,300	-11,500	-44,000	-697,500
After-tax	600	-300	-1,000	-1,600	-34,000	-7,800	-2,600	-6,500	-29,500	-507,000
Share (Percentage points)										
Before-tax	0.3	0.8	1.4	2.0	-3.8	0	1.2	0.6	-0.2	-5.3
After-tax	0.6	1.1	1.5	2.0	-4.2	0	1.0	0.4	-0.4	-5.2
Percentage Change in Average Income, 2007 to 2009										
Average before-tax income	-2	-5	-5	-5	-18	-12	-5	-6	-14	-36
Average after-tax income	3	-1	-2	-2	-17	-10	-2	-4	-13	-37

Source: Congressional Budget Office.

Notes: Average tax rates are calculated by dividing tax liabilities by before-tax income.

Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income.

Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

After-tax income is the sum of market income and government transfers, minus federal tax liabilities.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Federal taxes include individual and corporate income taxes, social insurance (or payroll) taxes, and excise taxes.

Income amounts have been rounded to the nearest \$100. \* = between -0.05 percentage points and zero.



# The Distribution of Household Income and Federal Taxes, 2008 and 2009

## Introduction

In this analysis, the Congressional Budget Office (CBO) examines the distribution of household income and federal taxes, focusing on calendar years 2008 and 2009. This study builds on the work in previous CBO publications that looked at income and taxes over the 1979–2007 period.<sup>1</sup>

Using data from the Internal Revenue Service (IRS) and survey data collected by the Census Bureau, CBO estimated income—including government transfer payments and federal taxes—for a representative sample of households in each year during that period. (The appendix contains a more detailed discussion of the data and methodology.) This report shows average tax rates for various income categories for the four largest sources of federal revenue—individual income taxes, social insurance (or payroll) taxes, corporate income taxes, and excise taxes—and for the four taxes combined. The report also presents average household income (before and after taxes) and shares of federal taxes and income for each fifth (or quintile) of the income distribution and for subgroups of the top quintile.

The study uses several measures of income. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. (Labor income includes the value of income received in-kind from sources such as employer-paid health insurance premiums; business income includes taxes paid by businesses that are imputed to households.) Before-tax income is the sum of market income and government transfers, and after-tax income is before-tax income minus federal tax liabilities.

The analysis focuses on annual income, showing average income in different years for different households grouped by income. The households in any particular segment of the income distribution in 2009 were not necessarily the same households who were in that segment in earlier years. The analysis does not assess trends in the distribution of other measures of economic well-being, such as household income measured over a longer period, household consumption, or household wealth. The analysis presents average income and tax rates for various income groups. Within each income group there is considerable variation in income, taxes paid, and tax rates, but this report does not examine that variation.

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1. See Congressional Budget Office, *Trends in the Distribution of Household Income Between 1979 and 2007* (October 2011), and *Average Federal Taxes by Income Group* (June 2010). The methodology used in this report differs somewhat from that used in the earlier studies, although the primary conclusions of the earlier studies are unaffected by the changes in methodology. In conjunction with this report, CBO has also published supplemental tables that present estimates for the 1979–2009 period derived using the current methodology. Those tables are available at [www.cbo.gov/publication/43310](http://www.cbo.gov/publication/43310).

## Estimates for 2008 and 2009

Changes in households' before-tax income and average tax rates in 2008 and 2009 were substantial and differed markedly across the income distribution. Average after-tax income fell notably, owing to a drop in market income that was caused by the recession that began in December 2007 and was only partially offset by increases in government transfers and decreases in federal taxes.

### Households' Before-Tax Income

Market income is very unevenly distributed. In 2009, households in the lowest income quintile received 2.2 percent of market income, equal to about \$7,600 per household, and those in the middle quintile received 13.5 percent, or \$54,200 per household (see Table 1 on page 4). Households in the highest quintile received 56.8 percent of income, or \$218,800 per household, but that average masks wide differences between subgroups of that quintile; households in the 81st to 90th percentiles received \$125,800, on average, compared with \$1.2 million for households in the top percentile. This analysis does not separately examine subgroups of the top percentile.

Aggregate market income declined in both 2008 and 2009, largely because of the recession that began in December 2007 and lasted through June 2009 and the slow recovery that followed. Declines were especially steep for capital gains, which fell by 75 percent in real (inflation-adjusted) terms between 2007 and 2009. Other sources of capital income also fell: interest income by 40 percent and dividend income by 33 percent. Wages, the largest source of income, fell by a more modest 6 percent. Average real market income fell by 16 percent between 2007 and 2009.<sup>2</sup>

That decline in market income was mitigated somewhat by an increase in government transfers. Payments from most government transfer programs grew: Transfers rose by 15 percent for Social Security, nearly tripled for unemployment insurance, nearly doubled for the Supplemental Nutrition Assistance Program, and grew by between 5 percent and 10 percent for Medicare and Medicaid. Consequently, real before-tax income fell by 12 percent, less than the 16 percent decline in market income alone.

Government transfers lift incomes for all income groups, but the increases are larger for households with less income. In 2009, households in the bottom quintile of the market-income distribution received over 40 percent of total transfer payments—an average of about \$23,000

per household. Almost two-thirds of that came from Social Security and Medicare. The share of transfers received fell steadily moving up the income distribution, with the top quintile receiving less than 10 percent of transfer payments. (Higher-income households receive transfers because eligibility for some large programs, such as Social Security and Medicare, is not based on household income.)

Because of that pattern, before-tax income is more evenly distributed than is market income alone. Households in the lowest quintile of the before-tax income distribution received 5.1 percent of income, the middle quintile received 14.7 percent, and the top quintile received 50.8 percent.

### Federal Tax Rates

Decreases in federal taxes meant that the drop in after-tax income was also less than the decline in market income. The overall average federal tax rate (household federal tax liabilities divided by before-tax household income) declined from 19.9 percent of income in 2007 to 18.0 percent in 2008 and 17.4 percent in 2009 (see Table 2 on page 6).

The average individual income tax rate (household income tax liabilities divided by before-tax household income) fell to 7.2 percent in 2009—a drop of 2.0 percentage points from 2007—owing to both declines in income and changes in tax law. The average social insurance tax rate (household payroll tax liabilities divided by before-tax household income) rose 0.7 percentage points, to 8.0 percent of household income in 2009. That average rate rose because earnings fell by less than did other sources of income and because earnings above the cap on payroll taxes (\$106,800 in 2009) fell more rapidly than did earnings below it.

The average individual income tax rate is typically higher than the payroll tax rate, but in 2009 it was lower. Two factors explain that unusual result. First, because the tax base for payroll taxes is limited to earnings, a steep drop in nonwage income (such as interest, dividends, and capital gains) reduced income taxes but not payroll taxes in 2009. Second, the American Recovery and Reinvestment Act of 2009 (ARRA, Public Law 111-5) made several changes that lowered individual income taxes in that year. The act introduced new refundable income tax credits and expanded existing ones. In the analysis for this

2. Real personal income—the measure of income the Bureau of Economic Analysis (BEA) uses in the national income and product accounts (NIPAs)—also declined from 2007 to 2009, though not by nearly as much as CBO's income measure. Much of that difference in the two measures occurs because CBO includes capital gains in market income; in contrast, BEA does not include capital gains as part of personal income in the NIPAs.

report, CBO measured individual income taxes net of refundable credits.<sup>3</sup>

The average corporate income tax rate (corporate taxes allocated to households divided by before-tax household income) also fell between 2007 and 2009—by 1.4 percentage points, to a rate of 1.5 percent in 2009. That change reflects both a sharp decline in corporate profits in 2008 that was only partially reversed in 2009 and legislation that reduced corporate income taxes in both 2008 and 2009. Excise taxes averaged 0.6 percent of household income in 2009, up 0.1 percentage point from 2007.

### Distribution of Federal Taxes Across the Income Scale

The federal tax system is progressive—that is, average tax rates generally rise with income. In 2009, households in the bottom fifth of the before-tax income distribution paid 1.0 percent of their before-tax income in federal taxes, households in the middle quintile paid 11.1 percent, and households in the highest quintile paid 23.2 percent (see Figure 1 on page 8). Average rates were higher for higher-income groups within the top quintile, and households in the top 1 percent of the before-tax income distribution faced an average rate of 28.9 percent.

Because average federal tax rates rise with income, the share of federal taxes paid by higher-income households exceeded their share of before-tax income, and the opposite was true for lower-income households. In 2009, households in the highest quintile received 50.8 percent of before-tax income and paid 67.9 percent of federal taxes; households in the top 1 percent received 13.4 percent of income and paid 22.3 percent of taxes (see Figure 2 on page 9). In all other quintiles, the share of federal taxes paid was smaller than the share of before-tax income: Households in the bottom quintile received 5.1 percent of income and paid 0.3 percent of taxes, and households in the middle quintile received 14.7 percent of income and paid 9.4 percent of taxes.

**Individual Income Taxes.** Much of the progressivity of the federal tax system derives from the individual income

tax. In 2009, the bottom quintile's average rate for the individual income tax was -9.3 percent—that is, refundable tax credits exceeded the income tax owed by that group (see Figure 3 on page 10). On average, households in the second quintile also received more in refundable credits than they paid in individual income taxes. The average income tax rate was 1.3 percent for the middle quintile, 4.6 percent for the fourth quintile, and 13.4 percent for the highest quintile. The top 1 percent, on average, paid 21.0 percent of their income in individual income taxes.

Two changes in tax law lowered individual income tax rates in 2008 and 2009 relative to what they were in 2007. The Economic Stimulus Act of 2008 (P.L. 110-185) provided a partially refundable payment of between \$300 and \$600 per person in 2008.<sup>4</sup> Several provisions of ARRA reduced individual income taxes in 2009. The largest tax provision was the Making Work Pay credit, a refundable credit of up to \$400 for a single worker or \$800 for a married couple. Other provisions of ARRA increased the exemption for the alternative minimum tax, provided special additional payments for Social Security beneficiaries, lowered the threshold for the refundable child tax credit, created the American Opportunity Tax Credit (a new credit for college expenses), expanded the earned income tax credit, and exempted some unemployment compensation from individual income taxes.

