

## Simplified Distributional National Accounts

Thomas Piketty  
Emmanuel Saez  
Gabriel Zucman

January 2019



World Inequality Lab

## **Simplified Distributional National Accounts** \*

Thomas Piketty (Paris School of Economics); Emmanuel Saez (UC Berkeley and NBER);

Gabriel Zucman (UC Berkeley and NBER)

Piketty, Saez, and Zucman (2018) (hereafter PSZ) propose a method to distribute total national income across individual adults in the United States. The method has recently been applied to a number of countries as reviewed in the World Inequality Report 2018 (Alvaredo et al. 2018). The key advantage relative to earlier work using fiscal income such as Piketty and Saez (2003) or survey data is that the national income concept is comprehensive, homogeneous over time, and comparable across countries. In particular, distributional national income statistics can be used to study both growth and inequality in a consistent framework that aggregates cleanly to national income from national accounts. In contrast, fiscal income or survey income aggregates display growth levels that are quite different from national income growth both in the short-term year-to-year fluctuations and in the long-term growth rates averaged over decades (see PSZ for a detailed discussion).

The PSZ methodology starts from individual tax return data providing information on fiscal income at the micro-level and then imputes forms of income that are in national income but not in fiscal income such as fringe benefits for employees, imputed rent of homeowners, retained profits of corporations, etc. These imputations are made at the individual level based on a number of assumptions and combining information from income tax data and auxiliary datasets such as survey data and national accounts data. Naturally, there are many assumptions involved and each assumption can be questioned. Because the number of assumptions made is very large, the methodology lacks simplicity and hence the end results are not as transparent as the simpler earlier fiscal income series by Piketty and Saez (2003).

As shown in Figure 1, the Piketty and Saez (2003) fiscal income series showed a huge increase in the top 1 percent fiscal income share in recent decades. The top 1 percent fiscal

---

\* Piketty: Paris School of Economics, 48 Boulevard Jourdan, 75014 Paris, (e-mail: [piketty@psemail.eu](mailto:piketty@psemail.eu)); Saez: University of California, Berkeley, CA 94720, (e-mail: [saez@econ.berkeley.edu](mailto:saez@econ.berkeley.edu)); Zucman: University of California, Berkeley, CA 94720, (e-mail: [zucman@berkeley.edu](mailto:zucman@berkeley.edu)). We acknowledge funding from the Berkeley Center for Equitable Growth, the Sandler Foundation, and the Institute for New Economic Thinking. We thank Katherine Abraham and David Johnson for helpful comments and discussions.

income share grew by about 10 points from 8.4 percent in 1960 to 17.8 percent in 2016. The new PSZ series based on national income also show a large increase in the share of national income going to the top 1 percent from about 10 percent in 1980 to about 20 percent today. This doubling of the top 1 percent national income share in the PSZ series takes place both when the top 1 percent is defined based on individual adults with equal splitting of income within married couples (the benchmark PSZ series) and when the top 1 percent is defined based on tax units (as in the Piketty and Saez 2003 fiscal income series). Recently, Auten and Splinter (2018) have proposed an alternative set of assumptions for distributing non-fiscal income and have found a much more modest increase in top 1 percent income shares. Auten and Splinter use the individual adult unit. All these series are depicted on Figure 1.

To cast light on these discrepancies and help understand better the overall plausibility of the large set of assumptions in PSZ and Auten and Splinter (2018), this paper develops a simplified methodology that starts from the fiscal income top income share series and makes very basic assumptions on how each income component from national income that is not included in fiscal income is distributed. This simplified methodology has two main goals.

First and most important, it can be used to create distributional national income statistics in countries where fiscal income inequality statistics are available but where there is limited information to impute other income at the individual level. Alvaredo et al. (2016) distributional national accounts guidelines proposed a simplified methodology for countries with less data (Section 7). The methodology proposed here can be seen as an even simpler method that can be applied to countries for which fiscal income top income share statistics exist<sup>1</sup> and for which national accounts and fiscal income aggregates are sufficiently detailed.

Second, this simplified methodology can also be used to assess the plausibility of the PSZ assumptions. In particular, we will show that the simplified methodology can be used to show that the alternative assumptions proposed by Auten and Splinter (2018) imply a drastic equalization of income components not in fiscal income which does not seem realistic.

## **I. Simplified Distributional National Accounts**

---

<sup>1</sup> Such series exist for a large number of countries and are available online in the World Inequality Database [wid.world](http://wid.world). See Atkinson, Piketty, and Saez (2011) for a review of this literature.

In what follows, we focus solely on pre-tax national income defined as market income after the operation of public and private pension systems (i.e., net of pension contributions either public through social security payroll taxes or private through defined benefit and defined contributions pension plans and including all pension benefits public and private). Pre-tax national income is before all taxes (except payroll taxes funding social security benefits) and before any government transfers (except public pensions). As discussed extensively in Alvaredo et al. (2016) distributional national accounts guidelines, considering income after the operation of pension systems allows to control for the effects of aging (as retirees typically have very little factor income) and whether a country organizes pensions privately or publicly. PSZ pre-tax income benchmark series also use this pre-tax national income definition.

