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Evidence from Distributional Macroeconomic
Accounts**

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The Rise of Income and Wealth Inequality in America: Evidence from Distributional Macroeconomic Accounts*

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Abstract

This paper studies inequality in America through the lens of distributional macroeconomic accounts—comprehensive distributions of the aggregate amount of income and wealth recorded in the official macroeconomic accounts of the United States. We use these distributional macroeconomic accounts to quantify the rise of income and wealth concentration since the late 1970s, the change in tax progressivity, and the direct redistributive effects of government intervention in the economy. Between 1978 and 2018, the share of pre-tax income earned by the top 1% rose from 10% to about 19% and the share of wealth owned by the top 0.1% rose from 7% to about 18%. In 2018, the tax system was regressive at the top-end; the top 400 wealthiest Americans paid a lower average tax rate than the macroeconomic tax rate of 29%. We confront our methods and findings with those of other studies, pinpoint the areas where more research is needed, and describe how additional data collection could improve inequality measurement.

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1 Introduction

For the measurement of inequality of income and wealth, there is no equivalent to Gross Domestic Product statistics—that is, no government-run standardized, documented, continually updated, and broadly recognized methodology similar to the national accounts which are the basis for GDP. Starting in the mid-2010s, along with our colleagues from the World Inequality Lab, we have worked to address this shortcoming by developing “distributional national accounts,” statistics that provide consistent estimates of inequality capturing 100 percent of the amount of national income and household wealth recorded in the official national accounts.

This effort is motivated by the large and growing gap between the income recorded in the datasets traditionally used to study inequality—household surveys, income tax returns—and the amount of national income recorded in the national accounts. The fraction of national income that is reported in individual income tax data has declined from 70% in the late 1970s to about 60% in 2018. The gap is larger in survey data, such as the Current Population Survey, which do not capture top incomes well. This gap makes it hard to address questions such as: what fraction of national income is earned by the bottom 50%, the middle 40%, and the top 10% of the distribution? Who has benefited from economic growth since the 1980s? How does the growth experience of the different groups of the population in the United States compare to that seen in other countries?

Distributing the totality of income and wealth allows us to compute income growth rates for the different social groups consistent with the official macroeconomic growth rates, thus bridging the gap between macroeconomic analysis and the study of inequality. This procedure reduces arbitrariness compared to approaches that focus on narrower notions of economic resources. In addition, because the macroeconomic aggregates are defined and estimated following harmonized, internationally-agreed concepts and methods, distributional national accounts should maximize the comparability of inequality over time and across countries.

Piketty, Saez, and Zucman (2018) present a prototype of distributional national accounts for the United States. These series are supplemented by a set of publicly available micro-files representative of the US population. In these micro-files, each variable corresponds (and adds up) to a national account aggregate, such as compensation of employees, corporate profits, or income taxes paid; and each observation is a synthetic individual created by combining tax, survey, and other publicly available data sources. These microfiles allow anyone to reproduce all our findings on US inequality—including those described in this article—and to compute other statistics of interest. In the same way as the national accounts are constantly updated, revised,

and refined, we regularly update our series and micro-files whenever new data become available and improved estimation techniques are designed. These revisions are documented in methodological notes that explain the changes made and their effect on previously reported statistics. Following regularly updated guidelines (Alvaredo et al., 2020), similar methods are applied to construct prototype distributional national accounts in a growing number of countries, including France, India, China, and Brazil. The series are made available on the World Inequality Database <http://WID.world>, along with all computer code and technical appendices. Because the code and raw data are generally publicly available, alternative methodologies can be tested.

In time, we hope that our prototype distributional national accounts will be taken over by governments and published as part of the official toolkit of government statistics. Inequality statistics are too important to be left to academics, and producing them in a timely fashion requires resources that only government and international agencies possess. A similar evolution happened for the national accounts themselves, which were developed in the first half of the twentieth century by scholars in the United States (such as Simon Kuznets), the United Kingdom (such as James Meade and Richard Stone), France (such as Louis Dugé de Bernonville), and other countries, before being taken over by government agencies.

It may take decades before we get there. Economic statistics like aggregate output or concentration of income are not physical facts like mass or temperature. Instead, they are creations that reflect social, historical, and political contexts. How the data sources are assembled, what conceptual framework is used to combine them, what indicators are given prominence: all of these choices reflect objectives that must be made explicit and broadly discussed. Before robust distributional national accounts are published by government agencies, there are still many decisions to be taken and agreed on by the academic and statistical community. As part of that process, our prototype can be used to characterize the rise of inequality in the United States, to confront our methods and findings with those of other studies, and pinpoint the areas where more research is needed.

2 The Rise of Wealth Inequality

A first step towards the creation of US distributional national accounts was taken in Saez and Zucman (2016), who produced estimates of US wealth inequality allocating 100 percent of the household wealth recorded in the Financial Accounts, the official US macroeconomic balance sheet. Household wealth includes all the non-financial assets (such as real estate) and financial assets (such as equities, bonds, and pension wealth, whether held in individual retirement

accounts or through pension funds) of US households, net of debts.

In 2019, the Federal Reserve released its own official Distributional Financial Accounts, painting a similar picture of a large rise in wealth concentration.

2.1 Measuring Wealth When There is No Administrative Data on Wealth

Because there is no administrative data on wealth in the United States, Saez and Zucman (2016) use an indirect method, known as the income capitalization technique, to estimate wealth inequality. The idea is to link the Financial Accounts aggregates to the income flows that these assets generate: thus, interest-bearing assets are linked to interest payments, corporate equities are linked to dividends and capital gains, business assets are linked to business profits, and so on. Concretely, if the ratio between the stock of interest-bearing assets in the Financial Accounts and the total flow of interest income reported in tax returns is 50, then someone with \$1,000 in interest is assigned \$50,000 in bonds, saving accounts, and other interest-generating assets. Wealth, in other words, is estimated by capitalizing income; in the preceding example, interest is capitalized using a capitalization factor of 50, or equivalently an interest rate of 2%. Because not all assets generate taxable income (pensions, most importantly, do not), tax data need to be supplemented with other data source to capture all forms of wealth.

The basic capitalization method is simple and transparent, and it delivers results consistent with other evidence about US wealth. In 2016, according to the basic capitalization method, billionaires owned \$3.1 trillion in wealth, a number close to the one implied by the *Forbes* annual list of the 400 wealthiest Americans, \$3.0 trillion. Tax units with less than \$1 billion and more than \$50 million in net wealth owned \$9.2 trillion, a number not dissimilar to the one found in the Survey of Consumer Finances, \$10.2 trillion.

In its simplest form, the capitalization method relies on the assumption that within an asset class, the link between income reported in tax returns and wealth is the same across individuals; in other words, that people have the same realized rate of return to wealth. But of course, not everybody actually has the same realized rate of return. The rate of returns may even be positively correlated with wealth. In Saez and Zucman (2016) we showed that the assumption of constant realized returns within asset class appeared reasonable, based on data from estate tax returns matched to the income tax return of the decedent the year before death; the Survey of Consumer Finances; and tax returns from foundations. In particular, we showed that the capitalization technique works well for US foundations despite the fact that the wealthiest foundations—with sophisticated investments in private equity and hedge funds—

have higher total rates of returns than less wealthy foundations. The reason for this apparent paradox is that the high total returns of top foundations stem from high unrealized capital gains, not high realized income (interest, dividends, realized capital gains) relative to wealth. What matters for the capitalization method is that, within an asset class, the flow of *realized* income be proportional to wealth, which seems to generally be the case.

However, we also found, in matched estate-income tax data, an interest rate premium seemed to appear among the rich starting around the time of the Great Recession of 2008–2009, and noted (p. 550) that this pattern should be watched. Subsequent research suggests that the interest rate premium of the rich has become a fixture of the post-Great Recession era. In the Survey of Consumer Finances, the top 1 percent richest households have a higher-than-average interest rate in the 2010, 2013 and 2016 waves of the survey, by a factor of 1.3 (Bricker, Volz, and Hansen 2018; Saez and Zucman, 2019). In matched estates-income tax data, estates above \$10 million have continued to exhibit a slightly higher interest rates than average Americans after 2012, the last year in Saez and Zucman, 2016 (Smith, Zidar, and Zwick, 2020). Thus, assuming that all Americans have the same interest rate exaggerates the interest-bearing assets of the wealthy in the post-Great Recession period.

For equity wealth, the capitalization method infers assets based on dividends and realized capital gains, and thus it cannot capture the wealth of someone who receives no dividend and barely realizes any capital gains. A striking example is given by Warren Buffett, the main shareholder of Berkshire Hathaway, a company that does not pay dividends. In 2016, Buffett disclosed he had adjusted gross income of \$11.5 million in 2015, a negligible realized return relative to the value of his stake in Berkshire Hathaway, which amounted to about \$60 billion. Six of the top 10 wealthiest Americans—Jeff Bezos (Amazon), Mark Zuckerberg (Facebook), Warren Buffett (Berkshire Hathaway), Sergey Brin (Alphabet), Larry Page (Alphabet), and Elon Musk (Tesla), collectively worth more than \$600 billion in September 2020, 0.6% of all US wealth—are the main shareholders of corporations that do not pay dividends. Indeed, by triangulating the available sources on the reported incomes of the ultra-wealthy, Saez and Zucman (2019) estimate that the top 400 wealthiest Americans as a whole earn less taxable equity income (dividends and realized capital gains) relative to their equity wealth than the rest of the population, by a factor of about 2. Assuming that all Americans have the same realized return on equities underestimates the equity assets of billionaires—a problem that has become more acute in the 2010s with the growth of giant tech companies that do not distribute dividends.

