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# Inequality's drag on aggregate demand

## The macroeconomic and fiscal effects of rising income shares of the rich

**Report** • By Josh Bivens and Asha Banerjee • May 24, 2022

**What this report finds:** Rising inequality has had serious economic and fiscal effects. Key among them: It has hurt economic growth. By 2018, the rise in income inequality since 1979 was reducing growth in aggregate demand by about 1.5% of GDP. Rising inequality constrains overall economic growth by reducing economywide spending: Spending falls as inequality redistributes income from lower-income households (that need to spend more of their income to meet living expenses) to higher-income families (that have the luxury to save money). EPI's estimate of the "all else equal" drag on household spending growth from rising inequality is based in part on a careful calculation of savings rates by income group that allows even savings decisions of very high-income households to be examined. For example, the data show that by 2018, the top 1% were securing 16.4% of income (income before taxes and benefits), up from 8.9% in 1979. And they were saving 30.6% of their income, over 60 times as much as the bottom fifth of households.

**Why it matters:** Our key fiscal and monetary policymaking institutions have far too often failed to stabilize demand growth and counter the effects of rising inequality. Congress has not made the tax and benefits (aka "transfers") system more progressive—taxing more at the top and spending more at the bottom—to counteract the rise in inequality. It has also tolerated long stretches of weak aggregate demand without

### SECTIONS

raising government spending enough to boost that demand. And with interest rates until just recently sitting at or near zero since the Great Recession, the Fed has had little room to boost spending with interest rate cuts. Without policy changes, inequality will likely drag on household spending, further slowing overall economic growth in the future as well.

**What we can do about it:** Because reduced worker bargaining power in the labor market is a key driver of the rise in income inequality before taxes and spending, policies that build worker power can help offset these trends. Policymakers can also enact tax policies that reduce the upward redistribution of income and spend more on tax credits and benefits that raise the overall share of income going to lower-income households.

# Introduction and key findings

Starting in the late 1970s, inequality in the U.S.—measured both by income before taxes and government benefits and income after taxes and benefits—began rising rapidly. This growth lasted until at least the early 2000s and never significantly reversed. The rise in income inequality reflects a failure of policy on two fronts. First, policy choices were made to intentionally weaken the bargaining power of workers, and this erosion of workers' power fueled inequality in market-based incomes. Second, the U.S. system of federal taxes and benefits (known as transfers), while income-equalizing generally, did not become more progressive in the face of rising inequality and thus largely failed to slow it. These policy failures were not just detrimental to workers—they had a negative effect on macroeconomic growth.

Our analysis of rising inequality, its main drivers, and its potential effects on U.S. economic performance and on fiscal outcomes finds that:

- Our tax and transfer system is designed to be progressive (taxing more at the top and spending more at the bottom) but it barely slowed the expanding gap between incomes of high- and low-earning families over the last four decades.
    - In technical terms, rising inequality in disposable incomes (i.e., income after taxes and benefits, or "post-fiscal income") is more than explained by developments in pre-tax and benefits (or *pre-fiscal*) incomes: pre-fiscal income gaps grew significantly, and taxes and benefits only very modestly *reduced* the rise in pre-fiscal income inequality. For example, the top 1% of households saw their share of total income before taxes and government benefits rise by 7.5 percentage points between 1979 and 2018 (from 8.9% to 16.4%), while their share of income after taxes and benefits rose by a still sizable 6.0 percentage points (from 7.4% to 13.4%).
- Due to their expanding share of income over the last four decades, the top 10% (as of

2018) secured 34.5% of all post-tax-and-benefits income in 2018, more than the bottom 60% (31.9%).

- By redistributing income from lower-income households that spend money to higher-income households that have the luxury to save money, the rise in inequality reduces growth in aggregate demand by about 1.5% of GDP annually. This "all else equal" drag on household spending growth imposed by rising inequality in post-tax-and-benefits income was even higher in 2007, when it peaked at 2.0% of GDP.
- Policy failures in the labor market have helped fuel the rise in inequality. Pre-tax-and-benefits income inequality grew largely because typical workers lost bargaining power, thanks in part to intentional policy decisions that shifted the balance of power in labor markets away from typical workers. The reduced bargaining power of workers is evident in the split between productivity growth and pay: Between 1979 and 2019 economywide productivity rose by nearly 60%, while hourly pay for nonsupervisory workers rose less than 14%. In the first three decades following World War II, when policy was oriented much more strongly to give rank-and-file workers more power, these measures rose much more tightly together.
- The pronounced shift in labor market power had profound effects on a number of economic outcomes (at least before the COVID-19 pandemic). In addition to the rapid rise in pre-fiscal income inequality discussed, the shift in labor market power reduced the pace of wage growth at any given unemployment rate. And, by fueling the rapid rise in pre-fiscal income inequality, the shift in labor market power contributed immensely to the significant drag on growth in household consumption spending (documented above) that led to reduced growth in aggregate demand more generally.
- The policy institutions meant to stabilize demand growth have proved not up to the task in the face of this large rise in inequality. Both fiscal and monetary policy failures failed to significantly slow inequality's expansion or stem its effects.
    - As noted, policymakers (i.e., Congress) have not made the tax and transfer system more progressive—taxing more at the top and spending more at the bottom—to counteract the rise in inequality. And they have tolerated long stretches of weak aggregate demand without raising government spending enough to boost that demand.
    - Monetary policymakers (i.e., at the Federal Reserve) for a time try to keep an increase in household savings from dragging on demand by lowering interest rates to spur investment. But when rates settled near zero around 2008 and mostly remained there, the Fed had little room left to boost sluggish spending with interest rate cuts.
- The large rise in pre-fiscal income inequality has also had large potential effects on the nation's fiscal balance and public debt. However, many of these effects are likely counterbalancing.
    - All else equal, the rise in pre-fiscal inequality likely *reduced* budget deficits as tax payments collected from higher-income households increased more than benefits and tax expenditures going to lower-income households (the first-round

mechanical effect). These effects reduced the federal budget deficit by almost 3.5% of GDP in 2018. Federal income taxes collected from the top 10% of the income distribution were a significant contributor: as their share of income essentially doubled, the progressive income tax system meant that more revenue was collected even as their federal tax *rates* fell.

- But at the same time there was pressure increasing budget deficits arising from another large potential effect of rising pre-fiscal income inequality, specifically its effect on overall economic growth. If overall growth was demand-constrained for a significant number of years in recent decades, and if this demand constraint was exacerbated by the rise in pre-tax fiscal income inequality, then budget deficits would be pushed up in those years by the rise in inequality. We find that the effect of demand-constraints generally on growth over the post-1979 period likely increased budget deficits enough to add roughly 30 to 70 percentage points to public debt over that period. This is about half as large in absolute terms as the mechanical effects stemming from changing income shares highlighted in the previous bullet point.

The sections that follow begin with some important data clarifications, namely that the measure of income before taxes and government benefits actually includes labor-related benefits payments like Social Security and unemployment benefits because that is what is included in the data set from the Congressional Budget Office. We then document trends in inequality, present evidence that changing relative bargaining power in labor markets is the root cause of many of these trends, and discuss the large potential macroeconomic effects of rising inequality and how policy institutions meant to stabilize macroeconomic outcomes have been overwhelmed by the rise in inequality. Finally, we examine the channels through which rising income inequality may affect budget deficits and debt.

# Trends in inequality

Since 1979, U.S. incomes have become increasingly dispersed (spread over a wider range, and thus more unequal), and the share of total income held by the top 10%, 5%, and 1% has risen rapidly (Piketty, Saez, and Zucman 2018; CBO 2021). We assess trends in income growth using data from the latest report in the Congressional Budget Office's *Distribution of Household Income* series, which includes data through 2018 (CBO 2021). The CBO data set compiles comprehensive income information for all five income quintiles or "fifths," as well as the top 10%, top 5%, and top 1% of the income distribution.

## Definitions of household income

CBO's income data set includes many different definitions of income. *Market income* consists solely of income derived from wages and other forms of labor income (including cash wages, employer contributions to health insurance premiums, payroll taxes, business income), and capital income (such as capital gains, dividends, rent, interest payments, and business income). Market income does not include *any* effects from taxation by the

government, or from the payments and benefits that individuals and families with specific needs get from government-run safety net and social insurance programs. These benefits, such as food stamps and unemployment benefits, are known as transfers because they transfer resources from the government's tax coffers to individuals and families in need.