We consider tax units (as opposed to individual adults as in the main PSZ series) because fiscal income series by Piketty and Saez (2003) are based on tax units (following the tax definition). Moving from tax units to individual units with income equally split within married couples (the benchmark series of PSZ) is fairly easy to do but would require re-computing fiscal income series. As shown in Figure 1, using tax units vs. the individual adult (with equal split within married couples) has only a very minor effect on series as displayed in Figure 1.<sup>2</sup>

To simplify the exposition, here as in the rest of the computations presented below, we exclude taxes on products and production (primarily sales and excise taxes) from national income. This implies that we consider factor-price national income (instead of full national income). This has no consequence on the distributional analysis as distributional national income methodology distributes taxes on products and production proportionally to factor-price national income on a pre-tax basis. Conceptually, factor-price national income can be seen as the income that would allow to buy all the production carried out by the factors (labor and capital) owned by residents provided that this production can be bought at prices that do not include taxes on products and production. The evolution of taxes on products and production has only a very modest effect on the evolution of the top 1 percent income share.

---

<sup>2</sup> Auten and Splinter (2018) estimates--as well as the Congressional Budget Office estimates, CBO 2018)--do not use consistent definitions when ranking units to define the top 1 percent and when defining income to compute top income shares. Incomes for ranking are normalized by household size including children but incomes for computing top shares are not. This inconsistency in definitions mechanically biases downward the top 1 percent income share (as the incomes of the top 1 percent are actually not the highest top 1 percent incomes). This does not seem sensible to us. In our view, the top 1 percent should be the top 1 percent highest income earners.

The simplified methodology starts with the fiscal income top income share series developed by Piketty and Saez (2003). As shown on Figure 1, the top 1 percent fiscal income share (excluding capital gains) has increased from 8.4 percent in 1960 to 17.8 percent in 2016. Everybody agrees that the concentration of reported fiscal income has increased a lot since 1960. This is uncontroversial because this fiscal income is directly observable in tax data.

Reported fiscal income (excluding capital gains) adds up to 64 percent of factor-price national income in 2016 down from 70 percent in 1960. As shown in Figure 2A, the majority of the pre-tax income not visible on individual tax returns is capital income (corporate retained earnings, corporate income taxes, tax-exempt interest, imputed rents, property taxes, investment income earned by pension funds, income paid to trusts, fiduciaries, etc.). As shown in Figure 2B, untaxed capital income accounts for the vast majority of total capital income in the economy. As pension funds grow overtime and are more equally distributed than other forms of wealth, it is useful to split untaxed capital income into the untaxed capital income earned by pension funds and other untaxed capital income.

PSZ offers a sophisticated treatment of untaxed income that involves a detailed reconciliation with national accounts totals component by component. However it is possible to reproduce the PSZ results quickly and to understand what their methodology amounts to doing in a simple way. The 36 percent of pre-tax (factor-price) national income not reported in tax data in 2016 can be decomposed as follows:

- 12.7 percent is untaxed labor and pension income (employer contributions to health insurance, Social Security benefits, untaxed private pension benefits such as Roth IRAs and after-tax Defined Contribution plans, under-reported labor income most of which is from non-corporate business profits),
- 10.6 percent is untaxed capital income earned on pension plans (including the fraction of the corporate income tax, business property tax, and retained earnings attributable to pension plans),
- 13.0 percent is untaxed capital income other than earned on pension plans.

We use the following two assumptions in our simplified methodology:

- 1) Untaxed labor and pension income and untaxed capital income earned on pension plans is distributed like taxable labor and pension income,

2) Other untaxed capital income is distributed like taxable capital income,

With these two assumptions and using the composition of top fiscal incomes (broken down in (a) labor and pension income, and (b) capital income) provided by Piketty and Saez (2003) compositional series, we can compute pre-tax national income top income shares as follows (see attached excel file for complete computations).

The share of untaxed labor and pension income and untaxed capital income earned on pension plans accruing to top 1 percent earners is assumed to be the same as the share of labor and pension income in fiscal income accruing to top 1 percent earners. It grows from 6 percent in 1960 (when labor income had low concentration) to 15 percent in 2016 (when labor income is much more concentrated). The share of other untaxed capital income in national income accruing to top 1 percent earners is assumed to be the same as the share of taxable capital income in fiscal income accruing to top 1 percent earners. Such taxable capital income has always been highly concentrated with the share accruing to the top 1 percent growing from 40 percent in 1960 to 48 percent in 2016. These two calculations use the two assumptions stated above and assume that any effects due to re-ranking (when moving from fiscal income to national income) are negligible.