Capturing these trends calls for implementing a more sophisticated version of the capitaliza-

tion method. The September 2020 update of the Saez and Zucman (2016) estimates of wealth inequality, published on the World Inequality Database and also presented in this paper, incorporate the interest rate premium of the rich seen in matched estates-income tax data. They also upgrade the equity wealth of billionaires so that the total net worth of billionaire keeps matching *Forbes*. These changes do not significantly affect the level of top wealth shares nor their trend, but bring asset composition in line with the existing evidence. In these updated series, interest-bearing assets account for 23 percent of the wealth of the top 1 percent for example, in 2018, consistent with the asset composition seen in the official Federal Reserve data on wealth inequality.¹

2.2 Distributional Financial Accounts: A Landmark

In 2019, the Federal Reserve released its own Distributional Financial Accounts. It was the first time that the Federal Reserve published statistics on wealth covering the entire population—from the bottom 50 percent up to the top 1 percent—consistent with its own official macroeconomic balance sheets.²

Like in Saez and Zucman (2016), the Distributional Financial Accounts start from the Financial Accounts aggregate and allocate these totals across the population. Methodologically, the two approaches have some differences. The Federal Reserve relies on the Survey of Consumer Finances supplemented with the *Forbes* 400 to allocate the Financial Account aggregates; it does not use income tax data. The Survey of Consumer Finances is a high-quality wealth survey that over-samples the rich. However, the survey is only conducted triennially, starting in 1989. Thus, the Distributional Financial Accounts start in 1989 and the data is interpolated between each wave of the SCF. Like all household surveys, the SCF relies on self-reported information and suffers from small sample sizes at the top. In the latest wave of the survey, about 6,200 families were sampled.

The Federal Reserve includes consumer durables and unfunded pensions in its definition of

¹Smith, Zidar and Zwick (2020) also modify the benchmark Saez and Zucman (2016) capitalization method. However they assume the wealthiest Americans earn an interest rate higher than what is seen in the datasets where both income and wealth can be observed. This leads them to under-estimate the interest-bearing assets of the wealthy. Smith, Zidar and Zwick (2020) also infer equity wealth based on dividend income, despite the fact that the wealthiest Americans often own equities that do not pay dividends. As a result they capture only 57 percent of the billionaire wealth estimated by *Forbes*. Once the correct interest rate is used and equity wealth is fixed to match the estimates of billionaire wealth from *Forbes*, the Smith, Zidar and Zwick (2020) estimates are very close to the Saez and Zucman (2016) updated series; see Saez and Zucman (2020).

²When we produced our wealth inequality estimates, we had a fruitful exchange with the researchers at the Federal Reserve who produce and analyze the Survey of Consumer Finances. These exchanges, sometimes vigorous (Bricker et al. 2016, Bricker, Henriques, and Hansen 2018), helped nurture the creation of the Federal Reserve Distributional Financial Accounts, a key and widely accessible tool.

wealth, in contrast to Saez and Zucman (2016). Although including durables and unfunded pensions can be appropriate for some purposes, it raises some issues. Durables are not assets in the UN System of National Accounts (United Nations, 2009); other countries do not include these items in their estimates of aggregate household wealth (Piketty and Zucman 2014). Unfunded pensions—99 percent of which involve promises to government employees (in 2018)—are not backed by actual wealth. Including unfunded pensions in wealth would logically call for also including promises of future Social Security benefits and promises of other future government benefits (such as Medicare, future spending on education, etc., net of future taxes), which neither the Federal Reserve, nor Saez and Zucman (2016), nor other countries do. For international comparability and conceptual consistency, durables and unfunded pensions are best left out of wealth.

One important but subtle issue in thinking about inequality is whether to measure the distribution of economic resources across households, as the Federal Reserve does, or across adult individuals or tax units, as in Saez and Zucman (2016). There are more tax units (180 million in 2016) than households (126 million), because roommates form separate tax units but one household, as do parents living with an adult child, and unmarried partners. We believe that data users should be allowed to choose the unit of observation that fits the question they are asking.

For instance, if one is interested in tax reforms, like the introduction of a wealth tax, then the tax unit is the proper unit of observation. In the micro-files of Piketty, Saez and Zucman (2018), one can look at the distribution of wealth across tax units or across adult individuals with the assumption that wealth is equally split among married spouses. This “equal-split adult” approach assumes that there is a full sharing of resources between married spouses—albeit not between unmarried partners, in contrast to the household-based approach. One merit of using equal-split adults is that it improves the comparability of inequality statistics over time and across countries, since the definition of adult (in our case an individual aged 20 or more) is fixed, while definitions of households and tax units can vary. However, equal-split adult statistics understate inequality, because not all wealth is equally shared among married spouses. In France, Fremeaux and Leturcq (2020) find that a growing fraction of wealth is individualized, as opposed to jointly owned between spouses. An important area for future research involves collecting more data on the division of wealth between spouses. It would also be helpful if the Federal Reserve allowed users to look at the distribution of wealth across individuals and tax units.

In the meantime, we can convert the Federal Reserve Distributional Financial Accounts from

households to tax units ourselves, and compare the resulting distributions to Saez and Zucman (2016).³ Once the same unit of observation and the same definition of wealth are used, the Federal Reserve Distributional National Accounts are very close to the Saez and Zucman (2016) estimates. As shown in Figure 1, in both cases, the top 10 percent wealthiest tax units owned 77–78 percent of wealth in 2018, an increase of 10 points since 1989. In both cases, the top 1 percent wealthiest tax units owned 38 percent of wealth in 2018, also an increase of 10 points since 1989.

Overall, whether one looks at the absolute level of wealth at the top, the shares of wealth owned by the top groups, the portfolio allocation of the wealthy—and how all of this has evolved since 1989—the Distributional Financial Accounts and the Saez and Zucman (2016) estimates paint the same picture. By construction, total wealth is the same in these two datasets, equal to the Financial Accounts aggregate. In 2018, the 1 percent richest tax units had about 38 times the average wealth of \$482,000 that year—that is, about \$18 million on average. In terms of portfolio composition, interest-bearing assets account for close to a quarter of the net wealth of the top 1 percent in both datasets, and pension assets for 10 percent.

The Distributional Financial Accounts chooses not to report wealth statistics for the top 0.1 percent or smaller groups. But we can apply the Federal Reserve methodology and compute the top 0.1 percent wealth share in that way. As shown in Panel C of Figure 1, the Federal Reserve data again appear consistent with the Saez and Zucman (2016) estimates, although the increase in the top 0.1 percent wealth share is slightly more pronounced in capitalized income statistics. Given the limitations of the capitalization method, the Saez and Zucman (2016) series might overestimate the rise of the top 0.1 percent wealth share. But it is at least equally likely that the Survey of Consumer Finances under-estimates the rise of this top share, because the SCF does not capture the full extent of the rise of income inequality at the top end of the scale.⁴

³For all intents and purposes high-end families are the same as high-end tax units. In Saez and Zucman (2016), “the top 1 percent” includes 1.8 million tax units in 2016, while in the Federal Reserve data, “the top 1 percent” includes 1.26 million households and around 1.26 million tax units, i.e., captures only the top 0.7 percent wealthiest tax units. Standard Pareto-interpolation techniques imply that the share of the top 0.7 percent within the top 1 percent is $(\frac{0.7}{1})^{\frac{a-1}{a}}$ where a is the Pareto coefficient, equal to about 1.3 in the Distributional Financial Accounts. Therefore one needs to multiply the share of wealth owned by the richest 1 percent households by 1.08 to capture the share of wealth owned by the richest 1 percent tax units. Excluding consumer durables and unfunded pensions, the top 1 percent wealthiest households have 35.4 percent of total wealth in the Federal Reserve Distributional Financial Accounts in 2018, hence the top 1 percent wealthiest tax units have 38 percent of total wealth, a number identical to the Saez and Zucman (2016) estimate.

⁴Respondents to the Survey of Consumer Finances are asked about their income as reported on their tax return. But as pointed in Saez and Zucman (2016), the top 0.1 percent capital income share rose less in the SCF than in the real world tax data from 1989 to 2016. Bricker et al. (2016, p. 290) argue that this gap may owe to income misclassification: SCF respondents may, for example, call wages what in fact is business income. But the share of *total income* earned by the top 0.1 percent also rose less in the SCF than in the entire population, suggesting that the SCF does not capture the full extent of the rise in the top 0.1 percent wealth share.

The *Forbes* 400 ranking, which roughly corresponds to the wealthiest 0.00025 percent households, can be used to focus on much narrower slices of the wealth distribution. These data confirm the surge of wealth concentration seen in tax data: the top 0.00025 percent wealth share according to *Forbes* has increased even faster than the top 0.1 percent wealth share according to the tax data. To be sure, *Forbes* is far from an ideal data source. It may miss people who own wealth in diversified portfolios of stocks and bonds (for which no public information exists) and overstate the value of private businesses. To alleviate some of these concerns, we can focus on the very top of the ranking, the top 0.00001 percent wealthiest Americans, a group that includes 17 tax units today and 10 in 1982, the first year that the *Forbes* 400 was published. It is not unreasonable to assume that in a given year the 10 or 20 wealthiest people in the country are correctly identified by *Forbes* and their holdings broadly accurately estimated. This group is a mix of major shareholders of big, publicly listed companies (in 2020, Amazon, Facebook, Google, Walmart, Microsoft, Berkshire Hathaway; in 1982, Getty Oil, Standard Oil, Hewlett Packard, etc.), for which valuations are observable; and giant private businesses (Koch Industries and Bloomberg LP today; Mars and Hunt Oil Company in 1982) that attract public scrutiny. As shown by the Panel D of Figure 1, the share of wealth owned by this elite group has risen from 0.13 percent of total US wealth in 1982 to 1.2 percent in 2020, an almost tenfold increase.

