Distributional National Accounts: Methods and Estimates for the United States, 1913-2013*

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Abstract

This paper combines tax, survey, and national accounts data to build new series on the distribution of national income in the United States since 1913. In contrast to previous attempts, our "Distributional National Accounts" estimates capture 100% of national income recorded in the national accounts. This allows us to provide decompositions of growth by income groups consistent with total economic growth used in macroeconomic analysis. We compute both pre-tax and post-tax per adult incomes. Post-tax series deduct all taxes and add back all transfers and public good spending. We find an overall U-shape for pre-tax top income shares over the century 1913-2012, although less marked than the Piketty-Saez series. Growth for the bottom 90% incomes has been slower than for upper income groups since the 1970s. The top 1% has captured about 40% of real income growth per adult since 1980, both when income is measured pre-tax and post-tax. Overall, the tax and transfer system is redistributive but its redistributive effect has not changed much since the 1970s with reductions in tax progressivity offsetting the overall increase in progressive transfers.

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1 Introduction

Income inequality has increased significantly in many developed countries over the last decades. This trend has attracted considerable interest among academics, policy-makers, and the global public. In recent years, following up on Kuznets' (1953) pioneering attempt, a number of authors have used administrative tax records to construct long-run series of top income shares (Alvarado et al., 2011-2016). Yet despite this endeavor, we still face limitations when measuring income inequalities. One important limitation is the large gap between national accounts—which focus on economic aggregates and macro-economic growth—and inequality studies—which focus on distributions using survey and tax data but usually without trying to be fully consistent with macro aggregates. This gap makes it hard to rigorously address questions such as: What fraction of total economic growth accrues to the bottom 50%, the mddle 40% and the top 10% of the distribution? How much is due to changes in the labor and capital shares in national income, and how much is due to changing dispersions of labor earning, capital ownership, and returns to capital? How does per capita growth of the bottom 50% and the bottom 90% compare to overall growth, and how much is this affected by taxes and transfers?

This paper attempts to bridge the gap between national accounts and inequality studies more systematically than has been done in the past. We combine tax, survey, and national accounts data in a comprehensive and consistent manner to build new series on the distribution of total national income in the United States since 1913. In contrast to previous attempts which typically capture about 60% of US national income (such as Piketty and Saez, 2003), our estimates capture 100% of national income recorded in the national accounts. This allows us to provide decompositions of growth by income groups consistent with total economic growth used in macroeconomics.

From a methodological perspective, our key contribution is to construct prototype micro-files of pre-tax income consistent with macro-aggregates, obtained by statistically matching tax and survey data and making explicit assumptions about the distribution of income categories for which there is no directly available source of information. We also include taxes and transfers in our prototype micro-files so that we can measure their overall magnitude and the effect they have on inequality and growth by income groups. The corresponding micro-files and computer codes are available on-line. Our objective is to extend these methods and estimates to as many countries as possible in the coming years.[1]

[1] All updated files and results will be made available on-line on the World Wealth and Income Database (WID) websites: see `http://www.wid.world/`.

Although the present paper is primarily methodological, we also come with a number of substantial conclusions. First, we find an overall U-shape for pre-tax top income shares over the century 1913-2012, although less marked than the Piketty-Saez series. The rise in the top 1% income share is primarily due to a surge in top labor incomes in the 1970s to 1990s. Since 2000, the rise in the top 1% income share is primary due to a surge in top capital incomes. Second, growth for the bottom 90% incomes has been slower than for upper income groups since the 1970s. The top 1% has captured about 40% of real income growth per adult since 1980, both when income is measured pre-tax and post-tax. Thrid, the tax and transfer system is redistributive but its redistributive effect has not changed much since the 1970s with reductions in tax progressivity offsetting the overall increase in progressive transfers.

The paper is organized as follows. Section 2 relates our work to the existing literature. Section 3 presents our income concept, unit of observation, price deflator and discusses the general pattern of aggregate income growth and factor shares. In section 4, we reconcile the total flow of income reported in tax data with that recorded in the national accounts and discuss the way we allocate non-taxable income across the distribution. In Section 5 we present our results on the distribution of pre-tax national income and compare them to earlier attempts, and we provide decompositions of primary national income growth groups consistent with total macroeconomic growth. Section 6 attempts to include taxes and transfers into the analysis and analyzes how much this affects our findings. The conclusion (Section 7) discusses a number of venues for future research.

2 Related literature

2.1 Previous Attempts at Introducing Distributional Measures in the National Accounts

There exists a long tradition of research aiming to introduce distributional measures in the national accounts. Historically, Kuznets was interested in both national income and its distribution and did path-breaking advances on both fronts using administrative tabulated data (Kuznets 1941, 1953). Even before Kuznets, economists trying to measure aggregate economic activity were also interested in its distribution (see King 1927, 1930).

National accounts are constructed with administrative data while distributional statistics have been mostly constructed with survey data starting in the 1950s-1960s. Survey data cannot be reconciled easily with national accounts. This is in large part due to the fact that some forms of income (such as capital income) and most forms of wealth are very highly concentrated. As

a result, a significant share of income and wealth accrues to very top groups that are difficult to capture in traditional surveys. However, recent decades have seen the emergence of high quality administrative population wide data that can be used for economic research. Hence, there is a new opportunity to build distributional statistics consistent with national accounts. In some sense, this project goes back to Kuznets original intent to work in parallel on the development of National Accounting and Distributional analysis. However, instead of using tabulated data only as Kuznets did, we are using individual micro data, combining both administrative tax data with traditional survey data.

More recently, there have been and there are ongoing efforts to introduce distributional measures in the national accounts.

First, Landais, Piketty and Saez (2011) created a micro-dataset for tax policy simulations in France that was consistent with National accounts and wealth aggregates but it was done only for a single year. Hence, this study could not speak about the distribution of economic growth that requires a multi-year analysis.

Second, the US Bureau of Economic Analysis (BEA) has a long-term plan to introduce some distributional information in the National Accounts. Fixler and Johnson (2014) and Fixler et al. (2015) describe this effort and make a first attempt to scale up income from the Current Population Survey to match personal income from National Accounts. In contrast, in our paper, we start from income tax data which cover the top of the distribution much more accurately that survey data. We use however survey data to supplement the tax data along various dimensions.

Third, there have been a number of studies trying to provide a reconciliation between national accounts aggregates and aggregates coming out of micro-data either from household surveys or individual tax data. For example, the OECD-Eurostat Expert Group on "Disparities in a National Accounts framework" has provided a macro reconciliation between survey/tax data and national accounts. The work of this Group has been summarized in Fesseau, Wolff and Mattonetti (2012) and Fesseau and Mattonetti (2013). Such comparisons have long been conducted at national levels (for example, Atkinson and Micklewright, 1983, for the UK) and there have been earlier cross country comparisons (for example in the OECD report by Atkinson, Rainwater and Smeeding, 1995, Section 3.6).

2.2 National Transfer Accounts

National Transfer Accounts (NTA): a comprehensive system of age-based accounting drawing on the analytic methods of demography and economics (United Nations, 2013). Cross-sectional in

nature, not cohort-based. Uses an extended concept of wealth compared to SNA, which includes transfer wealth (present value of future transfers). See NTA website: `http://www.ntaccounts.org/`. See special issue of Journal of the Economics of Aging, vol. 5, April 2015. NTA manual (United Nations, 2013). Basic idea: decompose macro flows by age group, in particular flows of consumption and labor income: if consumption>labor income → "life cycle deficit" = children and retirees. There are reallocations from surplus to deficits age groups through cross-sectional transfers (public eduction, public health care, familial support of children and parents, charitable contributions...) and asset-based reallocations, with a distinction between "capital" (produced) and "property" (financial assets + natural resources). Public capital income = 0 by construction in the national accounts; but public property income can be large (interest on public debt, sovereign wealth funds). Each age group is a net receiver/sender of transfers (public and private) and of asset-based reallocations. Positive asset-based reallocation = asset income > saving.

Generational accounting, developed by Auerbach, Gokhale and Kotlikoff (1991, 1994) indicate, in present value, the net amount that current and future generations are projected to pay to the government now and in the future. Net payments of future generations balance net payments of current generations and the present discounted value of current and future government consumption. Does not say how this should be allocated to current generations.

In general, a government deficit means either higher taxes, lower government transfers or both in the future. Taxes can be implicit, e.g., financial repression (lowers returns on assets; may also lower bankers' wages). Transfer reduction: case of 19th century UK with arguably lower educational spending compared to counterfactual without Napoleonic war debts. Whether taxes or transfers adjust depends on regime (democracy vs. oligarchy), maybe the type of event generating the deficit (war vs. financial crisis; cyclical vs. structural), so no general rule on whether deficit should be seen as affecting future taxes more or less than future transfers. So to allocate the deficit it to the existing population, one possibility is to reduce everybody's transfers and increase everybody's taxes proportionally and with equal weights on taxes and transfers. More sophisticated possibility is to allocate the deficit based on age × taxes paid × transfers received (rather than taxes paid × transfers received only). For instance, if government deficit is due to public transfers to elderly being bigger than taxes, and if people have life-cycle saving motive only, then currently young people are those who will ultimately have to pay more taxes/receive less transfers → deficit could be seen as reducing young people's current transfers and increasing their current tax liabilities, leaving the disposable income of the elderly unchanged. Generational accounting is heavily influenced by this life-cycle saving view and

so tends to see government deficit as affecting young people disproportionately. But if people have dynastic preferences, then the deficit will trigger increased saving by current pensioners, reducing their income available for consumption; in that case it's less clear that the deficit should only be allocated to young people.

3 Aggregate Income: Definitions, Data Sources, and Trends

3.1 From Fiscal Income to National Income: Data Sources

Our objective is to combine tax, survey, and national accounts data so as to build new series on the distribution of total national income. We start from the distribution of fiscal income and attempt to estimate the distribution of national income. In order to do so, we match tax and survey data and make explicit assumptions about the distribution of income categories for which there is no readily available source of information, as described in the following sections.

Our fiscal income data comes from the IRS. For the post-1962 period, we rely on the yearly public-use micro-files available at the NBER that provide information for a large sample of taxpayers, with detailed income categories. We supplement this dataset using the internal use Statistics of Income (SOI) Individual Tax Return Sample files from 1979 forward.[2] For the pre-1962 period, no micro-files are available so we rely instead on the Piketty-Saez (2003) series of top incomes which were constructed from annual tabulations of income and its composition by size of income (U.S. Treasury Department, Internal Revenue Service, Statistics of Income).

Our aggregate income data come from the National Income and Product Accounts (US Department of Commerce, Bureau of Economic Analysis, 2014) for the period 1929-2013, Kuznets (1941) for the period 1913-1929 and King (1930) for 1913-1919. Basic aggregate series for GDP and national income are described in on-line appendix tables (see also the data appendix of Piketty and Zucman (2014)).

3.2 Income Concept

We provide income distribution estimates using two broad concepts of income: pretax income and disposable income.

We are primarily interested in the distribution of total pre-tax national income, that is, gross domestic product minus capital depreciation plus net income received from abroad. Although macroeconomic analysis and the general public often focus on GDP, capital depreciation is not

[2]SOI maintains high quality individual tax sample data since 1979 and population wide data since 1996, with information that could be used to refine our estimates.

an income for anybody and so is better left out of income for our purposes. Income received from abroad can be important for very high income earners, who often derive a large fraction of their income from foreign stocks and bonds. In moving away from GDP and toward national income, we follow one of the recommendations made by the Stiglitz commission (Stiglitz, Sen and Fitoussi 2009) and also get back to the historical (pre-World War II) focus on national income (King 1930, Kuznets, 1941).

Generally speaking, we follow the official definitions of national income as codified in the latest System of National Accounts (SNA, United Nations 2009). In particular, national income does not include imputed returns on government assets (such as land and buildings) nor interest paid on government debt, which is considered to be a transfer from the government to private debt holders. Economically, government interest payments can be seen as a positive pre-tax income for bond-holders, and a negative pre-tax income for the collectivity. In order to match the total pre-tax national income recorded in the national accounts, we allocate government interest payments to public bond holders and simultaneously subtract them to the entire adult proportionally to each adult's share of pre-tax national income. As a result, our national income aggregates excludes government interest payments (just like the national accounts), but our income share series take account of the unequal ownership of government debt. We also provide series ignoring the redistribution induced by government interest. We do not attempt to include imputed returns on government assets.

The only modification we make to national income as recorded in the national accounts is that we subtract the investment income earned by non-profit institutions (currently about 2% of US national income). Some non-profits (such as private foundations like the Bill and Melinda Gates foundations) are controlled by individuals, such that we could allocate their capital income to specific groups of the population. However, for most non-profits, such as museums, universities, hospitals, etc., there is no clear way to allocate their income to any living individuals. Therefore we exclude non-profits investment income from our national income total.

3.3 Unit of Observation

Our unit of observation is the adult, i.e., we allocate total pre-tax national income to all US residents aged over 20.[3] This seems preferable to possible alternatives. First, while national

[3]We include the institutionalized population in our base population. This includes prison inmates (about 1% of adult population in the US); population living in old age institutions (about 0.6% of adult population) and mental institutions; and the homeless population. Institutionalized population is generally not covered by surveys, so BEA removes income of institutionalized households from NIPA aggregates to construct their distributional accounts (see Furlong slides 2014). We prefer to take everybody into account and allocate zero or

accounts are often expressed per capita (and Kuznets 1953 used per capita unit to compute his top income shares), children do not contribute to production, hence higher fertility initially reduces per capita income growth (and conversely), which does not seem very meaningful. We prefer to allocate pre-tax national income to adults when we deal with primary distribution (pre-tax, pre-transfer), and then to introduce children later on in the analysis, when we deal with taxes and transfers (see section 6 below). Second, survey-based inequality studies are at the household-level and use equivalence scales (such as income divided by the square root of the number of household-members). But these equivalence rules are again problematic from a growth perspective, as packing people in large households increases growth. Third, the family tax unit (as used, e.g., in Piketty and Saez 2003, and Zucman and Saez 2014) has the problem that it is sensitive to the fraction of the population that is married, which can affect growth trends: fewer marriages lead to lower income growth per family.[4] Similarly, the choice of the household as unit which is done in official Census based measures derived from the Current Population Survey (see US Census 2015) is problematic as a trend toward larger households (e.g. children staying with their parents longer) increases income growth per household. Against this backdrop, the most sensible choice for the study seems to use the adult as our unit.