Figure 3 displays the resulting simplified top 1 percent pre-tax national share. It shows that this simplified top income share tracks very closely the corresponding sophisticated PSZ income share in both levels and trends. Put another way, the PSZ methodology delivers results that are about the same as the results one would obtain by decomposing national income into taxable income and three categories of untaxed income, and making simple assumptions about how these three categories are distributed.

The PSZ series and the simplified series track each other closely with an almost perfect match in 1960 and 2016. The main difference is in the late 1970s early 1980s when very little taxable capital income was reported (due to large business losses due in large part to the development of tax shelters). Such business losses were corrected for in PSZ (by ignoring business losses) but not with this simplified method. As a result, the simplified series undershoot slightly the PSZ series in that period.

More generally, the simplified assumptions are clearly too coarse. In particular, the aggregate of untaxed labor and pension income is a mixed bag of heterogeneous income

categories that are distributed very differently (e.g., Social Security benefits are equally distributed, while under reported labor income, most of which is in businesses, is unequally distributed.) Similarly, untaxed capital income includes elements that are very concentrated (such as retained earnings of corporations not owned by pension plans) and elements that are much less concentrated (such as imputed rent of homeowners). Therefore, the sophisticated PSZ approach is required to deliver more accurate results. But at least our two basic assumptions are a reasonable way to distribute the aggregate amount of untaxed income, and for all its complexity the PSZ methodology amounts to making roughly these simple assumptions.

## **II. Comparison with Auten and Splinter (2018)**

Auten and Splinter (2018) also propose to distribute national income by income groups but making different assumptions than PSZ along many dimensions. They start from the fiscal income series of Piketty and Saez (2003), make a number of definitional changes, and add various income components not included in fiscal income. In the end, they find a top 1 percent income share of 14.2 percent in 2015. Using the national income at factor prices total of \$14.98Tr in 2015, this means that their top 1 percent earns \$2.13Tr in 2015. In the Piketty and Saez (2003) fiscal series including realized capital gains, the top 1 percent income share in 2015 is 21.6 percent of a \$10.26Tr fiscal income total, which means that the top 1 percent earns \$2.22Tr in fiscal income in 2015. Therefore, Piketty and Saez (2003) find *more* income going to the top 1 percent by simply looking at their reported fiscal income (including realized capital gains) than what Auten and Splinter (2018) obtain after adding various income components that enlarge the denominator income base by 46 percent from \$10.26Tr to \$14.98Tr.

As shown on Figure 1, Auten and Splinter also find that the top 1 percent share of pre-tax national income has barely increased since 1960 (+2.8 points instead of +9.4 for fiscal income). For this to be true, it must be the case that the 36 percent of national income which are not reported on individual tax returns have become enormously less concentrated over time. This equalization process must have been so powerful as to offset the upsurge in the concentration of the (much larger) flow of reported fiscal income. Piketty, Saez, and Zucman (2018) find that the 36 percent of national income not in tax returns has become slightly less concentrated over time. Is it conceivable that it has in fact become dramatically less concentrated?

What assumptions on the evolution of the distribution of the untaxed income categories are needed to recover the Auten and Splinter (2018) results? One can recover the Auten and Splinter (2018) top 1 percent pre-tax income shares by changing our two assumptions as follows.

Under our assumption 1, non-taxable labor and pension income and capital income earned on pension plans is distributed like taxable labor income. The share going to the top 1 percent grows from 6 percent in 1960 (when labor income had low concentration) to 15 percent in 2016 (when labor income is much more concentrated). Instead, to replicate Auten and Splinter, we assume that the concentration of non-taxable labor and pension income and capital income earned on pension plans remains frozen at its 1960 level, i.e., the top 1 percent get only 6 percent of such income throughout the full period 1960-2016. This is a very low level that essentially states that the rich have been largely left out of the explosion of pension funds, fringe benefits, and the surge of business income that is under-reported on tax returns.<sup>3</sup>

Under our assumption 2, the share of other untaxed capital income in national income accruing to top 1 percent earners is assumed to be the same as the share of taxable capital income in fiscal income accruing to top 1 percent earners. It is very concentrated with the share accruing to the top 1 percent growing from 40 percent in 1960 to 48 percent in 2016. Instead, to replicate Auten and Splinter, we assume that the share of other untaxed capital income earned by the top 1 percent declines linearly from 30 percent in 1960 to 10 percent in 2016. Hence, we assume that this share declines dramatically so that non-taxable capital income (outside of pension funds) is now more equally distributed than labor income. This assumption is therefore extreme and amounts to assuming that capital income and wealth are now extremely equally distributed in the United States.

