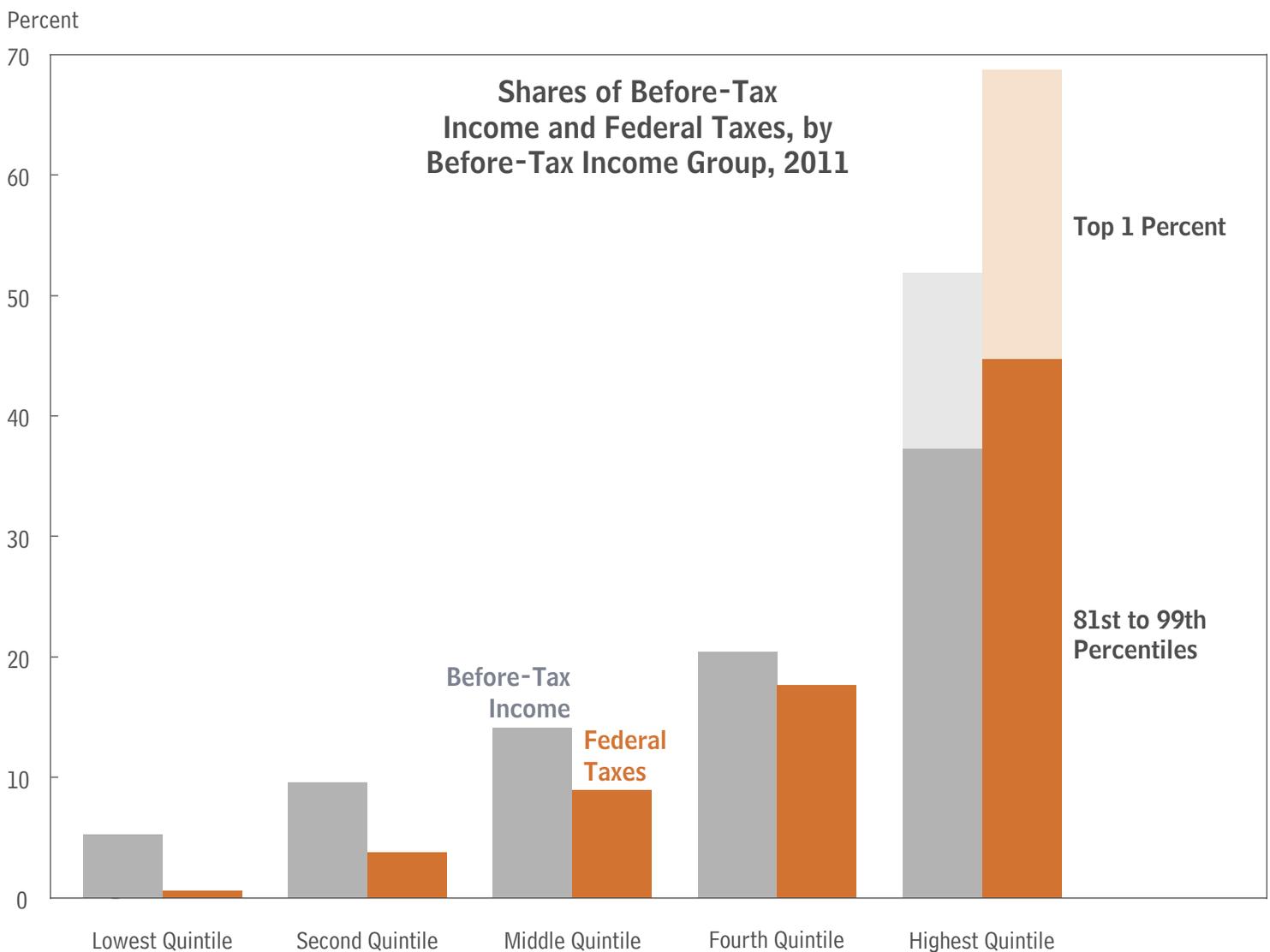


CBO

The Distribution of Household Income and Federal Taxes, 2011



NOVEMBER 2014

Notes and Definitions

Numbers in the text, tables, and figures may not add up to totals because of rounding. Dollar amounts are generally rounded to the nearest hundred.

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

Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Before-tax income is market income plus government transfers.

Federal taxes include individual income taxes, payroll (or social insurance) taxes, corporate income taxes, and excise taxes. In this analysis, those taxes for a given year are the amount a household owes on the basis of income received in that year, regardless of when the taxes are paid. Taxes from those four sources accounted for approximately 92 percent of federal revenues in fiscal year 2011. Revenue sources not examined in this report include states' deposits for unemployment insurance, estate and gift taxes, customs duties, and miscellaneous receipts.

After-tax income is before-tax income minus federal taxes.

Average federal tax rates are calculated by dividing federal taxes by before-tax income.

Income groups are created by ranking households by their size-adjusted income. Specifically, income is adjusted for differences in household size by dividing income by the square root of the number of people in the household. A household consists of people sharing a housing unit, regardless of their relationships. Each income quintile (fifth) contains approximately equal numbers of people but different numbers of households. Similarly, each percentile (hundredth) contains approximately equal numbers of people but different numbers of households. If a household has negative income (that is, if its business or investment losses are larger than its other income), it is excluded from the lowest income group but included in totals.

When examining household income over time, income is adjusted for inflation using the personal consumption expenditures price index, which is calculated by the Bureau of Economic Analysis.

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

Supplemental data showing household income and average federal tax rates for households with children, elderly childless households, and nonelderly childless households are posted along with this report on CBO's website (www.cbo.gov/publication/49440).



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The Distribution of Household Income and Federal Taxes, 2011

Summary

In 2011, according to the Congressional Budget Office's (CBO's) estimates, average household market income—a comprehensive income measure that consists of labor income, business income, capital income (including capital gains), and retirement income—was approximately \$81,000. Government transfers, which include benefits from programs such as Social Security, Medicare, and unemployment insurance, averaged approximately \$13,000 per household. The sum of those two amounts, which equals before-tax income, was about \$94,000, on average. Federal taxes as examined in this report comprise four separate sources: individual income taxes, payroll (or social insurance) taxes, corporate income taxes, and excise taxes. Taken together, those taxes were about \$17,000 per household, on average, in 2011. Thus, average household income after taxes was about \$77,000, and the average federal tax rate (federal taxes divided by before-tax income) was 17.6 percent.

How Were Income and Federal Taxes Distributed in 2011?

Before-tax income was unevenly distributed across households in 2011. Average before-tax income among households in the lowest one-fifth (or quintile) of the distribution of before-tax income was approximately \$25,000 in 2011, CBO estimates (see Table 1). Among households in the middle income quintile, average before-tax income was about \$66,000. Relative to those two income groups, households in the highest income quintile had average before-tax income that was much higher—approximately \$246,000.

Overall, federal taxes are progressive, meaning that average tax rates generally rise as income increases. Households in the lowest income quintile paid about \$500 in federal taxes in 2011, on average, which amounted to an average federal tax rate of about 2 percent, CBO estimates.¹ Households in the middle quintile paid about \$7,000 in federal taxes, and households in the

highest quintile paid about \$58,000 in federal taxes, which results in average federal tax rates of approximately 11 percent and 23 percent, respectively.

As a result of the progressive federal tax structure, households in the highest quintile of before-tax income paid a greater share of federal taxes in 2011 than they received in before-tax income, while households in each of the other quintiles paid a smaller share of federal taxes than they received in before-tax income (see Figure 1). Households in the highest income quintile received a little more than half of total before-tax income and paid more than two-thirds of all federal taxes in 2011. In contrast, households in the lowest income quintile received approximately 5 percent of total before-tax income in 2011 and paid less than 1 percent of all federal taxes, CBO estimates.

The progressive federal tax structure also results in a distribution of after-tax income that is slightly more even than that of before-tax income. Households in the lowest income quintile received approximately 6 percent of after-tax income in 2011, compared with 5 percent of before-tax income, and households in the highest income quintile received about 48 percent of after-tax income, compared with 52 percent of before-tax income, CBO estimates.

How Did Changes in Tax Rules Between 2011 and 2013 Affect Average Federal Tax Rates?

Tax rules have changed since 2011 in several important ways. Most notably, by 2013, several provisions affecting high-income taxpayers—originally enacted in 2001 (in the Economic Growth and Tax Relief Reconciliation Act, or EGTRRA) and 2003 (in the Jobs and Growth Tax Relief Reconciliation Act, or JGTRRA)—were allowed to

1. In this analysis, federal taxes are the amount a household owes on the basis of income received in that year, regardless of when the taxes are paid. The term “paid” is used throughout the report for simplicity.

Table 1.**Average Household Income, Transfers, and Taxes, by Before-Tax Income Group, 2011**

Dollars

	Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	All Households
Market Income	15,500	29,600	49,800	83,300	234,700	80,600
Government Transfers	9,100	15,700	16,500	14,100	11,000	13,300
Before-Tax Income	24,600	45,300	66,400	97,500	245,700	93,900
Federal Taxes	500	3,200	7,400	14,800	57,500	16,600
After-Tax Income	24,100	42,100	59,000	82,600	188,200	77,300

Source: Congressional Budget Office.

Notes: Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Before-tax income is market income plus government transfers.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

After-tax income is before-tax income minus federal taxes.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people.

For more detailed definitions of income, see the appendix.

expire. In addition, payroll tax rates that had been reduced in 2011 and 2012 were reset to their previous, higher levels in 2013, and new taxes for high-income taxpayers enacted in the Affordable Care Act took effect in 2013.² As part of this analysis, CBO estimated the effects of those changes on the distribution of federal taxes.³

If the income distribution was unchanged between 2011 and 2013, the average federal tax rate for all households would have been 1.7 percentage points higher under 2013 tax rules than it was in 2011, CBO estimates. Although average federal tax rates would have increased by about 1 percentage point across much of the income

distribution, the average tax rate for households in the top 1 percent of the income distribution would have increased by an estimated 4.3 percentage points.

What Are the Trends in the Distribution of Household Income and Federal Taxes?

Over the 33-year period from 1979 to 2011, average after-tax income—which equals market income plus government transfers minus federal taxes—grew at significantly different rates at different points in the income scale.⁴ For households in the top 1 percent of the income distribution, inflation-adjusted after-tax income grew at an estimated average rate of 3.5 percent per year. As a result, inflation-adjusted after-tax income was 200 percent higher in 2011 than it was in 1979 for households

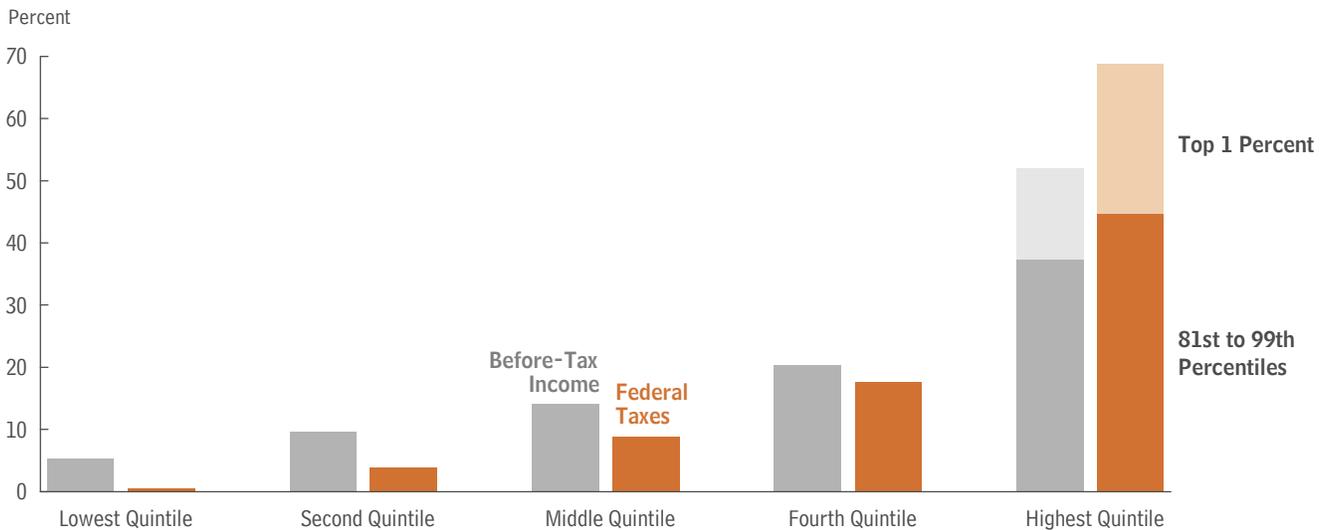
2. As used in this report, the Affordable Care Act comprises the Patient Protection and Affordable Care Act (Public Law 111-148), the health care provisions of the Health Care and Education Reconciliation Act of 2010 (P.L. 111-152), and the effects of subsequent judicial decisions, statutory changes, and administrative actions.

3. Although tax law changed significantly again in 2014, owing largely to other provisions of the Affordable Care Act, CBO is still developing a methodology to incorporate the effects of those changes in its distributional analyses.

4. CBO chose 1979 as a starting point for the analysis because it is the earliest year for which the Census Bureau provides consistent estimates of some measures of income. The beginning and end points of the analysis—1979 and 2011—were quite different in terms of economic activity; 1979 was a peak year for the economy right before a recession, whereas 2011 was a year in which the economy was still slowly recovering from the deep recession that began in 2007.

Figure 1.

Shares of Before-Tax Income and Federal Taxes, by Before-Tax Income Group, 2011



Source: Congressional Budget Office.