*Income before taxes and transfers* per the CBO is a little bit of a misnomer. It actually consists of market income *plus some* of what is generally considered transfers income, specifically social insurance benefits, including Social Security, Medicare, unemployment insurance, and workers' compensation. The reasoning for including this income is that receiving income from these programs is conditional upon labor earnings earlier in one's career. In our summary and figures, this is the income we are discussing when we refer to income before government taxes and benefits. In our detailed analyses, we use the shorthand term *pre-fiscal income*, as it represents income largely before the effects of fiscal policy (government taxing and spending) kick in.

*Income after taxes and transfers* as calculated by CBO includes market income and social insurance benefits and adds *means-tested transfers* and tax credits then subtracts federal tax payments. *Means-tested transfers* are cash payments and in-kind benefits from safety net and anti-poverty programs operated by local, state, and federal governments, programs such as Supplemental Nutrition Assistance Program (SNAP, commonly known as food stamps), Medicaid, and Temporary Assistance to Needy Families (TANF). In our summary and figures, this is the income we are discussing when we refer to income after government taxes and benefits (it is also commonly referred to as *disposable income*)**.** In our detailed analyses, we use the shorthand term *post-fiscal income*, as it represents income largely after the effects of fiscal policy (government taxing and spending) kick in.

The inclusion of social insurance payments in pre-fiscal income is slightly odd. Social Security, for example, is clearly a government transfer, and it is far from obvious why a measure of households' resources *before* fiscal policy (government taxing and spending) is accounted for should include it. Often for ease of comparability and exposition we stick with the CBO definitions and our shorthand terms for the CBO categories. But occasionally we include social insurance incomes in a measure of transfer payments, and when we do, we note that explicitly in the text.

Obtaining a measure of income inequality requires *ranking* households by the level of income. Because there are a number of definitions of income, there are also a number of options for how households are ranked to define inequality. For this paper, we rank households by post-fiscal, or disposable, income. This essentially ranks households on the basis of the resources available to them in the real world (i.e., after the influence of the tax and transfer system is exerted).

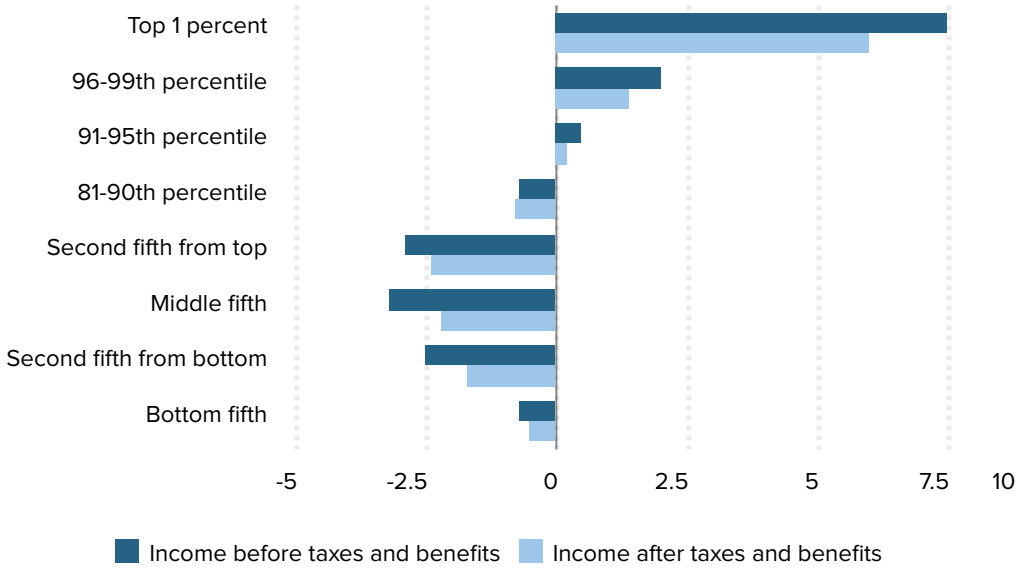
## Large income share changes between 1979 and 2018

By either measure of income, both pre-fiscal and post-fiscal, inequality has risen sharply since 1979. This trend has led to a sharp concentration of income in the top of the

Figure A

## Since 1979, income share has risen for the top 10% but fallen for the rest

Percentage-point change in each income group's share of total income from 1979 to 2018




**Notes:** We subtract 1979 income shares from 2018 income shares for each group. Income before taxes and government benefits includes benefits from social insurance programs like Social Security and unemployment because the Congressional Budget Office includes those labor-related benefits in its data set. Income after taxes and benefits includes not only social insurance benefits but benefits like food assistance payments that households qualify for by virtue of their incomes, as well as income from tax credits, minus tax payments. Households are ranked in the income distribution by income after taxes and benefits.

**Source:** Congressional Budget Office household income data (CBO 2021).

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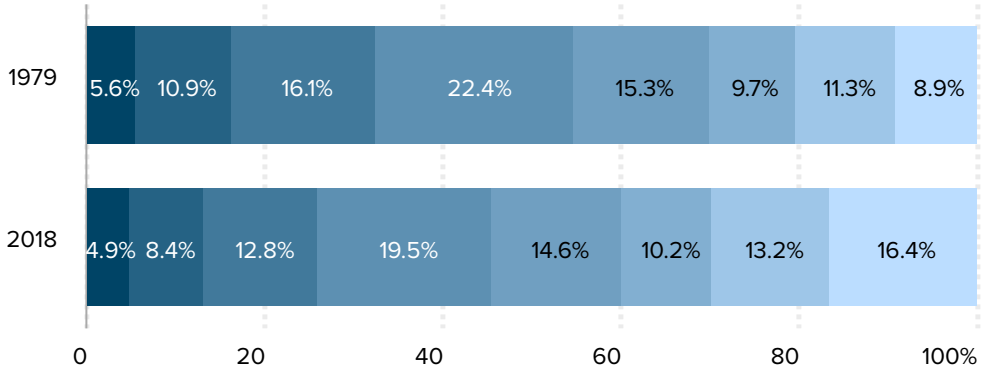
distribution. **Figure A** shows the percentage-point change in the share of total income held by each income group between 1979 and 2018, for both types of income. Both sets of income follow the same general trend: the top 1% increased its share of income the most, followed by the 96th-99th percentile, while households in each of the fifths below the top fifth saw steep declines in their income shares. Figure A also documents that the income share increases for households in the higher-income groups and corresponding income share decreases for households in the lower-income groups are consistently larger for pre-fiscal income than for post-fiscal income.

**Figure B** shows what these trends mean in terms of actual income shares held by each group. As the figure shows, the bottom fifth held just 4.9% of all pre-fiscal and 7.0% of post-fiscal income in 2018, down from 5.6% and 7.5% respectively in 1979. The middle fifth saw its share of income shrink from 16.1% to 12.8% (pre-fiscal) and from 16.6% to 14.4% (post-fiscal) from 1979 to 2018. Meanwhile, over this same period, the share of income held by the top 10% increased from 29.9% to 39.8% (pre-fiscal) and from 26.9% to 34.5% (post-fiscal).

