# Using Tax Data to Measure Long-Term Trends in U.S. Income Inequality

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**Abstract**

Previous studies using U.S. tax return data conclude that the top one percent income share increased substantially since 1960. This study re-estimates the long-term trend in inequality after accounting for changes in the tax base, income sources missing from individual tax returns and changes in marriage rates. This more consistent estimate suggests that top one percent income shares increased by only about a quarter as much as unadjusted shares. Further, accounting for government transfers suggests that top one percent shares increased a tenth as much. These results show that unadjusted tax return based measures present a distorted view of inequality trends, as incomes reported on tax returns are sensitive to changes in tax laws and ignore income sources outside the individual tax system.

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Changes in income inequality could indicate equity shifts or other problems within a society. Stiglitz (2012) uses income inequality as an indicator of the concentration of political power and the level of economic rent-seeking. Piketty, Saez and Stantcheva (2014) argue that increases in measured top income shares result from increases in the bargaining power of top earners for compensation. Under these hypotheses, increasing inequality could imply various problems: decreasing institutional accountability due to concentrated power, decreasing economic efficiency due to rent-seeking, and stagnating middle class wages due in part to relative bargaining power. These issues emphasize the importance of correctly measuring top income inequality.

A number of studies have used income tax data to measure inequality trends over long time periods. Income tax data are generally thought to be less subject to underreporting and measurement error than survey data.[1] However, there are important limitations to income tax data that could lead to biased estimates for measuring inequality trends. The goal of this paper is to examine the extent to which estimates of the levels and trends of U.S. top income shares have been biased as a result of failing to account for these limitations.

One important limitation of tax data is that the income reported on tax returns is subject to change over time, especially with major tax reforms. Such changes can be quite important in measuring long-term trends in top income shares. Using income as reported on U.S. tax returns, Piketty and Saez (2003, hereafter PS) estimate that the share of market income received by the top one percent of tax units increased from 9 to 19 percent between 1960 and 2013. About 40 percent of this increase, however, occurred in the years just before and after the Tax Reform of 1986 (TRA86).

The potential for TRA86 to affect measures of U.S. inequality has been noted by Feenberg and Poterba (1993), Gordon and MacKie-Mason (1994), and MacKie-Mason and Gordon (1997). Several theories have been advanced for the sharp increase in measured top income shares following TRA86, including shifting from C corporations to S corporations (Plesko, 1994; Slemrod, 1996) and behavioral responses to lower individual tax rates (Carroll and Joulfaian, 1997; Saez, 2004; and Cooper et al., 2016).

Tax return-based measures of income inequality can also be affected by changing incentives for distributing or retaining C corporation earnings (Gordon and Slemrod, 2000; Clarke and Kopczuk, 2016). In the 1960s and 1970s, top individual income tax rates of 70 percent (91 percent before 1964) provided business owners strong incentives to retain earnings inside corporations rather than paying dividends or higher executive salaries. This reduced measured top income shares because retained earnings do not appear as income on individual returns. This incentive decreased in the 1980s—when the top individual rate fell to 50 percent—and then reversed when TRA86 reduced the top rate to 28 percent. Several studies have found that tax return based inequality trends in other countries are also biased due to failing to account for changing incentives for corporate retained earnings.[2]

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[1] Information reporting to the Internal Revenue Service (IRS) and the potential for audit mean that reporting rates are high for most income. Of course, some income is under-reported due to non-compliance, especially for self-employment and small business income not subject to information reporting to the IRS. Under-reported income as a fraction of reported income tends to be highest in the bottom quintile and lowest in the top one percent (Auten and Gee, 2009), although this does likely does not account for all evasion. Atkinson, Piketty and Saez (2011) discuss concerns with using survey data to measure top incomes.

[2] Burkhauser, Hahn and Wilkins (2015) showed that a 1985 Australian tax reform captured a larger share of capital gains and corporate profits on individual tax returns, thereby increasing measured top one percent income shares by

Another limitation of using tax data is that it misses important sources of income, including non-taxable employer provided benefits and government transfer payments. In addition, measured long-term trends in inequality can be affected by social changes, such as declining marriage rates, and by changes in technical tax rules that affect who is required to file a tax return and how income is reported on those returns.

This paper presents new estimates of top income shares using two consistent measures of income. Our measure of *consistent market income* includes full corporate profits and adjusts for changes from TRA86, including changes to the tax base and increased filing by dependent filers. In addition, we include employer paid payroll taxes and health insurance and adjust for falling marriage rates. The effect of these adjustments on estimated top income shares are dramatic. Using a consistent measure of market income shows that the increase in income shares of the top one percent since 1979 is about half of the PS unadjusted estimate.[3] The increase since 1960 is about one-quarter of the unadjusted estimate. Moreover, our measure of *broad income* that includes government transfers reduces the top one percent share increase to one-tenth of the unadjusted estimate.

The inconsistency of unadjusted tax return income results in part from incomplete coverage of market incomes. For example, PS market income including capital gains covers only about 60% of NIPA income in recent years (Figure 1). The inclusion of corporate retained earnings and taxes and employer paid health insurance and payroll taxes in our measure of consistent market income increases this coverage to about 70%. However, the fraction of total income covered has declined for both of these measures of market income. Our measure of broad income including government transfers increases the fraction of NIPA income covered to almost 90% and this share is stable since 1960.[4]

Other studies using broader measures of income also find lower levels and smaller increases in top income shares in recent decades. Using Survey of Consumer Finance data, Bricker et al. (2016a) found that the top one percent share increased by 3 percentage points from 15 to 18 percent from 1988 to 2012 compared to PS estimates of a 6 percentage point increase from 15 to 21 percent. Using tax return and Census data, the Congressional Budget Office (2014) found that the top one percent share increased 5.7 percentage points from 8.9 to 14.6 percent from 1979 to 2013 compared to PS estimates of a 10 percentage point increase from 9 to 19 percent. Our measure of broad income results in a 3.5 percentage point increase over this time period from 8.8 to 12.3 percent. Examining the longer period between 1967 and 2004 using internal Census data

about one sixth. Wolfson, Veall and Brooks (2016) estimated that including retained earnings of controlled private corporations increases Canadian top one percent income shares by about a quarter. Alstadsæter et al. (2015) showed that an increase in the dividends tax rate caused a dramatic increase in corporate retained earnings in Norway. After the reform, tax return based top one percent income shares were underestimated by about a third. Atkinson (2007) estimated that during the 1950s and early 1960s, including retained company profits increased United Kingdom top one percent income shares (excluding capital gains) by about half. When accounting for retained earnings in Chile, Fairfield and Jorratt (2016) found a large increase in top income shares.

[3] PS do account for capital gains excluded from adjusted gross income before TRA86.

[4] In this paper, we define NIPA income as personal income plus corporate profits less dividends so as to include corporate retained earnings as well as transfer payments. Our measure of broad income differs from NIPA income in several ways. For example, tax-based retirement income is much less because it is measured on a distribution basis. NIPA retirement income is measured on an accrual basis and so includes tax-exempt employer contributions and retained investment income ("inside buildup") of pension funds as they accumulate (Ledbetter, 2007).

to overcome top-coding issues, Burkhauser et al. (2012) estimated that the top one percent share only increased 2 percentage points from 10 to 12 percent. In comparison, PS estimated that top one percent shares excluding capital gains increased about 8 percentage points from 8 to 16 percent.

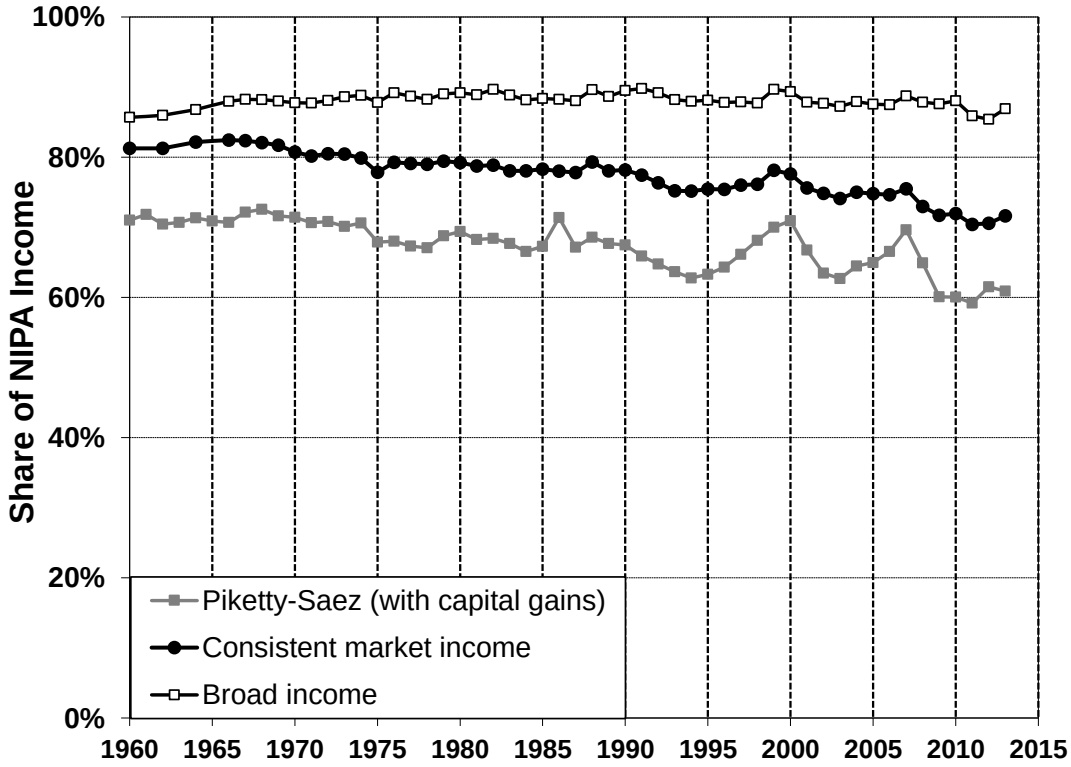


**Figure 1: Total income as a share of NIPA income**

*Notes*: NIPA income is personal income plus corporate profits less net dividends. Broad income is consistent market income plus government transfers. Adjustments used to estimate consistent market income and broad income are listed in Tables 1 and A1 described in detail in the online appendix. All measures are pre-tax.

*Sources:* Authors' calculations, IRS, BEA, and Piketty and Saez (2003 and updates).

This study makes a number of contributions to the emerging "consistent income inequality" literature. While other studies present results only for recent decades or use survey data, this paper measures consistent top income shares since 1960 using administrative tax data. We also adjust for a number of specific tax data issues and show the sensitivity of top income shares to each issue. The most important of these are the effects of the Tax Reform Act of 1986 on the individual income tax base and on the incentives to report income and organize businesses. Another contribution is that instead of using realized capital gains—which are sensitive to capital gains tax rates and reflect income that has accrued over many years—the analysis looks through the corporate veil by including retained earnings in corporations. This leads to important findings in the 1960s, when high individual income tax rates appear to have caused significant realization deferrals and sheltering of income inside corporations to avoid high individual income tax rates (Auten, Splinter and Nelson, 2016).

The following section briefly describes our consistent income measures. Section II discusses the data used to construct these measures. Section III discusses the adjustments to tax data used in estimating our consistent income measures. Section IV presents the results of the analysis and Section V provides a summary and conclusions.

## I. Measuring top income shares with consistent definitions of income

Our analysis uses annual tax microdata to estimate consistent market income. Starting with the PS income and sample definitions, we make a number of adjustments: (1) accounting for major changes in tax laws, especially TRA86, (2) including missing sources of market income, and (3) correcting for the decline in marriage rates.

TRA86 lowered individual tax rates and broadened the tax base. The base-broadening was targeted at high income taxpayers, including deduction limitations for rental losses and losses on passive investments.[5] The reform also motivated some corporations to switch from filing as C to S corporations and to start new businesses as passthrough entities (S corporations or partnerships or sole proprietorships), causing more business income to be passed through directly to individual tax returns. Before TRA86, the top individual tax rate was greater than the top corporate tax rate (50 percent vs. 46 percent), allowing certain sheltering of income in C corporations. This incentive had been even larger in the 1960s and 1970s when the top individual rate was 70 percent compared to a 48 percent corporate rate. After TRA86, the top individual tax rate was less than the top corporate tax rate (28 vs. 34 percent), creating strong incentives to organize businesses as passthrough entities.[6] When estimating consistent incomes, we directly account for deduction limitations and indirectly account for the shift into passthrough entities by including corporate retained earnings, which tend to decline as business shifts into passthrough entities.

TRA86 also dramatically increased the number of dependent filers.[7] If no adjustments are made, these returns would be included as low-income tax units and thus distort the top income shares. This is because the number of non-filers in the PS analysis equals the difference between the estimated total number of tax units and tax returns. Hence the increase in the number of tax returns decreases the estimated number of non-filing tax units. As dependent filers have lower average incomes than non-filers, this decreases total income of those outside the top income groups. To make the estimates consistent, we remove these dependent filers, as well as other young filers and non-resident filers who are not in the Census data used to estimate the total number of tax units. We also use an improved estimate of non-filer incomes.

