

Income Inequality in the United States: Using Tax Data to Measure Long-term Trends

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Abstract

Previous studies using U.S. tax return data concluded that top one percent income shares increased substantially since 1960. But tax return based measures are biased by tax base changes and missing income sources. Accounting for these limitations suggests that top one percent income shares increased only one third as much. Further, accounting for government transfers suggests that they increased one tenth as much. After-tax income results are similar. This shows that unadjusted tax return based measures present a distorted view of inequality because incomes reported on tax returns are sensitive to tax law changes and omit significant income sources.

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Based on the results of studies using income tax data (Piketty and Saez, 2003), the idea that inequality has increased dramatically since the 1960s has become one of the most powerful narratives of our time. Broad acceptance of this view has induced speculation about possible links to other social problems. Increasing inequality could be an indicator of greater concentration of political power and increased rent-seeking (Stiglitz, 2012); increases in top income shares may be the result of increases in the bargaining power of top earners for compensation (Piketty, Saez and Stantcheva, 2014). 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 shifts in relative bargaining power.

Such implications emphasize the importance of correctly measuring top income inequality. Income tax data are generally thought to be less subject to underreporting and measurement error than survey data and also better representative of top income groups.¹ However, there are important limitations to using income tax data. This paper examines 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 has changed over time, especially with major tax reforms. Such changes can have important effects on measures of 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

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. 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 likely does not account for all evasion. Atkinson, Piketty and Saez (2011) discuss concerns with using survey data to measure top incomes.

return based inequality trends in other countries are also biased due to failing to account for changing incentives for corporate retained earnings.²

Another limitation of using tax data is that it misses important sources of income, including government transfer payments and non-taxable employer provided benefits. 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 income measures that are consistent over time. 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 1960 is about one-third of the unadjusted estimate. Moreover, the increase in the top one percent share is only about one-tenth of the unadjusted estimate using *pre-tax income* that includes government transfers.

The inconsistency of unadjusted tax return income over time results in part from incomplete coverage of market incomes. For example, PS market income including capital gains accounts for only about 60% of NIPA income in recent years (Figure 1). The inclusion of corporate retained earnings and taxes, employer paid health insurance and payroll taxes, and imputed rents in our measure of consistent market income increases this coverage to about 75%. However, the fraction of total income covered by these measures of market income has declined over time. Our measure of pre-tax income including government transfers increases the fraction of NIPA income covered to about 90% and this share is stable since 1960.³

Other recent studies using broader measures of income also find lower levels and smaller increases in U.S. top income shares. Using Survey of Consumer Finance data, Bricker et al. (2016a) found that the top one percent share increased 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 (2016) found that the top one percent share of before-tax income increased 6 percentage points from 9 to 15 percent from 1979 to 2013, compared to PS estimates of a 10 percentage point increase from 9 to 19 percent. In comparison, our measure of pre-tax income increases by 4 percentage points over this time period from 8 to 12 percent. Examining the longer period between 1967 and 2004 using

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 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 one 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 In this paper, NIPA income is defined as personal income plus corporate profits less dividends so as to include corporate retained earnings as well as transfer payments. This is generally within 4 percent of national income. Tax-based income measures differ from NIPA measures in a number of ways, as discussed in the sensitivity analysis and Ledbetter (2007).

internal Census data 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.

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 adjust for a number of specific tax data issues and show the sensitivity of top income shares to each issue. The most important are the effects of the Tax Reform Act of 1986 on broadening the individual income tax base and changing the incentives for reporting income and organizing 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). In addition, we take advantage of tax data to measure after-tax top income shares and average effective tax rates. This reveals that despite the top individual tax rate decreasing from 91.0 to 39.6 percent between 1960 and 2013, after-tax top one percent income shares increased only about 1 percentage point and average top tax burdens were about the same.

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 first estimate *consistent market income*. Starting with the PS income and sample definitions, we adjust for: (1) major changes in tax laws, primarily TRA86, (2) the decline in marriage rates, and (3) missing sources of market income.

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.⁴ 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, partnerships, or sole proprietorships), causing more business income to be reported directly on individual tax returns. Before TRA86, the top individual tax rate was higher than the top corporate tax rate (50 percent vs. 46 percent), allowing certain sheltering of income in C corporations. This incentive was 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 lower than the top corporate tax rate (28 vs. 34 percent), creating strong incentives to organize businesses as passthrough entities.⁵ 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.

⁴ See the appendix and Auten, Splinter and Nelson (2016) for more detail on the base-broadening changes in TRA86.

⁵ 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.

TRA86 also dramatically increased the number of dependent filers.⁶ If no adjustments are made, these returns would be included as if they were low-income households. Top income shares would be distorted because the PS estimate of non-filers equals the estimated number of potential tax units of U.S. residents age 20 and over less the actual number of tax returns filed. Hence the increase in dependent tax returns decreases the estimated number of non-filing tax units. Since dependent filers have lower average incomes than non-filers, this decreases the total income of those outside the top income groups. To make the estimates consistent over time and between tax and Census data, certain returns are removed from the sample: dependent filers, other filers under age 20, and non-resident filers who are not in the Census data used to estimate the number of tax units. We also use an improved estimate of non-filer incomes.

Declining marriage rates outside the top of the distribution also explain part 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 rather than an equal number of tax units.

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

Government transfers are then added to estimate *pre-tax income*. As seen in Figure 2, government transfers grew from 5 to 16 percent of pre-tax income between 1960 and 2013. To estimate *after-tax income*, federal, state, and local taxes are subtracted from pre-tax income. In addition, income groups for this measure are based on the approach used by the Congressional Budget Office (2016) where individuals are ranked by family size-adjusted incomes and percentiles have equal numbers of individuals rather than equal numbers of tax units or adults.

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 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 most of the adjustments discussed below. Total non-filer income, excluded combat pay, and the distribution of employer sponsored health insurance, are estimated

⁶ Auten, Gee, and Turner (2013) estimated that the number of dependent filers and filers younger than 20 years old increased from about 8 million in 1986 to 13 million by 1988.

using 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. Values for these sources of income, as well as target totals for income items that are only partially reported on tax returns, are from the Bureau of Economic Analysis (BEA) National Income and Product Accounts (NIPA). Note that *C corporation retained earnings* are defined as undistributed corporate profits and calculated as profits with inventory value and capital consumption adjustments less taxes and net corporate dividends. These amounts include reinvested earnings of incorporated foreign affiliates of U.S. corporations, that is, unrepatriated foreign earnings.⁷

III. Adjustments to income and sample to obtain consistent measures over time

This section describes the adjustments made to unadjusted individual income tax data to estimate market income, pre-tax income, and after-tax income on a consistent basis over time. Tables 1 and 2 show the impact of each of these adjustments on top one percent income shares in select years. Additional details are provided in Table A1 and the online appendix.

Different income definitions serve different goals. Market income includes only income earned from labor and investments. Our consistent market income adjusts tax based market income for changes to the income tax base and in marriage rates so that it is consistent over time. The transition from PS market income to consistent market income is divided into adjustments that are precisely distributed, as they use information on tax returns (Table 1, panel 1), and expansions necessary for consistency but that rely on imputations (Table 1, panel 2).

Pre-tax income is our preferred income measure because it includes transfer payments and other sources of income excluded from the tax base. After-tax income provides a closer measure of welfare inequality, as it deducts taxes as well as including government transfers.

Our analysis starts by replicating PS total filer market income excluding capital gains. Market income is adjusted gross income, plus statutory adjustments, less taxable Social Security and unemployment benefits and Schedule D capital gains. Using these filer incomes and following PS assumptions for non-filers, we replicate PS top income shares and use this as our baseline measure of income. Consistent market income is estimated in three steps. First, adjustments are applied to the units of observation and income sources already included in PS market income, but measured inconsistently. Second, income groups are set by the number of adults. Third, permanently excluded market income sources are added. To estimate pre-tax income, government transfers are then added. Finally, taxes are removed from pre-tax income to estimate after-tax income.

Consistent market income: Adjustments

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. Next, the inclusion of tax-exempt interest modestly increases top income shares (0.4 percentage points) in the 1960s when holdings of tax-exempt securities were concentrated

⁷ For more details, see www.bea.gov/national/pdf/chapter13.pdf

among the highest income taxpayers, but has a smaller effect (0.2 percentage points) in recent decades due to broader holdings of these securities.

The PS estimate of the number of potential tax units is based on the U.S. Census resident population of married males and unmarried single individuals age 20 or older. However, some tax filers are younger than 20 years old or live abroad and therefore not included in the Census numbers. In order to limit the sample of tax returns to adult residents, these returns are removed from the sample, thereby increasing the estimated number of non-filer tax units. In addition, some filers age 20 and over 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.⁸ These corrections have significant effects on the sample since 1987. For example, in 2013 there were 7.4 million filers under age 20, 0.8 million non-resident filers, and 3.8 million dependent filers age 20 and over, which in total accounted for over 8 percent of all returns filed.

Non-filer market income is estimated using 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 identify non-filers as individuals who did not file a tax return as of 2016, were age 20 through 99 and alive at the end of the year. An estimate of the market income of non-filers is obtained using Forms W-2 (wages), 1099-R (pensions), 1099-DIV (dividends), and 1099-MISC (miscellaneous income). Adjustments include accounting for income not on information returns, such as self-employment and under-the-table income. 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, non-filer income is assumed to be 30 percent of average filer income.⁹ This is larger than the Piketty and Saez (2003) assumption of 20 percent, but the same as the Piketty and Saez (2001) assumption.

Next, several additional adjustments are made to filer incomes: add excluded income from dividends before 1987 and tax-exempt combat pay, and remove gambling losses (up to the amount of gambling income), net operating loss carryovers from prior years, capital gains distributions listed separately from Schedule D since 1971, and taxable state and local income tax refunds.¹⁰

⁸ Those who file as dependent filers age 19 or over must be full-time students, receive more than half of their support from taxpayers claiming an exemption for them, must generally be under age 24, and meet additional requirements. Thus, they are not comparable to fully independent tax units and the incomes on their tax returns reflect only a portion of their economic resources and support. The potential to influence measured inequality trends is illustrated by the increase in school enrollment by those age 20 to 24 from 13 percent in 1960 to 40 percent in 2012. Thus, fewer in this age group are independent and self-supporting. A more detailed discussion is found in the appendix.

⁹ This is a conservative estimate because it excludes many sources of income that can be important for some non-filers. Among the most important excluded sources are income from sole proprietorships, partnerships, S corporations, fiduciaries, alimony, and interest. In addition, income from illegal sources is not included. Corrections are made to the raw administrative data to eliminate outliers. Information returns for individuals over age 99 are excluded because these records often reflect erroneous SSNs or fraudulent returns.

¹⁰ Since gross gambling winnings are reported as other income but gambling losses (up to the amount of winnings) are an itemized deduction, failing to make this adjustment would overstate the economic income of these taxpayers. Reported net operating losses carryovers reflect prior year rather than current year income. This adjustment also prevents counting the same loss multiple times when it takes several years for a very large loss to be used to offset other income. Taxable state and local income tax refunds are an adjustment for an over-deduction in the prior year

Consistent market income: Set income groups by number of adults

Marriage rates among tax filers have fallen consistently over the past five decades from 69% in 1960 to 40% in 2013 (after removing filers younger than 20 years old, dependent filers, and non-residents).¹¹ However, marriage rates among the top one percent have remained consistently high: 90% in 1960 and 86% in 2013. Holding all else constant, declining marriage rates below the top of the income distribution increases top income shares. The importance of adjusting for declining marriage rates is illustrated by the Larrimore (2014) estimate that declining U.S. marriage rates explain 23 percent of the increase in household income Gini coefficients between 1979 and 2007.

In order to control for these declining marriage rates, our analysis defines income groups based on the number of adults, rather than the number of tax units. Joint returns are counted as two adults and other returns as one adult. About 40 percent of non-filer tax units are married and thus counted as two adults.¹² Dividing tax units into income groups by the number of adults controls for changes in marriage rates while still measuring income at the tax unit level.¹³ This adjustment decreases top one percent income shares by about one-tenth in all years: 0.7 percentage point in the 1960s and about 1.8 in recent years.

Other studies found similar reductions in top one percent income shares when moving away from tax units as the unit of observation. For example, Bricker, et al. (2016b) estimate that in 2010 using families rather than tax units decreases top one percent income share by 2.4 percentage points. Larrimore, Mortenson and Splinter (2017) find that using households composed of individuals at the same address rather than tax units reduces the top income share by 2.0 percentage points. The results of these papers suggest that measuring centiles by the number of adults closes most but not all of the difference between tax units and households.

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, including corporate income not on tax returns, imputed rental income on housing, and employer paid health insurance and payroll taxes.

Our measure of consistent income treats pre-tax corporate profits as income to capital owners, regardless of whether profits are distributed, retained, or paid out in taxes. Corporate profits distributed as dividends are already included in taxable income. Since retained earnings are not

rather than income. Our replication of PS suggests that their computations of market income net of capital gains did not account for capital gains distributions reported on a separate line from Schedule D gains in most years since 1971.

¹¹ Growth in cohabitation can explain some of this change. While there was relatively 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 incomes may understate the economic welfare of some single or head of household filers because the income of other members of the household is not included (Larrimore, Mortenson and Splinter, 2017).

¹² In 2009, 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 estimate of about 20 million non-filing tax units. This implies a non-filer marriage rate of about 40 percent. This assumption appears robust since 1960 (see online data).

¹³ This approach differs from actual individual income shares, which results in higher measured inequality due to unequal spousal incomes (Saez and Veall, 2004). Also, this adjustment does not re-rank tax units. In a later adjustment, we re-rank by size-adjusted income to present measures more relevant for the distribution of economic welfare.

reported on individual tax returns they must be allocated among individual corporate owners. The share of retained earnings attributed to retirement account corporate ownership is excluded to prevent double counting, as these earnings are already reflected in taxable income at the time of withdrawal or pension payments. With the growth of retirement savings, the retirement account share of corporate ownership increased dramatically from 4 to 54 percent between 1960 and 2013. The portion of retained earnings reflecting ownership by non-profit organizations and domestic government, which increased from 5 to 7 percent, is also excluded.¹⁴ The remaining retained earnings associated with non-retirement private ownership are distributed to individual tax returns. Three-quarters of retained earnings are distributed based on a tax filer's share of dividends and one-quarter based on their share of capital gains.¹⁵ The results are robust to alternative allocations, as shown in the sensitivity analysis.