Figure 4 shows that our simplified methodology combined with these two alternative assumptions reproduces closely the Auten and Splinter (2018) estimates both in levels and trends. However, these alternative assumptions are extreme and hence unrealistic. In particular, assumption 2 goes starkly against a body of evidence showing that the concentration of wealth in

---

<sup>3</sup> The classical reference on the distribution of under-reported income Johns and Slemrod (2010) finds that adding under-reported income does not affect the distribution of fiscal income (their Table 5). Johns and Slemrod (2010) also find that the fraction of Schedule C business income evaded by the top 0.5 percent is 55 percent and almost identical to the full population average of 57 percent (their Table 4). This is consistent with PSZ methodology but in sharp contrast to Auten and Splinter (2018) who attribute a disproportionately large and growing fraction of under-reported income to the bottom 90 percent.



the United States has in fact increased sharply (as summarized in Zucman 2019). As far as we can see, Auten and Splinter do not provide any corroborating evidence which could justify assumption 2, while there is ample evidence to justify assumption 1 as a benchmark hypothesis.

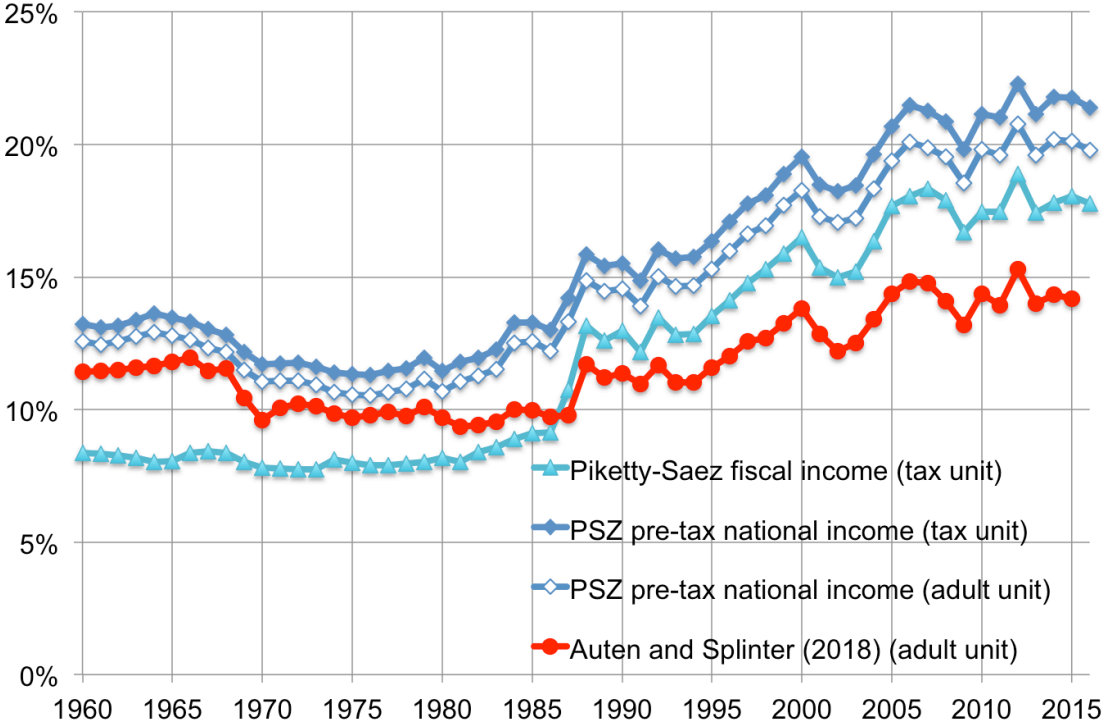
The share of total household wealth owned by the top 1 percent of households in the Survey of Consumer Finances (SCF) (which excludes the Forbes 400) has increased from 29.7 percent in 1989 to 38.8 percent in 2016 (Bricker et al. 2017). The share of wealth owned by the Forbes 400 has been multiplied by more than 3 since 1982 (see Zucman 2019) growing from less than 1 percent in the early 1980s to over 3 percent in the 2010s. Saez and Zucman (2016) created wealth inequality series using the capitalization method and systematically distributing all sources of household wealth from financial accounts. They also find a large increase in wealth concentration. These findings are illustrated in Figure 5 (reproduced from Zucman, 2019). Figure 5 displays the top 1 percent wealth share estimates based on Saez and Zucman (2016) series capitalizing income tax returns and the top 1 percent wealth share combining the official SCF estimates of Bricker et al. (2017) and the Forbes 400 wealth share (as the Forbes 400 are excluded by definition from the SCF). Both series show a sharp increase in the top 1 percent wealth share. In 2016, both series show that about 40 percent of total household wealth is owned by the top 1 percent. The SCF estimates for 2016 show a slightly higher top 1 percent wealth share (40.7 percent) than the Saez-Zucman capitalized income estimates (38.9 percent). These 2016 estimates are up from 30.8 percent in 1989 using the SCF series and up from 23.6 percent in 1980 using the capitalized income tax series.