The changes in tax law reduced average tax rates more for lower-income taxpayers than for higher-income taxpayers, primarily because of the Making Work Pay credit, which phased out for taxpayers with higher income. Between 2007 and 2009, the individual income tax rate fell by more than 3 percentage points for the lowest income quintile, about 2.5 points for the second quintile, just under 2 points for the middle quintile, roughly 1.5 points for the fourth quintile, and about 1 point for the top quintile. In contrast, the average rate for households in the top percentile rose. The reason is that capital gains and dividends, which are taxed at preferential rates below the rates on other taxable income, fell by much more than other sources of income, and capital gains and

3. In the federal budget, the refundable portion of income tax credits is counted as outlays. In fiscal year 2009, the revenues collected from individual income taxes (which do not count the refundable portion of those tax credits) were a slightly larger share of gross domestic product (6.6 percent) than the revenues collected from social insurance taxes (6.4 percent).

4. The Internal Revenue Service made those payments to taxpayers in 2008 on the basis of information provided on their 2007 tax returns. Taxpayers who did not receive an advance payment could take a credit against their 2008 tax liabilities. In this analysis, CBO counted such payments as part of 2008 tax liabilities.

**Table 1.****Distribution of Before-Tax Income, by Income Group, 2007 to 2009**

Income Group	With Households Ranked by Market Income			With Households Ranked by
	Market Income	Transfers Received	Before-Tax Income	Before-Tax Income
Average Income (2009 dollars) <sup>a</sup>				
<i>2009</i>				
Lowest Quintile	7,600	22,900	30,500	23,500
Second Quintile	30,100	14,800	45,000	43,400
Middle Quintile	54,200	10,400	64,600	64,300
Fourth Quintile	86,400	7,100	93,500	93,800
Highest Quintile	218,800	6,000	224,800	223,500
All Quintiles	75,700	12,700	88,400	88,400
81st to 90th Percentiles	125,800	5,800	131,600	131,700
91st to 95th Percentiles	169,800	5,700	175,500	175,800
96th to 99th Percentiles	266,200	6,200	272,400	271,800
Top 1 Percent	1,219,600	9,000	1,228,600	1,219,700
<i>2008</i>				
Lowest Quintile	8,900	20,300	29,200	23,500
Second Quintile	33,100	12,300	45,500	43,800
Middle Quintile	57,100	8,500	65,600	65,400
Fourth Quintile	89,800	6,100	95,900	95,700
Highest Quintile	243,200	5,400	248,700	246,600
All Quintiles	82,600	11,000	93,600	93,600
81st to 90th Percentiles	130,000	5,100	135,100	135,000
91st to 95th Percentiles	175,900	5,300	181,200	180,500
96th to 99th Percentiles	286,800	5,800	292,600	290,500
Top 1 Percent	1,559,900	9,000	1,568,900	1,558,900
<i>2007</i>				
Lowest Quintile	9,900	19,700	29,600	23,900
Second Quintile	35,200	12,000	47,100	45,600
Middle Quintile	59,800	8,200	68,000	67,600
Fourth Quintile	92,500	6,100	98,600	98,400
Highest Quintile	269,400	6,000	275,400	273,000
All Quintiles	90,300	10,800	101,000	101,000
81st to 90th Percentiles	132,800	5,300	138,200	138,000
91st to 95th Percentiles	182,300	5,700	187,900	187,300
96th to 99th Percentiles	310,700	7,200	317,900	315,800
Top 1 Percent	1,919,700	9,400	1,929,100	1,917,200

Continued

Table 1.

Continued

## Distribution of Before-Tax Income, by Income Group, 2007 to 2009

Income Group	With Households Ranked by Market Income			With Households Ranked by Before-Tax Income
	Market Income	Transfers Received	Before-Tax Income	Before-Tax Income
Share of Income (Percent)				
2009				
Lowest Quintile	2.2	40.5	7.7	5.1
Second Quintile	7.6	22.4	9.7	9.8
Middle Quintile	13.5	15.5	13.8	14.7
Fourth Quintile	21.7	10.7	20.1	21.1
Highest Quintile	56.8	9.3	50.0	50.8
All Quintiles	100.0	100.0	100.0	100.0
81st to 90th Percentiles	16.2	4.4	14.5	14.9
91st to 95th Percentiles	11.1	2.2	9.9	10.1
96th to 99th Percentiles	14.1	2.0	12.4	12.5
Top 1 Percent	15.4	0.7	13.3	13.4
2008				
Lowest Quintile	2.5	42.3	7.1	5.0
Second Quintile	7.6	21.4	9.2	9.4
Middle Quintile	13.0	14.5	13.2	13.9
Fourth Quintile	20.5	10.5	19.3	20.1
Highest Quintile	57.8	9.8	52.1	52.8
All Quintiles	100.0	100.0	100.0	100.0
81st to 90th Percentiles	15.2	4.5	14.0	14.3
91st to 95th Percentiles	10.6	2.4	9.7	9.8
96th to 99th Percentiles	13.9	2.1	12.5	12.6
Top 1 Percent	18.0	0.8	16.0	16.0
2007				
Lowest Quintile	2.5	41.7	6.7	4.8
Second Quintile	7.4	21.1	8.9	9.0
Middle Quintile	12.5	14.3	12.7	13.3
Fourth Quintile	19.3	10.6	18.4	19.1
Highest Quintile	59.2	11.0	54.1	54.6
All Quintiles	100.0	100.0	100.0	100.0
81st to 90th Percentiles	14.5	4.9	13.4	13.7
91st to 95th Percentiles	10.1	2.6	9.3	9.5
96th to 99th Percentiles	13.8	2.7	12.6	12.7
Top 1 Percent	20.8	0.9	18.7	18.7

Source: Congressional Budget Office.

Notes: Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Before-tax income is the sum of market income and government transfers. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by either their market or before-tax income. Quintiles contain equal numbers of people.

a. Income amounts have been rounded to the nearest \$100.

**Table 2.****Distribution of Federal Taxes, by Income Group, 2007 to 2009**

Before-Tax Income Group	All Federal Taxes	Individual Income Taxes	Social Insurance Taxes	Corporate Income Taxes	Excise Taxes
Average Federal Tax Rate (Percentage of before-tax income)					
<i>2009</i>					
Lowest Quintile	1.0	-9.3	8.3	0.5	1.5
Second Quintile	6.8	-2.6	7.9	0.5	0.9
Middle Quintile	11.1	1.3	8.4	0.6	0.8
Fourth Quintile	15.1	4.6	9.1	0.7	0.6
Highest Quintile	23.2	13.4	7.2	2.3	0.4
All Quintiles	17.4	7.2	8.0	1.5	0.6
81st to 90th Percentiles	18.8	7.7	9.7	0.9	0.5
91st to 95th Percentiles	21.1	10.3	9.2	1.1	0.5
96th to 99th Percentiles	24.1	14.6	7.4	1.7	0.4
Top 1 Percent	28.9	21.0	2.5	5.2	0.2
<i>2008</i>					
Lowest Quintile	1.5	-9.1	8.6	0.6	1.3
Second Quintile	7.3	-2.5	8.3	0.6	0.9
Middle Quintile	11.6	1.2	8.9	0.8	0.7
Fourth Quintile	15.6	4.7	9.4	0.9	0.6
Highest Quintile	23.6	14.0	6.5	2.7	0.4
All Quintiles	18.0	7.8	7.8	1.8	0.6
81st to 90th Percentiles	19.1	7.9	9.6	1.1	0.5
91st to 95th Percentiles	21.7	10.8	9.1	1.4	0.4
96th to 99th Percentiles	24.7	15.4	6.8	2.1	0.4
Top 1 Percent	28.1	20.4	2.0	5.5	0.2
<i>2007</i>					
Lowest Quintile	5.1	-5.8	8.7	1.0	1.2
Second Quintile	10.3	-0.1	8.6	1.0	0.8
Middle Quintile	14.0	3.1	8.9	1.3	0.7
Fourth Quintile	17.5	6.1	9.3	1.5	0.6
Highest Quintile	24.7	14.4	5.8	4.1	0.3
All Quintiles	19.9	9.2	7.3	2.9	0.5
81st to 90th Percentiles	20.6	8.9	9.4	1.8	0.5
91st to 95th Percentiles	22.5	11.2	8.5	2.3	0.4
96th to 99th Percentiles	25.4	15.5	6.0	3.5	0.3
Top 1 Percent	28.3	19.4	1.6	7.2	0.1

Continued

Table 2.

