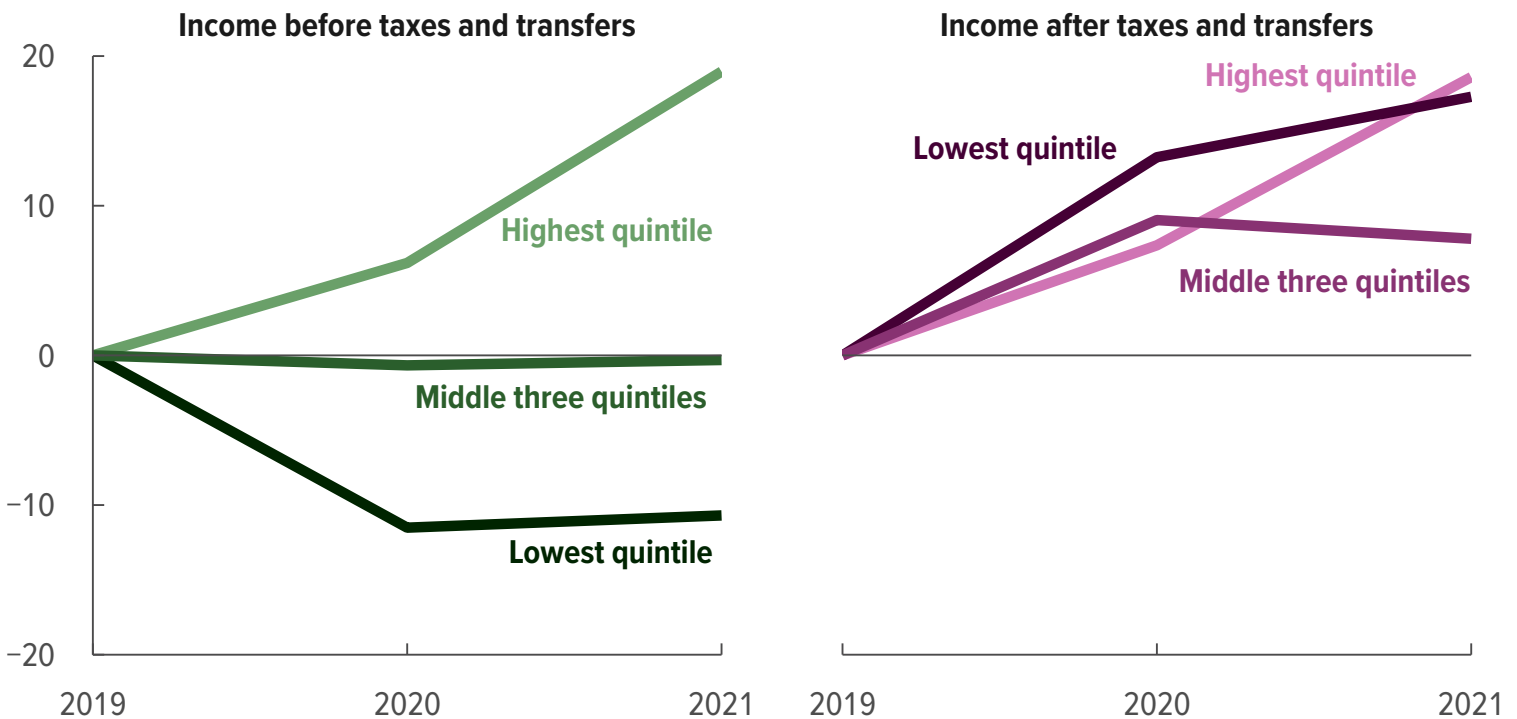


The Distribution of Household Income in 2021

Cumulative Growth in Average Household Income, by Income Group
 Percent



At a Glance

The Congressional Budget Office regularly analyzes household income in the United States. This report presents the distributions of household income, means-tested transfers, and federal taxes in 2021 and explores how they differ from the distributions in 2020 and 2019. (Means-tested transfers are cash payments or in-kind services provided primarily on the basis of income.)

Largely because of the economic disruption caused by the coronavirus pandemic, 2020 and 2021 were unusual years. In response to that disruption, the federal government implemented an unprecedentedly large amount of fiscal stimulus. The policies enacted in response to the pandemic affected household income throughout the distribution—unlike the usual means-tested transfers, which are typically targeted at households toward the bottom of the income distribution.

Those policies altered household income through their effects on wages, employment, transfers, and taxes. Some policies (such as recovery rebate credits) provided direct benefits to households, whereas other policies (such as the pause on federal student loan payments) increased households' resources without providing them with additional income. Still other policies (such as the Paycheck Protection Program) provided financial support to entities such as businesses, nonprofit organizations, and state and local governments. This report focuses on the effects of policies that provided direct benefits to households.

The main findings from CBO's analysis of the distribution of household income in 2021 are these:

- **Income before transfers and taxes was more skewed toward the top of the income distribution in 2021 than in 2020 or 2019, in large part because of capital gains.** Income from realized capital gains, which mostly accrues to higher-income households, was higher in 2021 than in any other year since at least 1979 (the first year in CBO's analysis). Moreover, labor income among lower-income households increased only slightly in 2021 after a sharp decline from 2019 to 2020. As a result, in 2021 the average income before transfers and taxes among households in the highest quintile (or fifth) of the income distribution was roughly 19 times that of households in the lowest quintile; in 2020, such income among households in the highest quintile was 17 times that of those in the lowest quintile.
- **Among lower-income households, means-tested transfers were nearly as large in 2021 as in 2020, and federal taxes were lower.** As in 2020, the recovery rebate credit and expanded unemployment compensation provided direct payments to households. In addition, the child tax credit was expanded in 2021. The benefits from those three policies were broadly dispersed among households across the income distribution, but they constituted a larger share of income for lower-income households than for other households.
- **Transfers and taxes reduced income inequality in 2021 by almost as much as in 2020, but income inequality increased nonetheless.** Income inequality before transfers and taxes reached an all-time high in 2021, mainly because of increases in realized capital gains. Although high means-tested transfer rates and low federal tax rates boosted income for low-income households and reduced it for other households, income inequality *after* transfers and taxes was nonetheless at its highest level since 2012.

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Notes About This Report

Numbers may not add up to totals because of rounding.

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

All dollar amounts are expressed in 2021 dollars and are rounded to the nearest hundred. To convert dollar amounts to 2021 dollars, the Congressional Budget Office used the price index for personal consumption expenditures from the Bureau of Economic Analysis.

Some figures in this report uses shaded vertical bars to indicate the duration of recessions. A recession extends from the peak of a business cycle to its trough.

Unless this report indicates otherwise, “income” refers to household income including social insurance benefits but before means-tested transfers and federal taxes are accounted for; “transfers” refers to means-tested transfers; and “taxes” refers to federal taxes. (For additional definitions, see Appendix D.) In the graphics, specific colors represent certain income concepts: Green denotes income before transfers and taxes, blue denotes means-tested transfers, orange denotes federal taxes, and purple denotes income after transfers and taxes.

Supplemental data, additional data for researchers, and an interactive tool that allows users to create customized tables are posted along with this report at www.cbo.gov/publication/60341#data. The supplemental data and the additional data for researchers present detailed information about income, means-tested transfers, federal taxes, and household types. Links to reports in this series going back to 2001 are available at <https://go.usa.gov/xF8ht>.

A companion slide deck, available at www.cbo.gov/publication/60342, examines trends in the distribution of household income from 1979 to 2021.

The Distribution of Household Income in 2021

For more than 30 years, the Congressional Budget Office has reported on the distribution of household income and federal taxes. This report focuses on the distribution of household income in 2021, the most recent year for which relevant data from tax returns are available. (For a discussion of the data and methods that CBO used in this analysis, see Appendix A.) The report also examines how the distribution of household income in 2021 differed from that in 2020, when the economic downturn brought about by the coronavirus pandemic began in the United States, and in 2019, before the onset of that downturn.

The roughly 131 million households in the United States in 2021 received a total of about \$18.3 trillion in annual income, CBO estimates.¹ That income was distributed unevenly among the quintiles (or fifths) of the income distribution: The average income of households in the highest quintile was about \$418,100, CBO estimates, roughly 19 times the average income of households in the lowest quintile, which was \$22,500. After accounting for transfers and taxes, the income of households in the highest quintile (\$316,800) was about 7 times that of those in the lowest quintile (\$48,700).

Households experience changes in their income, transfers, taxes, or household composition from year to year. As a result, the households in any given group of the income distribution in 2021 are not the same households that were in that group in 2020 or 2019. This analysis focuses on the changes in the overall distribution of household income rather than the experiences of particular households.²

Overview of Changes in Income

The pandemic significantly affected the U.S. economy—particularly the labor market. The unemployment rate rose from 3.5 percent in February 2020 to a peak of 14.8 percent in April of that year, the highest level since the Great Depression. The unemployment rate declined to 6.7 percent by the end of 2020 and to 3.9 percent by the end of 2021. As a result, average labor income grew by 1.4 percent in 2021 in real terms (that is, after adjusting to remove the effects of inflation). Some of the gains in average labor income were offset by decreases in unemployment compensation, especially at the bottom of the income distribution. Inflation, as measured by the personal consumption expenditures price index, was higher in 2021 (4.2 percent) than in 2019 (1.4 percent) or 2020 (1.1 percent). All income discussed in this report is adjusted for inflation. In nominal terms—that is, without adjusting for inflation—labor income grew by 5.6 percent in 2021.

In 2021, the income source with the largest growth was realized capital gains—that is, the amount gained (or lost) from the sale of assets that year, but not accounting for increases (or decreases) in the value of assets that were not sold in that year. Capital gains per household grew by 72 percent in 2021 to an average of \$15,700 (or \$2.1 trillion in aggregate)—the highest amount per household since at least 1979 (the first year included in CBO’s analysis) and 60 percent higher than its previous peak in 2007. Most of that income accrued to households in the highest quintile.

As a result, income growth was larger among high-income households than low-income households, and income inequality increased. Income inequality before transfers and taxes was greater in 2021 than in any year in CBO’s analysis. Means-tested transfers and federal taxes—in particular, transfers and taxes resulting from certain temporary policies enacted in response to the pandemic—reduced inequality by nearly the same amount as they did in 2020. But income inequality after transfers and taxes was greater in 2021 than in any year since 2012. CBO has produced a complementary analysis (available at www.cbo.gov/publication/60342) that examines trends in the distribution of household income, means-tested transfers, and federal taxes from 1979 to 2021.

Overview of Effects of Transfers and Taxes on Household Income

The federal government's fiscal (tax and spending) policies greatly affect the economic resources available to U.S. households. In 2021, average income among all households before means-tested transfers and federal taxes were taken into account was \$139,000, CBO estimates. The net effect of those transfers and taxes was to decrease household income by about \$15,200, on average, bringing average household income to \$123,800. Means-tested transfers provided households with an additional \$9,000 in income, on average, and federal taxes reduced income by \$24,200 per household, on average.³ (For more details about income, transfers, and taxes by income group, see Appendix C.)

Those averages obscure a large amount of variation in household income and in how transfers and taxes affect income. Typically, transfers and taxes reduce income inequality because low-income households receive a larger share of their income as means-tested transfers than high-income households do and because high-income households pay a larger share of their income in federal taxes than low-income households do.

In 2020 and 2021, temporary policies were enacted or extended that provided households with financial support and had significant effects on the distribution of household income.⁴ Three of those policies—the recovery rebate credit, expanded unemployment compensation, and the expanded child tax credit—together increased income by more than \$720 billion, or about \$5,500 per household, on average, in 2021; those policies increased income by about \$6,800 per household, on average, in 2020. (For more details about those policies, see Appendix B). In this report, the recovery rebate credit and the expanded child tax credit are considered refundable tax credits, and expanded unemployment compensation is considered a means-tested transfer.

All three temporary policies provided benefits to households across the income distribution. In 2021, about half of those benefits went to households in the two lowest quintiles, whereas about three-quarters of permanent means-tested transfers (which do not include expanded unemployment compensation) went to households in those quintiles. In addition, in 2020 and 2021, legislation expanded some means-tested transfer programs—such as Medicaid and the Supplemental Nutrition Assistance Program (SNAP)—and reduced the taxes households owed by expanding or introducing tax credits, exclusions, and deductions, such as the earned income tax credit and the child and dependent care credit.

The federal government also implemented policies that provided support to entities besides households. The Paycheck Protection Program (PPP), for example, supported businesses and nonprofit organizations, and the Coronavirus Relief Fund supported state and local governments. The effects of those policies are included in this analysis to the extent that they indirectly affected household income (such as by altering wages and employment). Other effects of such policies—for example, PPP benefits that ultimately boosted businesses' profits—are not included in this analysis. Also excluded are policies that did not increase household income but that nevertheless increased the resources available to households, such as the continued pause on student loan payments.

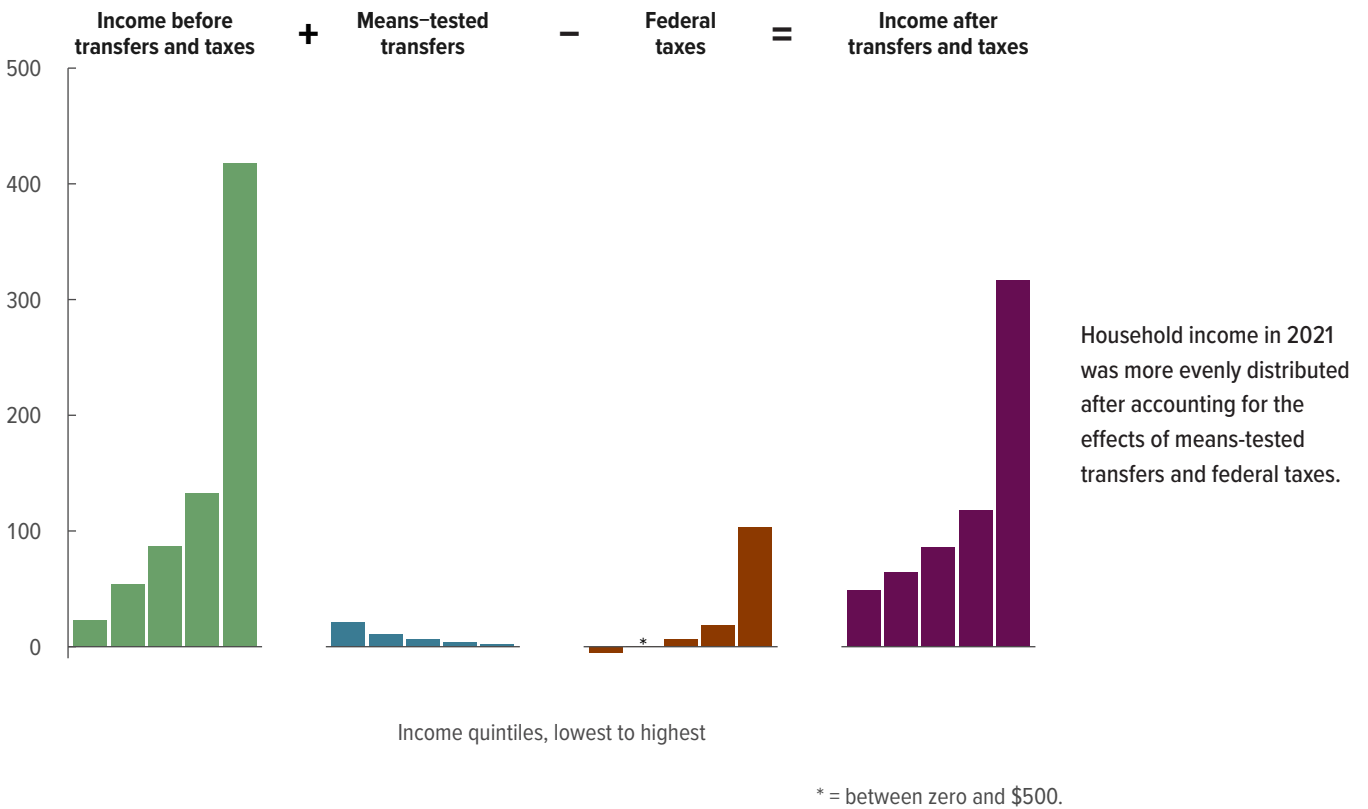
Transfers and Taxes Produced a More Even Distribution of Income

The distribution of income *after* transfers and taxes is more equal than the distribution of income *before* transfers and taxes because of the redistributive effects of the tax and transfer systems. Those effects are most evident among households at the top and bottom of the income distribution.