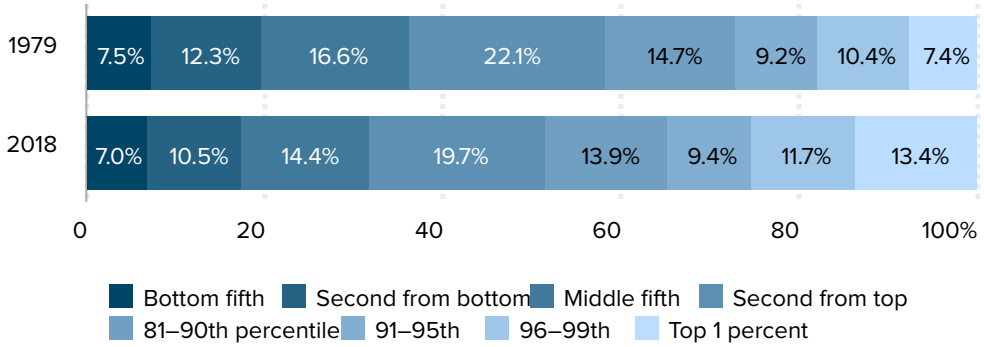
Figure B

## Rising income shares at the top mean the top 10% get a greater share of income than the bottom 60%

Income before taxes and benefits




Income after taxes and benefits




**Source:** Congressional Budget Office household income data (CBO 2021).

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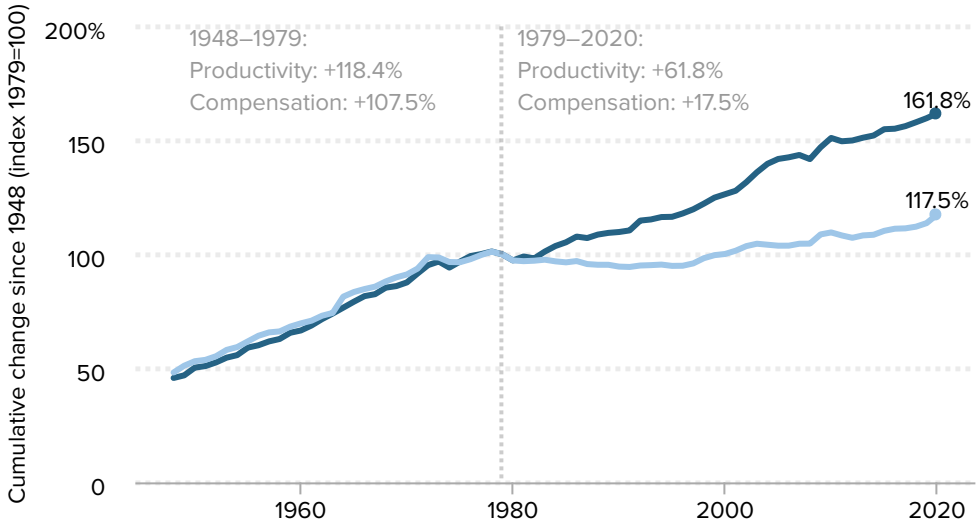
The steeper gains and losses in income shares before taxes and government benefits suggest that it is trends and developments in pre-fiscal income that have been driving inequality since 1979. Perhaps most strikingly, the loss of pre-fiscal income shares for the bottom fifth from 1979 to 2018 barely changes when the effect of government taxes and benefits factor in (a 0.7 percentage-point decline becomes a 0.5 percentage-point decline). In short, the tax and transfer system seems to be doing quite little to shield the poorest fifth of households from the effects of rising inequality.

Figure C

## The gap between productivity and a typical worker's compensation has increased dramatically since 1979

Productivity growth and hourly compensation growth, 1948–2020




**Notes:** Data are for compensation (wages and benefits) of production/nonsupervisory workers in the private sector and net productivity of the total economy. "Net productivity" is the growth of output of goods and services less depreciation per hour worked.

**Source:** Adapted from "The Productivity–Pay Gap" (EPI 2021), which is based on EPI analysis of unpublished Total Economy Productivity data from Bureau of Labor Statistics (BLS) Labor Productivity and Costs program, wage data from the BLS Current Employment Statistics, BLS Employment Cost Trends, BLS Consumer Price Index, and Bureau of Economic Analysis National Income and Product Accounts.

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# Labor market power as the root cause of rising inequality

As the previous section suggests, it is trends in pre-fiscal income that have driven the post-1979 rise in inequality. Bivens and Mishel (2021) document more specifically that is trends in market income—and particularly in the U.S. labor market—that have been the root cause of this rise in inequality. **Figure C** highlights this labor market weakness, tracking growth in economywide productivity and real (inflation-adjusted) hourly pay for typical U.S. workers over the long run. Productivity is a measure of the national income (or output) generated in the average hour of work in the economy. It includes not just wages and benefits paid to workers, but corporate profits, business income, proprietor's income, property rent, and all other income flows. Because productivity growth means more income is being generated per each hour of work, it represents the ceiling on how much living standards can grow on average in the economy.

From 1948 to the mid-1970s, the typical workers' hourly pay grew in lockstep with productivity growth. During this period, the United States was in the second half of a period of declining inequality known as the "Great Compression" of incomes that began

following the Great Depression and the run-up to World War II. Since the business cycle peak of 1979 these measures have diverged sharply, with hourly pay of production/nonsupervisory workers in the private sector lagging further and further behind productivity. This growing wedge between pay and productivity meant that large amounts of income were being generated in the U.S. economy but were not ending up in typical workers' paychecks. Instead, this income ended up, mostly, in large increases in pay for corporate managers and executives and, to a lesser degree, in corporate profits and other measures of business income. This transfer of income that once went to typical workers' pay going toward the salaries of managers and executive and toward profits led to large increases in overall inequality. By 2019 (before the COVID-19 pandemic and its unusual impact on the economy), productivity was up nearly 60% since 1979, while worker pay was up just under 14%.

The labor market changes that led to this wedge between pay and productivity have been intensely debated for decades. Through the 1980s and 1990s most explanations were generally centered in competitive models of the labor market where workers' wages are assumed to track their marginal productivity. This competitive models–based research focused on influences—like "skill-biased technological change" or the effect of international trade on the structure of U.S. production—that could shift the relative demand and supply of workers in competitive markets. But, as much research has documented, these explanations fail to account for a number of salient facts about the U.S. labor market (Card and DiNardo 2002; Schmitt, Shierholz, and Mishel 2013; Bivens and Mishel 2021). For example, workers with highly similar observable characteristics (age and years of education, say) often earn very different hourly wages and these differences are correlated tightly with race and gender. In competitive labor markets, one would expect similar workers to earn similar pay. As another example, in the late 1990s, we stopped seeing a correlation between increasing wage inequality and a rising return for having a four-year college degree. In competitive labor markets, one would expect that workers who obtain college degrees would be able to leverage the demand for their education and skills to secure wage increases. But since 2000, wages for college graduates as a whole have grown anemically, while wages for the overall top 5%—and especially the top 1% of workers—have grown at an ever-accelerating rate.

The failure of competitive labor market models to explain key wage and employment trends has led to increasing calls to adopt models of the labor market in which some sort of market power is present. In fact, the 2021 Nobel Memorial Prize in Economics winner David Card focused on this in his speech for the 2022 Annual Meeting of the American Economic Association (Card 2022), noting that "the time has come to recognize that many—or even most—firms have some wage-setting power. Such a shift was made with respect to firm's *price-setting* power many decades ago." Stansbury and Summers (2020) note the strong evidence that declining worker power is the key factor in driving inequality in recent decades. Bivens and Mishel (2021) analyze a range of discrete policy changes that shifted bargaining power in labor markets away from typical workers, and survey the research literature to assess how much each change explains the wedge between productivity and pay that has emerged since the late 1970s.

They find that discrete policy changes likely explain three-quarters of the entire wedge

between productivity and pay by 2019.[1] And of these policy changes, there are three that account for half of the gap between productivity and pay:

- The turn to more-austere macroeconomic policy driven largely by a desire to keep inflation (rather than unemployment) very low at all times, but sometimes simply by partisan politics.[2]
- The decline in unionization driven by the failure of labor law and its enforcement to protect workers seeking to form unions from employer tactics that thwart collective bargaining rights.
- The integration of the U.S. economy and the much-poorer global economy on terms deeply disadvantageous to U.S. workers.

For those concerned that the growth in inequality has been a bad thing for American society, the strong link between inequality and policy changes is in some ways promising news. If policy efforts that changed the rules of the labor market so effectively redistributed income upward in the past, rewriting these rules to orient them toward boosting wage growth for typical workers could progressively redistribute income toward working families. Too often, federal policy debates assume that the only way we can reliably reduce inequality is to use taxes and transfers to claw back some income for the bottom parts of the income distribution. In other words, they assume that income inequality before taxes and government benefits is a given, and that all we can do is try to use taxes and benefits to shrink inequality. This clearly isn't true—there are a range of other policies with the power to deliver a more-equitable distribution of income, if that's what policymakers choose.

# How inequality affects economic growth

As the previous two sections have shown, pre-fiscal incomes have driven overall inequality since the late 1970s, and the dramatic decrease in workers' bargaining power in the labor market is the largest contributor to the rise in pre-fiscal income inequality over the same period. This section documents that it is not just low- and middle-income households who suffer, but the economy as a whole. In addition to shunting more and more income growth away from low- and middle-income households, rising inequality also hurts the macroeconomy. Most obviously, the rise in inequality slows aggregate household spending by redistributing income *from* households with higher propensities to spend their current income (i.e., lower-income households) and *toward* households with higher propensities to save (i.e., higher-income households). If this drag on household spending growth is not somehow counterbalanced by increased spending by businesses and governments, then it will pull down aggregate demand and potentially constitute a large drag on economic growth.