Notes: Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments. Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes. Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well. For more detailed definitions of income, see the appendix.

in that group. In contrast, households in the bottom quintile experienced inflation-adjusted after-tax income growth of 1.2 percent per year, on average. Consequently, inflation-adjusted after-tax income was 48 percent higher in 2011 than it was in 1979 for that income group. Those differences in growth rates for after-tax income are largely attributable to differences in growth rates for market income, although changes in taxes and transfers played a role as well.⁵

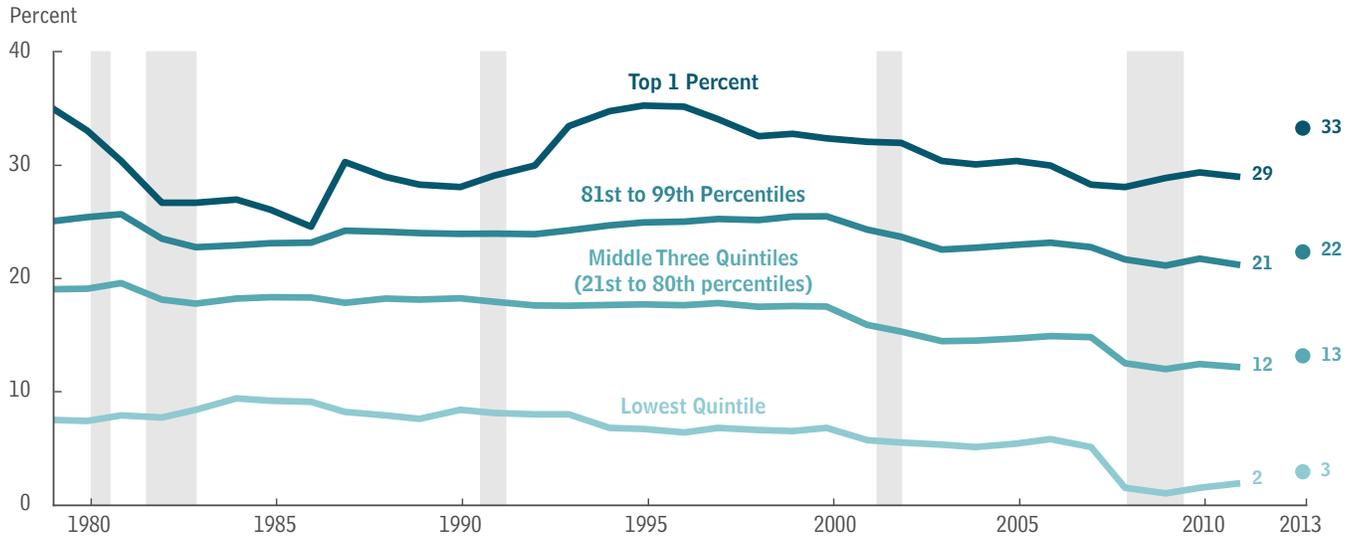
Average federal tax rates fluctuate over time because of changes in tax law and changes in the composition and

distribution of income. In 2011, average federal tax rates were near their lowest levels since 1979 for households in most of the income groups examined in this report. The only exception was for households in the top 1 percent of the income distribution. For that group, the average federal tax rate in 2011 was near its lowest level since the early 1990s (see Figure 2).

CBO estimates that average federal tax rates under 2013 law would be higher—relative to tax rates in 2011—across the income spectrum. The estimated rates under 2013 law would still be well below the average rates from 1979 through 2011 for the bottom four income quintiles, slightly below the average rate over that period for households in the 81st through 99th percentiles, and well above the average rate over that period for households in the top 1 percent of the income distribution.

Government transfers and federal taxes lessen income inequality because federal taxes are progressive and payments from government transfer programs generally

5. Taxes and transfers can affect households' market income by creating incentives for people to change their behavior. If an additional dollar earned or saved leads to reductions in transfers or increases in taxes, then the after-tax return from working and saving is reduced, which may cause people to work or save less. However, those changes in transfers and taxes also reduce after-tax income, which may cause people to work or save more. In this analysis, CBO did not attempt to adjust market income to account for those behavioral effects of transfers and taxes.

Figure 2.**Average Federal Tax Rates, by Before-Tax Income Group, 1979 to 2011 and Projected Under 2013 Law**

Source: Congressional Budget Office.

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

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Federal tax rates for 2013 are calculated by applying individual income tax and payroll tax rules in place in 2013 to the income distribution observed in 2011.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

decline as a share of income as income rises. Between 1979 and 2011, government transfers reduced income inequality to a greater extent than federal taxes, based on a standard measure of inequality known as the Gini index. In 2011, government transfers accounted for approximately two-thirds of the reduction in income inequality observed between market income and after-tax income.

Income and Taxes Across Households in 2011

Throughout this report, CBO analyzes the distribution of three separate measures of income. The first, market

income, is broadly measured. It equals the sum of labor income, business income, capital income (including capital gains), and retirement income. Labor income includes cash wages and salaries, including amounts allocated by employees to 401(k) plans; employer-paid health insurance premiums; the employer's share of payroll taxes for Social Security, Medicare, and federal unemployment insurance; and the share of corporate income taxes borne by workers (see Box 1).⁶ The second measure examined in this report is before-tax income, which equals market

6. See the appendix for more details on the other sources of income included in market income.

income plus government transfers.⁷ The third measure examined is after-tax income, which equals before-tax income minus federal taxes.⁸

Average market income for households in 2011 was \$80,600, CBO estimates.⁹ On average, households received \$13,300 in government transfers in that year—\$9,100 from Social Security and Medicare and \$4,200 from other government transfers. Before-tax income, on average, was therefore \$93,900. In 2011, households paid an estimated \$16,600 in federal taxes, resulting in average household after-tax income of \$77,300. The average federal tax rate in 2011 (which is equal to federal tax liabilities divided by before-tax income)—17.6 percent—was the sum of four average tax rates: individual income taxes (8.4 percent), payroll taxes (6.7 percent), corporate income taxes (1.9 percent), and excise taxes (0.7 percent).

All of those measures—market income, government transfers, before-tax income, federal tax rates, and after-tax income—vary across the income scale, sometimes significantly. Market income is highly skewed toward the top of the income distribution: Households in the top quintile of the distribution of market income in 2011 received an estimated 58.1 percent of total market income, while households in the bottom quintile received an estimated 2.2 percent. Because government transfers

constitute a larger share of market income toward the bottom of the income distribution, before-tax income is somewhat more evenly distributed across the income scale than market income—but it is still very skewed toward the top of the distribution. The progressivity of the federal tax system reduces the level of income inequality further by disproportionately decreasing income at the top of the distribution. After-tax income, therefore, is more equally distributed across the income scale than before-tax income. Nonetheless, households in the top quintile of the distribution of before-tax income in 2011 received an estimated 48.2 percent of total after-tax income, while households in the bottom quintile received an estimated 6.3 percent.

Market Income Across the Income Scale

Market income is highly skewed toward households at the top of the income distribution (see Figure 3 on page 8). In 2011, households in the lowest quintile of market income earned an estimated 2.2 percent of total market income, or about \$7,900 per household, on average.¹⁰ Households in the middle quintile earned 13.0 percent of total market income (or about \$55,400, on average), and households in the top quintile earned 58.1 percent (or about \$240,800, on average). Within the top quintile of households, market income is also skewed toward the very top of the income distribution. The approximately 1.1 million households in the top 1 percent of the market income distribution earned 16.9 percent of total market income, or about \$1.4 million per household, on average.

In 2011, labor income made up the largest share—at least two-thirds—of market income for each income quintile (see Table 2 on page 9). However, the share of market income derived from labor falls off significantly for households in the top 1 percent of the distribution (although the dollar amount continues to increase). Labor income accounts for an estimated 73 percent of

7. Transfers as measured in this report do not equal total government spending on the transfer programs included in the analysis. The values of most transfers are based on amounts reported in the Census Bureau's Current Population Survey. The values of transfers from Medicare, Medicaid, and the Children's Health Insurance Program are based on the Census Bureau's estimate of the government's average cost of providing those benefits. In addition, because some transfers go to recipients outside the scope of the survey data collected by the Census Bureau and because some recipients misreport the amount of transfer payments they receive, the total amount of government transfers observed in the data used here is lower than the total amount the government spends through those transfer programs. See the appendix for more details.

8. For this analysis, federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes, which together accounted for approximately 92 percent of all federal revenues in fiscal year 2011. Revenues from states' deposits for unemployment insurance, estate and gift taxes, miscellaneous fees and fines, and net income earned by the Federal Reserve, which make up the remaining 8 percent, are not allocated to households in this analysis, mainly because it is uncertain to which households those revenue sources should be attributed.

9. Dollar amounts presented in this report are generally rounded to the nearest hundred.

10. Differences between the values presented in this section and those presented in Table 1 stem from differences in the income measure by which households are ranked. In Table 1, households are ranked by before-tax income, which includes income from government transfer programs, including Social Security and Medicare; in this section, households are ranked by market income, which excludes income from transfer programs. The different ranking means that the households in the lowest quintile of before-tax income are not the same as those in the lowest quintile of market income.

Box 1.**Issues With Measuring Income**

In its broadest—but most difficult to measure—form, income can be viewed as the value of all goods and services consumed plus any net change in the purchasing power of wealth over a given period. In its analyses of the distribution of income and taxes, the Congressional Budget Office (CBO) strives to measure income as broadly as possible and thus includes in income some items that people may not usually consider to be part of income. For example, CBO counts taxes paid by businesses as part of household before-tax income; because those taxes are ultimately borne by households in the form of reduced income, CBO adds them to before-tax income in order to measure more accurately what a household's ability to consume would have been in the absence of those taxes. Similarly, CBO includes in households' before-tax income employers' contributions to health insurance and the cost of government health insurance programs such as Medicare and Medicaid. Although not provided in cash, those items are included in income because they increase people's ability to consume goods and services.

However, the measure of income used by CBO departs in significant ways from a theoretically ideal measure. Many of those departures occur because of limitations in the underlying source data from which CBO constructs its estimates.¹ As a result, CBO's estimates of the distribution of income might differ considerably from the distribution of income measured in a more ideal way. The direction and size of any such differences—and how they have changed

1. The measures of income used by CBO for its analyses of the distribution of income and taxes are constructed from data on individual income tax returns prepared by the Statistics of Income division of the Internal Revenue Service and from household survey data collected by the Census Bureau. See the appendix for more details.

over time—are uncertain. The following discussion focuses on six notable ways in which CBO's measure of income differs from a theoretically ideal measure.

Unrealized Capital Gains

An increase in the value of an asset represents income to the owner of that asset, regardless of whether the asset is sold. The tax system, however, records that income and levies tax on it only when the owner sells the asset and realizes the gain, in large part because of the difficulty of measuring increases in the value of assets as they accrue if they are not sold. CBO follows the treatment of the tax system and includes realized capital gains in income; accrued but unrealized gains are excluded.

Effects of Inflation on Capital Income

An ideal measure of income would include only the portions of interest income and realized capital gains that reflect increases in people's ability to consume goods and services; it would not include the portions of interest income and capital gains that reflect changes in the prices of goods and services because those portions do not correspond to increases in purchasing power. Tax data and survey data, however, do not contain the information necessary to accurately remove the parts of income from those sources that reflect changes in prices over the relevant periods. Therefore, CBO counts nominal income from interest and realized capital gains in its measure of before-tax income without any adjustment for the amounts attributable to inflation.

Retirement Income

In an ideal measure of income, income from defined benefit pension plans, defined contribution pension plans, and individual retirement accounts would be counted when the benefits from those plans accrued. However, survey data and administrative data do

Continued

market income among households in the 96th through 99th percentiles but only 37 percent of market income among households in the top 1 percent. Capital income (including realized capital gains) increases significantly for the top 1 percent of households and therefore makes up a much larger proportion of market income, pushing down the share attributable to labor.

Before-Tax Income Across the Income Scale

Market income is by far the largest component of before-tax income for all income groups—ranging from an estimated 63 percent of before-tax income for households in the lowest quintile of before-tax income to about 99 percent of before-tax income for households in the top 1 percent (see Table 3 on page 10).

Box 1.

Continued

Issues With Measuring Income

not capture well the increases in assets in individual households' retirement accounts or in the value of benefits promised under defined benefit plans. Consequently, CBO measures retirement income when it is withdrawn from households' accounts or received as benefits.

Business Income

The organizational structure of a business determines when profits from that business need to be distributed to its shareholders. Businesses with certain structures, such as partnerships and S corporations, must annually distribute all profits to their shareholders, who are required to report those profits as income through the individual income tax system. Businesses with other structures, such as C corporations, may choose to retain their profits rather than distribute them as dividends. An ideal measure of income would include all income derived from businesses' profits in a given period, regardless of whether those profits were distributed or retained. However, CBO includes in its income measure only profits that are distributed; profits that are retained by C corporations are not included, although some are captured in subsequent dividend payments or realized capital gains.

Imputed Income From Owner-Occupied Housing

Landlords receive rental payments for the property they own, and those payments are generally included

in their reported income. By contrast, the value of housing services received by homeowners from the property they own is not included in their reported income. An ideal measure of income would include that value (net of depreciation, interest payments, and taxes), but because the necessary data are not available, CBO does not impute the value of the services derived from owner-occupied housing. Similarly, CBO does not include the implicit income from other durable goods, such as automobiles, in its measure of household income.

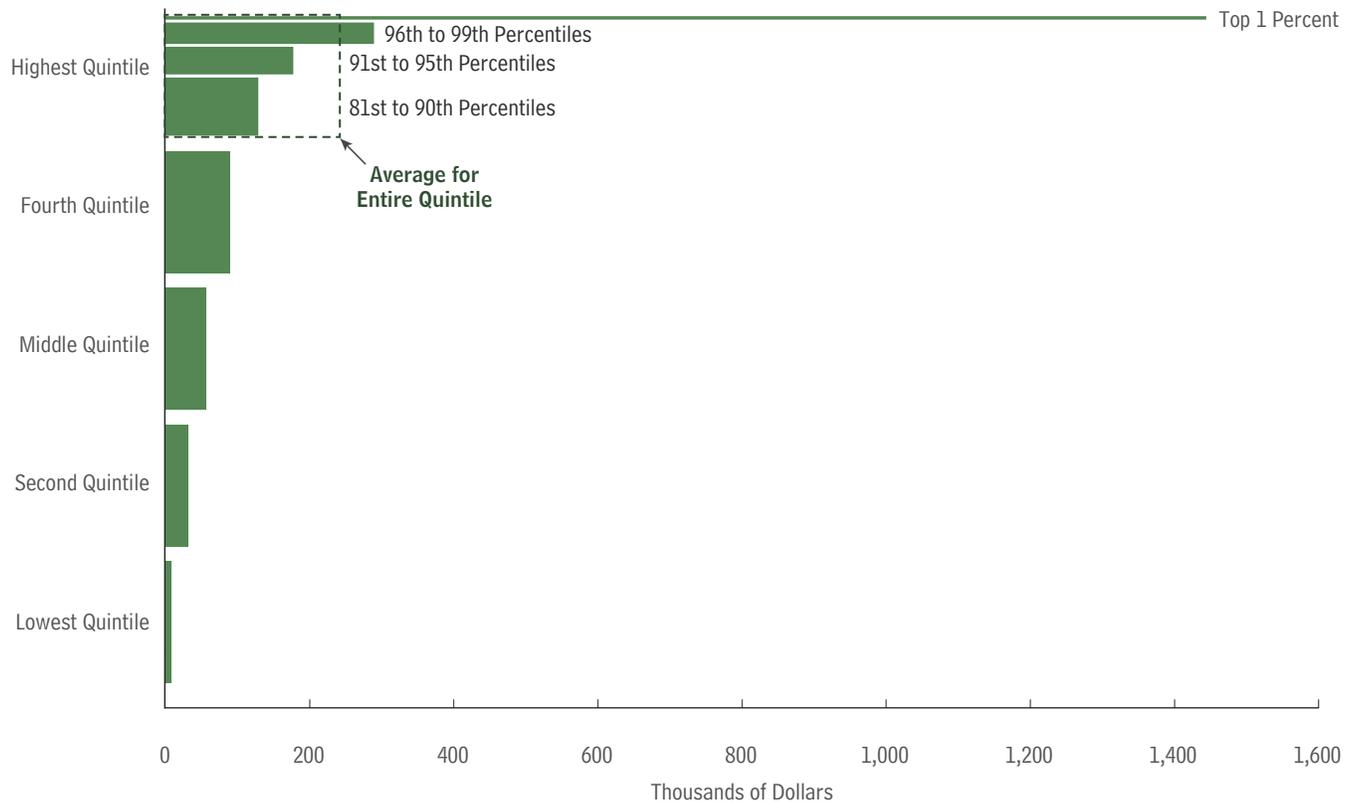
Misreporting of Income

The Statistics of Income data used in this report are the most comprehensive and highest quality data about incomes that are available, but some income is misreported in those data because of tax avoidance. CBO also uses information from survey data in its calculation of household income (particularly for transfer payments and other nontaxable sources of income), and that information is less reliable because it relies on respondents' recall of their past income. As a result of those problems, total income reported in tax and survey data taken together is less than total income in the economy. How that discrepancy is distributed across the income scale, however, is uncertain, and CBO makes no attempt to correct for any distributional effects of the underreporting of income.