Due to the inclusion of retained earnings, corporate capital gains from Schedule D are excluded from our measures of consistent income. Our imputation of retained corporate earnings should lead to similar income shares as multi-year capital gains.¹⁶ 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.

Since consistent income is a pre-tax measure, it includes taxes paid by businesses before income is reported in the individual tax system. C corporation income taxes are allocated following a method similar to that described in Joint Committee on Taxation (2013), with three-quarters being borne by C corporation capital owners (identified by dividends and capital gains) and one quarter by wage earners.¹⁷ Business property taxes are distributed to tax filers by business income (dividends, capital gains, interest, and passthrough income). 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. These payroll taxes are estimated based on reported wages for filers. Missing amounts relative to NIPA totals from non-filers (usually 5 to 10 percent) are allocated to the bottom of the distribution.

Imputed rental income from owner occupied housing is also added to income. This is allocated by deductions for real estate taxes for the top ten percent and the rest of the NIPA total is allocated to the lower 90 percent. Note that these imputed rents exclude non-housing rents from consumer durable goods, such as cars and washing machines. Including these other rents would likely slightly lower top income shares.

¹⁴ It is unclear how the corporate retained earnings earned by non-profits and governments should be distributed. Note that foreign owned equities and corporate passthrough entities (S corporations and REITs) are removed before estimating ownership shares of individuals, retirement accounts, and non-profits. 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).

¹⁵ The portion allocated to capital gains reflects the fact that some corporations do not pay dividends and a substantial portion of capital gains is from the sale of corporate stock.

¹⁶ Armour, Burkhauser and Larrimore (2014) take the alternative approach of estimating annual accrued capital gains, which tend to be volatile.

¹⁷ Distributing the corporate tax to all capital, including non-C corporation capital would imply an infinite elasticity of substitution between different forms of business organization or a long-run equilibrium. Since this approach was used by Piketty, Saez and Zucman (2016) it is examined in the sensitivity analysis. While there was some immediate switching from existing C corporations to S corporation status following TRA86, most of the shift into the passthrough sector occurred gradually from more new businesses forming as S corporations or partnerships, as discussed in the appendix and Auten, Splinter and Nelson (2016). This suggests significant frictions between the C corporate sector and other forms of business, especially for larger corporations whose shares are publicly traded..

Employer provided health insurance is non-taxable income and thus another important addition to market income. Between 1960 and 2013, these benefits increased from 1 percent to 5 percent of pre-tax income. Since the value of employer provided health insurance has only recently become available in tax data, the distribution of total NIPA amount spent on private group health insurance by income group is based on insurance reported on 2014 Forms W-2. Bureau of Labor Statistics data presented in Warshawsky (2016) suggest that the distribution of this benefit in top earnings groups was very similar in 1992 (see online appendix).

The amount spent on health insurance may differ from the value to the employee (Baicker and Chandra, 2006). Some healthy or financially constrained employees may value insurance less than the actual cost to the employer. Others may argue that the value exceeds the pre-tax income required to purchase that level of insurance, in part because of the tax exclusion of this fringe benefit.

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) business property taxes, (4) imputed rental income on housing, (5) the employer portion of payroll taxes, and (6) employer provided health insurance costs. Table 1 and Figure A1 show the impact of each of these adjustments on top one percent income shares. 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.

Pre-tax income: Including government transfers

Government cash and non-cash transfers represent a growing share of personal income and are included in our measure of pre-tax income.¹⁸

Social Security and unemployment insurance (UI) benefits reported on tax returns since 1985 and 1981 are added to income. The remaining NIPA Social Security and UI total benefits are added to the income of the bottom 90 percent.¹⁹ For earlier years, these observed distributions are used to allocate these benefits by income group. The NIPA value of other cash transfers is also added to income of the bottom 90 percent. 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. In addition, \$83 billion in 2008 stimulus payments are distributed to qualifying tax filers. The NIPA value of Medicare is added by assuming each income group receives a share proportional to the 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 income of the bottom 90 percent.

As shown in Table 1, the inclusion of transfers decreases top one percent income shares with a growing effect over time: 0.5 percentage points in 1960, 0.8 in 1979, and 2.2 in 2013.

¹⁸ Pre-tax income does not net out taxes used to pay for these government transfers. This treatment is consistent with measures of before-tax income in Congressional Budget Office (2016), gross income in the Luxembourg Income Study, and the income definition used by the Census Bureau. In computing after-tax income in the following section, the distribution of Social Security benefits and taxes are considered together.

¹⁹ Adding Social Security benefits strongly impacts non-filer incomes because about 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 Social Security benefits and 40 percent with them.

After-tax income

Taxes are subtracted from pre-tax income sequentially in order to show the effect of each on top one percent shares (Table 2). For each tax, the difference between the amounts accounted for on tax returns with itemized deductions and NIPA totals are attributed to the bottom 90 percent of the distribution, which includes non-filers and almost all non-itemizers. Since the overwhelming majority of tax returns at the top of the distribution itemize deductions (including state income taxes and personal real estate taxes), this approach provides good measures for top income groups.²⁰ Estate and gift taxes are not considered because personal transfers are not included in pre-tax income.

Federal individual income taxes are federal tax liability after non-refundable credits plus foreign tax credits, which reflect foreign withholding taxes paid. Refundable tax credits are already accounted for in cash transfers included in pre-tax income. State and local income taxes are allocated by deducted amounts. Property taxes include both previously calculated business property taxes and personal real estate taxes. In years where specific tax deductions are not available, distributions are set to those in surrounding years. The large effect of property taxes on top shares in 1960 is due to the substantial fraction of business property taxes allocated to corporate equity owners. This fraction declines as corporate ownership shifts to retirement accounts. Corporate income taxes are those previously calculated for market income.

Payroll taxes include employer and employee taxes, as well as self-employment taxes reported on tax returns. Employee payroll taxes are set equal to previously calculated employer taxes except for years with special rates (1984, 2010, and 2011). Because NIPA labeled the value of the 2010-2011 employee payroll tax holiday as refundable tax credits, \$55 billion in each year of the holiday is removed from refundable credits and instead applied to reduce NIPA payroll tax totals in this step.²¹ Sales and other taxes are distributed by disposable income (after-tax income after removing payroll taxes) less savings, where saving rates are significantly larger for higher income groups and come from the Surveys of Consumer Finance results presented in Dynan, Skinner and Zeldes (2004).

After-tax income: Set groups by number of individuals and size-adjusted income

To present a measure more relevant to the distribution of economic welfare, income groups are based on the number of individuals and tax units are ranked using size-adjusted incomes, which account for sharing and economies of scale. For example, when a family shares a residence the incremental costs are likely to decrease with each additional person. To leave total income unchanged, tax unit level income is still used in estimating income shares.

Various equivalence scales are used to account for size differences among tax units or households. Our analysis follows the Congressional Budget Office (2016) approach by dividing tax unit income by the square-root of the number of individuals in a tax unit, including both adults and dependents. This adjustment is also similar to that used by the Census Bureau to estimate equivalence-adjusted income inequality (DeNavas-Walt and Proctor, 2015). The square-root of the number of individuals in the sharing unit is commonly used as an equivalence scale because it is between the extremes of assigning the full tax unit income to each individual

²⁰ The fraction of the top one percent itemizing was generally at least 95 percent between 1960 and 2013. Most of these non-itemizers live in states with no income tax.

²¹ The revenues from the 0.9 percent Additional Medicare Tax, which began in 2013, are included in federal income taxes.

(complete economies of scale, i.e., non-rivalrous consumption) and per capita income (equal sharing but no economies of scale, i.e., completely rivalrous consumption). This size-adjustment implicitly assumes equal sharing among all individuals within the tax unit in all years.

IV. Results

Using a measure of market income that is consistent over time and includes income sources not included in income subject to the individual income tax has a dramatic effect on estimated top income shares. These effects are shown in Figure 3 and in summary form in Table 3. 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.

For 1960, the top one percent share of consistent market income was 11.5 percent, or 2.5 percentage points higher than the PS market income estimate of 9.0 percent. The most important factor in this higher share is the addition of pre-tax C corporation income (including corporate income and property taxes) in place of realized capital gains. This reflects the sheltering of income inside corporations to avoid high individual income tax rates, as well as the deferral of realizations of capital gains. The addition of pre-tax corporate income increases the top one percent share by 4.3 percentage points, but this is partly offset by other adjustments

For 2013, the consistent market income share was 14.5 percent, while the PS income share was 19.0 percent. The most important factors in this difference are controlling for the decrease in the marriage rate of lower income tax units (1.8 percentage points) and including employer provided health insurance (0.7 percentage points) and the employer share of payroll taxes (1.0 percentage points).

Over the period from 1979 to 2013, the top one percent share of consistent market income share increased about half as much as the PS market income share (5.4 vs. 10.0 percentage points). The increase in the top one percent income share since 1960 is about one-third of PS market income (3.0 vs. 10.0 percentage points). Rather than a clear upward trend in recent decades, the apparent anomaly for consistent incomes is relatively low top income shares in the 1970s and early 1980s, a period characterized by frequent recessions, high inflation, and low corporate profits.²²

Our measure of pre-tax income includes government transfers, the largest of which is Social Security benefits. In 1960, the top one percent pre-tax income share was slightly lower than consistent market income (11.0 vs. 11.5 percent), since government transfers were relatively small. In 2013, the pre-tax income share was significantly lower (12.2 vs. 14.5 percent). Using the Survey of Consumer Finances, Bricker et al. (2016b) also estimate that top one percent transfer-inclusive income shares were 2.3 percentage points less. Congressional Budget Office (2016) supplemental data suggest that including transfers decreases top one percent income shares by 3 percentage points.

Using pre-tax income, the increase in the top one percent income share since 1960 is about one-tenth of the PS estimate (1.2 vs. 10.0 percentage points). The overall difference of about 9 percentage points is accounted for as follows: about 2 percentage points from using C corporation retained earnings in place of realized capital gains, about 2 percentage points from

²² Inflation adjusting interest income would have only a small effect on our measures of top income shares because the same income groups receiving lower interest payments would receive offsetting higher business income, as inflation adjusting decreases business real interest deductions

including corporate taxes and business property 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.

Taxes reduce top one percent shares by about one-fifth, or between about one and two percentage points, but have little impact on the trend in top income shares. While the paper only discusses top one percent income shares, increases in income shares for the top 10 percent and top 0.1 percent are also much smaller for consistent, pre-tax, and after-tax incomes (Figure A2).

Distribution of economic growth

Correcting income measures also has implications for understanding computations of the distribution of U.S. economic growth over time. Using the approach of PS (online updates), Table 4 shows that 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 approach to consistent market income would imply that about one-third (37%) of the increase in income was earned by the top one percent of tax units. The approach also implies that the top one percent earned only one-quarter (24%) of pre-tax income and one-eighth (12%) of after-tax income. Using consistent income measures thus suggest that economic growth has been shared much more equally 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 one 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 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 the incomes of individuals over time rather than comparing cross-sections in different years.

Tax burdens over time

The top individual income tax rate has fallen dramatically from 91 percent in 1960 to 39.6 percent in 2013 and was as low as 28 percent from 1988 to 1990. However, these top tax rates present only a limited picture of the true tax burden of the top one percent. Before the base-broadening reforms of TRA86, high income taxpayers were able to shelter more of their income. In recent decades, the bottom 90 percent has received a larger share of its income from sources excluded from the tax base. However, only a few taxpayers paid the top tax rates in the 1960s; in recent decades the top tax rates have applied more broadly. These considerations suggest that it would be useful to examine overall tax burdens using a consistent measure of broad income. Figure 4 shows the total federal, state, and local tax burden as a percent of pre-tax income (i.e., the average effective tax rate) and the distribution of this burden by type of tax for the top one percent (upper figure) and the bottom 90 percent (bottom figure) of the population from 1960 through 2013. Payroll taxes are excluded at this point and considered later along with social insurance benefits.

Total tax burdens of the top one percent ranged from 38 to 50 percent over this period, averaging about 42 percent and with no clear trend. Indeed, the average effective tax rate was about 44 percent in 1960 and 45 percent in 2013. While a constant tax burden with falling tax rates may seem surprising, it is consistent with earlier analyses of tax burdens in the 1960s (Pechman and Okner, 1974).²³ Despite the persistence of the overall tax burden for the top one percent, the type of taxes paid has changed substantially. In 1960, about one third of their taxes were from federal individual income taxes, one third from corporate income taxes, and one third from state and local taxes. In 2013, about two-thirds were from federal individual income taxes.²⁴ Corporate and property taxes decreased substantially as a percent of income, while state and local income taxes increased for the top one percent.

The variation in average tax rates of the top one percent over this period is primarily due to factors affecting federal individual income tax liabilities. First, top incomes are highly procyclical, pushing a larger fraction of their incomes into higher tax brackets during expansions and lower brackets during recessions. Second, top tax rates have changed frequently. Especially prominent are the 1968-1970 Vietnam War surtax and the top rate increase in 1993. Third, the individual income tax includes capital gains taxes, even though pre-tax income replaces realized capital gains with corporate retained earnings. The spike in 1986 in taxes paid by the top one percent was due to the unlocking of unrealized gains before capital gains tax rates increased with TRA86.

Our estimated top one percent tax burdens for the 1960s are lower than measures based on unadjusted tax return based income such as Piketty and Saez (2007). For example, they estimated an average federal income tax rate of 24 percent for 1960 compared to our estimate of 17 percent. Our lower effective rate is due to including retained corporate earnings in place of realized capital gains. This situation reverses in more recent years. For 2004, Piketty and Saez (2007) estimated an average federal individual tax rate of 21 percent compared to our estimate of 25 percent. Our higher effective rate is largely due grouping tax units by the number of individuals to control for declining marriage rates over time. Since the marriage rate is much higher for the top one percent, grouping by the number of individuals means that the top one percent includes fewer tax units and consequently higher average incomes and tax burdens.