By any metric, the period from 1980 to 2020 has been an era of extraordinary wealth accumulation among the rich in the United States. Not only has wealth become more concentrated, but wealth itself has been growing faster than income and output. In 1980, the ratio of aggregate household wealth to national income was 300%. In 2020, this ratio approaches 570%, the highest level ever recorded in the history of the United States. In other words, during the 1980–2020 period, wealth as a whole has been growing almost twice as fast as income. The result is that relative to what is produced and earned in a given year, the wealth of the rich has skyrocketed. In 1980, on average members of the top 1% owned in wealth the equivalent of 60 years of average US income. In 2020, whether one looks at the Saez and Zucman (2016) or Distributional Financial Accounts estimates, they own 200 years of average US income in wealth (Figure 2).

Although it is notable that the main sources used to estimate US wealth inequality deliver consistent results, it would be a mistake to exaggerate our ability to measure top-end wealth. Changes in tax avoidance, the growth of wealth held in foundations, and the globalization of wealth management pose formidable challenges (for discussion, see Zucman, 2015). It is a failure of public statistics that the only information on billionaire wealth comes from magazines. We

could and should do better to measure wealth inequality than rely on a survey of 6,200 families or indirectly infer asset ownership based on income flows.

One merit of a well-administered wealth tax is that it would provide better information on the distribution of wealth, one of the most hotly debated issues in democratic societies. Even without a wealth tax, governments could collect information on assets and debts from third parties (banks, pension funds, brokers, and others), as they already do for income. These data could be used to improve tax enforcement—as currently done in Denmark—and allow for the construction of more accurate Distributional Financial Accounts.

Like all important economic statistics, even the Financial Accounts themselves have limitations and remain, decades after their creation, a work in progress. One challenge involves the valuation of private business assets, which tends to be conservative in these accounts. Another relates to offshore wealth: foreign bank accounts, portfolios of equities and bonds held through foreign financial institutions, and holdings of foreign mutual funds (including hedge funds) that are not intermediated through a US broker are not captured in the Financial Accounts (Zucman 2013). The forms of wealth that are broadly shared tend to be accurately measured, while the more complex investments, involving legal and financial intermediaries in foreign countries with a great deal of secrecy, are less well captured. The estimates of wealth concentration we have today, which by construction are anchored to the Financial Accounts totals, should be seen as lower bounds.

3 The Rise of Income Inequality: Beyond Tax Data

3.1 Bridging the Gap Between the Study of Inequality and Macroeconomics

There has been a surge of research in recent years, to which we have contributed our share, measuring income inequality using administrative tax data rather than self-reported household survey data. However, this work has made us aware of the large and growing gap between national income and taxable income. On the labor side, untaxed labor income includes tax-exempt employment benefits (contributions made by employers to pension plans and to private health insurance), employer payroll taxes, the labor income of non-filers, and unreported labor income due to tax evasion. The fraction of labor income which is taxable has declined from 80–85 percent in the post-World War II decades to just under 70 percent in 2018, due to the rise of employment fringe benefits—in particular the rise of employer contributions for health insurance, particularly expensive in the United States. Most studies of wage inequality ignore

fringe benefits even though they are a large and growing fraction of labor costs. As for capital, only one-third of total capital income is reported on tax returns. Untaxed capital income includes undistributed corporate profits, the imputed rents of homeowners, capital income paid to pension accounts, and dividends and interest retained in trusts, estates, and fiduciaries.

Piketty, Saez and Zucman (2018) estimate the distribution of 100 percent of national income by combining national accounts, tax, and survey data. As Figure 3 shows, in both fiscal income and national income statistics, the share of income earned by the top 1 percent was high before the 1930s, fell from the 1930s to the 1970s, before rising again from the late 1970s on. This U-shaped evolution of income concentration is a bit less spectacular when one looks at national income rather than fiscal income, mainly because only the fraction of corporate profits paid out as dividends are included in fiscal income statistics, while all corporate profits are included in national income. Accounting for the totality of corporate profits generally increases the top 1 percent income share, but the effect is stronger in the post-World War II years, a time before the rise of pension plans somewhat broadened equity ownership.

One virtue of distributional national accounts is that they are not affected by legal changes in business organization. In the United States, a growing number of businesses have been organized as “pass-through” entities since the late 1980s. The income of pass-through entities—partnerships, S-corporations, sole proprietorships—is not subject to the corporate income tax; instead, all the income of these businesses is passed to their individual owners and subject to the individual income tax only. When more businesses operate as pass-throughs, more income mechanically shows up on individual income tax returns, especially at the top-end of the income distribution. In our distributional national accounts, all corporations are de facto treated as pass-through entities, no matter their legal status. In the same way as partnership income is allocated to partners, all corporate income is allocated to shareholders. In the same way as partners pay the individual income tax on their share of partnerships’ income, shareholders pay the corporate tax on their share of corporations’ income. This seems a logical way to allocate the corporate tax.

Because there is no administrative data in the United States on the ownership of non-pass-through corporations, we must make assumptions to allocate the portion of corporate profit that is not paid out as dividends. In our distributional national accounts, we allocate 50 percent of undistributed profits proportionally to dividends and 50 percent proportionally to realized capital gains. This method is far from ideal. In the real world, some people with little dividends and realized capital gains are major shareholders of corporations with large undistributed profits. For a deeper understanding of income inequality, the government should collect information

about the ownership of corporations. This information exists in private financial institutions, such as the Depository Trust Company, the central securities depository of the United States, which *de facto* acts as the ultimate bookkeeper for the ownership of securities.⁵

3.2 From Macroeconomic Growth to People’s Growth

An advantage of distributing the totality of national income is that it allows for apples-to-apples comparisons of inequality across countries, because national income is defined and computed in the same way internationally. (National income is equal to GDP minus capital depreciation plus net income received from abroad.) Our benchmark statistics use the equal-split adult as the unit of observation. Our benchmark definition of income, pre-tax national income, includes all pension income (from Social Security and private pensions) and subtract all corresponding pension contributions, making estimates comparable across countries with different age structures.

For example, compare France and the United States. In the United States, national income reached \$17.5 trillion in 2018, close to \$72,500 on average among the 242 million adults who lived in the US. The bottom 50 percent earned 12.5 percent of national income, which means that members of the bottom 50 percent earned a quarter of the average income in the economy, or about \$18,500 on average. In France, using purchasing power parity exchange rates to convert euros into US dollars, national income per adult was \$53,000—substantially less than in the US. But the bottom 50 percent earned 22.5 percent of national income, or about \$23,400 on average. Even though average income is 37% higher in the US than in France, the market delivers higher incomes to the bottom 50 percent in France than it does in the United States. The French welfare state is not responsible for this feat, as we are talking here about pre-tax national income (before government taxes and transfers other than Social Security). Moreover, the income comparison does not include the better health outcomes and more extensive leisure time in France.

Distributing the totality of national income also allows for rigorous comparisons of income over time. Figure 4 shows the growth rate of income for each percentile of the income distribution from 1946 to 1980 and 1980 to 2018. From 1946 to 1980, average per adult national income

⁵In a paper titled “Capitalists in the 21st century” Smith et al. (2019) find that “the typical top earner derives most of her income from human capital.” They obtain this finding by noting that pass-through business income is a key source of income at the top of the fiscal income distribution and estimating that 75% of this income is labor income rather than capital income. However, fiscal income misses two thirds of total capital income, in particular the profits of corporations that do not pay dividends (such as Amazon, Facebook, and Google). Moreover, the estimate that only 25% of pass-through business income is capital income is not consistent with the large capital stock of these businesses. Saez and Zucman (2020) discuss these points and estimate that capital income is slightly more than half of income for the top 1% and about two thirds for the top 0.1% of the national income distribution.

rose 2.0 percent a year, one of the highest growth rates recorded over a generation in a country at the world’s technological frontier. Moreover, this growth was widely shared, with only the income of the top 1 percent growing a bit less than average. One easily understands why many economists chose, during this period, to treat the US distribution of income as a constant.

From 1980 to 2018, average growth in per adult national income falls to 1.4 percent a year. For almost 90 percent of the population, growth has been below—often much below—that figure. For the bottom 50 percent as a whole, growth in pre-tax income has been only 0.2 percent on average per year. This quasi-stagnation is not due to population aging, since pre-tax income includes Social Security and other retirement benefits. Excluding the elderly (aged 65 or more), average bottom 50 percent pre-tax income has slightly declined since 1980. During the last four decades, macroeconomic growth has not been representative of the growth experience of the vast majority of the population.

We need a different measure of economic growth to capture the lived reality of growth in an era of rising inequality. Saez and Zucman (2019b) propose “people’s growth,” which is the arithmetic average of the growth rate of each percentile of the income distribution. People’s growth captures how income grows on average across people, as opposed to how the average income grows. From 1946 to 1980, people’s growth and national income growth coincided in the United States (2.0 percent a year). From 1980 to 2018, people’s growth has been only 0.65 percent a year, much less than macro growth (1.4 percent).

With a full picture of the distribution of national income over time, we can ask how income would have grown across the income distribution if growth had been equitably distributed. If macro growth had been equitably shared from 1980 to 2018, the average pre-tax income of the bottom half of the income distribution would have been 57 percent higher in 2018 than it was in actual facts. For the middle-class—from the 50th to the 90th percentile of the distribution—average incomes would have been 16 percent higher in 2018. However, for the upper middle class (from the 90th to 99th income percentile), average incomes would have been 8 percent lower, and for the rich (the top one percent), 36 percent lower.