A number of sources of market income are excluded from gross incomes on individual tax returns. To address this issue, consistent income includes a number of these excluded sources: tax-exempt interest, employer paid health benefits and payroll taxes, and undistributed corporate profits. In the aggregate, these excluded sources of pre-tax market income have averaged about 20 percent of broad income since 1960. Because of the declining importance of undistributed corporate profits (corporate taxes and retained earnings) after the 1960s and 1970s and the growing importance of employer provided health benefits, the composition of these excluded sources has shifted toward income outside the top of the distribution (Figure 2).

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[5] See the appendix for more detail on the base-broadening changes in TRA86.

[6] This simple comparison ignores the double taxation of corporate income at the individual level. TRA86 also increased the maximum long-term capital gains tax rate from 20 to 28 percent, which may have further lowered the value of C corporations relative to passthrough businesses. Goolsbee (2004) and Auten, Splinter and Nelson (2016) reviewed this literature.

[7] Auten, Gee, and Turner (2013) estimated that the number of dependent filers younger than 20 years old increased from about 1 million to 12 million, and the number of non-dependent filers younger than 20 years old decreased from about 6 million to 2 million.

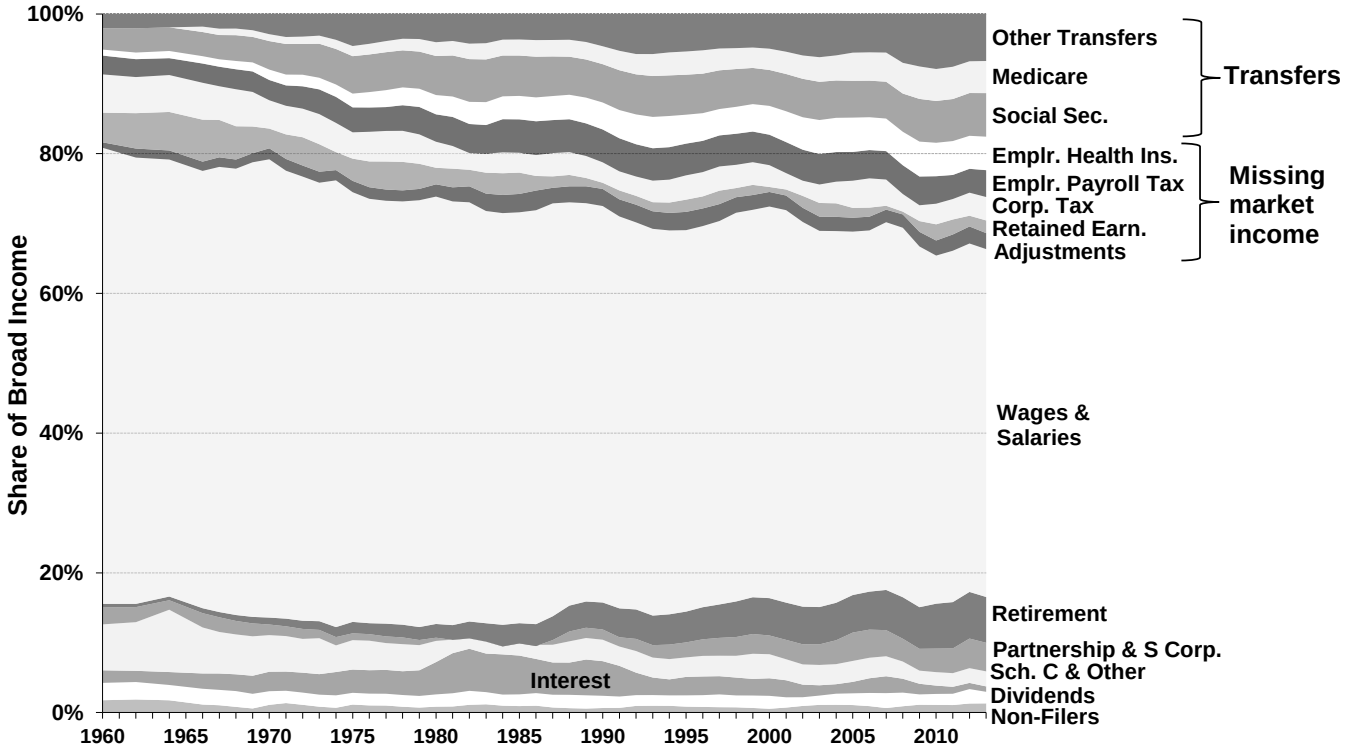


**Figure 2: Income sources as a share of broad income**

*Notes*: Missing market income adjustments includes the correction listed in Table 1, Panel 1. Sch. C and Other includes small amounts from unlisted sources, such as alimony, rents, etc. Sources are pre-tax.
*Sources:* Authors' calculations, IRS, and BEA.

Declining marriage rates outside the top of the distribution explain some of the increase in measured top income shares. This is because, holding all else equal, as the marriage rate in the bottom of the distribution decreases, the total number of tax units increases. Thus, the number of tax units included in the top one percent also increases (Saez, 2004). To address changing marriage rates, we take account of the two adults in married tax units and calculate income groups by the number of these adults. That is, each percentile has an equal number of adults age 20 and over rather than an equal number of tax units.[8]

Finally, government transfers are added to estimate broad income. As seen in Figure 2, these transfers grew from 5 to 18 percent of broad income between 1960 and 2013.

## II. Data

Our analysis uses annual samples of individual income tax returns from 1960 to 2013. Each cross-section sample consists of between 80 and 340 thousand tax returns, with oversampling of tax returns with high incomes. Public use individual income tax files are used for years before 1979. There are no public use files for 1961, 1963, and 1965. Beginning with 1979, we use

[8] In comparison, Congressional Budget Office (2014) defined income groups based on all individuals, including children and other dependents, so that there are an equal number of people in each group. Bricker et al. (2016b) use the Survey of Consumer Finances to estimate that switching from tax units to families decreases the 2010 top one percent income share by 2.4 percentage points. Larrimore, Mortenson and Splinter (2017) use population tax data to estimate that switching from tax units to households decreases this share by 2.0 percentage points. This study estimates that switching from tax units to adults decreases this share in 2013 by about a tenth, or 1.7 percentage points. Similarly, Alvaredo et al. (2013) converted United Kingdom families into adults and also estimated that top income shares fell by about a tenth.

internal IRS Statistics of Income (SOI) individual income tax samples and Social Security Administration data including dates of birth. These microdata allow us to estimate relative income group cutoffs after each of the adjustments discussed below. To estimate total non-filer income, excluded combat pay, and the distribution of employer sponsored health insurance, we use IRS administrative data, which includes the universe of tax returns and information returns.

Our measures of income include various sources that are not reported on income tax returns. To obtain values for these sources of income, as well as target totals for income items that are only partially reported on tax returns, we use values from the National Income and Product Accounts (NIPA). For example, C corporation retained earnings are defined as undistributed profits of domestic corporations (profits with inventory value and capital consumption adjustments less taxes and net corporate dividends) from Table 1.12 of NIPA, produced by the Bureau of Economic Analysis (BEA). Before allocating corporate retained earnings, we first adjust for accelerated and bonus depreciation as described in the online appendix. Next, we remove the amount of income associated with non-profit and government ownership (as this is not attributable to individuals) and with deferred pension, retirement, and life insurance ownership (as this is already included in adjusted gross income on a realization basis), where ownership is based on Federal Reserve Financial Accounts. C corporation taxes include federal and state C corporation taxes from NIPA Table 1.12. Total tax-exempt interest is based on monetary interest paid by state and local governments from NIPA Table 7.11, but distributions are based on tax returns since 1987 and Surveys of Consumer Finances in prior years. Employer provided health insurance is private group health insurance from NIPA Table 7.8 and government transfers come from NIPA Table 3.12.

## III. Adjustments to top income shares

This section describes the adjustments made to PS market income to estimate consistent and broad income. Table 1 shows the impact of each of these adjustments on top one percent income shares in select years. Additional details are provided in the online appendix.

Our analysis starts by replicating PS total filer market income excluding capital gains using annual tax files. Market income is adjusted gross income plus statutory adjustments less taxable Social Security and unemployment benefits and taxable Schedule D capital gains. Using these filer incomes and following PS assumptions for non-files, we replicate PS top income shares.[9]

### *Consistent market income: Corrections*

The first adjustment is to apply post-TRA86 limitations on deductions of losses for rent and other passive income to years before the reform. For years prior to 1987, this makes a significant fraction of losses non-deductible, substantially increasing the incomes of those taking advantage of tax shelters. The next adjustment is to include tax-exempt interest. This has a modest effect on top income shares in the 1960s and 1970s when holdings of tax-exempt securities were concentrated among the highest income taxpayers, but only small effects in recent decades due to broader holdings of these securities.

Following PS, the total predicted number of tax units is based on the U.S. Census resident population age 20 or older. Some tax filers are younger than 20 years old or live abroad and therefore not in the Census numbers. These returns are removed from the sample, thereby

[9] In 1964, we add an additional $21.5 billion in total income to the bottom of the distribution in the public use file to match PS and published IRS total income. This replicates 1964 PS top income shares.

increasing the estimated number of non-filer tax units. In addition, some filers over age 20 are claimed as dependents on other tax returns, primarily college students and some elderly parents. Under the assumption that these filers are not independent economic units, these filers are also dropped from the sample and the predicted number of tax units is reduced accordingly. These adjustments have significant effects on the sample since 1987. For example, in 2011 there were 0.8 million non-resident filers, 5.1 million dependent filers under age 20, 2.2 million other filers under age 20, and 3.7 million dependent filers age 20 and over. In total, there were 11.8 million such returns, just under a tenth of the 134.4 million tax returns filed. While the effect on top income shares is small, failing to adjust for these filers tends to increase measured inequality.

To estimate non-filer market income, we use the SOI Databank, an individual level panel containing every person with a taxpayer identification number who was born before 2012 and had not died by 1996. For each filing year from 2000 through 2012, we select individuals who did not file a tax return (late filers are removed), were younger than 100 years old, and had not died. A conservative estimate of the market income of non-filers is obtained using Forms W-2 (wages), 1099-R (pensions), 1099-DIV (dividends), 1099-MISC (miscellaneous income). Adjustments are made to account for income not on information returns, such as self-employment and under-the-table income, and for the wages of taxpayers with Individual Taxpayer Identification Numbers (ITINs).[10] Summing income from these sources and dividing by the number of corrected non-filer tax units gives average non-filer income. Since the estimated non-filer income for this period averages about 30 percent of filer income, we assume that non-filer income is 30 percent of average filer income. This is larger than the Piketty and Saez (2003) assumption of 20 percent, but the same as the Piketty and Saez (2001) assumption.

Next, we make several additional corrections to filer incomes: add excluded income from dividends before 1987, tax-exempt combat pay, and remove gambling losses (up to the amount of gambling income), and taxable state and local income tax refunds, and net operating loss carryovers from prior years.

The appropriate treatment of retirement savings and income presents difficult choices when thinking about distribution issues (Office of Tax Analysis, 1987). The basic options are to count retirement income when it is earned, when it is distributed, or both. Under the first option, contributions to retirement accounts are counted when the income is earned and investment income on retirement savings is counted as it accrues. While consistent with a Haig-Simons definition of income, this implies that many retired people have very little market income and it is unclear how to use tax data to distribute this income to workers, as most is not reported on tax returns until distribution. If retirement income is counted only when distributed, this shifts income from individuals' working years to retirement years, understating the amount of earned income. Because of misleading features of these options, some distribution studies count retirement income both when earned and when distributed, but this results in more total income than exists in the economy. Consistent market income includes income from pensions, retirement

[10] This is a conservative estimate because it excludes many sources of income that can be important for some non-filers. Among the important excluded sources are income from partnerships, S corporations and fiduciaries, alimony, and interest income. In addition, income from illegal sources is not included. Corrections are made to the raw data to eliminate outliers. The deduction of wages reported on tax returns with ITIN filers limits double-counting of these wages.

savings accounts, and annuities only when taxable, which (except for Roth plans) usually corresponds to when retirement income is distributed.[11]