Figure 4 suggests that the inequality reducing effect of taxes has increased between 1960 and 2013: taxes for the top one percent remained over 40 percent of income, while for the bottom 90 percent taxes decreased from 21 to 17 percent of income.²⁵ For the bottom 90 percent, the decrease in tax burdens was primarily due to falling federal individual income taxes. This suggests that the increase in tax progressivity was primarily due to federal individual income tax changes.

²³ For the top one percent in 1966, Pechman and Okner (1974) estimated that total federal, state, and local taxes were from 32 to 39 percent of their measure of adjusted family income using a broad range of incidence assumptions. By comparison, our comparable baseline estimate for 1966 is about 39 percent. This situation of high statutory but low effective tax rates in the 1960s was described by Harvey Brazer as “dipping deeply into the incomes of the wealthy with a sieve.”

²⁴ In 2013, the average federal individual income tax rate of the top one percent increased about 3 percentage points due to an increase in the top rate and the adoption of two new surtaxes. The increase in marginal tax rates was more than twice as large (Auten, Splinter and Nelson, 2016). Including payroll taxes increases the top one percent average tax from 44 to 48 percent of income.

²⁵ Including refundable tax credits here would decrease bottom 2013 tax rates another percentage point.

Payroll taxes and the associated Social Security benefits and disability insurance (i.e., old age, survivor, and disability insurance, or OASDI), Medicare, and unemployment insurance are also important factors affecting the distribution of before and after-tax income. These social insurance transfers are dependent on having paid payroll taxes, and in the case of Social Security, increase with the amount of taxes paid. While payroll taxes appear regressive relative to annual income, the transfer side of these programs is progressive.²⁶ This asymmetry means that in order to present a more distributionally representative picture of these programs, the incidence of payroll taxes and social insurance transfers should be presented jointly.

Figure 5 shows that that before the mid-1980s, payroll taxes and social insurance benefits were about the same percent of pre-tax income for both the bottom 90 and top one percent. Since then, payroll tax rates leveled off for the bottom 90 percent while their benefits continued increasing. Meanwhile, payroll taxes for the top one percent jumped in 1994 with the uncapping of the 2.9 percent Medicare tax while their benefits remained unchanged. This change increased the overall progressivity of the combined payroll tax and social insurance policies.

The estimates in Figure 5 actually understate the system's progressivity because it does not include the income tax on Social Security benefits of higher income recipients since 1984 that also goes into the Social Security Trust Fund. In addition, it excludes the earned income tax credit, which was intended in part to encourage work by offsetting the cost of payroll taxes. The effects of these two provisions were accounted for earlier in the analysis.

V. Sensitivity Analysis

The main results presented above rely on a number of choices about the incidence of corporate taxes, the distribution of retained earnings and the measurement of income groups. This section presents sensitivity tests of alternative assumptions. These sensitivity tests suggest that while alternative assumptions can result in modestly higher or lower top income shares and changes in these shares over time, they are generally within about one percentage point of our main results.

The incidence of the corporate income tax has long been a controversial tax policy issue and researchers have drawn different conclusions. As discussed earlier, our analysis distributes 25 percent of the corporate tax burden to wages and 75 percent to corporate capital. Using this approach, the top one percent shares of after-tax income increased from 11.0 percent in 1960 to 12.2 percent in 2013, an increase of 1.2 percentage points. Alternatively, distributing all of the corporate tax to corporate capital results in top one percent pre-tax income shares of 11.4 and 12.3 percent, an increase of only 0.9 percentage points. Distributing the corporate tax to all forms of capital, including passthrough capital, results in top one percent pre-tax income shares of 10.7 and 12.3 percent, an increase of 1.6 percentage points.

Corporate retained earnings may also be distributed in alternative ways. Rather than distributing all of the retirement portion of corporate retained earnings by retirement income reported on tax returns, distributing half to wages results in the top one percent after-tax income share increasing from 8.9 to 9.4 percent between 1960 and 2013. This is an increase of 0.6 percentage points, rather than 0.9. Instead of distributing retained earnings by 25 percent capital gains and the rest by dividends, distributing 50 percent to both capital gains and dividends results in the top one

²⁶ The OASDI tax base is capped and HI taxes were also capped before 1993. Below these caps, earnings are taxed proportionally. Social Security benefits are paid relative to average earnings using a progressive formula.

percent after-tax income share increasing from 8.9 to 9.9 percent, a 1.0 percentage point increase.

In order to adjust for the decline in marriage rates and changes in tax unit size, our analysis determines after-tax income groups based on the number of individuals and to account for economies of scale ranks tax units by size-adjusted incomes. In an alternative approach, Piketty, Saez and Zucman (2016) divide married incomes by two, which also assumes equal sharing but no economies of scale, and set income groups based on these incomes and the number of adults. Relative to our approach, this does not take into account dependents either for economies of scale or in setting the size of each group. Under this equal-split income approach, the top one percent after-tax income share would increase from 8.8 to 9.9 between 1960 and 2013, an increase of 1.1 percentage points.

The treatment of retirement savings and income presents difficult choices when thinking about distribution issues (Nelson, 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 approach implies that many retired people have very little income other than Social Security. In addition, it is unclear how to use tax data to distribute this income to workers because 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 income earned but more consistent with the timing of the ability to consume. Some distribution studies count retirement income both when earned and when distributed, but this results in more total income than exists in the economy. Our consistent income measures generally include income from pensions, retirement savings accounts, and annuities when the retirement income is distributed.²⁷ Some factors suggest that counting the market component of such income when it accrues would likely increase the estimated income shares of the top income groups. First, individuals tend to save more later in their working life when their incomes are generally higher and they are thus higher in the income distribution. Second, higher income households and tax units tend to contribute more to retirement savings and accrue private pension rights at any age. However, studies following this approach generally ignore the importance of the Social Security program, which provides a large share of retirement income for much of the population and may reduce the perceived need of lower income and financially constrained households to save for retirement. A consistent and comprehensive measure of accruing retirement income should include the accrual of Social Security retirement benefits as well as the accrual of private retirement savings and pension benefits.²⁸ It is unclear how such a measure would compare to our results. Attempting such an analysis is beyond the scope of the current paper, but would be an important subject for future research.

The difference between national income and our measure of pre-tax income may also be of interest, especially in recent years. Pre-tax income is about 4.5 percent lower than national income in 2013 (\$13.8 vs. \$14.4 trillion). About 1 percentage point of this gap is due to the exclusion of non-profit and government income from interest, dividends, and retained earnings.

²⁷ This is the essentially the approach used in most studies of income inequality, including Piketty and Saez (2003).

²⁸ The importance of accounting for Social Security is illustrated by the fact that in recent years these benefits are about equal to total private pensions and IRA distributions. For 2013, taxpayers reported \$639 billion of taxable pensions and \$214 billion of IRA distributions. Social Security and Railroad Retirement Benefits totaled \$811 billion.

About 1 percentage point is due to not distributing retirement account interest income. About half a percentage point is from lower net rental income in tax data. Another half a percentage point is explained by differences in farm income (corporate and non-corporate), which is negative in tax data but positive in national income. Distributing this income to retirees, landlords, and farmers should have little effect on top income shares and in the extreme case that the remaining 1.5 percentage points were allocated to the top one percent, this would still imply top shares well below those based on unadjusted tax-based measures or Piketty, Saez and Zucman (2016) distributions of national income.

The results of these sensitivity tests suggest that while alternative assumptions can result in modestly higher or lower top income shares and changes in these shares over time, the results are robust to alternative assumptions. Our basic findings of lower levels of inequality and relatively little change in top income shares since the 1960s only change by a few percentage points of the main results.

VI. Summary and Conclusions

Studies using tax return data have argued that the market income shares of top income groups have increased substantially since 1960. However, such studies generally do not account for the effects of major tax reforms, income sources not in the individual income tax base, and changes in marriage rates. Failing to account for these factors results in a distorted view of income inequality levels and trends. Using administrative U.S. tax data, this paper examines the importance of using consistent and broader measures of income that better reflect individual incomes within each year and are more comparable across years.

Our measure of consistent market income corrects for tax base changes, adds market income excluded from the individual tax base, such as undistributed corporate profits and employer provided health insurance, and adjusts for declining marriage rates. Using unadjusted tax-based measures, Piketty and Saez (2003 and updates) estimated that between 1960 and 2013 top one percent pre-tax income shares increased by 10 percentage points. Using our consistent measure of market income results in an increase of only 3 percentage points. The most important factors are accounting for C corporation retained earnings (2 percentage points), corporate taxes and business property taxes (2 percentage points), employer paid payroll taxes and health insurance (1 percentage point), and falling marriage rates (1 percentage point).

While market income provides a measure of how individuals are compensated for their labor and investments, it provides an incomplete picture of the overall resources available at both the top and bottom of the income distribution. Because government transfers have grown substantially in recent decades, the inclusion of transfers has become more important in measures of income inequality. Our measure of pre-tax income measure includes government transfers and suggest that the top one percent share has increased only about 1 percentage point since 1960.

The use of broad and consistent income measures is also important for measuring tax burdens and after-tax incomes over time. The average tax burden of the top one percent (not including payroll taxes) was approximately the same percent of pre-tax income in 1960 and 2013, in spite of much lower statutory rates. Since the average tax burden of the bottom 90 percent declined over this period, this suggests that the overall tax system has become moderately more progressive. Considered separately, the combined effects of payroll taxes and social insurance benefits have also become more progressive. The top one percent share of after-tax income increased by about one percentage point, about the same amount as pre-tax income.

An alternative narrative about top income shares emerges when consistent and broad measures of pre-tax and after-tax incomes are used: any change in the top one percent income shares over the last half century is likely to have been relatively modest.

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

Adjustments	Top 1% income shares					Top 1% share changes				
	1960	1979	1985	1989	2013	1960	1979	1985	1989	2013
Piketty-Saez (with CGs, PS)	9.0	9.0	11.1	13.8	19.0	----	----	----	----	----
Piketty-Saez (no CGs)	8.3	8.1	9.2	12.8	17.8	-0.7	-0.9	-1.9	-1.0	-1.2
<i>Panel 1: Consistent Market Income, Adjustments & Group by Adults</i>										
Remove non-deductible losses	8.3	8.3	9.7	----	----	*	0.3	0.5	----	----
Add tax-exempt interest	8.6	8.7	10.1	13.2	18.0	0.4	0.3	0.4	0.3	0.2
Limit returns to adult residents	8.7	8.7	10.1	13.0	17.6	0.1	*	*	-0.2	-0.4
Adjust non-filer income	8.6	8.6	10.0	12.8	17.4	-0.2	-0.1	-0.1	-0.2	-0.2
Correct income definition	8.6	8.6	9.9	12.7	17.0	*	*	-0.1	-0.1	-0.3
Set income groups by adults	7.9	7.6	8.9	11.5	15.2	-0.7	-1.0	-1.0	-1.2	-1.8
Cumulative change from PS						-1.1	-1.4	-2.2	-2.3	-3.7
<i>Panel 2: Consistent Market Income, Expansions</i>										
C-corporation retained earnings	10.2	9.2	9.9	11.9	16.0	2.3	1.7	0.9	0.4	0.8
C-corporation taxes	11.6	9.6	9.9	11.9	16.0	1.4	0.4	0.1	0.0	0.0
Business prop. tax	12.2	9.8	10.0	12.1	16.2	0.6	0.2	0.1	0.2	0.2
Imputed rent	11.8	9.6	9.9	11.9	15.8	-0.4	-0.1	-0.1	-0.2	-0.4
Employer payroll tax	11.6	9.2	9.5	11.4	15.2	-0.7	-0.5	-0.6	-0.7	-1.0
Employer health insurance	11.5	9.0	9.2	11.0	14.5	-0.1	-0.2	-0.3	-0.4	-0.7
Consistent market income and total changes	11.5	9.0	9.2	11.0	14.5	2.5	0.0	-1.9	-2.8	-4.5
<i>Panel 3: Pre-tax Income, Add Transfers</i>										
Social Security benefits	11.2	8.6	8.7	11.0	13.6	-0.3	-0.4	-0.5	-0.6	-0.9
Unemployment benefits	11.1	8.6	8.7	11.0	13.5	-0.1	*	*	*	-0.1
Other cash transfers	11.0	8.5	8.6	10.9	13.3	-0.1	-0.1	-0.1	-0.1	-0.2
Medicare	----	8.4	8.4	10.7	12.8	----	-0.1	-0.1	-0.2	-0.5
Other non-cash transfers	11.0	8.2	8.3	10.4	12.2	*	-0.1	-0.2	-0.2	-0.6
Pre-tax income and total changes	11.0	8.2	8.3	10.4	12.2	2.0	-0.8	-2.8	-4.0	-6.8

Notes: Cumulative changes are relative to the Piketty and Saez series with capital gains (thresholds set without capital gains). See Table A1 and online appendix for detailed description of adjustments. * denotes changes between -0.05 and 0.05 percentage points.

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

Table 2: Effects of taxes on top 1% income shares

Adjustments	Top 1% income shares					Top 1% share changes				
	1960	1979	1985	1989	2013	1960	1979	1985	1989	2013
Pre-tax income	11.0	8.2	8.3	9.8	12.2	----	----	----	----	----
<i>Panel 1: After-tax income, Decreases to top shares</i>										
Federal indiv. income tax	10.1	7.2	7.0	8.5	10.0	-0.9	-1.0	-1.3	-1.3	-2.2
State/Local indiv. income tax	9.9	7.1	6.7	8.2	9.4	-0.2	-0.1	-0.3	-0.3	-0.6
Corporate income tax	8.5	6.6	6.6	8.1	9.2	-1.4	-0.5	-0.1	-0.1	-0.2
Property tax	7.8	6.4	6.5	7.9	9.0	-0.6	-0.2	-0.1	-0.1	-0.3
<i>Panel 2: After-tax income, Increases to top shares</i>										
Payroll tax	8.2	7.0	7.1	8.7	9.5	0.4	0.5	0.6	0.8	0.6
Sales and other taxes	8.6	7.2	7.3	8.9	9.7	0.4	0.3	0.2	0.2	0.2
Group by individuals and size-adjusted income	9.2	7.6	7.7	9.2	9.9	0.5	0.4	0.4	0.3	0.2
Total change from pre-tax income						-1.9	-0.7	-0.6	-0.6	-2.3

Notes: Cumulative changes are relative to pre-tax income. Tax totals are based on NIPA amounts. Fuel and utility taxes are not included. See Table A1 and online appendix for detailed description of adjustments.