In some datasets, only the total labor income of married couples is observable (e.g. in the IRS tax data for joint filers). How to divide labor income in married couples? There are two options, and we will use both of them: a) individual market-based labor income (using other data sources, such as the CPS and internal IRS files);[5] b) equal splitting. Moving from a) to b) is useful to assess the equalizing effect of sharing resources through marriage (assuming that marriage leads to a full sharing of ressources, which is clearly an exageration). A more ambitious - and fairly uncertain - strategy would be to split resources according to the sharing rules that are estimated in the empirical literature on non-unitary households (see e.g., Chiappori and Meghir, 2015).

Regarding capital income, we will always split it 50/50 between spouses. Wealth acquired during marriage is generally jointly owned. Shared ownership usually means 50/50 split in case of divorce in community property states (like Texas and California). In other states, shared ownership means an equitable distribution in case of divorce (which might take into account

small pre-tax income to institutionalized households (see on-line files).

[4]Also note that over the 1913-1947 period the US income tax system was de facto individualized as couples where both spouses had income were better off filing separate returns. In other words looking at tax units can bias a number of historical evolutions (as well as international comparisons).

[5]The methods and do-files that we use in order to impute individual income and age information to joint-filers data are further described in the on-line appendix.

relative contributions and also give more to the spouse with less earning potential). But bequests and pre-marriage assets are generally not split 50/50. A more ambitious methodology would be to split capital income based on actual ownership (using information returns used to administer the tax system).

3.4 Price Deflator

We use the national income deflator (NID), i.e. the price index for net national product (from NIPA table 1.7.4). It is better to use the NID than the CPI for two reasons. First, this index corresponds to what we conceptually want to use, as we are interested in overall national income, and not only consumption. Second, the CPI is not chained and hence tends to over-state inflation. The CPI under-states real growth by 0.5% per year as compared to NID, which has large effects over long periods. The Census Bureau still uses the CPI for official distributional and poverty statistics (US Census, 2015) as Piketty and Saez (2003) do, thus under-stating real growth compared to what national accounts aggregates show. The NID closely follows the GDP (and GNP) deflators, which are also chained. The CPI deflator misses investment (whose price increases less than consumption, especially once quality improvements have been accounted for) and public consumption. In the US, the price of public goods seems to have grown a bit more than the price of private goods.

3.5 Aggregate income growth

Figure 1 compares the growth of Piketty-Saez per-tax-unit CPI-based fiscal income series and our new per-adult NID-based national income series. Fiscal income includes all income items reported on tax returns and before all deductions: salaries and wages; business and partnership income; dividends, interest, rent and royalties; taxable pension income (we return below to the issue of pensions). Fiscal income is computed before individual income taxes and individual payroll taxes, but after employer payroll taxes and corporate taxes. As compared to national income, fiscal income naturally excludes tax-exempt labor and capital income.

Figure 1 depicts real income growth (base 100 in 1946) from 1946 to 2012 in tax data vs. national accounts. The tax data is based on Piketty and Saez series. Tax data income includes market income reported on tax returns (including realized capital gains) and excluding government transfers. It is measured per tax unit (defined as a single person with children dependents if any or a married couple with children dependents if any). The tax data series is deflated using the Consumer Price Index. The national accounts series is based on National

Income and it measured per adult (all individuals aged 20+ in the US population). As one can see from Figure 1, there is a large and growing gap between the two series. Between 1946 and 2012, per-tax-unit CPI-based fiscal income grew at 1.2% per year (i.e. a multiplication by 2.2), while per-adult NID-based national income grew at 1.7% per year (i.e. a multiplication by 3.1). Throughout the period, the gap created by the difference in price deflator amounts to about 0.2% per year (CPI overstates NID inflation by 0.2% per year, both between 1946 and 1980 and between 1980 and 2012). However, the gap due to the unit of observation rises over time: the number of tax units always grows faster than the number of adults, but the gap rises from about 0.1% per year over the 1946-1980 period to 0.3% per year over the 1980-2012 period (reflecting a large rise of divorce and single headed households since 1980). Most importantly, the gap due to the income concept (i.e. the gap between aggregate national income growth and aggregate fiscal income growth) also rises over time, from 0% per year between 1946 and 1980 to 0.3% per year between 1980 and 2012. As we see below, this comes from the growing importance of tax-exempt labor income.

3.6 Labor and Capital Shares

Throughout the analysis, we decompose national income Y into a labor income component Y_L and a capital income component Y_K. By definition, $Y = Y_L + Y_K$. The share of national income accruing to capital is $\alpha = Y_K/Y$ and the labor share is $1-\alpha$. To decompose the mixed income of non-corporate businesses into a labor and a capital component, we assume that factor shares are the same in the corporate and non-corporate business sectors. This assumption is irrelevant for our results on trends in national income shares and growth decompositions.[6] Computing factor shares also requires to make assumptions about tax incidence. We assume that all labor taxes fall on labor, all capital taxes fall on capital, and taxes on production T_p fall on labor and capital proportionally to the share of labor and capital in factor-price national income $Y-T_p$. According to international guidelines, production taxes - in the sense defined by national accounts - include in particular all product taxes (value added taxes, excise duties, sales taxes, import taxes, etc.), which are indeed difficult to attribute either to labor or capital (see Section 4.5 for a more detailed dicussion of tax incidence).[7]

[6] We also used other methods to decompose mixed income (e.g. one can attribute to the human capital - education and experience - used by self-employed workers the same returns as those observed for wage earners; or one can attribute to the non-human assets used by non-corporate businesses the same rate of return as other assets). This makes very little difference regarding the total capital share α.

[7] In the U.S., production taxes represent about 7-8% of national income throughout the 1913-2013 period (except in the 1930s when they briefly reach 11-12%). See appendix table A14, col.(6).

Figure 2 depicts the level and composition of the capital share α. We break down capital income Y_K into five categories: (1) housing rents (owner- and tenant-occupied, in both cases net of mortgage interest payments), (2) the capital component of non-corporate business income, (3) corporate profits (after deduction of interest payments), (4) interest on fixed claim assets (net of interest paid on non-mortgage debts), (5) profits and interest earned by capital in pension funds.[8]

Two findings are worth noting. First, there is an overall U-shape over the century. The share of capital income is around 30% or a little more before the Great Depression, stays typically below 25% until the late 1970s, and then increases back to about 30% in recent years with a particularly fast increase since 2000. Since 2010, α is above 30%, a level not reached since 1929. Second, there are sharp business cycle fluctuations as capital income tends to fall in recessions and increase in expansions as corporate and non corporate profits are more pro-cyclical than national income. Third, while capital income collapsed during the Great Depression (as non corporate and corporate profits fell to zero), capital income only fell modestly and very temporarily during the Great Recession.

The rise of the capital share in recent decades has a very significant impact on the overall pattern of aggregate income growth. I.e. per adult national income has increased at 1.4% per year in real terms over the 1980-2012 period, but per adult labor income grew at only 1.1% per year, while per adult capital income rose at 2.3% per year. The conclusions are even more extreme over the 2000-2012 period: per adult national income rose at 0.4% per year, but per adult labor income actually declined by 0.2% per year (in effect more than 100% of aggregate income growth was absorbed by capital income).

4 Imputations Methods for Non-Taxable Income

In recent years, administrative tax data have been increasingly used to study the dynamics of the income distribution (see e.g. Piketty and Saez, 2003). But tax data do not—or imperfectly—capture tax-exempt labor income (such as health care contributions paid by employers), tax-exempt capital income (such as corporate retained earnings), and a number of taxes. They also only capture the income reported to tax authorities, disregarding the income of legally exempt taxpayers and income that illegally evades taxes. In this Section, we provide a macroeconomic reconciliation between the flow of tax-reported income and total pre-tax national income. In brief: about two thirds of capital income and one quarter of labor (as measured by national

[8]Interest payments on government bonds are included.

accounts) currently do not get reported on tax returns, mostly for legal reasons. Legally tax-exempt labor income has increased significantly in recent decades, so that the overall share of fiscal income in national income has declined significantly: more than 70% of factor-price national income used to be reported on tax returns, and the share is now about 60%. We explain how we allocate all the pre-tax income not reported to the IRS to the entire adult population.

First at the macro-level, we have conducted a large-scale reconciliation exercise between tax data and national accounts income data to track the evolution of the fraction of total economic capital income reported on tax returns, each year since 1913. Our conclusion is that this fraction has been remarkably constant.[9] In addition to legally exempt income (pensions, owner-occupied rents, and non-filers' income), the main reason why economic capital income exceeds taxable income is corporate retained earnings, which are not taxed at the individual level. Yet, despite much higher tax rates on distributed profits, retained earnings were no higher from the 1950s to the 1970s (about 4.5% of factor-price national income) than today (4.2% on average since 2000, and more than 6% since 2009).

4.1 Labor income

On the labor side, there are two main forms of employee compensations that are not taxable: (i) contributions paid by employers to private group health insurance, and (ii) contributions to defined benefits and defined contributions (such as 401(k)) pension plans (except for contributions to 401(k) that exceed a certain threshold, $17,500 in 2013). Tax-exempt employer-provided health insurance has increased significantly over the last decades, from the equivalent of 1% of all taxable wages in the early 1960s, to 5% in the early 1980s, and 10% today. Contributions to pension plans have increased more moderately, from the equivalent of 8% of all taxable wages in the 1960s to 12-13% today. Neither employer-provided health benefits, nor contributions to pension plans (except contributions to 401(k) above the exemption threshold) appear on federal income tax returns. Both, however, are reported to the IRS on W2 forms—an information we will use to distribute non-taxable labor compensation (see Section 4 below).[10] Similarly, employer level payroll taxes have increased significantly from less than 2% of total employee

[9] See Appendix Tables A24 to A34 for detailed results.

[10] Contrary to employer-provided health and pension contributions, contributions to individual retirement accounts (IRAs) are not subtracted from income on forms 1040s (although they are tax-deductible). Health benefits is reported on W2 forms since 2012 for the administration of the Affordable Care Act.

compensation in the 1950s to over 5% today.[11]

Figure 3 decomposes the compensation of employees (which represents over 80% of labor income in National Income) into various components: wages and salaries reported on tax returns, and four other categories which are not reported on tax returns: employer provided health benefits, pension contributions (to DB or DC pensions including 401(k)s), employer payroll taxes, and other small categories. The figure shows that the fraction of reported wages and salaries in total employee compensation has fallen significantly from over 85% in the 1950s to around 72% in the last decade. To the extent that non-taxable employee compensation is distributed differently from total income, this can bias inequality measures. More importantly, this also implies that growth in tax reported income is going to be lower than growth in national income as a larger and larger fraction of national income becomes non-taxable.

4.2 Capital income

On the capital side, tax data miss the retained earnings of corporations, and tax-exempt personal capital income (returns on pension funds and life-insurance funds, imputed homeowners rental income, imputed interest of bank accounts, etc.). Tax evasion for small proprietorships. Capital income of non-filers is large before the 1940s when 90% of the population does not file tax returns. As we see below, a significant and rising part of corporate profits and interest is actually paid to tax-exempt pension and insurance funds.

Figure 4 provides a reconciliation of tax-returns and total economic capital income. The first category (in black) includes all forms of capital income reported on individual tax returns (dividends, interest, rents, and business profits reported on tax returns). Such tax return capital income is only about a third of total capital income in National Income. Missing capital income on tax returns includes imputed rent of homeowners (which is non-taxable) net of mortgages, capital income paid to pensions and insurance funds (which is not part of taxable income either and has grown substantially since the 1970s), capital income from non-filers and unreported small business profits (which is a minor category today), corporate income tax (that we assume falls on capital income, see below), and retained earnings of corporations. This large gap between reported capital income on tax returns and total capital income in National Income suggests that measures of inequality based solely on reported capital income (as done in Piketty and Saez, 2003) might not capture accurately the distribution of total National Income.

[11] Employee level payroll taxes are almost as large as employer level payroll taxes but they are included in reported taxable wages.

As a simple rule of thumb for recent years: 1/3 x 1/3 (K) + 3/4 x 2/3 (L) = 1/9 + 1/2 = 60% of national income is reported on tax returns

4.3 Distributing tax-exempt labor income

Allocation of non-taxable labor compensation (other than pension contributions) We allocate non-taxable employee fringe benefits across the adult population using information reported to the IRS on W2 forms.

Allocation of pension contributions Tax data include pension distributions, although these are not part of pre-tax national income. The vast majority (72% in 2012) of pension distributions are taxable in the United States. Note that non-taxable pension distributions (which correspond to social security payments to tax units with total income below exemption level) are also typically reported on tax returns. Piketty and Saez (2003) include taxable pension distributions to form their estimates of top income shares.

We offer two treatment for pensions. In our "factor income" series, we treat pensions on a contribution basis. That is, we include all pension contributions and payroll taxes in our pre-tax national income flow, and exclude all pension distributions from it. One potential pitfall of this procedure is that it allocates little income to retirees who mostly live off of pension distributions, and therefore that it tends to overestimate primary inequality in aging societies. One way to correct for this is to look at primary inequality within working-age population.

In our "pretax income" series (our preferred series), we treat pension distributions as income and allocate total national accounts compensation of employees to each adult based on who receives wages and pensions (as if pensions were purely a deferred form of labor compensation). In these alternative estimates, we distinguish between social security and other pension distributions, and we decompose other pension distribution into a capital component and a capital income component.

