WEALTH INEQUALITY IN THE UNITED STATES SINCE 1913: EVIDENCE FROM CAPITALIZED INCOME TAX DATA

Emmanuel Saez
Gabriel Zucman

Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax
Data
Emmanuel Saez and Gabriel Zucman
NBER Working Paper No. 20625
October 2014
JEL No. H2,N32

ABSTRACT

This paper combines income tax returns with Flow of Funds data to estimate the distribution of household
wealth in the United States since 1913. We estimate wealth by capitalizing the incomes reported by
individual taxpayers, accounting for assets that do not generate taxable income. We successfully test
our capitalization method in three micro datasets where we can observe both income and wealth: the
Survey of Consumer Finance, linked estate and income tax returns, and foundations' tax records. Wealth
concentration has followed a U-shaped evolution over the last 100 years: It was high in the beginning
of the twentieth century, fell from 1929 to 1978, and has continuously increased since then. The rise
of wealth inequality is almost entirely due to the rise of the top 0.1% wealth share, from 7% in 1979
to 22% in 2012—a level almost as high as in 1929. The bottom 90% wealth share first increased up
to the mid-1980s and then steadily declined. The increase in wealth concentration is due to the surge
of top incomes combined with an increase in saving rate inequality. Top wealth-holders are younger
today than in the 1960s and earn a higher fraction of total labor income in the economy. We explain
how our findings can be reconciled with Survey of Consumer Finances and estate tax data.

Emmanuel Saez
Department of Economics
University of California, Berkeley
530 Evans Hall #3880
Berkeley, CA 94720
and NBER
saez@econ.berkeley.edu

Gabriel Zucman
Department of Economics
London School of Economics and Political Science
Houghton Street
London WC2A
g.zucman@lse.ac.uk

1   Introduction

Income inequality has sharply increased in the United States since the late 1970s, yet currently available evidence suggests that wealth concentration has not grown nearly as much. One possible explanation is that rising inequality is purely a labor income phenomenon: despite an upsurge in top wage and entrepreneurial incomes (Piketty and Saez, 2003), the working rich might not have had enough time yet to accumulate a lot of wealth—perhaps because they have low saving rates, face high tax rates, or have low returns on assets. Should this be true, the implications for analyzing the US economy and for policy-making would be far-reaching.

Our paper, however, challenges this view. On the basis of new, annual, long-run series, we find that wealth inequality has considerably increased at the top over the last three decades. By our estimates, almost all of this increase is due to the rise of the share of wealth owned by the 0.1% richest families, from 7% in 1978 to 22% in 2012, a level comparable to that of the early twentieth century (Figure 1).

Although the top 0.1% is a small group—it includes about 160,000 families with net assets above $20 million in 2012—carefully measuring its wealth is important for two reasons. First, the public cares about the distribution of economic resources. Since wealth is highly concentrated (much more than labor income, due to the dynamic processes that govern wealth accumulation), producing reliable estimates requires to pay careful attention to the very top. This is difficult to achieve with survey data and motivates our attempt at using tax records covering all the richest families. The top 0.1% also matters from a macroeconomic perspective: it owns a sizable share of aggregate wealth and accounts for a large fraction of its growth. Over the 1986-2012 period, the average real growth rate of wealth per family has been 1.9%, but this average masks considerable heterogeneity: for the bottom 90%, wealth has not grown at all, while it has risen 5.3% per year for the top 0.1%, so that almost half of aggregate wealth accumulation has been due to the top 0.1% alone.

To construct our series on the distribution of wealth, we capitalize income tax data. Starting with the capital income reported by individuals to the Internal Revenue Service—which is broken down into many categories: dividends, interest, rents, profits, mortgage payments, etc.—for each asset class we compute a capitalization factor that maps the total flow of tax income to the total amount of wealth recorded in the Flow of Funds. We then combine individual incomes and aggregate capitalization factors by assuming that within a given asset class the capitalization factor is the same for everybody. For example, if the ratio of Flow of Funds fixed income claims to tax reported interest income is 50, then $50,000 in fixed income claims is attributed to an

individual reporting $1,000 in interest. By construction, the wealth distribution we estimate is consistent with the Flow of Funds totals. Our paper can thus be seen as a first attempt at creating distributional Flow of Funds statistics that decompose aggregate wealth and saving by fractiles. This allows us to jointly analyze growth and distribution in a consistent framework.