To be sure, this counterfactual analysis has limitations. Perhaps with less inequality, average growth might have been lower (there would perhaps have been less innovation if million-dollar earners had not been able to earn the sums they did) or higher (there might have been more innovation if credit-constrained households had been able to earn more than they did). But the counterfactual does illustrate vividly the shift in income distribution.

3.3 Pitfalls of Personal Income Distributions

In March 2020, the US Bureau of Economic Analysis released a prototype distribution of personal income, one of the aggregate measures of income used in the US national accounts. These data provide an important step toward the creation of official distributional national accounts. But there are strong reasons to prefer national income over personal income.

First, personal income is specific to the US national income and product accounts. It is not computed in other countries and in fact does not exist in the UN System of National Accounts. This makes it impossible to compare inequality internationally.

Second, personal income is a mixture of pre-tax and post-tax income, and for that reason not a satisfactory definition of income conceptually. Personal incomes does not subtract payroll taxes or individual income taxes, but it includes all individualized government transfers, such as Social Security benefits, welfare assistance, Medicare, and Medicaid. Therefore, personal income double counts some forms of income.

Third, personal income does not include corporate profits; it only includes the portion of corporate profits distributed as dividends. As a result, personal income is affected by businesses' choices of organizational form. If a person operates as a pass-through entity, all her income gets counted in personal income. If the same person operates as a corporation, her income can be zero. Warren Buffet has billions in pre-tax national income; his personal income is smaller by a factor of 1,000. Unsurprisingly, the inequality of personal income is lower than the inequality of national income. If more individuals incorporate to take advantage of the low federal corporate tax rate enacted in 2018, personal income and its concentration will fall, even though nothing else will change than the tax form used by the business owner. The distribution of personal income is likely to become a poorer and poorer indicator of income inequality.

The Bureau of Economic Analysis justifies the choice of personal income by stating that this aggregate “is closest to the measure of economic resources available to households to purchase goods” and that “[s]tarting with personal income will allow further analysis of disposable personal income (after taxes) and a better comparison to consumption” (Fixler et al. 2020, p. 3). The implicit view is that consumption is what matters. Consistent with this view, BEA uses the household as the unit of observation, not the adult individual as in Piketty, Saez and Zucman (2018).⁶ Our own view is that income and consumption both deserve to be studied, but separately since they are distinct concepts.

⁶The BEA also uses household equivalence scales, in which household income is divided by the square root of household size, as an adjustment for differences in household size, which makes it impossible to draw direct connections from distributions to macroeconomic growth.

National income is a more meaningful concept to study income inequality than personal income, because it includes all the forms of income that accrue to individuals, no matter the specific ways in which this income is earned, consumed, or saved. The notion of personal income was popular among BEA statisticians in the 1950s; the first distributions of personal income were computed at that time. In the 1950s, when large corporations were controlled by multiple stakeholders, what happened in the realm of corporations could feel disconnected from what happened in the realm of households. Today, shareholders exercise much more control over their firms; the frontier between corporations and households is fuzzy; the fiction that what happens in the corporate world has nothing to do with income inequality is no longer tenable. Looking forward, it is essential for BEA to distribute national income.

4 How Government Taxes and Spending Affect Inequality

In the United States, federal, state, and local governments collect about 28 percent of national income in taxes and spend more than 28 percent of national income. In Denmark and France, taxes and government spending reach 50 percent of national income. Our distributional national accounts can be used to ask questions like: Do high-income people pay more or less in taxes relative to their income than the average individual? How do cash transfers compare to taxes for low-income groups? Are middle-class incomes higher after taxes and transfers than before taxes and transfers?

According to a widespread view, a government transfer is simply a tax with a minus sign and all that matters is people's budget sets, net of all taxes and transfers. We emphasize, however, that taxes and transfers are distinct objects that must be studied as such. For example, taxes reduce cash income but most government transfers do not increase cash income. The bulk of government transfers are in-kind—such as health insurance for the poor and the elderly, Medicaid and Medicare—or take the form of collective consumption, such as spending on education, police, and defense. Even when transfers are monetary, it's important to recognize that taxes are often paid cash on the nail, while transfers are generally received with a lag. For a poor, credit-constrained worker, paying \$100 in payroll taxes each and every month and receiving a one-time check of \$1,200 the following year (such as an Earned Income Tax Credit payment) is not equivalent to zero tax and no transfer. With an extra \$100 a month, people are less likely to default on a monthly rent or interest payment; they are more likely to be able to afford an emergency expense, such as a visit to the doctor, and to afford basic daily consumption needs

such as food for their family.

4.1 The Collapse of Tax Progressivity

There is a long tradition of research on the distribution of US taxes, pioneered by Colm and Tarasov (1940), Musgrave et al. (1951), and Pechman and Okner (1974). This tradition has been refined by government agencies. Our distributional national accounts make four main departures relative to the analysis carried out by US agencies—most prominently the Congressional Budget Office—and think-tanks.

First, we include taxes at all levels of government, instead of federal taxes only. State and local taxes are sizable: about 10 percent of national income, a third of total tax revenue. In addition, state and local governments often make substantial use of sales and excise taxes that are regressive, and so ignoring these taxes gives a misleading picture of the progressivity of the tax system.⁷

Second, we consider taxes as a share of pre-tax national income, the broadest and most consistent definition of income. This is particularly important because a sizable fraction of the true pre-tax income of the wealthy—their share of corporate profits that is not paid out as dividends or realized as capital gains in a given year—is not subject to individual income taxation. Since we include all taxes and all national income in our analysis, the average tax rate in our statistics is equal to the officially recorded macroeconomic tax rate, 28 percent of US national income in 2018.

Third, we do not shift taxes from one factor of production to another. In our statistics, consumption taxes are assigned to consumers, labor taxes are assigned to the corresponding workers (even when employers nominally pay them), and capital taxes are assigned to the corresponding owners of capital. In particular, the corporate tax is assigned to shareholders, just like the income tax paid on the profit of pass-through businesses is assigned to the owners of pass-through businesses. This framework allows us to allocate all taxes while keeping national income constant in a conceptually consistent manner (as discussed in Saez and Zucman, 2019c). It also makes it possible to measure the economically relevant tax wedge on each factor of production, such as the gap between what it costs to employ a worker and what the worker receives. For the most part, the methodology currently followed by government agencies to study the distribution of taxes is similar to the methodology we use. It allocates all labor taxes to workers, all consumption taxes to consumers, most capital taxes to capital owners, and keeps

⁷The Institute on Taxation and Economic Policy (2018) is the only institution that provides comprehensive distributional state and local tax analysis state by state.

national income constant. However, it shifts part of the corporate tax to people other than shareholders. The corporate tax is partly allocated to workers because it is assumed to depress domestic capital and reduce wages. This procedure is inconsistent with maintaining a constant level of national income and leads to biased trends in tax progressivity.⁸

Finally, in our analysis refundable tax credits are treated as government transfers—not as negative taxes. In the national accounts, payments made by the government to people are transfers, no matter which administration is in charge of sending these transfers. That the Earned Income Tax Credit payments are administered by the Internal Revenue Service (rather than, say, the Social Security administration) has no economic implication. In the macroeconomic statistics of tax revenues (for instance, the government revenue statistics published by the OECD), the refundable portion of the EITC is never subtracted from taxes. The same is true for the refundable portion of the Child Tax Credit. Proponents of the EITC felt that the program would be more acceptable politically if presented as a tax reduction rather than a transfer, and a large portion of the US public has been used to thinking about the EITC as a negative tax. The Congressional Budget Office and some think-tanks that produce distributional tax statistics choose to subtract refundable tax credits from taxes paid. But what may be perceived as good politics does not necessarily correspond to what is most conceptually consistent. Economically, the EITC is no different from other cash transfers to low-income families.

The choices we make in our distributional national accounts are of course not the only possible ones, but we stress that they are the opposite of arbitrary. Instead, they follow consistent, internationally defined economic concepts. Using—at least as a starting point—concepts that are the product of international deliberation can help control the effect of national political and ideological idiosyncracies, and contribute to more coherent and comparable statistics.

When taking a comprehensive perspective on taxation, a dramatic decline in the progressivity of the US tax system appears. Figure 5 depicts the US average tax rate by income groups for various years from 1950 to 2018. All federal, state, and local taxes are included and taxes are expressed as a fraction of pre-tax income. P0-10 denotes the bottom 10 percent of the income distribution, P10-20 the next 10 percent, etc. We split the top 10 percent into smaller groups all the way to the top 400 wealthiest Americans popularized by *Forbes*. Taking all taxes together,

⁸For example, the Congressional Budget Office (2012) allocates 25 percent of the corporate tax to workers and 75 percent to capital owners, including owners of interest-bearing assets. If a C-corporation elects to be treated as an S-corporation (a pass-through business), then in the CBO treatment pre-tax income inequality increases (income that was previously assigned to workers is now allocated to shareholders, who are higher up in the income distribution), the labor share of national income falls, and the tax system becomes more progressive (taxes that used to be paid by workers are now paid by shareholders), despite the fact that nothing real has changed in the economy or in the tax system.

the US tax system used to be slightly progressive or roughly proportional for the bottom 99 percent of the income distribution, but highly progressive within the top 1 percent. In 1950, for example, the upper middle class (the top 10 percent excluding the top 1 percent) paid average tax rates of around 25 percent, while the top 0.01 percent paid almost 70 percent of its income in taxes.