Sources: Authors' calculations, IRS, and BEA.

Table 3: 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 market income	11.5	9.0	14.5	5.4	3.0
Pre-tax income	11.0	8.2	12.2	4.0	1.2
After-tax income	9.2	7.6	9.9	2.3	0.9

Notes: Piketty and Saez market income includes capital gains and thresholds are set by income excluding capital gains to make more comparable to consistent market incomes. Adjustments used to estimate consistent market income, pre-tax income, and after-tax income are listed in Tables 1, 2, and A1 and described in detail in the online appendix.

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

Table 4: Fraction of total income increase earned by top 1% for different income definitions

	Piketty-Saez Market Income	Consistent Market Income	Pre-tax Income	After-tax Income
1960-2013	36%	19%	14%	7%
1979-2013	79%	38%	24%	12%
1993-2003	59%	35%	25%	13%

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

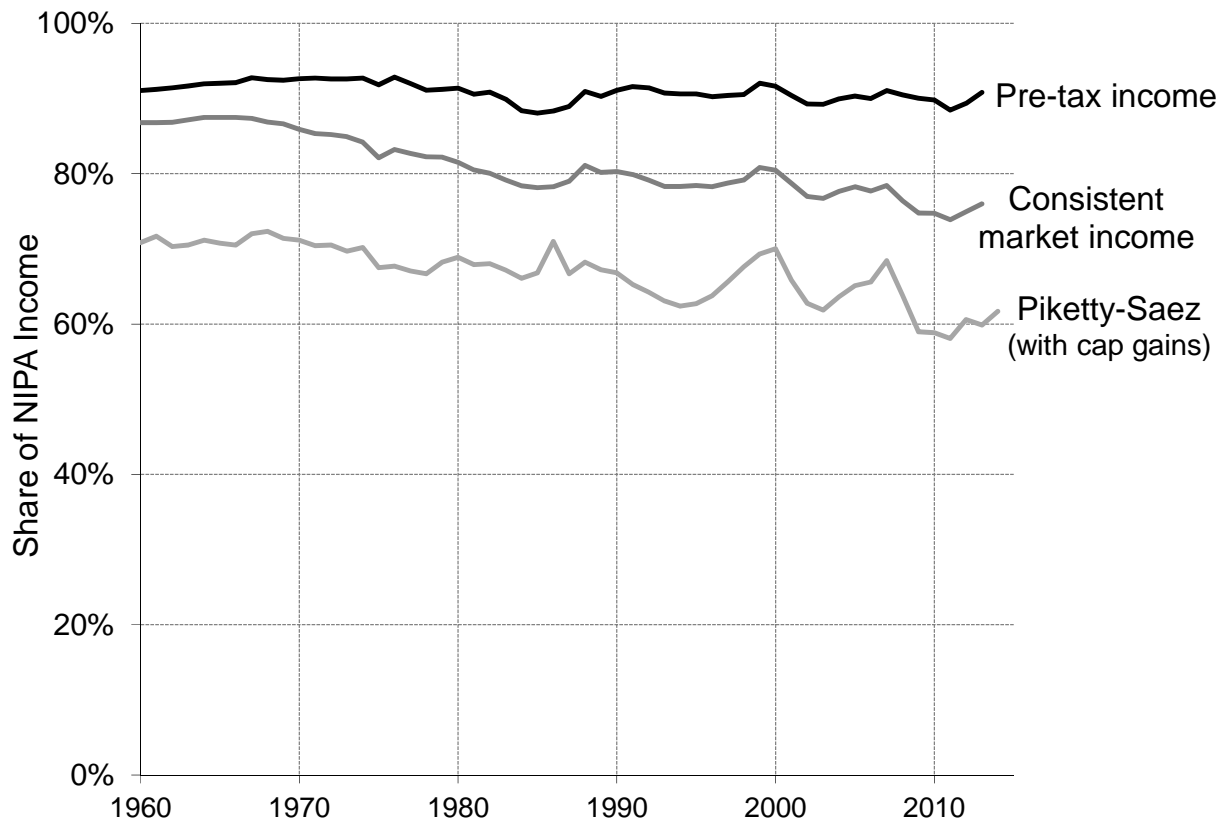


Figure 1: Total income as a share of NIPA income

Notes: NIPA income is personal income plus corporate profits less net dividends. Pre-tax income is consistent market income plus government transfers. Adjustments used to estimate consistent market income and pre-tax 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).

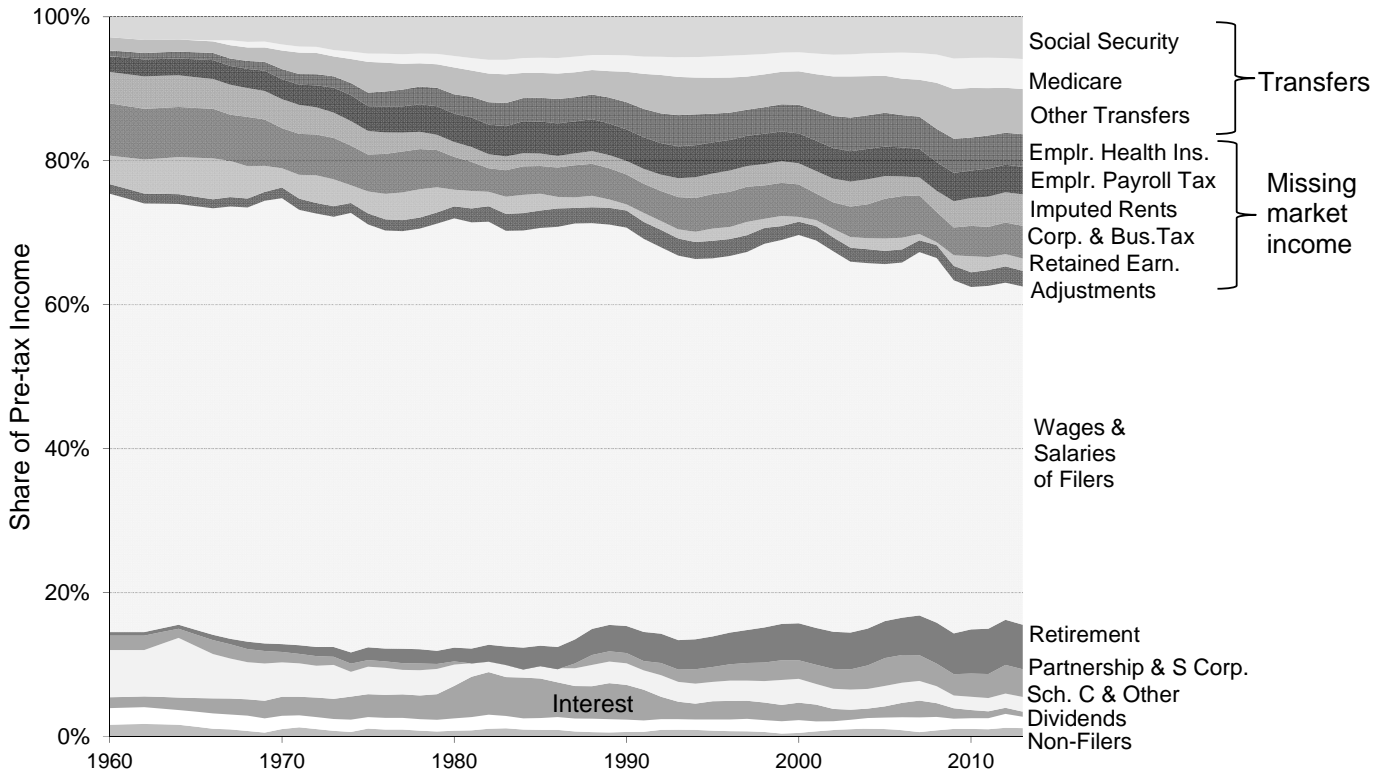


Figure 2: Income sources as a share of pre-tax income

Notes: Adjustments (bottom group of missing market income) are listed in Table 1, Panel 1. Sch. C and Other includes small amounts from unlisted sources, such as alimony, rents, etc. Corp. and Bus. Tax is federal and state corporate income tax and business property taxes. Income sources are pre-tax.

Sources: Authors' calculations, IRS, and BEA.

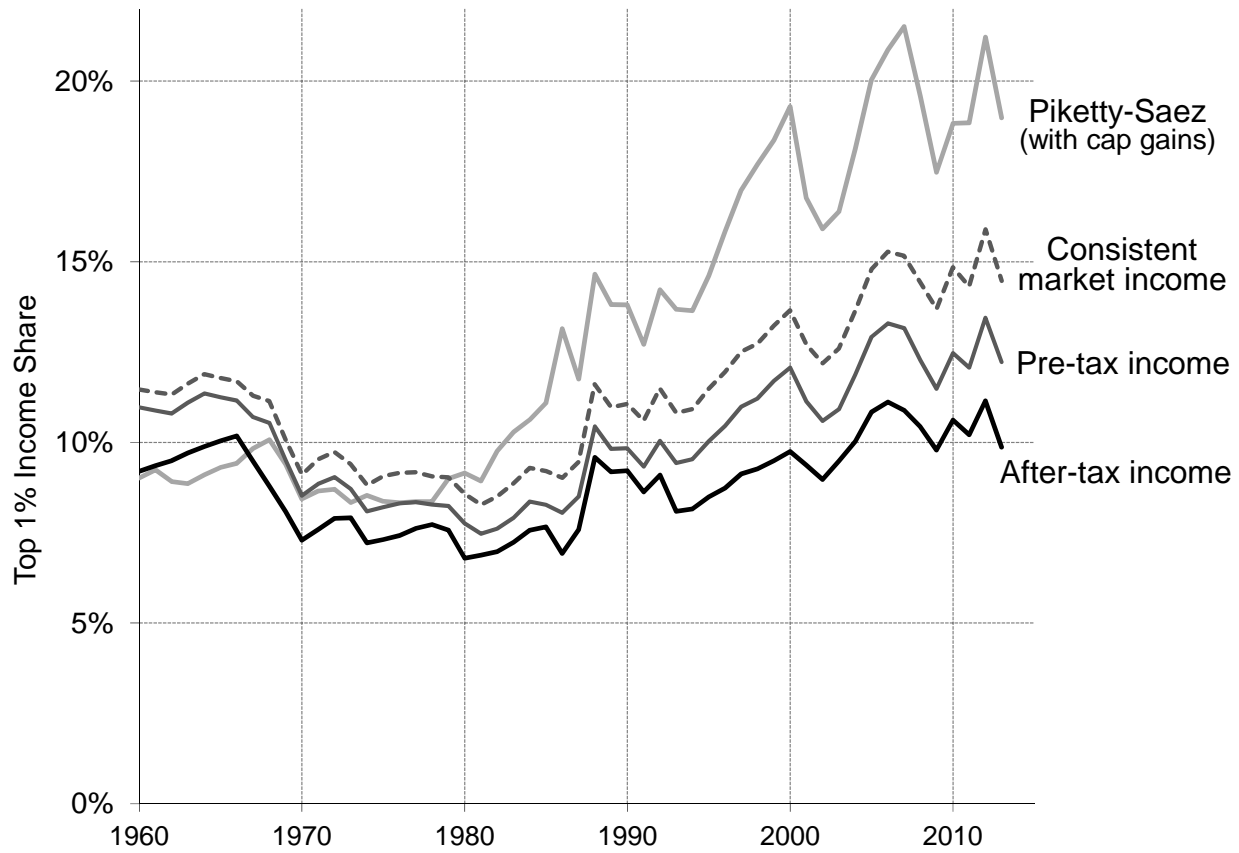


Figure 3: Comparison of top 1% income shares

Notes: Piketty and Saez series includes capital gains (thresholds set without capital gains). Pre-tax income is consistent market income plus government transfers. After-tax income subtracts federal, state, and local taxes.