Government transfers increase income across the entire income distribution, on average, but make up a significantly larger share of before-tax income for lower-income groups than for higher-income groups.¹¹ In 2011, government transfers accounted for more than one-third of before-tax income for households in the lowest and second-lowest income quintiles and one-quarter of before-tax income for households in the middle quintile, CBO estimates. Those shares fall off significantly for higher-income households. Among households in the highest income quintile, less than 5 percent of their before-tax income comes from transfers; for households in the top 1 percent, that figure is less than 1 percent.

Social Security and Medicare are the two largest government transfer programs. Transfers from those programs are provided mostly to elderly households, many of which

11. CBO recently undertook a more comprehensive analysis of the distribution of federal spending in 2006. Although that study used a similar methodology to the one used in this report, it differed in some important respects, most notably by adjusting the amount of transfer income reported in survey data to match the budgetary totals reported in the Treasury Department's *Monthly Treasury Statements*. The data used in this report are not aligned to budgetary totals and, because of underreporting of transfer income in surveys, do not capture the full effects of government transfers on household income. For more details, see Congressional Budget Office, *The Distribution of Federal Spending and Taxes in 2006* (November 2013), www.cbo.gov/publication/44698.

Figure 3.**Market Income, by Market Income Group, 2011**

Source: Congressional Budget Office.

Notes: Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income excluding capital gains, income received in retirement for past services, and other sources of income.

Income groups are created by ranking households by market income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

have low market income. Other transfers—including payments from the Supplemental Nutrition Assistance Program and benefits from Medicaid and the Children’s Health Insurance Program—are provided even more disproportionately to households in the lower portion of the income distribution.

Despite government transfers going predominantly to lower-income households, the fact that total transfers make up less than 15 percent of total before-tax income means that the distribution of before-tax income is only slightly less uneven than the distribution of market income. In 2011, households in the lowest quintile received an estimated 5.3 percent of total before-tax income, or about \$24,600 per household, according to

CBO’s estimates (see Figure 1 on page 3).¹² Households in the middle fifth received 14.1 percent of the total, or about \$66,400 per household. Households in the top quintile received 51.9 percent of the total, or about \$245,700 per household.

12. Transfers increase income most significantly for households at the bottom of the income distribution. Therefore, when households are ranked by before-tax income, which includes government transfers, households that are in the lowest market income quintile may be moved into higher before-tax income quintiles. Conversely, households in higher market income quintiles that receive less in transfers may move into lower before-tax income quintiles. Because of that reranking, income groups based on before-tax income are not directly comparable with income groups based on market income.

Table 2.**Components of Market Income, by Market Income Group, 2011**

	Quintiles					All Households	Percentiles			
	Lowest	Second	Middle	Fourth	Highest		81st to 90th	91st to 95th	96th to 99th	Top 1
Market Income (Dollars)	7,900	31,100	55,400	89,600	240,800	80,600	132,400	180,900	293,000	1,447,500
Market Income (Percent)										
Labor income	67	75	80	83	67	74	83	81	73	37
Business income	11	4	3	3	11	7	3	5	11	22
Capital income and gains	5	4	3	3	15	10	4	5	10	36
Other income ^a	17	17	13	11	7	8	9	9	7	4

Source: Congressional Budget Office.

Notes: Income groups are created by ranking households by market income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

a. Includes income received in retirement for past services and other sources of income.

Before-tax income within the top quintile is also skewed toward the very top of the income distribution. Households in the 81st through 90th percentiles (the bottom half of the top quintile) received 14.6 percent of total before-tax income and had an average before-tax income of \$138,800. Households in the top 1 percent of the income distribution also received 14.6 percent of total before-tax income, which amounted to \$1.4 million per household, on average, CBO estimates.

Federal Taxes Across the Income Scale

Average federal tax rates generally rise with income.¹³ In 2011, households in the bottom fifth of the distribution of before-tax income paid an estimated 1.9 percent of their before-tax income in federal taxes, households in the middle quintile paid 11.2 percent, and households in the top quintile paid 23.4 percent. Furthermore, average tax

rates within the top quintile continued to increase as income rose, and households in the top 1 percent of the before-tax income distribution had an average tax rate of 29.0 percent (see Figure 4).

Because average federal tax rates are progressive, the share of taxes paid by higher-income households exceeds their share of before-tax income, and the opposite is true for lower-income households (see Figure 1 on page 3). In 2011, households in the highest quintile received an estimated 51.9 percent of before-tax income and paid 68.7 percent of federal taxes; households in the top 1 percent received 14.6 percent of before-tax income and paid 24.0 percent of federal taxes. In all other quintiles, the share of federal taxes was smaller than the share of before-tax income: Households in the bottom quintile received 5.3 percent of income and paid 0.6 percent of taxes, and households in the middle quintile received 14.1 percent of income and paid 8.9 percent of taxes.

Individual Income Taxes. Most of the progressivity of the federal tax system derives from the individual income tax. In 2011, households in the lowest quintile of before-tax income had an average tax rate for the individual income tax of -7.5 percent, and households in the second quintile had a rate of -1.3 percent, CBO estimates. (An income quintile has a negative average income tax rate if refundable tax credits in that quintile exceed other income tax

13. Because of the complexity of estimating state and local taxes for individual households, this report considers federal taxes only. Researchers differ about whether state and local taxes are, on net, regressive, proportional, or slightly progressive, but most agree that state and local taxes are less progressive than federal taxes. For estimates of the distribution of state and local taxes, see Gerald Prante and Scott A. Hodge, *The Distribution of Tax and Spending Policies in the United States*, Special Report No. 211 (Tax Foundation, November 2013), <http://taxfoundation.org/article/distribution-tax-and-spending-policies-united-states>; and Carl Davis and others, *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*, 3rd ed. (Institute on Taxation and Economic Policy, November 2009), <http://tinyurl.com/ke3abe2>.

Table 3.**Components of Before-Tax Income, by Before-Tax Income Group, 2011**

	Quintiles					All Households	Percentiles				
	Lowest	Second	Middle	Fourth	Highest		81st to 90th	91st to 95th	96th to 99th	Top 1	
Before-Tax Income (Dollars)	24,600	45,300	66,400	97,500	245,700	93,900	138,800	186,700	299,000	1,453,100	
Before-Tax Income (Percent)											
Market income	63	65	75	86	96	86	91	94	97	99	
Labor income	54	56	62	69	62	63	73	73	68	37	
Business income	6	3	2	2	11	6	3	5	10	22	
Capital income and gains	1	1	2	3	15	9	4	6	10	36	
Other income	2	5	9	11	8	7	11	11	8	4	
Government transfers	37	35	25	14	4	14	9	6	3	1	
Social Security	9	12	11	7	2	6	4	3	2	*	
Medicare	9	9	7	4	1	4	2	2	1	*	
Medicaid	9	8	4	1	*	2	1	*	*	*	
Other cash and in-kind	10	6	4	2	1	2	1	1	*	*	

Source: Congressional Budget Office.

Notes: Before-tax income is market income plus government transfers.

Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

* = between zero and 0.5 percent.

liabilities.)¹⁴ The average individual income tax rate was 2.4 percent for the middle quintile, 5.8 percent for the fourth quintile, and 14.2 percent for the top quintile (see Figure 5). Households in the top 1 percent of the income distribution paid 20.3 percent of their before-tax income in individual income taxes, on average.¹⁵

14. In the federal budget, the refundable portion of individual income tax credits is treated as an outlay. In this analysis, CBO considers the refundable portion of certain individual income tax credits—the earned income tax credit and the child tax credit—to be a negative tax liability rather than a federal outlay.

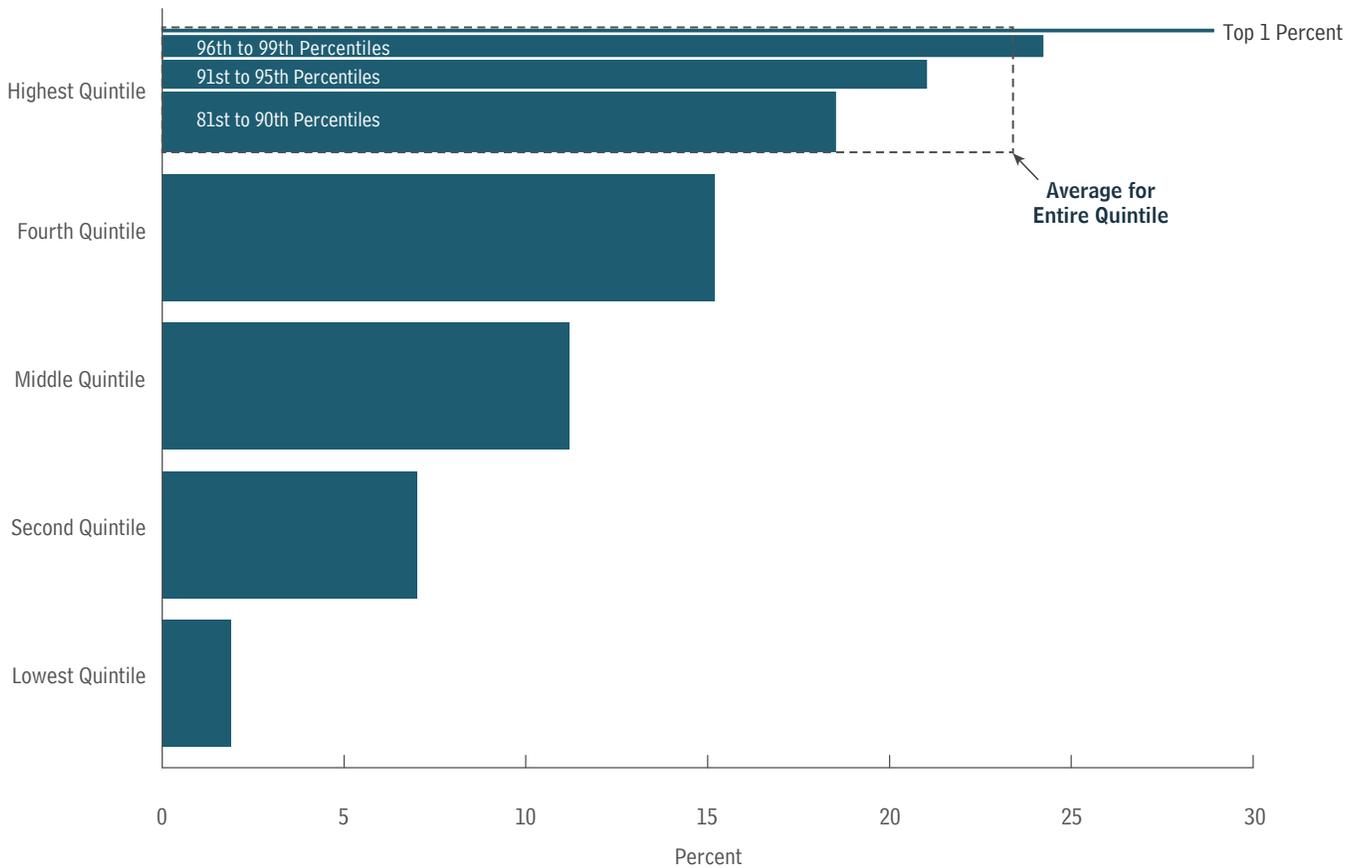
15. In addition to varying *across* income groups, average tax rates can vary significantly *within* each income group. The variation within income groups is attributable to several factors, including differences in the composition of income, family structure, and use of tax preferences, as well as the progressive rate structure. For more discussion of the variation in average tax rates within income groups, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2010* (December 2013), www.cbo.gov/publication/44604.

Payroll Taxes. Average rates for payroll taxes are very similar across most of the income distribution but lower at the top of the distribution. In 2011, the average payroll tax rate was 7.1 percent for households in the lowest quintile of before-tax income, 6.7 percent for the second quintile, 7.2 percent for the middle quintile, and 7.8 percent for the fourth quintile, CBO estimates. The rate for the highest income quintile was 5.9 percent. The average rate among households in the top percentile was significantly lower—2.1 percent—than the rates for all other households, in part because more of the earnings for those households were above the maximum earnings subject to Social Security payroll taxes (\$106,800 in 2011) and in part because earnings were a smaller share of their total income. Payroll taxes account for more than half of total federal taxes among households in all but the top quintile, on average.

Corporate Income Taxes. The average corporate income tax borne by households increases with income. CBO allocates most of that tax in proportion to each

Figure 4.

Average Federal Tax Rates, by Before-Tax Income Group, 2011



Source: Congressional Budget Office.