**Table 1: Effects of adjustments on top 1% pre-tax income shares**

| | 1962 | | 1979 | | 1986 | | 2013 | |
|---|---|---|---|---|---|---|---|---|
| **Adjustments** | **Share** | **Change** | **Share** | **Change** | **Share** | **Change** | **Share** | **Change** |
| Piketty-Saez (no cap gains) | 8.3 | ---- | 8.1 | ---- | 9.4 | ---- | 17.8 | ---- |
| ***Panel 1: Consistent market income, Corrections*** | | | | | | | | |
| Remove non-deduct. losses | 8.4 | 0.0 | 8.3 | 0.3 | 9.9 | 0.5 | ---- | ---- |
| Add tax-exempt interest | 8.7 | 0.3 | 8.7 | 0.3 | 10.4 | 0.4 | 18.0 | 0.2 |
| Remove <20 yr old filers | 8.8 | 0.1 | 8.7 | 0.0 | 10.4 | 0.0 | 17.9 | -0.1 |
| Remove dep. filers | ---- | ---- | ---- | ---- | ---- | ---- | 17.7 | -0.2 |
| Remove nonresident filers | ---- | ---- | 8.7 | 0.0 | 10.3 | 0.0 | 17.6 | -0.1 |
| Adjust non-filer income | 8.7 | -0.2 | 8.6 | -0.1 | 10.2 | -0.2 | 17.4 | -0.2 |
| Correct income definition | 8.7 | 0.0 | 8.6 | 0.0 | 10.1 | -0.1 | 17.0 | -0.3 |
| **Cumulative Change from PS** | | **0.3** | | **0.5** | | **0.7** | | **-0.7** |
| ***Panel 2: Consistent market income, Expansions and set groups by the number of adults*** | | | | | | | | |
| Add C-corp retained earnings | 11.4 | 2.7 | 10.2 | 1.7 | 10.9 | 0.8 | 17.9 | 0.8 |
| Add C-corp taxes | 12.9 | 1.5 | 11.0 | 0.8 | 11.3 | 0.4 | 17.9 | 0.1 |
| Add employer payroll tax | 13.1 | 0.2 | 10.9 | -0.2 | 10.9 | -0.4 | 17.4 | -0.6 |
| Add employer health insur. | 12.9 | -0.1 | 10.6 | -0.3 | 10.5 | -0.3 | 16.5 | -0.9 |
| Set income groups by #adults | 12.3 | -0.6 | 9.7 | -0.9 | 9.5 | -1.0 | 14.8 | -1.7 |
| **Cumulative Change from PS** | | **4.0** | | **1.6** | | **0.1** | | **-3.0** |
| ***Panel 3: Broad income*** | | | | | | | | |
| Add SS benefits | 12.0 | -0.3 | 9.3 | -0.4 | 9.0 | -0.5 | 13.8 | -1.0 |
| Add UI benefits | 11.9 | -0.1 | 9.3 | 0.0 | 9.0 | 0.0 | 13.7 | -0.1 |
| Add other cash transfers | 11.8 | -0.1 | 9.1 | -0.1 | 8.8 | -0.1 | 13.5 | -0.2 |
| Add Medicare | ---- | ---- | 9.0 | -0.1 | 8.6 | -0.2 | 12.9 | -0.6 |
| Add other non-cash transfers | 11.7 | 0.0 | 8.8 | -0.2 | 8.5 | -0.2 | 12.3 | -0.6 |
| **Cumulative Change from PS** | | **3.4** | | **0.7** | | **-1.0** | | **-5.5** |

*Notes:* Replicated Piketty and Saez series excluding capital gains is shown and the percent change is relative to this share for cumulative changes. See Table A1 and online appendix for detailed description of adjustments. Changes between -0.05 and 0.05 are shown as 0.0 due to rounding.
*Sources:* Authors' calculations, IRS, BEA, and Piketty and Saez (2003 and updates).

### *Consistent market income: Expansions*

The next step in computing consistent market income is to add a number of income sources that are not captured on individual tax returns. For example, corporate profits paid out as dividends are included in taxable income, while retained earnings are excluded. Our measure of consistent income treats the full amount of corporate profits as income to capital owners, regardless of whether profits are distributed or retained.

The portion of corporate retained earnings attributable to individual ownership is allocated each year. The portion of retained earnings associated with ownership by retirement and life insurance accounts is excluded, as it is already reflected in our income measure at the time of benefit withdrawal. The portion reflecting ownership by non-profit organizations and domestic government is also excluded. The estimated C corporation ownership share of retirement accounts increased from 4 to 54 percent between 1960 and 2013, while the non-profit and

[11] This is the essentially the approach used in most studies of income inequality, including Piketty and Saez (2003). Piketty, Saez and Zucman (2016) estimate two measures to address this issue: their measure of factor national income ignores payments in and out of pensions, while their measure of pre-tax national income takes into account these flows (as well as Social Security taxes and benefits).

government share increased from 5 to 7 percent.[12] The remaining retained earnings associated with non-retirement private ownership are distributed to individual tax returns. Specifically, three-quarters of retained earnings are distribute based on a tax filer's share of dividends and one-quarter based on their share of capital gains. The results are robust to alternative allocations (see Figure B3 in the online appendix).

Due to the inclusion of retained earnings, capital gains are generally excluded from our measures of consistent income. As the same individuals who realize large capital losses in some years tend to also have large capital gains in other years, our imputation of retained corporate earnings should lead to similar income shares as multi-year capital gains.[13] The timing of capital gains may differ substantially from that of retained earnings, in some cases by decades, but over the long run they tend to equalize (Clarke and Kopczuk, 2016). An important exception are capital gains that are never realized due to the step up in basis at death.

As consistent income is a measure of pre-tax income, it includes taxes paid by businesses before income is reported in the individual tax system. C corporation taxes are allocated following the method used in Joint Committee on Taxation (2013), with three-quarters being borne by capital owners (identified by dividends and capital gains) and a quarter by wage earners. Next, employer payroll taxes are added. These taxes are estimated based on reported wages for filers and average wages for non-filers. Despite their statutory label, the full burden of employer payroll taxes is generally assumed to fall upon workers and arguably should be considered in their pre-tax economic income.

Consistent income also includes non-taxable employer provided health insurance. As estimated in NIPA accounts, these benefits have increased from 1 to 6 percent of total income between 1960 and 2013. As the value of employer provided health insurance has only recently become available in tax data, we use the proportional tax unit distribution of insurance reported on 2014 Forms W-2 to distribute the total NIPA amount spent on private group health insurance in all years to each income group.

In summary, consistent income expansions add the following income sources: (1) C corporation retained earnings associated with non-retirement private ownership, (2) C corporation taxes, (3) the employer portion of payroll taxes, and (4) employer provided health insurance costs. Table 1 and Figure A2 show the impact of each of these adjustments on top one percent income shares.[14] The effects of adding retained earnings and corporate taxes decrease over time as the share of business conducted by C corporations and corporate tax rates decrease. Meanwhile, the effects of payroll taxes and health insurance increase over time.

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[12] Note that foreign owned equities and corporate passthrough entities (S corporations and REITs) are removed before estimating ownership shares. Passthrough corporations have little or no undistributed profits. Our approach to attributing ownership of C corporations among these groups closely follows that of Rosenthal and Austin (2016) and Piketty, Saez and Zucman (2016).

[13] Armour, Burkhauser and Larrimore (2014) take the alternative approach of estimating annual accrued capital gains, which tend to be volatile.

[14] Corporate profits declined substantially in the 1970s to 14 percent of gross value added compared to 18 percent in the 1960s (See Table A2). While the recessions in 1970 and 1973-1974 explain some of this decline, increases in net interest and miscellaneous costs (due to rising inflation) and costs of consumption of fixed capital accounted for most of the increase. Increases in relative amounts of employee compensation accounted for most of the rest.

*Consistent market income: Measure income groups by number of adults*

Marriage rates among tax filers have fallen consistently over the past five decades from 66% in 1962 to 40% in 2013 (after removing filers younger than 20 years old, dependent filers and non-residents).[15] However, marriage rates among the top one percent have remained consistently high: 90% in 1962 and about 86% in 2013. Holding all else constant, declining marriage rates below the top of the income distribution will increase top income shares. These effects can also be seen on measures of distribution wide inequality. Larrimore (2014) estimated that declining U.S. marriage rates between 1979 and 2007 explain 23 percent of the increase in household income Gini coefficients.

In order to control for declining marriage rates, we define income groups based on the number of adults, rather than the number of tax units. In computing fractile thresholds, joint returns are counted as two adults and other returns as one adult, while 40 percent of non-filer tax units are assumed to be married and so counted as two adults.[16] Incomes remain at the tax unit level (that is, incomes are only counted once), but the number of tax units in each income group adjusts such that the number of adults in each percentile is equal.[17] This adjustment decreases top one percent income shares modestly in the 1960s and more significantly in recent years.

*Broad income: Including government transfers*

Broad income adds a number of government transfer payments to consistent income. Note that our measure of broad income does not remove taxes used to pay for government transfers as it is a pre-tax measure. While it could be argued that this double counts these dollars, our treatment is consistent with measures of gross income in the Luxembourg Income Study.

First, we add Social Security and unemployment insurance (UI) benefits reported on tax returns since 1985 and 1981, respectively, and impute benefits in earlier years based on these observed distributions. Next, the gap between NIPA Social Security and UI total benefits and those reported on tax returns are added to total income.[18]

The NIPA value of other cash transfers is also added to total income, which assumes that none is received by tax filers in the top tenth of the distribution. These cash transfers include federal supplemental security income and refundable tax credits (generally, earned income and additional child tax credits), as well as transfers from state and local governments. The NIPA value of Medicare is added by assuming each income group receives a share proportional to the

[15] Growth in cohabitation can explain some of this change. While there was very little cohabitation before 1970, more than 27 percent of couples currently living together are cohabitating (Lundberg, Pollak and Stearns, 2016). The rise in non-married couples means tax unit level incomes, especially for single and head of household filers, will present misleading measures of economic welfare as income from other members of the household are not included (Larrimore, Mortenson and Splinter, 2017).

[16] In 2009, we estimate that there were 28 million non-filing resident individuals age 20 or over. Subtracting the number of filing tax units (after the adjustments for dependent filers, etc.) from the predicted number of tax units yields an estimated number of about 20 million non-filing tax units. This implies a marriage rate of about 40 percent.

[17] Our adjustment is equivalent to measures based on splitting tax unit income equally between spouses, and so differs from actual individual income shares, which would likely be more concentrated due to unequal spousal incomes (Saez and Veall, 2005). The equal split assumption would generally be preferable for inferences about economic welfare, as it takes into account joint labor decisions and consumption sharing within married couples.

[18] Adding Social Security benefits strongly impacts non-filer incomes. We estimate that nearly half of non-filing individuals are aged 65 and over. Assuming that 60 percent of these individuals are married, their tax unit income is about 10 percent of average filer income without SS benefits. When SS benefits are included, this increases to 40 percent.

number of adults aged 65 or older. Finally, the NIPA value of remaining non-cash transfers, such as Medicaid and food stamps, is added to total income. The inclusion of transfers decreases top one percent income shares with a growing effect over time: 0.6 percentage points in 1962, 0.9 in 1979, and 2.5 in 2013 (see Table 1 and Appendix Figure A3).

## IV. Results

As shown in Figure 3 and in summary form in Table 2, there is a dramatic effect on estimated top income shares when using a measure of consistent market income. Since the addition of retained earnings can be viewed as reflecting capital gains accruing inside of C corporations, consistent market income is compared to PS income including capital gains. In 1960, the top one percent share of consistent market income was 12.0 percent, compared to the PS market income estimate of 9.0 percent. The most important factor in this higher share is the addition of C corporation retained earnings in place of realized capital gains. This has a substantial effect in the 1960s and reflects the sheltering of income inside corporations to avoid high individual income tax rates, as well as the deferral of realizations of capital gains.

In 2013, the consistent market income share was 14.8 percent, while the PS income share was 19.0 percent. The most important factors in this difference are the inclusion of employer provided health insurance and the adjustment for the decrease in the marriage rate of lower income tax units.

Over the period from 1979 to 2013, the increase in the top one percent consistent market income share is about half of PS market income (5.1 vs. 10.0 percentage points). The increase in the top one percent income share since 1960 is about one-quarter of PS market income (2.8 vs. 10.0 percentage points).

**Table 2: Comparison of top 1% income share increases**

| | 1960 | 1979 | 2013 | 1979-2013 Change | 1960-2013 Change |
|---|---|---|---|---|---|
| **Piketty Saez market income** | 9.0 | 9.0 | 19.0 | 10.0 | 10.0 |
| **Consistent Income** | 12.0 | 9.7 | 14.8 | 5.1 | 2.8 |
| **Broad Income** | 11.5 | 8.8 | 12.3 | 3.4 | 0.8 |

*Notes*: Piketty and Saez market income includes capital gains and equals adjusted gross income plus adjustments less taxable Social Security benefits and unemployment compensation. Top one percent thresholds are set by income excluding capital gains to make them more similar to consistent market incomes. Adjustments used to estimate consistent market income and broad income are listed in Tables 1 and A1 and described in detail in the online appendix. All measures are pre-tax.
*Sources:* Authors' calculations, IRS, BEA, and Piketty and Saez (2003 and updates).