Continued

## Distribution of Federal Taxes, by Income Group, 2007 to 2009

Before-Tax Income Group	All Federal Taxes	Individual Income Taxes	Social Insurance Taxes	Corporate Income Taxes	Excise Taxes
Share of Federal Tax Liabilities (Percent)					
2009					
Lowest Quintile	0.3	-6.6	5.3	1.8	12.2
Second Quintile	3.8	-3.5	9.7	3.2	15.1
Middle Quintile	9.4	2.7	15.4	5.8	18.8
Fourth Quintile	18.3	13.4	24.0	10.2	21.3
Highest Quintile	67.9	94.1	45.3	77.2	32.1
All Quintiles	100.0	100.0	100.0	100.0	100.0
81st to 90th Percentiles	16.1	15.9	17.9	8.7	12.5
91st to 95th Percentiles	12.2	14.3	11.6	7.4	7.5
96th to 99th Percentiles	17.3	25.2	11.6	14.1	7.7
Top 1 Percent	22.3	38.7	4.2	47.1	4.4
2008					
Lowest Quintile	0.4	-5.8	5.5	1.7	11.9
Second Quintile	3.8	-3.0	10.0	3.2	14.6
Middle Quintile	8.9	2.2	15.8	5.7	18.1
Fourth Quintile	17.4	12.1	24.3	9.9	20.9
Highest Quintile	69.2	94.6	44.1	78.0	34.1
All Quintiles	100.0	100.0	100.0	100.0	100.0
81st to 90th Percentiles	15.1	14.5	17.6	8.5	12.6
91st to 95th Percentiles	11.8	13.5	11.4	7.3	7.7
96th to 99th Percentiles	17.3	24.8	11.0	14.4	8.1
Top 1 Percent	25.0	41.8	4.2	47.8	5.7
2007					
Lowest Quintile	1.2	-3.0	5.6	1.7	10.9
Second Quintile	4.7	-0.1	10.5	3.2	14.2
Middle Quintile	9.4	4.6	16.2	5.8	18.3
Fourth Quintile	16.8	12.6	24.4	9.9	22.2
Highest Quintile	67.8	86.0	43.1	78.5	34.2
All Quintiles	100.0	100.0	100.0	100.0	100.0
81st to 90th Percentiles	14.2	13.3	17.6	8.6	13.5
91st to 95th Percentiles	10.7	11.6	11.1	7.7	7.9
96th to 99th Percentiles	16.2	21.5	10.4	15.6	8.0
Top 1 Percent	26.7	39.6	4.1	46.7	4.8

Source: Congressional Budget Office.

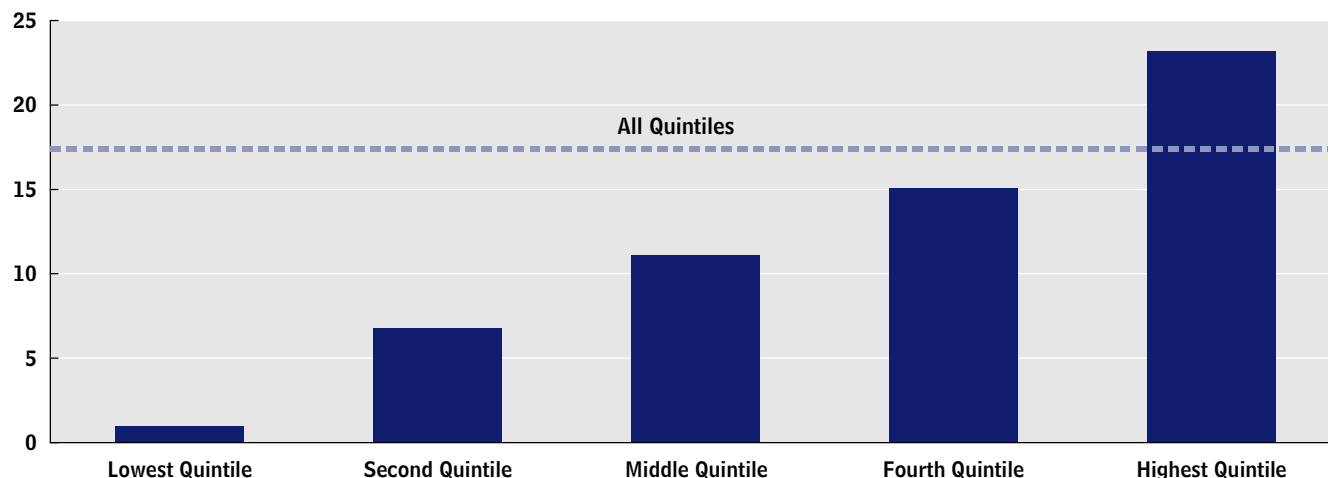
Notes: Average tax rates are calculated by dividing tax liabilities of each type by total before-tax income for each income group.

Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

**Figure 1.****Average Federal Tax Rates, by Income Group, 2009**

(Percent)



Source: Congressional Budget Office.

Notes: Average tax rates are calculated by dividing tax liabilities by before-tax income.

Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Federal taxes include individual and corporate income taxes, social insurance (or payroll) taxes, and excise taxes.

dividends are a much larger portion of income for households in the top percentile than for those in other income groups.

The changes in average individual income tax rates between 2007 and 2009 led to a larger share of income taxes being paid by households who were higher in the income distribution. Specifically, between 2007 and 2009, the share of taxes paid fell for the bottom three income quintiles, was close to flat for the fourth quintile, but rose for the highest quintile (from 86 percent to 94 percent). Within the top quintile, however, the shift was uneven; the share paid by the top percentile fell, and the share paid by the rest of the top quintile rose.

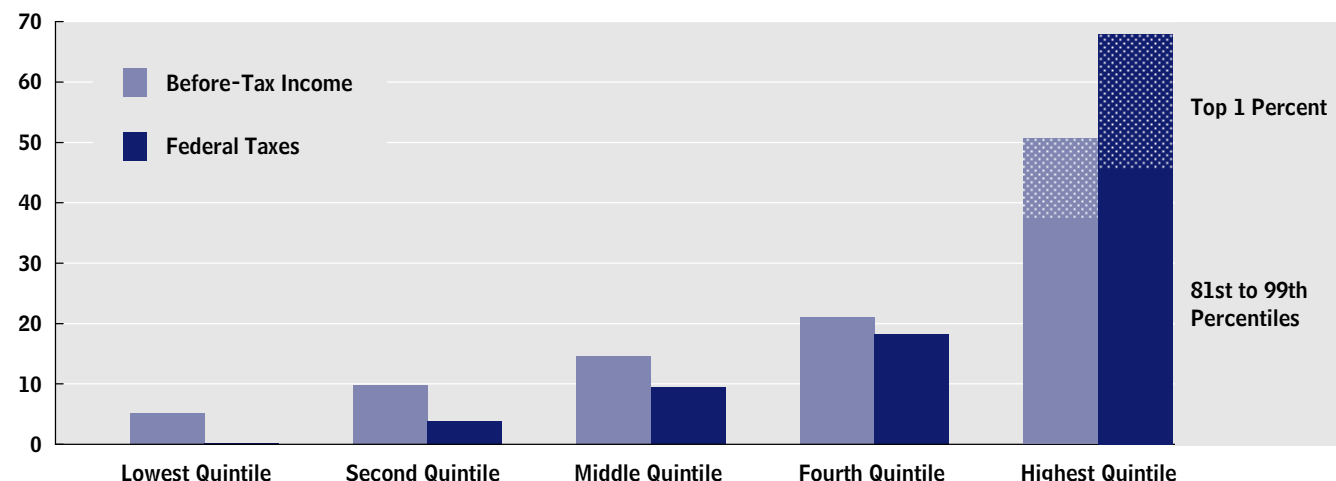
**Social Insurance (Payroll) Taxes.** Average rates for payroll taxes are fairly flat across most of the income distribution but are lower at the top. In 2009, the average payroll tax rate was 8.3 percent for the lowest quintile, 7.9 percent for the second quintile, 8.4 percent for the middle quintile, and 9.1 percent for the fourth quintile,

compared with 7.2 percent for the highest quintile and 2.5 percent for the top percentile of households (see Table 2 on page 6). The rate for higher-income households is lower than that for others in part because more of the earnings for those households are above the maximum income subject to Social Security taxes and in part because earnings are a smaller share of their income. Social insurance taxes account for the largest share of taxes paid by households in all but the top quintile.

The average social insurance tax rate (social insurance taxes as a share of before-tax income) rose between 2007 and 2009, from 7.3 percent to 8.0 percent. Aggregate payroll tax rates increased because wages and salaries—the base for the tax—fell more slowly than did other types of income, pushing up payroll taxes as a share of total income. Also, wages of taxpayers whose earnings were above the taxable maximum fell by more than wages of taxpayers whose earnings were below it. Consequently, the share of wages subject to the Social Security payroll tax rose, pushing up the average tax rate.

**Figure 2.****Shares of Before-Tax Income and Federal Taxes, by Income Group, 2009**

(Percent)



Source: Congressional Budget Office.

Notes: Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Federal taxes include individual and corporate income taxes, social insurance (or payroll) taxes, and excise taxes.

The pattern of changes was not uniform across the income distribution, however. Average payroll tax rates decreased for the bottom three quintiles; for those groups, wages declined as a share of total income, because government transfers rose and wages fell. In contrast, the rate for the highest quintile rose by 1.4 percentage points, because wages fell by less than did income from sources not subject to the payroll tax.

**Corporate Income Taxes.** The impact of the federal corporate income tax also rises with income, because CBO assumed in this analysis that most of the tax is borne by capital income, which is a larger share of income at the top of the distribution. Under CBO's assumption, the highest income quintile paid almost 80 percent of the corporate income tax during the 2007–2009 period. In 2009, the average corporate income tax rate (corporate taxes as a share of before-tax household income) was 0.5 percent for the lowest quintile, 0.6 percent for the middle quintile, and 2.3 percent for the highest quintile. The average rate fell between 2007 and 2009, from 2.9 percent to 1.5 percent. Higher-income groups experienced a larger percentage-point decline in the tax.

**Excise Taxes.** The effect of federal excise taxes, relative to income, is greatest for lower-income households, who tend to spend a large share of their income on such goods as gasoline, alcohol, and tobacco, which are subject to such taxes. Average excise tax rates changed little between 2007 and 2009, however—no more than three-tenths of a percentage point for any income group.