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

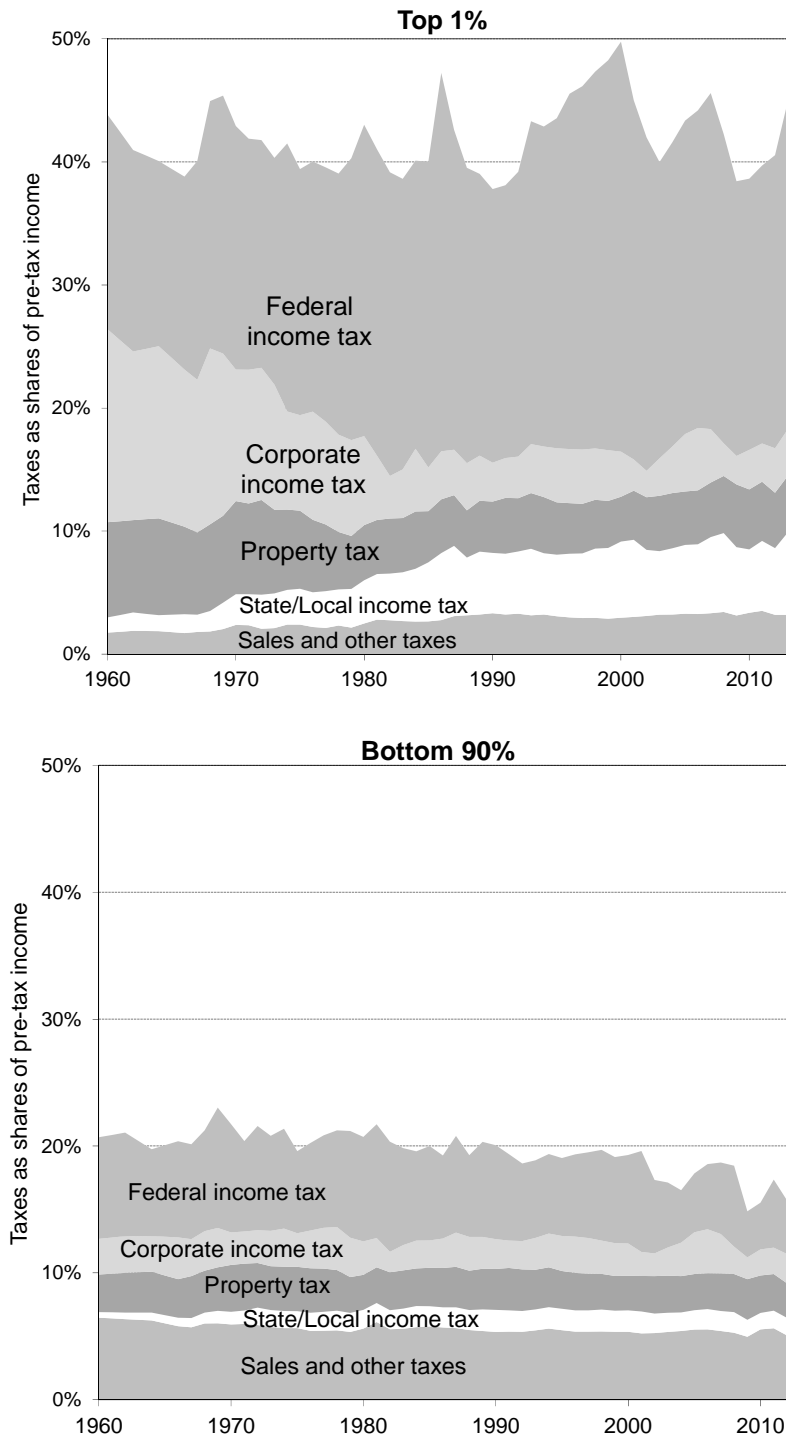


Figure 4: Taxes as shares of pre-tax income

Notes: Payroll taxes are examined in Figure 5 in connection with transfer payments. Refundable tax credits are included in pre-tax income and excluded from income taxes.

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

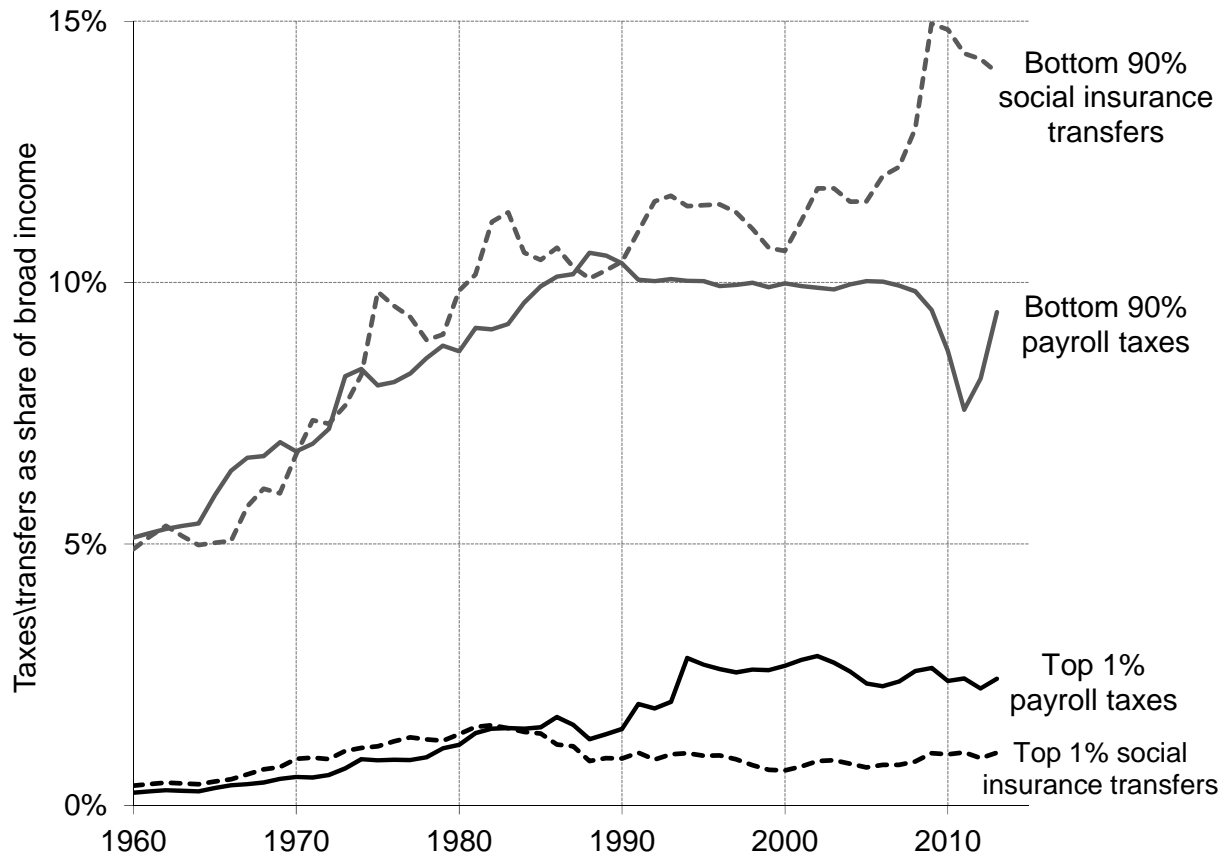


Figure 5: Payroll and social insurance as a share of pre-tax income

Notes: Social insurance transfers includes benefits from Social Security, Medicare, and disability and unemployment insurance. Surtaxes beginning in 2013 are included with income taxes rather than payroll taxes.

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

Appendix

Table A1: Descriptions of adjustments to income and tax units

Adjustments	Years	Adjustment Method
Consistent Market Income		
<i>Corrections</i>		
Remove nondeductible losses	1960-1986	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 other 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
Net out gambling losses	1972-2013	From tax returns. Before 1991, misc. deductions up to other income which includes gambling income.
Remove cap. gains distributions	1971-2013	From tax returns. Line not on Form 1040 in 1997 and 1998.
Remove tax refunds adjustment	1971-2013	Adjustment for previously deducted state and local tax refunds, not on 1040 before 1971
Remove net operating losses	1960-2013	Before 1989, equals 80 percent of other income losses
Set income groups by #adults	All Years	Set income groups by giving joint filers twice their tax unit weight
<i>Expansions</i>		
Add C-corp retained earnings	All Years	Allocate household portion 3/4 by dividends, 1/4 by capital gains
Add corporate income tax	All Years	Allocate household portion 3/4 by capital & 1/4 by wages, retirement portion by taxable pension income on 1040
Add business property tax	All Years	Allocate to corporate capital by asset share and then hh equities by dividends, capital gains, interest, and taxable pension income on 1040
Add imputed rents	All Years	Allocate by real estate taxes deducted
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 insurance using 2014 Form W-2 distribution
Pre-tax income		
Add Social Security benefits	All Years	Include reported benefits, use 1985 distribution in prior years
Add unemployment benefits	All Years	Include reported benefits, use 1981 distribution for prior years
Add other cash transfers	All Years	SSI, ref. tax credits, workers comp., state/local social insurance family assistance, temporary disability, 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.
After-tax Income		
Remove federal indiv. inc. tax	All Years	Include foreign tax credits
Remove state/local indiv. inc. tax	All Years	Based on tax deductions, unallocated in total income
Remove corporate income tax	All Years	As calculated above
Remove property tax	All Years	Allocate business portion as above & housing portion by deductions
Remove payroll tax	All Years	Employee tax equal employer FICA tax, except in 1981, 2010 and 2011
Remove sales and other taxes	All Years	Allocate to filers by after-tax income less savings
Set groups by #indivs/sz-adj. inc.	All Years	Set income groups by #individuals and rank by size-adjusted income

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

Effects of the Tax Reform of 1986 on reported income

Many provisions of TRA86 affected income reported on individual income tax returns and thus affected measured top income shares. Table A2 shows the revenue estimates of key base-broadening provisions that were expected to increase revenues by more than \$20 billion in 1990 when the effects of most provisions were fully phased in. A large share of the base broadening was targeted at the top of the income distribution and at their tax shelters. The Treasury model used for the 1986 tax reform estimated that 69 percent of the base-broadening effect for partnership and rental income was from the top one percent or the bottom income group that was dominated by taxpayers with negative AGIs due to tax shelter losses and the fact that only 40 percent of capital gains were included in AGI (Nunns, 1987). At the top tax rate of 28 percent that likely applied to almost all of this base broadening, the \$20 billion of base broadening revenue would result from about \$50 billion of increased taxable income, or about one quarter of the observed increase in top one percent incomes.

The effects of TRA86 on top one percent income shares can be seen using cross-section tax return data to examine the base-broadening reforms and a 1985-1993 panel of tax returns to show the effect of business entity shifting. Table A3 shows that the unadjusted top one percent income share increased over 50 percent 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. Since 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 one 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 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 A4 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 of top one percent shares 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%). 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 A2: 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 A3: 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 tax return income including capital gains and the number of tax returns (non-filers are not considered). 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 A4: 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 total income excluding capital gains from the 1985-86 average. New S corporation and partnership income is for taxpayers not reporting income from these sources in 1985 or 1986. Top 1% thresholds are based on tax return income including capital gains and the number of tax returns (non-filers are excluded).

Sources: 1985 base year individual tax return panel and authors' calculations.

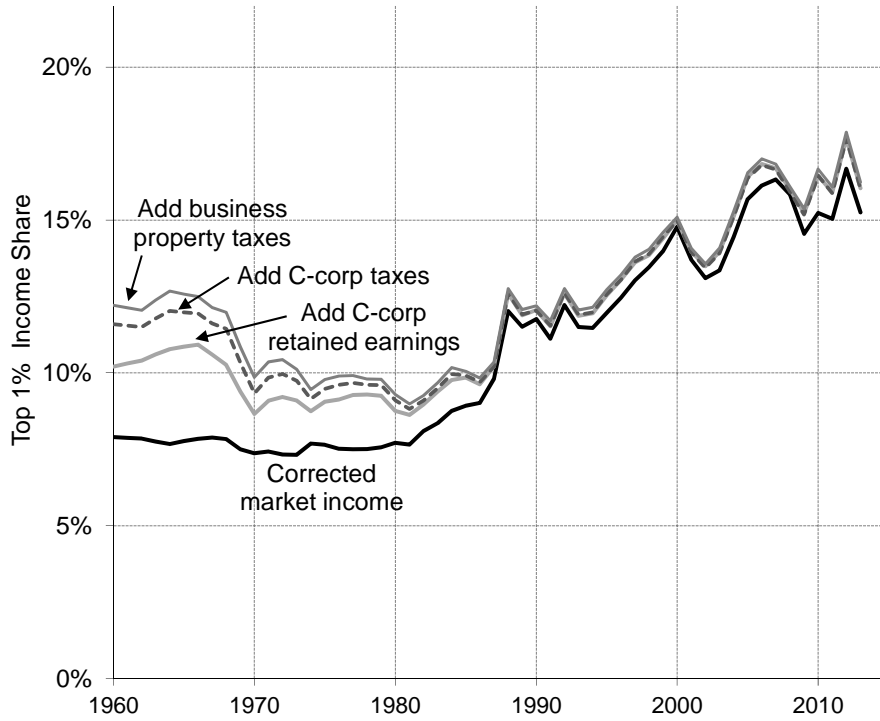
Table A5: Top Income Shares, 1960-2013

Year	Consistent market income		Pre-tax income		After-tax income	
	Top 1%	Top 0.1%	Top 1%	Top 0.1%	Top 1%	Top 0.1%
1960	11.5	4.2	11.0	4.0	9.2	3.7
1961	11.4	4.1	10.9	3.9	9.4	3.5
1962	11.3	4.1	10.8	3.9	9.5	3.4
1963	11.6	4.3	11.1	4.1	9.7	3.6
1964	11.9	4.4	11.4	4.2	9.9	3.7
1965	11.8	4.4	11.2	4.2	10.0	3.7
1966	11.7	4.3	11.2	4.1	10.2	3.7
1967	11.3	4.1	10.7	3.9	9.5	3.4
1968	11.1	4.1	10.5	3.9	8.8	3.2
1969	10.1	3.6	9.5	3.4	8.1	2.7
1970	9.1	3.0	8.5	2.8	7.3	2.3
1971	9.5	3.3	8.8	3.0	7.6	2.5
1972	9.7	3.3	9.0	3.1	7.9	2.7
1973	9.4	3.1	8.7	2.8	7.9	2.6
1974	8.8	2.8	8.1	2.6	7.2	2.3
1975	9.1	2.9	8.2	2.6	7.3	2.4
1976	9.2	3.0	8.3	2.7	7.4	2.5
1977	9.2	3.0	8.3	2.7	7.6	2.6
1978	9.1	3.0	8.3	2.7	7.7	2.6
1979	9.0	3.1	8.2	2.8	7.6	2.6
1980	8.6	2.8	7.8	2.5	6.8	2.1
1981	8.3	2.7	7.5	2.4	6.9	2.2
1982	8.5	2.8	7.6	2.5	7.0	2.2
1983	8.9	3.1	7.9	2.7	7.2	2.4
1984	9.3	3.5	8.4	3.1	7.6	2.5
1985	9.2	3.3	8.3	2.9	7.7	2.6
1986	9.0	3.2	8.1	2.8	6.9	2.2
1987	9.5	3.4	8.5	3.0	7.6	2.6
1988	11.6	4.7	10.4	4.2	9.6	3.8
1989	11.0	4.2	9.8	3.8	9.2	3.5
1990	11.1	4.2	9.8	3.7	9.2	3.5
1991	10.6	3.9	9.3	3.4	8.6	3.1
1992	11.5	4.5	10.0	3.9	9.1	3.5
1993	10.8	4.1	9.4	3.5	8.1	2.9
1994	10.9	4.1	9.5	3.6	8.2	2.9
1995	11.5	4.4	10.0	3.8	8.5	3.1
1996	11.9	4.7	10.5	4.1	8.7	3.3
1997	12.5	5.0	11.0	4.4	9.1	3.5
1998	12.7	5.2	11.2	4.5	9.3	3.6
1999	13.2	5.5	11.7	4.9	9.5	3.8
2000	13.7	5.9	12.1	5.2	9.8	3.9
2001	12.7	5.2	11.1	4.5	9.4	3.6
2002	12.2	4.9	10.6	4.2	9.0	3.4
2003	12.6	5.2	10.9	4.5	9.5	3.7
2004	13.6	5.9	11.9	5.1	10.0	4.2
2005	14.8	6.6	12.9	5.8	10.8	4.7
2006	15.3	6.8	13.3	5.9	11.1	4.8
2007	15.2	6.8	13.2	5.9	10.9	4.6
2008	14.4	6.3	12.3	5.4	10.4	4.4
2009	13.7	6.0	11.5	5.0	9.8	4.1
2010	14.8	6.8	12.5	5.6	10.6	4.7
2011	14.3	6.2	12.1	5.2	10.2	4.2
2012	15.9	7.3	13.4	6.1	11.1	5.0
2013	14.5	6.3	12.2	5.3	9.9	4.0

Notes: Adjustments used to estimate consistent market income, pre-tax income, and after-tax income are listed in Tables 1, 2, and A1 and described in detail in the online appendix.