4.4 Distributing tax-exempt capital income

Corporate retained earnings Corporations distribute only a fraction of their after-tax profits in the form of dividends, the rest being retained within the corporation. For corporations which never pay dividends, such retained earnings generate capital income in the form of realized capital gains when individual owners sell the stock. Indeed, our analysis from Section **??** shows that the real price of corporate equities is stable in the long-run. This implies that stock

price indexes increase faster than the GDP deflator only because of retained earnings in the long-run. The volume of realized capital gains on individual tax returns is approximately equal (when averaging over years) to the volume of retained earnings. This motivates our decision to use realized capital gains when capitalizing equities and estimating wealth levels (we do not use realized capital gains for ranking individuals by wealth because capital gains are often lumpy).

Recall that our price effects for corporate equities control for corporate savings so that our saving rates include both corporate and personal savings.[12]

In the long-run, we found no evidence of secular real price effects by asset class (see Appendix Table A37). In words, real housing prices or stock prices do not increase secularly once we take into account net investment in each asset class.[13] Hence, no differential price effects by wealth group in the long-run is a reasonable assumption if all groups hold a similar composition of assets within asset class (e.g., everybody owns corporate stocks through a universal index fund).

4.5 Tax incidence assumptions

In terms of taxes, tax data miss all indirect taxes on production, corporate income taxes and part of payroll taxes on earnings (employer social contributions are not subject to income taxes, but employee social contributions are taxable).

We assume that labor taxes fall on labor and capital taxes fall on capital and product taxes fall on labor and capital proportionally.

Note that for non corporate profits, we assume that the ratio of profits to total value added of the non corporate sector is the same as in the corporate sector. We also assume that the corporate income tax falls equally on all capital income (and not only corporate equities) following the standard incidence assumption.[14]

4.6 Non-filers and tax evasion

The BEA includes estimates of tax evasion by sole proprietorship owners in national income. This component is quite small (1-2% of national income).

Under-reporting by individual taxpayers in personal income tax returns. See IRS papers on tax gap, e-mail by Kim Bloomquist, Johns and Slemrod: "The ratio of aggregate misreported

[12] An individual owning corporate stock that appreciates due to retained earnings effectively saves through his stock ownership.

[13] Naturally, there can be strong price effects in the short-run. For example, stock prices were particularly low in the 1970s and particularly high in the late 1990s, implying a strong positive price effects from the 1970s to the late 1990s.

[14] For a detailed explanation of our tax incidence assumptions, see Appendix Table A21.

income to true income generally increases with income, although it peaks among taxpayers with adjusted gross income in the 99.0 to 99.5 percentile. In sharp contrast, the ratio of underreported tax to true tax is highest for lower-income taxpayers."

4.7 Pre-1962 national income shares

Before 1962, we impute based on share of each category (wages, dividends, interest, rent, business) that goes to each fractile and assuming that the distribution of NIPA wage income is the same as IRS wage income, etc. (as Saez and Zucman 2014 do for wealth pre-1962).

5 The Distribution of Pre-Tax National Income

5.1 Trends in Top Income Shares

Figure 5 displays the share of national income going to the top 10% (top panel) and top 1% (bottom panel) adults. For comparison purposes, the graphs also display the top 10% and top 1% income shares from Piketty and Saez (2003) which are based on tax unit and the narrower tax reported income concept. Three points are worth noting. First, the overall U-shape for top income shares found by Piketty and Saez (2003) remains valid with national income. Second, top 10% national income shares are higher than top 10% IRS market income shares, especially in the post war period. This is due primarily to the fact that labor incomes between spouses were very unequally distributed during that period (as most married women had small or no earnings). Inequality across individuals has increased sharply while inequality between spouses within couples has fallen. As a result, the U-shape pattern for the top 10% income share is less pronounced for national income per adult. Third (and in contrast), our national income top 1% income share series is much closer to the Piketty-Saez top 1% income share in both levels and trends. In particular, the most striking finding of Piketty-Saez of a doubling of the top 1% income share since the late 1970s remains approximately true when looking at national income per adult.

Figure 6 focuses on the role of tax units vs. individual adult in explaining the difference between our new series and the Piketty and Saez (2003) series. The figure displays the share of national income going to the top 10% (top panel) and top 1% (bottom panel) from 1962 to 2013. The first series is the Piketty and Saez (2003) series based on fiscal income excluding realized capital gains and based on tax units. The second series uses the same fiscal income definition but uses the individual adult as the unit to define top income groups. The third series

is our pre-tax income series using the national income definition and the individual adult unit. The series for the top 10% shows that using the tax unit leads to significantly lower top 10% income share in the 1960s and 1970s than the adult unit but that the top 10% income share with the tax unit vs. the adult unit are very similar in recent years. This is explained by (a) the increased gender equality within couples since the 1960s, and (b) the relative fall in the fraction of married tax units and the increase of single tax units (which tend to have lower incomes than the married). For the top 1%, the difference between the tax unit and the individual unit in both levels and trends is much attenuated as there is still very large gender inequality among couples in the top 1%. Shifting from the fiscal income to the national income definition increases income concentration as a 2/3 of capital income (which is heavily concentrated) is missing in fiscal income while only about 1/3 of labor income (more equally distributed) is missing in fiscal income.

Next, we can also examine the distribution of capital income and labor income using our new series. Figure 7 depicts labor income of the top 1% as a share of national income (left panel) and capital income of the top 1% as a share of national income (right panel). The sum of these two series is the top 1% income share depicted in Figure 4 (right-panel). Labor income is also decomposed into employee compensation and labor income in non corporate businesses. Capital income is decomposed into housing net rents, non-corporate profits, corporate profits, net interest, and profits and interests paid to pension and insurance funds. The figure shows that the increase in the top 1% income share since the 1970s is due primarily to the employee compensation component. However, this component stops growing after the peak of 2000. Since 2000, it is mostly the capital income component (and particularly corporate and non-corporate profits) that drives the increase in the top 1% income share.

5.2 Decompositions of National Income Growth

We can also use our series to analyze income growth by groups. Figure 8 depicts the average real incomes per adult along with the average real incomes for bottom 90% adults since 1946 using our National income based series and shares. It shows that incomes for the bottom 90% grew as much as average incomes from 1946 to 1980, at an annual rate of 2%, so that real incomes double from 1946 to 1980. In contrast, from 1980 to 2012, while average incomes grow at a 1.4% annual rate, bottom 90% incomes grow only at a 0.7% annual rate. As a result, while average incomes grow by 55% from 1980 to 2012, bottom 90% incomes grow only by 25%.

Figure 7 depicts the top 10% (left-panel) and top 1% (right-panel) real incomes from 1946

to 2012. The average real income for the bottom 90% is also depicted for comparison on the right y-axis. Annual growth rates for each group are also reported for the periods 1946-1980 and 1980-2012. It shows that growth for the top 10% and especially the top 1% has been much faster than for the bottom 90% in the period 1980-2012. While bottom 90% incomes grow at a .7% annual rate from 1980 to 2012, top 10% incomes grow at a 2.3% rate and top 1% incomes grow at a 3.5% rate. As a result, the top 10% has captured 75% of real economic growth per adult with the bottom 90% getting only 25% of real economic growth per adult. The top 1% has captured 38% of real economic growth per adult. Hence our results show that excluding the top makes a very large difference in growth numbers relative to the macro-aggregate per adult. Piketty and Saez (2003) series have sometimes been reported in growth terms but the real income numbers from Piketty and Saez (2003) suffer from the drawbacks we mention above: overstated CPI, family composition effects, and incomplete income measures. Hence, they exaggerate the share of growth going to top groups. With our new series, we will be able to put the discussion of the distribution of income growth on a much stronger and comprehensive footing.

Table 1 decomposes growth by income groups and time periods. The top panel of the table displays real growth rates of pre-tax national income per adult by income groups and time periods. The bottom panel of the table displays the fraction of real growth of pre-tax national income per adult capture by each income group in each time period. In the period 1929-1946, average growth is bottom incomes grow faster than average while top incomes grow more slowly. The rate of growth is even negative for the top 1% and above. In the period 1946-1980, growth is approximately even across groups. In the period 1980-2012, average growth is lower than in the previous periods and concentrated among top income groups. Bottom 90% incomes grow at 0.7% per year while average incomes grow at 1.4% per year.

6 The Role Taxes and Transfers

6.1 Pre-tax vs. Post-tax Income Shares

In this section, we compute post-tax income shares. Our post-tax incomes deduct all taxes and add back all government spending and transfers. It incorporates the operation of the pension systems both public and private by deducting contributions from income and adding back pension benefits. It alsodeducts the government deficit (and adds the net surplus of private pension systems) so that our aggregate post-tax income matches exactly National income as our pre-tax factor income concept does. The government deficit is imputed assuming that 50% of it

is distributed as taxes and 50% is distributed as government spending. This effectively assumes that any government deficit will translate into increased taxes and reduced government spending 50/50. The imputation of government deficit has very little impact on income shares as taxes and government spending are both progressive so that increasing taxes and reducing government spending equally has very little net distributional impact. Deducting the government deficit has a significant impact on overall real growth particularly in years with large deficits as during the great recession of 2008-9. In 2009-11, the government deficit was around 10 GDP points, about 7 GDP points higher than usual. Hence, without deducting the government deficit, the growth of post-tax incomes would have been much stronger than for pre-tax incomes.

The incidence of taxes has been discussed in the previous section. Computing post-tax incomes requires to impute all forms of public spendings. All direct transfers to individuals are imputed directly to recipients. Non-cash transfers (such as Medicare) are imputed at cost value. Imputing in-kind public spending (such as defense, infrastructure spending, etc.) requires making strong assumptions. Absent direct evidence on how these transfers are distributed, we assume that they fall proportional to post-tax income (so that they are distributionally neutral). This is the most reasonable benchmark to start with and it can later be modified as more information becomes available on how such public good spending should be distributed.

Figure 10 depicts pre-tax vs. post-tax income shares for the top 10% (top-panel) and top 1% (bottom-panel). Pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems. Two findings are worth noting. First and as expected, there is less inequality in post-tax income than in pre-tax income because taxes are progressive and because transfers are also progressive. For example, in 2012, the bottom 10% income share is 55% pre-tax but only 43.5% post-tax. Similarly, in 2012, the top 1% income share is 25% pre-tax in 2012 and 19% post-tax. Second, both the pre-tax and the post-tax measures show a strong trend toward more income concentration since 1980. From 1980 to 2012, the top 10% income shares increases from 42.5% to 55% pre-tax and from 34.5% to 43.5% post-tax. The top 1% income share almost doubles from 1980 to 2012 both in pre-tax and post-tax cases. This implies that the direct redistributive role of the government has not altered the trend in inequality. While redistributive transfers (such as social security, medicare, and medicaid) have increased in volume, tax progressivity has also been reduced so that the net effect is almost unchanged.

Figure 11 focuses on the bottom 50%. The figure depicts pre-tax vs. post-tax income shares

for the bottom 50%. The top panel defines income at the individual level (capital income is split equally among couples but labor income is based on actual earnings within the couple). This corresponds to a situation with no sharing within couples of earnings. It shows a fairly stable pre-tax income share for the bottom 50% first slightly increasing and then slightly declining. The post-tax series show first a significant increase in the 1960s and 1970s from 12% to 18% followed by a slight decline down to 16% by 2013. The increase in the post-tax share in the 1960s and 1970s is explained by the growth of transfers. Social Security retirement benefits grow significantly, Medicare and Medicaid start being implemented in the Great Society of President Johnson. The lack of significant changes in pre-tax inequality is explained by a combination of two factors going in opposite directions. First, the increase in gender equality, particularly within married couples, is a force increasing the share of income going to the bottom 50% adults (which includes many women and in particular married women with no or small earnings). Second, the increase in inequality within gender, and particularly among men, is a force decreasing the share of income going to the bottom 50% adults. The first force dominates slightly in the 1960s and 1970s when the gender gap is significantly reduced. The second force dominates starting in the 1980s when inequality within gender increases fast.

The effect of gender equality within couples can be controlled for by considering an alternative income definition where both labor and capital income is split equally within couples. This corresponds to a situation with full sharing within couples of earnings. The bottom panel of Figure 11 depicts the pre and post-tax income shares of the bottom 50% according to this equal split income definition. The pre-tax series show a very clear erosion of the bottom 50% income share from 17.5% in the mid-1960s down to 8% in recent years. Interestingly, this erosion starts in the late 1960s and has been pretty continuous since then, except for a plateau during the booming economy of the 1990s.

Figure 12 focuses on the next 40% (P50-90). The figure depicts pre-tax vs. post-tax income shares for the P50-90 group. The top panel defines income at the individual level (capital income is split equally among couples but labor income is based on actual earnings within the couple). This corresponds to a situation with no sharing within couples of earnings. The top panel show two main findings. First, pre-tax and post-tax income shares are almost the same in level for this broad "middle class" group showing that the taxes paid by this group are about the same as the transfers and public good spending received. Second, both series show a large downward trend. The P50-90 group had about 50% of total income pre-tax and post-tax in the early 1960s. In 2012, it has slightly less than 40% pre-tax and slightly more than 40% post-tax. The collapse

in the middle class income share also combines two effects going in the same direction. First, the increase in gender equality reduces the share of income going to the P50-90 adults (which includes men disproportionately). Second, the overall increase in inequality is very skewed so that even a group above the median such as P50-90 looses ground over all.

Again, the effect of gender equality within couples can be controlled for by considering an alternative income definition where both labor and capital income is split equally within couples. This corresponds to a situation with full sharing within couples of earnings. The bottom panel of Figure 12 depicts the pre and post-tax income shares of P50-90 according to this equal split income definition. In the 1960s and 1970s, the pre-tax P50-90 increases according to this equal split measure implying that the middle class gains ground (when abstracting from inequality within couples). However, after 1980, the pre-tax P50-90 share falls significantly from 47-48% in 1980 down to 40-41% in the early 2010s. The post-tax series show less variation (no increase in the 1960s and 1970s as the growth in transfers benefits mostly the bottom 50%) and a reduced fall after 1980, as taxes on the middle-class fall slightly.