Inequality's drag on demand was documented in Bivens 2017, which found that relative to a 1979 baseline, by 2007, rising inequality lowered aggregate demand growth by over 4

percentage points of GDP annually. Decreased aggregate demand growth is not the only way in which inequality can affect growth. Cingano (2014), for example, has found that among nations of the Organisation for Economic Co-operation and Development (OECD), a period of an expanding gap between low-income households and the rest of the population has a negative impact on subsequent growth, specifically through the channel of human capital. Specifically, Cingano (2014) finds that the gap between low-income households and the rest of the population depresses skill developments for those with lower parental education background. Cingano (2014) concludes that redistribution policies in the tax and transfer system are critical to sustaining growth by making sure the benefits of growth are fairly distributed.

## Higher-income households have much higher savings rates

The way that income inequality drags on aggregate demand is relatively straightforward: It redistributes income away from low- and middle-income households (which save a lower share of their income, because basic living expenses consume so much of their income) toward higher-income households (which save a higher share of income, because they have the luxury to do so). Thus, rising inequality means that each dollar of income in the economy now supports less household spending, and more savings. The resulting lower household spending due to income redistribution then, all else equal, weakens aggregate demand. In theory, there are countervailing economic forces that can keep an increase in household savings from dragging on aggregate demand. For example, if interest rates fall then businesses might desire to invest more in new plant, equipment and processes, and hence the increase in savings could be seamlessly channeled into new spending, keeping aggregate demand stable. In practice, most of these countervailing forces depend on active policy decisions, and they have largely not been able to keep aggregate demand stable in the face of rising inequality.

While intuitively it makes sense that higher-income households save a higher share of their income, efforts to quantify savings rates by income group—especially small groups at the top of the income distribution—are quite difficult. For example, the Consumer Expenditure Survey conducted by the U.S. Census Bureau on behalf of the Bureau of Labor Statistics is widely thought to miss lots of consumption spending by rich households (see Aguiar and Bils 2015), and its income measures are "top-coded" so that the true incomes at the top of the income distribution cannot be calculated (Yang and Toth 2014). See Gould 2019 for an explanation of top-coding, which essentially involves protecting the confidentiality of top wage earners by recording wages only up to a certain threshold, which hasn't increased in decades.

Our methodology for constructing savings rates for even small income groups at the top of the distribution builds from Maki and Palumbo 2001, Cynamon and Fazzari 2015, and Bivens 2017, and involves tracking net new assets acquired by households (which is essentially the definition of savings).

We build on Bivens 2017 in one key way. Bivens 2017 used data from the Survey of

Consumer Finances (SCF) from the Federal Reserve to obtain the share of various assets held by income groups.[3] This distributional data was then combined with aggregate macroeconomic data from the Financial Accounts of the United States (FAUS) showing the net acquisition of each asset in a given year.

This 2022 analysis, like Bivens 2017, uses the macroeconomic data from the FAUS on net acquisition of various assets. But it exploits a new distributional data set that does not require using the microdata from the SCF: the Distributional Financial Accounts of the United States (DFA), also compiled by the Federal Reserve. The DFA provides data on the *share* of fairly detailed assets and liabilities held by each income grouping. We can then map this onto the macroeconomic data showing the aggregate net acquisition of these assets and liabilities in a given year. **Appendix Table 1** provides the precise mapping between the DFA and the FAUS.

For each income group, this allows us to construct a measure of the value of total assets (net of liabilities) newly acquired each year. As noted, this acquisition of net new assets is essentially the definition of savings. For each income group we then obtain an estimate of aggregate income by multiplying the number of households in each group by the average household income—both of which are provided in the CBO data on household income distribution. Finally, by dividing the net acquisition of financial assets by total income for each group, we derive a group-specific (average) savings rate.

Most macroeconomic measures of personal savings do not include realized capital gains in their income measure. To make our measure more comparable with standard measures, we pull out realized capital gains from the measure of post-fiscal income that we use in the denominator of our savings rate. **Figure D** clearly shows a staggering difference in saving rates for each income group. The top 1% of the income distribution saves 30.6%, compared with 0.5% for the bottom 20%, a 61-fold difference.

**Why haven't most measures of personal savings risen?**

Measured at a point in time, savings rates of high-income households in the United States are always far higher than savings rates of low- and middle-income households. However, since 1979, even as the share of total income in the economy claimed by high-saving and high-income households has risen sharply, many conventional measures of the U.S. personal savings rate have not risen or have even declined. If high-income households are securing a growing share of income, and if they save a lot of their income, then it seems the personal savings rate for the economy overall would be rising. Yet it is not. Can this be explained?

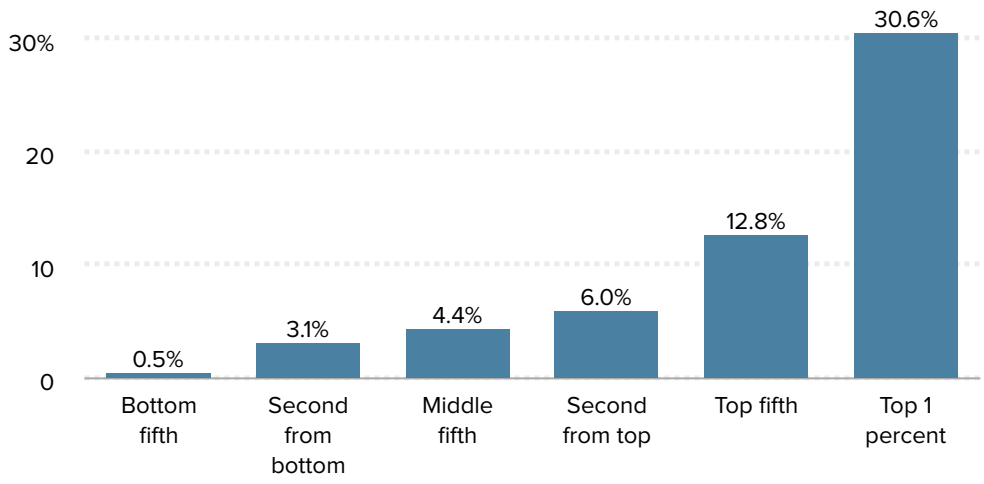
It can, as there are many scenarios in which individual households' attempts to save a higher share of their income fail to translate into an economywide increase in savings.

First, there are measurement complications that may explain the discordance in the data. For example, for rich households, much of their savings are actually

Figure D

## The top 1% of the income distribution saves over 60 times as much as the bottom 20%

Net savings rates by income group (2007–2018 pooled data average)




**Notes**: Savings rates are a measure of net new assets acquired by households, which are grouped according to distribution of income after government taxes and benefits.

**Source:** Data on personal savings and income shares from the Federal Reserve Board (FRB 2021a, 2021b) and household income data from the Congressional Budget Office (CBO 2021).

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held in the form of retained earnings by the corporations whose stock they own (Bivens 2017; Chen, Karabarbounis, and Neiman 2022; and Mian, Straub, and Sufi 2019). Savings by corporations have risen sharply in recent decades. Given that the way we measure savings in this current paper looks only at new acquisitions of corporate equities, savings by corporations (held implicitly on behalf of their owners) thereafter will escape being captured by our household-level data. These corporate savings are also missed by conventional measures of personal savings.

As another example, when households make savings decisions to meet a specific desired level of wealth, they may include in their calculation capital gains—increases in an asset's value that raise measured wealth but are not captured in traditional measures of "savings." Measures of personal savings rates that show declines in recent decades do not include realized or unrealized capital gains (increases in the value of assets owned, whether they were realized by selling them or not). If households adjust savings out of current income to target a given level of wealth, then it could be argued that the proper way to measure changes in wealth (or savings) of these households should account for

these capital gains. Including them has been shown to raise measured savings rates substantially (Robbins 2018).

Besides these measurement issues is a more subtle—but hugely important—effect of savings patterns on economic data, as explored by Pettis (2017) and Krugman (2009), among others. As they explain, it is possible for a strong increase in desired savings by households to translate into no increase—or even a decrease—in total personal savings. The chain of effects is as follows. First, a sharp increase in household savings *reduces* household consumption spending. All else equal, this will lower aggregate demand and cause productive resources in the economy to be idled. Then, in turn, GDP and national incomes will decline. Since households' desired savings are generally a fixed fraction of total income, this decline in total income will lead to a decline in total savings, even as households are "trying" to save more (i.e., trying to devote a higher share of income to savings rather than consumption). In fact, an increase in households' desired savings will only translate seamlessly into higher total savings and higher savings rates when the increase in savings is channeled smoothly into higher business investment or higher government spending (which will in turn generate larger budget deficits).

In the last sections of this paper, we show that federal budget deficits likely were reduced in recent decades through some of the channels linking inequality, taxes, and transfers. One interpretation of this is that the expected boost in national savings stemming from the redistribution of income toward higher-income households took the form of increased public savings (or smaller budget deficits) rather than increased personal savings rates.