Therefore, our simplified methodology can show very simply that one needs extreme and hence unrealistic assumptions on equalization of income components not in fiscal income to reverse the large increase in income concentration obtained from fiscal income series of Piketty and Saez (2003).

## References

- Alvaredo, Facundo, Anthony B. Atkinson, Lucas Chancel, Thomas Piketty, Emmanuel Saez, and Gabriel Zucman.** 2016. “Distributional National Accounts (DINA) Guidelines: Concepts and Methods used in WID.world.” WID.world Working Paper 2016/1.
- Alvaredo, Facundo, Lucas Chancel, Thomas Piketty, Emmanuel Saez, and Gabriel Zucman.** 2018. The World Inequality Report 2018. Cambridge: Harvard University Press. Online at <http://wir2018.wid.world/>
- Atkinson, Anthony, Thomas Piketty, and Emmanuel Saez.** 2011. “Top Incomes in the Long Run of History.” *Journal of Economic Literature* 49: (1), 2011.
- Auten, Gerald and David Splinter.** 2018. “Income Inequality in the United States: Using Tax Data to Measure Long-term Trends.” U.S. Department of the Treasury, Office of Tax Analysis, unpublished mimeo, August 2018 version.
- Bricker, Jesse, Lisa J. Dettling, Alice Henriques, Joanne W. Hsu, Lindsay Jacobs, Kevin B. Moore, Sarah Pack, John Sabelhaus, Jeffrey Thompson, and Richard A. Windle.** 2017. “Changes in U.S. Family Finances from 2013 to 2016: Evidence from the Survey of Consumer Finances.” *Federal Reserve Bulletin* 103 (3): 1-42.
- Congressional Budget Office.** 2018. “The Distribution of Household Income, 2015.” Congressional Budget Office.
- Johns, Andrew, and Joel Slemrod.** 2010. “The Distribution of Income Tax Noncompliance.” *National Tax Journal* 63(3): 397-418.
- Piketty, Thomas and Emmanuel Saez.** 2003. “Income Inequality in the United States, 1913-1998.” *Quarterly Journal of Economics* 118 (1): 1-39.
- Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman.** 2018. “Distributional National Accounts: Methods and Estimates for the United States.” *Quarterly Journal of Economics* 133 (2): 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 (2): 519-578.

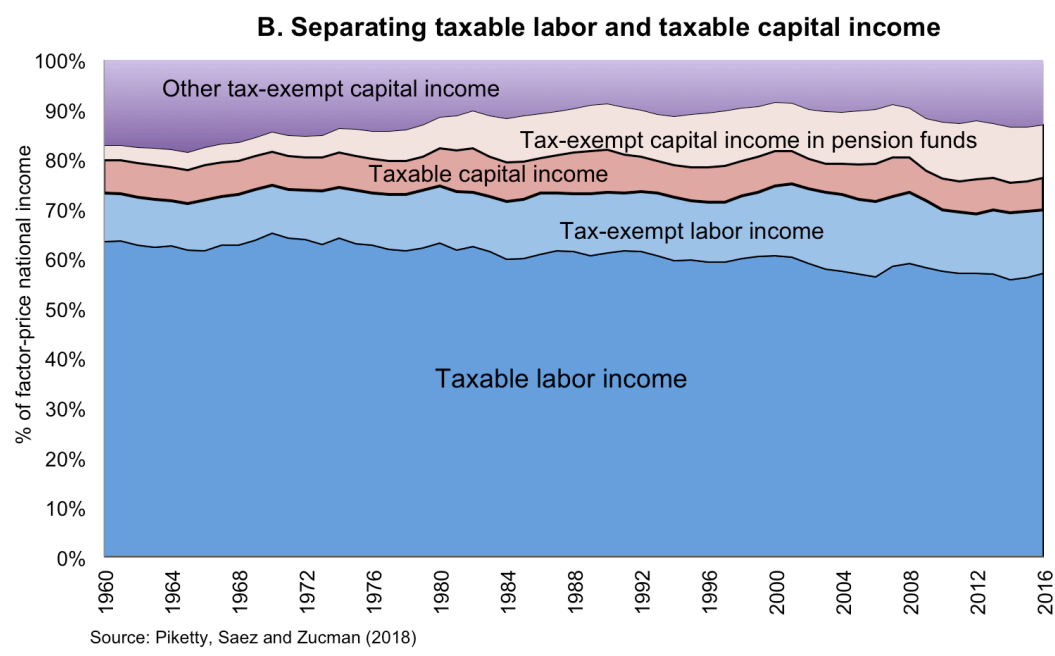
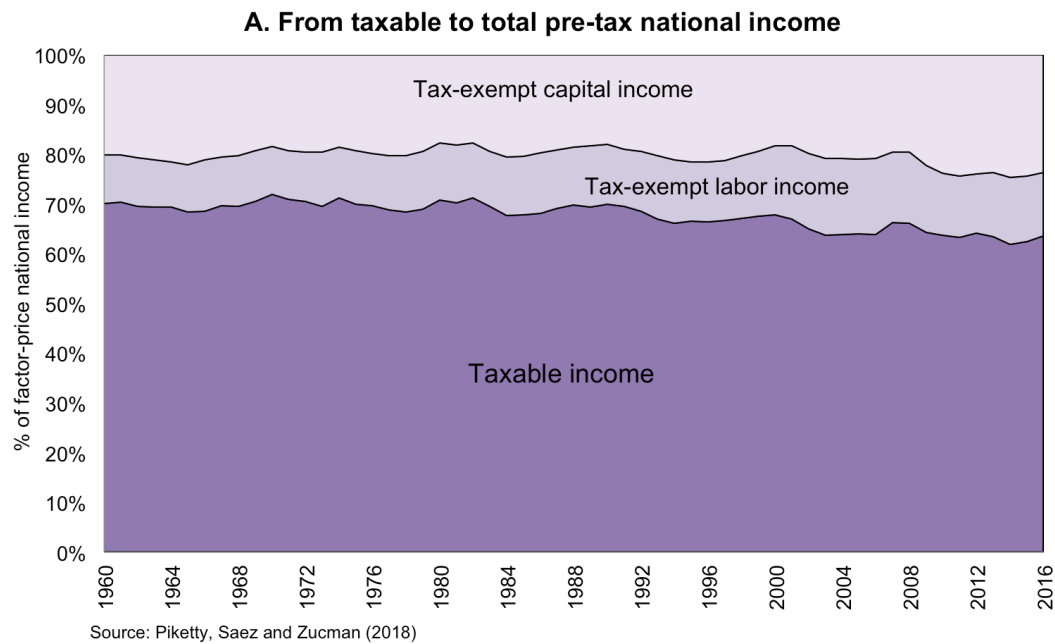
**Zucman, Gabriel.** 2019. "Global Wealth Inequality." *Annual Review of Economics* 11, forthcoming.