In 2021, means-tested transfers and federal taxes increased income among households in the lowest quintile by \$26,200 (or 116 percent), on average, to \$48,700. Among households in the highest quintile, transfers and taxes decreased average income by \$101,300 (or 24 percent) to \$316,800.

Average Real Income, Means-Tested Transfers, and Federal Taxes in 2021

Thousands of 2021 dollars



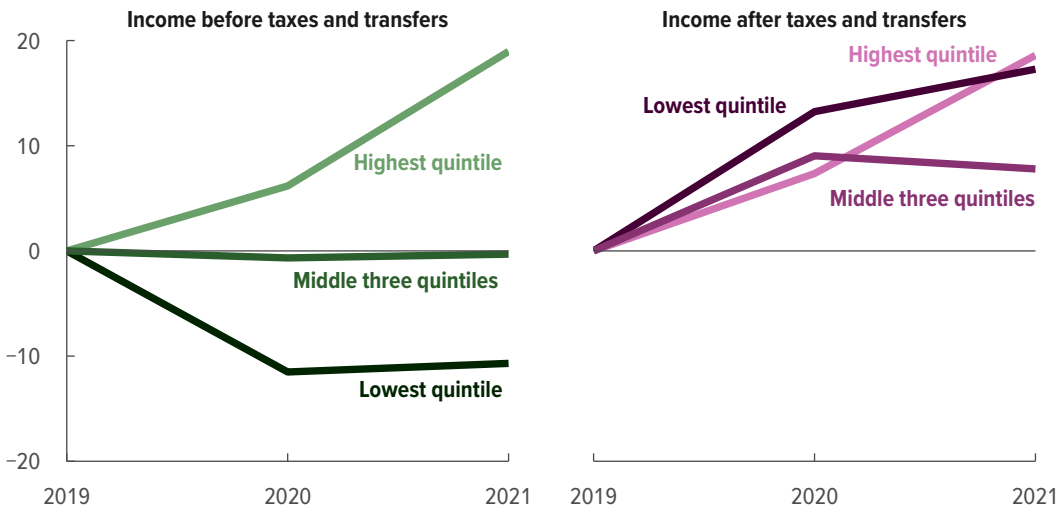
Income Before Transfers and Taxes Grew Significantly Only for High-Income Households, Whereas Growth in Income After Transfers and Taxes Was More Widespread

From 2019 to 2021, income before transfers and taxes grew by about 19 percent among households in the highest quintile. Income among households in the middle three quintiles was roughly unchanged, whereas for households in the lowest quintile, income fell by about 11 percent (after adjustments for inflation).

Income after transfers and taxes grew for the lowest- and highest-income households in 2020 and 2021. Among households in the middle three quintiles, income after transfers and taxes increased in 2020 but then decreased in 2021.

Cumulative Growth in Average Household Income, by Income Group

Percent



From 2019 to 2021, income before transfers and taxes increased by 19 percent, on average, among households in the highest quintile and decreased by 11 percent among those in the lowest quintile.

By contrast, income after transfers and taxes was higher for all income groups in 2021 than in 2019.



Income Before Transfers and Taxes

CBO's measure of income before transfers and taxes consists of market income plus social insurance benefits. Market income comprises wages and other forms of labor income (including cash wages, employers' contributions for health insurance premiums, and payroll taxes paid by employers), business income, capital gains, and other income sources. Social insurance benefits include Social Security and Medicare benefits, regular unemployment insurance (but not expanded unemployment compensation, which is considered a means-tested transfer), and workers' compensation. Notably, income before transfers and taxes excludes the effects of government policies carried out through means-tested transfer programs or the direct effects of the federal tax system. (For definitions of terms used in this analysis, see Appendix D.)

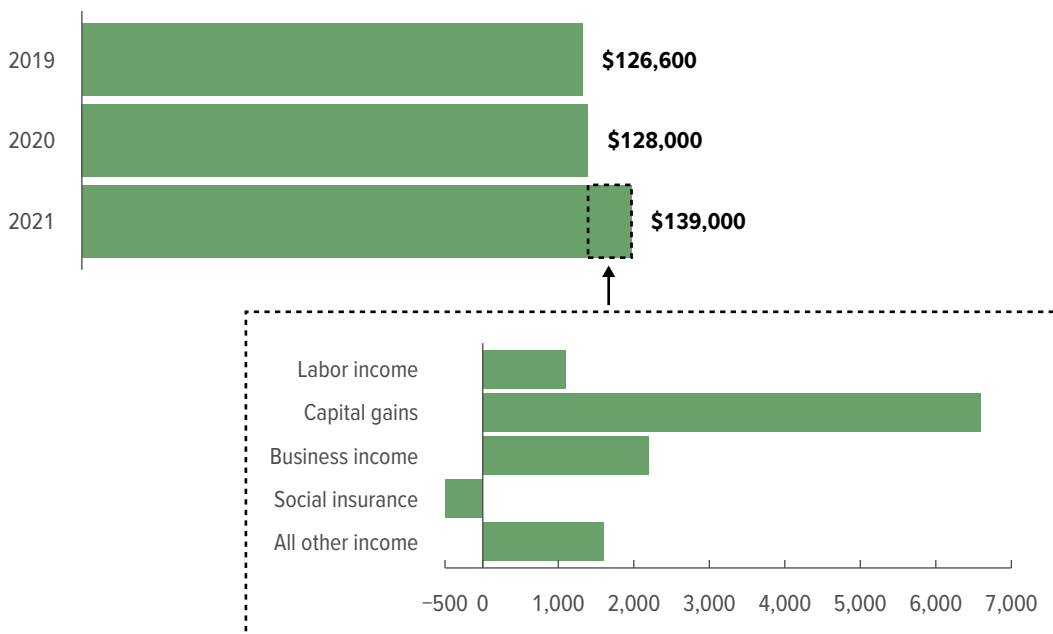
The composition of income before transfers and taxes varies across the distribution. For most households, labor income makes up the bulk of their income. But among households at the top of the distribution, capital gains constitute a greater portion of income before transfers and taxes than they do for other households. Additionally, as income rises, social insurance benefits tend to decline as a share of income.

Overall Income Growth Was Largely Attributable to Capital Gains

From 2020 to 2021, average household income grew by about 9 percent, from \$128,000 to \$139,000, after adjusting for inflation. (From 2019 to 2020, such income grew by about 1 percent.) In 2021, as the economy continued to recover from the downturn caused by the pandemic, all forms of income increased except social insurance benefits, which decreased because regular unemployment insurance decreased. The largest increases came from realized capital gains (\$6,600 per household, on average), business income (\$2,200, on average), and labor income (\$1,100, on average).

Changes in Average Household Income Before Transfers and Taxes

2021 dollars



In 2021, average household income grew by \$11,000 as labor and business income recovered, but the largest contribution to income growth came from increases in realized capital gains.

Capital Gains Reached a Record High

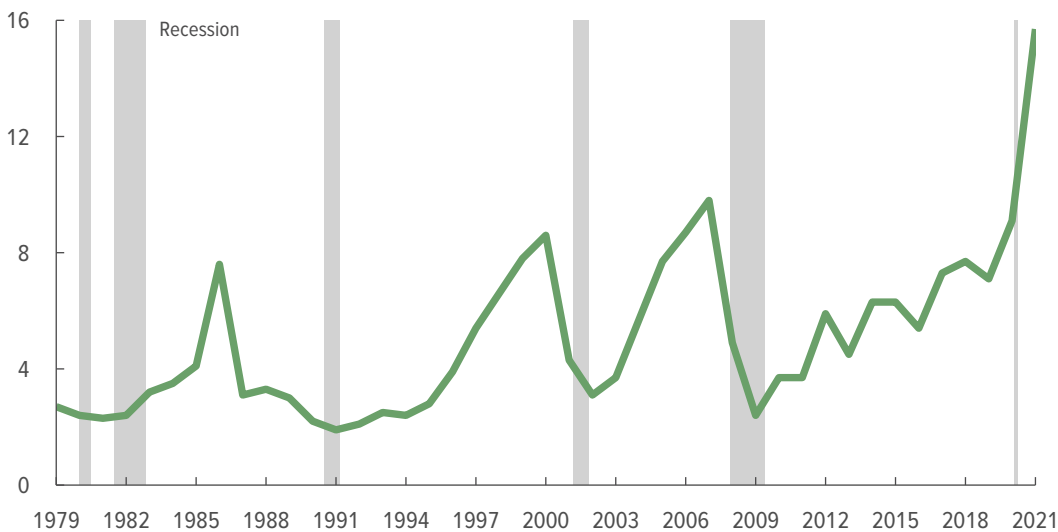
In 2021, average income from realized capital gains exceeded previously recorded amounts. Before 2021, the year with the highest average realized capital gains per household was 2007, when that average amounted to \$9,800. Income from capital gains grew steadily after the 2007–2009 financial crisis and saw its largest year-over-year increase from 2020 to 2021, when it averaged \$15,700—about 60 percent higher than its previous peak.

According to CBO’s estimates, 32 million households realized capital gains in 2021. Among those households, the average income from capital gains was \$64,200. In 2020, by comparison, 28 million households realized capital gains, which averaged \$40,200 per household.

Over economic cycles, income from realized capital gains tends to be more volatile than other forms of income. Much of that volatility is attributable to people’s responses to changes in tax laws (in 1986 and 2012, for example) or to significant increases or decreases in asset prices (in 2001 and 2007, for example).

Average Household Income From Realized Capital Gains

Thousands of 2021 dollars



In 2021, income from realized capital gains averaged across all households was higher than in any other year included in CBO’s analysis.



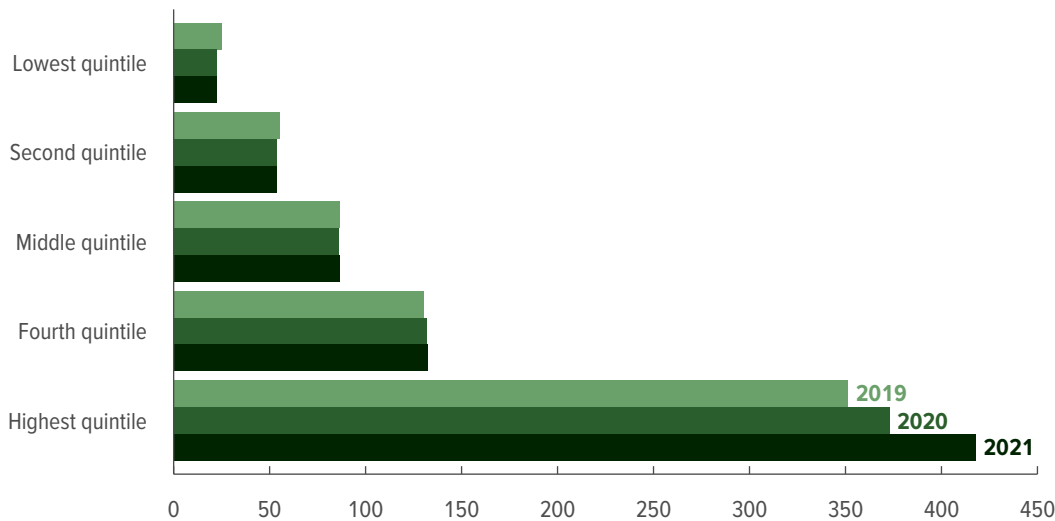
Income Grew Predominantly Among Households in the Highest Quintile

From 2020 to 2021, income increased for households in every quintile, on average. Those increases were largest among households in the highest quintile, mainly because of the growth in capital gains. Income increased by 1 percent, on average, among households in the lowest quintile, by less than half of 1 percent among those in the middle quintile, and by 12 percent among those in the highest quintile, after adjusting for inflation. (Inflation topped 4 percent in 2021, as measured by the personal consumption expenditures price index. In nominal terms, income was 5 percent higher in 2021 than in 2020 among households in the lowest quintile, 4 percent higher among those in the middle quintile, and 17 percent higher among those in the highest quintile.)⁵

Income among households in the three lowest quintiles was still lower in 2021 than it was in 2019, before the onset of the economic downturn caused by the pandemic. Income for households in the lowest quintile was 11 percent lower, on average, in 2021 than in 2019. For households in the fourth quintile, income was 2 percent higher, and for those in the highest quintile, it was 19 percent higher, after adjusting for inflation.

Average Household Income, by Income Group

Thousands of 2021 dollars



In 2021, households in the lower four quintiles saw their income increase slightly, on average, whereas those in the highest quintile saw substantial increases in income.