To summarize, our series confirm the decline in pre-tax incomes among all groups below the top 10%, particularly since 1980. This decline is tempered by a reduction in the gender gap which improves the bottom 50% income share (measured on a strictly individual basis) particularly in the 1960s and 1970s. The role of taxes and transfers is actually fairly modest for the top of the distribution. The growth in transfers in the 1960s and 1970s helps the bottom 50% but the reduction in tax progressivity offsets this equalizing effect on top income shares.

6.2 Pre-tax vs. Post-tax Income Growth

We explore the real growth in pre-tax vs. post-tax incomes by income group in Figures 13 and 14 .

Figure 13 depicts pre-tax vs. post-tax income growth per adult for the top 10% (top-panel) and top 1% (bottom-panel) from 1962 to 2013 starting from a base 100 in 1962. The average Pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems. The series for the full adult population is also reported in green (as a reference comparison). For the full population, per adult pre-tax and post-tax series are identical by definition. The figure shows that top incomes have grown much faster than average incomes since 1980. The bottom panel shows that top 1% income growth is virtually identical on the pre-tax vs. post-tax basis confirming the fact that

the overall effect of taxes and government spending has been neutral thanks a sharp reduction of tax rates for the top 1%. For the top 10%, pre-tax income grows somewhat faster than post-tax income.

Figure 14 depicts pre-tax vs. post-tax income growth per adult for the bottom 50% (top-panel) and the next 40% (bottom-panel) from 1962 to 2013 starting from a base 100 in 1962. The figure shows that pre-tax bottom 50% incomes grew the same as average incomes from 1962 to 2007 before the Great Recession. The Great recession generated a much large fall for bottom 50% income than average and the recovery from the Great Recession has been much more modest for the bottom 50% than for the average. By 2013, the pre-tax real incomes of bottom 50% adults are at the same level as in 1988, 25 years earlier.

The bottom panel shows that P50-90 income growth is virtually identical on the pre-tax vs. post-tax basis confirming the fact that the overall effect of taxes and government spending has been neutral this middle class group. Middle class incomes have grown significantly less than average particularly after 2000 with almost zero growth from 2000 to 2013.

Finally, Figure 15 depicts the pre-tax vs. post-tax median income per adult from 1962 to 2013. The average pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems. The figure that pre-tax median real income per adult in 2013 is at the same level as in 1988 implying stagnation of median real income over the last 25 years. In particular, median incomes have hardly recovered from the large drop they experienced during the Great Recession from 2007 to 2009. In contrast, there has been significant increase in post-tax median income over the last 25 years. By 2013, post-tax median income is almost as high as in 2007, just before the Great Recession. Therefore, the striking conclusion is that it is only thanks to government transfers that median income per adult in the United States has grown at all over the last 25 years. This highlights the enormous role that the government plays in terms of the distribution of economic growth.

7 Conclusion

This paper has combined tax, survey, and national accounts data to build new series on the distribution of national income in the United States since 1913. In contrast to previous attempts, our "Distributional National Accounts" estimates capture 100% of national income recorded in the national accounts. This allows us to provide decompositions of growth by income groups

consistent with total economic growth used in macroeconomic analysis. We compute both pre-tax and post-tax per adult incomes. We find an overall U-shape for pre-tax top income shares over the century 1913-2012, although less marked than the Piketty-Saez series. Growth for the bottom 90% incomes has been slower than for upper income groups since the 1970s. However, in contrast to survey and individual tax data, we find substantial increase in average real pre-tax incomes for the bottom 90% since the 1970s.

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Table: Decomposition of real growth rates

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
	All	Bottom 90%	bottom 99%	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.01%
	Average yearly growth rates of real national income per adult								
1913-2012	**1.7%**					**1.8%**	1.7%	1.7%	2.0%
1913-1946	**1.7%**					**0.6%**	0.2%	-0.9%	-1.6%
1913-1929	**1.3%**					**1.9%**	1.5%	1.0%	2.3%
1929-1946	**2.2%**	2.9%	2.8%	**1.3%**	0.7%	**-0.5%**	-1.0%	-2.7%	-5.1%
1946-2012	**1.7%**	1.4%	1.6%	**2.1%**	2.2%	**2.4%**	2.5%	3.0%	3.8%
1946-1980	**2.0%**	2.0%	2.1%	**1.9%**	1.7%	**1.4%**	1.3%	1.4%	1.8%
1980-2012	**1.4%**	0.7%	1.0%	**2.3%**	2.6%	**3.5%**	3.8%	4.7%	6.1%
2009-2012	**2.0%**	0.1%	0.8%	**3.9%**	4.8%	**7.0%**	7.8%	9.1%	9.5%
	Fraction of total national income growth accruing to each groups								
1913-2012	100%					**21%**	16%	9%	5%
1913-1946	100%					**6%**	1%	-3%	-2%
1913-1929	100%					**30%**	19%	8%	7%
1929-1946	100%	74%	104%	**26%**	11%	**-4%**	-6%	-8%	-5%
1946-2012	100%	43%	76%	**57%**	44%	**24%**	19%	12%	6%
1946-1980	100%	62%	92%	**38%**	24%	**8%**	5%	3%	1%
1980-2012	100%	27%	62%	**73%**	61%	**38%**	31%	20%	10%
2009-2012	100%	1%	32%	**99%**	91%	**68%**	58%	38%	18%

Table 1: Decomposition of Real Growth Rates per Adult pre-Tax

Notes: The top panel of the table displays real growth rates of pre-tax national income per adult by income groups and time periods. The bottom panel of the table displays the fraction of real growth of pre-tax national income per adult capture by each income group in each time period. In the period 1929-1946, average growth is bottom incomes grow faster than average while top incomes grow more slowly. The rate of growth is even negative for the top 1% and above. In the period 1946-1980, growth is approximately even across groups. In the period 1980-2012, average growth is lower than in the previous periods and concentrated among top income groups. Bottom 90% incomes grow at 0.7% per year while average incomes grow at 1.4% per year.

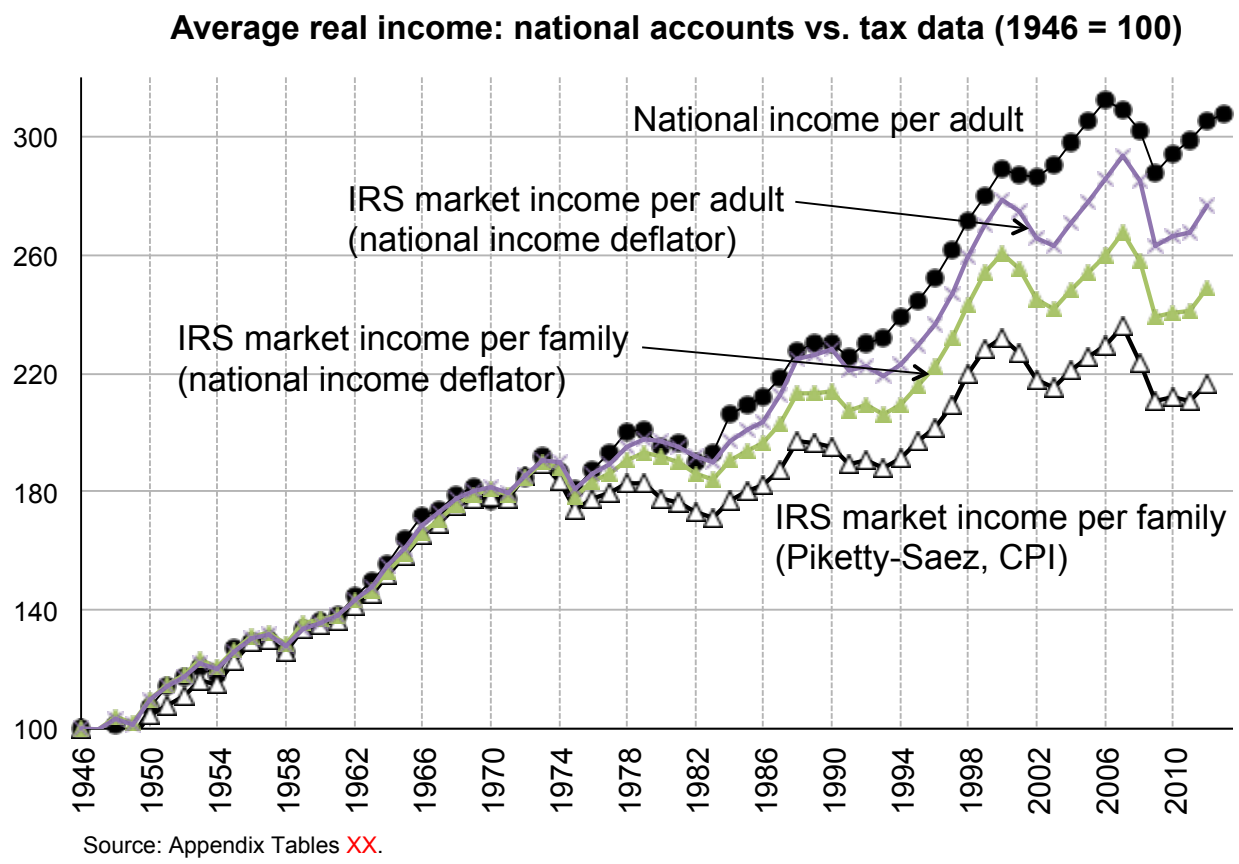


Figure 1: Average Real Income in Tax Data vs. National Accounts

Notes: The figure depicts real income growth (base 100 in 1946) from 1946 to 2012 in IRS tax data vs. national accounts. The IRS market income per family is based on Piketty and Saez series. Tax data income includes market income reported on tax returns (including realized capital gains) and excluding government transfers. It is measured per tax unit (defined a single person with children dependents if any or a married couple with children dependents if any). The tax data series is deflated using the Consumer Price Index (research series). The national accounts series is based on National Income and it measured per adult (all individuals aged 20+ in the US population). The national income series are deflated using the National Income deflator. The figure displays two intermediate series. The series in green triangles starts from the IRS market income per family but uses the national income deflator (instead of the consumer price index). The series in purple crosses then computes average income per adult (instead of per family). The decomposition shows that the gap in growth between the two series since the mid-1970s is explained 1/3,1/3,1/3 by differences in the inflation deflator, the use of tax units instead of adults, and the difference in income concept.

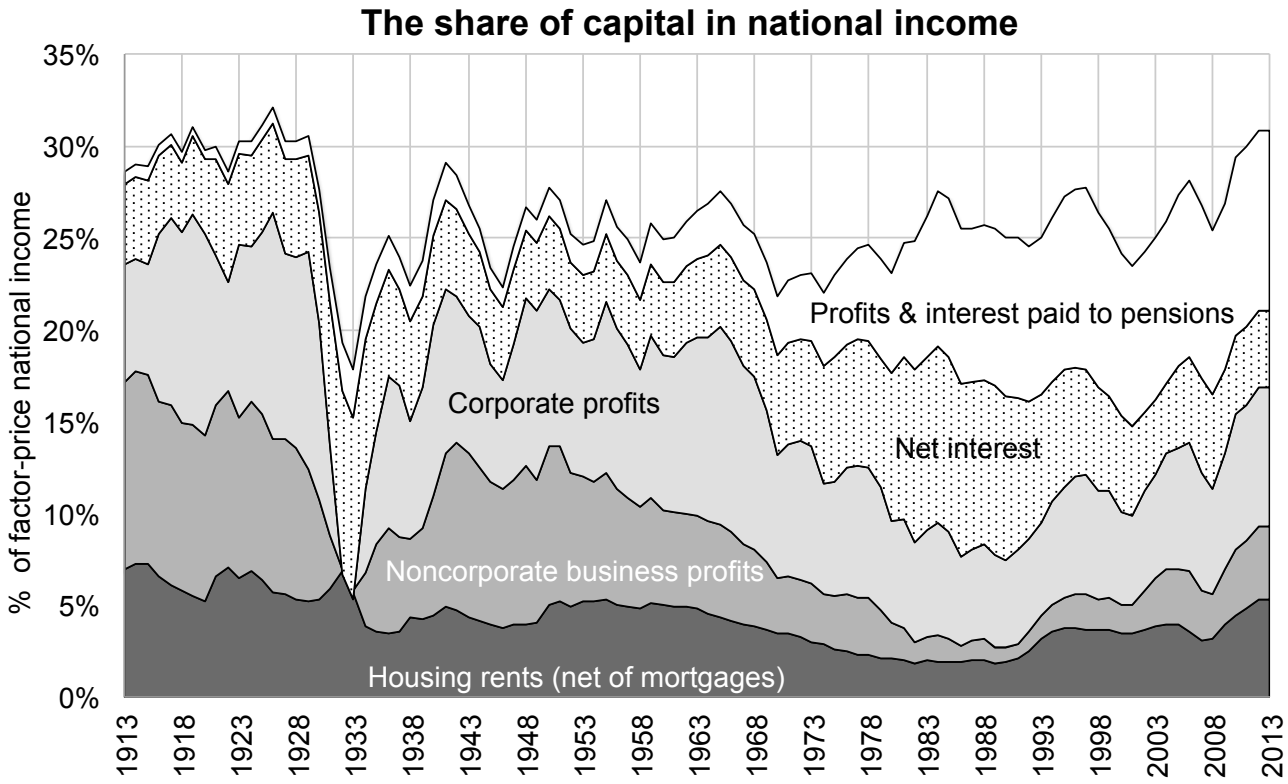


Figure 2: Share and Composition of Capital in National Income

Notes: The figure depicts the level and composition of the capital share expressed in percentage of National Income (α factor). We break down capital income Y_K into the five following categories: (1) housing rents (owner- and tenant-occupied, in both cases net of mortgage interest payments), (2) the capital component of non-corporate business income, (3) corporate profits (after deduction of interest payments), (4) interest on fixed claim assets (net of interest paid on non-mortgage debts), (5) profits and interest paid on pension funds.