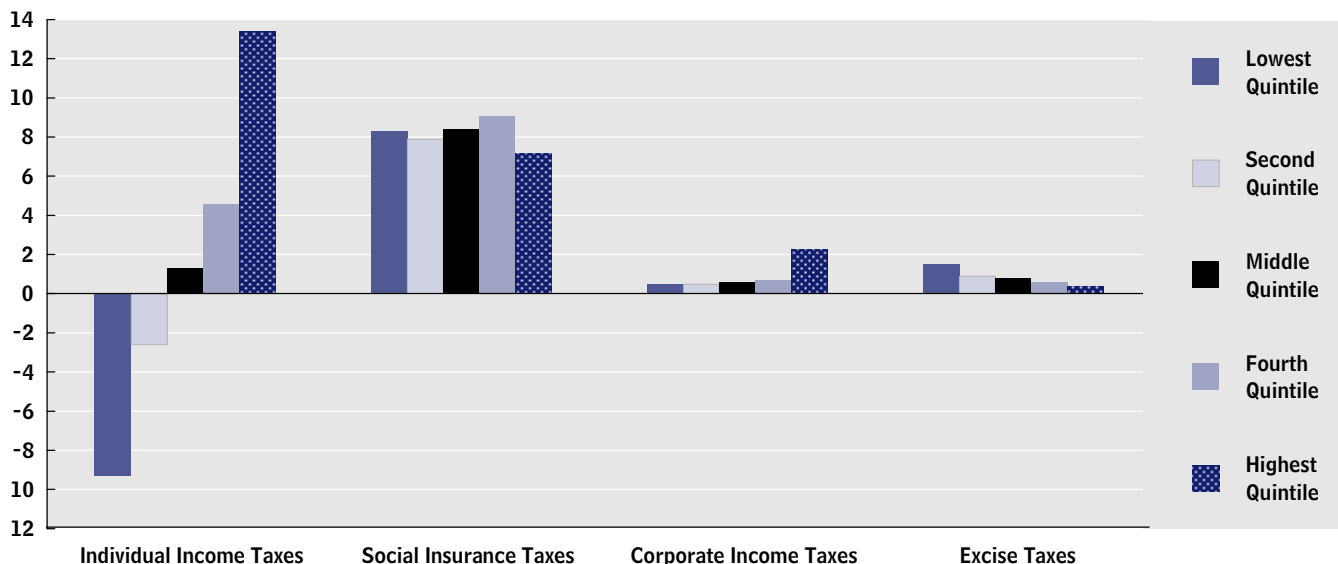
**Households' After-Tax Income**

Average federal tax rates rise with income, causing the distribution of after-tax income to be more even than that of before-tax income.<sup>5</sup> In 2009, households in the bottom four quintiles of the before-tax income distribution each received a share of after-tax income that was about 1 percentage point larger than their share of before-tax income (see Figure 4 on page 11). In contrast, households in the highest quintile received 47.2 percent of after-tax income and 50.8 percent of before-tax income.

5. This report includes only federal taxes. CBO did not include state and local taxes in this analysis because of the difficulty of estimating them for individual households.

**Figure 3.****Average Federal Tax Rates, by Income Group and Tax Source, 2009**

(Percent)



Source: Congressional Budget Office.

Notes: Average tax rates are calculated by dividing tax liabilities of each type by total before-tax income for each income group.

Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Declines in after-tax income between 2007 and 2009 were heavily concentrated at the top of the income distribution (see Table 3 on page 12). After-tax income fell by 37 percent for the top 1 percent of households and by about 5 percent for households in the 81st to 99th percentiles. Households in the middle three quintiles of the income distribution experienced more modest declines (1 percent to 2 percent), and after-tax income increased slightly for households in the lowest quintile. As a consequence of those changes, the share of after-tax income accruing to the top percentile of the distribution fell by 5.2 percentage points. The share earned by each of the bottom four income quintiles rose between 0.6 and 2.0 percentage points, and the share earned by the 81st to 99th percentiles rose 1.0 percentage point.

Changes in the distribution of market income were responsible for much of the shift in the distribution of after-tax income between 2007 and 2009. Large declines in sources of market income that tilt heavily toward high-income households—such as capital gains and interest—

caused the large decline in top incomes; for households in the highest percentile, average market income dropped 36 percent between 2007 and 2009.

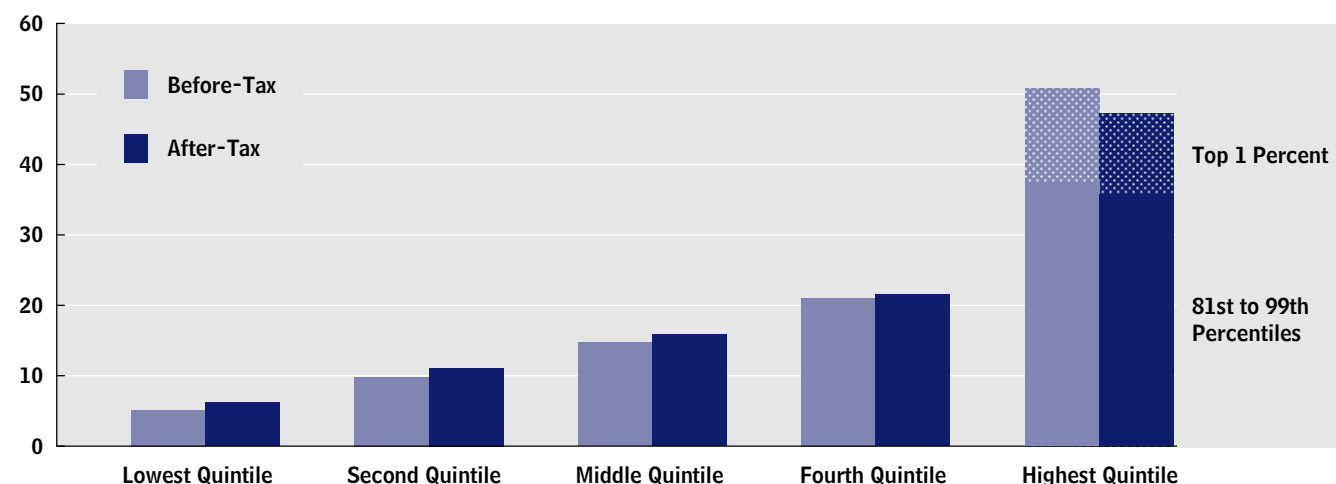
Although market income was the primary factor causing the shift in the distribution of after-tax income, federal taxes and government transfers also contributed. Transfers were flat, in real terms, for the highest income quintile but rose for all other income groups. And average federal tax rates rose slightly for the top 1 percent of households but fell for all other groups, with the largest decreases experienced by those at the bottom of the income distribution. Thus, the downward shift in the distribution of income after federal taxes and transfers was larger than the downward shift in market income.

**Historical Trends**

Many of the changes in average federal tax rates and after-tax income in 2008 and 2009 are notable when viewed from a longer historical perspective:

**Figure 4.****Shares of Before- and After-Tax Income, by Income Group, 2009**

(Percent)



Source: Congressional Budget Office.

Notes: Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs.

After-tax income is the sum of market income and government transfers, minus federal tax liabilities.

For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Federal taxes include individual and corporate income taxes, social insurance (or payroll) taxes, and excise taxes.

- The overall average federal tax rates of 18.0 percent in 2008 and 17.4 percent in 2009 were the lowest in the 1979–2009 period (see Figure 5 on page 14) and were well below the previous low of 19.4 percent in 2003 and the average of 21.0 percent over that period.
- The average federal individual income tax rate also reached a new low in 2009, at 7.2 percent of household income, falling below previous low marks in 2008 and 2003. The average individual income tax rate fell below the average social insurance tax rate for the first time in the 31 years covered by this analysis.
- The average federal corporate income tax rate also approached the lowest level in the 1979–2009 period.
- The decline in after-tax income for the highest-income households reversed a substantial portion of the sharp rise in their income between 1979 and 2007 (see Figure 6 on page 15).

**Average Federal Tax Rates, by Source**

The 2009 overall average federal tax rate (household tax liabilities divided by before-tax income) was the lowest observed in the 1979–2009 period, falling from 22.0 percent in 1979 to 17.4 percent in 2009 (see the top panel of Figure 5 on page 14). The rate declined in the early 1980s, then rose through much of the 1980s and 1990s. It peaked at 22.7 percent in 2000 and then fell sharply following the 2001 recession and tax legislation enacted in 2001 and 2003, reaching just under 19.4 percent in 2003. The rate rebounded somewhat over the next few years as economic conditions improved, before dropping substantially in 2008 and 2009.

The average individual income tax rate peaked at 11.9 percent of household income in 1981, then fell as the reduction in tax rates enacted in 1981 took effect. Legislation enacted in 1993 and rapidly rising incomes pushed the rate up again in the late 1990s—to 11.7 percent in 2000, close to its highest level. The rate then fell to 8.3 percent in 2003 as a result of the 2001 and 2003

**Table 3.****Distribution of Before- and After-Tax Income and Federal Taxes, by Income Group, 2007 to 2009**

Before-Tax Income Group	Before-Tax Income	Federal Tax Liability	After-Tax Income
Average Amount (2009 dollars) <sup>a</sup>			
<i>2009</i>			
Lowest Quintile	23,500	200	23,300
Second Quintile	43,400	2,900	40,500
Middle Quintile	64,300	7,200	57,100
Fourth Quintile	93,800	14,100	79,600
Highest Quintile	223,500	51,900	171,600
All Quintiles	88,400	15,300	73,100
81st to 90th Percentiles	131,700	24,700	107,000
91st to 95th Percentiles	175,800	37,000	138,700
96th to 99th Percentiles	271,800	65,600	206,200
Top 1 Percent	1,219,700	353,000	866,700
<i>2008</i>			
Lowest Quintile	23,500	300	23,200
Second Quintile	43,800	3,200	40,600
Middle Quintile	65,400	7,600	57,900
Fourth Quintile	95,700	14,900	80,700
Highest Quintile	246,600	58,300	188,300
All Quintiles	93,600	16,900	76,700
81st to 90th Percentiles	135,000	25,800	109,200
91st to 95th Percentiles	180,500	39,100	141,400
96th to 99th Percentiles	290,500	71,600	218,900
Top 1 Percent	1,558,900	438,300	1,120,500
<i>2007</i>			
Lowest Quintile	23,900	1,200	22,700
Second Quintile	45,600	4,700	40,800
Middle Quintile	67,600	9,500	58,100
Fourth Quintile	98,400	17,200	81,200
Highest Quintile	273,000	67,400	205,600
All Quintiles	101,000	20,100	80,900
81st to 90th Percentiles	138,000	28,400	109,600
91st to 95th Percentiles	187,300	42,100	145,200
96th to 99th Percentiles	315,800	80,100	235,700
Top 1 Percent	1,917,200	543,400	1,373,700

Continued

Table 3.