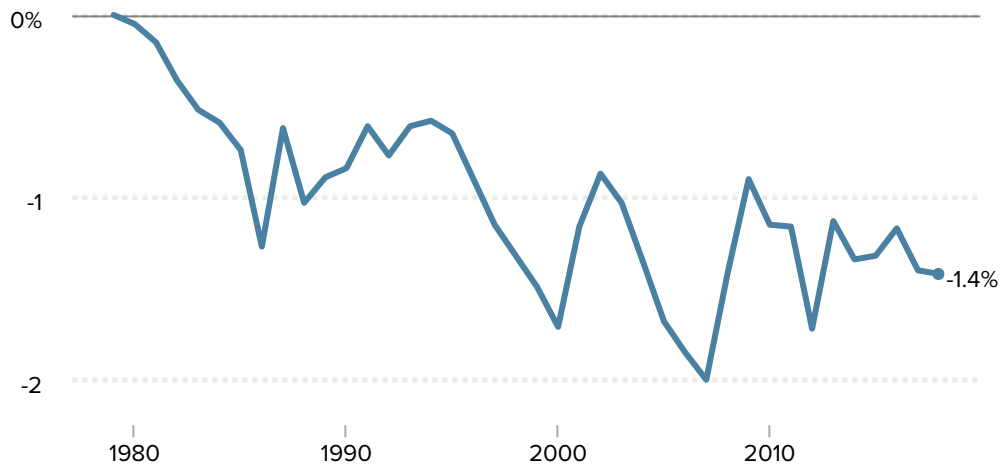
## The redistribution of income toward higher-saving households translates into slowed spending economywide

With these estimates of savings rates by income group, we can quantify more specifically the impact of inequality's redistribution of income on economic growth and aggregate demand. We know that redistribution of income from the bottom and middle to the top of the income distribution should be expected to curtail household consumption spending, all else equal. In **Figure E**, we calculate this spending drag as a percentage of GDP, using the savings rates from Figure D. To construct this, we multiply the change in income share for each income group by *one minus their savings rate*. This provides a rough estimate for how much consumption spending changed for each income grouping. Then, we sum across income groups to obtain a measure of how much *aggregate* consumption spending changed due to the inequality-induced changes in income shares. This implied

Figure E

## Income concentration at the top has dragged on household spending since 1979

How much the upward redistribution of income lowered economywide household spending, as a share of GDP




**Notes:** To estimate the drag on household spending stemming from the upward redistribution of income, we subtract the savings rates by income group (See Figure D for savings rates calculations) from 1, and then multiply this derived propensity to consume out of income by the income shares for each group to estimate household spending for each group. Then, we sum across all groups to get an aggregate household spending estimate. We do this with actual data, and then construct a counterfactual level of spending that holds 1979 income shares constant. The difference between these is the "all else equal" effect of changing income shares on household spending. We express this spending drag as a percent of overall U.S. GDP.

**Source:** Congressional Budget Office household income data (CBO 2021) for savings rates and income shares and GDP and personal income data from the Bureau of Economic Analysis's National Income and Product Accounts (BEA 2021a; 2021b).

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fall in aggregate household spending we initially calculate is implicitly expressed as a share of total household income (because that is what the CBO data is measuring). Because many macroeconomic variables traditionally are scaled to overall gross domestic product (GDP), we convert this into a fall in household spending as a share of overall GDP by multiplying it by the ratio of aggregate personal income to GDP.

By doing this, we provide a measure of the "all else equal" effect of how much the rise in inequality dragged on household spending relative to the baseline of no increase in inequality. By 2007 this drag reached 2% of overall GDP. The temporary decline in inequality that occurred when financial markets and stock prices collapsed during the Great Recession of 2008–2009 reduced this drag, but by 2018 rising inequality was still curbing spending by almost 1.5% of GDP.

To put a raw dollar figure on this drag, imagine policymakers wanted to undo this drag through a fiscal stimulus package (presumably because the Fed has little room to boost sluggish spending with interest rate cuts). Imagine further that the stimulus package was

reasonably well-structured, with a "fiscal multiplier" of 1.25—meaning that every dollar spent generated $1.25 in additional economic activity. This package would have to be nearly $300 billion, and it would have to recur each year.

## Failure of countervailing levers lets inequality slow growth

Slowed household spending doesn't always reduce aggregate demand or impinge on economic growth. If other countervailing forces in the economy allow the expanding pool of household savings to be channeled into more investing by businesses or other activities that boost aggregate demand, or if governments spend more (via expansionary fiscal policy), then aggregate demand can be held constant in the face of the drag on household spending. But in recent decades, the policy institutions meant to stabilize the macroeconomy have not been able to either curb rising inequality or lessen the resulting drag on aggregate demand.

Monetary policy as deployed by the Federal Reserve has been more consistently applied to spur growth in recent decades than in the more distant past, but it has proved too weak as an expansionary policy tool. Most notably, the Fed has regularly ratcheted down the federal funds rate (the interest rate that banks pay on overnight loans) in the hope of prompting declines in credit card, mortgage, and other rates thereby stimulating investment and consumption. However, this policy lever has all but been maximized since the early 2000s, as shown in **Figure F**. It shows the federal funds rate since 1960 along with decade averages (the horizontal bars). As the decade averages show, the Fed's policy interest rate has continued to decline, resting at essentially 0 since after the 2007–2009 Great Recession.

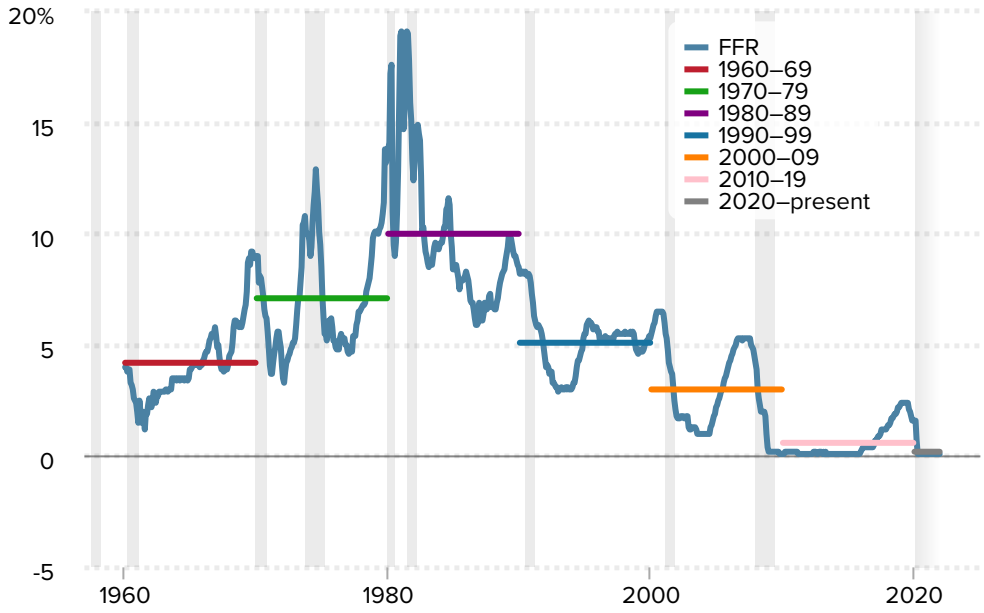
The failure of low interest rates to reliably spur growth has sometimes been analogized to "pushing on a string." Despite low and falling interest rates, the economic recoveries from each of the three most recent recessions before 2020 were agonizingly slow. Essentially, interest rates have been effectively pushed to near zero for decades, making it impossible to further cut rates in an attempt to neutralize economic phenomena—like rising inequality—that may be dragging on aggregate demand. As a result, the slowdowns in aggregate demand have become the binding constraint on overall growth.