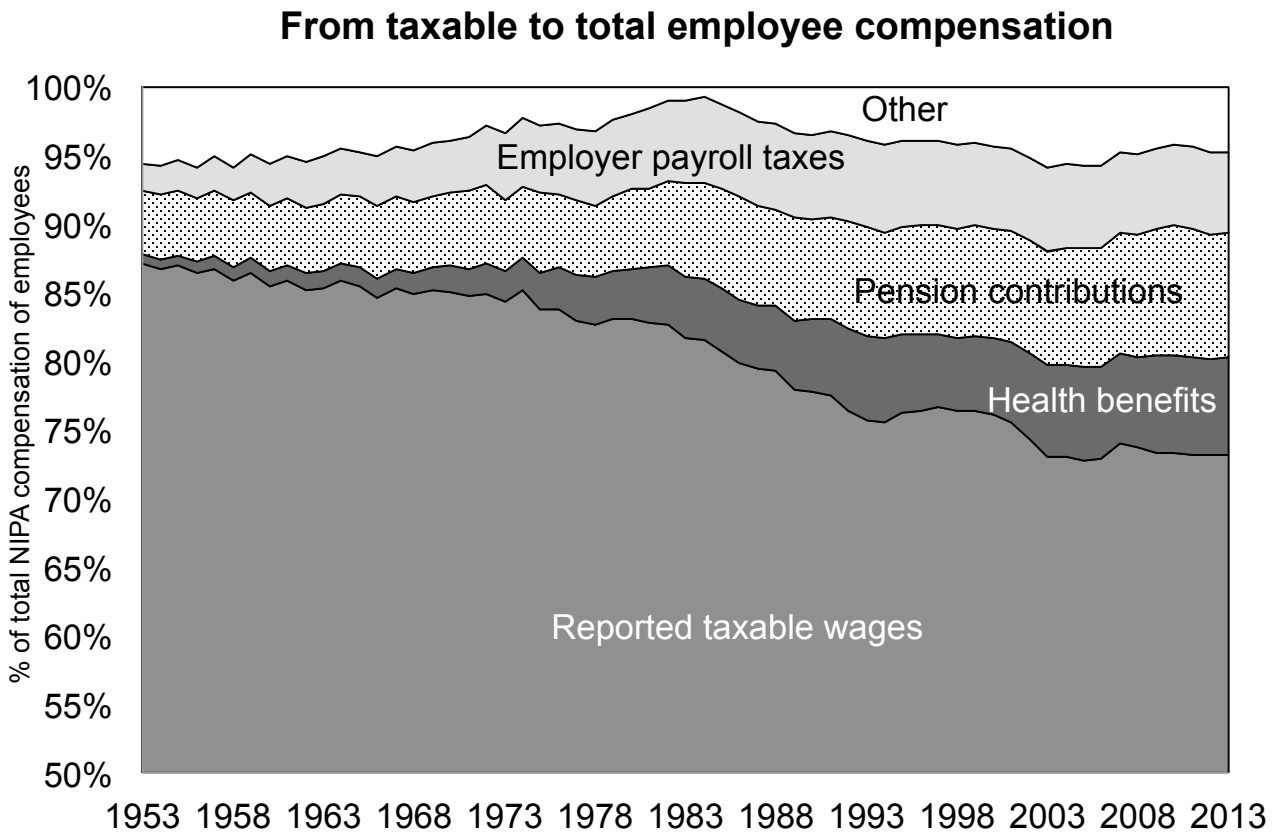


Figure 3: Labor Income: from Taxable to Total Employee Compensation

Notes: The figure decomposes the compensation of employees (which represents over 80% of labor income in National Income) into various components: wages and salaries reported on tax returns, and four other categories which are not reported on tax returns: (a) employer provided health benefits, (b) pension contributions (to DB or DC pensions including 401(k)s), (c) employer payroll taxes, and (d) other small categories which include worker's compensation, allowance made for tax evasion and non-filers. The figure shows that the fraction of reported wages and salaries in total employee compensation has fallen significantly from over 85% in the 1950s to around 72% in the last decade.

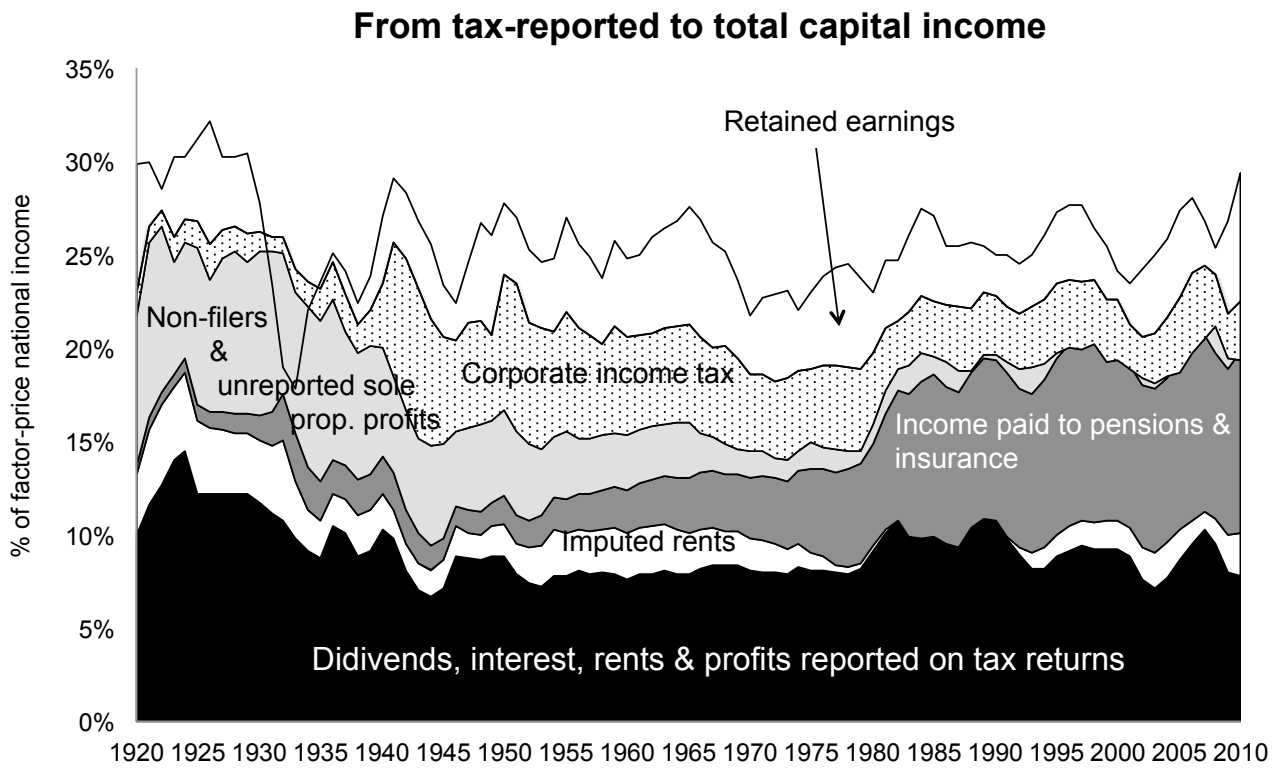
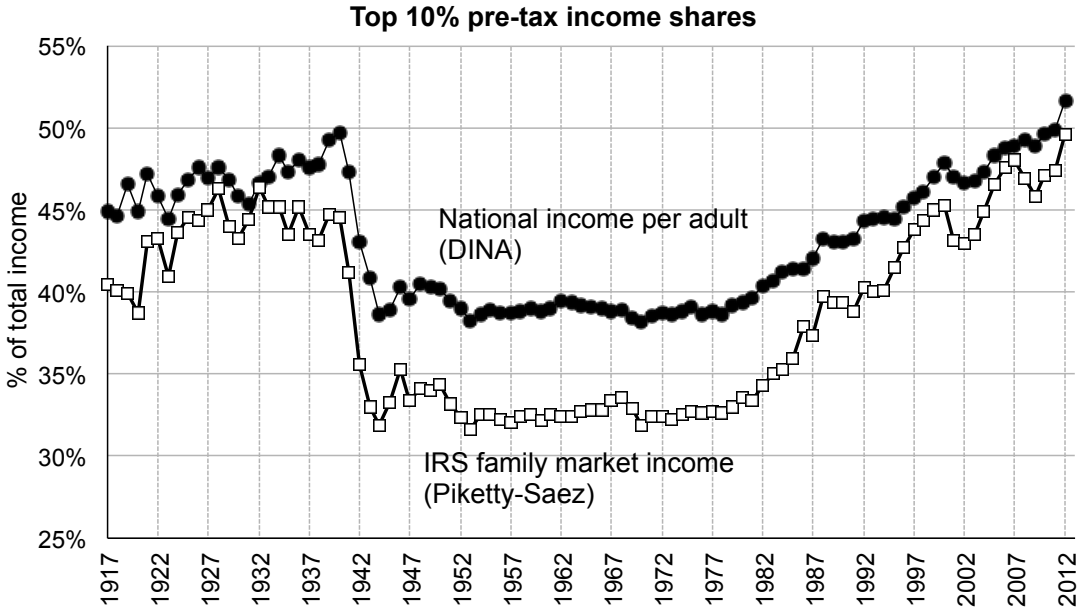
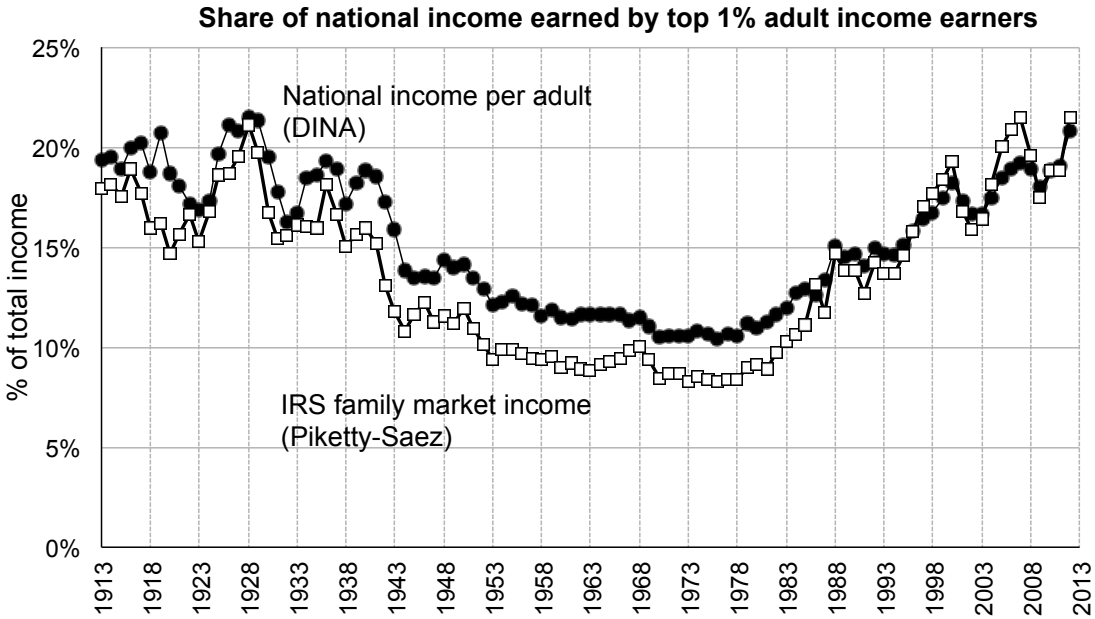


Figure 4: Capital Income: from Taxable to Total Capital Income in National Income

Notes: The figure provides a reconciliation of tax-returns and total economic capital income by displaying the following 6 stacked series of capital income components (as a percentage of National Income). (a) Capital income reported on tax returns (dividends, interest, rents and profits) represents only about one third of total capital income in National income. We exclude realized capital gains reported on tax returns (which are not part of national income). Missing capital income on tax returns includes 5 additional components: (b) imputed rent of homeowners (which is non-taxable) net of mortgages, (c) capital income paid to pensions and insurance funds (which is not part of taxable income either and has grown substantially since the 1970s), (d) capital income from non-filers and unreported small business profits (which is a minor category today), (e) corporate income tax (that we assume falls on capital income, see below), and (f) retained earnings of corporations.



This figure displays the share of total pre-tax national income earned by top 10% adult income earners and the share of total IRS market income earned by top 10% family tax units. Source: Appendix Tables XX.



This figure displays the share of total pre-tax national income earned by top 1% adult income earners and the share of total IRS market income earned by top 1% tax units. Source: Appendix Tables XX.

Figure 5: Top Income Shares

Notes: The figure displays the share of national income going to the top 10% (top panel) and top 1% (bottom panel) adults from 1913 to 2012. For comparison purposes, the graphs also display the top 10% and top 1% income shares from Piketty and Saez (2003) which are based on tax unit and the narrower tax reported income concept.