Continued

### Distribution of Before- and After-Tax Income and Federal Taxes, by Income Group, 2007 to 2009

Before-Tax Income Group	Before-Tax Income	Federal Tax Liability	After-Tax Income
Share of Total Amount (Percent)			
<i>2009</i>			
Lowest Quintile	5.1	0.3	6.2
Second Quintile	9.8	3.8	11.1
Middle Quintile	14.7	9.4	15.8
Fourth Quintile	21.1	18.3	21.6
Highest Quintile	50.8	67.9	47.2
All Quintiles	100.0	100.0	100.0
81st to 90th Percentiles	14.9	16.1	14.6
91st to 95th Percentiles	10.1	12.2	9.6
96th to 99th Percentiles	12.5	17.3	11.4
Top 1 Percent	13.4	22.3	11.5
<i>2008</i>			
Lowest Quintile	5.0	0.4	6.0
Second Quintile	9.4	3.8	10.6
Middle Quintile	13.9	8.9	15.0
Fourth Quintile	20.1	17.4	20.7
Highest Quintile	52.8	69.2	49.1
All Quintiles	100.0	100.0	100.0
81st to 90th Percentiles	14.3	15.1	14.1
91st to 95th Percentiles	9.8	11.8	9.4
96th to 99th Percentiles	12.6	17.3	11.6
Top 1 Percent	16.0	25.0	14.1
<i>2007</i>			
Lowest Quintile	4.8	1.2	5.6
Second Quintile	9.0	4.7	10.0
Middle Quintile	13.3	9.4	14.3
Fourth Quintile	19.1	16.8	19.6
Highest Quintile	54.6	67.8	51.4
All Quintiles	100.0	100.0	100.0
81st to 90th Percentiles	13.7	14.2	13.6
91st to 95th Percentiles	9.5	10.7	9.2
96th to 99th Percentiles	12.7	16.2	11.8
Top 1 Percent	18.7	26.7	16.7

Source: Congressional Budget Office.

Notes: Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs.

After-tax income is the sum of market income and government transfers, minus federal tax liabilities.

For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

a. Income amounts have been rounded to the nearest \$100.

tax cuts and the recession in 2001. Rates fell again in 2008 and 2009, to a new low of 7.2 percent of household income, largely because of declines in income and changes in tax law, as discussed earlier.

The average social insurance tax rate rose from 6.8 percent in 1979 to 8.0 percent in 2009. The rate rose throughout the 1980s because of legislated increases in the cap on earnings subject to the Social Security payroll tax and because of legislation enacted in 1983 that accelerated previously scheduled increases in the Social Security payroll tax rate. Subsequent legislation in the early 1990s first increased and then eliminated the cap on earnings subject to the Hospital Insurance payroll tax (which is used to finance a portion of Medicare). The payroll tax rate declined in the late 1990s and early 2000s as labor income grew more slowly than other income sources and as earnings above the maximum level subject to Social Security taxes grew more rapidly than earnings below that level. Those trends reversed in 2008 and 2009, causing the average payroll tax rate to rise.

#### Average Federal Tax Rates, by Income Group

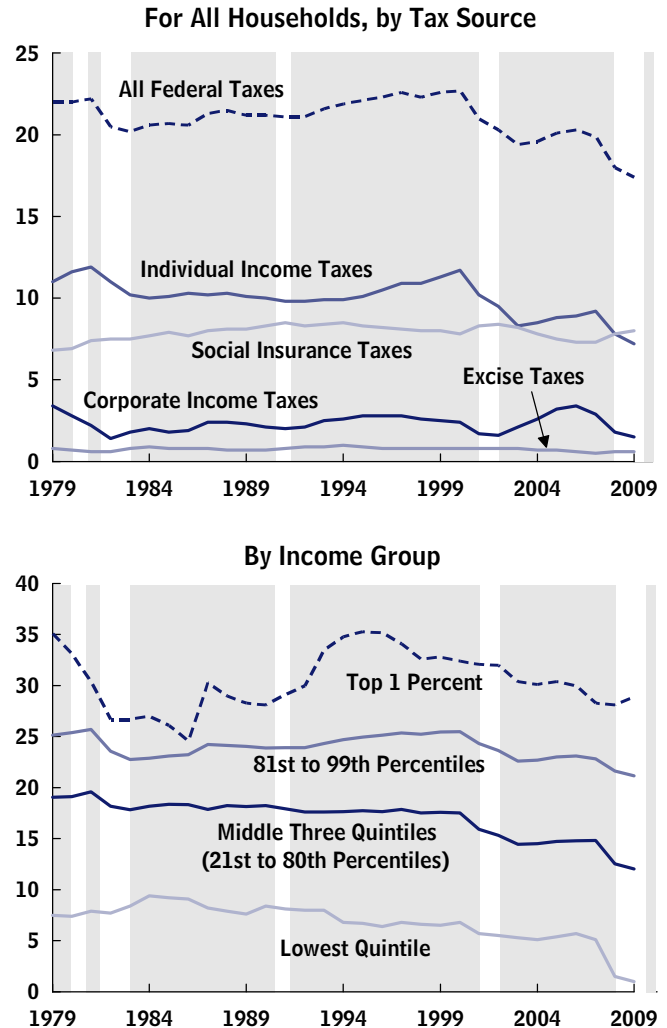
For most income groups, the 2009 average federal tax rate was the lowest observed in the 1979–2009 period (see the bottom panel of Figure 5). The pattern in the intervening years is more varied, reflecting the interaction of numerous changes to tax law and changes in the composition and distribution of income. For the lowest income group, the average rate fell from 7.5 percent in 1979 to 1.0 percent in 2009. Almost two-thirds of that decline came between 2007 and 2009, largely as a result of new refundable tax credits, as discussed earlier. Declines in earlier years were mainly caused by increases in the earned income tax credit, especially in the 1990s. Payroll tax rates rose steadily for the lowest income group, offsetting some of the decline in their individual income tax rates.

Households in the middle three income quintiles saw their average tax rate fall by 7.1 percentage points over 30 years, from 19.1 percent in 1979 to 12.0 percent in 2009. That decline was due primarily to declines in individual income taxes. The average tax rate for that group fell somewhat in the early 1980s and then fluctuated within a fairly narrow band through the 1980s and 1990s. Between 2000 and 2003, the rate declined by 3.1 percentage points, reflecting numerous changes in

**Figure 5.**

### Average Federal Tax Rates, 1979 to 2009

(Percent)



Source: Congressional Budget Office.

Notes: Average tax rates are calculated by dividing tax liabilities of each type by total before-tax income for each income group.

Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

law enacted in 2001—such as the expansion of the child tax credit, reductions in tax rates, and increases in the standard deduction for married couples—that lessened taxes for households in the middle quintiles. The average tax rate on the middle quintiles then rose slightly over the 2003–2007 period, before falling 2.8 percentage points from 2007 to 2009.

The average tax rate for households in the 81st to 99th percentiles of the income distribution also reached a low point in 2009, about 4 percentage points below its 1979 level. That rate fell in the early 1980s and then crept up over the remaining part of that decade and the 1990s, so in 2000 it slightly exceeded its 1979 level. The average tax rate for that group fell 2.9 percentage points between 2000 and 2003, crept up from 2003 to 2007, and then fell another 1.7 percentage points from 2007 to 2009.

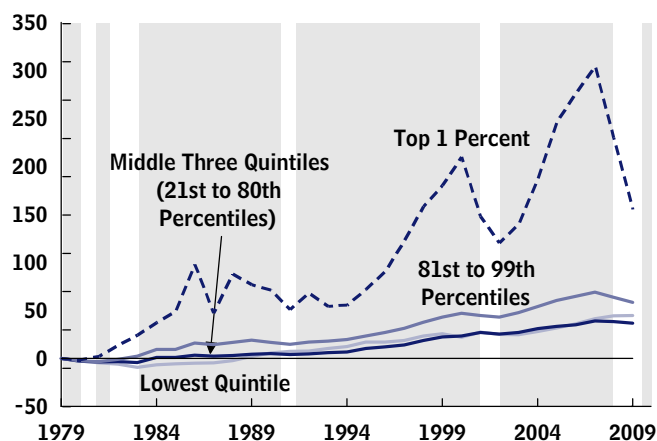
In contrast, in 2009 the average tax rate for households in the top 1 percent of the before-tax income distribution was above its low point, reached in the early 1980s. The average tax rate for those households fell in the early 1980s and then rose following enactment of the Tax Reform Act of 1986. The average tax rate for that group then fell somewhat again in the latter half of the 1980s before climbing, on balance, in the 1990s. That upward movement reflected changes in law that raised tax rates for that group as well as rapid increases in their income, which caused their average tax rate to rise as more income was taxed in higher tax brackets. Tax rates for households in the top percentile declined after 2000. The decline was especially rapid in 2003, when a reduction in the tax rate for the top tax bracket enacted in 2001 took effect and further changes in law reduced tax rates on dividends and realized capital gains. The tax rate fell again in 2007, mostly because of declines in corporate income taxes, then rose somewhat from 2007 to 2009, as sharp declines in capital gains income caused a larger portion of the income of that group to be subject to the ordinary income tax rates.

The decline in after-tax income between 2007 and 2009 was much larger at the top of the income distribution than further down the distribution. The decline in income for the highest-income households reversed a substantial portion of the sharp rise in their income between 1979 and 2007 (see Figure 6). The closest historic parallel is the 2001 recession, which, like the most recent recession, was accompanied by a large drop in the value of assets. After-tax income for households in the

**Figure 6.**

### Cumulative Growth in Average After-Tax Income Adjusted for Inflation, by Income Group, 1979 to 2009

(Percentage of 1979 income)



Source: Congressional Budget Office.