**Figure 1. Top 1 percent income shares, 1960-2016**

*Notes:* This figure displays (a) the top 1 percent fiscal income share from Piketty and Saez (2003) using tax units and pre-tax fiscal income excluding capital gains, (b) the top 1 percent income share from Piketty, Saez, Zucman (2018) (PSZ) using tax units and pre-tax national income, (c) the top 1 percent income share from Piketty, Saez, Zucman (2018) (PSZ) using the individual adult unit (with equal split of income within married couples) and pre-tax national income, (d) the top 1 percent pre-tax income share from Auten and Splinter (2018) using the individual adult unit and pre-tax national income. This paper shows how to reproduce approximately the Piketty, Saez, Zucman and Auten and Splinter series starting from the Piketty and Saez fiscal income series and making simple assumptions on how non-taxable income is distributed.

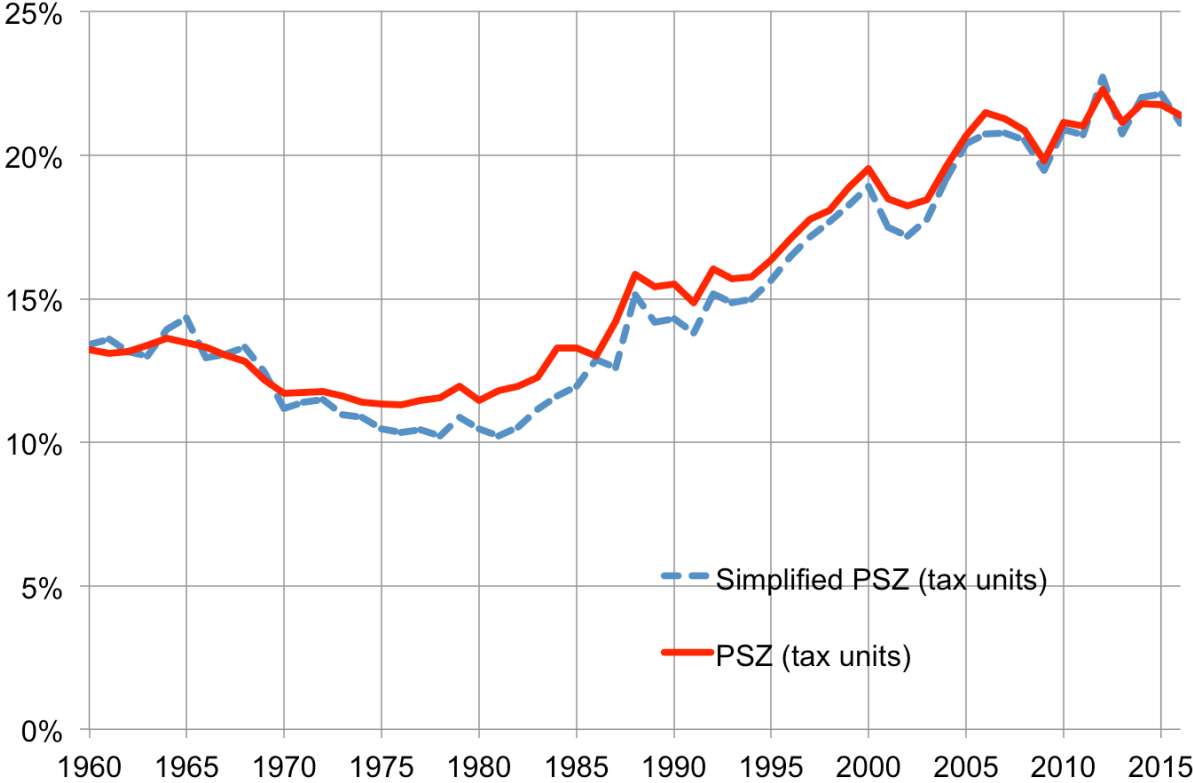
*Source:* Piketty and Saez (2003), Piketty, Saez, and Zucman (2018), Auten and Splinter (2018).