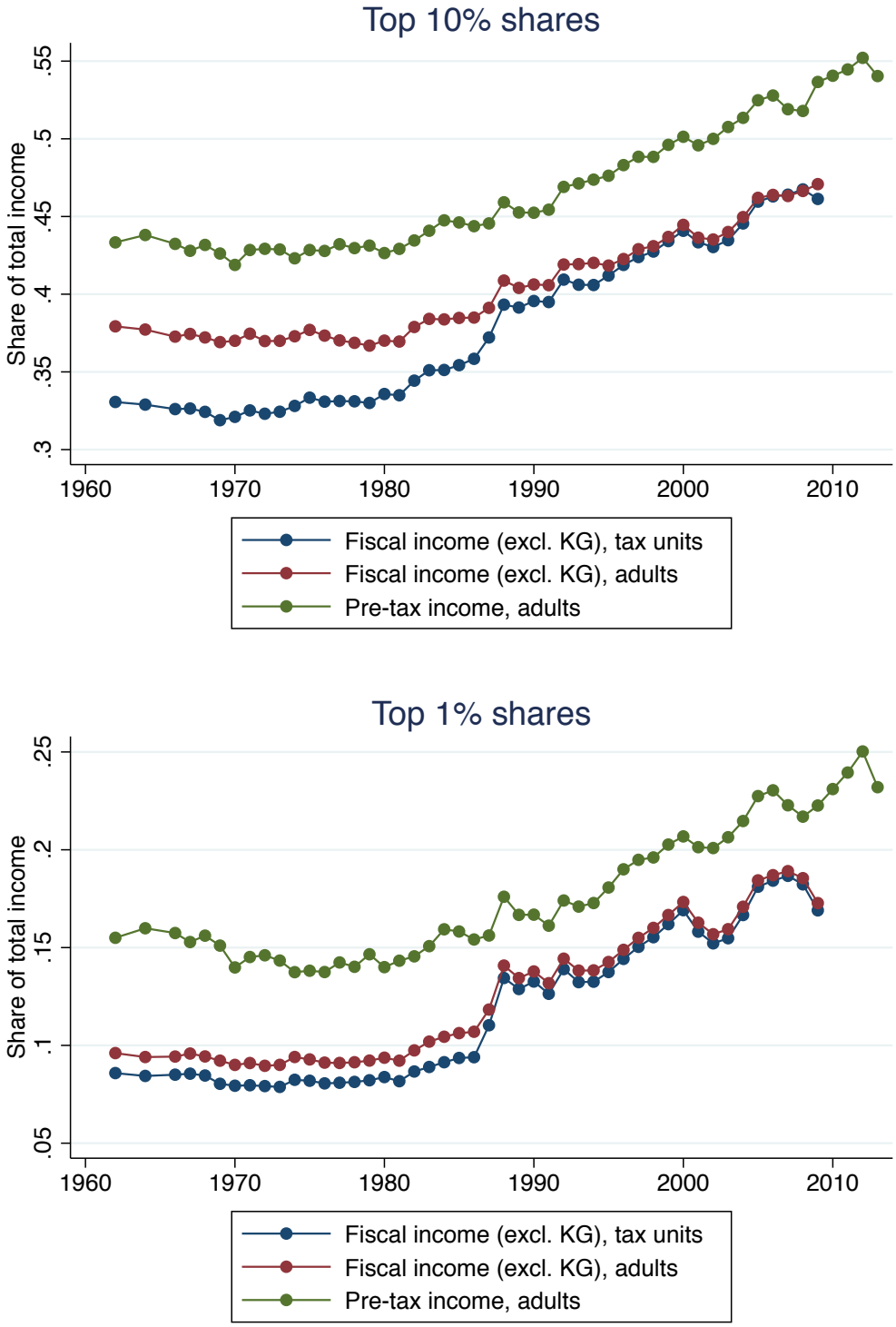


Figure 6: Top Income Shares: Tax Units vs. Individuals

Notes: The figure displays the share of national income going to the top 10% (top panel) and top 1% (bottom panel) from 1962 to 2013. The first series is the Piketty and Saez (2003) series based on fiscal income excluding realized capital gains and based on tax units. The second series uses the same fiscal income definition but uses the individual adult as the unit to define top income groups. The third series is our pre-tax income series using the national income definition and the individual adult unit.

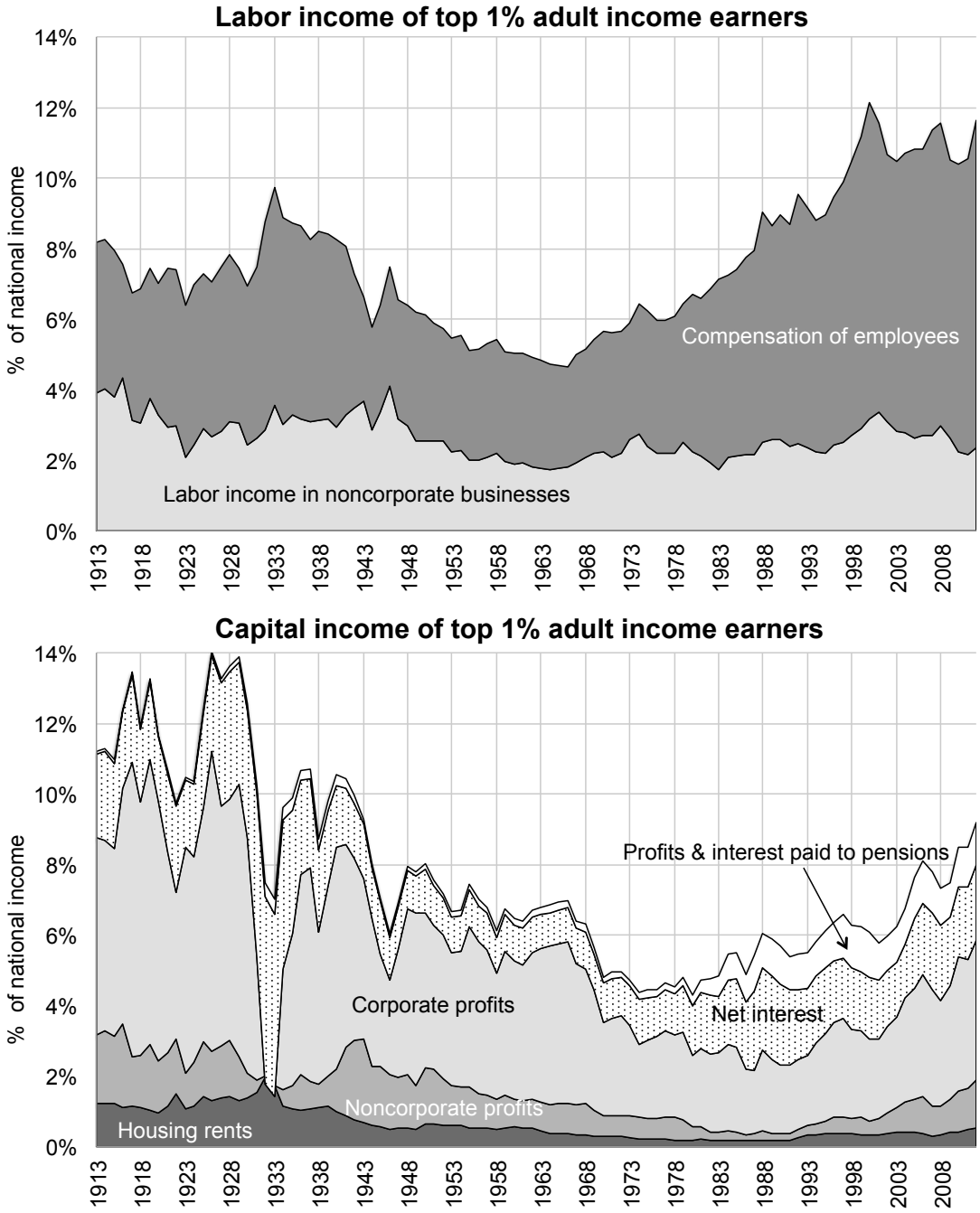


Figure 7: Labor and Capital Components of Top 1% Income Share

Notes: The figure depicts labor income of the top 1% as a share of national income (top panel) and capital income of the top 1% as a share of national income (bottom panel). The sum of these two series is the top 1% income share depicted in Figure 5 (bottom-panel). Labor income is also decomposed into employee compensation and labor income in non corporate businesses. Capital income is decomposed into housing net rents, non-corporate profits, corporate profits, net interest, and profits and interests paid to pension and insurance funds.

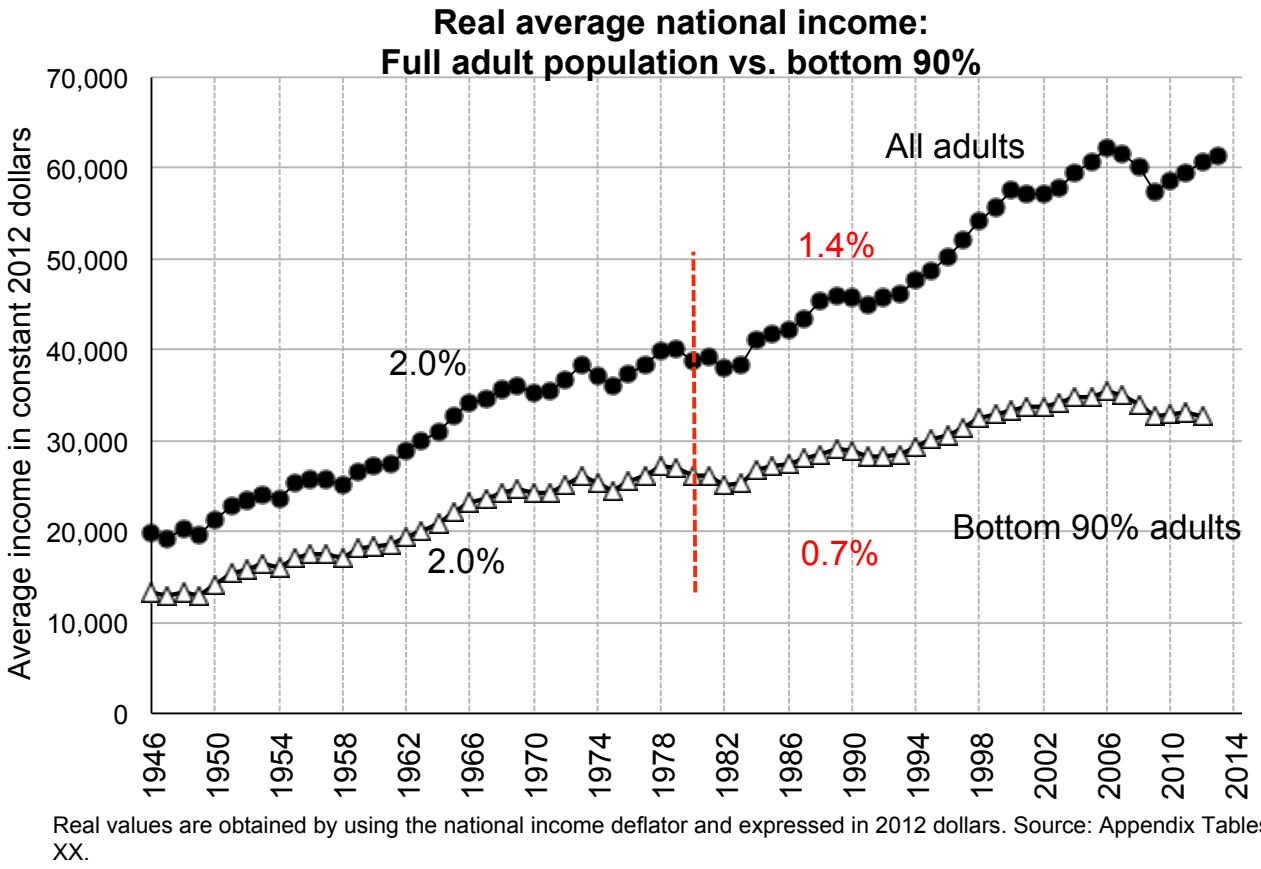
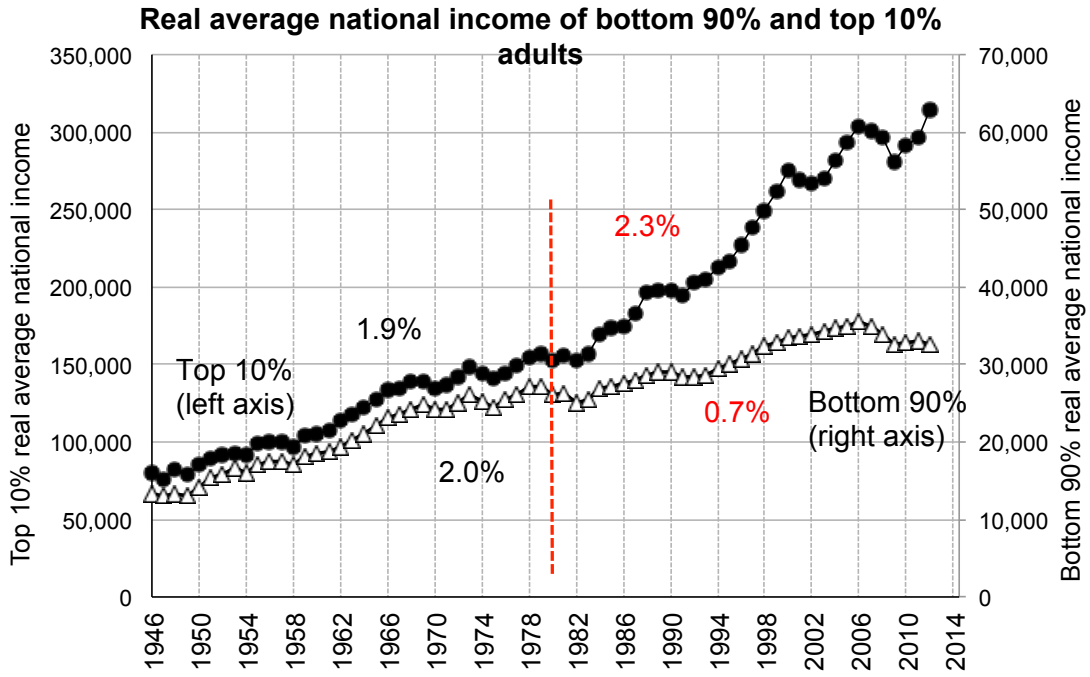
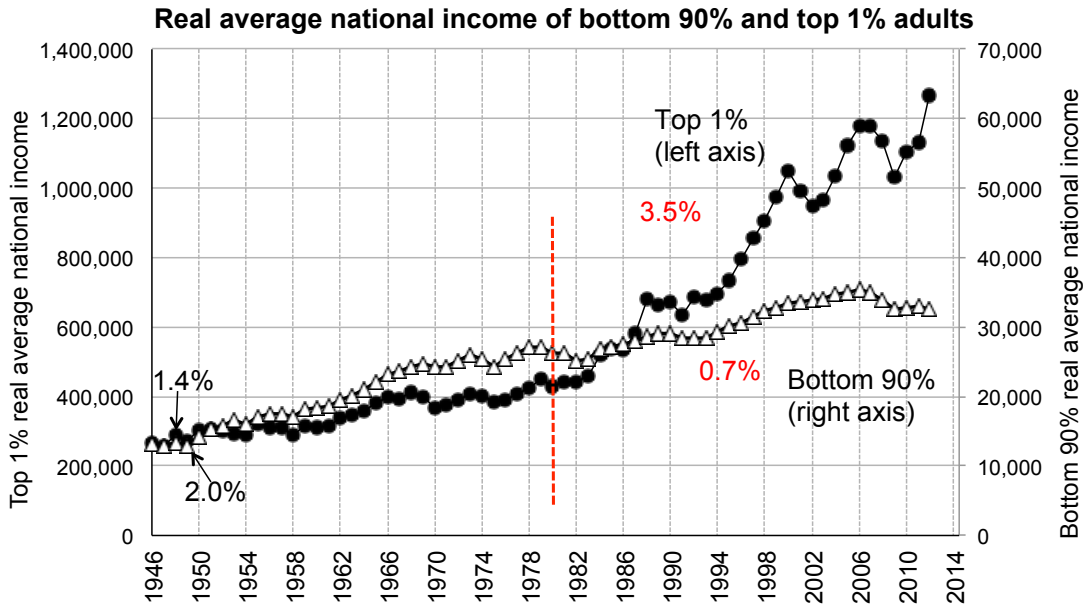


Figure 8: Growth in Real National Income per Adult: Full population vs. Bottom 90%

Notes: the figure depicts the average real incomes per adult along with the average real incomes for bottom 90% adults since 1946 using our National income based factor income series and shares. It shows that incomes for the bottom 90% grew as much as average incomes from 1946 to 1980, at an annual rate of 2%, so that real incomes double from 1946 to 1980. In contrast, from 1980 to 2012, while average incomes grow at a 1.4% annual rate, bottom 90% incomes grow only at a 0.7% annual rate. As a result, while average incomes grow by 55% from 1980 to 2012, bottom 90% incomes grow only by 25%.