Our measure of broad income includes government transfers, the largest of which is Social Security benefits. In 1960, the broad income share was slightly lower than consistent market income (11.5 vs. 12.0 percent), as there were few government transfers. In 2013, the broad income share was significantly lower (12.3 vs. 14.8 percent).[19] Using broad income, the increase

[19] Other studies show similar effects from broadening income definitions to include transfers. Bricker et al. (2016b) estimate that when using Survey of Consumer Finances data, a transfer-inclusive income definition as compared to a tax based definition decreases the 2010 top one percent income share by 2.3 percentage points. Congressional Budget Office (2014) supplemental data suggest that including transfers decreases this share by 2.4 percentage points. This study estimates that including transfers decreases this share by 2.7 percentage points.

in the top one percent income share since 1960 is a tenth of the PS estimate (0.8 vs. 10.0 percentage points), or about 9 percentage points less.[20]

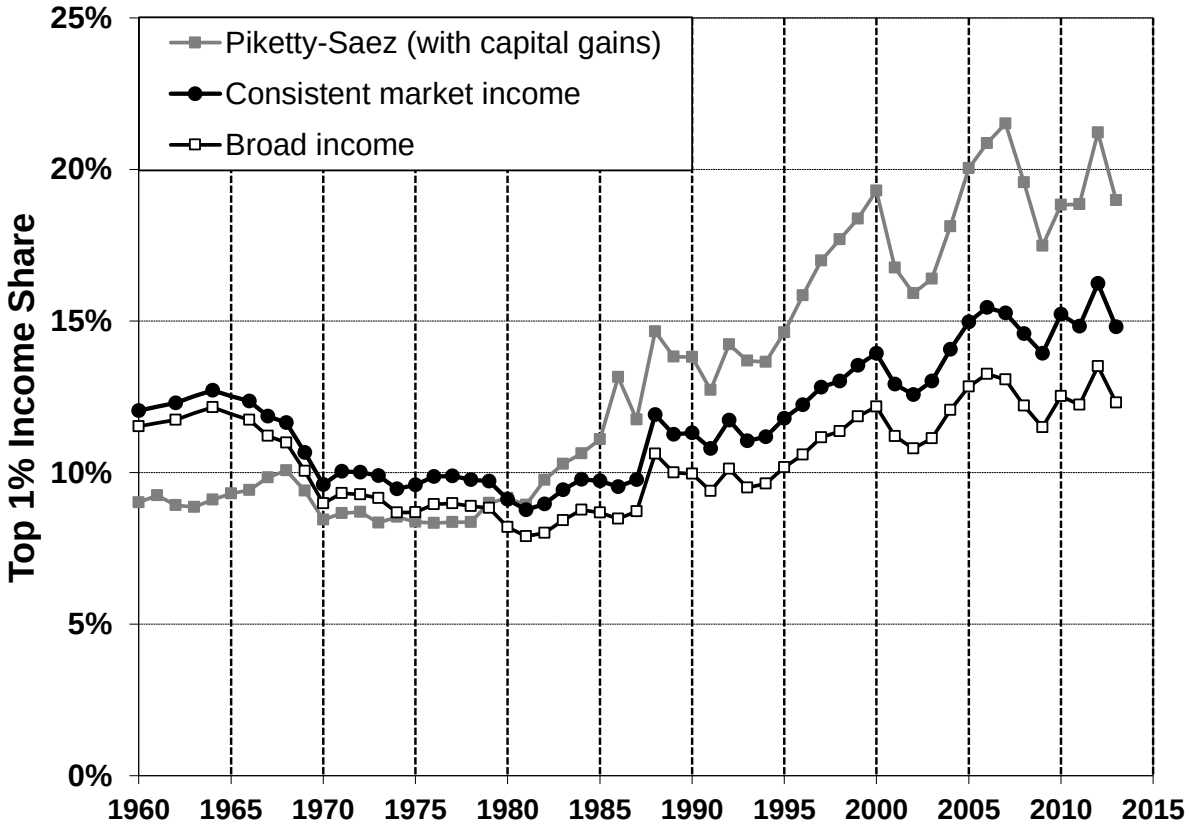


**Figure 3: Comparison of top 1% income shares**

*Notes*: Piketty and Saez series includes capital gains, where top one percent thresholds are defined by income excluding capital gains. Broad income is consistent market income plus government transfers. Adjustments used to estimate consistent market income and broad income are listed in Tables 1 and A1 and described in detail in the online appendix. All measures are pre-tax.
*Sources:* Authors' calculations, IRS, BEA, and Piketty and Saez (2003 and updates).

This overall difference of about 9 percentage points can be allocated among the adjustments as follows: about 2 percentage points from using C corporation retained earnings in place of realized capital gains, about 2 percentage points from including corporate taxes, about 2 percentage points from including government transfers, about 1 percentage point from including employer paid payroll taxes and health insurance, about 1 percentage point from controlling for falling marriage rates, and about 1 percentage point from correcting filer demographics and non-filer incomes.

Correcting income measures also has implications for understanding the distribution of U.S. economic growth over time. Using the methodology of PS (online updates), unadjusted tax return based incomes imply that over three-quarters (79%) of the increase in pre-tax market income between 1979 and 2013 was captured by the top one percent of tax units. In contrast, applying this methodology to consistent market income suggests that less than half (41%) of the increase in income was earned by the top one percent of tax units. Using broad income suggests

[20] Figure A1 in the Appendix shows that increases in top 10 percent and top 0.1 percent income shares were also much smaller for consistent and broad incomes.

that only one-quarter (24%) was earned by the top one percent. This suggests that economic growth has been shared much more equally among income groups than implied by market income as reported on tax returns.

It is important to note that these computations of the distribution of economic growth have the implicit assumption that it is the same people at the top of the income distribution over time. Income mobility studies show that it is not the same people at the top across years and that the incomes of the majority of those in top income groups in a given year decline in later years. For example, Auten, Gee and Turner (2013) estimate that at least a third of those in the top one percent drop out after one year and more than two-thirds after five years and Auten and Gee (2009) find that median incomes of those in the top one percent decreased over 30 percent after 10 years. These results illustrate that most of those at the top in a particular year tend to disproportionately earn little, if any, of the economic growth in following years. Instead, median incomes of those in the lowest income groups increase by the largest percentages in following years, suggesting that economic growth is shared more equally throughout the income distribution if one tracks incomes of individuals over several years rather than comparing cross-sections in different years.

Our results also show that rather than stagnating, "middle class" real incomes have continued to increase. The unadjusted tax-based average income of the bottom 90 percent of tax units *decreased* 8 percent (from $34,500 to $31,600 in 2014 dollars) between 1979 and 2013. In contrast, broad income *increased* 35 percent (from $32,900 to $44,100) for the bottom 90 percent of adults. Other studies reach similar conclusions. Between 1979 and 2007, the Congressional Budget Office (2011) and Burkhauser, Larrimore and Simon (2012) estimate that median size-adjusted after-tax and transfer household income increased about 35 percent.

## IV. Summary and Conclusions

Unadjusted tax-based incomes can produce inconsistent measures of inequality over time. Using administrative tax data, we estimate consistent market incomes to provide more accurate measures within each year and more comparable measures across years.

An alternative narrative for top income shares emerges when consistent and broader measures of income are used. While unadjusted top shares increased dramatically, consistent top shares remained relatively flat over the last half century. Rather than a clear recent trend, the apparent anomaly for consistent incomes is relatively low top income shares in the 1970s and early 1980s. These were decades characterized by frequent recessions, high inflation, and low corporate profits.

Consistent market income corrects for tax base changes, including base-broadening in TRA86. It adds market income excluded from the individual tax base, such as undistributed corporate profits and employer provided health insurance. It also corrects for increases in the number of tax units related to decreasing marriage rates, a phenomenon that is independent from market dynamics at the top of the distribution. While an improvement on unadjusted tax-based income measures, our consistent market income measure does not capture all market income.

While market income provides a measure of how individuals are compensated for their labor and investments, it provides an incomplete picture of the fraction of overall resources available to the top of the distribution. As government transfers have grown significantly over recent decades, the inclusion of transfers in measures of income inequality has become more important. Our

measure of broad income includes government transfers to address some of these concerns. But broad income does not measure individual consumption potential as it does not remove taxes, control for the number of dependents in a tax unit, or account for sharing within a tax unit or across multiple tax units (Burkhauser, Larrimore and Simon, 2012).

Using unadjusted tax-based measures, Piketty and Saez (2003 and updates) estimate that between 1960 and 2013 top one percent pre-tax income shares increased by 10.0 percentage points. Using a consistent market income measure results in an increase of only 2.8 percentage points. Using a broad income measure with government transfers results in an increase of only 0.8 percentage points. Compared to unadjusted top one percent income shares, broad income shares were about 4 percentage points larger in the 1960s due to the inclusion of corporate retained earnings and taxes. They were about 5 percentage points lower in recent decades due to controlling for lower marriage rates outside the top of the distribution and including employer provided health insurance and government transfers. These differences illustrate how unadjusted tax-based income measures can present a distorted picture of inequality, as income sources outside the individual tax system can strongly impact inequality trends.

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# Appendix

## Table A1: Descriptions of adjustments to income and tax units

| Adjustments | Years | Adjustment Method |
|---|---|---|
| **Consistent Market Income** | | |
| *Corrections* | | |
| Remove nondeductible losses | 1962-1986 | Limit pre-1986 business losses based on post-TRA86 rules |
| Add tax-exempt interest | All Years | On returns since 1987, allocate 1960-1987 based on SCF shares |
| Remove filers <20 years old | All Years | Remove tax filers not in Census age 20+ population |
| Remove dependent filers | 1987-2013 | Primarily college students age 20-23, few before 1987 |
| Remove non-resident filers | 1979-2013 | Remove if excluded foreign earned income or not residing in US, not available before 1979 |
| Adjust non-filer income | All Years | Assume non-filer income is 30% of avg. filer income |
| Include excluded dividends | 1960-1986 | $100/200 exclusion ended with Tax Reform Act of 1986 |
| Add tax-exempt combat pay | 1995-2013 | Use information returns and interpolate for missing years |
| Include gambling losses | 1972-2013 | From tax returns. Before 1991, misc. deductions up to other inc. (includes gambling inc.) |
| Remove tax refunds adjustment | 1971-2013 | Adjustment for previously deducted state and local tax refunds, not on 1040 before 1971 |
| Remove net operating losses | 1962-2013 | Before 1989, equals 80 percent of other income losses |
| *Expansions and set income groups by adults* | | |
| Add C-corp retained earnings | All Years | Allocate household portion 3/4 by dividends, 1/4 by capital gains |
| Add C-corp taxes | All Years | Allocate household portion 3/4 by capital & 1/4 by wages, retirement portion by taxable pension income on 1040 |
| Add employer payroll tax | All Years | Calculated based on reported wages or non-filer income |
| Add emplr. sponsored insurance | All Years | Allocate NIPA private group health insur. using 2014 Form W-2 distribution |
| Set income groups by # adults | All Years | Set income groups by giving joint filers twice their tax unit weight |
| **Broad Income** | | |
| Add SS benefits | All Years | Include reported benefits, use 1985 distribution in prior years |
| Add UI benefits | All Years | Include reported benefits, use 1981 distribution for prior years |
| Add other cash transfers | All Years | SSI, ref. tax credits, wkrs. comp., state/local social insur., family assist., temp. disab., etc. |
| Add Medicare | 1965-2013 | Allocate by fraction of age 65+ adults, use 1979 distrib. prior years |
| Add other non-cash transfers | All Years | SNAP, state/local medical care, general assistance, energy assist., etc. |

*Notes*: Unallocated amounts of transfer payments are allocated to income groups below the top 10 percent.

## Table A2: Corporate profits and costs as a share of gross value added

| | 1960s | 1970s | 1980s | 1990s | 2000s |
|---|---|---|---|---|---|
| Corporate profits | 18.1% | 14.0% | 11.1% | 12.3% | 13.3% |
| Consumption of fixed capital | 9.2% | 10.9% | 12.8% | 13.2% | 14.5% |
| Compensation of employees | 62.7% | 63.7% | 63.1% | 63.1% | 61.2% |
| Taxes less subsidies | 9.0% | 8.6% | 8.0% | 8.4% | 8.1% |
| Net interest and misc. payments | 0.5% | 2.2% | 4.1% | 2.1% | 1.9% |
| Business current transfer payments (net) | 0.6% | 0.6% | 0.9% | 0.9% | 1.0% |
| Gross value added of corporate business | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

*Notes*: Corporate profits include inventory valuation and capital consumption adjustments.
Decade shares are averages of annual shares.
*Sources*: BEA NIPA Table 1.14 and authors' calculations.

**Effects of the Tax Reform of 1986 on reported income**

Many provisions of TRA86 affected income reported on individual income tax returns and thus can affect measured top income shares. Table A3 shows the revenue estimates of key base-broadening provisions. Most affected the top of the income distribution and hence expected increases in revenues followed from expected increases in income reported on top tax returns. Specifically, these base-broadening provisions were expected to increase revenues by more than $20 billion in 1990. At the top tax rate, this amount of revenue would result from about $70 billion of increased taxable income, or about a third of the observed increase in top one percent incomes. This is an upper bound of the forecasted effects of base-broadening on top incomes, as some tax units in lower income groups were also affected.