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

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

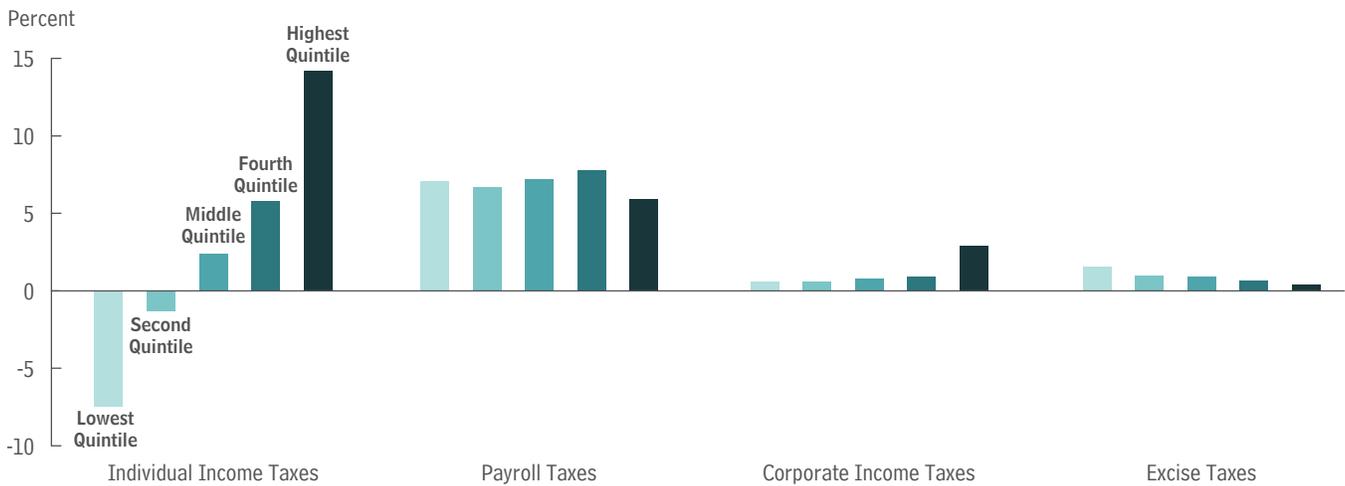
Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

household’s share of total capital income (including adjusted capital gains), which constitutes a larger share of income at the top of the distribution.¹⁶ In 2011, the average corporate income tax rate—corporate taxes divided by before-tax household income—was 2.9 percent for households in the highest quintile and between 0.6 percent and 0.9 percent for households in the other four income quintiles, CBO estimates. The share of the total corporate tax burden borne by households in the highest income quintile was 78.6 percent in 2011, and the share borne by households in the top 1 percent of the income distribution was 48.7 percent.

Excise Taxes. Sales of a wide variety of goods and services are subject to federal excise taxes. Most of the revenues

16. CBO allocates 75 percent of the corporate income tax to households in proportion to their share of capital income and 25 percent to households in proportion to their share of labor income. For more discussion of the incidence of the corporate income tax, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2008 and 2009* (July 2012), www.cbo.gov/publication/43373. For more discussion of the adjustments made to realized capital gains when allocating the corporate tax to households, see the appendix.

Figure 5.**Average Federal Tax Rates, by Before-Tax Income Group and Tax Source, 2011**

Source: Congressional Budget Office.

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

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Negative average tax rates for individual income taxes result when refundable tax credits, such as the earned income tax credit and the child tax credit, exceed the other income tax liabilities of the households in an income group.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people.

For more detailed definitions of income, see the appendix.

raised come from taxes on the sale of motor fuels (gasoline and diesel fuel), tobacco products, alcoholic beverages, and aviation-related goods and services (such as aviation fuel and airline tickets). The burden of excise taxes relative to income is greatest for lower-income households, which tend to spend a larger share of their income on those taxed goods and services. In 2011, average excise tax rates were 1.6 percent for households in the lowest income quintile, 0.9 percent for households in the middle income quintile, and 0.4 percent for households in the highest income quintile, CBO estimates.

After-Tax Income Across the Income Scale

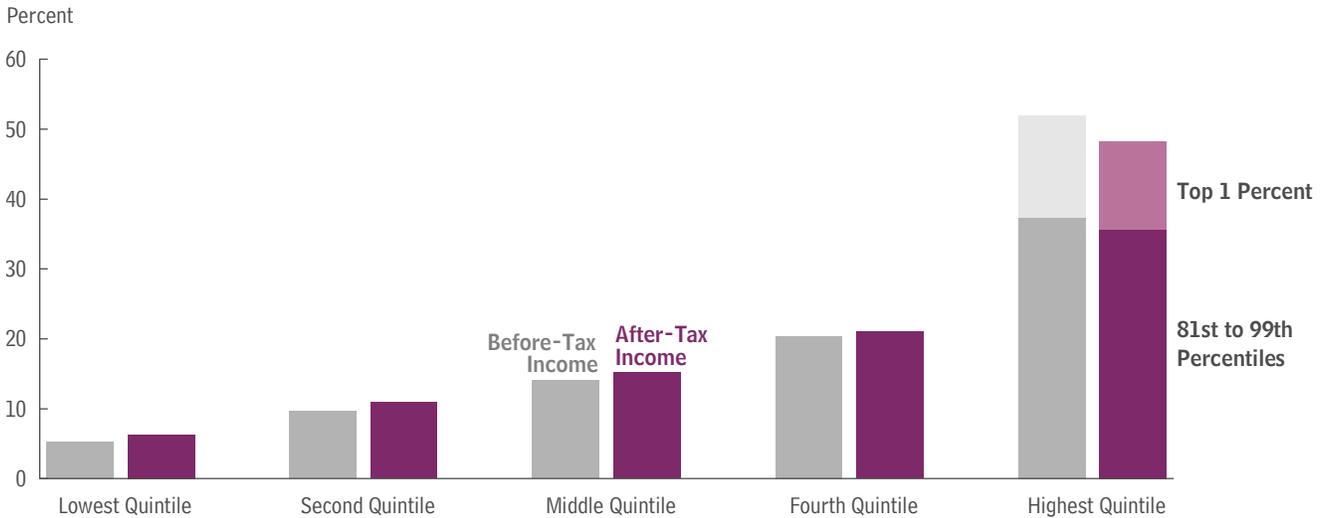
For each income group in 2011, the average household paid a positive amount of federal taxes, so average after-tax income was lower than average before-tax income. Because average federal tax rates rise with income, the difference between before-tax and after-tax income grows as income rises and the distribution of after-tax income is slightly more even than the distribution of before-tax

income. In the lowest quintile of before-tax income, average after-tax income was approximately \$500 lower than average before-tax income (\$24,600 versus \$24,100); for households in the middle quintile of before-tax income, the difference was approximately \$7,400 (\$66,400 versus \$59,000); for households in the highest quintile of before-tax income, the difference was approximately \$57,500 (\$245,700 versus \$188,200); see Table 1 on page 2. For households in the top 1 percent, the difference was approximately \$421,000 (\$1,453,000 versus \$1,032,000), CBO estimates.

Another metric used to examine how the distributions of after-tax income and before-tax income differ is the differences in the shares of those income measures going to each income group (see Figure 6). According to CBO's estimates, households in the bottom four quintiles of the distribution of before-tax income received shares of after-tax income that were roughly 1 percentage point larger than their shares of before-tax income (the exact amounts

Figure 6.

Shares of Before-Tax and After-Tax Income, by Before-Tax Income Group, 2011



Source: Congressional Budget Office.

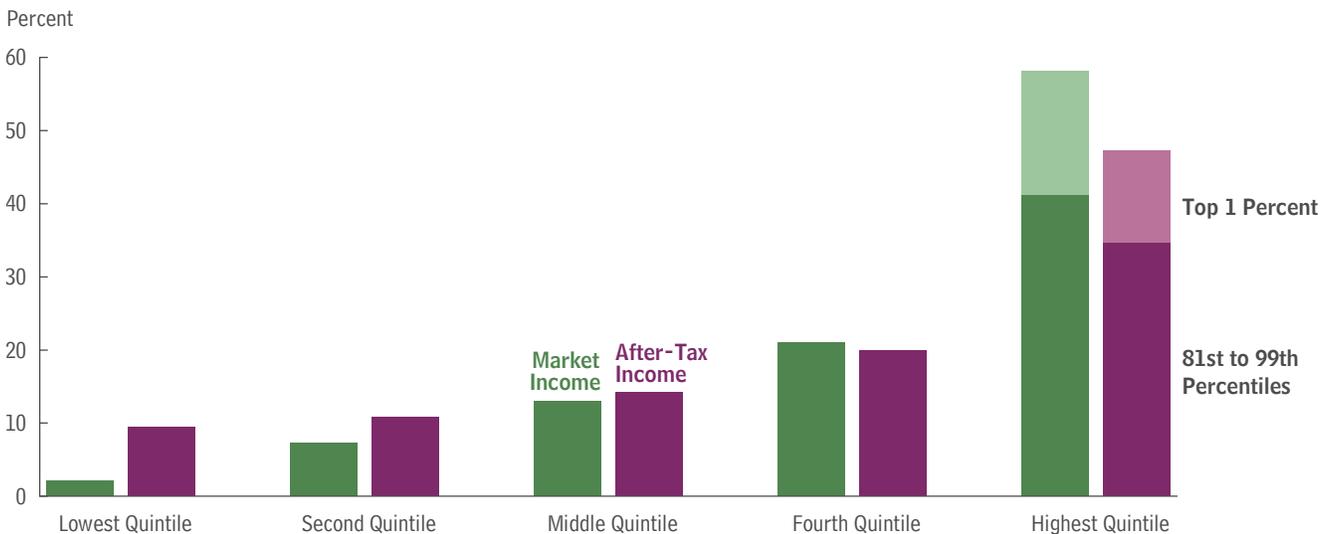
Notes: Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income (excluding capital gains), income received in retirement for past services, and other sources of income. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments. After-tax income is before-tax income minus federal taxes. Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes. Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well. For more detailed definitions of income, see the appendix.

were 1.0, 1.3, 1.1, and 0.6 percentage points from the first quintile to the fourth quintile, respectively). In contrast, for households in the top quintile, the share of after-tax income was 3.7 percentage points lower than the share of before-tax income (48.2 percent of after-tax income versus 51.9 percent of before-tax income). More than half of that difference for the top income quintile—2 percentage points—was attributable to the difference between the shares of after-tax and before-tax income for the top 1 percent of the income distribution. Households in that income group received about 14.6 percent of before-tax income and 12.6 percent of after-tax income.

After-tax income also reflects the impact of government transfers on the distribution of income. The distributional effects of the combination of government transfers and federal taxes can be seen by examining differences in the distributions of market income (income before government transfers and federal taxes) and after-tax income (see Figure 7).¹⁷ Those differences were most significant

for households in the lowest and highest quintiles of market income. Households in the lowest income quintile had a share of after-tax income that was 7.2 percentage points higher than their share of market income—9.4 percent versus 2.2 percent. In contrast, households in the highest income quintile had a share of after-tax income that was 10.8 percentage points lower than their share of market income—47.3 percent versus 58.1 percent. The differences in the shares of market income and after-tax income were not as large for households in the other three quintiles. Households in the second and middle quintiles had larger shares of after-tax income than market income, whereas households in the fourth

17. Differences in the distributions of after-tax income shown in Figure 6 and Figure 7 are attributable to differences in the income measure used to rank households in the two figures. Households are ranked by before-tax income adjusted for household size in Figure 6 and market income adjusted for household size in Figure 7.

Figure 7.**Shares of Market and After-Tax Income, by Market Income Group, 2011**

Source: Congressional Budget Office.

Notes: Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income excluding capital gains, income received in retirement for past services, and other sources of income.

After-tax income is market income plus government transfers minus federal taxes. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments. Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Income groups are created by ranking households by market income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

quintile had a smaller share of after-tax income than market income.

Federal Taxes Under 2013 Tax Rules

Between 2011 and 2013, tax rules changed significantly—and probably shifted the distribution of federal taxes in notable ways. CBO estimated the effects of major changes to individual income tax and payroll tax provisions that occurred between 2011 and 2013 by simulating tax liabilities under 2013 tax rules using reported 2011 incomes.¹⁸ Those estimates do not include any shifts in the income distribution that have occurred between 2011 and 2013 attributable to either the continued recovery of the economy since the last recession or any behavioral effects in response to the tax law changes.

Changes in Tax Rules Between 2011 and 2013

The three most significant changes in provisions of the individual income tax and payroll tax between 2011 and 2013 were the following:

- Several income tax provisions affecting high-income taxpayers, originally enacted in EGTRRA and JGTRRA, expired at the end of 2012;

18. Specifically, CBO deflated the dollar amounts specified in the 2013 tax rules by the nominal growth in per capita income between 2011 and 2013 (approximately 4.5 percent) and then applied those adjusted tax parameters to 2011 incomes. The resulting estimated changes in average tax rates thus reflect both the effects of changes in tax law and a small amount of “bracket creep” to the extent that incomes grew faster than the inflation-indexed tax parameters. Those adjustments were applied only to the individual income tax and the payroll tax; the corporate income tax rates and excise tax rates in effect in 2011 were assumed to be unchanged in 2013.

- Payroll tax rates that had been reduced in 2011 and 2012 were reset to their previous, higher levels in 2013; and
- New taxes for high-income taxpayers enacted in the Affordable Care Act took effect in 2013.

Although the tax rules enacted in EGTRRA and JGTRRA were originally scheduled to expire at the end of 2010, they were extended through 2012 by the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010. Therefore, the tax rules in effect in 2011 reflected the changes made in EGTRRA and JGTRRA, which lowered tax rates on ordinary income (by creating a 10 percent bracket and expanding the 15 percent bracket) and on capital gains realizations and dividends and enlarged the standard deduction for married couples and the child tax credit. The 2010 tax law also extended for two years most of the tax credits enacted in the American Recovery and Reinvestment Act of 2009 (ARRA), although the Making Work Pay tax credit was allowed to expire and was not in effect during 2011. In addition, the 2010 tax act reduced the employee's share of the Social Security payroll tax—from 6.2 percent to 4.2 percent—for one year; that provision was extended through 2012 by two subsequent laws, but it was not extended into 2013. The 2010 tax act also increased the exemption amounts for the alternative minimum tax (AMT) in both 2010 and 2011.¹⁹

The American Taxpayer Relief Act of 2012, which was enacted in January 2013, made permanent most of the major provisions of EGTRRA and JGTRRA—with significant exceptions for high-income taxpayers. Specifically, for taxpayers earning in excess of \$400,000 (for individual filers) or \$450,000 (for married people filing jointly), the lower tax rates originally enacted in 2001 expired as scheduled, and the top statutory tax rate of 39.6 percent was reinstated. Also, the tax rate for long-term capital gains and dividends was increased from 15 percent to 20 percent for those high-income taxpayers, and limitations on the use of personal exemptions and itemized deductions for taxpayers whose adjusted gross income was above \$250,000 (for individual filers)

or \$300,000 (for joint filers) were reinstated. The act also permanently limited the reach of the alternative minimum tax and extended through 2017 the ARRA tax credits that were in effect in 2012. As noted above, the law did not extend the reduction in the payroll tax rate.