The tax system was highly progressive in the 1950s because corporate profits, the main source of income for the rich, were subject to a high effective corporate tax rate of 50 percent. Very high top marginal individual income tax rates (91 percent until 1963 at the federal level) made it impossible for business owners to bypass the corporate tax by using pass-throughs, such as partnerships. Moreover, high incomes were hit both by the progressive individual income tax on their realized capital income and by a progressive estate tax at the time of death. The combination of the income tax, the corporate tax, and the estate tax made the tax system extremely progressive and hard to avoid (Saez and Zucman 2019). Low-income households paid lower taxes than today because the payroll tax was lower in the past.

In 2018, the tax system looks like a giant flat tax that becomes regressive at the very top end. The working class and the middle class pay substantial taxes because payroll taxes are large and state and local sales and excise taxes are regressive. The very top pays low effective tax rates because of the demise of the federal corporate tax, which in 2018 collected only 1 percent of national income, down from 5-7 percent in the 1950s. The effective individual income tax rate falls at the top-end because the very rich earn income through corporations and can avoid reporting individual income. The regressivity of the tax system at the extreme top end in 2018 is striking—a direct consequence of the 2018 cut in the corporate tax. But the figure shows a decades-long shift, with a slow erosion of the corporate tax, the estate tax, and gradually lower progressivity of the individual income tax at the top.

If the low corporate tax of 21 percent set in 2018 continues, there is a real risk that the wealthy will incorporate, earn income through their corporations, and bypass the progressive individual income tax by retaining earnings within their corporations. If held until death, the capital gains generated by such retained earnings will never be taxed.

4.2 Have Government Transfers Offset the Rise of Inequality?

Taxes are only half of the government equation. On the spending side, Social Security (retirement and disability) and unemployment insurance replace lost labor earnings due to retirement, disability, or unemployment. These programs grew fast after World War II to about 6 percent of national income in the late 1970s and have been stable afterwards. We include these trans-

fers in our measure of pre-tax income. The remaining forms of government spending are part of post-tax income (but not pre-tax) and can be classified in three categories, from easiest to allocate to individuals to hardest: cash transfers, in-kind transfers, and collective consumption.

Cash (or quasi-cash) individualized transfers include welfare assistance and refundable tax credits for low-income families with children, food stamps for the poor, and supplemental security income for the low-income elderly and the disabled. These transfers come closest to pure redistribution as individuals can freely (except in the case of food stamps) choose how to spend them, just like earned income. Cash transfers are small, 2–3 percent of national income with no clear trend after the mid-1970s. More specifically, refundable tax credits have grown but welfare assistance has fallen in the same proportion. Cash transfers go overwhelmingly to the bottom 50 percent.

Next, in-kind individualized transfers, such as public health insurance (Medicaid and Medicare), housing assistance, and higher education tuition subsidies, have grown from almost zero in 1960 to about 8 percent of national income in 2018. This growth is overwhelmingly driven by Medicare and Medicaid, which account for over 90 percent of all in-kind transfers in 2018. In our distributional national accounts, we allocate these transfers as a lump sum per beneficiary; that is, we divide the sums paid on Medicare by the number of Medicare beneficiary and assign each beneficiary the average Medicare transfer. A large fraction of in-kind transfers go to the bottom 50 percent.

The last category of government spending is collective consumption expenditure. This category includes government spending on education, defense, public order (police, prisons, courts), and other public goods. Collective consumption is large (about 18 percent of national income) and has been fairly stable since 1960. Spending on defense has shrunk while other forms of collective consumption have increased; spending on prisons has increased particularly fast, due to a massive increase in incarceration rates in the 1980s and 1990s. Government spending on education has been stable at 5 percent of national income since 1970. In our distributional national accounts, we allocate all collective consumption neutrally, so that collective consumption does not affect income inequality. Obviously, if we were to allocate collective consumption on a per capita basis, that would make inequality look lower.⁹

How does incorporating taxes and transfers affect the distribution of income? In the big picture, the tax system is approximately a flat tax—taxes are proportional to income—while

⁹The main reason why Auten and Splinter (2019) find low top income shares on a post-tax basis is because they allocate half of government consumption per capita. See Saez and Zucman (2010) for a complete discussion of Auten and Splinter (2019).

the transfer system is closer to a flat amount per person. This combination reduces inequality: post-tax inequality is less than pre-tax inequality.

With our distributional national accounts, we can also examine whether changes in government intervention in the economy have lifted incomes at the bottom. The short answer is “yes, but not a lot.” The average pre-tax income for the bottom 50 percent, as we have seen, has almost stagnated since 1980 in real terms: It was \$17,500 per adult in 1980 and is \$18,500 in 2018. After deducting taxes and adding all forms of government spending, average post-tax income has increased by 25 percent since 1980. This is better than quasi-stagnation, but still less than the 70 percent increase in average income per adult from 1980 to 2018. The rise of government transfers to the bottom has offset roughly one-third of the growth gap between the bottom half and the average American.

Most of the growth in bottom 50 percent post-tax incomes is driven by the surge in Medicaid and Medicare. To see this, it is useful to consider a narrower definition of post-tax income, disposable cash income. Disposable cash income is pre-tax income minus all taxes plus all cash or quasi-cash transfers; it excludes in-kind transfers and collective consumption expenditures. This notion of disposable income is close to the one used to measure the poverty rate (US Census Bureau, 2019), with the important difference that we deduct all taxes and add refundable tax credits and food stamps. Economy wide, cash disposable income per adult has increased about as much as national income from 1980 to 2018, by close to 70 percent (thanks in part to being bolstered by growing federal deficits). Figure 6 shows that for the bottom 50 percent, disposable cash income has grown very modestly over the last four decades: it was \$16,000 in 1980 and \$18,600 in 2016, a 16 percent increase over 36 years.

Until 2008, the bottom 50 percent paid more in taxes than it received in cash transfers: pre-tax income was higher than cash disposable income. The cash disposable income of bottom 50 percent adults was lifted up by the large government deficits run during the Great Recession. Since 2012, cash disposable income is almost identical to pre-tax income. Thus, the gains in post-tax income for the bottom 50 percent over this time take the form of in-kind transfers (primarily Medicaid), and collective public expenditures (education, defense, police and prisons being the main items).

4.3 The Limits of Post-Tax Income

The modest gains in post-tax income for the working class must be analyzed with care, because allocating in-kind transfers and collective consumption to individuals based on their cost for the government is highly problematic. All OECD countries have decided that everybody should

have access to quality education. All OECD countries except the United States have a national program for financing health care. The cost of universal provision of education and health looks like a large transfer relative to income for low-income families. But it is conceptually incorrect to treat this full transfer as income for its recipients. After all, if low-income families received an equivalent amount in cash, most of them would not spend it all on health or education. Perhaps the best conceptual alternative would be to assign the perceived cash value of individualized in-kind transfers to recipients, while treating the rest as a collective public good.

These conceptual problems are particularly thorny for health transfers in the United States. Medicaid transfers are large because the cost of health care is extraordinarily high in the United States. The money is not flowing into the bank accounts of beneficiaries; instead it's flowing to the bank accounts of health care providers, many of which are near the top of the income distribution. What sense does it make to rejoice in the rise of working-class post-tax incomes, if this rise reflects the rise in the rents earned by the medical and pharmaceutical sectors?

A similar issue arises with government mandates, like the rule in the Affordable Care Act in 2010 that employers with 50 or more employees are legally required to provide health insurance to their full-time workers (or pay a penalty of \$3,000 per employee). The cost of this mandatory private health insurance is large and growing; it is a heavy burden on low-paid workers. In conceptual terms, part of this cost should be considered as a tax on workers that the government imposes to achieve wider health insurance coverage (Saez and Zucman, 2019b). Like other taxes, this cost should be subtracted from income for the computation of post-tax income.

In short, there is no perfect measure of post-tax income. To measure the inequality of income after taxes and transfers, disposable cash income is perhaps the most meaningful concept. Disposable cash income captures income available for saving and consumption, excluding the collective consumption of services like education and health mandated by the government. But disposable cash income does not add up to national income. Post-tax national income captures all of national income by deducting all taxes and adding back all forms of government spending and the government deficit. But computing post-tax national income requires assigning collective consumption expenditures as well as the current government deficit to individuals. There is no obvious, universally "correct" way to do such an imputation, and there will never be.