From 2019 to 2021, Various Sources of Income Before Transfers and Taxes Contributed to the Patterns of Overall Income Growth

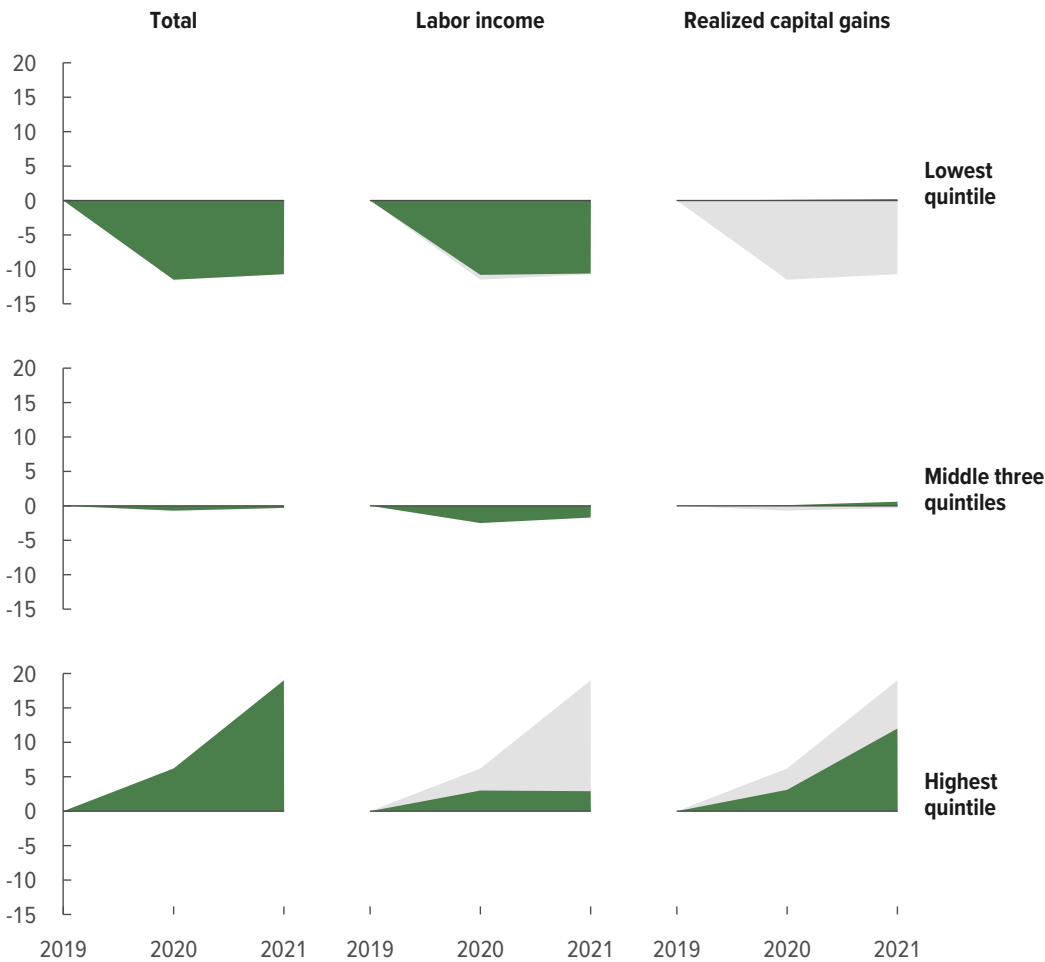
In 2020, income before transfers and taxes decreased significantly for households in the lowest quintile. Nearly all of that decrease was attributable to a decline in labor income. From 2020 to 2021, labor income remained constant (after adjusting for inflation) for households in that quintile.

In 2021, labor income grew for households in the middle three quintiles, partially reversing a decrease in labor income in 2020 attributable to the economic downturn caused by the pandemic. In 2020, declines in labor income were offset by increased unemployment insurance.

In 2020, for households in the highest quintile, increases in labor income and in realized capital gains each accounted for about half of the total growth in income before transfers and taxes. In 2021, labor income remained roughly constant (after adjusting for inflation) for households in that quintile, and realized capital gains accounted for about two-thirds of the total growth in their income before transfers and taxes since 2019.

Selected Components of Cumulative Growth in Average Household Income, by Income Group

Percent



Income among households at the bottom of the distribution decreased in 2020, mostly because of reductions in labor income, which remained constant (in real terms) in 2021.

Income among households in the highest quintile grew in both 2020 and 2021, driven largely by realized capital gains.

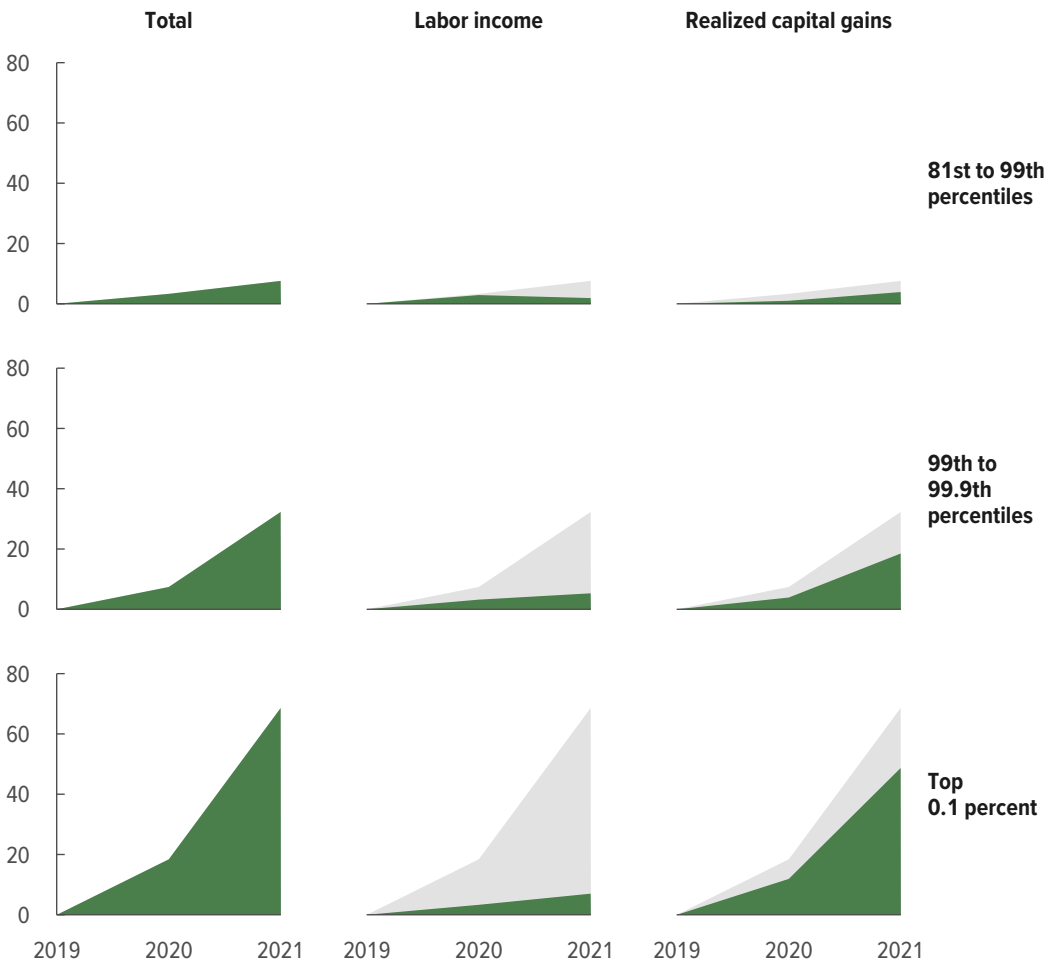


From 2019 to 2021, Households at the Top of the Highest Quintile Saw the Largest Increases in Income, Driven by Capital Gains

Overall income growth was largest among the highest-income households within the highest quintile. Realized capital gains were the main source of income growth for all income groups in that quintile, but capital gains drove more of overall income growth for the highest-income households. For households in the 81st to 99th percentiles, average income before transfers and taxes increased by 8 percent, from \$261,800 in 2019 to \$281,800 in 2021. About half of that increase was attributable to capital gains. For households in the top 0.1 percent of the distribution, income increased by 69 percent, from \$9.8 million to \$16.5 million, on average. About two-thirds of that increase resulted from capital gains.

Selected Components of Cumulative Growth in Average Household Income Within the Highest Quintile, by Income Group

Percent



From 2019 to 2021, most of the increases among all income groups in the highest quintile were driven by capital gains.



Means-Tested Transfers and Federal Taxes

Means-tested transfers are cash payments and in-kind benefits from federal, state, and local governments that are typically designed to assist individuals and families who have low income and few assets.⁶ From 1979 to 2019, those transfers went largely to households near the bottom of the income distribution.⁷

In 2020 and 2021, means-tested transfers were particularly large, mainly because of three key factors. First, in this analysis, that category includes expanded unemployment compensation (whereas regular unemployment insurance is still included in income before transfers and taxes). Second, legislative changes temporarily expanded SNAP and Medicaid.⁸ Third, some households whose income fell because of the economic downturn brought about by the coronavirus pandemic became newly eligible for means-tested transfers.

In this analysis, federal taxes consist of individual income taxes, payroll taxes, corporate income taxes, and excise taxes.⁹ Taken together, those taxes accounted for over 90 percent of all federal revenues collected in 2021. Among those sources of revenues, individual income taxes and payroll taxes are the largest, followed by corporate taxes and excise taxes.¹⁰

High-income households pay a larger share of federal taxes. In 2021, households in the highest income quintile received about 59 percent of all income—including 95 percent of realized capital gains—and paid 84 percent of federal taxes. (In 2019, households in that quintile received 54 percent of all income—including 93 percent of realized capital gains—and paid 69 percent of federal taxes.) For households in the two lowest quintiles, federal taxes were lower in 2021 than in 2020, in large part because the expanded child tax credit and the recovery rebate credit—which are counted as refundable tax credits in this analysis—reduced the taxes households owed.

Federal Legislation Offset Decreases in Income Resulting From the Pandemic's Economic Disruption

The federal government enacted several major laws in 2020 and 2021 to lessen the pandemic-related economic disruption for households, businesses, and state and local governments. Among the policies put in place were three temporary programs that provided direct payments to households. The first temporary program, the recovery rebate credit, provided payments of up to \$1,400 per person to taxpayers with income below specified limits in 2021. (Those payments represented the third round of recovery rebate credits during the pandemic, coming after two rounds that provided up to \$1,800 per person in total in 2020.) The second temporary program, expanded unemployment compensation, combined several policies that temporarily expanded the amount of, duration of, and eligibility for unemployment benefits. In 2021, eligible unemployed people (including previously self-employed people) received weekly payments of up to \$300 through September 6 in addition to their regular unemployment insurance benefits. And finally, the expanded child tax credit provided payments of up to \$3,600 per child to parents with low income. Those payments were made available to people whose income did not meet the threshold to file taxes. (For more details about those policies and how CBO estimated their effects, see Appendix B.) CBO estimates that nearly three-quarters of the total benefits from those three programs accrued to households in the three lowest quintiles.

Legislation enacted in 2020 and 2021 also expanded the two largest means-tested transfer programs, Medicaid and SNAP. In exchange for enhanced federal funding for Medicaid, the federal government required states to maintain coverage for all Medicaid enrollees regardless of any changes in their income or circumstances that would otherwise have caused them to become ineligible for the program. That requirement increased the number of Medicaid enrollees.¹¹ The government also introduced new financial incentives for states to expand Medicaid eligibility, allowed states to provide households with the maximum SNAP benefits for their household size, and, for part of 2021, increased SNAP benefits by 15 percent. CBO estimates that average benefits were larger for those two programs in 2021 than in 2020—by about 6 percent for Medicaid (which includes the Children's Health Insurance Program, or CHIP), and by nearly 30 percent for SNAP.

Some temporary changes were made to the tax system as well. For example, the government expanded the eligibility for premium tax credits for taxpayers using health insurance exchanges and expanded the earned income tax credit. (The effects of those changes are included in the measure of federal taxes in this report.)

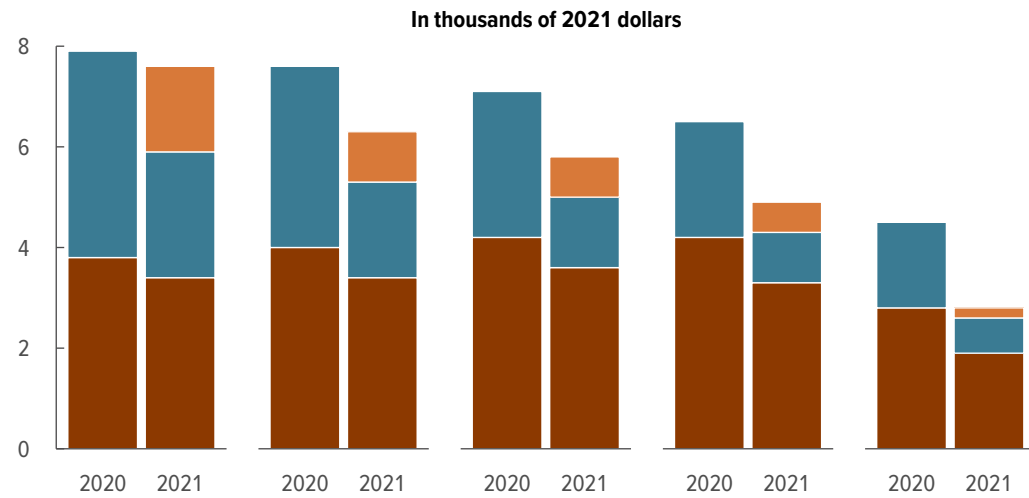
Some policies put in place by legislation provided financial support to businesses and state and local governments in 2021. Although those policies did not directly benefit households, they altered household income through their effects on the economy. The largest such policy was the extension of the Paycheck Protection Program, which provided about \$300 billion in funds to businesses in 2021.¹²

Other policies did not directly increase household income but did increase the resources available to households. For example, the government implemented a pause on federal student loan payments. The pause on payments was equivalent to a transfer to households. Although CBO has not analyzed the distributional effects of that policy, more than half of student loan debt is typically owed by households in the two highest quintiles of the income distribution.¹³ In CBO's assessment, even if the agency had included the benefits attributable to that policy as a transfer, those benefits would have increased income inequality only slightly.