A number of authors have used the capitalization in the past, notably King (1927), Stewart (1939), Greenwood (1983) in the United States, and Atkinson and Harrison (1978) in the United Kingdom. But these studies typically provide estimates for just a few years in isolation, do not use micro-data, or have a limited breakdown of capital income by asset class. Compared to earlier attempts, our main advantage is that we have more data.[1]

The capitalization method faces a number of potential obstacles. We carefully deal with each of them and provide checks showing that the method works well in practice. First, not all assets generate taxable investment income—owner-occupied houses and pensions, in particular, do not. These assets are well covered by a number of sources and we account for them by combining the available information—surveys, property taxes paid, pension distributions, wages reported on tax returns, etc.—in a systematic manner. Second, within a given asset class, richer households might have different rates of returns than the rest of the population, in particular because of tax avoidance. We have conducted a large-scale reconciliation exercise between income tax and national accounts data to track unreported income and we impute missing wealth (e.g., held through trusts) when necessary. We then investigate all the situations where both wealth and capital income can be observed at the micro level—in the Survey of Consumer Finances (SCF), matched estate and individual income tax data, and publicly available tax returns of foundations. In each case, we find that within asset-class realized returns are similar across groups, and that top wealth shares obtained by capitalizing income are very close to the directly observed top shares in both level and trend. At the individual level, the relationship between capital income and wealth is noisy, but the capitalization method works nonetheless because the noise cancels out when considering groups of thousands of families, which is what matters for our purposes.[2]

---

[1]King (1927) and Stewart (1939) had to rely on tax tabulations by income size (instead of micro-data). Atkinson and Harrison (1978) lack sufficiently detailed income data (they had access to tabulations by size of capital income but with no composition detail). Greenwood (1983) comes closest to our methodology. She uses one year (1973) of micro tax return data and various capital income categories but does not use the Flow of Funds to estimate returns by asset class so that her estimates are not consistent with the Flow of Funds aggregates. She relies instead on market price indexes to infer wealth from income. Asset price indexes, however, have shortcomings (such as survivor bias for equities) that can cause biases when analyzing long-time periods. Recently, Mian et al. (2014) also use the capitalization method and zip code level income tax statistics to measure wealth by zip code.

[2]A number of studies have documented the noisy relationship at the individual level between income and wealth, see, e.g., Kennickell (2001, 2009a) for the SCF, and Rosenmerkel and Wahl (2011) and Johnson et al. (2013) for matched estate-income tax data.

The analysis of the distribution of household wealth since 1913 yields two main findings.

First, wealth inequality is making a comeback, with the top 0.1% wealth share almost as high in 2012 as in the 1916 and 1929 peaks and three times higher than in the late 1970s. Despite population aging, however, the rich are younger today than half a century ago: in the 1960s, top 0.1% wealth holders were older than average, which is not the case anymore today. The key driver of the rapid increase in wealth at the top is the surge in the share of income, in particular labor income, earned by top wealth holders. Income inequality has a snowballing effect on the wealth distribution: top incomes are being saved at high rates, pushing wealth concentration up; in turn, rising wealth inequality leads to rising capital income concentration, which contributes to further increasing top income and wealth shares. Our core finding is that this snowballing effect has been sufficiently powerful to dramatically affect the shape of the US wealth distribution over the last 30 years. Due to data limitations we cannot provide yet formal decompositions of the relative importance of self-made vs. dynastic wealth, and we hope our results will motivate further research in this area.[3]

The second key result involves the dynamics of the bottom 90% wealth share. There is a widespread view that a key structural change in the US economy has been the rise of middle-class wealth since the beginning of the twentieth century, in particular because of the rise of pensions and home ownership rates. And indeed our results show that the bottom 90% wealth share gradually increased from 20% in the 1920s to a high of 35% in the mid-1980s. But in a sharp reversal of past trends, the bottom 90% wealth share has fallen since then, to about 23% in 2012. Pension wealth has continued to increase but not enough to compensate for a surge in mortgage, consumer credit, and student debt. The key driver of the declining bottom 90% share is the fall of middle-class saving, a fall which itself may partly owe to the low growth of middle-class income, to financial deregulation leading to some forms of predatory lending, or to growing behavioral biases in the saving decisions of middle-class households.