Notes: After-tax income is the sum of market income and government transfers, minus federal tax liabilities. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Federal taxes include individual and corporate income taxes, social insurance (or payroll) taxes, and excise taxes.

top percentile of the before-tax income distribution fell 28 percent from 2000 to 2002 and then began growing quickly, surpassing the 2000 level in 2005. Partial evidence, discussed in the next section, indicates that income at the top of the income distribution rebounded somewhat in 2010 from its 2009 level. In prior recessions, declines in income for the highest-income households were less severe than in the two most recent recessions. After-tax income for households in the top 1 percent of the before-tax income distribution fell 15 percent between 1989 and 1991 and, during the recessions of 1980 and 1981–1982, barely fell from its level in 1979.

## 2010 and Beyond

Although the detailed data that form the basis of CBO's estimates in this report are available only through 2009, other data can provide some insight into changes in the distribution of income and federal taxes in 2010 and 2011. Those data suggest that overall income continued to grow slowly in 2010 and 2011 and that income for households toward the higher end of the distribution increased more rapidly than income for households elsewhere in the income distribution in 2010. Average federal tax rates probably remained near their post-1979 low levels in both 2010 and 2011.

The Bureau of Economic Analysis (BEA) estimates that real per capita personal income grew by 1.1 percent in 2010 and 1.8 percent in 2011.<sup>6</sup> Personal income excluding transfer payments grew a little more slowly than personal income including transfer payments in 2010 and a little more rapidly in 2011.

In contrast, data from the Current Population Survey (CPS) have led the Census Bureau to estimate that real mean household income fell 2.3 percent between 2009 and 2010. In the CPS data, the decline in income was greater for households at the bottom of the income distribution than for those at the middle and the top.

Tabulations by the Internal Revenue Service of individual income tax returns filed for 2010 tell another, slightly different, story. Real income per return rose more than 2 percent from 2009 to 2010—a gain that exceeds the change in income in either the BEA or CPS data—perhaps because income from capital gains, which is excluded from those other measures of income, rose rapidly.<sup>7</sup> Income went up more rapidly for higher-income taxpayers than for other taxpayers—by more than 10 percent for those filing returns with income in the top

1 percent of the distribution of all returns. The share of total before-tax income reported on those tax returns rose by 1.5 percentage points, with capital gains accounting for much but not all of that gain. That increase reversed about one-third of the 2007–2009 decline in the share of income reported to the IRS on returns with income in the top 1 percent of all returns.

Total federal tax revenue grew slowly in 2010 and 2011. Receipts in fiscal year 2010 were 15.1 percent of gross domestic product (GDP), matching 2009 as the lowest share of GDP since 1950. They rebounded slightly in fiscal year 2011, to 15.4 percent of GDP. Those figures imply that average federal tax rates probably did not rise much in 2010 or 2011.

## Differences with Earlier Estimates

This report makes two significant changes to the methodology that CBO previously used in estimating average federal tax rates. The agency has changed:

- Its allocation of the incidence of the federal corporate income tax, and
- Its method for valuing government-provided health insurance.

Those changes alter CBO's estimates somewhat: The change in the assumed incidence of the corporate income tax makes the federal tax system appear a bit less progressive, and the change in valuing government-provided health insurance increases the measured level and growth of income for many households with low income. However, those methodological changes do not alter this report's basic findings about the distribution of income and federal taxes.

CBO has also changed the way in which it adjusts for inflation. The agency now uses the personal consumption expenditures (PCE) price index, also referred to as the PCE deflator, rather than the consumer price index. The PCE price index generally shows slightly less inflation than does the consumer price index, making measured growth in real income larger for all income groups.

## Incidence of the Corporate Income Tax

In previous reports, CBO allocated the entire economic burden of the corporate income tax to owners of capital

6. BEA's measures of income are different from those used by CBO. Personal income, as defined by BEA, is the income that people receive in return for their provision of labor, land, and capital used in current production plus net current transfer payments they receive from business and government.
7. Income is measured here as income from taxable sources plus tax-exempt interest and some nontaxable Social Security benefits. That is the broadest measure reported on tax returns, but it omits several nontaxable sources of income that are included in CBO's measure of before-tax income, such as employer-sponsored health benefits and payments from the Supplemental Nutrition Assistance Program.

in proportion to their capital income. CBO has reevaluated the research on that topic, and in this report it allocates 75 percent of the federal corporate income tax to capital income and 25 percent to labor income.

The incidence of the corporate income tax is uncertain. In the very short term, corporate shareholders are likely to bear most of the economic burden of the tax; but over the longer term, as capital markets adjust to bring the after-tax returns on different types of capital in line with each other, some portion of the economic burden of the tax is spread among owners of all types of capital. In addition, because the tax reduces capital investment in the United States, it reduces workers' productivity and wages relative to what they otherwise would be, meaning that at least some portion of the economic burden of the tax over the longer term falls on workers. That reduction in investment probably occurs in part through a reduction in U.S. saving and in part through decisions to invest more savings outside the United States (relative to what would occur in the absence of the U.S. corporate income tax); the larger the decline in saving or outflow of capital, the larger the share of the burden of the corporate income tax that is borne by workers.

CBO recently reviewed several studies that use so-called general-equilibrium models of the economy to determine the long-term incidence of the corporate income tax. The results of those studies are sensitive to assumptions about the values of several key parameters, such as the ease with which capital can move between countries. Using assumptions that reflect the central tendency of published estimates of the key parameters yields an estimate that about 60 percent of the corporate income tax is borne by owners of capital and 40 percent is borne by workers.<sup>8</sup>

However, standard general-equilibrium models exclude important features of the corporate income tax system that tend to increase the share of the corporate tax borne by corporate shareholders or by capital owners in general.<sup>9</sup> For example, standard models generally assume that corporate profits represent the "normal" return on capital (that is, the return that could be obtained from making a risk-free investment). In fact, corporate profits partly

represent returns on capital in excess of the normal return, for several reasons: Some corporations possess unique assets such as patents or trademarks; some choose riskier investments that have the potential to provide above-normal returns; and some produce goods or services that face little competition and thereby earn some degree of monopoly profits. Some estimates indicate that less than half of the corporate tax is a tax on the normal return on capital and that the remainder is a tax on such excess returns.<sup>10</sup> Taxes on excess returns are probably borne by the owners of the capital that produced those excess returns. Standard models also generally fail to incorporate tax policies that affect corporate finances, such as the preferences afforded to corporate debt under the corporate income tax. Increases in the corporate tax will increase the subsidy afforded to domestic debt, increasing the relative return on debt-financed investment in the United States and drawing new investment from overseas, thus reducing the net amount of capital that flows out of the country. In addition, standard models generally do not account for corporate income taxes in other countries; those taxes also reduce the amount of capital that flows out of this country because of the U.S. corporate income tax.

Those factors imply that workers bear less of the burden of the corporate income tax than is estimated using standard general-equilibrium models, but quantifying the magnitude of the impact of the factors is difficult. CBO chose to allocate 25 percent of the burden of the corporate income tax to workers and assigned that amount to households in proportion to their labor income. CBO allocated the remaining 75 percent to owners of capital and assigned that tax to households in proportion to their income from interest, dividends, adjusted capital gains,

8. Jennifer Gravelle, *Corporate Tax Incidence: Review of General Equilibrium Estimates and Analysis*, Congressional Budget Office Working Paper 2010-03 (May 2010).

9. For a detailed discussion of many of these features, see Alan Auerbach, "Who Bears the Corporate Tax? A Review of What We Know," in James M. Poterba, ed., *Tax Policy and the Economy*, vol. 20 (MIT Press, 2006).

10. William M. Gentry and R. Glenn Hubbard, "Distributional Implications of Introducing a Broad-Based Consumption Tax," in James M. Poterba, ed., *Tax Policy and the Economy*, vol. 11 (MIT Press, 1997); Eric Toder and Kim Rueben, "Should We Eliminate Taxation of Capital Income?," in Henry J. Aaron, Leonard E. Burman, and C. Eugene Steuerle, eds., *Taxing Capital Income* (Urban Institute, 2007); and Julie-Anne Cronin and others, *Distributing the Corporate Income Tax: Revised U.S. Treasury Methodology*, Office of Tax Analysis Technical Paper 5 (Department of Treasury, Office of Tax Analysis, May 2012).

and rents.<sup>11</sup> (The agency used capital gains scaled to their long-term historical level given the size of the economy and the tax rate that applies to them—called “adjusted capital gains”—rather than actual capital gains so as to smooth out large year-to-year variations in the total amount of gains realized.)

Because the share of labor income received by higher-income households is smaller than the share of capital income received by those households, CBO’s revision to the allocation of the federal corporate income tax shifts more of that tax to households who are lower in the income distribution. For 2009, the change in methodology reduced the share of the corporate tax paid by households in the top percentile of before-tax income by 12 percentage points. The estimated share of the corporate tax in that year paid by the rest of the top quintile rose by 3 percentage points, and the estimated shares paid by the lowest quintile through the fourth quintile rose by 1, 2, 3, and 4 percentage points, respectively.

The change in the allocation of the corporate tax has a larger impact on the average tax rate for households in the top percentile than for households in other income groups. For 2009, that change lowered the average tax rate by 1.0 percentage point for the top percentile and raised it by 0.2 to 0.3 percentage points for the rest of the top quintile and for the other four quintiles (see Table 4). Because CBO includes corporate income tax payments in before-tax income on the basis of the households to which those corporate taxes are assigned (increasing each household’s income by the amount of corporate income tax that the household is estimated to pay), changing the allocation of the corporate tax affects that measure of income. For 2009, that change raised average before-tax income by less than \$50 for the lowest quintile, by roughly \$100 for the second and middle quintiles, and by \$300 for the fourth quintile. In contrast, the change lowered average before-tax income for the highest percentile by more than \$14,000.