Benefits From Temporary Programs Were Lower Than in 2020

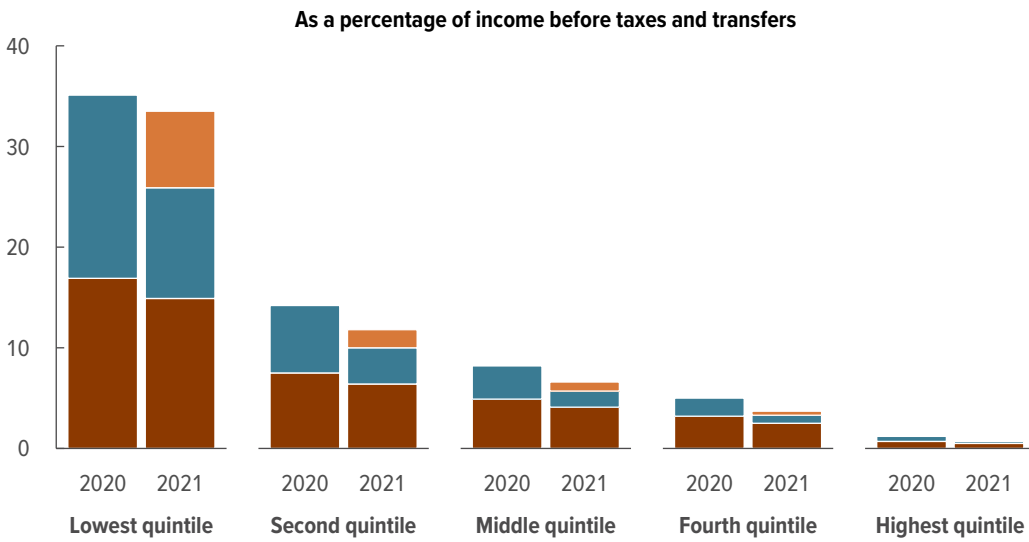
According to CBO’s estimates, households received an average of about \$6,800 in payments from temporary programs in 2020, after adjusting for inflation. In 2021, households received an average of roughly \$5,500 in such payments despite the introduction of the expanded child tax credit. In particular, expanded unemployment compensation decreased in 2021 because the expansion was less generous that year and because the labor market recovered in 2021. Households in the lowest quintile received nearly the same amount of total benefits from temporary programs in 2021 (\$7,600) as in 2020 (\$7,800) because the expanded child tax credit offset part of the decrease in expanded unemployment compensation.

Average Amount of Recovery Rebate Credits, Expanded Unemployment Compensation, and the Expanded Child Tax Credit, by Income Group



In 2021, total payments from temporary programs were lower than in 2020 for households in every income group.

On average, households in the lowest quintile received \$7,600 in payments in 2021, which amounted to about 34 percent of their income before transfers and taxes. Households in the highest quintile received \$2,700 in payments, which amounted to less than 1 percent of their income.

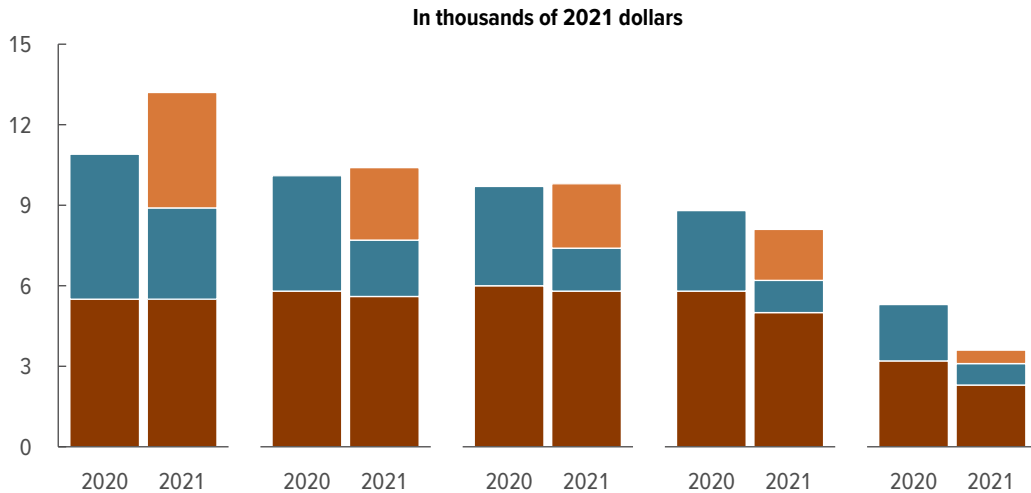


■ Recovery rebate credits ■ Expanded unemployment compensation ■ Expanded child tax credit

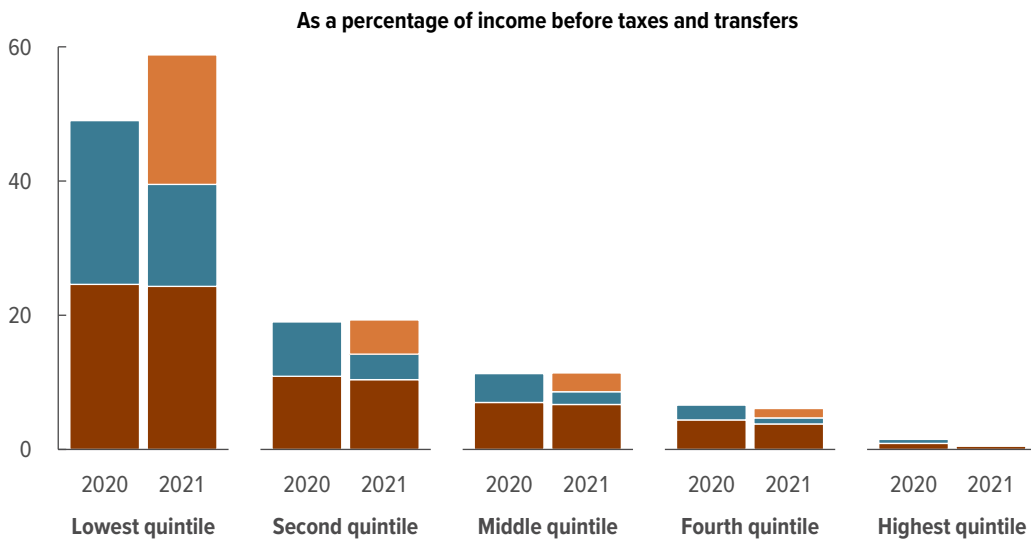
Households With Children Received Greater Benefits From Temporary Programs

In 2021, the new payments that resulted from the introduction of the expanded child tax credit offset the decreases in expanded unemployment compensation for many households with children. Because the child tax credit was increased and made fully refundable, low-income households with children received more in payments from temporary programs in 2021 than in 2020. In the lowest quintile, households with children received an average of about \$13,200 (59 percent of their total income) in 2021; such households received \$10,900 (49 percent of their total income) in 2020. Households with children in the middle quintile of the income distribution received nearly the same amount in payments in 2021 as they did in 2020, whereas those in the highest quintile received a lower amount. That is mainly because the expanded child tax credit and the 2021 recovery rebate credit phased out at lower income levels than did the two recovery rebate credits in 2020. (For more details about those programs, see Appendix B.)

Average Amount of Recovery Rebate Credits, Expanded Unemployment Compensation, and the Expanded Child Tax Credit Among Households With Children, by Income Group



In the lowest quintile, households with children received about \$2,300 more, on average, in payments from temporary programs in 2021 than they did in 2020. By contrast, households with children in the highest quintile received about \$1,800 less.



■ Recovery rebate credits
 ■ Expanded unemployment compensation
 ■ Expanded child tax credit

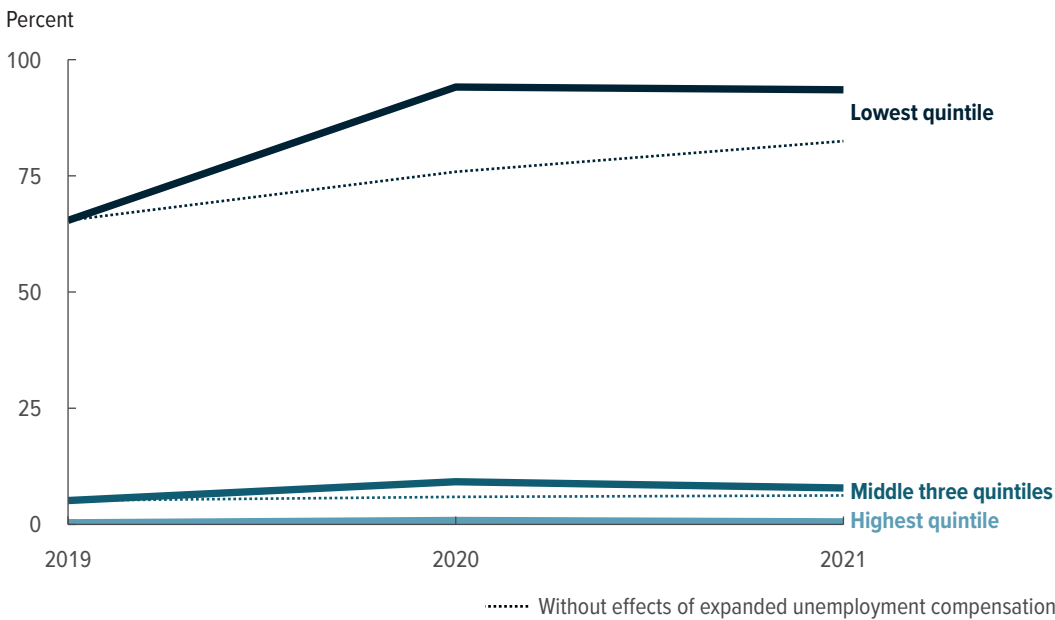


Means-Tested Transfer Rates Remained at the Historically High Levels They Reached in 2020

Among households in the lowest quintile, the average means-tested transfer rate (that is, transfers as a share of income) grew significantly from 2019 to 2020, from 65 percent to 94 percent. In other words, total means-tested transfers received by households in that quintile equaled 94 percent of all their income before transfers and taxes in 2020. In 2021, the average transfer rate in the lowest quintile remained at the same level—that is, total transfers grew at about the same pace as income, even though expanded unemployment compensation was smaller in 2021. (In CBO’s analysis, expanded unemployment compensation is considered a means-tested transfer, whereas regular unemployment insurance is considered a social insurance benefit and is therefore included in income before transfers and taxes.)

Increases in benefits from Medicaid and SNAP offset the decrease in expanded unemployment compensation. Although means-tested transfer rates would have been lower without expanded unemployment compensation, they would still have increased to 82 percent among households in the lowest quintile in 2021, which would have been a record high for the years included in CBO’s analysis.

Average Means-Tested Transfer Rates, With and Without the Effects of Expanded Unemployment Compensation, by Income Group



Means-tested transfer rates exceeded 90 percent for households in the lowest quintile in 2020 and 2021, in large part because of expanded unemployment compensation. However, even without that new program, transfer rates would still have been historically high (82 percent) in 2021.

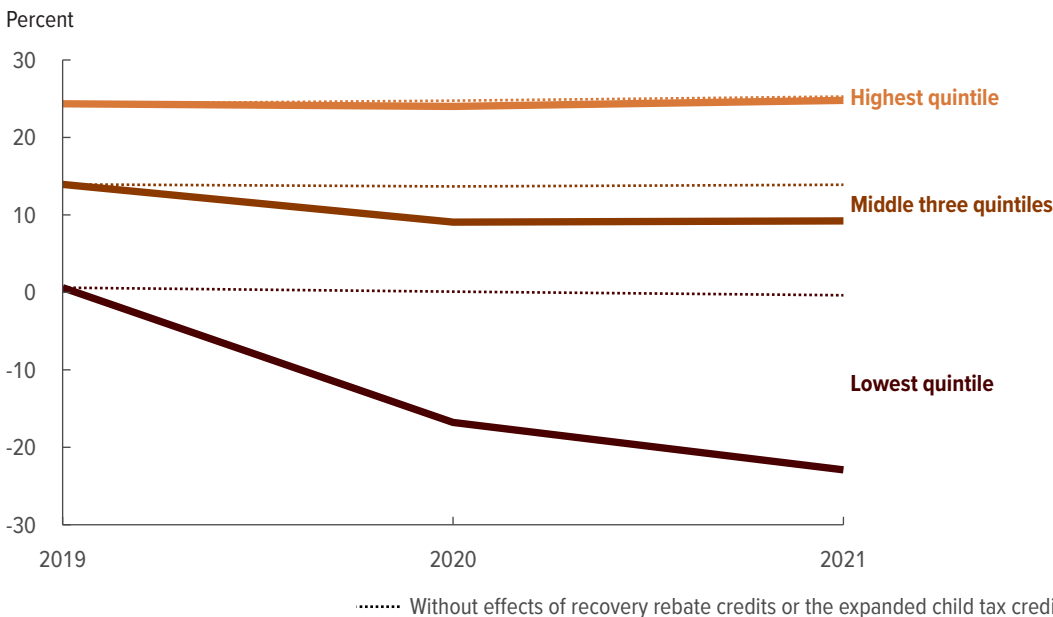


Federal Tax Rates Decreased Further for Low-Income Households

Average federal tax rates for households in the lowest quintile, which were already negative in 2020, fell by an additional 6 percentage points in 2021. (A tax rate can be negative because of refundable tax credits, which can result in net payments from the federal government that offset other taxes paid by those households.)¹⁴ That decrease was mainly attributable to the recovery rebate credit and the expanded child tax credit. Had it not been for those credits, the tax rate for the lowest quintile would have been 23 percentage points higher, at about zero.

Average federal tax rates remained constant in 2021 for households in the middle three quintiles and increased by about 1 percentage point for households in the highest quintile. Households in those income groups received smaller benefits from the expansion of the child tax credit.

Average Federal Tax Rates, With and Without the Effects of Temporary Tax Credits, by Income Group



Federal tax rates among households in the lowest quintile were lower in 2021 than in 2020, mainly because of the expanded child tax credit.

Had it not been for the effects of temporary policies, however, those rates would have remained roughly constant from 2019 to 2021.



Income After Transfers and Taxes

Income after transfers and taxes includes the addition of means-tested transfers and the subtraction of federal taxes. As income rises, means-tested transfer rates decrease, and federal tax rates increase. As a result, income after transfers and taxes is less skewed toward the top of the distribution than is income before transfers and taxes.

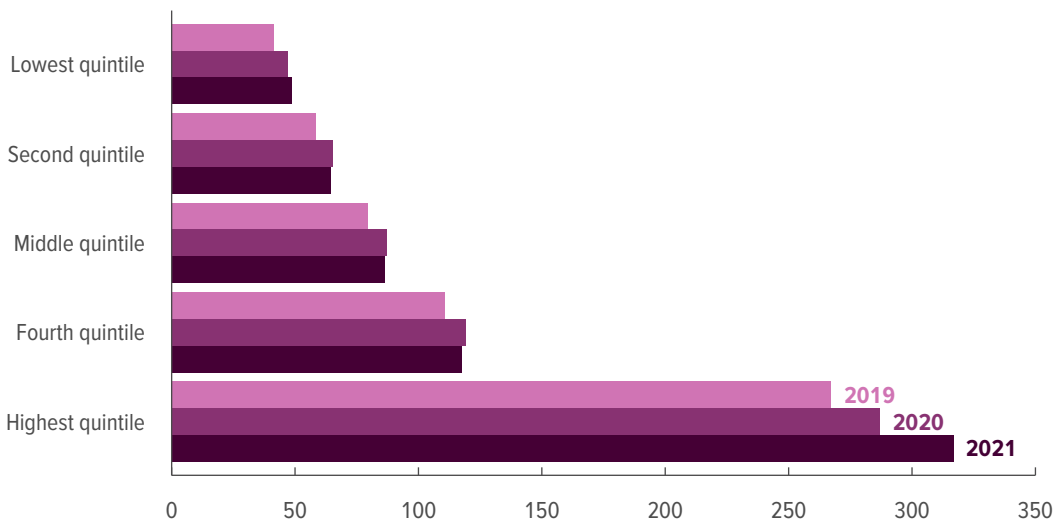
Means-tested transfers and federal taxes played a larger role in 2020 and 2021 than in 2019 in reducing the extent to which income was skewed toward the top of the distribution. That is mainly because of the introduction of temporary policies in response to the economic downturn caused by the pandemic—specifically the recovery rebate credit, expanded unemployment compensation, and the expanded child tax credit. A smaller role was played by legislative changes (such as those affecting Medicaid and SNAP) and by changes in the amounts of transfers and taxes that automatically occur in response to widespread shifts in household income.