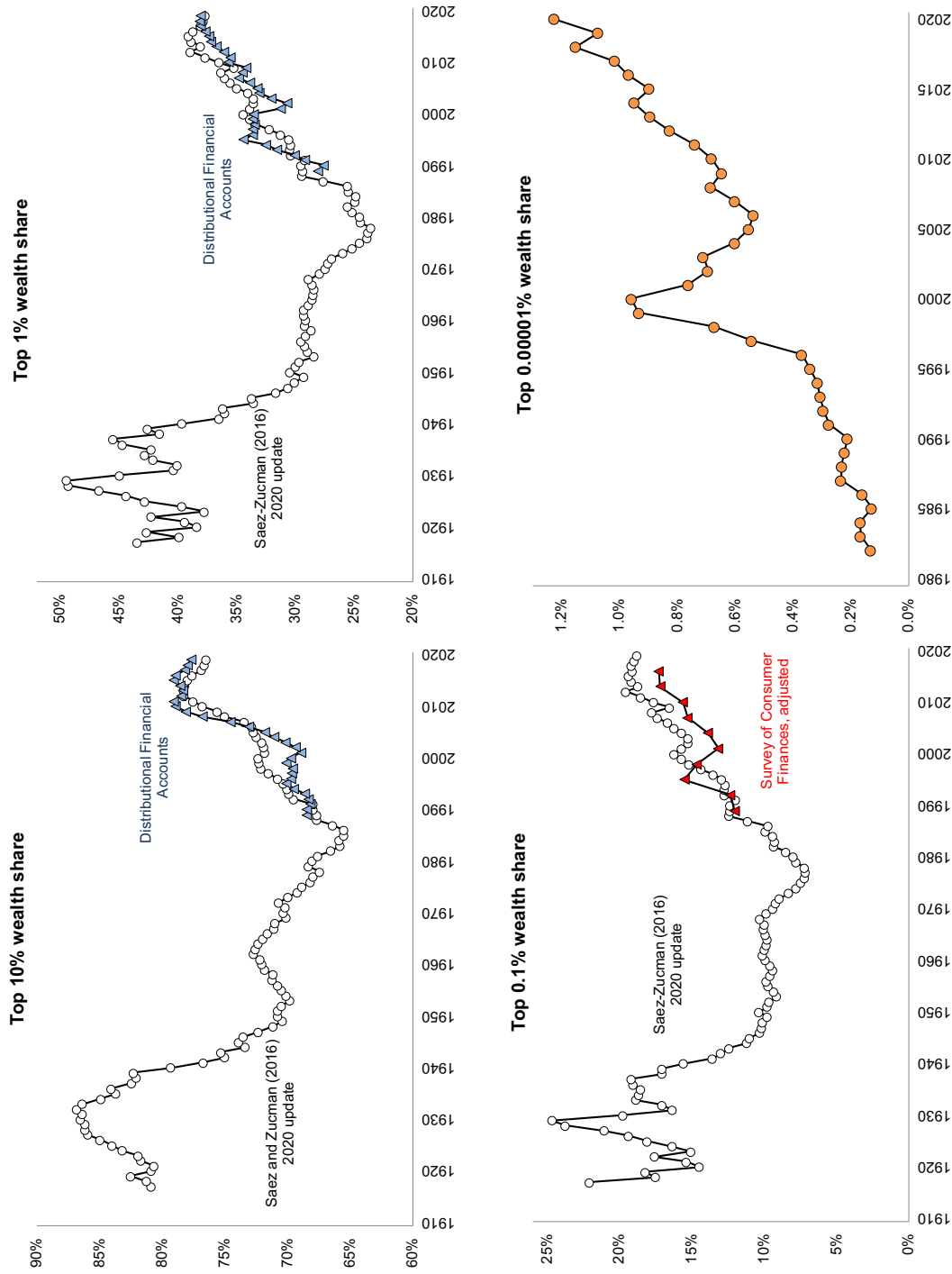
Does this mean that we cannot know what is happening to inequality? Of course not. There are no raw facts in the social sciences. Rather, there are attempts at describing reality through more or less elaborate statistical frameworks. The results of these attempts can only be properly understood once we know how the measurement tools work, what aspects of reality they aim to capture, what led to their creation, the objectives of their creators, the knowledge they embody,

the accountability of the institutions that publish them, and the theories that underpin them.

Once we understand how distributional national accounts are constructed, a reasoned use of these statistics becomes possible—just like a reasoned use of GDP statistics becomes possible once we understand their strengths and limitations.

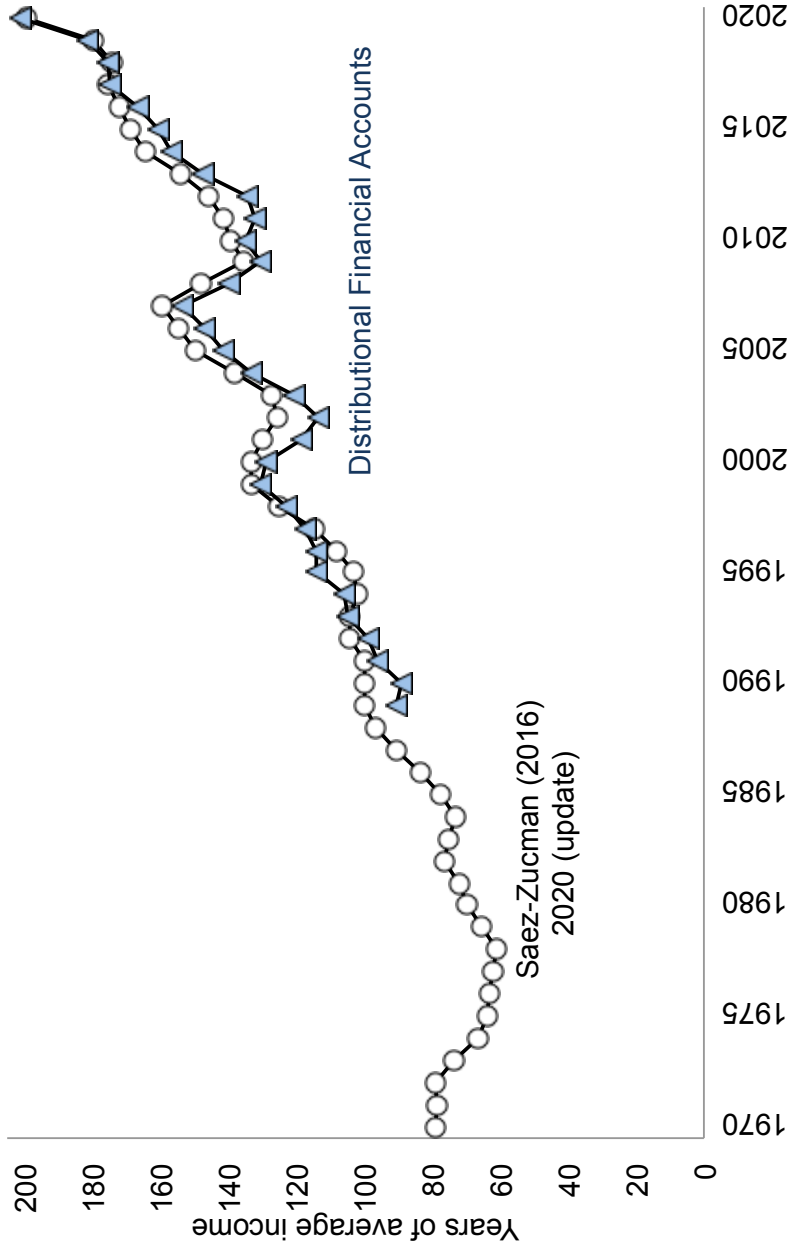
Pre-tax national income, which captures income earned from market activities, can be used to decompose macroeconomic growth and to compare inequality over time and across countries. Cash disposable income can be used to study the income available for saving and private consumption; by subtracting the saving component, it can be used to study consumption inequality. Post-tax national income can be used to estimate the total direct distributive effects of government intervention in the economy. All of these notions have merits and demerits and must be studied jointly. Ultimately, the best data would be published by government agencies, accountable to elected representatives, discussed by the press and parties with a stake in their improvement, and based on a regularly updated, internationally-agreed conceptual framework. This is the recipe that has made the national accounts successful; this is the way forward for all those interested in improving the measurement of inequality.

Figure 1: Top Wealth Shares in the United States: Comparing Estimates



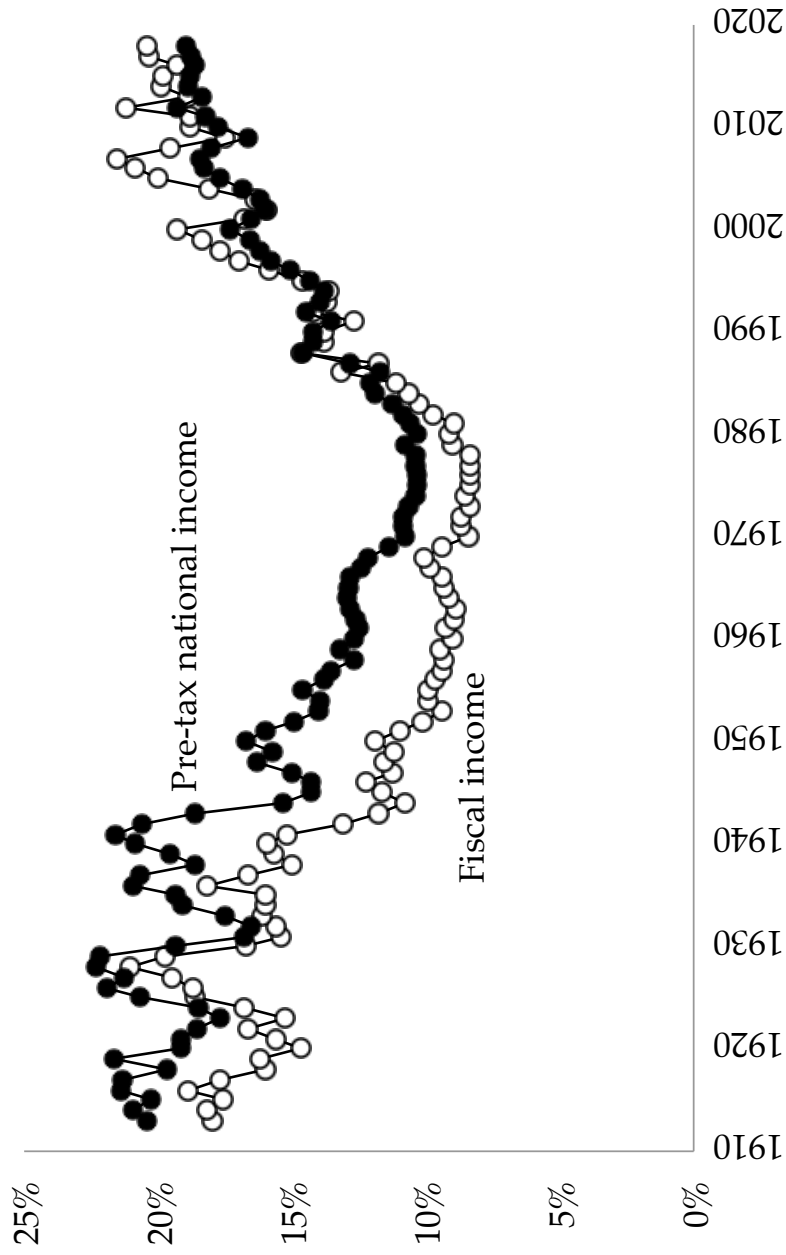
Notes: All the series use the same definition of household wealth (the market value of all non-financial and financial assets net of all debts, excluding consumer durables and unfunded pensions), have the same total wealth (the official Financial Accounts total, e.g., \$76.5 trillion in mid-2016), the same totals asset class by asset class, and use the same unit of observation (tax units). To move from households to tax units in the SCF and the Distributional Financial Accounts, we assume that each tax unit within the top 1 percent corresponds to one household, and make no correction for the next 9 percent. To make the SCF comparable to the other two sources, we add the Forbes 400 to the public-use SCF files and adjust reported wealth to match the Financial Accounts totals asset class by asset class. Sources: Federal Reserve, Saez and Zucman (2016), September 2020 update, and *Forbes*.