**Figure 2. From taxable to total pre-tax national income, 1960-2016**

*Notes:* Panel A decomposes factor-price national income (defined as national income excluding taxes on production and production) into taxable income (reported on tax returns), tax-exempt labor income (not reported on tax returns) and tax-exempt capital income (not reported on tax returns). Panel B further splits taxable income into taxable labor income and taxable capital income and tax-exempt capital income into tax-exempt capital income in pension funds and other tax-exempt capital income. In both panels, realized capital gains are excluded from taxable income.

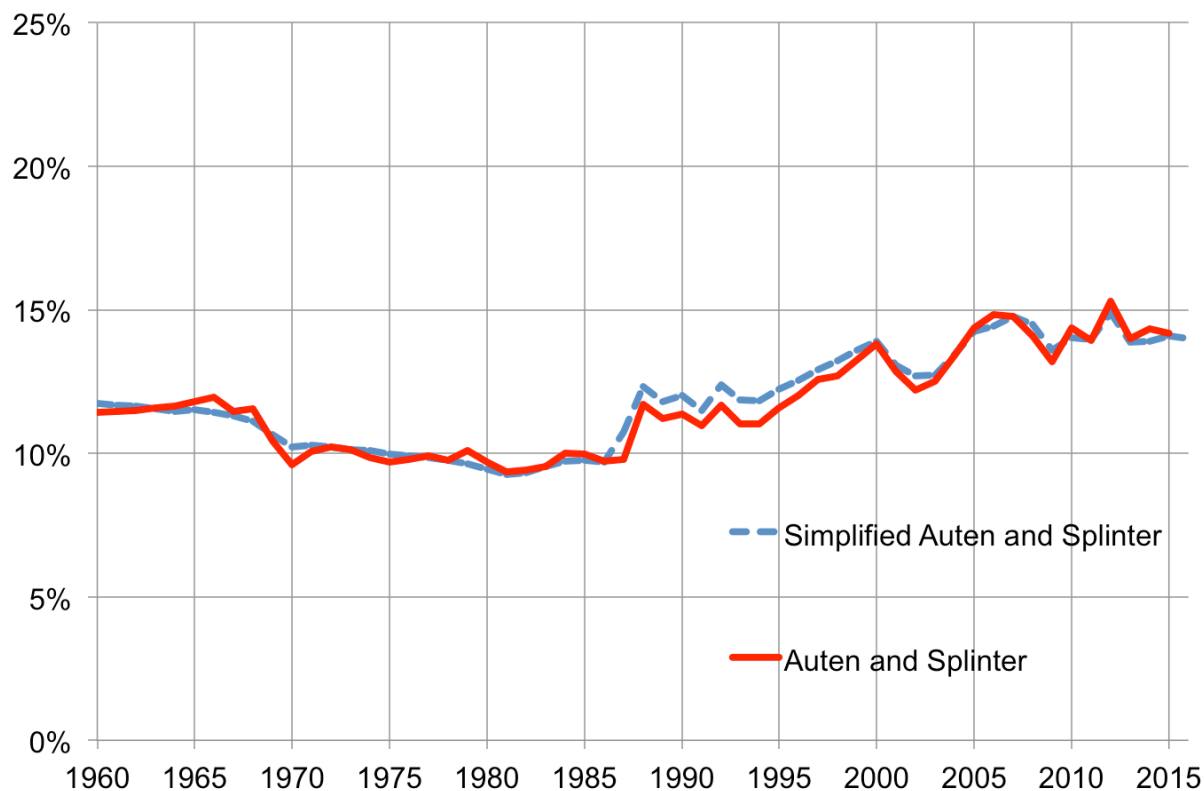
*Source:* Piketty, Saez, and Zucman (2018), series updated to 2016.