Fiscal policy has been even less effective than monetary policy in reining in inequality and alleviating demand constraints. The federal tax and transfer system can impact inequality by spending more on safety net and social insurance programs (transfer programs) that benefit households at the bottom, and taxing more at the top. One way we can estimate the efficacy of the tax and transfer system is by calculating the transfer rate, which is tax credits and deductions and transfers a household receives as a share of its pre-tax-and-transfer income. The transfer rate differs among households at different points in the income distribution just as tax rates do. **Figure G** shows the *net* transfer rate (the transfer rate minus the federal tax rate), to depict how much pre-fiscal incomes for each income group have been buoyed or reduced by the effect of taxes and transfers since 1979. In this period, the net effect of taxes and transfers has always boosted incomes for the bottom

Figure F

## Slowing demand means that lower and lower Interest rates have been needed over time

Effective federal funds rate, actual and decade averages, 1960–2021




**Notes:** Data are monthly averages. Horizontal lines are averages over dates indicated. Shading indicates recessions.

**Source:** Authors' analysis of Effective Federal Funds Rate data from the Federal Reserve (FRED 2021).

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40%, and since the early 1990s has even boosted incomes for the middle fifth of the income distribution. The fact that the transfer rate for the bottom fifth of households exceeds 40% confirms that our progressive tax system is working at least somewhat as designed: the lowest-income households don't have to pay large amount of taxes and they receive government benefits to help them meet their needs (though the U.S. social safety net is weaker than in other countries).[4]

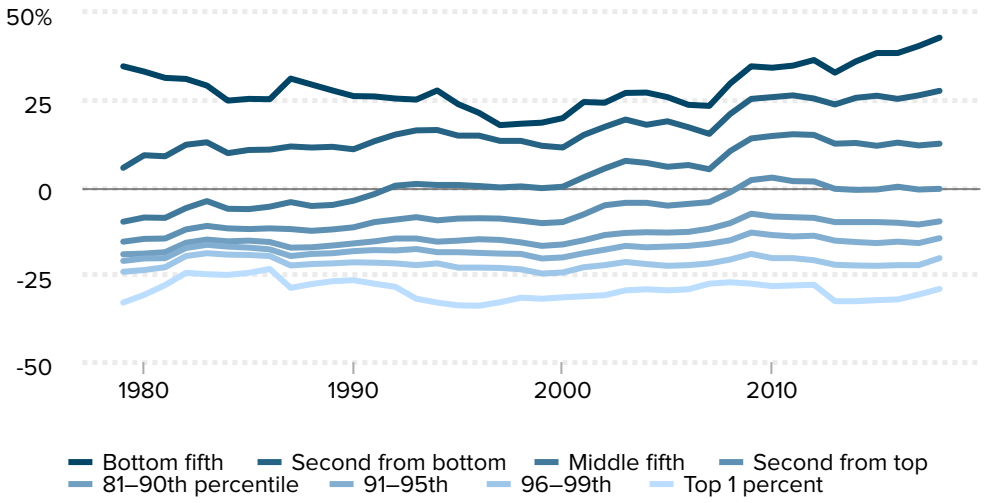
Conversely, the net effect of taxes and transfers reduces incomes for all groups with incomes at or above the 60th percentile, and, by growing amounts (an outcome of the progressive federal tax system). But, over the entire 1979 to 2018 period, these net transfer rates have not changed nearly enough to neutralize most of the rise in pre-fiscal inequality. Even when the net transfer rate has increased dramatically, it often turns out to have been driven as much by the denominator growing much slower (due to weak pre-fiscal income growth) as by increased absolute generosity of the tax and transfer system (the numerator). For example, in 1979 the net tax and transfer rate for the bottom fifth was 34.7%. It remained beneath this level until 2011. Between 2011 and 2018, it rose from 34.7% to 42.7%. But over that same period, the bottom fifth's market income grew at well under 1% per year (only about a third as fast as overall growth in market incomes).

The effect of all these intragroup changes in net transfer rates on the trajectory of income

Figure G

## For the bottom 60% of households—particularly the bottom fifth—the boost from government taxes and benefits has increased as share of income in recent decades

Overall transfer rate by household income group, 1979–2018




**Notes:** The overall transfer rate is the share by which pre-tax-and-transfer income is raised or lowered by taxes and transfers. It is calculated by dividing what a household receives in government benefits and tax credits minus any tax payments by pre-fiscal income (income before taxes and benefits). Although transfer rates are calculated as a share of pre-fiscal income, we rank households by post-fiscal income.

**Source:** Congressional Budget Office household income data (CBO 2021).

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inequality can, of course, simply be seen in the change in post-fiscal income shares presented in figures A and B. These changes are a bit smaller than the pre-fiscal income share changes so fiscal policy has blunted some of the rise in inequality, but the changes in post-fiscal income shares are still quite dramatic.

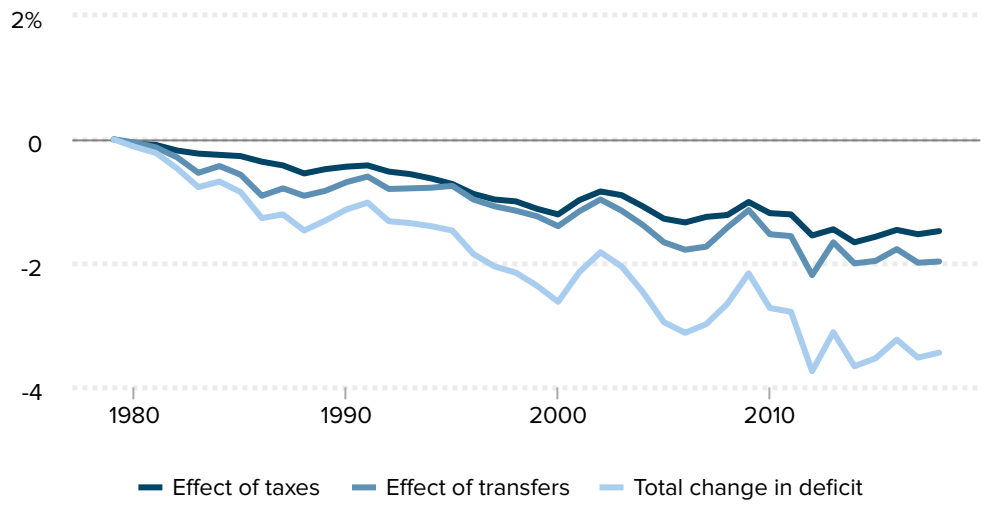
# Fiscal impact of the rise in inequality

Given its large potential macroeconomic effects, it follows that the rise in inequality also likely had large potential *fiscal* effects. There are two particularly important channels through which rising inequality can affect the federal fiscal balance: by changes in income growth mechanically raising or lowering tax collections and transfers for a given income group, and by the reduced tax collections and larger transfers that accompany slowing economic growth widening budget deficits.

Figure H

## All else equal, rising inequality lowers federal budget deficit

How much the decrease in transfer spending and the increase in tax revenues arising from growing inequality lowered the federal deficit, as a share of GDP




**Notes:** The figure estimates the "all else equal" effect of government spending on transfers and estimated government revenues from taxes had household groups kept the same share of income as they had in 1979 but everything else (average rates of growth and tax and transfer rates) followed the same path as actually occurred. The difference is the effect on the federal deficit. For example, as reflected in the top line, since the income share of the top 1% rose steeply after 1979, tax revenue collected from the group was much greater than it would have been in the counterfactual scenario, and this lowered the deficit relative to the counterfactual scenario.

**Source:** Household income data from the Congressional Budget Office (CBO 2021).

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# Differential tax and transfer rates by income group

In **Figure H**, we estimate the implications for the federal budget balance if the net tax and transfer rate for each income group evolved as it did between 1979 and 2019, but each group's pre-fiscal income share remained at its 1979 level in subsequent years. The difference between the actual and the counterfactual can be thought of as the "all else equal" effect of changing *just income shares* (i.e., rising inequality) on the federal budget deficit. Of course, this entire paper is about how inequality and growth and other macroeconomic variables are all interrelated, so this "all else equal" assumption is important—but it does help sharpen some intuition about the channels through which inequality can affect the federal budget deficit. The figure breaks out the effect of taxes and transfers separately.