Income After Transfers and Taxes Increased Only at the Top and Bottom of the Distribution

From 2019 to 2020, income after transfers and taxes increased among households in all income quintiles, on average. From 2020 to 2021, income decreased among households in the middle three quintiles and increased among households in the lowest and highest quintiles. The percentage of the increase was greater at the top of the distribution (10 percent) than at the bottom (4 percent), after adjusting for inflation. Among households in all quintiles, income after transfers and taxes was, on average, higher in 2021 than it was in 2019.

Average Income After Transfers and Taxes, by Income Group

Thousands of 2021 dollars



Households in the middle three quintiles of the income distribution experienced decreases in income after transfers and taxes in 2021, on average, whereas households in the lowest and highest quintiles saw their income after transfers and taxes increase.



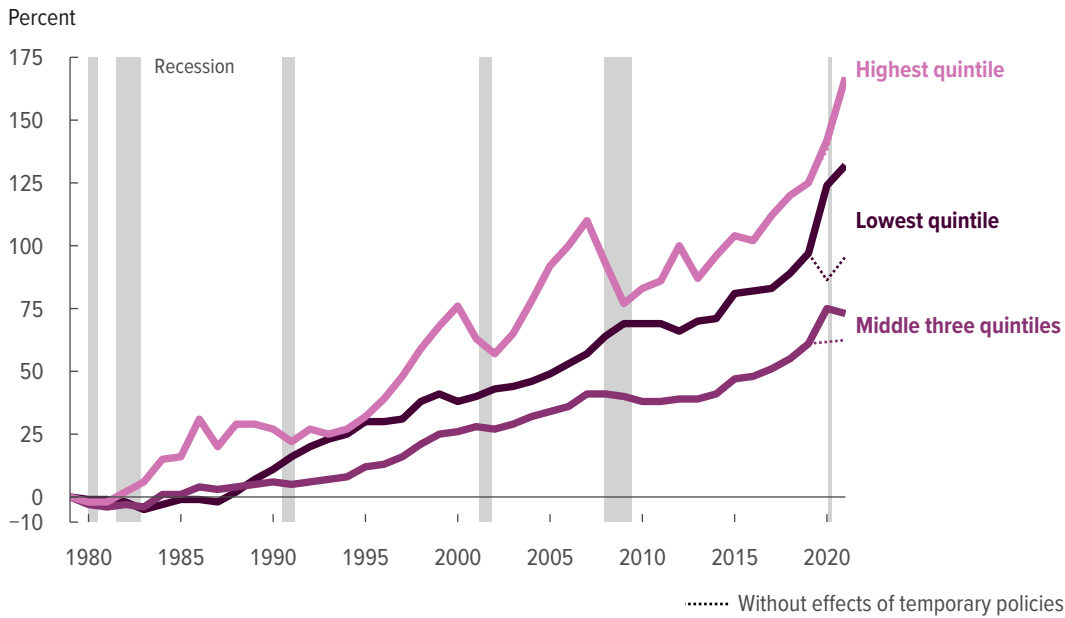
Among Households in the Lowest Quintile, Income After Transfers and Taxes Grew Significantly Because of Temporary Policies

In 2021, income after transfers and taxes increased the most for households in the highest quintile. The rate of income growth for households in that quintile would have been almost the same if the new temporary policies—the recovery rebate credit, expanded unemployment compensation, and the expanded child tax credit—had not been in place.

Households in the lowest quintile benefitted the most from those policies, which increased their average income after transfers and taxes to \$48,700. Had it not been for those policies, average household income in the lowest quintile would have been \$41,200, which is lower than it was in 2019, before the onset of the pandemic (\$41,600, in 2021 dollars).

Average income after transfers and taxes decreased for households in the middle three quintiles of the distribution from \$90,200 in 2020 to \$89,200 in 2021. It would have been even lower in 2021 (\$83,500) without the effects of temporary policies.

Cumulative Growth in Income After Transfers and Taxes, by Income Group



From 2019 to 2021, income after transfers and taxes increased for households at the bottom of the distribution largely because of the effects of temporary policies.

By contrast, increases among households at the top of the distribution were mainly attributable to growth in income before transfers and taxes.

Income Inequality

As the distribution of income shifts each year in the United States, so does the degree of income inequality. A standard statistical measure of income inequality is the Gini coefficient, which summarizes an entire distribution in a single number that ranges from zero to one. At the extremes, a value of zero means that income is distributed equally among all households, whereas a value of one indicates that all income is received by a single household (and none is received by any other households). The Gini coefficient can also be interpreted as a measure of one-half of the average difference in income between every pair of households in the population, divided by the average income of the total population. For example, the Gini coefficient based on income before transfers and taxes in 2021 was 0.560, which indicates that the average difference in income before transfers and taxes between pairs of households in that year was equal to 112 percent (twice 0.560) of average household income, or about \$101,900 (adjusted to account for differences in household size). This analysis compares Gini coefficients based on income before transfers and taxes and on income after transfers and taxes.

Income Inequality Increased, Both Before and After Transfers and Taxes

When calculated using income before transfers and taxes, the Gini coefficient—at 0.560—was higher in 2021 than in any other year since at least 1979, the earliest year in CBO’s analysis.¹⁵

When calculated using income after transfers and taxes, the Gini coefficient was 0.443. Despite the reductions in inequality stemming from means-tested transfers and federal taxes, the Gini coefficient was still higher in 2021 than in any other year since 2012. But without the effects of the temporary policies, it would have been 0.468, the highest since at least 1979.

Income Inequality as Measured by the Gini Coefficient



In 2021, inequality based on income before transfers and taxes was the highest it has been since at least 1979.

Temporary programs significantly reduced inequality based on income after transfers and taxes, but such income inequality still reached a nine-year high.

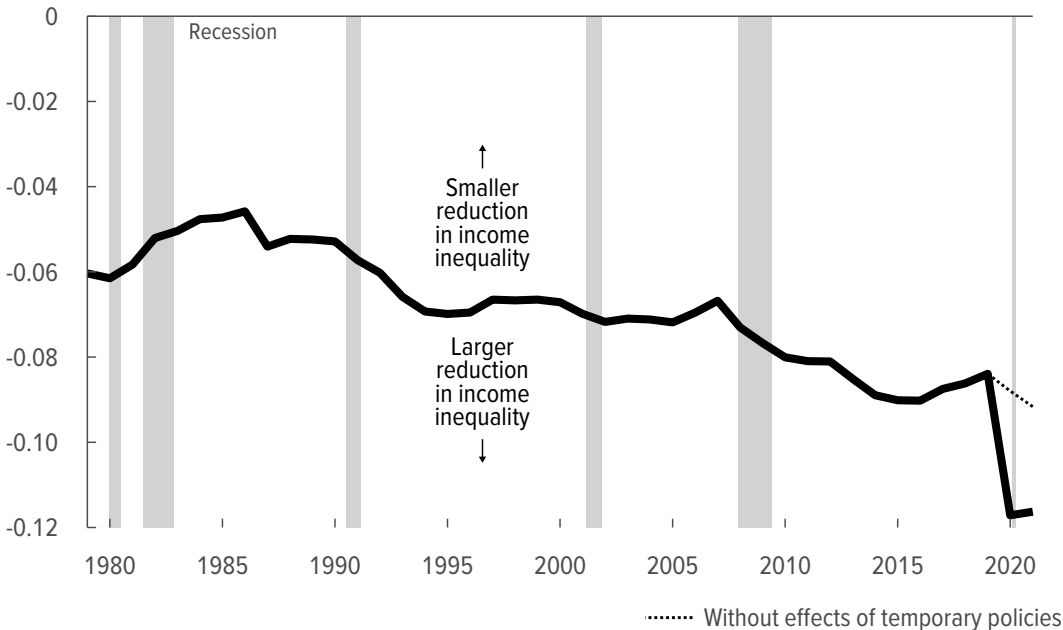


Transfers and Taxes Substantially Reduced Income Inequality in 2020 and 2021, Mainly Because of the Effects of Temporary Policies

The Gini coefficient for income *after* transfers and taxes is lower than the coefficient for income *before* transfers and taxes because means-tested transfers and federal taxes in the United States are progressive: Lower-income households receive a larger share of their income in transfers and pay a smaller share in taxes than higher-income households do. Although the degree to which transfers and taxes reduce inequality varies from year to year, the extent to which they have done so has generally increased over time.

In 2020, transfers and taxes did more to reduce inequality than in any other year since at least 1979, and their effect was only slightly smaller in 2021. The notable increase in the inequality-reducing effects of transfers and taxes in 2020 and 2021 was mostly attributable to temporary policies. Without those policies, transfers and taxes would have reduced inequality by about the same amount as they have over the past decade.

Reduction in Income Inequality Stemming From Means-Tested Transfers and Taxes, as Measured by the Gini Coefficient



Means-tested transfers and federal taxes reduced income inequality by about the same amount in 2021 as in 2020, which was significantly more than in any other year included in CBO's analysis.

Had it not been for the effects of temporary policies, however, the reductions in inequality would have been about the same as they have been over the past 10 years.



1. CBO estimates that 320 million people lived in those households. The agency's estimate of the U.S. population excludes members of the armed forces on active duty and people in institutions (such as prisons or nursing homes).
2. For a study that follows a panel of taxpayers through the economic downturn in 2020 and the subsequent recovery, see Jeff Larrimore, Jacob Mortenson, and David Splinter, "Earnings Business Cycles: The COVID Recession, Recovery, and Policy Response," *Journal of Public Economics*, vol. 225, article 104983 (September 2023), <https://doi.org/10.1016/j.jpube.2023.104983>.
3. Not all households receive means-tested transfers, but virtually all households pay federal taxes in some form (individual income taxes, payroll taxes, corporate taxes, or excise taxes).
4. For a comprehensive list of legislated changes to federal policies implemented in response to the pandemic in 2020, see Congressional Budget Office, *The Budgetary Effects of Laws Enacted in Response to the 2020 Coronavirus Pandemic, March and April 2020* (June 2020), www.cbo.gov/publication/56403, and *The Budgetary Effects of Major Laws Enacted in Response to the 2020–2021 Coronavirus Pandemic, December 2020 and March 2021* (September 2021), www.cbo.gov/publication/57343.
5. CBO applies the same inflation adjustment for all households. For details on how inflation may affect certain households differently across the income distribution, see Congressional Budget Office, *An Update About How Inflation Has Affected Households at Different Income Levels Since 2019* (May 2024), www.cbo.gov/publication/60166.
6. For this analysis, CBO analyzed these means-tested transfer programs (which are listed from largest to smallest): expanded unemployment compensation, Medicaid and the Children's Health Insurance Program, the Supplemental Nutrition Assistance Program, Supplemental Security Income, housing assistance, low-income subsidies for Part D of Medicare (which covers prescription drugs), Temporary Assistance for Needy Families, child nutrition, the Low Income Home Energy Assistance Program, and state and local governments' general assistance programs.
7. Although means-tested transfers are designed to assist people with low income, data indicate that some high-income households receive benefits from the transfer programs. That may happen for several reasons. For example, some people have income that varies during the year and may therefore qualify for benefits on the basis of low monthly income even though their annual income is high. In addition, some people who qualify for benefits because their own income is low live in high-income households. Moreover, a portion of the benefits reported as going to high-income households probably reflects some misreporting of income, program participation, and benefit amounts in the survey data that underlie CBO's estimates. Finally, expanded unemployment compensation, which is included in this analysis as a means-tested transfer, was available to all unemployed people (including previously self-employed people), regardless of their income.
8. The value of benefits provided through Medicaid (and the Children's Health Insurance Program) that CBO allocated to households in this analysis is based on the government's average cost of providing those benefits.
9. The remaining federal revenue sources not allocated to U.S. households in this analysis are states' deposits for unemployment insurance, estate and gift taxes, net income earned by the Federal Reserve System, customs duties, and miscellaneous fees and fines. Because of the complexity of estimating state and local taxes for individual households, this report considers federal taxes only. For estimates of the distribution of state and local taxes, see Meg Wiehe and others, *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*, 6th ed. (Institute on Taxation and Economic Policy, October 2018), <https://itep.org/whopays>; Gerald Prante and Scott Hodge, *The Distribution of Tax and Spending Policies in the United States*, Special Report 211 (Tax Foundation, November 2013), <https://tinyurl.com/roj9t2g>; and Gerald Auten and David Splinter, "Income Inequality in the United States: Using Tax Data to Measure Long-Term Trends," *Journal of Political Economy*, vol. 132, no. 7 (July 2024), pp. 2179–2227, <https://tinyurl.com/5n9xjw8h>. Researchers' conclusions about the distributional effects of state and local taxes differ.
10. Federal taxes allocated to households in this analysis are based on tax liabilities incurred in calendar year 2021.
11. In this analysis, CBO did not allocate Medicaid spending to enrollees who had other sources of health insurance but were only enrolled because of the new continuous eligibility policy.

12. The Paycheck Protection Program was created to provide loans to businesses with fewer than 500 employees. Nearly all those loans were ultimately forgiven, though, so the program's benefits were, in effect, grants to businesses.

Although the PPP resembled other programs that provided benefits to entities other than households and that therefore are not explicitly accounted for in this analysis, it was the largest new program created in response to the pandemic. As a result, allocating its benefits to households could alter CBO's analysis of the overall distribution of household income.

The PPP was intended to help employers continue to pay their employees through the economic disruption caused by the pandemic. Some studies have estimated the program's effectiveness at meeting that goal—for example, see Michael Faulkender, Robert Jackman, and Stephen Miran, *The Job-Preservation Effects of Paycheck Protection Program Loans* (February 2023), <https://tinyurl.com/3du5wtvc>. Program payments were made directly to employers, who used some portion of the funds for that purpose and other portions to pay providers of intermediate goods and services. Those effects are included in this analysis as part of income before transfers and taxes. The remainder of those funds may have accrued as direct benefits to employers.

Determining the extent to which employers used the funds for each of those purposes is difficult, in large part because the benefits were not taxable and therefore cannot be observed in CBO's data. The ultimate incidence of the PPP—that is, the share of program dollars that was allocated to workers versus employers—is also difficult to determine. The distribution of PPP payments depends heavily on those shares because the employees who would have lost their jobs if not for the program tend to be lower in the income distribution than the business owners and shareholders who also benefited from the program.