Figure 2: Average Wealth of 1% Wealthiest Adults (Divided by Average US Income Per Adult)



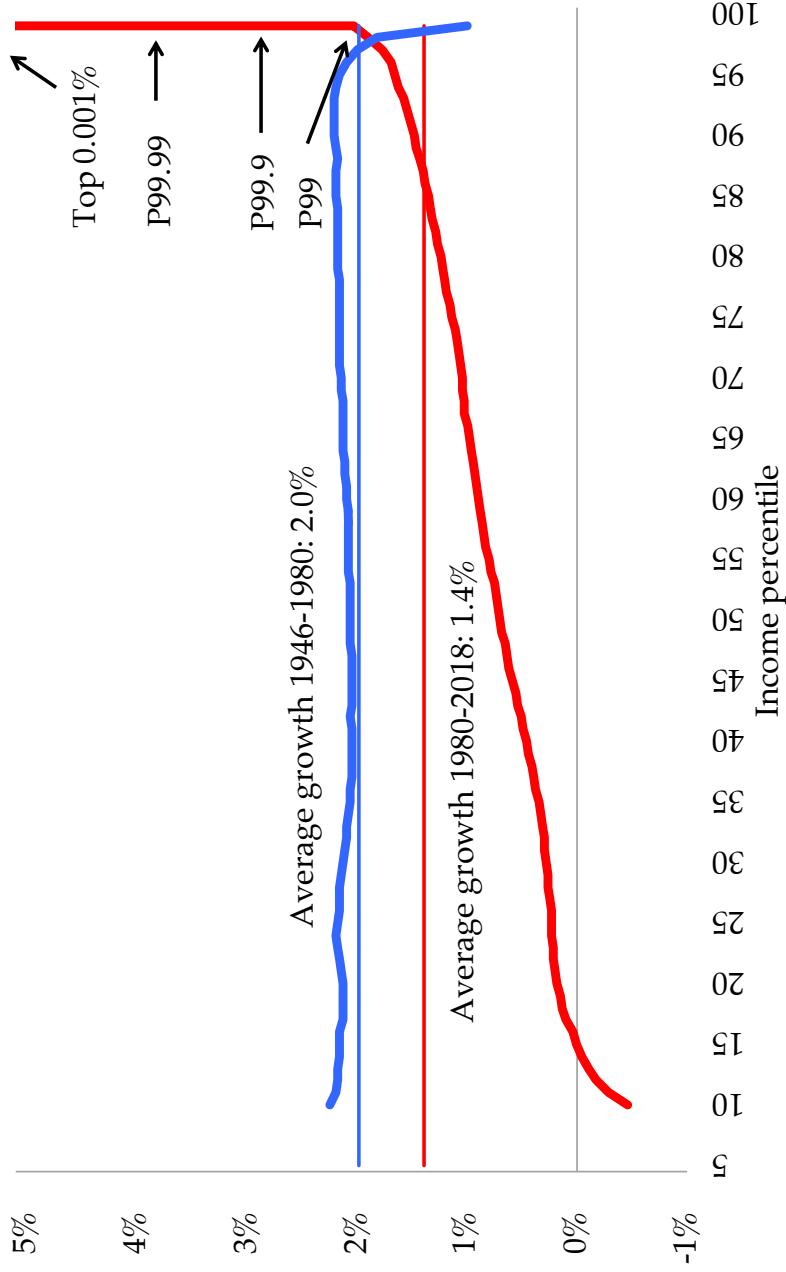
Notes: This figure shows the average wealth of the top 1% wealthiest adults (with wealth equally split among married spouses), expressed as a ratio to average US national income per adult. For the Distributional Financial Accounts, we assume that the average wealth of the top 1% households is the same as the average wealth of the top 1% equal-split adults. Source: Saez and Zucman (2016), September 2020 update, available on [WID.world](https://wid.world), and Federal Reserve Distributional Financial Accounts.

Figure 3: Share of Income Earned by the Top 1 Percent



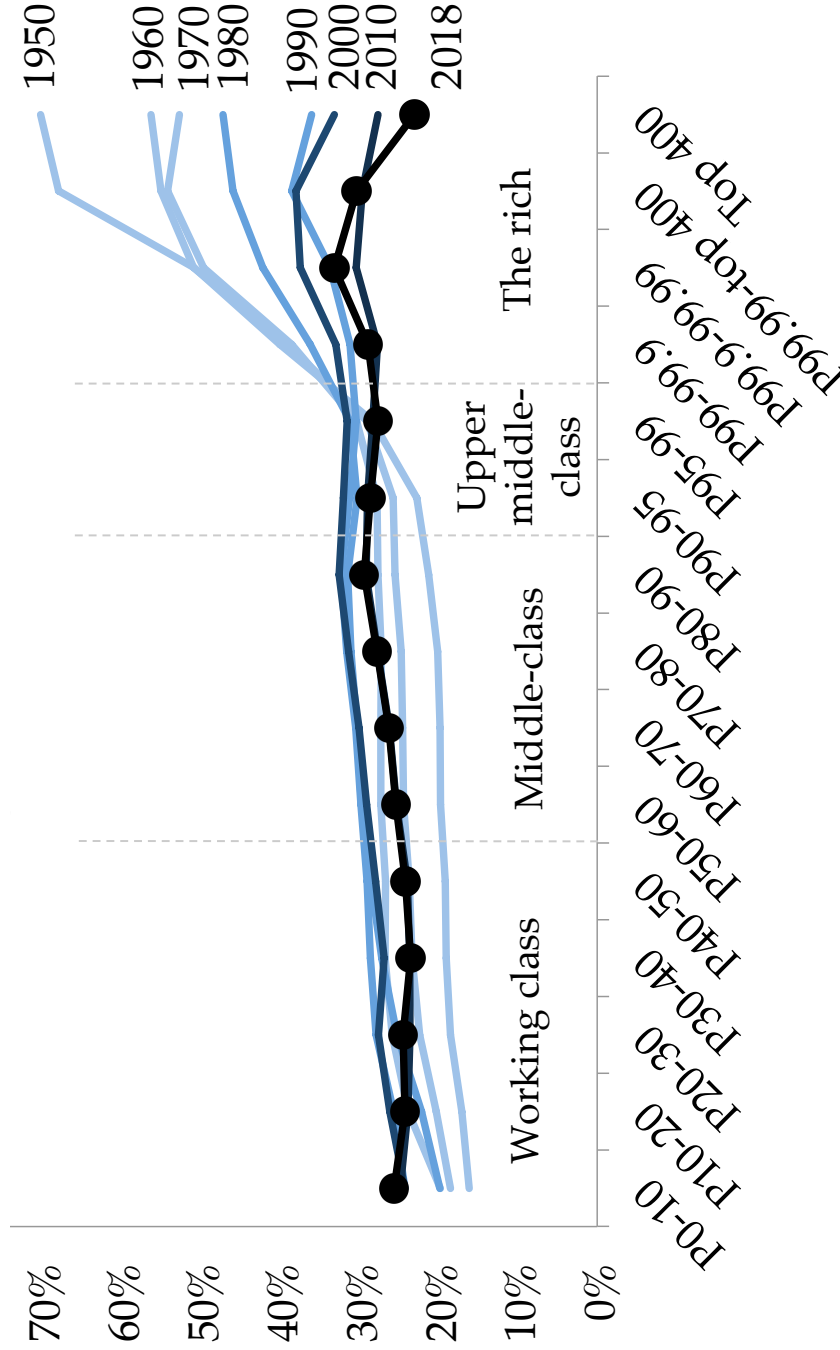
Notes: This figure compares the share of fiscal income earned by the top 1 percent tax units (from Piketty and Saez, 2003, updated; series including capital gains in income to compute shares but not to define ranks, to smooth the lumpiness of realized capital gains) to the share of pre-tax national income earned by the top 1 percent equal-split adults (from Piketty, Saez and Zucman, 2018, updated September 2020, available on [WID.world](https://www.wid.world)).