Our results confirm some earlier findings using different data but contradict some others. We provide a detailed reconciliation with previous studies. First, our results are consistent with Forbes Magazine data on the wealth of the 400 richest Americans. Normalized for population growth, the wealth share of the top 400 has increased from 1% in the early 1980s to over 3% in 2012-3, on par with the tripling of our top 0.01% wealth share. Second, the SCF—a high quality survey that over-samples wealthy individuals—displays a top 10% wealth share very close in level and trend to the one we find, but smaller increases in the top 1% and especially top 0.1% shares. Several factors explain this discrepancy: By design, the SCF excludes Forbes

---

[3]See Piketty et al. (2013) for such an analysis on French data.

400 individuals; aggregate wealth in the SCF and the Flow of Funds differs (Henriques and Hsu, 2013); and the unit of observation in the SCF (the household) is larger than the one we use (the family as defined by the tax code). After adjusting for these factors, the SCF displays a substantial increase in top wealth shares from 1989 to 2013, although still not as large as by our estimates. We also find that the SCF under-estimates the increase in capital income concentration from 1989 to 1998 (less so afterward). Although the SCF uses a rigorous sampling methodology—it itself relies on the capitalization method to determine the sample of households to be surveyed—it is always difficult for surveys to capture perfectly the very top groups (Kennickell, 2009a).[4] Last, the top 0.1% wealth share estimated by Kopczuk and Saez (2004) from estate tax returns is remarkably close in level and trend to the one we obtain up to the late 1970s, but then hardly increases from 1976 to 2000. Estate-based estimates are obtained using the mortality multiplier technique, whereby individual estates are weighted by the inverse of the mortality rate (conditional on age and gender) to capture the distribution of wealth among the living. The estate-based estimates of Kopczuk and Saez (2004) assume a constant mortality differential between the wealthy and the overall population. We show that the mortality differential has in fact sharply increased since the late 1970s, explaining why estate-based estimates fail to uncover the recent surge in top wealth shares.[5]

Despite our best effort, we stress that we still face limitations when measuring wealth inequality. The development of the offshore wealth management industry, changes in tax optimization behaviors, indirect wealth ownership (e.g., through trusts and foundations) all raise challenges. Because of the lack of administrative data on wealth, none of the existing sources offer a definitive estimate. We see our paper as an attempt at using the most comprehensive administrative data currently available, but one that ought to be improved in at least two ways: by using additional information already available at the Statistics of Income (SOI) division of the IRS as well as new data that the US Treasury could collect at low cost. A modest data collection effort would make it possible to obtain a better picture of the joint distributions of wealth, income, and saving. In turn, this information would be of great relevance to evaluate proposals for consumption or wealth taxation.

The remainder of the paper is organized as follows. Section 2 discusses our definition and aggregate measure of wealth. In Section 3 we analyze the distribution of taxable capital income

---

[4]Systematically comparing our estimates with SCF estimates is a useful input for further improving the SCF sample representativity so we view our approach as complementary to the extremely valuable SCF surveys.

[5]The recent increase in the mortality differential by life-time earnings and education levels has been carefully documented (see, e.g., Waldron, 2004, 2007). The differential mortality estimates by wealth class we compute could be used to improve the estate multiplier method. Hence, the capitalization method is also a useful complement to the estate multiplier method.

and present our method for inferring wealth from income. Section 4 discusses the pros and cons of the capitalization method and provides a number of checks suggesting that it works well in practice. We present our results on the distribution of household wealth in Section 5 and we analyze the relative importance of changes in income shares, saving rates, and capital gains in the dynamics of US wealth inequality in Section 6. Section 7 compares our estimates to previous studies. Section 8 concludes. The key steps of the analysis are presented in the text, while complete tabulations of results with detailed methodological notes are posted in a set of online Excel files on the authors' websites.

2 What is Wealth? Definition and Aggregate Measures

2.1 The Wealth Concept We Use

Let us first define the concept of wealth that we consider in this paper. Wealth is the current market value of all the assets owned by households net of all their debts. Following international standards codified in the System of National Accounts (United Nations, 2009), assets include all the non-financial and financial assets over which ownership rights can be enforced and that provide economic benefits to their owners.