Some studies have estimated the incidence and distributional effects of the PPP and the program's effectiveness at mitigating job losses, with varying results. In one study, for example, David Autor and coauthors (David Cho, Leland D. Crane, Mita Goldar, Byron Lutz, Joshua Montes, William B. Peterman, David Ratner, Daniel Villar, and Ahu Yildirmaz) estimate that 23 percent to 34 percent of PPP dollars in 2020 were used to preserve jobs. The authors allocated the program's benefits to households, estimating that 3 percent of the benefits accrued to households in the lowest quintile, and 72 percent accrued to households in the highest quintile. In another study, David Splinter and coauthors (Eric Heiser, Michael Love, and Jacob Mortenson) estimate that about 61 percent of PPP dollars went toward employee retention costs (including nonwage payroll costs). According to their allocations, about 10 percent of the benefits accrued to households in the lowest quintile, and a little over 40 percent accrued to households in the highest quintile.

Those studies use different data, methods, allocation rules, and income measures and thus attribute very different distributional consequences to the benefits of the PPP when measured as a percentage of household income. David Autor and coauthors find that PPP benefits were regressive—that is, households toward the bottom of the distribution received less as a share of their income than did households toward the top of the income distribution—whereas David Splinter and coauthors find the program to be progressive.

Because of the size of the PPP, any allocation of its benefits would alter the overall distribution of household income—and, as the results from those two analyses show, determining the appropriate allocation would entail a great deal of uncertainty. CBO's analysis does not attempt to separately allocate the effects of the PPP and probably excludes the portion of PPP funds that accrued directly to employers. For more information, see David Autor and others, "The \$800 Billion Paycheck Protection Program: Where Did the Money Go and Why Did It Go There?" *Journal of Economic Perspectives*, vol. 36, no. 2 (Spring 2022), pp. 55–80, <https://tinyurl.com/2983ywh8>; and David Splinter and others, *The Paycheck Protection Program: Progressivity and Tax Effects* (February 12, 2024), www.davidsplinter.com/ppp.pdf.

13. Sandy Baum and Adam Looney, "Who Owes the Most in Student Loans: New Data From the Fed" (Brookings Institution, October 9, 2020), <https://tinyurl.com/ycy8d5u7>.
14. In the federal budget, the portion of refundable tax credits that reduces the amount of taxes owed is typically counted as a reduction in revenues, and the portion that exceeds a filer's tax liability is typically treated as an outlay. In this analysis, CBO treated the refundable and nonrefundable portions of the recovery rebate credits jointly and treated the entire portion of the credits as an outlay. For more details about the history and economic effects of refundable tax credits, see Congressional Budget Office, *Refundable Tax Credits* (January 2013), www.cbo.gov/publication/43767.
15. Because of the extent to which capital gains drove the increase in income inequality in 2021, CBO also estimated what inequality would have been without capital gains. The agency found that income inequality before transfers and taxes, as measured by the Gini coefficient, would have been 0.523—significantly lower than with capital gains.

Appendix A: Data and Methods Used in This Analysis

The Congressional Budget Office has released its analyses of the distribution of household income and federal taxes for more than 30 years.¹ This appendix provides additional details about CBO’s analytic methods. The estimates in this report were produced using the agency’s framework for analyzing the distributional effects of both means-tested transfers and federal taxes.² That framework uses income before transfers and taxes, which consists of market income plus social insurance benefits. That measure is used to rank households when creating income groups and serves as the base income measure when calculating average means-tested transfer rates and average federal tax rates.³

The supplemental data posted along with this report include additional distributional data that rank

1. For links to reports in this series going back to 2001, see Congressional Budget Office, “Major Recurring Reports,” <https://go.usa.gov/xF8ht>.
2. For more details about CBO’s current framework and how it differs from the agency’s previous approach to distributional analyses, see Kevin Perese, *CBO’s New Framework for Analyzing the Effects of Means-Tested Transfers and Federal Taxes on the Distribution of Household Income*, Working Paper 2017-09 (Congressional Budget Office, December 2017), www.cbo.gov/publication/53345.
3. Social insurance benefits consist of benefits provided through Social Security (Old Age, Survivors, and Disability Insurance); Medicare (measured as the average cost to the government of providing those benefits, net of offsetting receipts); regular unemployment insurance (that is, not the temporary expansions to unemployment benefits that were enacted in response to the coronavirus pandemic); and workers’ compensation. Although those social insurance benefits are often considered forms of government transfers, they are included in the base measure of income that CBO uses to rank households. The distributional effects of those benefit programs are not directly examined in this report, however. Social Security and Medicare, in particular, provide substantial resources to retirees and significantly affect the distribution of household income. In CBO’s estimation, when analyzing the distributional effects of those programs, it is more appropriate to use lifetime measures of income earned, payroll taxes paid, and benefits received. The framework used to analyze the distribution of household income in this report is based on annual income data and, therefore, is less suitable for analyzing the distributional effects of those retirement benefit programs.

households according to alternate income measures, such as income after transfers and taxes. Those supplemental data, available at www.cbo.gov/publication/60341#data, also include data for three types of households: households headed by elderly people (defined as those age 65 or older); households with children (defined as those under age 18); and nonelderly, childless households. The additional data, broken out by household type, are reported for each income group.

In this report, CBO assesses the distribution of annual income, which is one measure of economic well-being. CBO does not examine other measures of economic well-being, such as household income measured over a longer period, household consumption, or household wealth. Nor does this report analyze the considerable variation in income, taxes paid, and tax rates within each income group, which cannot be captured by calculating averages alone.

In addition, this report does not explicitly or comprehensively assess the economic mobility of households—that is, their movement among income groups from one year to the next. However, in developing its estimates that compare the distribution of household income in 2021 and 2020 with that in 2019, CBO examined the movement of households among quintiles (or fifths of the distribution) between those two years and found that the amount and patterns resembled those in recent years. Other researchers have analyzed economic mobility more fully.⁴

4. For an overview of research on economic mobility, see Federal Reserve Bank of St. Louis and the Board of Governors of the Federal Reserve System, *Economic Mobility: Research and Ideas on Strengthening Families, Communities, and the Economy* (2016), <https://tinyurl.com/ycykrhbv>. See also David Splinter, “Income Mobility and Inequality: Adult-Level Measures From the U.S. Tax Data Since 1979,” *Review of Income and Wealth*, vol. 68, no. 4 (December 2022), pp. 906–921, <https://tinyurl.com/3bp4dwy6>; and Katharine Bradbury, *Family Characteristics and Macroeconomic Factors in U.S. Intragenerational Family Income Mobility, 1978–2014*, Working Paper 19-08 (Opportunity and Inclusive Growth Institute System, Federal Reserve Bank of Minneapolis, October 2019), <https://tinyurl.com/y2wrztu6>.

Finally, this report focuses on the effects of the federal government's fiscal (tax and spending) policies. The government's monetary, regulatory, and trade policies also affect the distribution of household income, but the direct distributional effects of those other federal policies are not examined in this report. Most state and local governments' fiscal policies also are not examined here, except for some state-level means-tested transfers (the largest of which are provided through Medicaid and the Children's Health Insurance Program, although those programs are funded mostly by the federal government).

Unit of Analysis

CBO uses households as the unit of analysis in its distributional reports. A household consists of the people who share a housing unit regardless of their relationship.⁵ A household can consist of more than one tax-filing unit, such as a married couple and their adult child.

The data used in CBO's analyses come from the Internal Revenue Service (IRS), which provides data on tax-filing units, and from the Census Bureau, which provides household-level data. To incorporate data on tax-filing units into its analysis, CBO creates tax-filing units from the household-level data on the basis of the information (on relationships and income) collected by household surveys. After both data sources are organized using the same unit of analysis (tax-filing units), they are statistically matched to create a database with information from both sources. For the final presentation of distributional results, data for those statistically matched tax-filing units are combined and represented at the household level.

Data

The core data used in CBO's distributional analyses come from the Statistics of Income (SOI), a nationally representative sample of individual income tax returns collected by the IRS. That sample of tax returns becomes available to CBO approximately two years after the returns are filed. Data on income are systematically and consistently reported in the SOI. The sample is therefore considered a reliable resource to use when analyzing the effects of fiscal policy on income. However, certain types of income are not reported in the SOI. In 2021,

for example, the portion of payments from the Paycheck Protection Program that was not used to pay for employees' wages was not taxable and therefore not available in the SOI data.

SOI data include information about tax filers' family structure and age, but they do not include certain demographic information or data on people who do not file taxes. For that information, CBO uses data from the Annual Social and Economic Supplement of the Census Bureau's Current Population Survey (CPS), which has data on the demographic characteristics and income of a large sample of households.⁶

CBO combines the two data sources, statistically matching each SOI record to a corresponding CPS record on the basis of demographic characteristics and income. Each pairing results in a new record that takes on some characteristics of the CPS record and some characteristics of the SOI record.

Statistical Matching

The first step in CBO's statistical matching process is to align the unit of analysis by constructing tax-filing units from CPS households.⁷ A tax-filing unit is a single person or a married couple plus any dependents. In CBO's analyses, the heads of CPS households (and their spouses, if present) are designated as tax-filing units. Tax rules are used to determine whether other members of the household can be claimed as dependents on the basis of their age, relationship with the primary tax-filing

5. The Treasury Department's Office of Tax Analysis uses family units in its distributional analyses. Family units are similar to household units but exclude unrelated people who live together. The Internal Revenue Service, the Joint Committee on Taxation, and the Urban-Brookings Tax Policy Center all use tax-filing units as the unit of analysis for their distributional analyses.

6. The CPS sampling frame seeks to represent the civilian noninstitutionalized population in the United States. The scope of CBO's analysis is therefore limited to that population. People living in correctional facilities, in nursing homes, and on military bases are not included in this analysis. However, members of the armed forces living in civilian housing units on a military base or in a household not on a military base are included. In 2014, the Census Bureau split the CPS sample into two groups to test new income and health insurance questions on a smaller subsample. For this report, CBO used the data corresponding to survey questions that were consistent with those used in prior years.

7. For a general description and evaluation of statistical matching, see Marcello D'Orazio, Marco Di Zio, and Mauro Scanu, *Statistical Matching: Theory and Practice* (John Wiley & Sons, 2006), <http://dx.doi.org/10.1002/0470023554>; and Michael L. Cohen, "Statistical Matching and Microsimulation Models," in Constance F. Citro and Eric A. Hanushek, eds., *Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling—Volume II: Technical Papers* (National Academies Press, 1991), pp. 62–86, <http://dx.doi.org/10.17226/1853>.

unit, and income.⁸ People who meet those criteria are classified as dependents; those who do not are classified as separate tax-filing units within the household. In CBO's estimates, when multiple people could claim one member of a household as a dependent, the household uses the arrangement that would result in the most advantageous tax situation. For example, two unmarried, cohabitating partners with two children would each claim one child and file as a head of household if doing so lowered their combined taxes.

Next, CBO divides the records for tax-filing units in each file into 15 demographic groups on the basis of marital status (married or single); number of dependents (zero, one, or two or more); whether the tax-filing unit can be claimed as a dependent (yes or no); and whether the tax filer and their spouse (if applicable) are 65 or older (neither, one, or both). Records from the two files are matched within the same demographic groups, with certain exceptions. Because the CPS file contains fewer head-of-household tax-filing units (single parents with dependent children) than the SOI file does, some SOI head-of-household tax-filing units are matched with single tax-filing units without children and married tax-filing units from the CPS. The deficit in head-of-household filers in the CPS data probably reflects some combination of misreporting of filing status in the SOI and a shortcoming of the algorithm that creates tax units for the CPS in accounting for complex living arrangements.

Within each demographic group, CBO estimates an ordinary least squares (OLS) regression model of total income as a function of all the sources of income that are common to both the SOI and the CPS—such as wages, interest, dividends, rental income, business income and losses, pension income, and unemployment insurance. The OLS models are estimated using the SOI data. CBO applies the coefficients estimated from the regression models to the records in both files to construct a predicted total income variable. CBO then sorts tax-unit records in both files (independently within each demographic cell) in descending order by predicted total income.

Because the SOI and CPS data come from samples, each record from both files has a sample weight associated with it. The sum of all the sample weights in the SOI file

represents the total number of tax units that filed taxes in a given year. The sum of all the weights in the CPS file represents all the tax units in the United States—those that filed a tax return as well as those that did not. The SOI file contains many more records than the CPS file, yet it represents fewer total tax units. Therefore, the average sample weight in the SOI file is lower than the average sample weight in the CPS file (see Table A-1).

Those differences in sample weights mean that SOI and CPS records cannot be matched one to one. Instead, within each demographic group, matching begins with the record from each file that represents the highest predicted total income. Of the two records, the one with the lower sample weight is matched to only one corresponding record from the other file. The record with the higher weight is “split” and is available (with its weight reduced) to be matched to the next record in the other file. (In practice, the highest-income SOI records have very low sample weights, so the matching algorithm matches the top CPS record to many SOI records.)

That process is repeated until all SOI records are exhausted. Each matched pairing results in a new record with the demographic characteristics of the CPS record and the income reported in the SOI. Some types of income, such as certain types of transfer payments and in-kind benefits, appear only in the CPS records; values for those items are drawn directly from that survey. Income values for CPS records that represent nonfiling tax units are taken directly from the CPS. In CBO's analysis, residual CPS records (those with the lowest predicted income) represent tax-filing units that did not file a tax return.

Finally, households are reconstructed from tax-filing units on the basis of relationships reported in the CPS. In general, CPS tax-filing units will have been matched to multiple SOI tax-filing units. When CPS tax-filing units are combined at the household level, multiple replications of a given household are created to cover all possible combinations of the matched SOI–CPS tax units. Each household replication is appropriately weighted so that the sum of all the replications equals the original CPS household-level sample weight.⁹

8. Dependents may be considered tax-filing units if they received income above a certain threshold in a given tax year.

9. For a graphical presentation of the statistical matching algorithm, see Kevin Perese, “Statistically Matching Administrative Tax Data With Household Survey Data” (presentation at a Washington Center for Equitable Growth workshop on distributional national accounts, July 21, 2017), www.cbo.gov/publication/52914.

Table A-1.

Weighted and Unweighted Sample Sizes in the Data CBO Used to Analyze the Distribution of Household Income, by Income Group, 2021

	Statistically matched data set (weighted)		Unweighted households	
	Households	Individuals	CPS	SOI
Negative income	569,393	1,326,178	1,077	16,753
Lowest quintile	26,672,737	62,583,187	12,269	28,163
Second quintile	26,650,346	63,908,987	11,955	32,925
Middle quintile	25,943,952	63,906,479	11,358	39,421
Fourth quintile	25,787,325	63,912,790	10,833	45,114
Highest quintile	25,690,961	63,909,793	11,656	275,905
81st to 90th percentiles	12,858,992	31,953,670	4,993	31,644
91st to 95th percentiles	6,463,974	15,978,611	2,586	29,035
96th to 99th percentiles	5,136,433	12,781,914	2,127	48,203
Top 1 percent	1,231,562	3,195,597	1,951	167,024
All quintiles	131,314,715	319,547,413	59,148	438,281

Data source: Congressional Budget Office. See www.cbo.gov/publication/60341#data.