Before reporting the results as depicted in the figure, it is instructive to take an example to understand how the various changes of the components impact the aggregate changes. For example, though not shown in the figure, the effective tax rate for the top 1% fell from

35.1% % in 1979 to 30.2% in 2018. (The effective tax rate is how much of their income these households paid in income, payroll, excise, and other taxes, not the tax rate for their tax bracket.) With just that information, one might think that there is no way that taxes collected overall from the top 1% as a share of the economy could rise. But over this same period, total pre-fiscal income claimed by the top 1% rose by 7.5 percentage points (from Figure A). This means that in 2018, taxes (net of transfers) collected from the top 1% actually *rose* by 2.3% of total household income relative to a scenario where income shares had remained constant at their 1979 level. The amount of this increase is simply the 7.7 percentage increase in the top 1%'s income share multiplied by the 30.2% tax rate in 2018. We repeat this exercise for transfers, and for all other income groupings in our data.[5]

Overall, these effects indicate that the federal budget deficit in 2018 was lower by roughly 3.4% of GDP due to the effect of changing income shares. This is a substantial amount. The overall effect is split through lower government outlays in the form of transfer payments and higher government revenues in the form of taxes paid that resulted from changing income shares. Higher tax collections from the top 1% account for roughly 60% of the overall effect (again, even as tax *rates* for the top 1% fell). But lower transfer payments flowing to the bottom 60% of households can account for nearly half of the overall effect as well. (Two different groups can contribute more than 100% to the total net effect if the influence of other groups is negative.) Households in the bottom 60% were net recipients of taxes and transfers in 2018 overall, but their lower income shares due to rising inequality reduced the effect of these transfers on the budget deficit.[6]

One way to understand this last point is to look at net tax and transfers *rates*, and then compare them to the aggregate amount of net taxes and transfers for the bottom fifth of households *measured as a share of aggregate income*. Between 1979 and 2015, the net tax and transfer rate for the bottom fifth rose from 34.5% to just under 39%. But, as a share of total household income economywide, net taxes and transfers going to the bottom fifth actually *fell* slightly, from 1.93% to 1.91%. This is because the higher tax and transfer *rate* was being multiplied in 2015 by an income *share* that significantly fell. In a sense, the federal budget moved closer to balance because falling income shares for the bottom 60% led, all else equal, to less money flowing to these households, as we devoted fewer of the economy's overall resources to pushing up incomes at the bottom.

## Chronic weak demand contributes to budget deficits

As noted above, the "all else equal" scenario that led our analysis to find a significant estimated reduction in the deficit from rising inequality is unlikely the case in the real world. When the economy operates below its potential for a sustained period, tax collections fall and more households rely on federal transfer payments for a higher share of income. In previous sections, we highlighted the potentially large drag on aggregate demand—and hence economic growth—exerted by rising inequality. If demand were weakened by rising inequality and this slowed overall growth, the slowdown would have large implications for the federal budget deficit. In this section, we provide a rough

estimate of how much a slack in demand may have pushed up deficits during the period of rising inequality. We then examine whether this upward pressure on the deficit from slack demand cancels out part of the downward pressure on the deficit from the tax and transfer system.

For this estimate, we draw on two data resources provided by the Congressional Budget Office. The first, an estimate of the "unemployment gap,." draws on the most-used measure of the economy's long-run potential level of resource utilization: the "natural" rate of unemployment (sometimes called the "non-accelerating inflation rate of unemployment" or NAIRU). This is the unemployment rate below which it is assumed that inflation will begin to accelerate and hence constitutes the lowest unemployment rate that is sustainable over more than a short time period. The unemployment gap is simply the difference between the estimated natural rate of unemployment and the actual unemployment rate. The gap is negative when the economy is operating beneath potential.

The second CBO estimate we use is the "cyclically adjusted" budget deficit. This is an estimate of what the budget deficit would have been in a given year if the economy had experienced an actual unemployment rate that matched the estimate of the natural rate. The difference between the actual budget deficit and the cyclically adjusted deficit hence provides an estimate of how much slack resource utilization (which is in turn caused by slack aggregate demand) increased budget deficits.

It could be argued that the CBO estimates of the natural rate of unemployment are too high, and that lower unemployment was possible over sustained periods (see Bivens 2021). But, even using the CBO estimates, large (negative) unemployment gaps put substantial upward pressure on budget deficits. **Figure I** shows the effect of tight or slack resource utilization (a positive or negative unemployment gap) on taxes and transfers for two long stretches of time: 1965–1979 and 1980–2020. We choose the first period because 1965 is the first year for which CBO calculates the cyclically adjusted budget deficit.

Between 1965 and 1979, the actual unemployment rate was 0.7 percentage points *lower* on average than estimates of the natural rate, providing a positive employment gap of 0.7%. Estimates of the relationship between the unemployment gap and the cyclical effect of budget deficits indicate that this positive unemployment gap reduced budget deficits by 0.3% of GDP on average in those years.

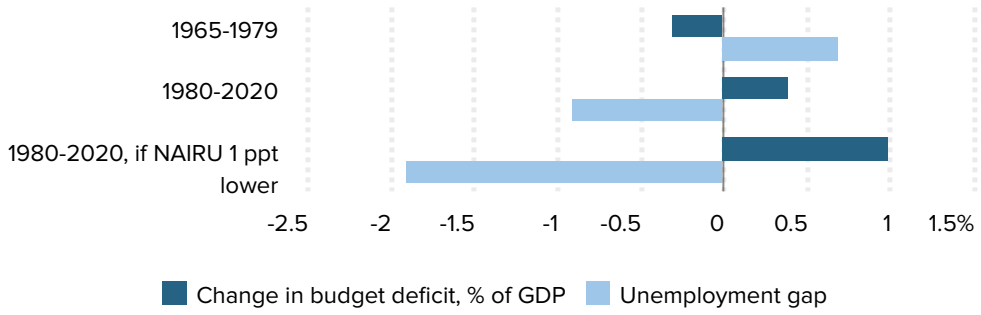
In comparison, between 1980 and 2020, the unemployment rate was higher on average than estimates of the natural rate and the gap averaged -0.9 percentage points. This negative employment gap led to budget deficits that were roughly 0.45% of GDP higher on average.

The bottom set of bars in the figure shows the effect of the negative unemployment gap on the budget deficit under the likely scenario that CBO's estimates of the natural rate of unemployment are too high (see Tasci 2019 for evidence and a discussion of the difficulty in estimating the natural rate of unemployment in real time). If the economy could actually hum along quite well (at optimum resource utilization but low inflation) at a lower rate of

Figure I

## Rising inequality's drag on household spending has large potential fiscal consequences

Estimated unemployment gap and resulting change in cyclically adjusted federal budget deficits as a share of GDP, 1965–1979, 1980–2020, and 1980–2020 had the employment gap since 1980 been underestimated




**Notes:** The figure shows what happens to the budget deficit when the economy outperforms or underperforms potential, as captured by the employment gap. When the unemployment gap is positive, it means that the actual unemployment rate is lower than the estimated nonaccelerating rate of unemployment (NAIRU)—or the unemployment rate below which inflationary pressures begin building. When the unemployment gap is negative, the unemployment rate is higher than is needed to keep inflationary pressures in check, thus resources (workers) are going unused for no good purpose and the economy is running under its potential. The bottom set of bars estimates the impact of the negative employment gap since 1980 under the (perhaps likely) scenario that estimates of the NAIRU are too high and thus the average negative gap is even larger, reflecting greater economic underperformance.

**Source:** Congressional Budget Office federal budget data (CBO 2020a; 2020b).

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unemployment, the actual effect of slack demand on budget deficits might be substantially higher. If, for example, the real natural rate of unemployment is 1 percentage point lower than what CBO estimates, then the negative unemployment gap would be even larger, reflecting an even greater degree of economic underperformance. Under this scenario, too-slack demand arising from increasing inequality after 1980 actually boosted budget deficits by roughly 1% of GDP on average *in each year*.

If demand slack really did increase budget deficits by 1% annually over the 1979–2020 period, and if this demand slack was largely due to rising inequality, this would imply that about half of the decline in public debt due to changing income shares (discussed in the previous section's Figure H) was offset by higher budget deficits resulting from the drag on demand growth imposed by inequality.[7] Further, if slack demand raised budget deficits by between 0.45 and 1.0% of GDP on average each year since 1980 (as in Figure I), over the entire 39-year period, this translates into an overall public debt to GDP ratio that was 30 to 70 percentage points higher by 2018.

More fundamentally, if the rise in inequality really did put the economy in a position where economic growth was being regularly held back by lower than necessary economic demand in recent decades, this implies that there is essentially no beneficial economic effect of the lower budget deficits caused by inequality-induced changes in income shares. That is because deficits, and the resulting additions to debt from them, affect the

economy very differently depending on whether growth is constrained by demand (workers and other resources are idling because firms don't expect enough paying customers) or by supply (all resources are fully utilized thus any increase in aggregate demand growth spills over into inflationary pressures rather than output growth). As noted in Bivens 2020, deficits only harm economic growth when economy growth is supply-constrained, not when it is demand-constrained. And as we have shown, rising inequality has produced demand constraints.