**Figure 3. Top 1 percent pre-tax national income share: PSZ vs. simplified computations**

*Notes:* This figure displays the top 1 percent pre-tax national income share from Piketty, Saez, and Zucman (2018) (PSZ) in solid line and using our proposed simplified computation in dashed line. The simplified computation uses realistic assumptions and reproduces closely the PSZ series both in levels and trends.

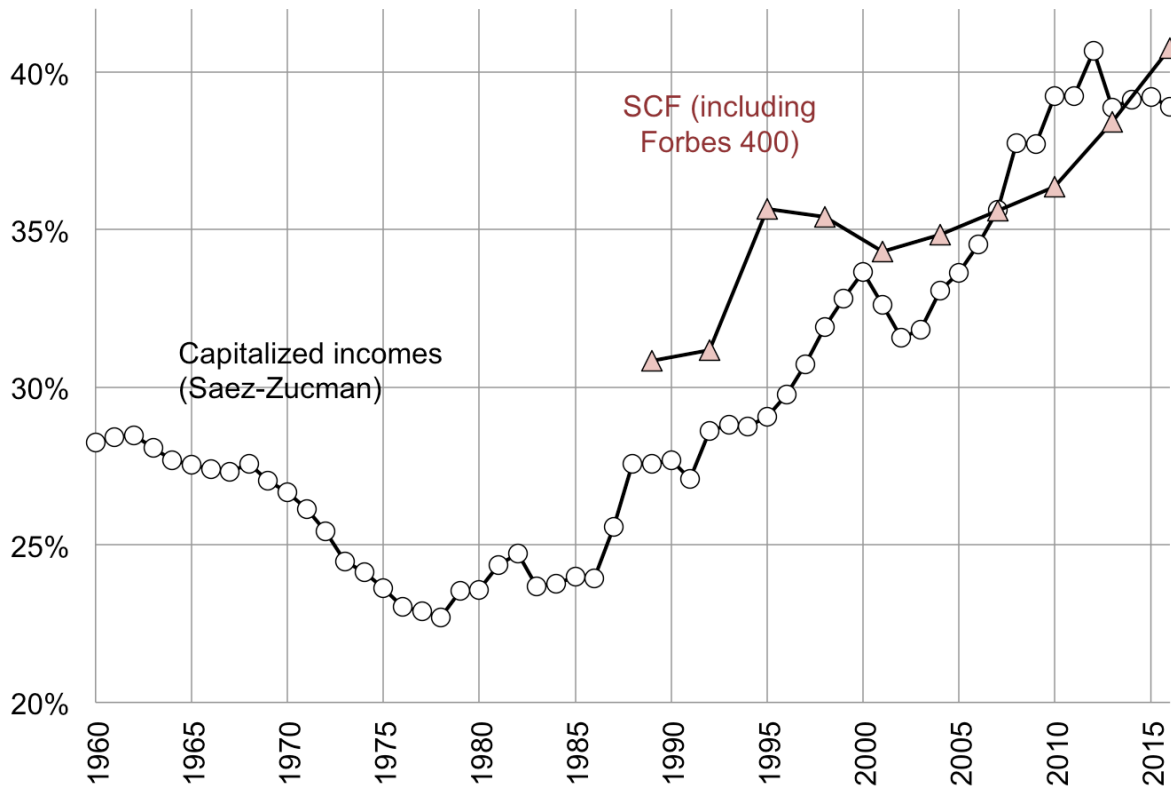
*Source:* Piketty, Saez, and Zucman (2018) and authors' computations.



**Figure 4. How to recover Auten and Splinter top 1 percent income share series using simplified computations**

*Notes:* This figure displays the top 1 percent pre-tax national income share from Auten and Splinter (2018) in solid line and using a simplified computation in dashed line. The simplified computation needs to use unrealistic assumptions to reproduce closely the Auten and Splinter series both in levels and trends. We need to assume that the concentration of non-taxable labor income and capital income on pension funds is stable and low even though the concentration of taxable labor income increases sharply. We also need to assume that the concentration of other non-taxable capital income declined sharply from 1960 to 2016 to unrealistically low levels by 2016.

*Source:* Auten and Splinter (2018) and authors' computations.



**Figure 5. Top 1 percent Wealth Share in the United States: Capitalized incomes and SCF**

*Notes:* This figure displays the top 1 percent wealth share obtained by capitalizing incomes and obtained from the Survey of Consumer Finances (SCF). The wealth of the Forbes 400 richest Americans (which by design are excluded from the SCF) is added to the wealth of the top 1 percent in the SCF. The unit of observation is tax units for capitalized incomes and households for the SCF.

*Source:* Saez and Zucman (2016), updated, and Bricker et al. (2017). Series are reproduced from Zucman (2019), Figure 2.