Real values are obtained by using the national income deflator and expressed in 2012 dollars. Source: Appendix Tables XX.



Real values are obtained by using the national income deflator and expressed in 2012 dollars. Source: Appendix Tables XX.

Figure 9: Growth in Real National Income per Adult among Top 10% and Top 1% Groups

Notes: The figure depicts the top 10% (top-panel) and top 1% (bottom-panel) real incomes from 1946 to 2012 (pre-tax national income per adult). The average real income for the bottom 90% is also depicted for comparison on the right y-axis. Annual growth rates for each group are also reported for the periods 1946-1980 and 1980-2012. It shows that growth for the top 10% and especially the top 1% has been much faster than for the bottom 90% in the period 1980-2012. While bottom 90% incomes grow at a .7% annual rate from 1980 to 2012, top 10% incomes grow at a 2.3% rate and top 1% incomes grow at a 3.5% rate. As a result, the top 10% has captured 75% of real economic growth per adult with the bottom 90% getting only 25% of real economic growth per adult. The top 1% has captured 38% of real economic growth per adult.

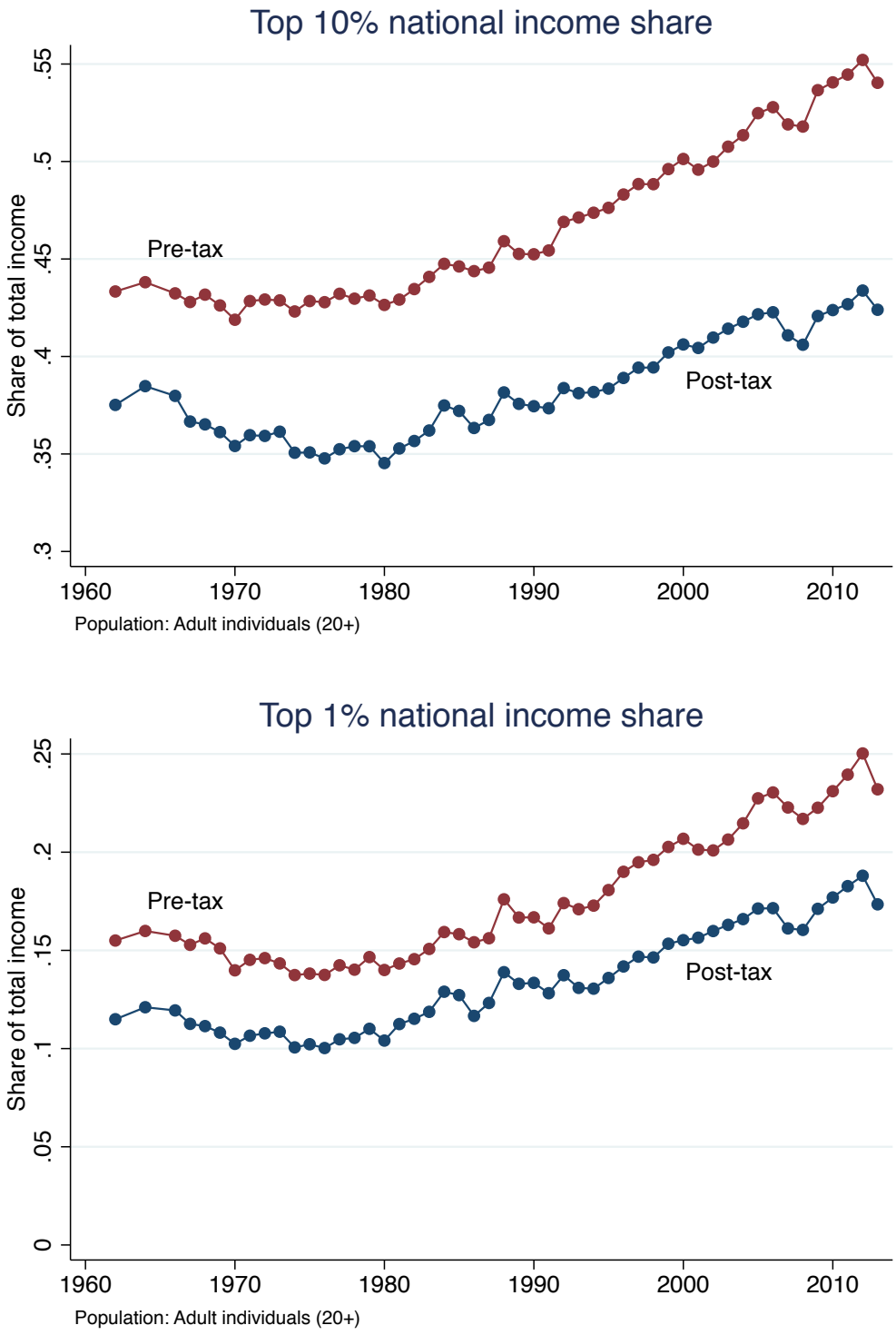


Figure 10: Pre-tax vs. Post-tax Income Shares

Notes: The figure depicts pre-tax vs. post-tax income shares for the top 10% (top-panel) and top 1% (bottom-panel). Pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems.

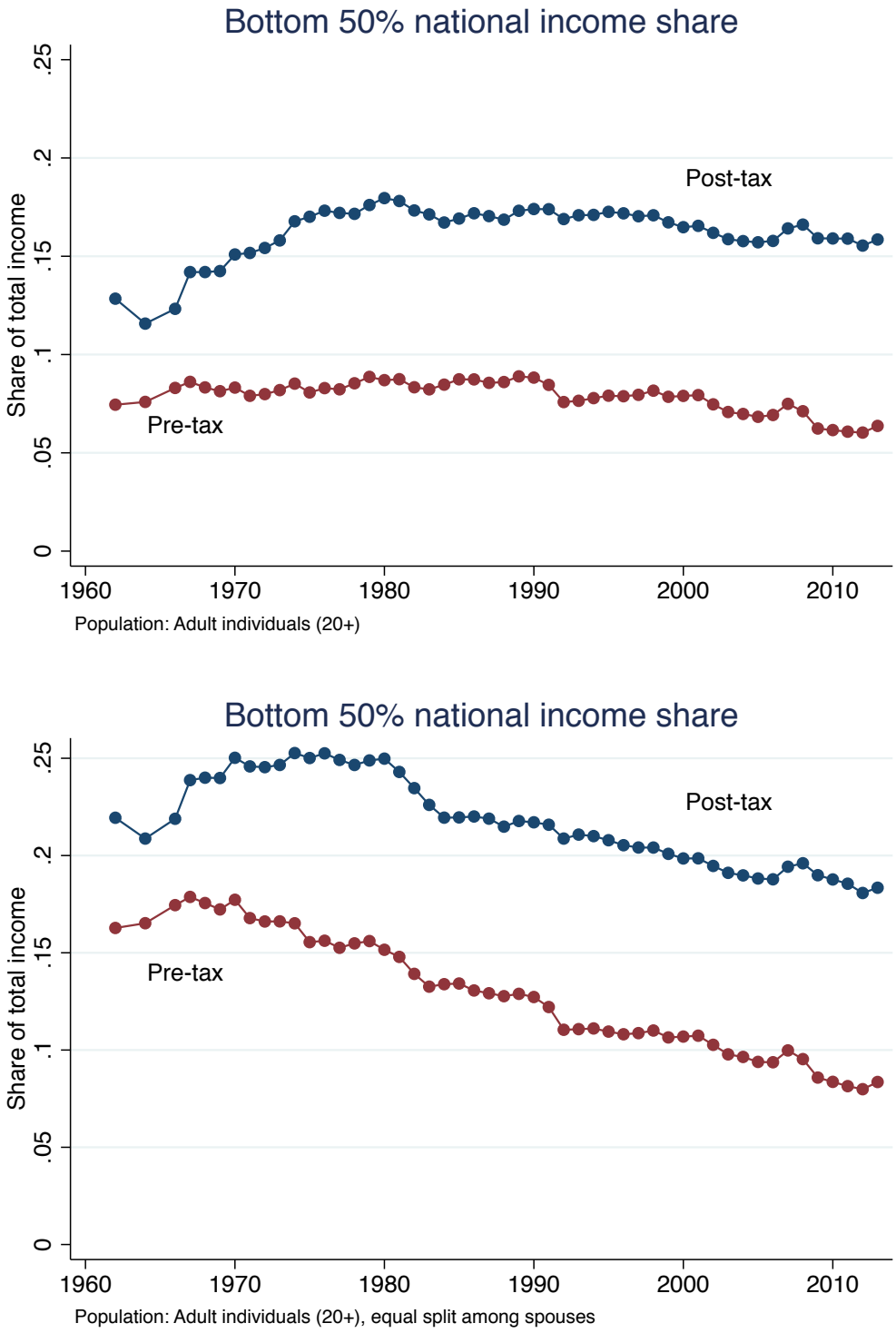


Figure 11: Pre-tax vs. Post-tax Bottom 50% Income Shares: Within Couple Split Effects

Notes: The figure depicts pre-tax vs. post-tax income shares for the bottom 50%. The top panel defines income at the individual level (capital income is split equally among couples but labor income is based on actual earnings within the couple). This corresponds to a situation with no sharing within couples of earnings. The bottom panel instead splits both labor and capital income equally within couples. This corresponds to a situation with full sharing within couples of earnings.

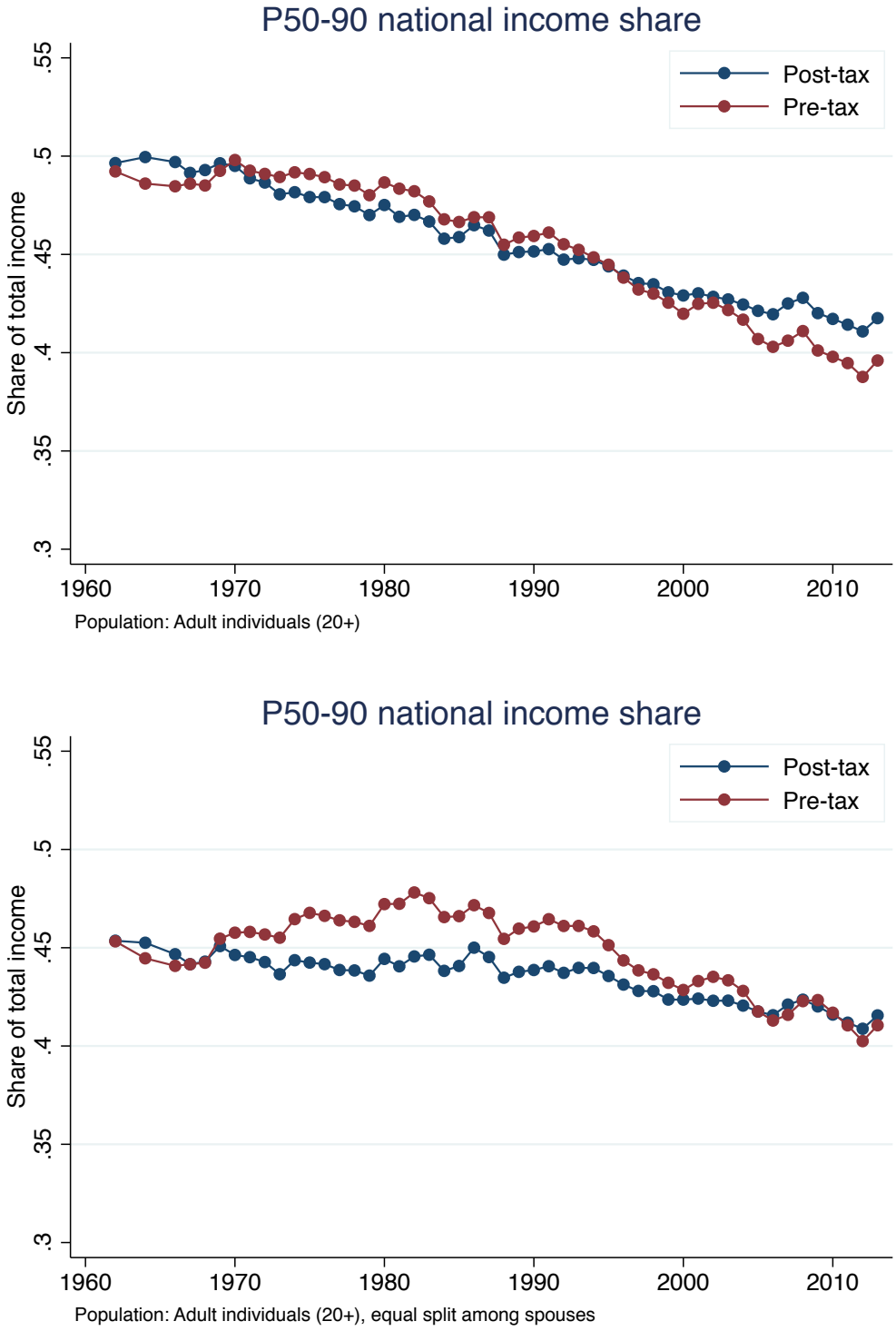


Figure 12: Pre-tax vs. Post-tax P50-90 Income Shares: Within Couple Split Effects

Notes: The figure depicts pre-tax vs. post-tax income shares for P50-90 (the top half excluding the top 10%). The top panel defines income at the individual level (capital income is split equally among couples but labor income is based on actual earnings within the couple). This corresponds to a situation with no sharing within couples of earnings. The bottom panel instead splits both labor and capital income equally within couples. This corresponds to a situation with full sharing within couples of earnings.