To estimate the effects of TRA86 on top one percent income shares, we use cross-sectional tax data to study the base-broadening reforms and panel data to show the effect of business entity shifting. Table A4 shows that the top one percent income share increased by about half between 1986 and 1988, from 7.8 to 12.8 percent. Half of this increase came from wages, some of which may reflect shifting of wages forward to 1987 or 1988. S corporation net income accounted for 0.8 percentage points of the change and partnership net income for 0.5 percentage points. As active S corporation owners report about half of their income as distributions and half as wages, a significant fraction of the increase in wages is likely due to increases in S corporation income that followed from TRA86.

Some of the base-broadening changes that affect total income can be observed directly from information on individual income tax returns. These include non-deductible rental losses, non-deductible passive losses, the extension of at risk rules to the activity of holding property (these further limit deductible losses), and the elimination of the dividend exclusion. These partial base-broadening changes account for almost a tenth of the increase in top one percent income shares between 1986 and 1988 (0.4 percentage points). Note that the effects of many base-broadening changes, such as changes in depreciation, are likely hidden in the net changes of partnership and sole proprietorship income.

Additional insight comes from following high-income taxpayers over time. Using a panel of a stratified sample of about 13,000 individual income tax returns from 1985 to 1990, Table A5 shows changes in top one percent incomes relative to 1985 and 1986 average incomes. In 1988, the changes in passthrough entity income as reported on individual tax returns account for 25.2% of the increase in top one percent income. Taxpayers whose first S corporation was after TRA86 may have converted C corporations into S corporations. Such new S corporations accounted for about an equal portion of the income increase as pre-existing S corporations. This suggests an important but limited role for the conversion of C corporations to S corporations in the increase in the top one percent share in 1987 and 1988. Partnership income from taxpayers with partnerships prior to TRA86 accounted for more of the increase in income than new partnerships (8.4 vs. 2.6 percent). Almost all of the change in net income for taxpayers with pre-existing partnership income was accounted for by partnerships with net losses in 1985 and 1986. This suggests that much of this change in partnership income reflected the tax shelter limitation effects of TRA86.

## Table A3: Revenue estimates of base-broadening provisions in the Tax Reform Act of 1986 that affect total income (fiscal year effects in millions of dollars)

| | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|
| **Total income on tax return (total effects)** | **4,454** | **11,427** | **14,562** | **18,683** |
| Cap employee contributions to 401k, 403b | 310 | 628 | 691 | 809 |
| Pension: repeal 3-year basis recovery | 1,096 | 1,763 | 2,001 | 2,015 |
| Pension: raise age limits, reduce DBs | 315 | 869 | 960 | 1,097 |
| Adjustments to sec. 404 limits | 17 | 42 | 45 | 49 |
| Non-discrimination benefit rules | 0 | 72 | 128 | 140 |
| Reduce foreign earned income exclusion | 24 | 34 | 45 | 56 |
| Unearned income of children under 14 (part) | 60 | 195 | 226 | 249 |
| Repeal unemployment compensation exclusion | 230 | 764 | 749 | 723 |
| Limit exclusion of scholarships/fellowships | 8 | 64 | 130 | 160 |
| Limit deduction for meals, travel, etc. (Sch. C) | 513 | 937 | 1,112 | 1,291 |
| Limit on passive losses | 1,166 | 4,488 | 7,479 | 10,932 |
| At-risk rules on real estate | 46 | 192 | 343 | 483 |
| Repeal dividend exclusion ($100/$200) | 212 | 573 | 580 | 605 |
| Recognition of gain/loss in liq. distributions | -1 | -13 | -32 | -44 |
| Purchase price allocation | -2 | 2 | 9 | 13 |
| RIC end of year distributions timing/excise tax | 484 | 866 | 163 | 180 |
| Installment sales | 12 | 42 | 31 | 32 |
| Taxation of prizes and awards | -21 | -59 | -63 | -66 |
| SEP plans | -15 | -32 | -35 | -41 |
| **Depreciation effects on tax returns (total effects)** | **-115** | **352** | **1,486** | **2,954** |
| Depreciation, expensing (individual portion) | -502 | -584 | 498 | 1,980 |
| Amortization of trademarks and trade names | 1 | 4 | 8 | 14 |
| Agricultural expensing and prepayment | 45 | 55 | 33 | 36 |
| Oil, gas, and geological depletion | 20 | 49 | 45 | 45 |
| Simplify LIFO for small business | -11 | -18 | -28 | -44 |
| Capitalize inventory, construction, and dev. | 146 | 479 | 583 | 639 |
| Farmer pre-productive period expenses | 56 | 161 | 144 | 121 |
| Long-term contracts | 98 | 109 | 103 | 62 |
| Repeal reserve for bad debt | 32 | 97 | 100 | 101 |
| **Total of all provisions (nominal)** | **4,339** | **11,779** | **16,048** | **21,637** |

*Notes*: The revenue changes to depreciation rules are for the individual portion (not corporate changes) and therefore affect total income on tax returns by changing the net amounts of partnership, S corporation and sole proprietorship income. Negative amounts for depreciation for the first few years reflect increases in the limits for expensing under section 179, which is quickly more than offset by the reductions in depreciation deductions.
*Sources:* Authors' calculations and Joint Committee on Taxation.

## Table A4: Changes in top 1% income shares after TRA86 (cross-section analysis)

| | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|
| **Top 1% income share** | **7.8** | **10.4** | **12.8** | **12.4** | **12.8** |
| **Change from 1986: Total** | | **2.6** | **5.1** | **4.6** | **5.0** |
| Wages | | 1.6 | 2.5 | 2.1 | 2.4 |
| S corporation, net | | 0.4 | 0.8 | 0.7 | 0.7 |
| Partnership, net | | 0.3 | 0.5 | 0.5 | 0.5 |
| Self-employment, net | | 0.2 | 0.4 | 0.3 | 0.4 |
| Base changes, partial | | 0.3 | 0.4 | 0.5 | 0.4 |
| Other | | -0.2 | 0.5 | 0.5 | 0.5 |

*Notes:* Income excludes capital gains, but top 1% thresholds are based on income including capital gains and the number of tax returns. Self-employment income is Schedule C income. Base changes include rental loss limits, disallowed rental and passive losses and at-risk rules and elimination of the dividend exclusion.
*Sources:* IRS and authors' calculations.

## Table A5: Increase in top 1% incomes due to TRA86 changes (panel analysis)

| | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|
| Total income increase ($billions) | 110.6 | 200.0 | 193.7 | 240.4 |
| **Percent of income increase due to listed TRA86 changes (%)** | | | | |
| New S corporations | 0.2 | 7.6 | 4.9 | 7.5 |
| Existing S corporations | 8.0 | 6.6 | 5.4 | 5.5 |
| New partnerships | 6.4 | 2.6 | 1.6 | 0.9 |
| Existing partnerships | 7.4 | 8.4 | 10.4 | 8.3 |
| **Total (%)** | **22.0** | **25.2** | **22.3** | **22.2** |

*Notes:* Income increase is the nominal change in income excluding capital gains, as defined by Piketty and Saez (2003), from the 1985-86 average. New S corporations and partnerships are for taxpayers not reporting income from these sources in 1985 or 1986. Top 1% thresholds are based on income including capital gains and the number of tax returns.
*Sources:* 1985 base year individual tax return panel and authors' calculations.

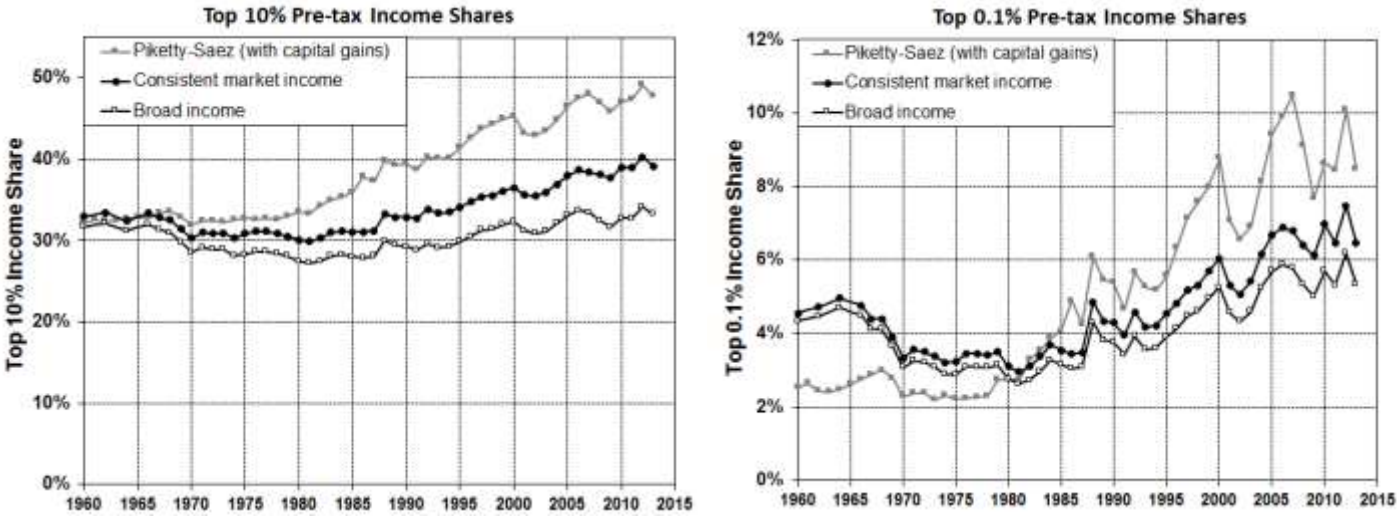


**Figure A1: Top income shares: Top 10% (left figure) and top 0.1% (right figure)**

*Notes*: Piketty and Saez series includes capital gains, where top one percent thresholds are defined by income excluding capital gains. Broad income is consistent market income plus government transfers. Adjustments used to estimate consistent market income and broad income are listed in Tables 1 and A1 described in detail in the online appendix. All measures are pre-tax.
*Sources:* Authors' calculations, IRS, BEA, and Piketty and Saez (2003 and updates).

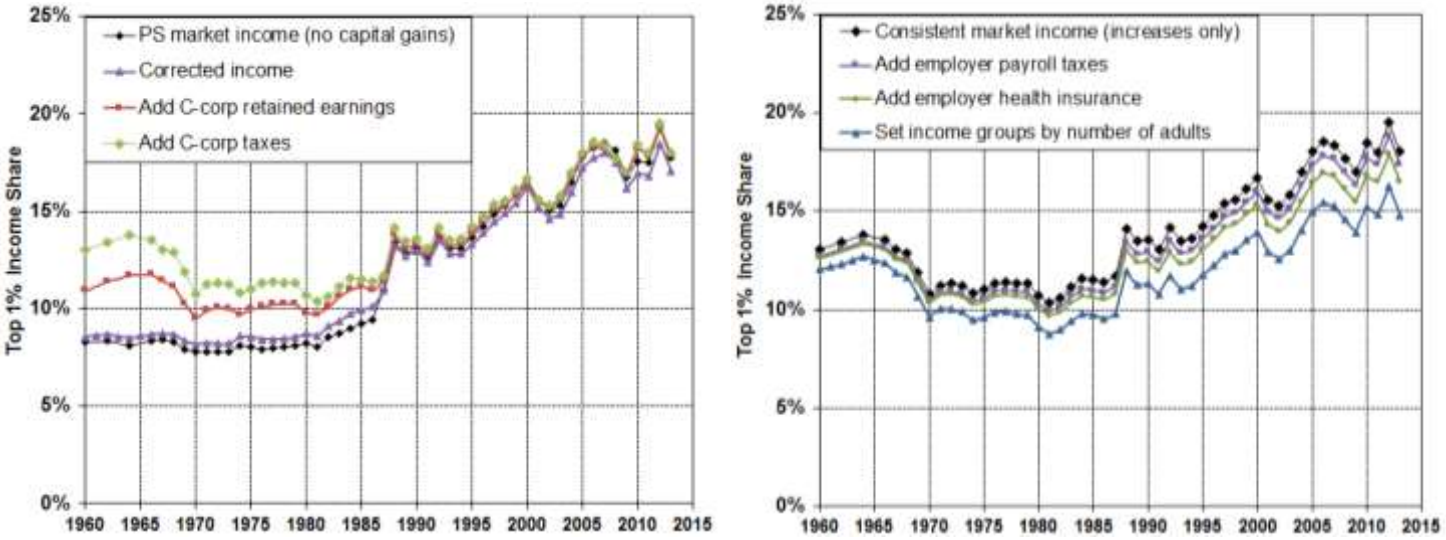


**Figure A2: Top 1% income shares: Consistent market income adjustments**

*Notes:* PS market income is replicated Piketty and Saez series excluding capital gains. See text for description of adjustments.
*Sources:* Authors' calculations, IRS, BEA.