Sources: Authors' calculations.

Top 1% Shares: Consistent Income Increases



Top 1% Shares: Expanded Mkt Income Decreases

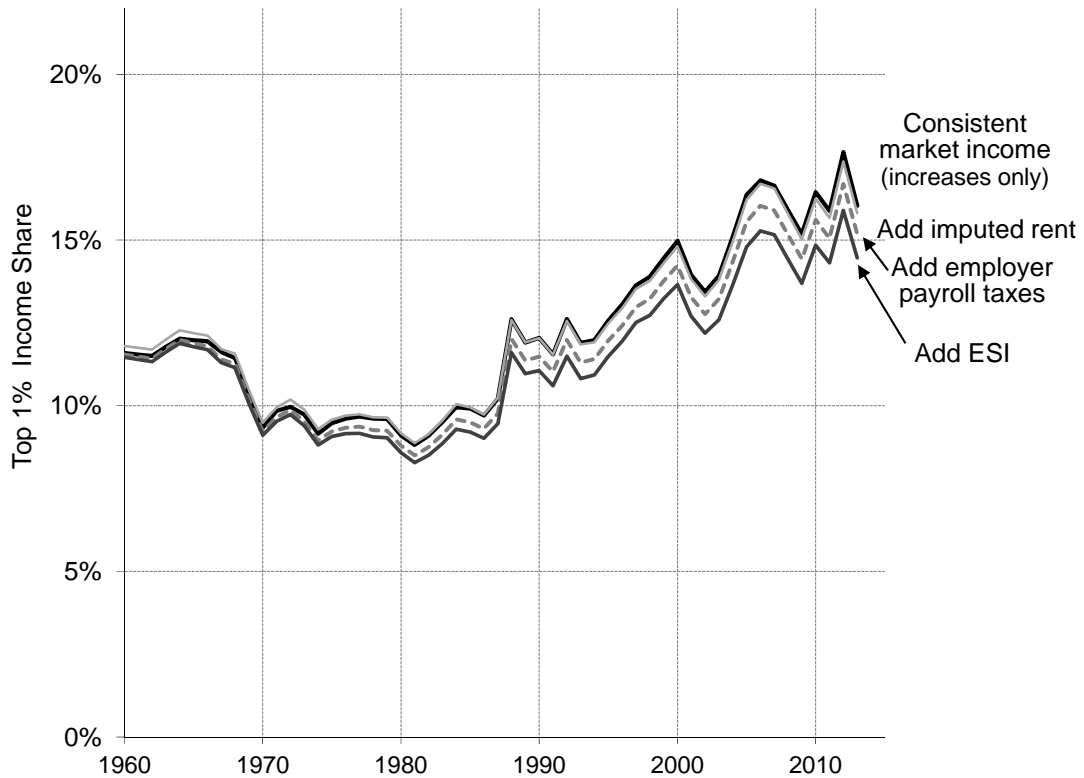


Figure A1: Top 1% income shares: Consistent market income adjustments

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

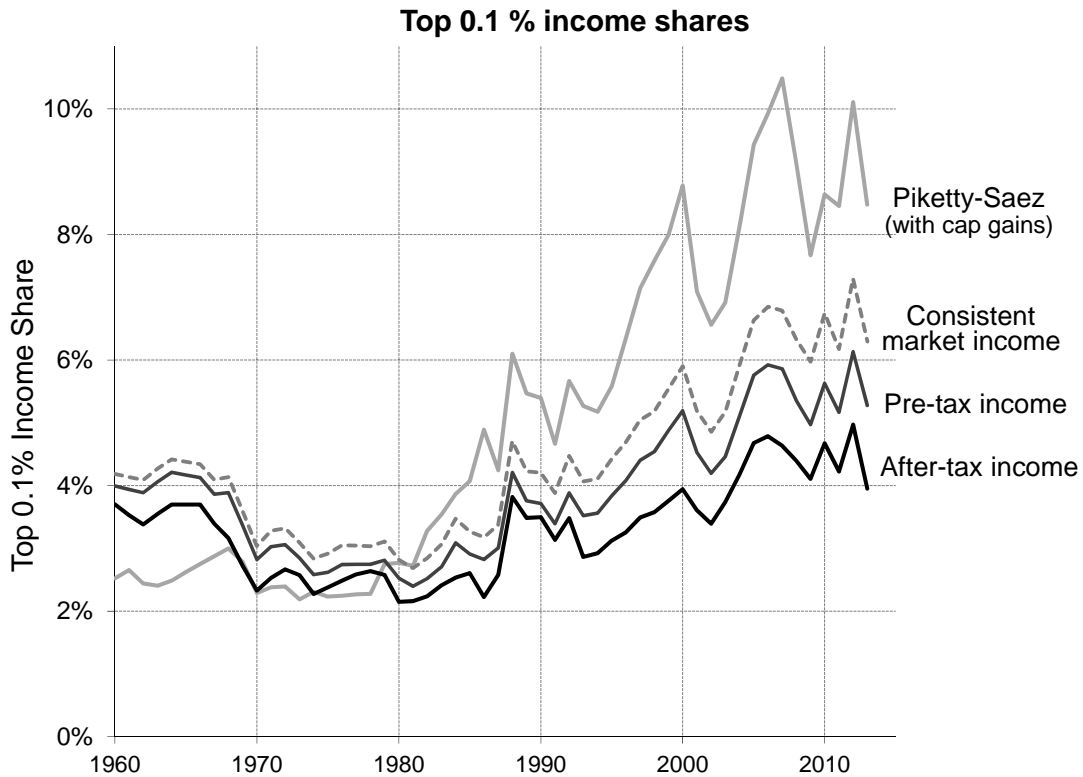
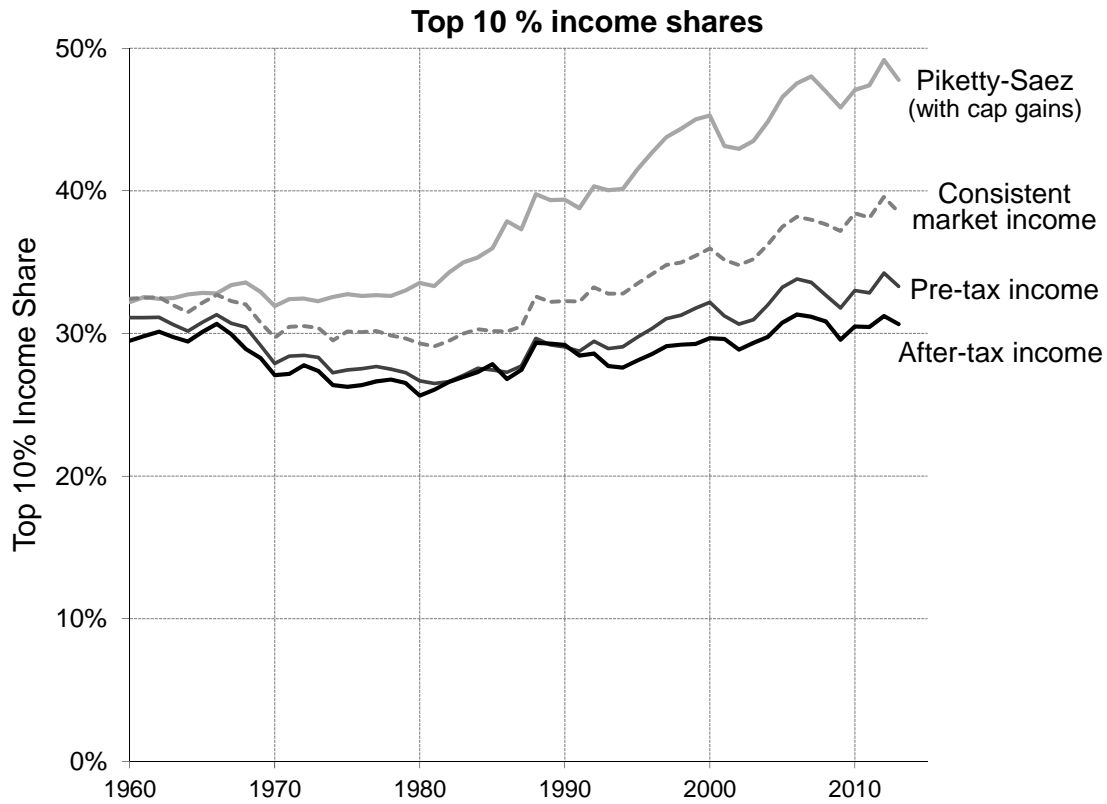


Figure A2: Top income shares: Top 10% (top figure) and top 0.1% (bottom figure)

Notes: Piketty and Saez series includes capital gains, where top one percent thresholds are defined by income excluding capital gains. Pre-tax income is consistent market income plus government transfers. After-tax income subtracts federal, state, and local taxes.

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

ONLINE APPENDIX

Income Inequality in the United States: Using Tax Data to Measure Long-term Trends

by Gerald Auten and David Splinter

This online appendix provides details about each adjustment made to create consistent market income, pre-tax income, and after-tax income. Table B1 summarizes each adjustment and the relevant data sources. Figure B1 shows the effect of each income correction and setting groups by the number of adults on top one percent income shares. Figure A1 in the main paper shows the effect of income expansions. Figures B2 and B3 show the effects of adding government transfers and removing taxes.

NIPA data sources

Our measures of income include sources not reported on income tax returns. Values for these sources of income, as well as target totals for income items that are only partially reported on tax returns, are taken from the Bureau of Economic Analysis (BEA) National Income and Product Accounts (NIPA). C corporation retained earnings are defined as undistributed profits, that is, profits with inventory value and capital consumption adjustments less taxes and net corporate dividends from NIPA table 1.12. C corporation taxes include federal and state C corporation taxes from NIPA table 1.12, but remove payments to the U.S. Treasury by Federal Reserve banks from NIPA table 3.2 (these are government income from the interest on Federal Reserve assets, mostly mortgages). Total tax-exempt interest is based on monetary interest paid by state and local governments from NIPA table 7.11 and distributed based on tax returns since 1987 and Surveys of Consumer Finances in prior years. The following come from various NIPA tables: employer provided health insurance from table 7.8, government transfers from table 3.12 (as NIPA counts the 2010 and 2011 payroll tax holiday as cash transfers rather than tax reductions, cash transfers and payroll taxes are reduced by equivalent amounts in these two years), federal income tax from table 3.2, state and local income and property taxes from table 3.3, net imputed rent from table 7.9, property taxes on housing from table 7.4.5, payroll taxes from table 2.1, fuel and utility “taxes” from table 3.5, and total taxes from table 3.1. Fuel taxes and public utility payments are excluded from total taxes because they are closer to “user fees” than taxes.

Replicating Piketty and Saez income shares

In 1964, an additional \$21.5 billion in income is added total income to match Piketty and Saez (2003, hereafter PS) and published IRS total income. This replicates PS 1964 top income shares. In addition, our replication of PS numbers treat capital gains distributions from mutual funds reported directly on the 1040 as ordinary income rather than as capital gains to match PS totals. Our computations of consistent market income treat these as capital gains.

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.¹ The imputation of non-deductible losses is based on the fractions of partnership/S corporation losses and rental losses that match those of non-deductible losses in years immediately following TRA86.²

Include tax-exempt interest

State and local government tax-exempt interest payments are excluded from federal taxable income, although they have been reported on tax returns since TRA86 and should be included in market income. Reported tax-exempt interest since 1987 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. Since 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 B4, high-income tax units were still shifting out of tax-exempt bonds in 1988. Between 1982 and 1986, the fraction of tax-exempt interest going to each income group is based on shares from the 1983 Survey of Consumer Finances, which are similar to the 1987 shares seen in the tax data. The shares for 1960 and 1962 are based on the 1962 Survey of Financial Characteristics of Consumers. The shares are assumed to decrease in a straight-line for years between 1962 and 1982. Before 1987, tax-exempt interest is allocated after tax units have already been divided into relative income groups.

Removing filers younger than 20 years old and remaining dependent filers

Using Census data for the U.S. resident population, 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. The implicit assumption is that all primary tax filers are age 20 and over and resident in the U.S. Our replication analysis starts with these estimates and assumes that the number of non-filers is the total number of tax units less the number of tax returns filed in a given year.³ However, substantial numbers of tax returns are filed by individuals who are under age 20. Removing these young filers increases the non-filer tax units in 2013 by more than 7 million.

Dependent filers are claimed as a dependent by another taxpayer but file their own tax return. To be claimed as a dependent means the individual provided less than half of his or her own support for the year, implying that they were not economically independent. Rules changes in TRA86 greatly increased the numbers of dependent filers beginning in 1987. Prior to 1987, dependents who filed their own return could claim a personal exemption (\$1,080 in 1986), but could not claim a standard deduction. Under TRA86, a dependent could no longer claim the personal exemption if claimed on another return, but could claim a standard deduction of the larger of

¹ 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 tax changes as these losses became less valuable; therefore, we impute non-deductible losses before TRA86 rather than make non-deductible losses deductible after TRA86.