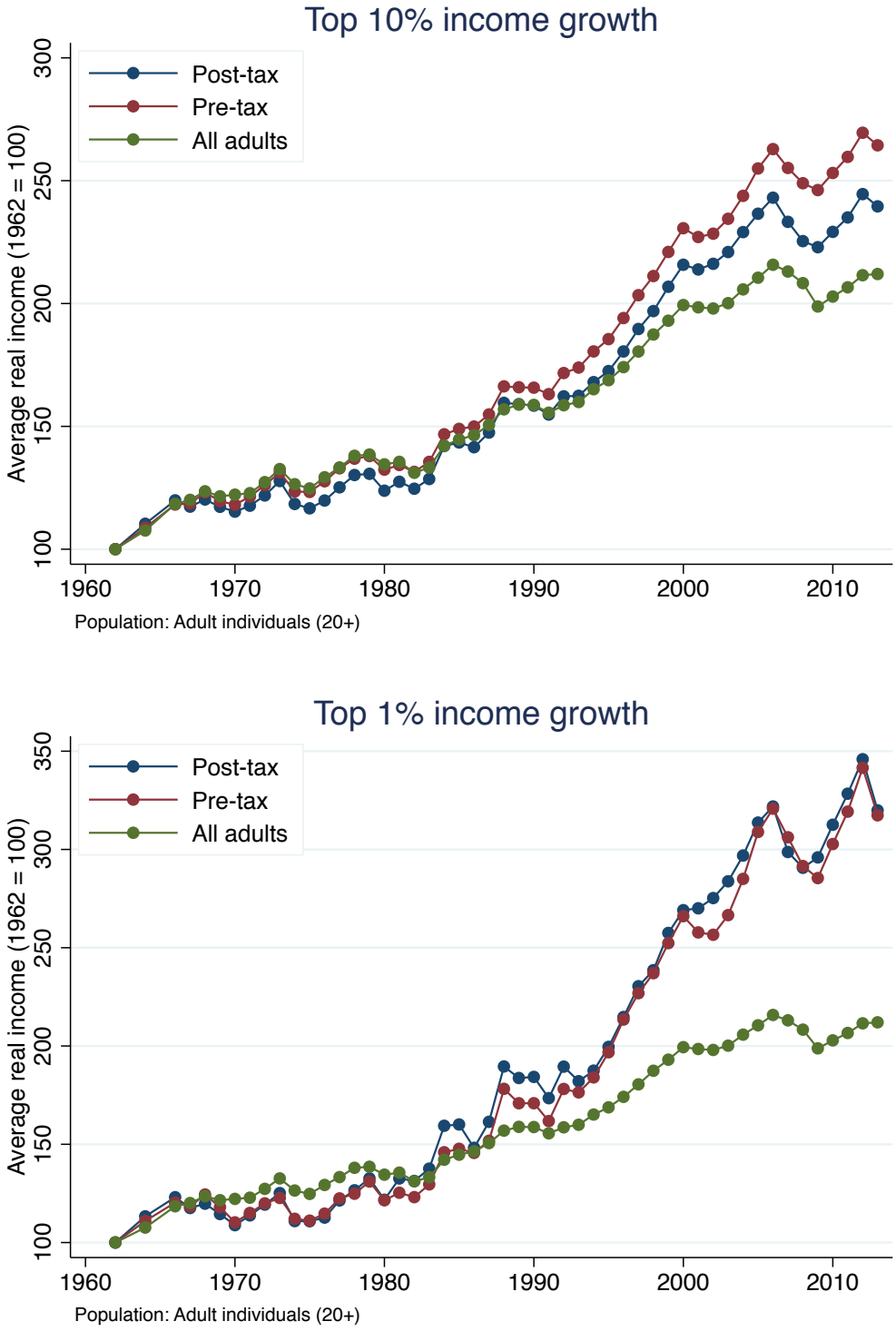


Figure 13: Pre-tax vs. Post-tax Top 10% and Top 1% Income Growth

Notes: The figure depicts pre-tax vs. post-tax income growth per adult for the top 10% (top-panel) and top 1% (bottom-panel) from 1962 to 2013 starting from a base 100 in 1962. The average Pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems. The series for the full adult population is also reported in green (as a reference comparison). For the full population, per adult pre-tax and post-tax series are identical by definition.

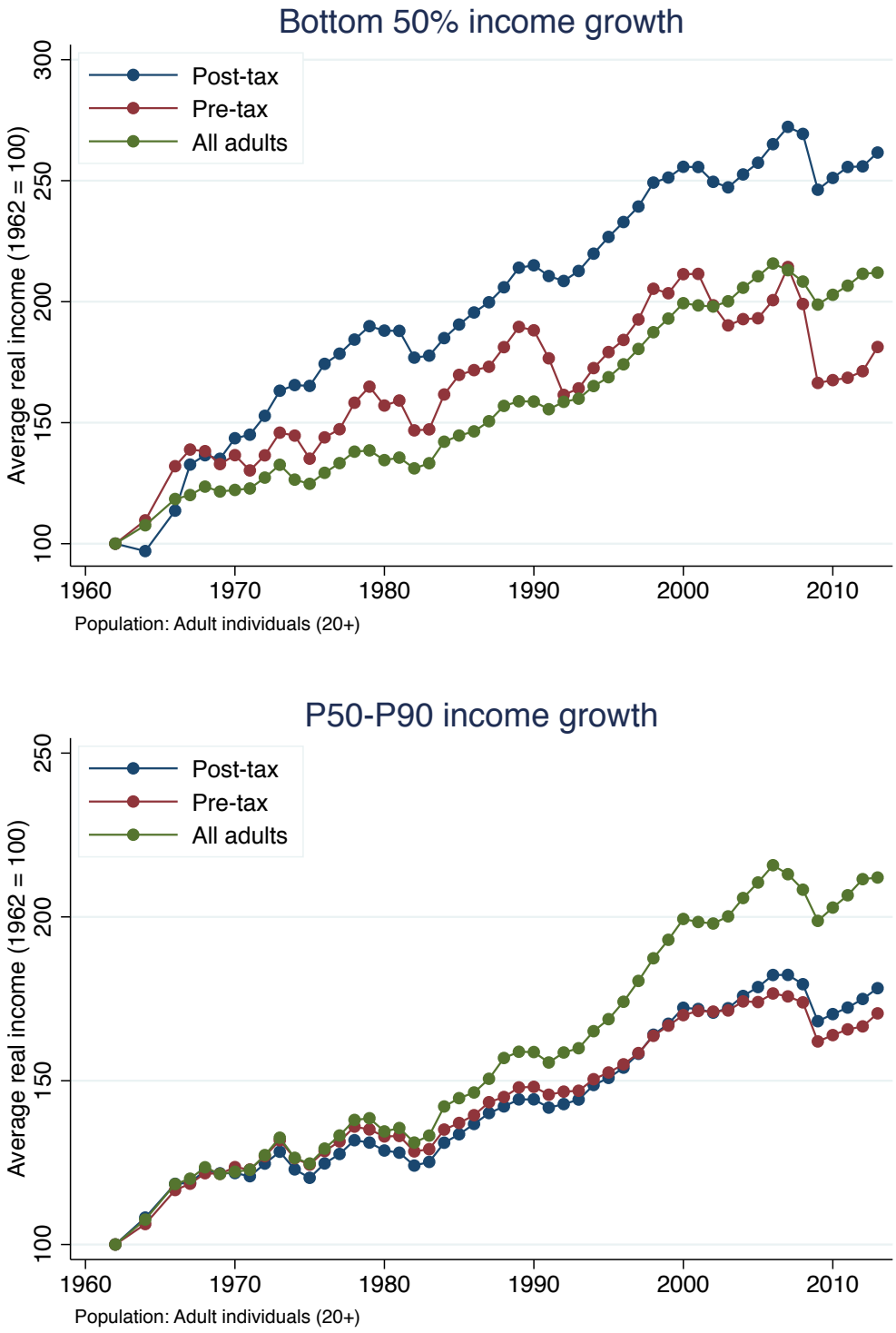


Figure 14: Pre-tax vs. Post-tax Bottom 50% and Next 40% Income Growth

Notes: The figure depicts pre-tax vs. post-tax income growth per adult for the bottom 50% (top-panel) and the next 40% (P50-90) (bottom-panel) from 1962 to 2013 starting from a base 100 in 1962. The average pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems. The series for the full adult population is also reported in green (as a reference comparison). For the full population, per adult pre-tax and post-tax series are identical by definition.

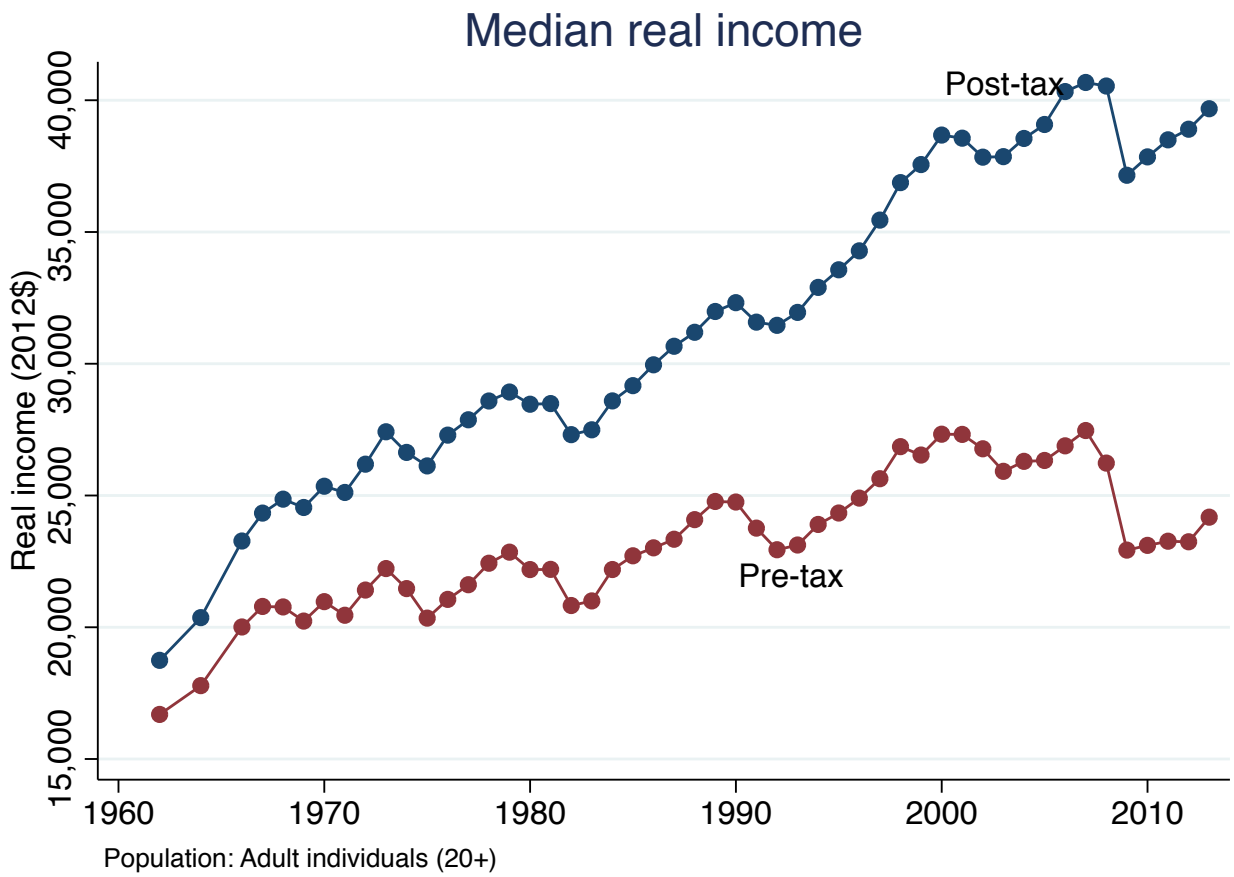


Figure 15: Pre-tax vs. Post-tax Median Real Income per Adult

Notes: The figure depicts the pre-tax vs. post-tax median income per adult from 1962 to 2013. The average pre-tax income is defined as national income before any taxes and before transfers. Post-tax income is defined as national income after all taxes and all government spending (both transfers and public goods) and after the operation of pension systems. The figure that pre-tax median real income per adult in 2013 is at the same level as in 1988 implying stagnation of median real income over the last 25 years. In particular, median incomes have hardly recovered from the large drop they experienced during the Great Recession from 2007 to 2009. In contrast, there has been significant increase in post-tax median income over the last 25 years. By 2013, post-tax median income is almost as high as in 2007, just before the Great Recession.