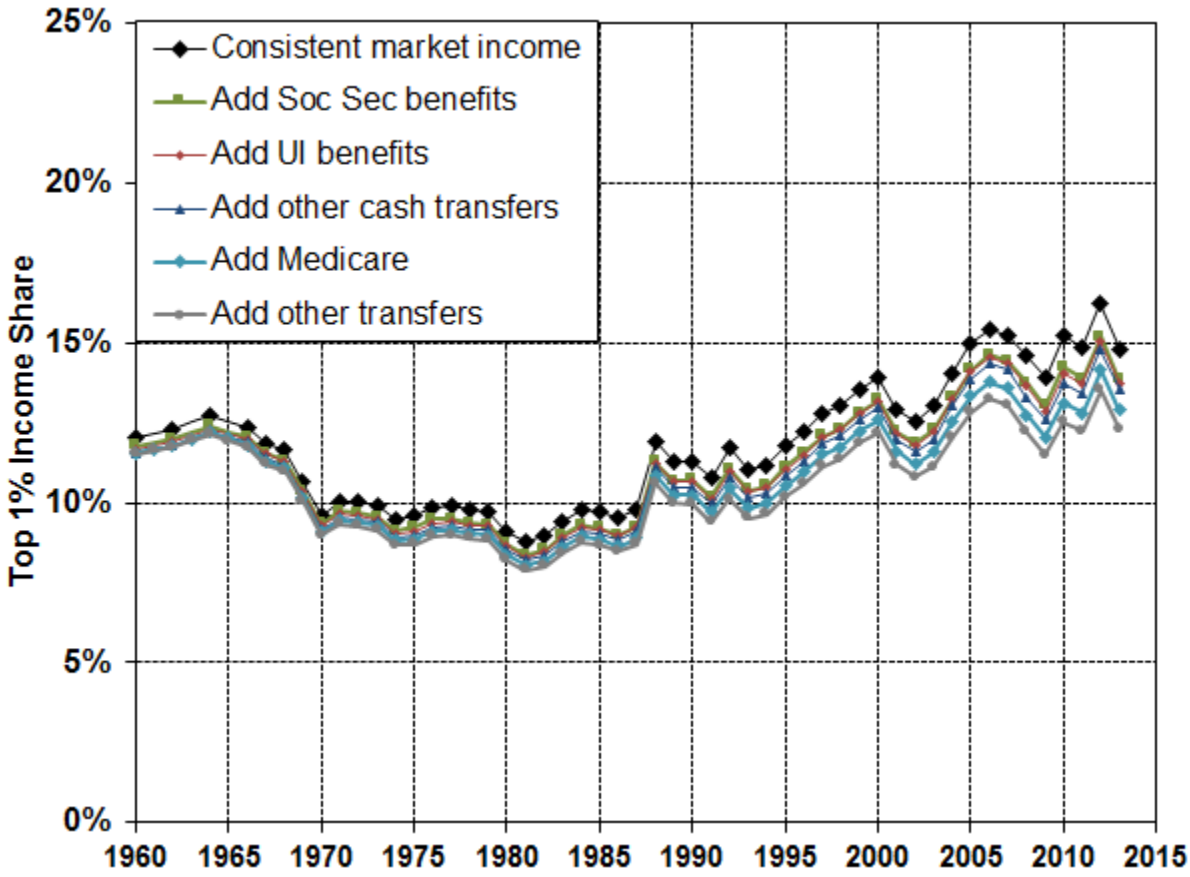


**Figure A3: Top 1% income shares: Broad income adjustments**

*Notes:* See text and online appendix for description of government transfers.
*Sources:* Authors' calculations, IRS, BEA.

# ONLINE APPENDIX

## Using Tax Data to Measure Long-Term Trends in U.S. Income Inequality

by Gerald Auten and David Splinter

This online appendix provides details about each adjustment made to create consistent income and broad income. Table B1 summarizes each adjustment. Figure B1 shows the effect of each income correction on top one percent income shares. Figures A1 and A2 in the appendix of the main paper show the effect of each income expansion, setting groups by the number of adults, and adding government transfers.

### 1. Consistent market income: Corrections

*Remove non-deductible losses before 1987*

Before TRA86, taxpayers could offset income with passive passthrough and rental losses (Joint Committee on Taxation, 1985). One of the goals of the reform was to limit the effect of these tax shelters with passive loss limitations (Nelson and Petska, 1990). The resulting non-deductible losses increased taxable income. In order to make non-deductible losses consistent before and after TRA86, post-TRA86 loss limitations are imputed in pre-TRA86 years.[21] The imputation of non-deductible losses is based on total partnership/S corporation and total rental losses that matches the totals and distributions of non-deductible losses in years immediately following TRA86.[22]

*Include tax-exempt interest*

Most state and local government interest payments are excluded from federal taxable income, although they have been reported on tax returns since TRA86. We include reported tax-exempt interest and imputed tax-exempt interest in earlier years. For each year before 1987, the total tax-exempt interest received by tax units is assumed to be 65 percent of NIPA state and local monetary interest paid, the average percentage reported on tax returns since 1987.

Tax units with high marginal tax rates tend to invest in tax-exempt bonds more than those with lower marginal rates. As top marginal rates were much higher before 1987, the fraction of tax-exempt interest going to the top of the distribution was also higher. As seen in Figure B2, high-income tax units were still shifting out of tax-exempt bonds in 1988. Between 1982 and 1986, we set the fraction of tax-exempt interest going to each income group based on shares estimated from the 1983 Survey of Consumer Finances, which are similar to the 1987 shares seen in the tax data. The shares in 1962 are based on the 1962 Survey of Financial Characteristic of Consumers. For years between 1962 and 1982, we assume a straight-line decrease. Shares in 1960 are set

[21] There is a gradual decline in the fraction of losses that are non-deductible after TRA86, which may be due to portfolio adjustments or other changes as these losses became less valuable; therefore, we impute non-deductible losses before TRA86 rather than make non-deductible losses deductible after TRA86.

[22] Non-deductible losses affect the top of the distribution more and allowed rental losses phase out for AGIs over $100,000. For tax units with AGIs over $100,000 in 1987 (indexed in earlier years), 85% of partnership/S corporation losses and 30% of rental losses are imputed as being non-deductible. For tax returns with AGIs below the threshold, they are set at 20% of partnership/S corporation losses.

equal to those in 1962. Before 1987, we impute tax-exempt interest after tax units have already been divided into relative income groups.

*Removing filers younger than 20 years old and remaining dependent filers*

Piketty and Saez (2003, hereafter PS) estimate the total number of tax units as the sum of married men, divorced and widowed men and women, and single men and women aged 20 and over using Census data. We start our analysis with these estimates and assume that the number of non-filers is the total number of tax units less the number of tax returns filed in a given year.[23] We remove primary filers younger than 20 years old, as they do not meet the tax unit age cutoff. Removing young filers increases the non-filer tax unit estimate in 2011 from 13 to 20 million (Table B2).

Dependent filers are claimed as a dependent by another taxpayer but file their own tax return.[24] To be claimed as a dependent means the individual did not provide more than half of his or her own support for the year, implying that they were not independent tax units. Most dependent filers are younger than 20 years old and were removed in the previous adjustment. There were few dependent filers before TRA86 and they are not directly identified in the tax data. After 1986, we remove dependent filers, regardless of age, and distribute their income evenly over the filer distribution. As we are effectively joining two tax units with this adjustment, we slightly reduce the total number of tax units.

*Remove non-resident filers*

As the number of total tax units is based on the U.S. resident population, we remove non-resident filers and replace them with non-filer tax units. We identify non-resident filers as any filer with excluded foreign earned income or with an address outside the fifty states or the District of Columbia. For example, in 2011 this includes 800 thousand tax filers with average incomes of $77,000. We only apply this correction since 1979, as the public use files do not have filer addresses. In 1979, this correction decreases top one percent income shares by only 0.02 percentage points and so any affect in earlier years should be small.

*Correct number and income of non-filers*

Based on non-filer information return data, we increase non-filer income from the PS assumption of 20 percent of average filer income to 30 percent in all years considered. Piketty and Saez (2001) also assume non-filer income is 30 percent of average income. Table B3 shows estimates of various non-filer income sources and that the 30 percent estimate is stable between 2000 and 2010.

To estimate non-filer income, we use the SOI Databank, an individual level panel containing every person with a taxpayer identification number who was born before 2012 and had not died by 1996. For each year, we select individuals who did not file a tax return (we remove late filers), were younger than 100 years old, and had not died. We then merge income from various information returns to these individuals: Forms W-2, 1099-DIV, 1099-MISC, and 1099-R. To control for outliers, 1099-MISC income for each source is excluded if $99,999 or more.

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[23] Note that the 2007 number of filers is adjusted to remove filers who were identified as only filing in order to claim a tax rebate. The actual number of 2007 tax filers was slightly more than the PS number of total tax units, as these filers include many younger than 20 years old.

[24] An individual may be claimed as a dependent if a number of tests are followed. A qualifying child must be younger than the filer and younger than 19 years old or be a student and younger than 24 years old. Other family members, such as elderly parents, may also be claimed as dependents.

Summing income from these sources and dividing by the number of corrected non-filer tax units gives average non-filer income.[25]

A number of adjustments should be made to non-filer income. First, we add unaccounted income from interest, rental, self-employment (normally reported on Schedule C), and under-the-table non-black market income. We assume there is $100 billion of unaccounted income in 2010 and index this amount by the national average wages in earlier years.[26] Second, we subtract wages of those filing tax returns where all filers use Individual Taxpayer Identification Numbers (ITINs) to avoid double counting these wages. These are numbers that the IRS began issuing in 1996 to individuals without Social Security Numbers (SSNs) so that they could file tax returns and in many cases claim refundable child tax credits. However, ITINs are not allowed to be used on Form W-2s. The IRS accepts tax returns where the ITIN on the tax return does not match the SSN on Form W-2. This ITIN/SSN mismatch implies that we would attribute a large fraction of those W-2 wages to non-filers, even though the wages were claimed by ITIN filers. We use individual tax return samples to estimate wages on tax returns where all filers have ITINs and subtract this amount from our non-filer income.

*Corrections for income sources*

Some income sources are missing from or do not belong in market income. We (1) add excluded dividends, (2) add excluded combat pay, (3) deduct gambling losses up to the amount of gambling income, (4) remove taxable state and local income tax refunds and (5) add back net operating losses that have been deducted from income.

Gambling winnings are generally included in other income on tax returns, but gambling losses may only be deducted up to the level of reported winnings and for taxpayers itemizing their deductions. We account for the asymmetric treatment of gambling gains and losses by subtracting deducted gambling losses. Refunds of state and local income taxes are included in total income on tax returns to correct for itemized deductions in the previous year that were too large (resulting in a lower tax burden). These refunds should not be included in measures of market income. Net operating losses are losses carried over from earlier years for tax purposes and do not represent income during the calendar year. Note that we do not include non-taxable pensions or non-taxable Individual Retirement Account (IRA) distributions reported on Form 1040, as most of the large values are likely to be rollovers, except for typically small amounts of pension basis recovery and small numbers of Roth IRA distributions in recent years.

Due to missing variables in early years, some corrections are missing or can only be imputed. We only deduct gambling losses since 1972 and remove tax refunds since 1971. The effect of ignoring gambling in the 1960s is small because this is well before the expansion of lotteries, casinos and other legalized gambling activity. Before 1991, we set gambling losses to equal miscellaneous deductions if miscellaneous deductions are equal to or slightly less than other income. In later years, this method accounts for over half of gambling loss deductions. Before 1989, we set net operating losses to 80 percent of other income losses, as a large fraction of

[25] In order to check that the adjusted number of non-filers matches information return data, we remove anyone with no income or younger than 20 years from any of the considered information returns. In 2009, we estimate 28 million non-filing individuals. Subtracting the number of filing tax units (after the adjustments for dependent filers, etc.) from the predicted number of tax units yields an estimated number of about 20 million non-filing tax units. This implies a marriage rate of about 40 percent.

[26] The Social Security Administration estimates that about a third of unauthorized immigrant wages are paid without any information returns, or about $40 billion. Alm and Erard (2015) estimate that self-employment income, including filers and non-filers, was underreported by over $100 billion in 2001.

losses in other income are net operating losses. The foreign earned income exclusion is included in other income on Form 1040 as an offset to wages reported on another line. Because the tax returns of those living abroad are dropped from the sample, there is no need to address the effects of the foreign earned income exclusion.

**2. Consistent market income: Expansions**

*Include C corporation retained earnings*

Capital gains may have accrued over many years but are only seen on tax returns when realized. In order to measure accrued corporate income, NIPA based C corporation retained (after two adjustments described below) are imputed to individual filers. As we want to attribute retained earnings accrued in a given year to the owners of corporations, we favor using dividends received as a means of indicating corporate ownership.[27] Three-quarters of retained earnings are imputed based on a tax filer's share of dividends and one-quarter based on their share of Schedule D capital gains. Our results are robust to alternative imputations (Figure B3).