² 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 estimated to be non-deductible. For tax returns with AGIs below the threshold, 20% of partnership/S corporation losses are assumed to be non-deductible.

³ Note that the 2007 sample omits returns identified as only filing in order to claim a tax rebate. The actual number of 2007 tax filers was more than the PS number of total tax units because nearly 10 million filers were younger than 20 years old.

\$500 or earned income up to the amount of the regular standard deduction. In addition to meeting a number of other tests, a child age 19 or over could not be claimed as a dependent unless they were a full time student receiving over half of their support from the taxpayer claiming them, and beginning in 1989 had to be under the age of 24. A child 18 or under can be claimed as a dependent if the other tests, such as the support test, are met. The drop from \$1,080 to \$500 in exempt income resulted in millions of additional tax returns being filed by young dependents.

Given the requirement needed to be claimed as a dependent, we remove remaining dependent filers regardless of their age. Since the unit of observation of our analysis is non-dependent tax units age 20 and over, the most appropriate approach is to treat dependent filers age 20 or older as part of another tax unit. The alternative, which seems less appropriate, would be to treat them as if they were low income independent households. In 2013, for example the average market income of dependent filers age 20 to 23 was about \$8,000 compared to \$18,000 for non-dependents. Therefore, our approach is drop all filers under age 20 and dependent filers over age 20 and allocate their income evenly over the filer distribution. Since this adjustment effectively joins two tax units, the total number of tax units is reduced by the number of dependent filers removed.

Remove non-resident filers

As the number of total tax units is based on the U.S. resident population, non-resident filers are dropped and replaced with non-filer tax units. Non-resident filers are identified 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. This correction is only used since 1979 because the public use files do not have the state code for filers. In 1979, this correction decreases top one percent income shares by only 0.02 percentage points, suggesting that any effect in earlier years would be small.

Correct number and income of non-filers

Based on non-filer information return data, non-filer income is assumed to be 30 percent of average filer income compared to the PS assumption of 20 percent of average filer income. Piketty and Saez (2001) also assume non-filer income is 30 percent of average income. Table B2 shows 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 ages 20 to 99 years and had not died. The information returns used to estimate the incomes of these individuals are: 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.⁴ Summing income from these sources and dividing by the number of corrected non-filer tax units gives average non-filer income.⁵

⁴ By comparing similar filers and non-filers, Larrimore, Mortenson and Splinter (2017) estimate that about 70 percent of non-filer 1099-MISC income are deductions. Accounting for this only reduces estimated non-filer income from 30 to about 28 percent of filer income.

⁵ In order to check that the adjusted number of non-filers matches information return data, anyone with no income or younger than 20 years is excluded. In 2009, this results in an estimate of 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.

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.⁶ 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. Our corrections and adjustments are to (1) add excluded dividends, (2) add excluded combat pay, (3) deduct gambling losses up to the amount of gambling income, (4) add back net operating losses that have been deducted from income, (5) remove capital gains distributions, and (6) remove taxable state and local income tax refunds.

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 by taxpayers itemizing their deductions. Since only net income from gambling should be counted as income, the asymmetric treatment of gambling gains and losses is corrected by subtracting deducted gambling losses. Net operating losses are losses carried over from earlier years for tax purposes and do not represent income during the calendar year. In addition, large operating losses in one year may result in negative AGI for several years so that the one-time loss can be counted multiple times in future years. Beginning in 1971, a new simplification measure allowed taxpayers with capital gains distributions and no other capital gains to report them directly on Form 1040 without filling out a Schedule D (except in 1997 and 1998). It appears that this change was not accounted for in PS computations of market income. Therefore the capital gains reported only on Form 1040 (adjusted for the capital gains exclusion) are subtracted as a correction from our replication of PS. In prior years, taxpayers did not have this option and so capital gains distributions were already removed in those years. 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. 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, and small numbers of Roth IRA distributions in recent years. While some of the smaller non-taxable pensions and distributions reflect typically small amounts of pension basis recovery or housing allowances for certain religious employees, these cases are not common and also difficult to identify.

⁶ The Social Security Administration estimates that about one 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.

Due to missing variables in early years, some corrections are missing or can only be imputed. State and local tax refunds are available in the data only since 1971, the first year this appears on IRS tax forms. This may reflect a new regulation as there is no mention of this in the instructions in prior years. Gambling losses are only deducted since 1972. 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, gambling losses are set equal to 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, net operating losses are generally assumed to be 80 percent of other income losses, since a large fraction of losses in other income in later years reflect net operating losses. In more recent years, the foreign earned income exclusion is included in other income on Form 1040 as an offset to wages. Because the tax returns with excluded foreign earned income are dropped from the sample, we do not 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, a portion of NIPA undistributed corporate profits (retained earnings) are imputed to individual filers. Since 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.⁷ 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.

The retained earnings distributed to individuals is reduced by the fraction of corporate ownership associated with retirement income. The inside buildup inside these accounts associated with retained earnings is captured at the time of withdrawal since taxable pensions and IRA distributions are included in consistent market 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.

Include C corporation taxes

C corporation taxes are imputed to tax filers following a similar assumption as the Congressional Budget Office (2016) and the Joint Committee on Taxation (2013), that one quarter of the tax is borne by wages and the rest is allocated to corporate capital owners. Capital is divided into three groups and then allocated to tax returns. The fraction associated with household corporate equity ownership is allocated by three-quarters dividends and one-quarter capital gains. The fraction associated with bonds is allocated by taxable interest. The fraction associated with retirement plan ownership is allocated to taxable retirement income.

⁷ 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 business property taxes

Business property taxes are added. The aggregate amount is defined as all property taxes less housing property taxes and is distributed to tax filers by all capital. Capital is divided into four groups and then allocated to tax returns. The fraction associated with household corporate equities is allocated by three-quarters dividends and one-quarter capital gains. The fraction associated with bonds is allocated by taxable interest. The fraction associated with retirement plan ownership is allocated to taxable retirement income. The fraction associated with passthrough ownership is distributed to passthrough entity positive net income.

Include imputed housing rents

Imputed rental income accruing to residents of owner-occupied houses is included and allocated by real estate taxes, which are identified for the top ten percent by deductions on tax returns.

Include employer payroll taxes

The employer portion of payroll taxes for filers is based on reported wages and for non-filers based on average wages and applying tax rates and annual 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. Since both spouses may work, we adjust the OASDI and UI covered wages for married filers by increasing the annual contribution limits for OASDI by between six- and eight tenths. The effect of adding employer payroll taxes to income is smaller in years before 1979, since 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. Bureau of Labor Statistics data presented in Warshawsky (2016) suggest that the distribution of this benefit in top earnings groups was very similar in 1992 and 2010 (see Table C11 of online appendix). We estimate that the top one and ten percent of tax units (grouped by the number of adults) had 1.6 and 20.6 percent of employer provided health insurance.⁸ The effect of adding employer provided health insurance on top income shares increased monotonically and in 2013 decreased the top one percent share by 0.7 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 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, approximately 71.3 million tax units were at least 20

⁸ Employer provided health insurance shares for the top 10, 5, 1, 0.5, 0.1 and 0.01 percent tax unit income groups (set by number of adults and based on PS total number of tax units) are: 20.6, 9.8, 1.6, 0.74, 0.15, and 0.02 percent. These estimates are similar to Treasury distributions of the health insurance exclusion tax expenditure (www.treasury.gov/resource-center/tax-policy/tax-analysis/Documents/Selected-Credits-Deductions-and-Exclusions-2015-Revised.pdf).

years old, of which 37.4 million filing tax units were married and about 5.7 million non-filing tax units were married. This implies a total of 114.4 million adults ($71.3+37.4+5.7$). 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 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. Pre-tax 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. The fraction of filers age 65 and over in the top one percent was higher in earlier years: about 1.8 percent 1962 compared to 1.2 percent in 1985. Adjusting shares of SS based on these fractions, the top one percent of adults received 3.8 percent in 1962 of SS benefits in 3.8 percent in 1962 and 2.5 percent in 1985. The fraction of SS benefits reported on tax returns (SS plus railroad retirement benefits) increased from one third in 1985 to two-thirds of NIPA totals 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.

4. After-tax income

Each tax is removed from pre-tax income sequentially. For each tax, the difference between the amounts accounted for on tax returns and NIPA totals are attributed to the bottom 90 percent of the distribution, which includes non-filers and almost all non-itemizers. Since the overwhelming majority of tax returns at the top of the distribution itemize deductions (including state income taxes and housing property taxes), this approach provides good measures of state and local taxes for top income groups. Note that estate and gift taxes are not removed because personal transfers are not included in pre-tax income.

Federal individual income taxes are federal tax liability after non-refundable credits because refundable credits are already accounted for in cash transfers. State and local income taxes are set to deducted amounts. Property taxes include both previously calculated business property taxes and deducted housing property taxes. In years where specific tax deductions are not available, distributions are set to those in surrounding years. The large effect of property taxes on top shares in 1960 is due to the substantial fraction of business property taxes being distributed corporate equity owners. This fraction declines as ownership shifts to retirement accounts. State and local income taxes are set to deducted amounts. Corporate income taxes are those previously calculated.

Payroll taxes removed include the employer and employee taxes, as well as self-employment taxes as reported on tax returns. Employee payroll taxes are set equal to previously calculated employer taxes except for 1984, 2010 and 2011. Since NIPA labeled the 2010-2011 employee payroll tax holiday as refundable tax credits, \$55 billion in each year of the holiday was removed from refundable credits and instead applied to lower NIPA payroll tax totals in this step. Two surtaxes on high-income taxpayers began in 2013: the Additional Medicare Tax and the Net Investment Income Tax. We include these surtaxes in federal income taxes despite their association with Medicare, because their tax base is not strictly labor earnings as is the case with other payroll taxes. Sales and other taxes (excluding fuel and utilities “taxes” as these are closer to user fees) are distributed by disposable income, which is after-tax income up to this point, less savings. Savings rates for the top ten percent groups come from the Surveys of Consumer Finance in Dynan, Skinner and Zeldes (2004): 24 percent for P90-95, 37 percent for P95-99, and 51 percent for the top one percent. For the bottom 90 percent, we assume that saving rates are 10 percent. This assumption also may account for the greater importance of purchases of food and other items exempt from sales taxes.

After-tax income: Set groups by number of individuals and size-adjusted income

Income groups are based on the number of individuals (primary and secondary taxpayers and dependents) and tax units are ranked using size-adjusted incomes, which accounts for sharing and economies of scale. The number of individuals is reduced since 2005 by the number of

secondary filers and children with ITINs. Since exemptions may be claimed for spouses and children living in Canada or Mexico, without this correction the number of individuals exceeds Census estimates in these years. Cilke (2014) also observed an excess number of resident children in the IRS tax data. Size-adjusted income is tax unit income divided by the square-root of the number of individuals in a tax unit.

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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
<i>Panel 1: Consistent market income, Corrections</i>				
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 yr 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		IRS 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)
Net out 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 cap. gains distributions	1971	2013	Tax return microdata	From tax returns. Line missing on Form 1040 in 1997 and 1998.
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
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
<i>Panel 2: Consistent market income, Expansions</i>				
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 corporate income tax	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 business property tax	All Years		NIPA Tables 3.3 and 7.4.5	Allocate to corp. capital and household equities by dividends, capital gains, interest, and taxable retire. income
Add imputed rent	All Years		NIPA Tables 3.3, 7.9, and 7.4.5	Includes real estate taxes as pre-tax measure. Allocate by real estate taxes deducted.
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
<i>Panel 3: Pre-tax income</i>				
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	Fed. 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
<i>Panel 4: After-tax income</i>				
Remove federal indiv. inc. tax	All Years		Tax return microdata & NIPA Table 3.12	Include foreign tax credits
Remove state/local indiv. inc. tax	All Years		Tax return microdata & NIPA Table 3.3	Based on tax deductions, unallocated in total income
Remove corporate income tax	All Years		see above	As calculated above
Remove property tax	All Years		Tax return data & NIPA Tables 3.3 & 7.4.5	Allocate business portion as above & housing portion by deductions
Remove payroll tax	All Years		Tax return microdata & NIPA Table 2.1	Employee tax equal employer FICA tax, except in 1981, 2010 and 2011
Remove sales and other taxes	All Years		Tax return data & NIPA Tables 3.1 & 3.5	Allocate to filers by after-tax income less savings
Set groups by #indivs/sz-adj. inc.	All Years		Tax return microdata	Set income groups by #individuals and rank by size-adjusted income

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

Table B2: 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, IRS population data, SOI individual tax return data, Piketty and Saez (2003 and updates).