# Conclusion

Since the late 1970s, income inequality has risen sharply enough and been sustained long enough to have significant macroeconomic and fiscal effects. This inequality has led to chronic shortfalls of demand stemming from weakened household spending. These chronic demand shortfalls have constrained economic growth—by as much as 3.4% of GDP per year—and contributed strongly to the very slow recoveries following the most recent three recessions predating the coronavirus recession. The early 1990s recovery was the first one dubbed "jobless," but employment recovered even more slowly in the early 2000s recovery and the recovery from the Great Recession of 2007–2009 (Bivens 2016).

Even as rising inequality dragged on demand growth and harmed recovery from these three recessions, policy levers meant to help the economy bounce back faster were either becoming less effective (interest rates were near or at zero and couldn't be lowered further) or were left unused (Congress failed to provide sufficient fiscal stimulus by boosting spending). So far, the recovery from the recession caused by the COVID-19 shock has been happily much more rapid, almost entirely due to the much greater fiscal effort—spending increases—put into recovery. But the fiscal push that aided recovery so far is gone, while almost certainly little progress has been made in lessening inequality. As time marches on, the demand-depressing effect of this higher inequality could start to reassert itself.

In fiscal terms, the key effect of rising inequality has been to redistribute income from the low- and moderate-income households that tend to be net recipients of disposable income from the tax and transfer system toward the higher-income households that tend to be net payers to this system. As income gets transferred from low-savings to high-savings households, where is the increased savings going? A good chunk of it goes to reducing measured budget deficits. As we note in the text box explaining why some measures of aggregate personal savings haven't risen over recent decades, the reduced budget deficits that accompanied the rise in inequality is in some sense "where" the extra savings one would expect from a rise in inequality have shown up.

There are economic circumstances in which moving closer to federal budget balance might aid economic growth. But the U.S. economy has not enjoyed those circumstances for much of the last four decades. Economic growth has been constrained by weakened demand for sustained periods since 1979, which means that there was no particular economic benefit from lower budget deficits. Essentially, the macroeconomic downside of

higher inequality—the drag on economic growth—likely neutralized any fiscal upside.

# Acknowledgments

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# Appendix: Constructing the savings rates in Figure D

To calculate savings rates by income group, we combined asset and liability information from two different data sets compiled by the Federal Reserve. The Distributional Financial Accounts provide data on the *share* of fairly detailed assets and liabilities held by each income grouping (FRB 2021a). We can then map this onto the macroeconomic data from the Financial Accounts of the United States (FRB 2021b) showing the aggregate net acquisition of these assets and liabilities in a given year. Appendix Table 1 provides the precise mapping between the two data sets.

Appendix Table 1

## Matching the assets and liabilities in the Distributional Financial Accounts (DFA) and the Financial Accounts of the US (FAUS)

The manual crosswalk of quintile-level income variables in the DFA data set to aggregate income variables in the FAUS data set

| DFA quintile-level income shares | FAUS aggregate income |
|---|---|
| ***Financial assets*** | Personal sector; total financial assets |
| ***Checkable deposits and currency*** | Households and nonprofit organizations; private foreign deposits; asset |
| | Personal sector; checkable deposits and currency; asset |
| ***Money market fund shares*** | Personal sector; money market fund shares; asset |
| ***Time deposits and short-term investments*** | Personal sector; total time and savings deposits; asset |
| ***Debt securities*** | Personal sector; debt securities; asset |
| ***U.S. government and municipal securities*** | Personal sector; Treasury securities; asset |
| | Households and nonprofit organizations; agency- and GSE-backed securities; asset |
| | Personal sector; municipal securities; asset |
| ***Corporate and foreign bonds*** | Households and nonprofit organizations; corporate and foreign bonds; asset |
| ***Loans (assets)*** | Personal sector; loans; asset |
| ***Corporate equities and mutual fund shares*** | Households and nonprofit organizations; corporate equities; asset |
| | Households and nonprofit organizations; mutual fund shares; asset |
| ***Other loans and advances (assets)*** | Nonprofit organizations; grants and trade receivables; asset |
| ***Life insurance reserves*** | Households and nonprofit organizations; life insurance reserves; asset |
| ***Pension entitlements*** | Households and nonprofit organizations; pension entitlements; asset |
| ***Miscellaneous assets*** | Personal sector; other financial assets |
| ***Nonfinancial assets*** | Personal sector; nonfinancial assets |
| ***Real estate*** | Personal sector; residential equipment and structures, current cost basis |
| ***Equity in noncorporate business*** | Personal sector; nonresidential structures, equipment, and intellectual property products, current cost basis |

Appendix Table 1 (cont.)

| DFA quintile-level income shares | FAUS aggregate income |
|---|---|
| ***Consumer durables*** | Households and nonprofit organizations; consumer durable goods, current cost basis |
| ***Liabilities*** | Personal sector; total liabilities |
| ***Home mortgages*** | Personal sector; one-to-four-family residential mortgages; liability |
| | Personal sector; commercial, multifamily, and farm mortgages; liability |
| ***Consumer credit*** | Households and nonprofit organizations; consumer credit; liability |
| ***Depository institutions loans n.e.c.*** | Personal sector; other loans and advances; liability |
| ***Other loans and advances (liabilities)*** | Personal sector; other liabilities |
| ***Deferred and unpaid life insurance premiums*** | Personal sector; net capital transfers paid |

**Source:** Personal savings data from the Financial Accounts of the United States and household income data from the Federal Reserve Board's Distributional Financial Accounts (FRB 2021a; 2021b).

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# Endnotes

1. Bivens and Mishel use the median worker as proxy for the typical worker, rather than the average production/nonsupervisory worker. The median worker is, by definition, the one in the exact middle of the wage distribution, while production and nonsupervisory workers are the 80% of the private-sector workforce who are not managers. From our perspective, either work well as a proxy for typical workers. The nonsupervisory data series goes back further in history, so is more useful for long-run comparisons. The median wage is more precisely defined and inarguably representative of a middle-wage worker, so might be better to use when it is available. Finally, because the rise in wage inequality is overwhelmingly generated by rapid growth in the pay of workers well above the median and not included in nonsupervisory workforces, either measure works well in the sense that it tracks wages for the group left behind in recent economic growth.

2. See Bivens 2016 and Bivens 2019 for very short histories of fiscal and monetary austerity in recent economic history.

3. Relative to those estimated in Bivens 2017, savings rates for high-income households are lower in this paper. This is because we account for increased liabilities of households (i.e., increases in debt, for example) in the current paper and register them as offsets to savings. Accordingly, the savings rates in Bivens 2017 can be seen as gross savings, whereas the current savings rates are net savings.

4. EPI's U.S. Tax & Spending Explorer compares the inequality reducing effects of the U.S. tax and transfer system with that in other countries. See EPI n.d., specifically https://www.epi.org/explorer/international.

5. Again, these estimates take the evolution of tax and transfers rates as given and only isolate the effect of changing income share (i.e., inequality). If one looks at the total taxes actually collected by the top 1% in 1979 (their 8.9% income share multiplied by a 35.1% net tax rate) and in 2018 (their 16.6% income share multiplied by their 30.2% net tax rate), then it just declines by 1.8%, not the 2.3% we highlight. But our estimates neutralized the effect of the changing tax rate—taking that as given—and only estimate the effect of rising inequality.

6. In some sense, this example of transfers going to the bottom fifth falling as a share of aggregate personal income highlights the limit of this "all else equal" approach to holding tax and transfer rates constant even as income shares change radically. Many of the transfers going to the bottom fifth of households are means-tested, with the test often involving fixed income thresholds. If slow growth in incomes of the bottom fifth led to more and more families falling beneath these fixed income thresholds, this would mechanically boost the measured tax and transfer rate. But given that tax and transfer rates in the CBO data have steadily increased for the bottom three-fifths since 1979, this just means that any effect of changing income shares in raising these rates that is missed in our analysis would strengthen the implied relationship between rising inequality and a smaller budget deficit. That is to say that if the transfer rate for the bottom fifth only rose *because* their pre-fiscal income share declined, this means that our estimate of the inequality effect in directing resources toward (or away) from this group over time is overstated as we should also be holding the transfer rate more-constant and not allowing it to be mechanically pulled up by income declines. More importantly, it is clear that large swings in net tax/transfer rates for any income group are driven much more by exogenous policy changes than by the mechanical operation of pre-existing means-tests.

7. While the average per year contribution to higher budget deficits stemming from income drag (1% per year in the high estimate) is less than a third of the end-year contribution of changing income shares (3.4%), the demand-drag effect happens each year, while the contribution of changing income shares starts very small in the early 1980s and then grows gradually as inequality grows. The overall effect on accumulated public debt over the entire time period stemming from rising income shares is hence only about twice as large as the effect stemming from demand-drag.

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