Also taking effect in 2013 were two new taxes on high-income taxpayers that were implemented under the Affordable Care Act. For taxpayers earning more than \$200,000 (for individual filers) or \$250,000 (for joint filers), the Medicare payroll tax rate was increased by 0.9 percentage points. In addition, a 3.8 percent surtax was imposed on the lesser of a taxpayer's investment income (from interest, dividends, capital gains realizations, and certain passive business activity) and total income over certain thresholds (\$200,000 for individual filers and \$250,000 for joint filers).

The Affordable Care Act also created tax subsidies (that took effect in 2014) for the purchase of health insurance through exchanges and an excise tax (that is scheduled to take effect in 2018) on certain health insurance plans with high premiums. CBO is still developing a methodology to incorporate the effects of those provisions of the Affordable Care Act in its distributional analyses.

Caveats About This Portion of the Analysis

Two important caveats apply to CBO's estimates of federal tax rates under 2013 tax rules. First, the analysis does not account for any shifts in the distribution of income between 2011 and 2013, which will not be known until detailed tax information becomes available. The further recovery of the economy might have resulted in uneven growth in incomes at different points in the income scale, which could affect tax rates for households in different income groups. Additionally, taxpayers probably changed their behavior in various ways in response to the changes in tax rules between 2011 and 2013. For example, higher-income taxpayers probably shifted some income from 2013 into 2012 in anticipation of the scheduled tax increases. Such shifts represent temporary changes in income, and holding incomes fixed, as this analysis does, may be a better way to measure the long-term effects of the tax changes. However, higher-income taxpayers probably also reduced their incomes in permanent ways because of the tax increases, and to the extent that is true, holding incomes fixed misstates the long-term effects of the tax changes.

19. The AMT is a parallel income tax system with fewer exemptions, deductions, credits, and rates than the regular income tax. Households must calculate the amount they owe under both the AMT and the regular income tax and pay the larger of the two amounts.

Table 4.**Average Federal Tax Rates, by Before-Tax Income Group, 2011 and Projected Under 2013 Law**

Percent

	2011	Projected Under 2013 Law	Change (Percentage points)
Lowest Quintile	1.9	2.9	1.0
Second Quintile	7.0	8.0	1.0
Middle Quintile	11.2	12.3	1.1
Fourth Quintile	15.2	16.4	1.2
Highest Quintile	23.4	25.5	2.1
All Households	17.6	19.3	1.7
81st to 90th Percentiles	18.6	19.8	1.2
91st to 95th Percentiles	21.1	22.3	1.2
96th to 99th Percentiles	24.3	25.4	1.1
Top 1 Percent	29.0	33.3	4.3

Source: Congressional Budget Office.

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

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Federal tax rates for 2013 are calculated by applying individual income tax and payroll tax rules in place in 2013 to the income distribution observed in 2011.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

Second, CBO considered only the major changes to individual income and payroll taxes and did not incorporate minor changes to those taxes or any changes to corporate income taxes or excise taxes.²⁰ For example, under 2011 law, tax filers with qualifying investment properties could deduct 100 percent of their investment expenses. That full expensing provision (introduced in the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010) expired at the end of 2012, and the depreciation schedule used for invest-

ments in 2013 was less generous than the full expensing in effect in 2011. Under the rules for 2013, depreciation deductions would have been smaller and taxable business income and taxes would therefore have been larger than the amounts reflected in CBO's analysis of 2011 data.

Federal Tax Rates Under 2013 Tax Rules Across the Income Scale

Holding the distribution of income constant and not incorporating any changes in taxpayers' behavior in response to the changes in tax rules, CBO estimates that the average federal tax rate for all households taken together would have been about 1.7 percentage points higher under 2013 tax rules than it was in 2011. The difference in federal tax rates would not have been uniform across the distribution of before-tax income, however: Average federal tax rates would have increased a little across much of the income distribution but sharply at the very top of the distribution (see Table 4).

20. The American Taxpayer Relief Act of 2012 significantly modified estate and gift tax rules for 2013 relative to the rules specified for that year under prior law, increasing the exemption amount from \$1 million to \$5.25 million and reducing the top tax rate from 55 percent to 40 percent. Estate and gift taxes are not included in this analysis, either for 2013 or for earlier years. However, those taxes were included in a previous CBO report; see *The Distribution of Federal Spending and Taxes in 2006* (November 2013), www.cbo.gov/publication/44698.

CBO estimates that the average tax rate for all households except those in the top 1 percent of the distribution of before-tax income would have been approximately 1 percentage point higher under 2013 law than they were in 2011. The uniformity of that increase stems primarily from the rise in payroll tax rates after the temporary reduction in those rates expired at the end of 2012. Even with that increase, however, average federal tax rates for households outside of the top 1 percent would have been below the average rates for households in their income groups between 1979 and 2011.

In contrast, CBO estimates that households in the top percentile of the distribution of before-tax income would have faced an average tax rate that was 4.3 percentage points higher under 2013 tax law than it was in 2011 (33.3 percent versus 29.0 percent). That increase can be attributed to the higher tax rates for high-income households that resulted from the expiration of earlier tax reductions and from the additional taxes on high-income households enacted in the Affordable Care Act. The average rate for households in that income group in 2013 would have been close to the highest rate for that group between 1979 and 2011.

Trends in Household Income and Federal Taxes

The distributions of household income and federal taxes depend on economic conditions and tax laws—both of which have changed over time. Changes in the distribution of after-tax income can be traced to changes in the distributions of market income, government transfers, and federal taxes.

Trends in Market Income

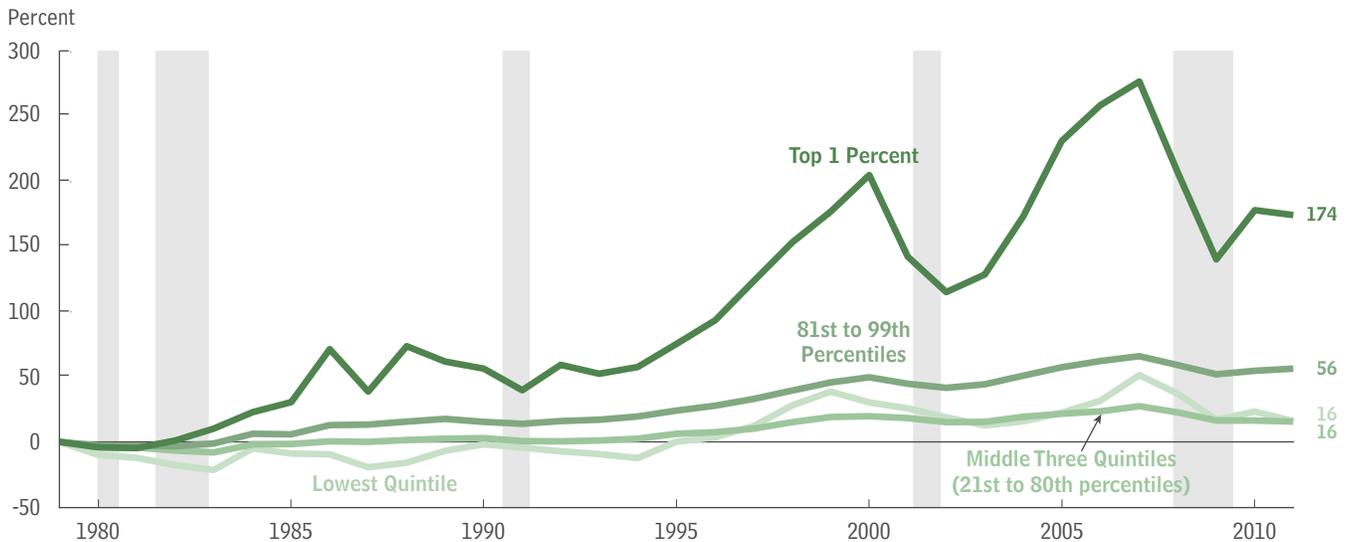
The growth in market income from 1979 to 2011 varied significantly across the income scale. Over the entire 33-year period, cumulative growth in inflation-adjusted market income was 16 percent for households in the bottom quintile, 16 percent for households in the next three quintiles taken together, and much greater for households in the top quintile, CBO estimates (see Figure 8). Specifically, cumulative growth in inflation-adjusted market income for households in the 81st through 99th percentiles was 56 percent over the period, and cumulative growth for households in the top 1 percent of the distribution was 174 percent over the period.

For households not in the top 1 percent of the income distribution, the composition of market income by source was relatively stable between 1979 and 2011. However, the composition of market income changed markedly over time for households in the top 1 percent (see Figure 9). Their labor income and business income grew especially rapidly—by more than 200 percent and 450 percent, respectively—while their capital income excluding capital gains grew by a comparatively modest 63 percent, CBO estimates. Realized capital gains for households in the top 1 percent of the income distribution increased by about 100 percent between 1979 and 2011. However, the year-to-year volatility of those gains means that cumulative growth differs dramatically depending on the precise period examined: Realized capital gains for this group increased by almost 400 percent between 1979 and 2007 and by 35 percent between 1979 and 2009.*

Because of the volatile nature of capital gains realizations and their significance in the income of the highest-income households, shifts in the relative importance of other sources of income for that group can be seen more clearly by examining market income excluding capital gains. From 1979 through the early 2000s, the share of that income for the top 1 percent of households that came from capital income excluding capital gains fell by half—from about 40 percent to about 20 percent, CBO estimates (see Figure 10 on page 20). The share of that income taking the form of capital income turned back up in the early 2000s and then dropped again in the late 2000s as capital income fell during the last recession. In contrast, the share of market income excluding capital gains for the top 1 percent of households that came from business income surged from 14 percent in 1979 to about 27 percent in 2011.

That shift in the composition of market income for households in the top 1 percent of the income distribution probably reflects, at least in part, significant changes in the organizational structure of businesses that have occurred over the past few decades. Following the Tax Reform Act of 1986, which lowered the top statutory tax rate on individual income below the top statutory tax rate on corporate income, many C corporations (which are taxed under the corporate income tax) were converted to S corporations (which pass corporate income through to their shareholders, where it is taxed under the individual income tax) or other types of entities not subject to

[* Values corrected on March 23, 2016]

Figure 8.**Cumulative Growth in Average Inflation-Adjusted Market Income, by Market Income Group, 1979 to 2011**

Source: Congressional Budget Office.

Notes: Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Income is converted to 2011 dollars using the personal consumption expenditures price index.

Income groups are created by ranking households by market income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

the corporate income tax.²¹ As a result, some income previously reported as capital gains and dividends (from C corporations) was instead reported as business income (from S corporations or other pass-through entities). That conversion also accelerated the realization of income, because profits of S corporations are required to be fully distributed to shareholders every year, whereas C corporations can retain their earnings. Business income jumped and capital income dropped over the 1986–1988 period as those conversions began, and the share of business income has continued to grow since then as more conversions occur and as new businesses are less likely to be set up as C corporations.

Trends in Before-Tax Income

Together, market income and government transfers constitute before-tax income. Government transfers include cash transfers (such as Social Security benefits and unemployment insurance benefits) and in-kind benefits (such as Medicare and Medicaid benefits).²² Those transfers have increased significantly during the past few decades and accrue disproportionately to low-income households, so the cumulative growth in before-tax income exceeds the cumulative growth in market income by the largest amount for income groups toward the bottom of the income distribution.

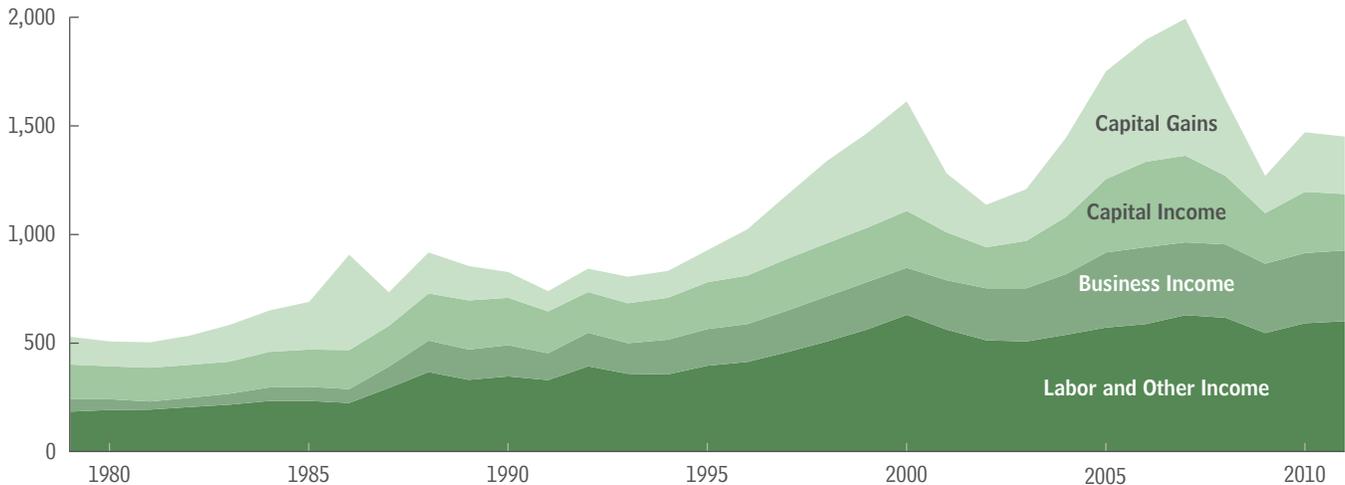
Between 1979 and 2011, the cumulative growth in inflation-adjusted before-tax income for households in the

21. For more details on that shift, see *Taxing Businesses Through the Individual Income Tax* (December 2012), www.cbo.gov/publication/43750.

22. The government transfers included in before-tax income are mostly federal transfers, but they also include transfers from state and local governments—the largest of which is states' share of the cost of Medicaid benefits.

Figure 9.**Components of Inflation-Adjusted Market Income for the Top 1 Percent of Households, 1979 to 2011**

Thousands of 2011 Dollars



Source: Congressional Budget Office.

Notes: Other income includes income received in retirement for past services and other sources of income.

Income is converted to 2011 dollars using the personal consumption expenditures price index.