Our definition of wealth includes all pension wealth—whether held on individual retirement accounts, or through pension funds and life insurance companies—with the exception of Social Security and unfunded defined benefit pensions. Although Social Security matters for saving decisions, the same is true for all promises of future government transfers. Including Social Security in wealth would thus call for including the present value of future Medicare benefits, future government education spending for one's children, etc., net of future taxes. It is not clear where to stop, and such computations are inherently fragile because of the lack of observable market prices for this type of assets. Unfunded defined benefit pensions are promises of future payments which are not backed by actual wealth. The vast majority (94% in 2013) of unfunded pension entitlements are for Federal, State and local government employees, thus are conceptually similar to promises of future government transfers, and just like those are better excluded from wealth. According to the Flow of Funds, unfunded defined benefit pensions represent the equivalent of 5% of total household wealth today, down from 10-15% in the 1960s-1970s. Treating them as household wealth would reinforce our finding of an inverted-U shaped evolution of the bottom 90% wealth share, as unfunded pensions are relatively equally distributed.[6]

Our wealth concept excludes human capital, which contrary to non-human wealth cannot

---

[6]Recall that we treat all *funded* defined benefit pensions as wealth, just like defined contribution pensions.

be sold on markets. Because the distributions of human and non-human capital are shaped by different economic forces (savings, inheritance, and rates of returns matter for non-human capital; technology and education, among others, matter for human capital), it is necessary to start by studying the two of them separately. In Section 5 we investigate how the labor income of top wealth-holders has evolved, and we refer to Aaberge et al. (2014) for a more comprehensive analysis of the joint distribution of human and non-human capital.

We also exclude the wealth of nonprofit institutions, which amounts to about 10% of household wealth.[7] The bulk of nonprofit wealth belongs to hospitals, churches, museums, education institutions and research centers, and thus cannot easily be attributed to any particular group of households. It would probably be desirable to attribute the wealth of some private foundations (e.g., Bill and Melinda Gates) to specific families. But this cannot always be done easily, as in the case of foundations created long ago (like the Ford or MacArthur foundations). The wealth of foundations is still modest compared to that of the very top groups—it amounts to 1.2% of total household wealth in 2012—but it is growing (it was 0.8% in 1985).[8]

Last, we exclude consumer durables (about 10% of household wealth) and valuables from assets. Durables are not considered as assets by the System of National Accounts and there is no information on tax returns about them.[9]

2.2 Aggregate Wealth: Data and Trends

With this definition in hand, we construct total household wealth—the denominator we use when computing wealth shares—as follows. For the post-1945 period, we rely on the latest Flow of Funds (US Board of Governors of the Federal Reserve System, 2014). The Flow of Funds report wealth as of December 31 and we compute mid-year estimates by averaging end-of-year values. For the 1913-1945 period, we combine earlier estimates from Goldsmith et al. (1956), Wolff (1989), and Kopczuk and Saez (2004) that are based on the same concepts and methods as the Flow of Funds, although they are less precise than post-1945 data.

For our purposes, the Flow of Funds data have two main limitations. First, they fail to capture most of the wealth held by households abroad such as the portfolios of equities, bonds, and mutual fund shares held by US persons through offshore financial institutions in Switzerland, the Cayman Islands, and similar tax havens, as well as foreign real estate. Zucman (2013, 2014)

---

[7]See Appendix Tables A31 and A32 for data on nonprofit institutions' wealth and income.

[8]See Appendix Table C9. Note that Forbes Magazine does not include the wealth transferred to private foundations in its estimates of the 400 richest Americans either.

[9]According to the Survey of Consumer Finances, cars, which represent the majority of durables wealth, are relatively equally distributed so adding durables would reduce the level of wealth disparity but may not have much impact on trends.

estimates that offshore financial wealth amounts to about 8% of household financial wealth at the global level and to about 4% in the case of the United States. We will examine how imputing offshore wealth to households affects our estimates. Second, the Flow of Funds evaluates fixed income claims at face value instead of market value. Changes in Federal fund rates can have large effects on long-term bond prices (issued at a fixed interest rate) and this variation is ignored when pricing bonds at face value. Because bonds are very unequally distributed,[10] face-value pricing means that we might under-estimate wealth concentration since the beginning of the low interest rate period in 2008.