Figure 4: Average Annual Income Growth Rates



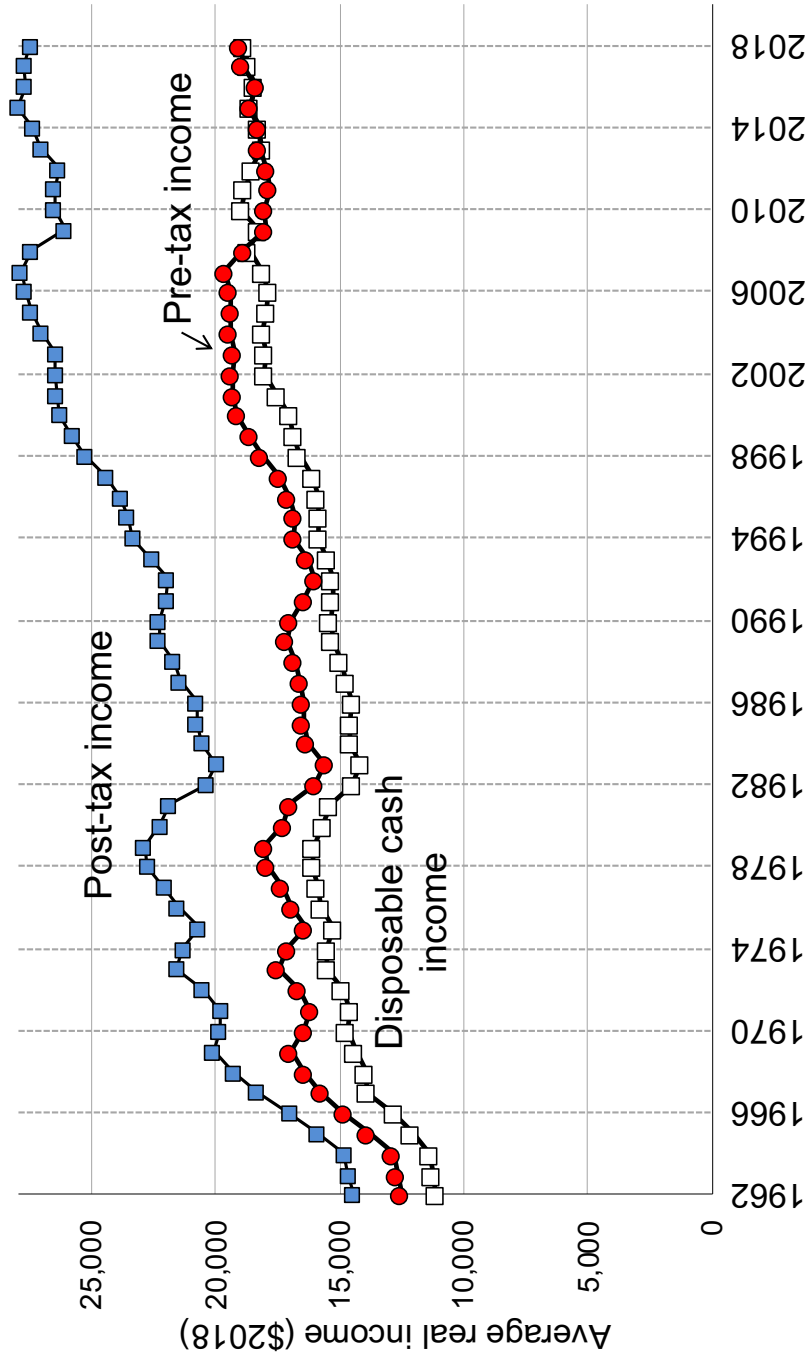
Notes: This figure depicts the annual real pre-tax income growth per adult for each percentile in the 1946-1980 period (in blue) and 1980-2018 period (in red). From 1946-1980, growth was evenly distributed with all income groups growing at the average 2 percent annual rate (except the top 1 percent which grew slower). From 1980 to 2018, growth has been unevenly distributed with low growth for bottom income groups, mediocre growth for the middle class, and explosive growth at the top. Source: Saez and Zucman (2019b).

Figure 5: Average Tax Rates By Income Groups (% Of Pre-tax Income)



Notes: The figure depicts the US average tax rate by income groups from 1950 to 2018. All federal, state, and local taxes are included. Taxes are expressed as a fraction of pre-tax income. P0-10 denotes the bottom 10 percent of the income distribution, P10-20 the next 10 percent, etc. Taking all taxes together, the US tax system used to be progressive with much higher effective tax rates at the top. It has slowly morphed into an almost flat tax with similar rates across income groups. Source: Saez and Zucman (2019b).

Figure 6: The Evolution of Bottom 50 percent Incomes



Notes: The figure depicts the evolution of the real incomes per adult (in 2018 dollars) for the bottom half of the income distribution for three income concepts: (1) pre-tax income before deducting taxes or adding government transfers (concept sums up to national income), (2) post-tax income that deducts all taxes and adds all transfers (cash and in-kind) and collective public expenditures minus the government deficit (also sums up to national income), (3) disposable cash income which is pre-tax income minus all taxes plus cash (or quasi-cash) transfers, i.e. (3) does not include in-kind transfers (primarily Medicaid and Medicare) and collective public expenditures that are included in (2). Source: Piketty, Saez and Zucman (2018), updated September 2020.

References

- Alvaredo, Facundo et al. 2020. “Distributional National Accounts (DINA) Guidelines: Concepts and Methods used in WID.world”, WID working paper, first published as WID Working Paper 2016/2, revised September 2020.
- Auten Gerald, and David Splinter. 2019. “Income Inequality in the United States: Using Tax Data to Measure Long-term Trends,” working paper (December 20, 2019).
- Bricker, Jesse, Alice Henriques, Jacob Krimmel, and John Sabelhaus. 2016. “Measuring income and wealth at the top using administrative and survey data.” *Brookings Papers on Economic Activity*, 261-331.
- Bricker, Jesse, Alice Henriques, and Peter Hansen. 2018. “How Much has Wealth Concentration Grown in the United States? A Re-Examination of Data from 2001-2013.” Finance and Economics Discussion Series 2018-024. Board of Governors of the Federal Reserve System.
- Census Bureau. 2019. *Income and Poverty in the United States: 2018*, available online at <https://www.census.gov/library/publications/2019/demo/p60-266.html>
- Colm, Gerhard, and Helen Tarasov. 1940. “Who pays the taxes.” *Temporary National Economic Committee*, Washington, DC.
- Congressional Budget Office. 2012. “The Distribution of Household Income and Federal Taxes, 2008 and 2009.” available online at <https://www.cbo.gov/publication/43373>.
- Fixler, Dennis, Marina Gindelsky, and David Johnson. 2020. “Measuring Inequality in the National Accounts,” BEA working paper series, WP2020-3.
- Fremeaux, Nicolas and Marion Leturcq. 2020. “Inequalities and the individualization of wealth,” *Journal of Public Economics*, 184, p. 104–145.
- Institute on Taxation and Economic Policy. 2018. *Who Pays: A Distributional Analysis of the Tax Systems in All 50 States*. 6th ed., Washington DC: ITEP.
- Musgrave, Richard A., John J. Carroll, Lorne D. Cook, and Lenore Frane. 1951. “Distribution of tax payments by income groups: a case study for 1948.” *National Tax Journal* 4(1): 1-53.
- Pechman, Joseph A., and Benjamin A. Okner. 1974. *Who Bears the Tax Burden?*, (Washington D.C: Brookings Institution).
- Piketty, Thomas, and Emmanuel Saez. 2003. “Income Inequality in the United States, 1913-1998.” *Quarterly Journal of Economics* 118, no. 1: 1-39.
- Piketty, Thomas, and Gabriel Zucman. 2014. “Capital is Back: Wealth-Income Ratios in Rich Countries 1700–2010.” *Quarterly Journal of Economics* 129(3): 1255-1310.
- Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. 2018. “Distributional National Accounts: Methods and Estimates for the United States.” *Quarterly Journal of Economics* 133, no. 1: 553–609.
- Saez, Emmanuel and Gabriel Zucman. 2016. “Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data.” *Quarterly Journal of Economics* 131, no. 2: 519-578.
- Saez, Emmanuel and Gabriel Zucman. 2019. “Progressive Wealth Taxation.” *Brookings Papers on Economic Activity*.
- Saez, Emmanuel and Gabriel Zucman. 2019b. *The Triumph of Injustice: How the Rich Dodge Taxes and How to Make them Pay*. New York: W. W. Norton.
- Saez, Emmanuel and Gabriel Zucman. 2019c. “Clarifying Distributional Tax Incidence: Who Pays Current Taxes vs. Tax Reform Analysis.” UC Berkeley Working Paper 2019.
- Saez, Emmanuel and Gabriel Zucman. 2020. “Trends in US Income and Wealth Inequality: Revising After the Revisionists.” UC Berkeley Working Paper 2020.

- Smith, Matthew, Owen Zidar, and Eric Zwick. 2019. "Capitalists in the 21st Century," *Quarterly Journal of Economics*, 134(4) p. 1675–1745.
- Smith, Matthew, Owen Zidar, and Eric Zwick. 2020. "Top Wealth in America: New Estimates and Implications for Taxing the Rich." Working Paper.
- US Census Bureau. 2019. "Income and Poverty in the United States: 2018 Current Population Reports," Publication P60-252, Census Bureau.
- Zucman, Gabriel. 2013. "The Missing Wealth of Nations: Are Europe and the U.S. net Debtors or net Creditors?" *Quarterly Journal of Economics* 128, no. 3: 1321-1364..
- Zucman, Gabriel. 2015. *The Hidden Wealth of Nations: The Scourge of Tax Havens*. Chicago: University of Chicago Press.