Each quintile (one-fifth of the distribution) and each percentile (one-hundredth of the distribution) contains approximately the same number of people but different numbers of households.

CPS = Current Population Survey; SOI = Statistics of Income (a nationally representative sample of individual income tax returns collected by the Internal Revenue Service).

Measures of Income, Federal Taxes, and Means-Tested Transfers

Most distributional analyses rely on a measure of annual income as the metric for ranking households. In CBO's analyses of the distribution of household income, information about taxable income sources for tax-filing units that file individual income tax returns comes from the SOI, whereas information about nontaxable income sources and income for tax-filing units that do not file individual income tax returns comes from the CPS. Among households at the top of the income distribution, the majority of income data are drawn from the SOI. Among households in the lower and middle quintiles, a larger portion of income data is drawn from the CPS (see Table A-1).

Most measures of income are drawn from federal tax returns, and those income measures are not adjusted to match the Bureau of Economic Analysis's (BEA's) national income and product accounts. This analysis does not capture income that is underreported or misreported to the IRS as a result of tax noncompliance.¹⁰ Underreported income that is excluded from this analysis may affect the distribution of income.

Income before transfers and taxes has five main categories: labor income, business income, capital income (including capital gains), other income, and social insurance. (For more information about each category, see Appendix B.) Those categories largely reflect how income is reported on individual income tax returns.

In this report, CBO's measures of federal taxes are based on tax liabilities incurred in a calendar year, regardless of when those liabilities are paid. By contrast, federal receipts measure taxes paid to the government in that year, regardless of when those liabilities are incurred. The measures of individual income taxes (including taxes on pass-through business income) and payroll taxes are calculated on the basis of the income and characteristics of each tax-filing unit in the underlying dataset. Those calculated values align closely with the reported values. The measure of excise taxes is drawn from data on tax liabilities and collections from the IRS. The measure of corporate taxes comes from BEA's estimate of taxes on corporate income plus CBO's estimate of repatriation tax payments due.¹¹

10. For a description of tax noncompliance, see Internal Revenue Service, *Federal Tax Compliance Research: Tax Gap Estimates for Tax Years 2014–2016*, Publication 1415 (August 2022), www.irs.gov/pub/irs-pdf/p1415.pdf.

11. CBO uses BEA's series from the national income and product accounts, Table 3.2, "Federal Government Current Receipts and Expenditures," line 8 (Taxes on Corporate Income). Repatriation tax payments reflect a provision of the 2017 tax act that imposed a onetime tax on foreign profits that had not been previously taxed by the United States. Corporations can make those payments in installments over an eight-year period that began in 2018.

The measures of transfers used in this report are mostly drawn from the agencies that administer the relevant programs. For example, the measure of benefits from the Supplemental Nutrition Assistance Program comes from the Food and Nutrition Service in the Department of Agriculture. CBO adjusts those data to align them with the CPS's sampling frame and reporting period.¹²

Incidence of Federal Taxes

CBO allocates individual income taxes and the employee's share of payroll taxes directly to the households paying those taxes. CBO also allocates the employer's share of payroll taxes to employees because employers appear to pass on their share of payroll taxes to employees by paying lower wages than they otherwise would.¹³ The incidence of those taxes could differ from CBO's allocation, though. Research literature suggests that many factors could cause such differences, especially in the short term.¹⁴

CBO's approach is to allocate excise taxes to households according to their consumption of taxed goods and services. Excise taxes on intermediate goods, which are paid by businesses, are allocated to households in proportion to their overall consumption. In CBO's estimates, household spending patterns among income and demographic groups in the CPS are similar to those observed in the Bureau of Labor Statistics' Consumer Expenditure Survey.

Researchers disagree about how to allocate corporate income taxes (and taxes on capital income generally). CBO's approach is to allocate 75 percent of corporate income taxes to owners of capital in proportion to their income from interest, dividends, rents, and adjusted capital gains.¹⁵ That measure excludes some forms of

capital income that are more difficult to measure, such as investment earnings in tax-preferred retirement accounts. Unrealized capital gains are also excluded from CBO's measure of income. For the purposes of allocating corporate income taxes, CBO adjusts capital gains by scaling them to their long-term historical level given the size of the economy and the applicable tax rate; that method reduces the effects of large annual variations in the total amount of gains realized. CBO allocates the remaining 25 percent of corporate income taxes to workers in proportion to their income from labor.¹⁶

Adjustments for Household Size

Households with identical income can differ in ways that affect their economic status. For example, 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. For that reason, household income is an imperfect measure of economic status.

To rank households in a way that better accounts for economies of scale, CBO adjusts the income measure, dividing household income by an adjustment factor known as an equivalence scale. Various equivalence scales are in use today, and a significant, if somewhat dated (though still useful), body of literature explores why and how alternative equivalence scales should be calculated for the purpose of setting public policy parameters—specifically, parameters related to measuring poverty and setting eligibility criteria for means-tested programs.¹⁷

To account for households' economies of scale, the equivalence scale should have a value between one and the number of people in the household. An equivalence scale equal to one would make no change to the income measure and would not account for the greater needs of larger households. An equivalence scale equal to the number of people in the household, by contrast, would

12. For more details about how CBO develops administrative totals for transfer programs, see Bilal Habib, *How CBO Adjusts for Survey Underreporting of Transfer Income in Its Distributional Analyses*, Working Paper 2018-07 (Congressional Budget Office, July 2018), www.cbo.gov/publication/54234.

13. In theory, if payroll taxes did not exist, an employee's salary or wages would be higher by approximately the amount of the employer's share of the payroll tax. Therefore, CBO adds the employer's share of payroll taxes to a household's earnings when calculating income before transfers and taxes.

14. Dorian Carloni, *Revisiting the Extent to Which Payroll Taxes Are Passed Through to Employees*, Working Paper 2021-06 (Congressional Budget Office, June 2021), www.cbo.gov/publication/57089.

15. For a discussion of alternative methods for allocating corporate income to individuals, see the online appendix to Matthew Smith and others, "Capitalists in the Twenty-First Century," *Quarterly Journal of Economics*, vol. 134, no. 4 (November 2019), pp. 1675–1745, <https://doi.org/10.1093/qje/qjz020>.

16. For a more detailed discussion about how CBO allocates corporate taxes, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2008 and 2009* (July 2012), www.cbo.gov/publication/43373.

17. See, for example, Organisation for Economic Co-operation and Development, *OECD Framework for Statistics on the Distribution of Household Income, Consumption, and Wealth* (June 2013), Chapter 8, <https://doi.org/10.1787/9789264194830-en>; Constance F. Citro and Robert T. Michael, eds., *Measuring Poverty: A New Approach* (National Academies Press, 1995), <http://dx.doi.org/10.17226/4759>; and Patricia Ruggles, *Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy* (Urban Institute Press, 1990), <https://tinyurl.com/mv75j5pv>.

imply that each person requires the same resources, which would not capture the benefits of shared consumption—most significantly, housing expenses—within the household.

A generalized formula for calculating an equivalence scale can be expressed as follows:

$$ES = n^e$$

where n is the number of people in the household and e is an elasticity parameter for household size that ranges from zero to one, with larger values implying smaller economies of scale.¹⁸ To adjust household income for differences in household size, CBO uses an equivalence scale known as the square root scale. Using that method, CBO calculates adjusted household income by dividing household income by the square root of the number of people in the household.

Calculating the equivalence scale as the square root of the number of people in the household is the same as setting the elasticity parameter for household size to 0.5 because $\sqrt{n} = n^{0.5}$. Using 0.5 as the elasticity parameter for household size is convenient for several reasons:

- It is the midpoint in the range of possible values for the parameter ($n^0 < n^{0.5} < n^1$).

18. Some equivalence scales have additional parameters to differentiate between the needs of additional adults and additional children. In that case, the formula would be $ES = 1 + (\alpha n_a + \gamma n_c)$, where α and γ are weights between zero and one applied to the additional number of adults and children (n_a and n_c) in the household, respectively.

- It implies that each additional person increases the household's needs but at a decreasing rate.
- The resulting household-size adjustment is similar to the family-size adjustments the Census Bureau uses in setting U.S. poverty thresholds.
- It is transparent and relatively easy to understand.

Applying the square root equivalence scale to adjust income for differences in household size means that some households with higher income but more people living in them may be considered equivalent in income to households with lower income but fewer people living in them.

CBO adjusts income for household size only for the purpose of ranking households and assigning them to income groups. (All other income measures in the agency's distributional analyses are unadjusted.) To provide additional detail, the highest quintile is broken down into smaller, percentile-based groupings (the 81st to 90th percentiles, the 91st to 95th percentiles, the 96th to 99th percentiles, the 99th to 99.9th percentiles, the 99.9th to 99.99th percentiles, and the top 0.01 percent). Each quintile contains approximately 20 percent of the civilian noninstitutionalized U.S. population, and each full percentile (that is, a percentile expressed as a whole number) contains approximately 1 percent of the population. However, because household sizes vary, the adjusted household income quintiles contain slightly different numbers of households (see Table A-1).

Appendix B: Details About the Recovery Rebate Credit, Expanded Unemployment Compensation, and the Expanded Child Tax Credit

The distribution of household income in 2021 was greatly affected by federal policies put in place temporarily in response to the coronavirus pandemic. The Congressional Budget Office has examined three of those policies in detail—the recovery rebate credit, expanded unemployment compensation, and the expanded child tax credit—because they had a particularly large impact.

The Recovery Rebate Credit

Beginning in March 2021, a recovery rebate credit of up to \$1,400 per qualifying adult or child was issued to taxpayers with income below specified limits. Although the federal budget counted the credits as outlays, CBO included them as part of refundable tax credits in this analysis because they were administered through the tax system.

The amount of each taxpayer's credit was determined according to a formula. Taxpayers with adjusted gross income (AGI) below certain limits were eligible for the maximum credit. Those limits were \$75,000 for single filers, \$150,000 for joint filers, and \$112,500 for head-of-household filers. The maximum credit was reduced until a taxpayer's AGI reached \$80,000 for single filers, \$160,000 for joint filers, and \$120,000 for head-of-household filers, beyond which taxpayers were not eligible for the credit.

To quickly obtain information about taxpayers' income to determine the credit amount for which they qualified, the federal government used each taxpayer's most recent tax return—in most cases, from 2019 or 2020. Many taxpayers who experienced changes in their income from 2019 to 2021 or from 2020 to 2021 received a different amount than what they would have qualified for on the basis of their 2021 income. Taxpayers who were eligible

on the basis of their 2021 income but not on the basis of their prior-year income could file to receive a payment later (known as a plus-up payment). Conversely, taxpayers who were eligible on the basis of their prior-year income but not their 2021 income received a payment but were not obligated to return it—that is, they had safe harbor from repayment.¹

The amount of the recovery rebate credit that went to each household was not available in the underlying data CBO used for this analysis. To compute those amounts, CBO used its microsimulation tax model, which applies the rules of the tax system to calculate the tax owed by each member of a representative sample of taxpayers. That model allowed CBO to apply the eligibility formula for the recovery rebate credit to the income associated with each member of its data sample for 2021.²

Expanded Unemployment Compensation

In 2020, lawmakers enacted legislation to temporarily expand unemployment compensation. The expansion took three forms, all of which were extended in 2021:

- Pandemic Unemployment Assistance (PUA) expanded the eligibility guidelines to include people who did not qualify for regular unemployment insurance, such as self-employed workers.

1. For a detailed discussion of plus-up payments and safe-harbor costs, see David Splinter, "Stimulus Checks: True-Up and Safe-Harbor Costs," *National Tax Journal*, vol. 76, no. 2 (June 2023), pp. 349–366, <https://tinyurl.com/2amjj5ub>.

2. To account for safe-harbor payments and plus-up payments, CBO used the lesser of 2020 and 2021 income to determine the size of the credit for each taxpayer.

- Pandemic Emergency Unemployment Compensation (PEUC) provided 13 additional weeks of compensation to people who exhausted their regular unemployment insurance benefits.
- Federal Pandemic Unemployment Compensation (FPUC) increased the benefit amount for people already receiving regular unemployment insurance or expanded benefits through PUA or PEUC by \$600 per week through July 2020. Payments resumed at the end of 2020 at a rate of \$300 per week and continued through September 6, 2021.

All of those benefits were funded in full by the federal government. The 2021 legislation also made the first \$10,200 in unemployment benefits for 2020 nontaxable for households. That effect is included in CBO's estimate of 2020 tax liabilities.

This analysis accounts for expanded unemployment compensation as a means-tested transfer program, even though regular unemployment insurance is accounted for as a social insurance benefit (and is therefore included in income before transfers and taxes). CBO allocated those types of unemployment benefits separately for three reasons. First, expanded unemployment compensation was the result of new legislation enacted in response to the pandemic. Second, its benefit amounts and eligibility criteria differed from those of regular unemployment insurance. Third, it was federally funded, whereas regular unemployment insurance is funded mainly by taxes collected from employers.

The payments made to households for unemployment benefits were recorded in both the Current Population Survey (CPS) and the Statistics of Income (SOI) data, which constitute the dataset that CBO uses for its distributional analyses. For this analysis, CBO made three adjustments to those data when allocating those benefits to households.

First, CBO adjusted the data to match the total unemployment benefits that were paid out according to administrative records. Although the SOI data contain information about which taxpayers received those benefits, those data cover only people who filed taxes. For people who did not file taxes, CBO used information about unemployment benefits from the CPS with a further adjustment: Because unemployment benefits were underreported in the CPS in 2021, CBO adjusted the data to allocate unemployment benefits

to nonfilers until the total in CBO's data matched the administrative total.³

Second, CBO reduced the total amount of unemployment benefits by about 10 percent to account for improper claims, including fraudulent claims, such as those made by people outside the United States using stolen identities. To determine the size of that adjustment, CBO assessed the research literature on the eligibility and receipt of unemployment claims in 2020.⁴

Finally, after CBO had allocated total unemployment benefits to each household in its dataset, the agency used a rule to allocate those benefits to one of two programs: pandemic-related expanded unemployment compensation or regular unemployment insurance. To make that allocation, CBO used the weekly earnings and employment data in the basic monthly versions of the CPS. Using those data, CBO simulated the rules of the two programs to estimate benefits under them for each affected individual. The agency then used those results to compute the average proportion of total unemployment benefits that came from each program according to individuals' total earnings and applied those averages to beneficiaries in its merged dataset. In general, people with lower earnings received a smaller share of their unemployment benefits in regular unemployment insurance than did those with higher earnings. That is because regular unemployment insurance benefits rise with earnings, whereas a large portion of expanded unemployment compensation benefits (specifically those provided through FPUC) were the same for all recipients. On average, a little over half of total unemployment benefits in 2021 were allocated to expanded unemployment compensation in CBO's analysis.