Income groups are created by ranking households by market income, adjusted for household size.

For more detailed definitions of income, see the appendix.

lowest quintile of before-tax income was 40 percent, CBO estimates (see Figure 11). For comparison, the cumulative growth in market income for households in the lowest quintile of market income was 16 percent over the same period.²³ For households in the middle three quintiles of before-tax income, the cumulative growth in inflation-adjusted before-tax income between 1979 and 2011 was 29 percent. That increase was greater than the cumulative growth in market income for households in the middle quintiles of market income but less than the cumulative growth in before-tax income for households in the lowest quintile of before-tax income.²⁴ For house-

holds in the 81st through 99th percentiles and in the top 1 percent, inflation-adjusted before-tax income increased by an estimated 59 percent and 175 percent, respectively, from 1979 to 2011. Those cumulative growth rates are only slightly larger than the ones observed for market income for households in the corresponding percentiles of the distribution of market income.

Trends in Average Federal Tax Rates by Tax Source

In 2011, households paid, on average, 17.6 percent of their before-tax income in federal taxes, CBO estimates (see Figure 12). That overall average federal tax rate is the second lowest rate seen over the 1979–2011 period. After a drop of roughly 2 percentage points in the early 1980s, primarily because of the combined effects of tax law changes and two recessions, the overall average tax rate rose steadily from the mid-1980s through the 1990s, reaching a peak in 2000 of 22.7 percent. That rate fell again in the early 2000s, largely as a result of the tax legislation enacted in 2001 and 2003. The overall average tax rate climbed in the mid-2000s as economic conditions improved but then dropped between 2007 and 2008. The large decline between those years stemmed mostly

23. Because households receive different amounts of government transfers, the ranking of households based on market income differs from the ranking of households based on before-tax income. As a result, income groups that are based on ranking households by before-tax income include different households than the corresponding groups that are based on ranking households by market income.

24. CBO recently examined trends in federal spending for means-tested transfer programs. See *Growth in Means-Tested Programs and Tax Credits for Low-Income Households* (February 2013), www.cbo.gov/publication/43934.

Figure 10.**Shares of Market Income Excluding Capital Gains, by Source, for the Top 1 Percent of Households, 1979 to 2011**

Source: Congressional Budget Office.

Notes: Other income includes income received in retirement for past services and other sources of income.

Income groups are created by ranking households by market income, adjusted for household size.

For more detailed definitions of income, see the appendix.

from two factors: sharp decreases in capital gains and other capital income at the upper end of the income distribution during the financial crisis and start of the severe recession, and the Economic Stimulus Act of 2008, which provided a partially refundable payment of between \$300 and \$600 to people whose income was below certain thresholds. Additional changes in tax law and slow economic growth from 2009 through 2011 kept the overall average tax rate near its lowest level over the 33-year period examined here.

Individual Income Taxes. The average individual income tax rate (individual income taxes divided by before-tax income) in 2011 was an estimated 8.4 percent, which is below the average rate of 9.9 percent between 1979 and 2011. Over that period, the average individual income tax rate peaked at 11.9 percent in 1981, declined because of the reduction in tax rates enacted in 1981, and rose again after 1993 as a consequence of changes in tax law and rapidly rising incomes. After peaking at 11.7 percent in 2000, the rate fell to 8.3 percent in 2003 as a result of the 2001 and 2003 tax cuts and the 2001 recession and subsequent slow recovery. The rate dropped again in 2008 and 2009, to a low of 7.2 percent, because of

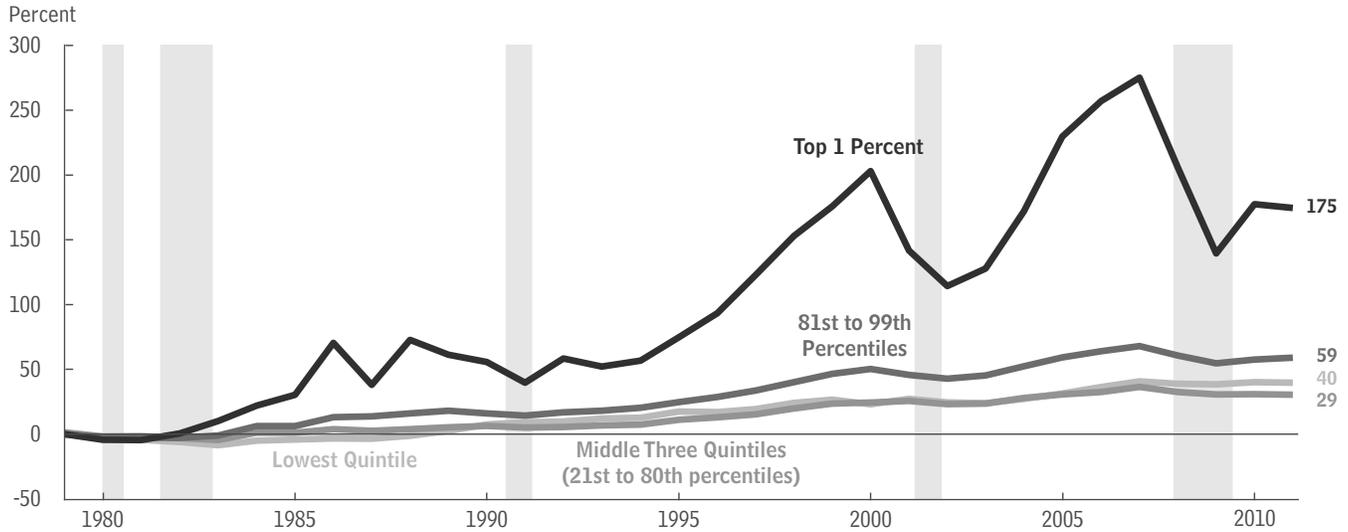
declines in income and changes in tax law. At the end of 2010, the Making Work Pay tax credit, a refundable credit of up to \$400 for a single tax filer or \$800 for a married couple, expired. Primarily as a result of that expiration, the average individual income tax rate increased between 2010 and 2011.

Payroll Taxes. Between 1979 and 1991, the average payroll tax rate rose steadily from 6.8 percent to a high of 8.5 percent, mostly because of legislated increases in the Social Security payroll tax rate and increases in the maximum earnings subject to that tax.²⁵ The payroll tax rate declined slightly in the late 1990s as labor income grew more slowly than other income sources and as earnings above the maximum subject to Social Security taxes grew more rapidly than earnings below that amount. The 2001 recession and slow recovery reversed those trends, leading the tax rate to rise a bit in the early 2000s. The rate resumed its decline in the mid-2000s when economic

25. The payroll tax rate is calculated as payroll taxes divided by total before-tax income. Therefore, when the amount of before-tax income subject to the tax rises, the average payroll tax rate increases as well.

Figure 11.

Cumulative Growth in Average Inflation-Adjusted Before-Tax Income, by Before-Tax Income Group, 1979 to 2011



Source: Congressional Budget Office.

Notes: Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Income is converted to 2011 dollars using the personal consumption expenditures price index.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

growth picked up, before climbing in 2008 and 2009 as the recession caused nonlabor income to fall more sharply than labor income and caused earnings above the maximum subject to Social Security taxes to fall more than earnings below that amount. The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 reduced the employee’s share of Social Security payroll taxes by 2 percentage points (from 6.2 percent to 4.2 percent), which decreased the average payroll tax rate to 6.7 percent in 2011. That rate was the lowest observed over the 1979–2011 period.

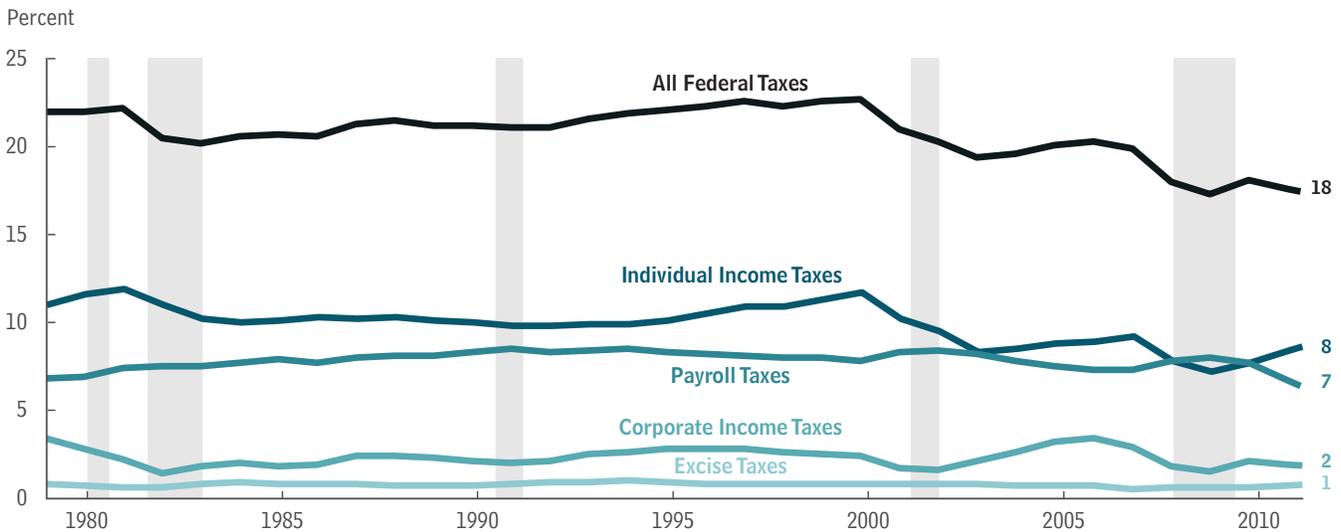
Corporate Taxes. The average corporate income tax rate declined significantly in the early 1980s and was then fairly steady over the next two decades, with some slight shifts that generally corresponded to economic expansions and contractions. After the 2001 recession, strong growth in corporate profits pushed the corporate income tax rate up through the mid-2000s. The rate then fell by more than half between 2006 and 2009 because of the sharp drop in corporate profits during the most recent

recession. In 2011, the average corporate income tax rate was 1.9 percent, CBO estimates, close to the values seen in each year since 2007.

Excise Taxes. Unlike tax rates for the other revenue sources, the average excise tax rate was fairly stable over the entire 1979–2011 period. In 2011, the average excise tax rate was an estimated 0.7 percent.

Trends in Average Federal Tax Rates by Before-Tax Income Group

For all of the income groups considered in this report, average federal tax rates in 2011 were below their averages over the preceding three decades (see Figure 2 on page 4). For households in the bottom quintile of before-tax income, the average federal tax rate in 2011 was 4.6 percentage points lower than the average rate for that quintile over the 1979–2011 period, CBO estimates. For households in the middle three quintiles of before-tax income taken together, the average tax rate in 2011 was also 4.6 percentage points below the average for those

Figure 12.**Average Federal Tax Rates, by Tax Source, 1979 to 2011**

Source: Congressional Budget Office.

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

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

For more detailed definitions of income, see the appendix.

33 years. For households in the 81st through 99th percentiles and households in the top 1 percent of the income distribution, average tax rates in 2011 were lower than the average rates for those groups over the 1979–2011 period but not by as much—by 2.6 percentage points and 1.4 percentage points, respectively.

Changes to federal tax rules between 2011 and 2013 pushed average federal tax rates higher, especially among the highest-income households. The top statutory income tax rate increased in 2013 from 35 percent to 39.6 percent. In addition, the Social Security payroll tax rate reverted to its previous, higher level in 2013 after a temporary reduction in 2011 and 2012. Moreover, two new taxes on high-income taxpayers took effect in 2013. Yet, even with the increases in average tax rates in 2013, CBO estimates that those rates would have been lower for most income groups than they were in 2007, the year before the most recent recession began. The exception to that pattern is in the top income percentile, which would have had an average federal tax rate in 2013 that was much higher than it was in the years immediately before the recession.

Lowest Quintile. Between 1984 and 2007, the average federal tax rate for households in the lowest quintile of the distribution of before-tax income declined fairly steadily. Expansions of the earned income tax credit pushed down the average income tax rate for this group, especially in the 1990s, while increases in the average payroll tax rate were a partially offsetting factor. Between 2007 and 2008, the average tax rate for this group dropped markedly, largely as a result of the creation of the Making Work Pay tax credit and an expansion of the earned income and child tax credits. The average tax rate for this group increased from 2009 to 2011, mainly because of the expiration of the Making Work Pay tax credit; the temporary reduction in the employee's share of the Social Security payroll tax provided a partial offset. The average tax rate for this group was 1.9 percent in 2011, CBO estimates, compared with an average of 6.5 percent during the entire 1979–2011 period.

The significant changes in individual income taxes and payroll taxes between 2011 and 2013 would have generated an increase in the average federal tax rate for this group (holding the distribution of income constant) of

approximately 1 percentage point, CBO estimates. The resulting average tax rate of 2.9 percent in 2013 would still have been well below the average for the preceding decades.

Middle Quintiles. Households in the middle three quintiles of before-tax income, taken as a group, experienced a decline in their average tax rate of almost 7 percentage points over the 1979–2011 period, from 19.1 percent in 1979 to 12.2 percent in 2011, CBO estimates. That decline was caused primarily by a drop in individual income taxes.

Specifically, the average tax rate for the middle three income quintiles fell somewhat in the early 1980s and then fluctuated within a fairly narrow range during the rest of the 1980s and the 1990s. Between 2000 and 2003, the rate declined by 3 percentage points, reflecting numerous changes in law—particularly the expansion of the child tax credit, reductions in tax rates, and increases in the standard deduction for married couples. The average tax rate for this group then edged up between 2003 and 2007 before falling by nearly 3 percentage points from 2007 to 2009. The estimated rate of 12.0 percent in 2009 was the lowest since at least 1979. Between 2009 and 2011, the average tax rate for the middle three income quintiles stayed near that low point.

Because of changes in tax provisions between 2011 and 2013, CBO estimates that the average federal tax rate for this group would have been 13.3 percent in 2013 (based on the distribution of income in 2011). That rate would still have been well below the average of 16.7 percent from 1979 through 2011.

81st Through 99th Percentiles. The average federal tax rate for households in the 81st through 99th percentiles of the distribution of before-tax income decreased in the early 1980s and then increased a little, on balance, during the rest of that decade and the 1990s. The rate then dropped nearly 3 percentage points between 2000 and 2003, rose modestly from 2003 to 2007, and fell again from 2007 to 2009. Its 2009 value of 21.1 percent was the lowest since at least 1979. Between 2009 and 2011, the rate changed only slightly.