11. Although shareholders of corporations would bear the portion of the corporate tax that is a tax on excess returns, measures of that share of the corporate tax are imprecise, as are efforts to identify corporate shareholders in the available data. CBO did not try to differentiate among capital owners in assigning the portion of the corporate income tax that falls on capital owners.

## Valuation of Government-Provided Health Insurance

Health insurance provided through Medicare, Medicaid, and the Children’s Health Insurance Program (CHIP) represents a significant and growing portion of government transfers. CBO assigned a higher value to that insurance for the estimates in this report than in previous analyses of the distribution of household income and federal taxes

Receiving health insurance enhances the economic well-being of recipients, enabling them to obtain health care services at a reduced out-of-pocket cost and thereby to consume more health care without giving up other forms of consumption. Accordingly, CBO includes estimated values of health insurance—whether provided by an employer or the government—in its analyses of household income. However, assigning a value to health insurance is difficult because it is unclear how much households would be willing to pay for that insurance.<sup>12</sup>

Some recipients of health insurance might prefer to receive a cash payment equal to the employer’s or government’s cost of that insurance because then they could choose whether to use all of that cash payment to purchase insurance on their own or to use some or all of it for other purposes. Therefore, the value of the health insurance to some recipients is lower than the cost of providing it, particularly for some low-income recipients, whose consumption of other goods and services is tightly constrained by their lack of resources. For other recipients, though, the value of health insurance is higher than the cost of providing it, because in many cases the bundle of services provided through insurance cannot be purchased by an individual household at a price equal to the employer’s or government’s cost. Determining how much the value of the insurance to recipients differs from the cost of providing it is impossible without knowing the preferences of individual recipients.

Analyses of the distribution of income differ greatly in their treatment of health insurance. The Census Bureau’s primary definition of household income excludes the value of health insurance, as do most studies based on

12. For a detailed discussion of issues involved in valuing insurance, see Bureau of the Census, *Conference on the Measurement of Noncash Benefits*, vol. 1, *Proceedings* (1986), [www.census.gov/hhes/www/poverty/publications/measurementconf.pdf](http://www.census.gov/hhes/www/poverty/publications/measurementconf.pdf).

**Table 4.**

## Effects of Changes in Methodology on Estimates of the Distribution of Income and Average Federal Tax Rates, 2009

Before-Tax Income Group	Previous Methodology	Current Methodology (New incidence of corporate income tax and new valuation of government-provided health insurance)	Change from New Incidence of Corporate Income Tax	Change from New Valuation of Government-Provided Health Insurance
<b>Average Before-Tax Income (2009 dollars)<sup>a</sup></b>				
Lowest Quintile	18,900	23,500	*	4,600
Second Quintile	41,700	43,400	100	1,600
Middle Quintile	63,600	64,300	100	600
Fourth Quintile	93,100	93,800	300	400
Highest Quintile	223,800	223,500	-500	200
All Quintiles	86,600	88,400	0	1,800
81st to 90th Percentiles	131,100	131,700	400	200
91st to 95th Percentiles	175,200	175,800	500	100
96th to 99th Percentiles	271,500	271,800	*	300
Top 1 Percent	1,234,600	1,219,700	-14,500	-400
<b>Average Federal Tax Rate (Rates in percent; changes in percentage points)</b>				
Lowest Quintile	-0.2	1.0	0.2	1.0
Second Quintile	6.8	6.8	0.3	-0.3
Middle Quintile	11.4	11.1	0.2	-0.5
Fourth Quintile	15.1	15.1	0.2	-0.2
Highest Quintile	23.4	23.2	-0.1	-0.1
All Quintiles	17.7	17.4	0	-0.3
81st to 90th Percentiles	18.6	18.8	0.3	-0.1
91st to 95th Percentiles	20.9	21.1	0.2	**
96th to 99th Percentiles	24.1	24.1	0.1	-0.1
Top 1 Percent	29.9	28.9	-1.0	**

Source: Congressional Budget Office.

Notes: CBO has revised its allocation of the incidence of the corporate income tax and its method for valuing government-provided health insurance. In this analysis, CBO has allocated 75 percent of corporate income taxes to capital owners and 25 percent to workers. Also, CBO has valued government-provided health insurance at the average cost to the government (total cost to the government divided by the number of program participants) of providing that insurance, as estimated by the Census Bureau. Those revisions are discussed in more detail in the report.

Before-tax income is the sum of market income and government transfers. Market income is composed of labor income, business income, capital gains, capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. For more detailed definitions of income, see the appendix.

Quintiles, or fifths, are created by ranking households by their before-tax income. Quintiles contain equal numbers of people.

Federal taxes include individual and corporate income taxes, social insurance (or payroll) taxes, and excise taxes.

\* = between -\$50 and \$50; \*\* = between -0.05 percentage points and 0.05 percentage points.

a. Income amounts have been rounded to the nearest \$100.

income tax returns, whereas the Census Bureau's alternative definitions of income reflect the so-called fungible value of Medicare, Medicaid, and CHIP.<sup>13</sup> That fungible value is designed to represent the amount of resources freed up for other uses by the government-provided health insurance, up to the average cost to the government of providing that insurance. Specifically, for each household, the Census Bureau compares the household's income with an estimate of the cost to the household of meeting its basic needs for food and housing. If a household does not have enough income to meet those basic needs, the Census Bureau assumes that the household would spend nothing on health care in the absence of the government programs, and it sets the fungible value of health insurance for that household equal to zero. For households with some income above what is necessary to meet their basic needs, the fungible value is set equal to the amount of income above that basic standard, up to the average cost to the government of providing that insurance. One study used both the fungible value of health insurance from the CPS and measures of medical spending constructed from the Medical Expenditure Panel Survey (MEPS).<sup>14</sup> Another study replaced the CPS measures of health insurance with its own estimates of the government's average cost of providing that insurance, again derived from the MEPS.<sup>15</sup>

In previous reports, CBO included in before-tax income the so-called fungible value of Medicare, Medicaid, and CHIP as defined and estimated by the Census Bureau using data from the CPS. In this report, CBO instead included in household income the full value of Medicare, Medicaid, and CHIP, defined to equal the Census

Bureau's estimate of the average cost to the government of providing that insurance. CBO's new treatment of government-provided health insurance is consistent with CBO's long-standing treatment of employers' contributions to health insurance, for which the full cost is included in before-tax income.<sup>16</sup>

The change in the valuation of health insurance provided through Medicare, Medicaid, and CHIP has a significant effect on measured income, especially for households near the bottom of the income distribution. The aggregate difference between the Census Bureau's fungible values and the government's average costs was roughly \$200 billion for 2009. The change in valuation adds that amount to the before-tax income of households whose other before-tax income does not exceed the cost of meeting its basic needs for food and housing by more than the government's average cost of providing that insurance. The change in methodology increased CBO's estimate of average income for households in the bottom quintile of the before-tax income distribution by roughly \$4,600 (or nearly 25 percent) and for households in the second quintile by roughly \$1,600 (see Table 4 on page 19).

The average federal tax rate for the population as a whole is 0.3 percentage points lower because of the increase in measured household income. Although one might expect the change to lower average tax rates the most for households in the lowest income quintile, the change actually boosts the average tax rate for that group by a percentage point. That increase occurs because the higher valuation of government-provided health insurance causes about one-eighth of the households in the bottom quintile under CBO's earlier methodology (roughly 3 million households) to be classified in the second quintile under CBO's new methodology, and it causes a corresponding number of households to be classified in the bottom quintile rather than the second quintile. The households who moved out of the bottom quintile generally had much lower cash income than did those who moved into it: The average household in the bottom quintile under

13. Arthur F. Jones Jr. and Daniel H. Weinberg, *The Changing Shape of the Nation's Income Distribution, 1974–1998*, Current Population Reports, Series P60-204 (Census Bureau, June 2000); Michael Strudler and others, *Analysis of the Distribution of Income, Taxes, and Payroll Taxes via Cross Section and Panel Data, 1979–2004* (Internal Revenue Service, Statistics of Income Division, 2006); and Thomas Piketty and Emmanuel Saez, "Income Inequality in the United States, 1913–1998," *Quarterly Journal of Economics*, vol. 118, no. 1 (February 2003), pp. 1–39.

14. See Gary Burtless and Pavel Svaton, "Health Care, Health Insurance, and the Distribution of American Incomes," *Forum for Health Economics & Policy*, vol. 13, no. 1 (2010), [www.bepress.com/fhep/13/1/1](http://www.bepress.com/fhep/13/1/1).

15. See Richard V. Burkhauser and Kosali I. Simon, *Measuring the Impact of Health Insurance on Levels and Trends in Inequality*, Working Paper 15811 (National Bureau of Economic Research, March 2010).

16. The Census Bureau assigns the average cost of government-provided health insurance to beneficiaries on the basis of average expenditures by state and by risk class. It estimates the cost of employers' contributions to health insurance on the basis of a separate survey of employers. A full description of the methods used to value noncash benefits is provided in Bureau of the Census, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1992*, Current Population Reports, Series P60, No. 186RD (September 1993), pp. viii–ix and B-1 to B-5.

both methodologies had about \$10,000 in cash wages, compared with \$3,000 for the average household who moved out of the bottom quintile and \$21,000 for the average household who moved into that quintile. Because households who moved into the bottom quintile had more income from taxable sources, their average tax rates were more than 5 percentage points higher, on average, than those of the households they replaced; as a result, the average tax rate for households in the lowest quintile rose. That reranking of households more than offset the decline in the average tax rate caused by the additional income for the bottom quintile.

The change in valuation also increases the measured long-term growth of income, especially for households near the bottom of the income distribution. The government's average cost of providing Medicare, Medicaid, and CHIP has risen more rapidly than has household income from most other sources, and including that full cost in income leads to faster growth of measured income for households receiving those benefits.<sup>17</sup>

Supplemental tables, available on CBO's Web site, show estimated household income and average federal tax rates

using a measure of income that includes only the fungible value of Medicare, Medicaid, and CHIP.