3. For a detailed discussion, see Jeff Larrimore, Jacob Mortenson, and David Splinter, "Unemployment Insurance in Survey and Administrative Data," *Journal of Policy Analysis and Management*, vol. 42, no. 2 (Spring 2023), pp. 571–579, <https://tinyurl.com/7r32pvs3>.

4. For example, see Government Accountability Office, *Unemployment Insurance: DOL Needs to Address Substantial Pandemic UI Fraud and Reduce Persistent Risks*, GAO-23-106586 (February 2023), www.gao.gov/products/gao-23-106586; and Eliza Forsythe, "Unemployment Insurance Reciprocity During the COVID-19 Pandemic," *National Tax Journal*, vol. 76, no. 2 (June 2023), pp. 367–391, <https://tinyurl.com/mrx7wud7>. Although some unemployment insurance benefits are paid out improperly each year, CBO usually does not adjust for them, because the overall benefits are relatively small. CBO decided to adjust its total to account for improper claims in 2020 and 2021 because the amount of unemployment benefits was much larger in those years than in prior years.

The Expanded Child Tax Credit

Before its expansion in 2021, the child tax credit amounted to \$2,000 per child for taxpayers with modified AGI up to \$200,000 for single filers and \$400,000 for joint filers. The credit phased out beyond those income thresholds.

In 2021, the child tax credit was temporarily amended in four main ways. First, the credit was increased to \$3,600 for each child under age six and to \$3,000 per child for other children of taxpayers with AGI under \$75,000 for single filers and \$150,000 for joint filers. Second, eligibility was extended to children age 17 instead of age 16. Third, the credit was made fully refundable, so taxpayers could receive the full credit even if they did not have offsetting tax liabilities or if they did not file taxes at all. And finally, an estimated portion of the credit was automatically paid to taxpayers in advance.⁵

5. A small portion of advance payments were repaid upon filing tax returns, mainly because of changes in filing status or increases in income.

Those changes expanded the child tax credit and nearly doubled total claims for it in 2021, increasing its total benefits from \$119 billion to \$228 billion. Moreover, because the eligibility thresholds for the expanded amounts were lower than before, lower-income households received a larger share of the expanded credit than under prior law. About 18 percent of the benefits of the regular child tax credit went to households in the lowest quintile, whereas 39 percent of the benefits attributable to the expansion of that credit went to those households.

The data sources in CBO's analysis did not include the full amounts of the child tax credit that were paid in advance to households that did not file taxes. To compute those amounts, CBO used its microsimulation tax model to apply the eligibility rules for the expanded version of the credit to the income associated with each member of its data sample for 2021.

Appendix C: Details About Income, Transfers, and Taxes

This appendix provides details about the average household income, means-tested transfers, and federal taxes for each income group in 2019, 2020, and 2021 in the Congressional Budget Office's analysis of the distribution of household income (see Table C-1). Those measures are

shown for each quintile, or one-fifth of the distribution, as well as for smaller groups. This appendix also provides data on tax and transfer rates and on each group's share of total income, transfers, and taxes (see Table C-2 and see Table C-3).

Table C-1.

Average Household Income, Means-Tested Transfers, and Federal Taxes, by Income Group, 2019 to 2021

2021 dollars

	Income before transfers and taxes			Means-tested transfers and federal taxes			Income after transfers and taxes		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
All quintiles	126,600	128,000	139,000	-18,000	-11,300	-15,200	108,600	116,700	123,800
Lowest quintile	25,200	22,300	22,500	16,300	24,700	26,200	41,600	47,100	48,700
Second quintile	55,600	53,500	53,600	2,900	11,900	10,900	58,400	65,400	64,500
Middle quintile	86,600	86,300	86,500	-7,200	800	-200	79,300	87,100	86,300
Fourth quintile	130,400	132,000	132,500	-19,700	-12,800	-14,800	110,700	119,200	117,700
Highest quintile	351,500	373,200	418,100	-84,300	-86,400	-101,300	267,100	286,800	316,800
81st to 90th percentiles	191,100	195,700	197,700	-36,700	-31,900	-34,900	154,400	163,900	162,800
91st to 95th percentiles	264,400	273,100	280,700	-57,000	-55,700	-59,300	207,400	217,400	221,400
96th to 99th percentiles	437,400	455,900	493,500	-105,800	-108,600	-122,000	331,600	347,300	371,500
Top 1 percent	2,097,900	2,391,100	3,126,400	-627,600	-719,200	-929,600	1,470,400	1,671,900	2,196,900

Data source: Congressional Budget Office. See www.cbo.gov/publication/60341#data.

Income before transfers and taxes is market income plus social insurance benefits. Means-tested transfers are cash payments and in-kind services provided through federal, state, and local government assistance programs for which eligibility is based primarily on income. Federal taxes consist of individual income taxes, payroll (or social insurance) taxes, corporate income taxes, and excise taxes. Income after transfers and taxes is income before transfers and taxes plus means-tested transfers minus federal taxes.

Income groups are created by ranking households by their size-adjusted income before transfers and taxes. Each quintile (one-fifth of the distribution) and each percentile (one-hundredth of the distribution) contains approximately the same number of people but different numbers of households. For information about the methods underlying this analysis, see Appendix A. For detailed definitions of income measures, see Appendix D.

Table C-2.

Average Means-Tested Transfer Rates and Federal Tax Rates, by Income Group, 2019 to 2021

Percent

	Means-tested transfer rate			Federal tax rate		
	2019	2020	2021	2019	2020	2021
All quintiles	5.1	7.8	6.5	19.3	16.6	17.4
Lowest quintile	65.4	94.1	93.5	0.6	-16.8	-22.9
Second quintile	14.1	23.1	20.5	8.9	0.9	0.3
Middle quintile	4.6	8.7	7.5	13.0	7.7	7.8
Fourth quintile	1.7	3.7	2.8	16.7	13.4	13.9
Highest quintile	0.3	0.9	0.5	24.3	24.0	24.8
81st to 90th percentiles	0.7	1.8	1.3	19.9	18.1	19.0
91st to 95th percentiles	0.4	1.1	0.8	22.0	21.5	21.9
96th to 99th percentiles	0.2	0.6	0.4	24.4	24.4	25.1
Top 1 percent	*	0.1	0.1	30.0	30.2	29.8

Data source: Congressional Budget Office. See www.cbo.gov/publication/60341#data.

Means-tested transfers are cash payments and in-kind services provided through federal, state, and local government assistance programs for which eligibility is based primarily on income. Average means-tested transfer rates are calculated by dividing the total means-tested transfers of each group by the group's total income before transfers and taxes (that is, market income plus social insurance benefits). Federal taxes consist of individual income taxes, payroll (or social insurance) taxes, corporate income taxes, and excise taxes. Average federal tax rates are calculated by dividing the total federal taxes of each group by the group's total income before transfers and taxes.

Income groups are created by ranking households by their size-adjusted income before transfers and taxes. Each quintile (one-fifth of the distribution) and each percentile (one-hundredth of the distribution) contains approximately the same number of people but different numbers of households. For information about the methods underlying this analysis, see Appendix A. For detailed definitions of income measures, see Appendix D.

* = between zero and 0.05 percent.

Table C-3.

Income Groups' Shares of Total Income, Means-Tested Transfers, and Federal Taxes, 2019 to 2021

Percent

	Income before transfers and taxes			Means-tested transfers			Federal taxes			Income after transfers and taxes		
	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
Lowest quintile	4.0	3.6	3.3	51.9	43.1	47.3	0.1	-3.6	-4.3	7.7	8.2	8.0
Second quintile	8.8	8.5	7.8	24.4	25.2	24.7	4.0	0.5	0.1	10.7	11.4	10.6
Middle quintile	13.7	13.5	12.3	12.4	15.1	14.1	9.2	6.3	5.5	14.6	14.9	13.8
Fourth quintile	20.4	20.2	18.7	6.7	9.5	8.0	17.7	16.3	15.0	20.2	20.0	18.7
Highest quintile	54.5	55.7	58.8	3.7	6.1	5.0	68.7	80.4	83.6	48.3	47.0	50.1
81st to 90th percentiles	14.8	14.7	13.9	2.1	3.4	2.8	15.3	16.0	15.2	14.0	13.5	12.9
91st to 95th percentiles	10.3	10.3	9.9	0.8	1.4	1.2	11.8	13.2	12.5	9.4	9.0	8.8
96th to 99th percentiles	13.4	13.5	13.9	0.6	1.0	0.8	17.0	19.8	20.0	11.9	11.3	11.7
Top 1 percent	15.9	17.3	21.1	0.1	0.2	0.2	24.7	31.4	36.0	13.0	13.3	16.6

Data source: Congressional Budget Office. See www.cbo.gov/publication/60341#data.

Income before transfers and taxes is market income plus social insurance benefits. Means-tested transfers are cash payments and in-kind services provided through federal, state, and local government assistance programs for which eligibility is based primarily on income. Federal taxes consist of individual income taxes, payroll (or social insurance) taxes, corporate income taxes, and excise taxes. Income after transfers and taxes is income before transfers and taxes plus means-tested transfers minus federal taxes.

Income groups are created by ranking households by their size-adjusted income before transfers and taxes. Each quintile (one-fifth of the distribution) and each percentile (one-hundredth of the distribution) contains approximately the same number of people but different numbers of households. For information about the methods underlying this analysis, see Appendix A. For detailed definitions of income measures, see Appendix D.

Appendix D: Terms Used in This Analysis

This appendix defines the many terms used in this analysis. The terms are listed according to the formulas used to compute the various measures. Within each category, the items are ordered from largest to smallest.

Household income, unless otherwise indicated, refers to income before the effects of means-tested transfers and federal taxes are accounted for. Throughout this report, that income concept is called **income before transfers and taxes**. It consists of market income plus social insurance benefits.

Market income consists of the following five elements:

- **Labor income.** Wages and salaries, including those allocated by employees to 401(k) and other employment-based retirement plans; employer-paid health insurance premiums (as measured by the Census Bureau's Current Population Survey); 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.
- **Business income.** Net income from businesses and farms operated solely by their owners, partnership income, and income from S corporations.
- **Capital gains.** Net profits realized from the sale of assets (but not increases in the value of assets that have not been realized through sales).
- **Capital income.** Taxable and tax-exempt interest, dividends paid by corporations (but not dividends from S corporations, which are considered part of business income), rental income, and the share of corporate income taxes borne by capital owners.
- **Other income sources.** Income received in retirement for past services and other nongovernmental sources of income.

Social insurance benefits consist of benefits from Social Security (Old Age, Survivors, and Disability Insurance), Medicare (measured by the average cost to the government of providing those benefits), regular unemployment insurance (but not expanded unemployment compensation), and workers' compensation.

Means-tested transfers are cash payments and in-kind services provided through federal, state, and local government assistance programs. Eligibility to receive such transfers is determined primarily on the basis of income, which must be below certain thresholds. Means-tested transfers are provided through the following programs: Medicaid and the Children's Health Insurance Program (measured by the average cost to the federal government and state governments of providing those benefits); the Supplemental Nutrition Assistance Program (formerly known as the Food Stamp program); housing assistance programs; Supplemental Security Income; Temporary Assistance for Needy Families and its predecessor, Aid to Families With Dependent Children; child nutrition programs; the Low Income Home Energy Assistance Program; and state and local governments' general assistance programs. For 2020 and 2021, CBO included expanded unemployment compensation in means-tested transfers.

Average means-tested transfer rates are calculated as means-tested transfers (totaled within an income group) divided by income before transfers and taxes (totaled within that income group).

Federal taxes consist of individual income taxes, payroll (or social insurance) taxes, corporate income taxes, and excise taxes. Those four sources accounted for over 90 percent of federal revenues in fiscal year 2021. Revenue sources not examined in this report include states' deposits for unemployment insurance, estate and gift taxes, net income of the Federal Reserve System that is remitted to the Treasury, customs duties, and miscellaneous fees and fines.

In this analysis, 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. Those taxes comprise the following four categories:

- **Individual income taxes.** Individual income taxes are levied on income from all sources, except those excluded by law. Statutory marginal individual income tax rates are the rates set in law that apply to the last dollar of income. Individual income taxes

can be negative because they include the effects of refundable tax credits (including recovery rebate credits and premium tax credits, which subsidize health insurance policies purchased through the exchanges established by the Affordable Care Act), which can result in net payments from the government. Specifically, if the amount of a refundable tax credit exceeds a filer's tax liability before the credit is applied, the government pays that excess to the filer.

- **Payroll taxes.** Payroll taxes are levied primarily on wages and salaries. They generally have a single rate and few exclusions, deductions, or credits. Payroll taxes include those that fund the Social Security trust funds, the Medicare trust fund, and unemployment insurance trust funds. The federal portion of the unemployment insurance payroll tax covers only administrative costs for the program; state-collected unemployment insurance payroll taxes are not included in the Congressional Budget Office's measure of federal taxes (even though they are recorded as revenues in the federal budget). Households can be entitled to future social insurance benefits, including Social Security, Medicare, and unemployment insurance, as a result of paying payroll taxes. In this analysis, average payroll tax rates capture the taxes paid in a given year and do not capture the benefits that households may receive in the future.
- **Corporate income taxes.** Corporate income taxes are levied on the profits of U.S.-based corporations organized as C corporations. In this analysis, CBO allocated 75 percent of corporate income taxes in proportion to each household's share of total capital income (including capital gains) and 25 percent to households in proportion to their share of labor income.

- **Excise taxes.** Sales of a wide variety of goods and services are subject to federal excise taxes. Most revenues from excise taxes are attributable to 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).

Average federal tax rates are calculated as federal taxes (totaled within an income group) divided by income before transfers and taxes (totaled within that income group).

Income after transfers and taxes is income before transfers and taxes plus means-tested transfers minus federal taxes.

Income groups are created by ranking households by their size-adjusted income before transfers and taxes. A household consists of people sharing a housing unit, regardless of their relationship. The income **quintiles** (or fifths of the distribution) contain approximately the same number of people but slightly different numbers of households (see Appendix A). Similarly, each full **percentile** (or hundredth of the distribution) contains approximately the same number of people but a different number of households. If a household has **negative income** (that is, if its business or investment losses exceed its other income), it is excluded from the lowest income group but included in totals.

About This Document

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

Bilal Habib wrote the report with guidance from Edward Harris, John McClelland, and Joseph Rosenberg (formerly of CBO). Brooks Pierce, Kurt Seibert, Naveen Singhal, and Ellen Steele contributed to the analysis. Daniel Page fact-checked the report.

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CBO seeks feedback to make its work as useful as possible. Please send comments to communications@cbo.gov.



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Director
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