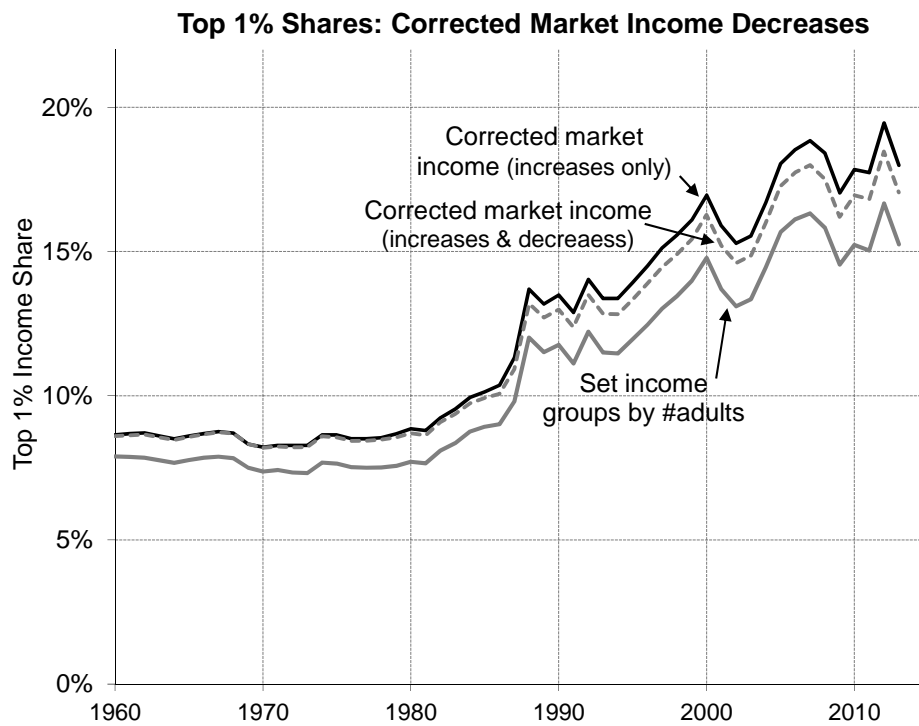
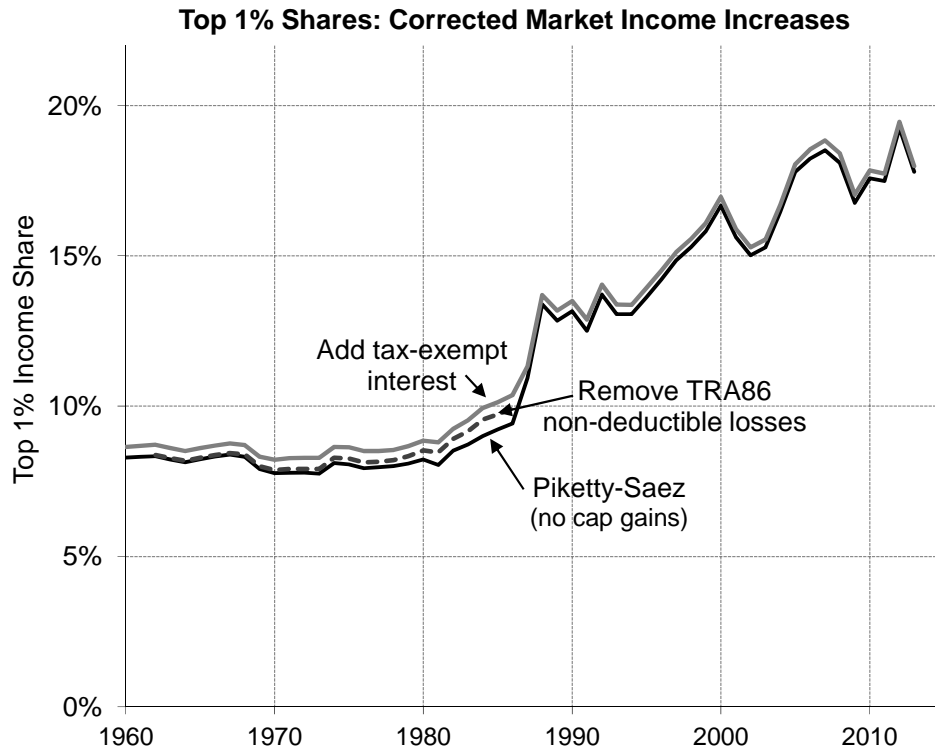


Figure B1: Top 1% income shares: Corrected market income adjustments

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).

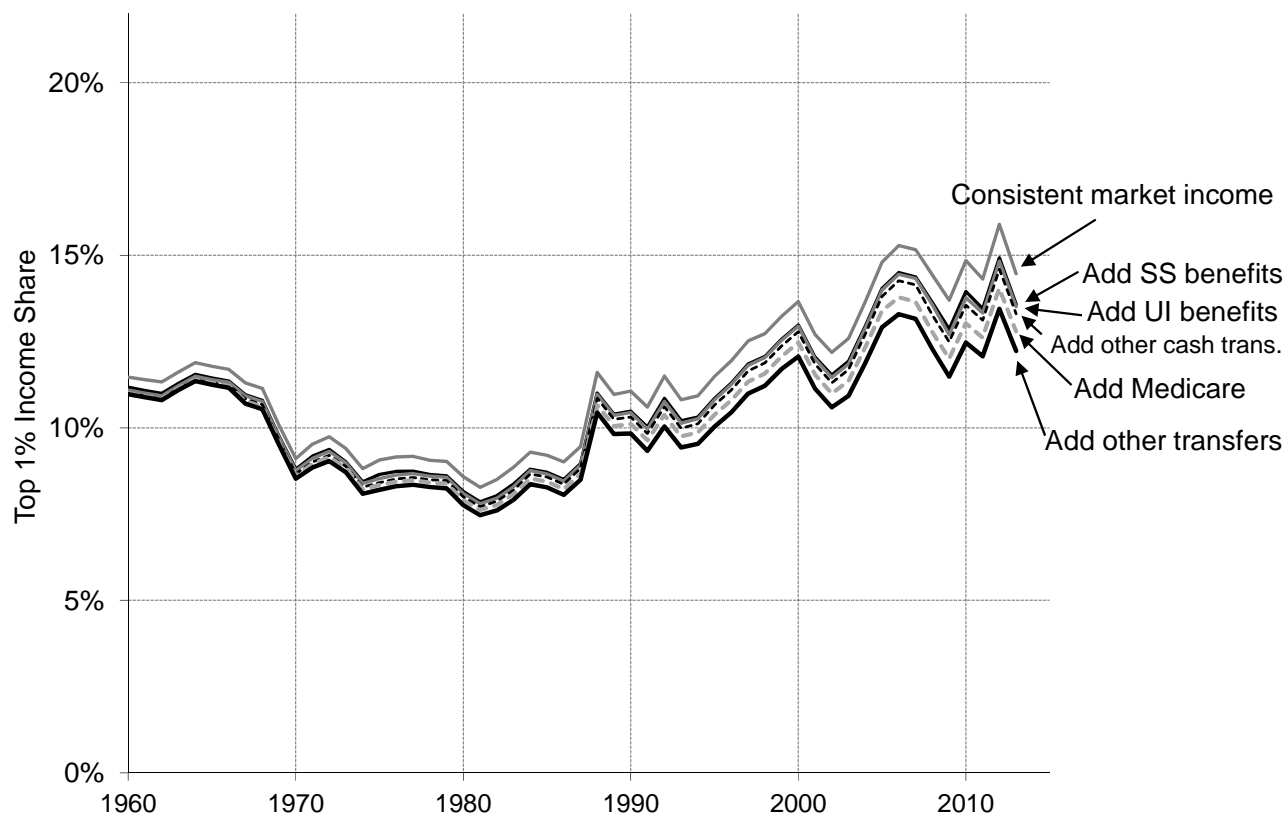


Figure B2: Top 1% income shares: Inclusion of transfers in pre-tax income

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 and shares are estimated in previous years.

Sources: Authors' calculations, IRS, and Surveys of Consumer Finance.

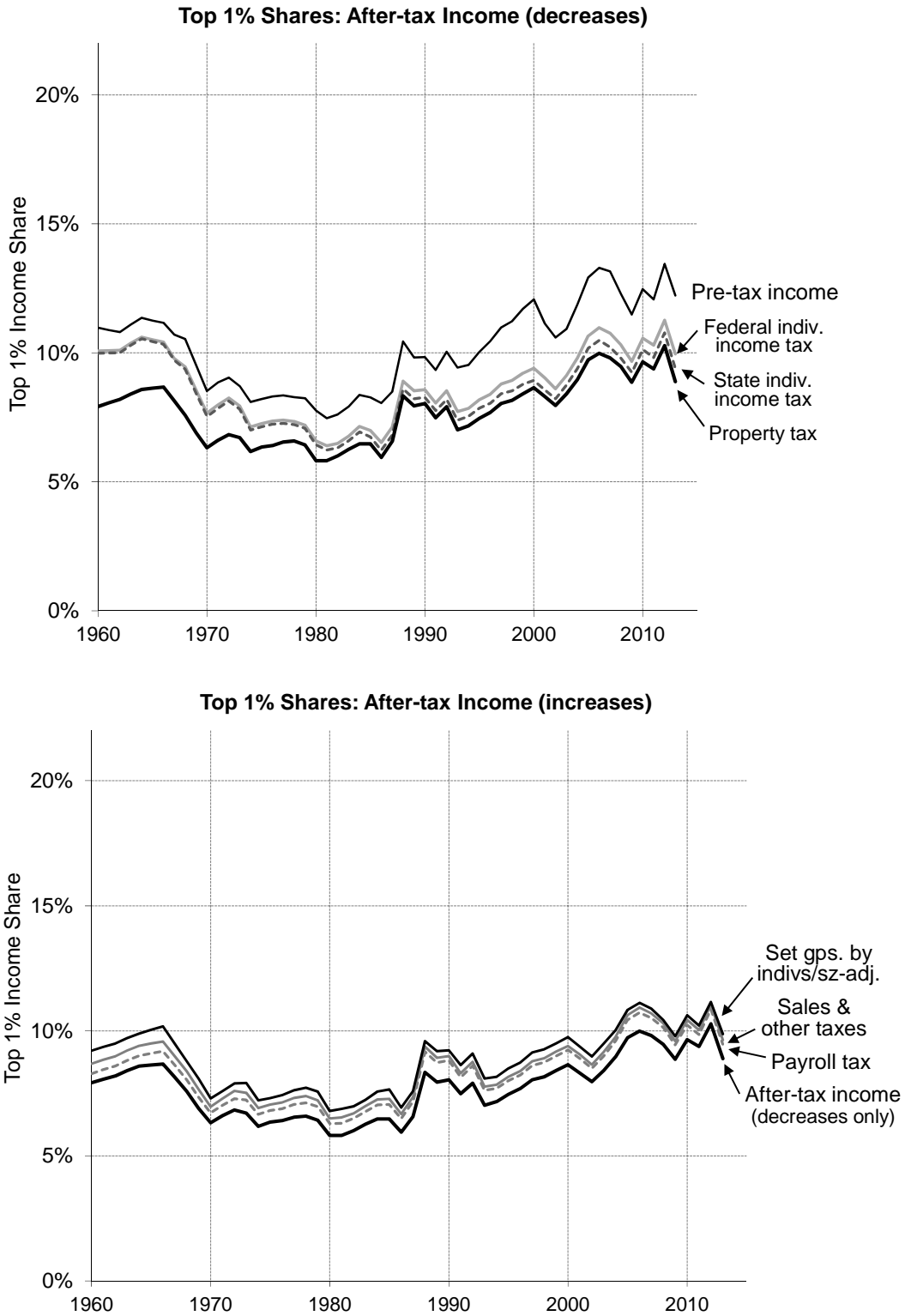


Figure B3: Top 1% income shares: After-tax income adjustments

Notes: Taxes that decrease top income shares are in the top figure and those increasing them in the bottom figure.

Sources: Authors' calculations, IRS, BEA.

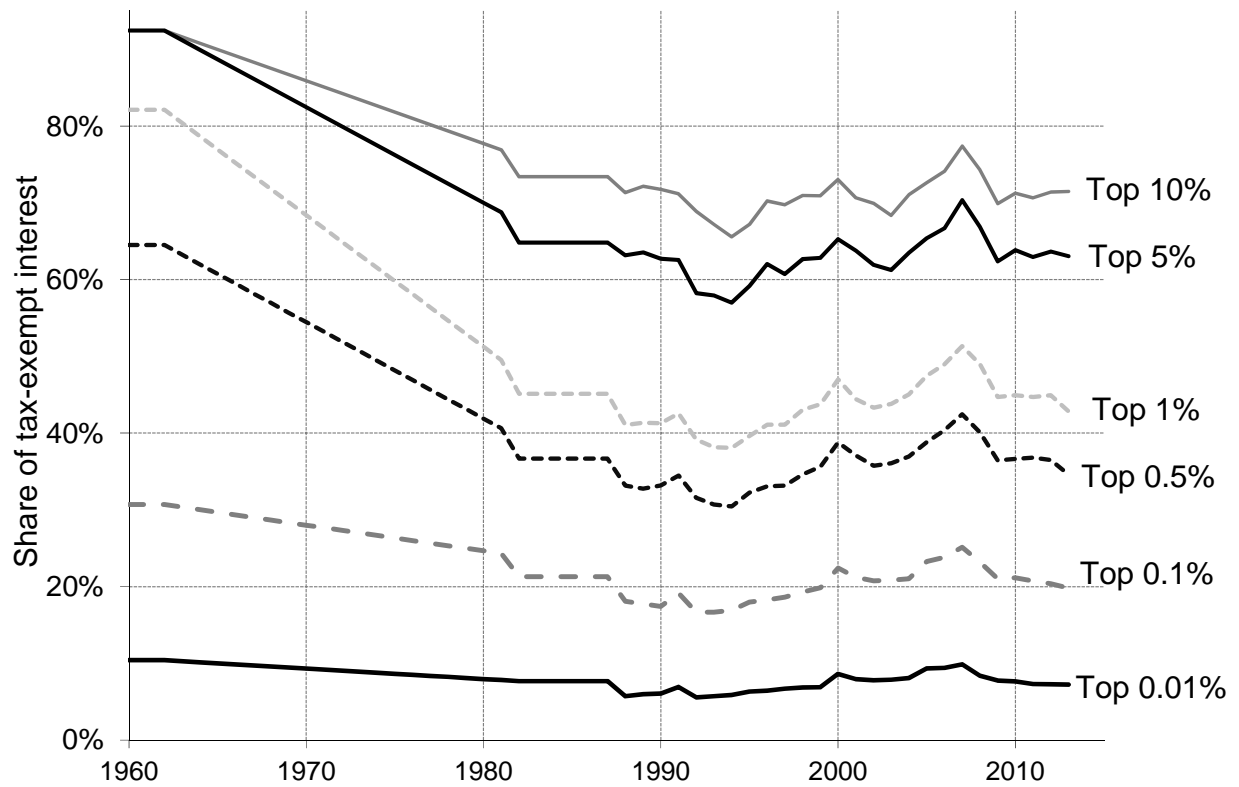


Figure B4: Share of tax-exempt interest by income group

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 and shares are estimated in previous years.

Sources: Authors' calculations, IRS, and Surveys of Consumer Finance.