Tax reforms have changed the rate at which investments can be depreciated for tax purposes. This affects reported business profits, as higher depreciation will depress reported profits (and hence corporate taxes, which is why businesses favor faster depreciation) and make comparisons of profits inconsistent over time. To control for large changes in depreciation, we adjust retained earnings in three periods. Accelerated depreciation resulting from the Economic Recovery Tax Act of 1981 applied to property placed in service after 1980 and before 1987. Percent depreciation (depreciation divided by depreciable assets) increased from 7.5% to 9.6% between 1980 and 1985 and then fell to 7.7% by 1990. We extend the trend line of percent depreciation from the 1970s and assume any percent depreciation over this rate between 1981 and 1987 was due to accelerated depreciation and add the excess to retained earnings (Figure B4). Increased bonus depreciation and expensing between 2002 and 2004 caused another increase in percent depreciation. As the three-year increase in percent depreciation was followed by a three-year drop, we consider any deviation from percent depreciation of 7.6% over these six years to be due to bonus depreciation and add the difference to legislative changes. We similarly adjust for a surge of percent depreciation in 2011 and fall in 2012 as a result of temporary100 percent bonus depreciation.

The retained earnings distributed to individuals is reduced by the fraction of corporate ownership associated with retirement income. The fraction of corporate equities and mutual funds owned by private and public pensions, Individual Retirement Accounts (IRAs) and life insurance funds is based on the Federal Reserve Financial Accounts, where we assume 80 percent of IRA assets are invested in corporate equities. The fraction of corporate ownership associated with these retirement funds was 4% in 1960, peaks at 62% in 2002, and decreases to 54% in 2013. The retained earnings distributed to individuals is also decreased by the fraction of corporate ownership by non-profit organizations and domestic governments. The fraction of corporate ownership associated with these increased from 5% in 1960 to 7% in 2013. Rosenthal and Austin (2016) present similar estimates. The inside buildup inside these accounts associated with retained earnings is captured at the time of withdrawal, as taxable pensions and IRA distributions are included in consistent market income.

[27] Alstadsæter et al (2015) use a national registry of stock ownership to impute accrued business income to personal owners in Norway. No centralized registry is available for the United States.

*Include C corporation taxes*

C corporation taxes are imputed to tax filers following the Congressional Budget Office (2014) and the Joint Committee on Taxation (2013) assumption that a quarter of the tax is borne by wages and the rest by capital owners. We identify capital owner burden as above: three-quarters is attributed to dividends and one-quarter to capital gains. Our results are somewhat sensitive to alternative imputations. In 1960, if 90 percent of corporate taxes are borne by capital owners then top one percent income shares are half a percentage point higher, if they only bear 60 percent then shares are half a percentage point lower (Figure B3). Corporate taxes associated with non-profit and government ownership are not allocated. Some corporate taxes will be associated with the fraction of investments in retirement funds, which we allocate based on a tax filer's share of taxable IRA distribution and pension and annuity income.

*Include employer payroll taxes*

We estimate employer payroll tax for filers based on reported wages and for non-filers based on average wages and apply annual tax rates and OASDI contribution limits. For individual filers in 2013, these taxes include a 6.2% OASDI tax on the first $113,700 of wages, a 1.45% Medicare tax on all wages, and a 6.0% unemployment insurance (UI) tax on the first $7,000 of wages. As both spouses may work, we adjust the OASDI and UI covered wages for married filers. We increase annual contribution limits for OASDI by six-tenths in 2010 and less for earlier years. For UI taxes, we assume that seven-tenths of spouses pay the maximum amount. The effect of adding employer payroll taxes to income is smaller in years before 1979, as the employer OASDI rate was below 4.0 percent for most of the 1960s and the Medicare tax was non-existent before 1966.

*Include employer provided health insurance*

We use the proportional distribution of non-taxable employer provided health insurance reported on 2014 Forms W-2 to distribute the total NIPA amount spent on private group health insurance in all years to each income group. Specifically, we estimate that the top one and ten percent of tax units had 2.2 and 27.2 percent of employer provided health insurance.[28] The effect of adding employer provided health insurance has grown monotonically and in 2013 decreases the top one percent income share by 0.9 percentage points. Kaestner and Lubotsky (2016) review distributional studies of the effect of adding employer provided health insurance. While adding insurance to income increases distribution-wide inequality, as the top half of the distribution earns most employer provided insurance, we show that it can decrease top one percent inequality, as insurance becomes a smaller share of income at the top of the distribution.

*Measure income group sizes using the number of adults*

Decreasing marriage rates outside the top of the income distribution have tended to increase unadjusted top income shares independent of any underlying economic change. Here is an example of how setting group sizes using the number of adults rather than the number of tax units affects top income shares. In 1962, we estimate 71.4 million tax units were at least 20 years old, of which 36.9 million filing tax units were married and an assumed 6.0 million non-filing tax units were married. This implies a total of 114.3 million adults (71.4+36.9+6.0). Rather than the top one percent including 0.7 million tax units, when setting groups by the number of adults the top one percent includes 1.1 million adults. Given the high marriage rate at the top of the distribution, these adults are part of only 0.6 million tax units. This is 90 percent of the number

[28] Employer provided health insurance shares for the top 10, 5, 1, 0.5, 0.1 and 0.01 percent tax unit income groups (based on PS total number of tax units) are: 27.2, 13.4, 2.2, 1.0, 0.18, and 0.04 percent.

of tax units when not controlling for the difference in marriage rates over the income distribution, resulting in slightly lower top income shares. The effect of this adjustment is larger in more recent years given the dramatic fall in marriage rates outside the top of the distribution.

## 3. Broad income

*Include Social Security benefits*

Most Social Security and disability insurance (SS) benefits are excluded from federal taxable income, but since 1984, some benefits have been reported on tax returns. We add reported benefits to tax filers' incomes since 1985 and imputed SS benefits in earlier years. To create an imputation, we match the 1985 distribution and adjust proportionally by the fraction of adults at least 65 years old in each income group, where both adults on joint returns are counted if the primary filer is at least 65 years old. These fractions are usually higher in earlier years. For example, about 1.2 percent of adults at least 65 years old were in the top one percent in 1985 and 1.8 percent in 1962. Adjusting shares of SS based on these fractions, the top one percent of adults received 2.5 and percent of SS benefits in 1985 and 3.8 percent in 1962. The fraction of SS benefits reported on tax returns relative to NIPA totals (SS plus railroad retirement benefits) increased from a third in 1985 to two-thirds more recently. Unattributed benefits are added to total income, assuming that the residual benefits do not go to those in the top ten percent of the income distribution.

*Include unemployment insurance benefits*

Unemployment insurance (UI) benefits were at least partially excluded from federal taxable income before 1987. Since 1979, UI benefits of filers have been reported on their tax return. Reported benefits since 1981 are added to tax filers' incomes and imputed benefits in earlier years. To create an imputation, we match the 1981 distribution and levels of reported benefits. In 1981, the top ten percent of adults receive only 2.2 percent of unemployment benefits. Since 1981, the total UI benefits received by tax units average 84 percent of NIPA unemployment insurance. Unattributed benefits are added to total income.

*Include other cash transfers*

We add the NIPA value of cash transfers to total income, assuming that no tax filers in the top of the distribution receive cash transfers. Cash transfers include federal supplemental security income (SSI) and refundable tax credits (generally, earned income and additional child tax credits). Also included are transfers from state and local governments: social insurance funds (generally, temporary disability insurance and workers' compensation), family assistance (generally, aid to families with dependent children and temporary assistance for needy families), and SSI.

*Include Medicare*

The NIPA value of Medicare is added, where each income group receives a share proportional to the number of adult individual tax filers aged 65 or older, assuming that if the primary filer is aged 65 or older then the secondary is also. In 2013, the share of individuals aged 65 or older in each income group is roughly proportional. That is, the top tenth of one percent contains 0.13 percent of individuals aged 65 or older, and the top one percent contains 1.09 percent of individuals aged 65 or older.

*Include other non-cash transfers*

We add the NIPA value of remaining non-cash transfers, such as Medicaid and food stamps to total income, assuming that top income groups receive none of these in-kind transfers. Kaestner and Lubotsky (2016) estimate that among top decile families less than one percent has a family member participating in Medicaid. Elwell and Burkhauser (2016) find that Medicaid is the largest income source in the bottom quintile.

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## Table B1: Descriptions and data sources of adjustments to income and tax units

| Adjustments | Initial Year | Final Year | Data source | Adjustment Method |
|---|---|---|---|---|
| *Panel 1: Consistent market income, Corrections* | | | | |
| Remove nondeductible losses | 1962 | 1986 | Tax return microdata | Limit pre-1986 business losses based on post-TRA86 rules |
| Add tax-exempt interest | All Years | | NIPA Table 3.3, tax return & SCF data | Listed on returns since 1987, shares before 1988 based on SCF, see Figure B2 |
| Remove <20 year old filers | All Years | | Tax return and Social Security microdata | Remove tax filers younger than 20 years old, as not counted in Census age 20+ population |
| Remove dependent filers | 1987 | 2013 | Tax return microdata | Primarily college students age 20-23, not identified before 1987, although very few before 1987 |
| Remove non-resident filers | 1979 | 2013 | Tax return microdata | Remove filers if excluded foreign earned income or not residing in states or DC (missing before 1979) |
| Adjust non-filer income | All Years | | CDW information return data | Assume non-filer income is 30% of avg. filer income, see Table B3 for details |
| Include excluded dividends | 1960 | 1986 | Tax return microdata | $100/200 exclusion ended with Tax Reform Act of 1986 |
| Add tax-exempt combat pay | 1995 | 2013 | IRS Compliance Data Warehouse | Use information returns, for missing years use military pay (2000-01), interpolate (2002-04), 1999 values minus $500M a year (1995-98) |
| Include gambling losses | 1972 | 2013 | Tax return microdata | Before 1991, equals miscellaneous deductions (not subject to 2% AGI limit after 1986), but only up to other income (which includes gambling winnings) |
| Remove tax refunds | 1971 | 2013 | Tax return microdata | State and local income tax refunds variable missing before 1971 |
| Remove net operating losses | 1962 | 2013 | Tax return microdata | Before 1989, equals 80 percent of other income losses |
| *Panel 2: Consistent market income, Expansions and set groups by number of adults* | | | | |
| Add C-corp. retained earnings | All Years | | NIPA Table 1.12, Tax return microdata & U.S. Financial Accounts | Allocate household portion 3/4 by dividends, 1/4 by capital gains |
| Add C-corp. taxes | All Years | | NIPA Table 1.12, Tax return microdata & U.S. Financial Accounts | Allocate household portion of C-corp. ownership 3/4 by capital (as above) & 1/4 by wages on tax returns. Allocate retirement portion of C-corp. ownership by pension income. |
| Add employer payroll tax | All Years | | Tax return microdata | Calculated based on reported wages or non-filer income and legislated rates and benefit bases |
| Add employer sponsored insurance | All Years | | 2014 Form W-2 & NIPA Table 7.9 | Allocate NIPA private group health insurance using 2014 Form W-2 distribution |
| Set income groups by number adults | All Years | | Tax return microdata | Set income group sizes and cutoffs by giving joint filers twice their tax unit weight |
| *Panel 3: Broad income* | | | | |
| Add SS benefits | All Years | | Tax return microdata & NIPA Table 3.12 | Include reported benefits, use 1985 distribution in prior years, unallocated in total income |
| Add UI benefits | All Years | | Tax return microdata & NIPA Table 3.12 | Include reported benefits, use 1981 distribution in prior years |
| Add other cash transfers | All Years | | NIPA Table 3.12 | Federal SSI, ref. tax credits, wkrs. comp., state/local social insur., family assist., SSI, temp. dis., wkrs. comp. |
| Add Medicare | 1965 | 2013 | NIPA Table 3.12 | Allocate based on fraction of age 65+ adults in each income group, use 1979 fractions for previous years |
| Add other non-cash transfers | All Years | | NIPA Table 3.12 | Includes federal SNAP, state and local medical care, general assistance, energy assistance, and other |

*Notes*: Unallocated amounts of transfer payments are allocated to income groups below the top 10 percent.

**Table B2: Effects of adjustments decreasing top shares on number of tax units and income in 2011**

| | Number of Tax Units (millions) | | | | | Income, no capital gains ($billions) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Piketty and Saez | Remove <20 yr old filers | Remove dependent filers | Remove nonresid. filers | Adjust non-filer incomes | Piketty and Saez | Remove <20 yr old filers | Remove dependent filers | Remove nonresid. filers | Adjust non-filer incomes |
| Non-dep. Filers, >=20 | 134.4 | 134.4 | 134.4 | 133.6 | 133.6 | 7,749 | 7,822 | 7,852 | 7,790 | 7,790 |
| Dependent Filers, >=20 | 3.7 | 3.7 | --- | --- | --- | 30 | 30 | --- | --- | --- |
| Non-dep. Filers, <20 years old | 2.2 | --- | --- | --- | --- | 25 | --- | --- | --- | --- |
| Dependent Filers, <20 years old | 5.1 | --- | --- | --- | --- | 25 | --- | --- | --- | --- |
| Non-filers, >=20 years old | 13.0 | 20.3 | 20.3 | 21.1 | 21.1 | 129 | 201 | 201 | 209 | 313 |
| **Total or Overall Average** | **158.4** | **158.4** | **154.7** | **154.7** | **154.7** | **7,958** | **8,053** | **8,053** | **7,998** | **8,103** |
| **%Change from Piketty & Saez** | | **0.0%** | **-2.3%** | **-2.3%** | **-2.3%** | | **1.2%** | **1.2%** | **0.5%** | **1.8%** |

*Notes*: Data is for tax year 2011. As the total number of tax units is based on Census data, ages are based on July 1st. Piketty and Saez average non-filer income is 20% of average income. Updated average non-filer income is 30% of average income.
*Sources*: SOI individual tax return and information return data, SSA Data Master File, Piketty and Saez (2003 and updates).