Given the changes in tax provisions between 2011 and 2013, the average federal tax rate for this group in 2013 (based on the 2011 distribution of income) would

have been 22.4 percent, CBO estimates—below its 1979–2011 average of 23.8 percent.

Top 1 Percent. The average federal tax rate for households in the top 1 percent of the distribution of before-tax income has followed a very different pattern than the average tax rates for other income groups. The average tax rate for this group fell sharply between 1979 and 1986, primarily because of changes in tax law, and reversed that decline between 1986 and 1995, when it peaked at 35.3 percent. The rate fell again between 1995 and 2008 and edged up, on balance, between 2008 and 2011. In 2011, the average tax rate for households in the top 1 percent of the income distribution was 29.0 percent, CBO estimates—near the average for the full 1979–2011 period of 30.4 percent, higher than the 28.2 percent average for the 1980s, and lower than the 32.6 percent average for the 1990s.

CBO estimates that the average federal tax rate for households in this income group would have increased to 33.3 percent in 2013 because of changes in tax provisions (and holding the distribution of income constant between 2011 and 2013, as discussed above). That rate would have been nearly 3 percentage points above the 1979–2011 average for this group.

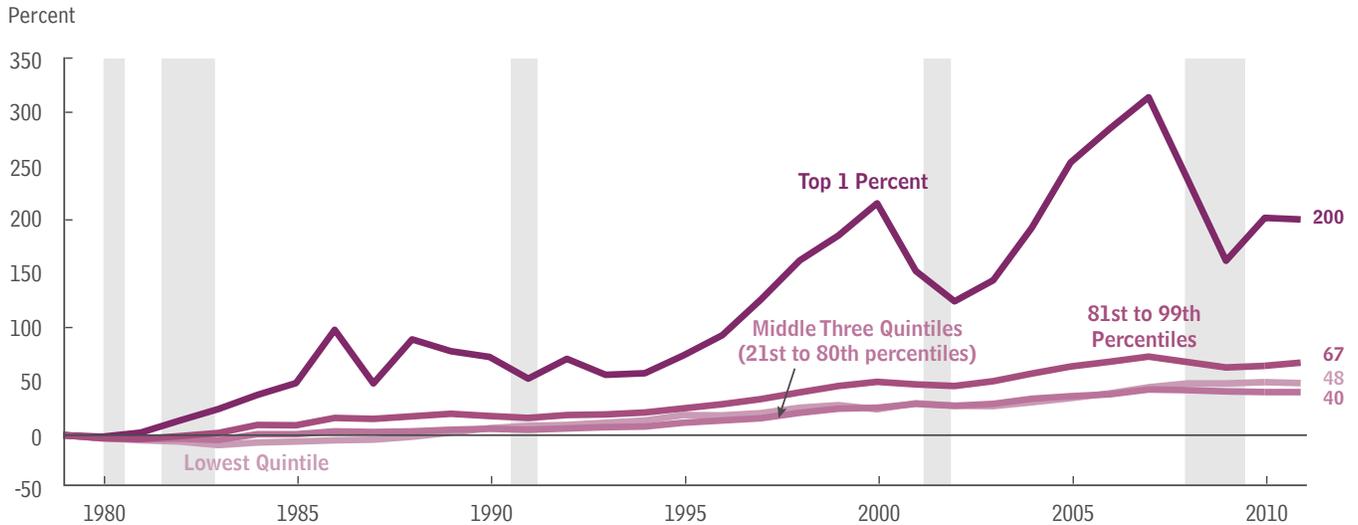
Trends in After-Tax Income

Changes in economic conditions, government transfer programs, and federal tax laws have resulted in after-tax income growing at different rates across the income spectrum over time. For households in the lowest quintile of before-tax income, inflation-adjusted after-tax income was 48 percent higher in 2011 than it was in 1979, CBO estimates. Cumulative growth in the inflation-adjusted after-tax income of households in the 21st to 80th percentiles, the 81st to 99th percentiles, and the top 1 percent of the before-tax income distribution was an estimated 40 percent, 67 percent, and 200 percent, respectively (see Figure 13).²⁶ Each of those percentage increases in after-tax income exceeds the percentage increases in before-tax income for the corresponding income groups because the average federal tax rate for each income group was lower in 2011 than in 1979.

26. Those cumulative growth figures are equivalent to average annual growth rates over the 33-year period of 1.2 percent, 1.1 percent, 1.6 percent, and 3.5 percent, respectively.

Figure 13.

Cumulative Growth in Average Inflation-Adjusted After-Tax Income, by Before-Tax Income Group, 1979 to 2011



Source: Congressional Budget Office.

Notes: After-tax income is before-tax income minus federal taxes.

Before-tax income is market income plus government transfers. Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), 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. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Income is converted to 2011 dollars using the personal consumption expenditures price index.

Income groups are created by ranking households by before-tax income, adjusted for household size. Quintiles (fifths) contain equal numbers of people; percentiles (hundredths) contain equal numbers of people as well.

For more detailed definitions of income, see the appendix.

Trends in Income Inequality

As the distributions of income have shifted over time, so has the degree of inequality in market income, before-tax income, and after-tax income.²⁷ A standard measure of income inequality is the Gini index, which summarizes an entire distribution in a single number that ranges from zero to one. A value of zero means that income is distributed equally among all income groups, while a value of one indicates that all of the income is received by the highest-income group and none is received by any of the lower-income groups. Inequality of all three measures of income increased between 1979 and 2011, according to CBO's estimates (see Figure 14*²⁸).

Inequality as measured by the Gini index is consistently lower for after-tax income than for before-tax income and consistently lower for before-tax income than for

market income.²⁹ Government transfers reduce income inequality because the transfers received by lower-income households are larger relative to their market income than are the transfers received by higher-income households. Federal taxes also reduce income inequality, because the taxes paid by higher-income households are larger relative to their before-tax income than are the taxes paid by lower-income households. The equalizing effects of government transfers were significantly larger than the equalizing effects of federal taxes from 1979 to 2011.

The effect of government transfers on income inequality varies across economic expansions and contractions because such transfers tend to decline when the economy is strong and to increase when the economy is weak—because of both automatic changes in benefits from some programs (such as unemployment insurance) and legislated changes in response to fluctuating economic conditions. During the most recent recession, the percentage decline in the Gini index attributable to government transfers increased from 15 percent in 2007 to 20 percent in 2009, CBO estimates (see Figure 15).³⁰ That additional reduction in inequality is attributable primarily to an automatic increase in unemployment insurance benefits and significant legislated expansions of those benefits and benefits from the Supplemental Nutrition Assistance Program (see Box 2).³¹

27. A significant body of research has examined changes in U.S. income inequality over time, using various data sources and measures of income. For example, Thomas Piketty and Emmanuel Saez rely on income tax data from the Internal Revenue Service's Statistics of Income; see Piketty and Saez, "Income Inequality in the United States, 1913–1998," *Quarterly Journal of Economics*, vol. 118, no. 1 (February 2003), pp. 1–39, <http://eml.berkeley.edu/~saez/pikettyqje.pdf>. Timothy M. Smeeding and Jeffrey P. Thompson rely on the Federal Reserve's Survey of Consumer Finances; see Smeeding and Thompson, "Recent Trends in Income Inequality," in Herwig Immervoll, Andreas Peichl, and Konstantinos Tatsiramos, eds., *Who Loses in the Downturn? Economic Crisis, Employment, and Income Distribution*, vol. 32 (Research in Labor Economics), pp.1–50, <http://tinyurl.com/qdk92x4>. Philip Armour, Richard V. Burkhauser, and Jeff Larrimore rely on the Census Bureau's Current Population Survey; see Armour, Burkhauser, and Larrimore, *Levels and Trends in United States Income and Its Distribution: A Crosswalk From Market Income Towards a Comprehensive Haig-Simons Income Approach*, Working Paper 19110 (National Bureau of Economic Research, June 2013), www.nber.org/papers/w19110.

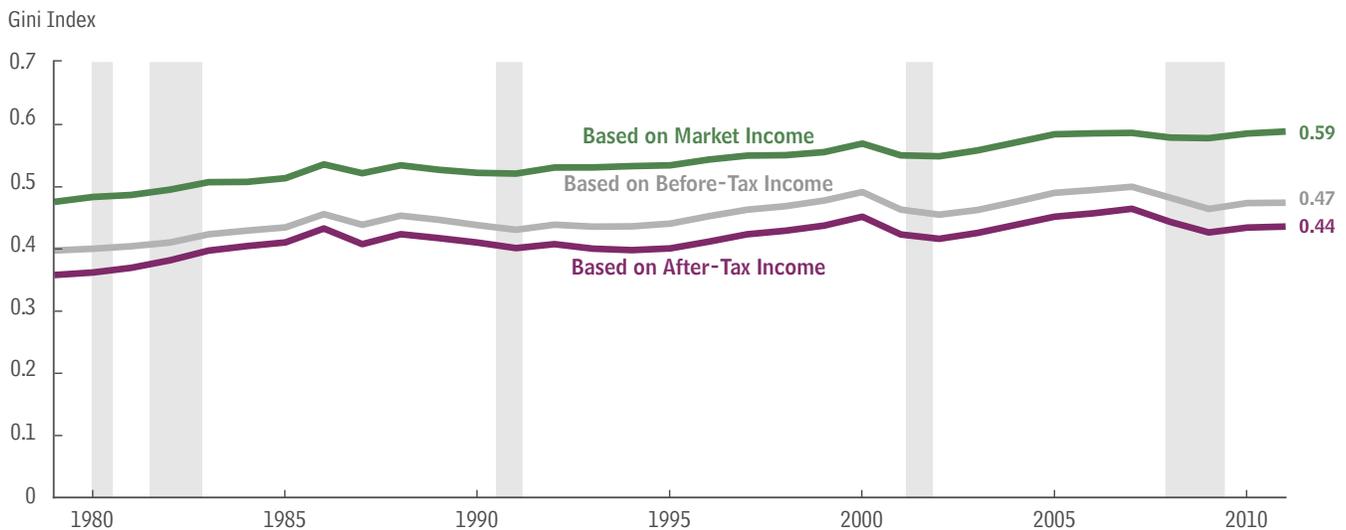
28. Gini indexes in this report are calculated on the basis of incomes adjusted for household size. For a more detailed discussion of CBO's approach to calculating Gini indexes, see *Trends in the Distribution of Household Income Between 1979 and 2007* (October 2011), www.cbo.gov/publication/42729.

29. Gini indexes for market, before-tax, and after-tax income reflect rankings of households based on those income measures. Therefore, some of the differences between the Gini indexes are attributable to the reranking of households across the indexes.

30. Transfers as measured in this report do not equal total government spending on the transfers because some transfers go to recipients outside the scope of the survey data collected by the Census Bureau and because recipients underreport, on average, the amount of transfer payments they receive. Therefore, the percentage reduction in the Gini index attributable to transfers probably understates the true magnitude of the effect.

31. See Congressional Budget Office, *Unemployment Insurance in the Wake of the Recent Recession* (November 2012), www.cbo.gov/publication/43734, and *Overview of the Supplemental Nutrition Assistance Program* (April 2012), www.cbo.gov/publication/43175.

[* Reference corrected on March 23, 2016]

Figure 14.**Gini Indexes Based on Market, Before-Tax, and After-Tax Income, 1979 to 2011**

Source: Congressional Budget Office.

Notes: The Gini index is a measure of income inequality that ranges from zero (the most equal distribution) to one (the least equal distribution). Gini indexes are calculated using income measures adjusted for household size.

Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income excluding capital gains, income received in retirement for past services, and other sources of income.

Before-tax income is market income plus government transfers. Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments.

After-tax income is before-tax income minus federal taxes. Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

For more detailed definitions of income, see the appendix.

The effect of federal taxes on income inequality was quite stable between the mid-1990s and 2011 because of two trends that were roughly offsetting.³² First, the share of federal taxes paid by higher-income households increased more than the share of income earned by that group. For example, the share of before-tax income received by households in the top quintile increased by 2.5 percentage points between 1995 and 2011, whereas the share of federal taxes paid by those households increased by

7.5 percentage points over that period, CBO estimates. Second, average federal tax rates across the income spectrum decreased. With federal taxes becoming both more progressive and smaller relative to before-tax income between the mid-1990s and 2011, those taxes had roughly the same effect in reducing income inequality throughout that period.

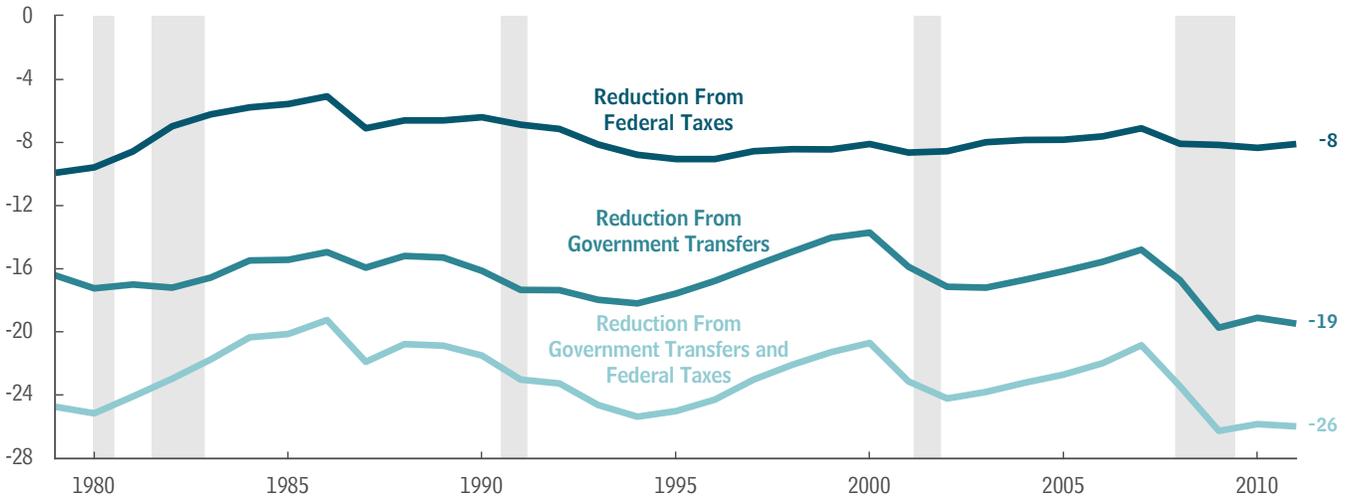
The changes in tax provisions that took effect between 2011 and 2013 would have made federal taxes more progressive. Holding all else equal, those changes would have increased the effect of federal taxes in reducing income inequality.