### Measuring Inflation

In this report, CBO adjusted household income for the effects of inflation using the personal consumption expenditures price index. That index is constructed by the Bureau of Economic Analysis as part of the national income and product accounts. Previously, CBO had used the Bureau of Labor Statistics' research series of the consumer price index for all urban consumers (CPI-U-RS). The average annual inflation rate over the 1979–2009 period was about 0.2 percentage points lower as measured by the PCE price index than as measured by the CPI-U-RS. In CBO's judgment, the PCE price index is a more appropriate deflator for the measures of income used in this report because its scope includes health care services purchased by third parties on behalf of people (services that are included in the measures of income used in this report) and because it more fully accounts for the adjustments that consumers make to their spending patterns as some prices change relative to other prices.<sup>18</sup>

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17. See Congressional Budget Office, *Trends in the Distribution of Household Income Between 1979 and 2007* (October 2011), Appendix C.

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18. For a more detailed discussion of alternative measures of inflation, see Congressional Budget Office, *Using a Different Measure of Inflation for Indexing Federal Programs and the Tax Code* (February 2010).





# Appendix: Methodology

**I**n estimating the distribution of household income and federal taxes, the Congressional Budget Office (CBO) draws on various data sources and makes judgments about the best way to use those data. This appendix explains the methodology CBO used in this report.

## Sources of Data

Information on household income for this analysis comes from two primary sources: the Statistics of Income (SOI), collected by the Internal Revenue Service, and the Current Population Survey (CPS), collected by the Census Bureau. The core data come from the SOI, a nationally representative sample of individual income tax returns that has increased in size from roughly 90,000 returns around 1980 to more than 300,000 returns in recent years. CBO used the full Individual Income Tax file, which contains more detail than the public-use version of the file. CBO supplemented those SOI data with data from the Annual Social and Economic Supplement to the CPS; those survey data contain information on the demographic characteristics and income of a large sample of households.

Both the SOI and the CPS lack important information needed for estimating and comparing after-tax household income over time. The SOI lacks information about couples and individuals who do not file a federal tax return; in addition, it does not report all income from government cash transfer programs, has no information on the receipt of in-kind transfers and benefits, and is organized by tax-filing units rather than households. The CPS lacks detailed information on high-income households, does not report capital gains, underreports other income from capital, and lacks information on the deductions and adjustments necessary to compute taxes.

To overcome the limitations of both data sources, CBO statistically matched each SOI record to a corresponding CPS record on the basis of demographic characteristics and income. Each pairing resulted in a new record that took on the demographic characteristics of the CPS record and the income reported in the SOI. (Some types of income, such as certain transfers and in-kind benefits, appear only in the CPS; values for those items were drawn directly from that survey.) Because not all households have to file tax returns, some households do not appear in the SOI. Therefore, after all SOI records were matched to CPS records, the remaining CPS records were recorded as households who did not file an income tax return, and their income values were taken directly from the CPS. CBO then estimated the tax liability for each record.

## Who Pays Taxes?

In its analysis, CBO assumed that households bear the economic cost of the taxes they pay directly, such as individual income taxes and the employee's share of payroll taxes. CBO further assumed—as do most economists—that employers pass on their share of payroll taxes to employees by paying lower wages than they would otherwise pay. Therefore, CBO included the employer's share of payroll taxes in households' before-tax income and in households' taxes.

CBO also assumed that the economic cost of excise taxes falls on households according to their consumption of taxed goods (such as tobacco and alcohol). Excise taxes on intermediate goods, which are paid by businesses, were attributed to households in proportion to their overall consumption. CBO assumed that each household spent the same amount on taxed goods as a similar household with comparable income is reported to spend in the

Bureau of Labor Statistics' Consumer Expenditure Survey.

Far less consensus exists about how to allocate corporate income taxes (and taxes on capital income generally). In this analysis, CBO allocated 75 percent of the burden of corporate income taxes to owners of capital in proportion to their income from interest, dividends, adjusted capital gains, and rents. The agency used capital gains scaled to their long-term historical level given the size of the economy and the tax rate that applies to them rather than actual capital gains so as to smooth out large year-to-year variations in the total amount of gains realized. CBO allocated 25 percent of the burden of corporate income taxes to workers in proportion to their labor income.

## Measuring Income

This analysis uses three measures of household income: market income; market income plus government transfers (referred to as before-tax income); and market income plus government transfers, minus federal tax liabilities (referred to as after-tax income).

**Market income** includes the following components:

- *Labor income*—Cash wages and salaries, including those allocated by employees to 401(k) plans; employer-paid health insurance premiums; the employer's share of Social Security, Medicare, and federal unemployment insurance payroll taxes; and the share of corporate income taxes borne by workers.
- *Business income*—Net income from businesses and farms operated solely by their owners, partnership income, and income from S corporations.
- *Capital gains*—Profits realized from the sale of assets. Increases in the value of assets that have not been realized through sales are not included in market income.
- *Capital income (excluding capital gains)*—Taxable and tax-exempt interest, dividends paid by corporations (but not dividends from S corporations, which are considered part of business income), positive rental income, and the share of corporate income taxes borne by owners of capital.
- *Other income*—Income received in retirement for past services and other sources of income.

**Government transfers** consist of cash payments from Social Security, unemployment insurance, Supplemental Security Income, Temporary Assistance for Needy Families (and its predecessor, Aid to Families with Dependent Children), veterans' programs, workers' compensation, and state and local government assistance programs. They also include the value of in-kind benefits, such as Supplemental Nutrition Assistance Program vouchers (formerly known as food stamps), school lunches and breakfasts, housing assistance, energy assistance, and benefits provided by Medicare, Medicaid, and the Children's Health Insurance Program. (The value of health insurance is measured on the basis of the Census Bureau's estimates of the average cost to the government of providing such insurance.)

**After-tax income** is the sum of market income and government transfers, minus federal tax liabilities. In assessments of the impact of various taxes, individual income taxes are allocated directly to households paying those taxes. Social insurance, or payroll, taxes are allocated to households paying those taxes directly or paying them indirectly through their employers. Corporate income taxes are allocated to households according to their share of capital and labor income, as described above. Federal excise taxes are allocated to households according to their consumption of the taxed good or service.

## Adjusting Income for Differences Among Households

CBO used households as the unit of analysis for this report. A household consists of the people who share a housing unit, regardless of their relationships. The presumption is that households make joint economic decisions, although that may not be true in every case (in a group house, for example). Households may comprise more than one taxpaying unit, such as a married couple and their adult children living together.

Households with identical income may differ in ways that bear on their economic status. Importantly, a larger household needs more income to support a given standard of living than does a smaller household. However, economies of scale in some types of consumption—housing, in particular—mean that two people generally do not need twice the income to live as well as an individual living alone. Therefore, to rank households by their standard of living, it is probably appropriate to divide household income by an adjustment factor that is

between one (which would result only in household income and would not capture the greater needs of larger households) and the number of people in the household (which would produce household income per capita and would not capture the benefits of shared consumption). CBO chose to adjust for household size by dividing household income by the square root of the number of people in the household, counting adults and children equally.<sup>1</sup> Households were then ranked by their adjusted income and grouped into quintiles that contain equal numbers of people. Because household sizes vary, different quintiles generally contain slightly different numbers of households.

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1. That adjustment implies that each additional person increases a household's needs but does so at a decreasing rate. For example, a household consisting of a married couple with two children and income of \$80,000 would have an adjusted income of \$40,000 (\$80,000 divided by the square root of 4) and would have the equivalent economic ranking of a single person with income of \$40,000 or a married couple without children with income of about \$56,600 (\$56,600 divided by the square root of 2 is approximately \$40,000). See Constance F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (National Academy Press, 1995).

Adjusting the income of households for other differences in their circumstances that affect their standard of living might also be desirable. For example, the prices of goods and services vary among locations, and households can incur different costs associated with working, such as the costs of commuting and child care expenses, depending on how many members of the household are employed. In this analysis, however, CBO did not attempt to adjust for those additional differences.

## Types of Households

Supplemental tables, available on CBO's Web site, show household income and average federal tax rates for three types of households: those with members under age 18 (households with children), those headed by a person age 65 or older and with no member under age 18 (elderly childless households), and all others (nonelderly childless households). The tables group households into quintiles by position in the income distribution across the full population, not by distribution within each type of household, so each type of household need not be evenly spread across the income quintiles.

# Lists of Tables and Figures

## Tables

S-1. Distribution of Federal Taxes and Household Income, by Income Group, 2007 and 2009	ii
1. Distribution of Before-Tax Income, by Income Group, 2007 to 2009	4
2. Distribution of Federal Taxes, by Income Group, 2007 to 2009	6
3. Distribution of Before- and After-Tax Income and Federal Taxes, by Income Group, 2007 to 2009	12
4. Effects of Changes in Methodology on Estimates of the Distribution of Income and Average Federal Tax Rates, 2009	19

## Figures

1. Average Federal Tax Rates, by Income Group, 2009	8
2. Shares of Before-Tax Income and Federal Taxes, by Income Group, 2009	9
3. Average Federal Tax Rates, by Income Group and Tax Source, 2009	10
4. Shares of Before- and After-Tax Income, by Income Group, 2009	11
5. Average Federal Tax Rates, 1979 to 2009	14
6. Cumulative Growth in Average After-Tax Income Adjusted for Inflation, by Income Group, 1979 to 2009	15

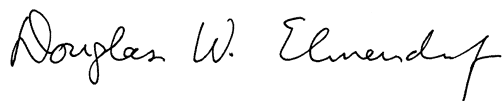
## About This Document

This Congressional Budget Office (CBO) report was prepared at the request of the Chairman of the Senate Finance Committee. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

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