**Table B3: Non-filer income as a fraction of filer income (at least 20 years old)**

| | Non-filers All ages Wages (millions $) | Non-filers >=20 yrs old Dividends (millions $) | Non-filers >=20 yrs old Misc Inc. (millions $) | Non-filers >=20 yrs old Txbl. Retire (millions $) | Non-filers >=20 yrs old Other Inc. (millions $) | ITIN filers All ages Total wages (millions $) | Non-filers >=20 yrs old Total Income (millions $) | Non-filers >=20 yrs old N. tax units (thousands) | Non-filers >=20 yrs old Avg. Income ($) | Filers >=20 yrs old Avg. Inc. ($) | Non-filers >=20 yrs old %Filer Inc. (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 112,000 | 8,000 | 27,000 | 23,000 | 77,000 | 5,000 | 242,000 | 16,800 | 14,405 | 42,200 | 34% |
| 2001 | 109,000 | 8,000 | 22,000 | 22,000 | 79,000 | 8,000 | 232,000 | 17,600 | 13,182 | 42,200 | 31% |
| 2002 | 113,000 | 5,000 | 24,000 | 23,000 | 80,000 | 11,000 | 234,000 | 19,300 | 12,124 | 41,100 | 29% |
| 2003 | 115,000 | 7,000 | 30,000 | 25,000 | 82,000 | 14,000 | 245,000 | 20,600 | 11,893 | 41,400 | 29% |
| 2004 | 132,000 | 12,000 | 34,000 | 28,000 | 86,000 | 19,000 | 273,000 | 20,800 | 13,125 | 43,600 | 30% |
| 2005 | 142,000 | 9,000 | 35,000 | 28,000 | 89,000 | 39,000 | 264,000 | 20,700 | 12,754 | 46,100 | 28% |
| 2006 | 154,000 | 11,000 | 37,000 | 28,000 | 93,000 | 49,000 | 274,000 | 19,300 | 14,197 | 48,600 | 29% |
| 2007 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2008 | 163,000 | 12,000 | 37,000 | 31,000 | 99,000 | 61,000 | 281,000 | 19,100 | 14,712 | 50,600 | 29% |
| 2009 | 151,000 | 11,000 | 36,000 | 34,000 | 98,000 | 57,000 | 273,000 | 20,100 | 13,582 | 47,300 | 29% |
| 2010 | 156,000 | 12,000 | 42,000 | 41,000 | 100,000 | 60,000 | 291,000 | 20,200 | 14,406 | 48,300 | 30% |

*Notes*: Wages are from Form W-2, dividends from Form 1099-DIV, miscellaneous income from Form 1099-MISC, and taxable retirement income from Form 1099-R. To control for outliers, 1099-MISC income for each source (non-employee compensation, medical payments, fishing income, rents, royalties, other income) is excluded if $99,999 or more. Individuals with years of death in subsequent years or aged 100 or more are removed. Other income (interest, self-employment income, under-the-table unauthorized immigrant income, and other non-black market income) is set at $100M in 2010 and indexed by the national average wage index in previous years. 2007 removed due to stimulus filers.
*Sources*: SOI Databank, CDW Compliance Data Warehouse, SOI individual tax return data, Piketty and Saez (2003 and updates).

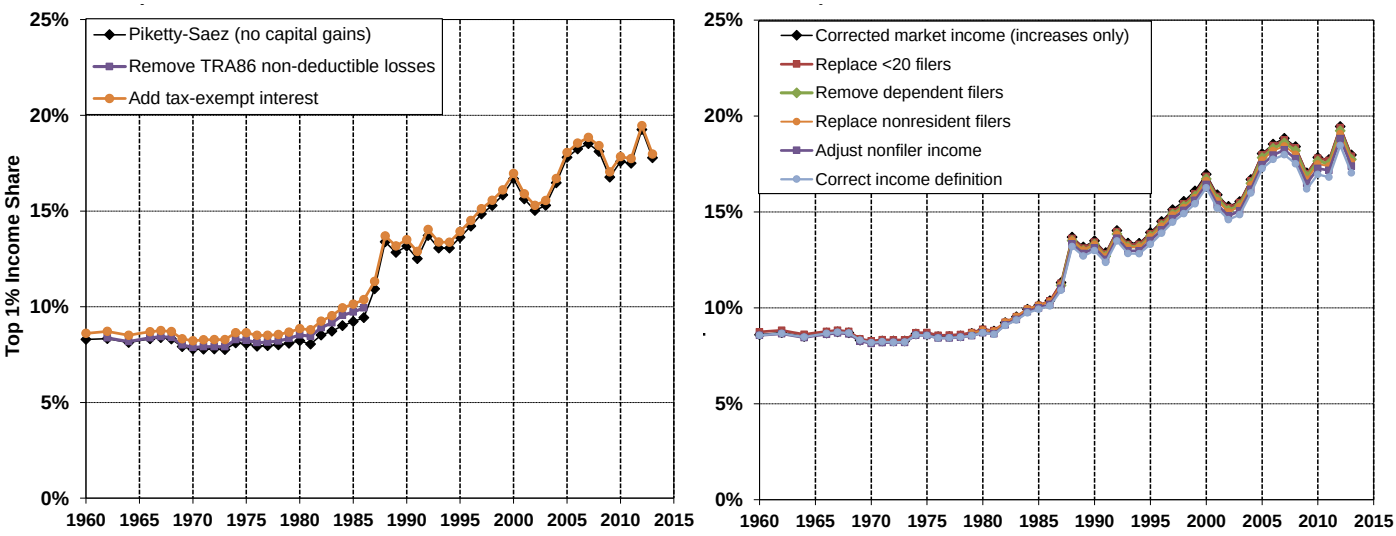


**Figure B1: Top 1% income shares: Corrected market income adjustments**

*Notes:* Replicated Piketty and Saez series is shown, where income is adjusted gross income less adjustments, government transfers, and capital gains. See text for description of adjustments.
*Sources:* Authors' calculations, IRS, BEA, and Piketty and Saez (2003 and updates).

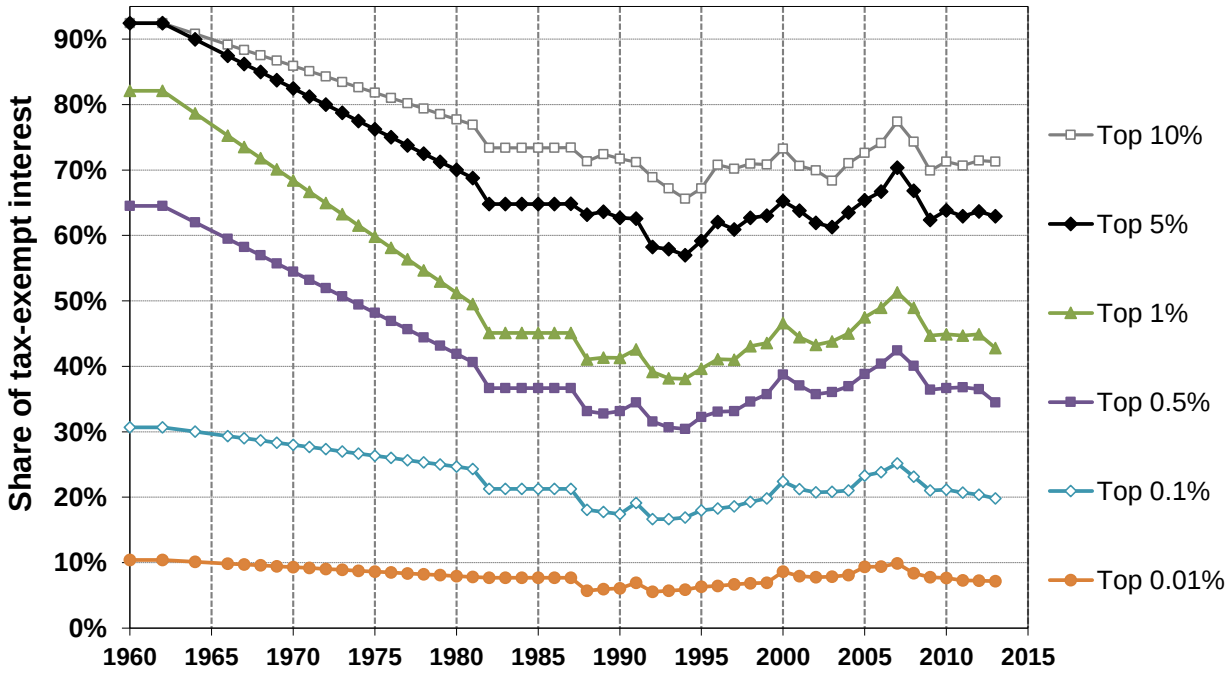


**Figure B2: Share of tax-exempt interest by income group**

*Notes:* Income groups are PS income excluding capital gains with non-deductible losses removed. Tax-exempt interest was only reported on tax returns since 1987. Shares are estimated in previous years.
*Sources:* Authors' calculations, IRS, and Surveys of Consumer Finance.


**Figure B3: Top 1% income shares: Alternative allocations of C Corporation retained earnings (left figure) and C corporation taxes (right figure)**

*Notes:* See text for description of adjustments.
*Sources:* Authors' calculations, IRS, BEA.

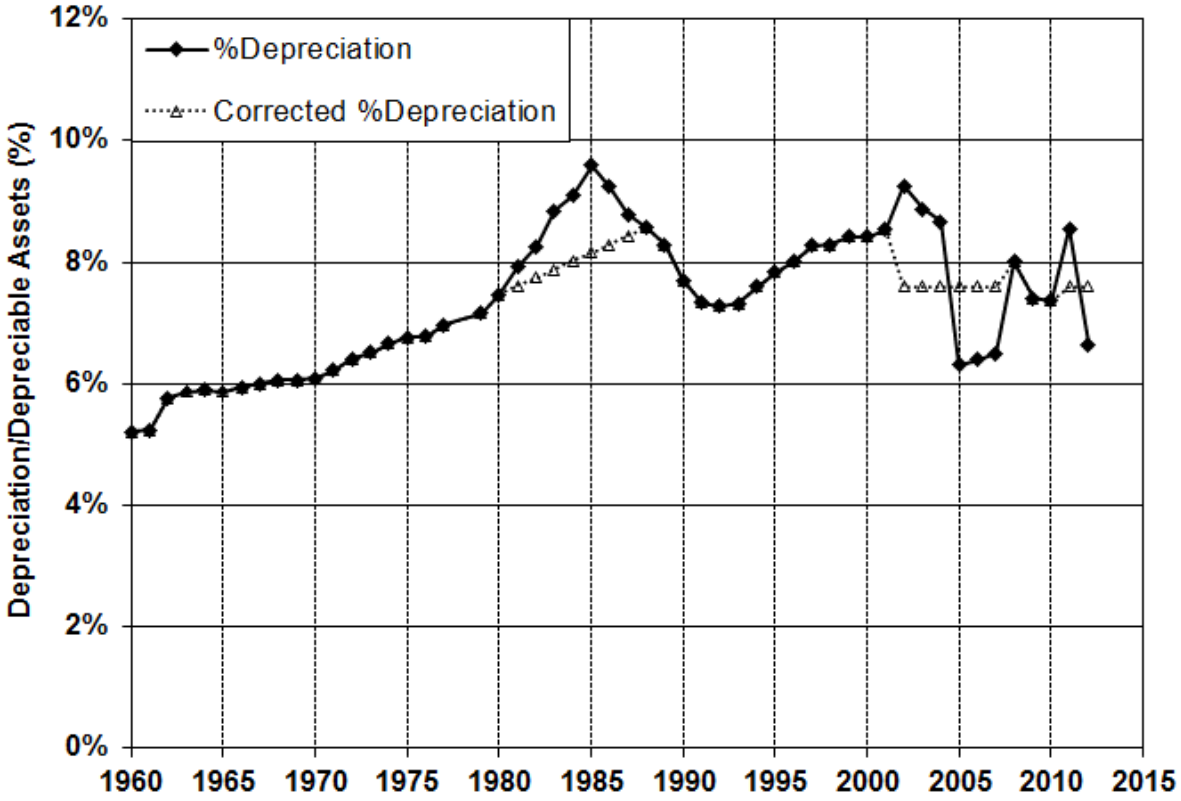


**Figure B4: Percent depreciation and corrected percent depreciation**

*Sources:* IRS and authors' calculations.