32. The percentage reduction in the Gini index attributable to government transfers and federal taxes is less than the sum of the percentage reductions resulting from each component. That occurs because the reduction stemming from federal taxes is calculated after the reduction resulting from government transfers.

Figure 15.

Reduction in Income Inequality From Government Transfers and Federal Taxes, 1979 to 2011

Percentage Reduction in Gini Index



Source: Congressional Budget Office.

Notes: The Gini index is a measure of income inequality that ranges from zero (the most equal distribution) to one (the least equal distribution). Gini indexes are calculated using income measures adjusted for household size.

Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Box 2.**Government Transfers and Federal Taxes Over Time**

This Congressional Budget Office (CBO) report examines three measures of income: market income, before-tax income, and after-tax income. Market income consists mainly of labor income, business income, capital income (including realized capital gains), and retirement income. Before-tax income is market income plus government transfers, which are made up of cash payments and in-kind benefits from federal, state, and local governments. The average tax rate equals tax obligations divided by before-tax income, which is a proxy for the income available to pay those obligations. After-tax income is before-tax income minus federal (but not state and local) taxes.

Government transfers and federal taxes both compress the distribution of income. In general, transfers increase income more toward the bottom of the distribution, and federal taxes reduce income more toward the top of the distribution.

Households in the highest quintile (or fifth) of the income distribution ranked by market income receive little transfer income and pay a significant share of their market income in federal taxes (see the figure).¹ In 2011, CBO estimates, households in that group had average market income of \$240,800 and average after-tax income of \$188,300. In contrast, households in the lowest quintile ranked by market income pay little in taxes but receive a significant amount in transfers. In 2011, CBO estimates, households in that group had average market income of \$7,900 and average after-tax income of \$31,600. Roughly

two-thirds of the transfer income for those households came from Social Security and Medicare. For households in the middle quintile, taxes and transfers (predominantly from Social Security and Medicare) nearly offset each other.

Market income and after-tax income evolved in markedly different ways during the recent recession and slow recovery. Between 2007 and 2011, after-tax income fell by less than market income across the income spectrum, with especially large differences in the bottom half of the distribution by market income. In those four years, inflation-adjusted market income for households in the lowest quintile of market income fell by 23 percent, but after-tax income for that group rose by 5 percent. Households in the middle quintile saw their market income fall by 11 percent but their after-tax income decrease by only 3 percent. The drop in market income and rise in transfers for this group caused their after-tax income to exceed their market income since 2008. That reverses the previous pattern: Between 1979 and 2007, federal taxes paid by this group were a little larger than the transfers they received, so their after-tax income was less than their market income, on average. For households in the highest quintile of market income, the difference between their change in market income and their change in after-tax income between 2007 and 2011 was much smaller: Market income declined by 14 percent, and after-tax income fell by 12 percent.

Over the 1979–2011 period, the cumulative growth in after-tax income was larger than the cumulative growth in market income for all income groups. For the lowest quintile and middle quintiles of market income, government transfers rose more rapidly than market income and average federal tax

1. In this section of CBO's analysis, income groups for both market income and after-tax income are based on households ranked by market income.

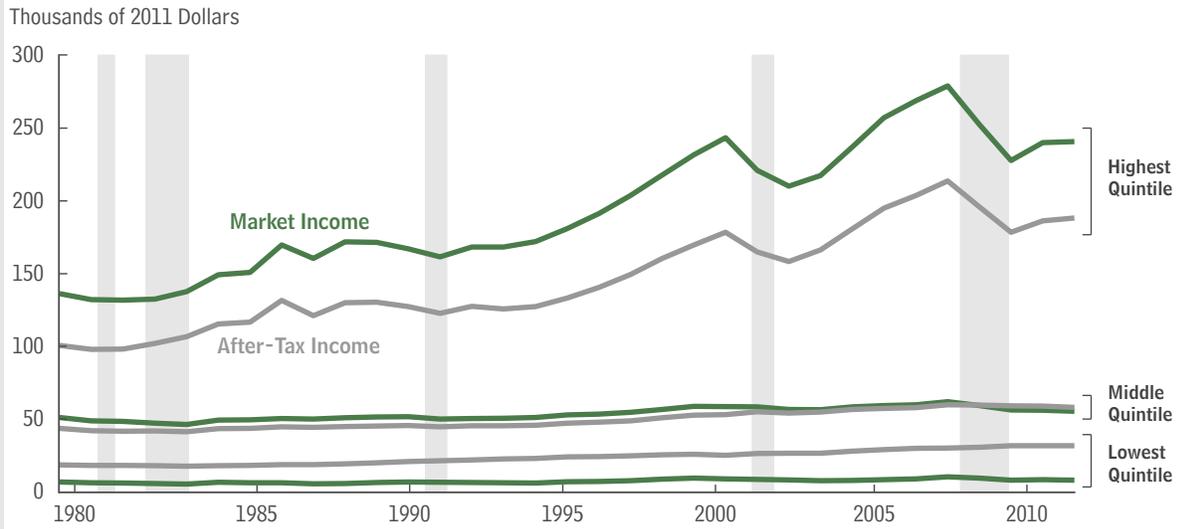
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Box 2.

Continued

Government Transfers and Federal Taxes Over Time

Average Market and After-Tax Income for Households in Selected Market Income Groups, 1979 to 2011



Source: Congressional Budget Office.

Notes: Market income consists of labor income, business income, capital gains (profits realized from the sale of assets), capital income excluding capital gains, income received in retirement for past services, and other sources of income.

After-tax income is market income plus government transfers minus federal taxes.

Government transfers are cash payments and in-kind benefits from social insurance and other government assistance programs. Those transfers include payments and benefits from federal, state, and local governments.

Federal taxes include individual income taxes, payroll taxes, corporate income taxes, and excise taxes.

Income is adjusted for inflation using the personal consumption expenditure price index.

Income groups are created by ranking households by market income, adjusted for household size. Quintiles (fifths) contain equal numbers of people.

For more detailed definitions of income, see the appendix.

rates declined, pushing up after-tax income relative to market income. Specifically, average market income among households in the lowest income quintile increased by an estimated 16 percent between 1979 and 2011, whereas average after-tax income for those households increased by 72 percent; the corresponding increases for households in the middle income

quintile were 9 percent and 33 percent. For the highest quintile of market income, government transfers are not a significant factor, but average federal tax rates declined for this group as well. Therefore, among households in the highest income quintile, market income rose by 77 percent and after-tax income rose by 87 percent over that period.



Appendix: Data and Methods

In this report, the Congressional Budget Office (CBO) examines the distribution of household income and federal tax rates, focusing on data from calendar year 2011. The current analysis builds on earlier CBO analyses, the most recent of which covered the period from 1979 through 2010.¹

Data Sources on Household Income

Information on household income for this analysis came from two primary sources: the Internal Revenue Service's Statistics of Income (SOI) and the Census Bureau's Current Population Survey (CPS). The core data came from the SOI, a nationally representative sample of individual income tax returns. The number of returns sampled grew over the time period studied, ranging from roughly 90,000 in some of the early years to more than 300,000 in the later years. CBO used the full Individual Income Tax file, which is more detailed than the public-use version of the file. The agency supplemented those data with data from the CPS's Annual Social and Economic Supplement; those data identify demographic characteristics and income for 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 does not include information about people who do not file federal tax returns, and it does not report all income from government cash transfer

programs. It also offers no information on the receipt of in-kind transfers and benefits, and it is organized by tax filing units rather than by households. The CPS lacks detailed information on high-income households, it does not report capital gains, it underreports other income from capital, and it lacks information on the deductions and adjustments necessary to compute taxes.

Together, however, the two sources can form a more complete picture. To overcome limitations in each source of data, CBO statistically matched SOI records to corresponding CPS records 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—certain transfers and in-kind benefits, for example—appear only in the CPS; their values were drawn directly from that survey.) Because some households are not required to file tax returns, the SOI does not have data on every household in the nation. To create a sample that was representative of the entire population, once all SOI records were matched to CPS records, the remaining CPS records were recorded as nonfiling households and their income values were taken directly from the CPS.

Allocation of Taxes to Households

CBO allocated individual income taxes and the employee's share of payroll taxes to the households paying those taxes directly.² The agency also allocated the employer's share of payroll taxes to employees because

1. CBO's reports on household income and taxation are posted together on the agency's website. See Congressional Budget Office, "Major Recurring Reports: Distribution of Household Income and Federal Taxes," www.cbo.gov/about/our-products/RecurringReports#15. Supplemental data that present estimates for the 1979–2011 period are available at www.cbo.gov/publication/49440.

2. For this analysis, CBO considered refundable tax credits as negative income taxes rather than transfers. Federal taxes in this analysis were incurred in 2011 but not necessarily paid to the government in that year.

employers appear to pass on their share of payroll taxes to employees by paying lower wages than they would otherwise pay.³ Therefore, CBO also added the employer's share of payroll taxes to households' earnings in calculating before-tax income.

CBO allocated excise taxes to households according to their consumption of taxed goods and services (such as gasoline, 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's spending on taxed goods and services was the same as that reported in the Bureau of Labor Statistics' Consumer Expenditure Survey for a household with comparable income and other characteristics.

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 corporate income taxes to owners of capital in proportion to their income from interest, dividends, rents, and adjusted capital gains; the adjustment smoothes out large year-to-year variations in actual realized gains by scaling them to an estimate of their long-term historical level given the size of the economy and the tax rate that applies to them.⁴ CBO allocated the remaining 25 percent of corporate income taxes to workers in proportion to their labor income.

Measures of Income

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

Market income consists of the following components:

- **Labor Income.** Cash wages and salaries, including amounts 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, excluding increases in the value of assets that have not been realized through sales.⁵
- **Capital Income Excluding Capital Gains.** Taxable and tax-exempt interest, dividends paid by corporations (but not dividends paid by 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 or from other sources.⁶

Government transfers consist of the cost of two types of benefits:

- **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'

3. That allocation reflects a consensus among economists. See Don Fullerton and Gilbert E. Metcalf, "Tax Incidence," in Alan J. Auerbach and Martin Feldstein, eds., *Handbook of Public Economics*, vol. 4 (Elsevier, 2002), pp. 1787–1872.

4. For a more detailed discussion of CBO's methodology for allocating corporate taxes, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2008 and 2009* (July 2012), www.cbo.gov/publication/43373.

5. CBO measures capital gains income when realized, partly because estimates of accrued gains depend crucially on assumptions that are very uncertain and partly because maintaining consistency with the measurement of taxes (which are levied on realized gains) is valuable. Various researchers have measured capital gains as they accrue, on the basis of assets held by households at different income levels; those researchers have reached disparate conclusions about the effect of accrued capital gains on levels and trends in income inequality, depending in large part on their assumptions about the rate of return on assets. See, for example, Timothy M. Smeeding and Jeffrey P. Thompson, "Recent Trends in Income Inequality," in Herwig Immervoll, Andreas Peichl, and Konstantinos Tatsiramos, eds., *Who Loses in the Downturn? Economic Crisis, Employment, and Income Distribution*, vol. 32 (Research in Labor Economics), pp. 1–50, <http://tinyurl.com/qdk92x4>; and Philip Armour, Richard V. Burkhauser, and Jeff Larrimore, *Levels and Trends in United States Income and Its Distribution: A Crosswalk From Market Income Towards a Comprehensive Haig-Simons Income Approach*, Working Paper 19110 (National Bureau of Economic Research, June 2013), www.nber.org/papers/w19110.

6. Most of the income in this category is pension income. That income includes taxable annuity payments from defined benefit pension plans; taxable withdrawals from defined contribution plans, such as 401(k)s; and taxable withdrawals from individual retirement accounts.

programs, workers' compensation, and state and local government assistance programs.

- *In-Kind Benefits.* The cost of Supplemental Nutrition Assistance Program vouchers (popularly 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.⁷

This report focuses on annual income. It does not assess trends in the distribution of other measures of economic well-being, such as household income measured over longer periods, household consumption, or household wealth.⁸ Because household income varies over time, a household in a given segment of the income distribution in one year could be in a different segment in another year.

Adjusting Income for Differences Among Households

CBO used the household as the unit of analysis for this report. A household consists of the people who share a housing unit, regardless of their relationship. Analyzing income and taxes on a household basis is most useful if households make joint economic decisions, which is probably true in most cases but not all (such as group houses). A household can consist of more than one tax-paying unit, such as a married couple living with an adult child.

Households with identical income can differ in ways that affect their economic status. A larger household generally needs more income to support a given standard of living than a smaller one does. However, economies of scale in some types of consumption—housing, in particular—can mean that two people generally do not need twice the income to live as well as one person who lives alone.

7. Health care benefits are measured using the Census Bureau's estimates of the average cost to the government of providing those benefits. For more details on CBO's approach to valuing health care benefits and the consequences of that approach, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2008 and 2009* (July 2012), www.cbo.gov/publication/43373.

8. Income measured over several years is more equally distributed—although only modestly so—than income for a single year. See Congressional Budget Office, *Effective Tax Rates: Comparing Annual and Multiyear Measures* (January 2005), www.cbo.gov/publication/16212.

Therefore, to rank households by their standard of living, it is probably appropriate to divide household income by an adjustment factor that is between 1 (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 person 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.⁹ Households were then ranked by adjusted income and grouped into quintiles (or fifths) of equal numbers of people. Because household sizes vary, different quintiles generally have slightly different numbers of households.

Adjusting income for other differences in circumstances that affect a household's standard of living also could be desirable. For example, the prices of goods and services vary geographically, and households can incur different costs associated with working—for commuting and child care expenses, for example—depending on how many members are employed. CBO did not adjust for any such additional differences.

Types of Households

Changes in the composition of household types—and household sizes—can affect the distribution of income over time. Supplemental tables, available online, 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 members under age 18 (elderly childless households), and all others (nonelderly childless households). The tables group households into quintiles by their position in the income distribution across the full population, not by their position in the income distribution for each type of household.

9. 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 an income of \$80,000 would have an adjusted income of \$40,000 ($\$80,000/\sqrt{4}$) and would have the equivalent economic ranking of a single person with an income of \$40,000 or of a childless married couple with an income of \$56,600 ($\$56,600/\sqrt{2}$ is almost \$40,000). See Constance F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (National Research Council, 1995), <http://tinyurl.com/mdhqjb4>.

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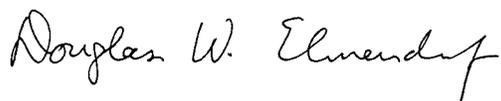
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About This Document

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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