At the aggregate level, the key fact about US wealth is that it is growing fast. The ratio of household wealth to national income has followed a U-shape evolution over the past century, a pattern also seen in other advanced economies (Piketty and Zucman, 2014a).[11] Household wealth amounted to about 400% of national income in the early 20th century, fell to around 300% in the post-World War II decades, and has been rising since the late 1970s to around 430% in 2013 (Figure 2). But the composition of wealth has changed markedly. Pensions were negligible a century ago and now amount to over 100% of national income, while there has been a secular fall in unincorporated business assets, driven primarily by the decline of the share of agriculture in the economy. One should not interpret the rise of pension wealth as a proof that inherited wealth is bound to play a minor role in the future. In 2013, about half of pension wealth is transmissible at death, namely all individual retirement accounts (IRAs), defined contribution pensions (such as 401(k)s), and non-annuitized life insurance assets.

3 From Reported Income to the Distribution of Wealth

The goal of our analysis is to allocate the total Flow of Funds wealth depicted in Figure 2 to the various groups of the distribution. To do so, we begin by looking at the distribution of reported capital income. We then capitalize this income, and systematically account for wealth that does not generate taxable income.

3.1 The Distribution of Taxable Capital Income

The starting point is the taxable capital income reported on individual tax returns. For the post-1962 period, we rely on the yearly public-use micro-files available at the NBER that provide

---

[10]According to our estimates, the top 0.1% of the wealth distribution owns about 39% of all fixed income claims (vs. 22% of all wealth), see Appendix Table B11.

[11]National income comes from the NIPAs since 1929, Kuznets (1941) for 1919-1929 and King (1930) for 1913-1919.

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. All the results using internal data used in this paper are published in Saez and Zucman (2014).[12] For the pre-1962 period, no micro-files are available so we rely instead on the Piketty and Saez (2003) series of top incomes which were constructed from annual tabulations of income and its composition by size of income (US Treasury Department, Internal Revenue Service, 2012). Our unit of analysis is the tax unit, as in Piketty and Saez (2003). A tax unit is either a single person aged 20 or above or a married couple, in both cases with children dependents if any. Fractiles are defined relative to the total number of tax units in the population—including both income tax filers and non-filers—as estimated from decennial censuses and current population surveys. In 2012, there are 160.7 million tax units covering the full population of 313.9 million US residents.[13] The top 0.1% of the distribution, therefore, includes 160,700 tax units.

Figure 3 depicts the share of reported taxable capital income earned by the top 0.1%. Capital income includes dividends, taxable interest, rents, estate and trust income, as well as the profits of S-corporations, sole proprietorships and partnerships, and excludes interest of municipal securities (which is tax exempt, although it is reported on tax returns since 1987). We also report the series including realized capital gains. The series in Figure 3 imperfectly capture the distribution of the total economic capital income of US families, because not all of it is taxable. But they nonetheless provide a useful starting point: they display the tax return data with no assumption whatsoever.

Three results are worth noting. First, the concentration of taxable capital income has risen enormously. The top 0.1% share excluding capital gains used to be 10% in the 1960s-1970s. In 2012, the latest data point available, it is 33%. Second, part of this rise occurs at the time of the Tax Reform Act of 1986, and may thus reflects changes in tax avoidance rather than in the distribution of true economic income. Yet the top 0.1% share including capital gains—which

---

[12]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. Our estimates use the public use files up to 1995 and the internal files starting in 1996 (due to methodological changes in the public use files altering its representativity at the high end starting in 1996).

[13]US citizens are taxable in the United States even when living abroad. In 2011, about 1.5 million non-resident citizens filed a 1040 return (Hollenbeck and Kahr, 2014, Figure B p.143, col. 2). These families should in principle be added to our tax units total. We ignore this issue and leave the task of accounting for the income and wealth of non-resident citizens to future research. The total number of US citizens living abroad is uncertain (a recent estimate of the Association of American Resident Overseas puts it at 6.3 million, excluding government employees). The lack of exchange of information between countries makes it difficult to enforce taxes on non-residents, so that a large fraction of them do not appear to be filing a return. Our estimates should be seen as representative of the distribution of income among US residents rather than US citizens.

were heavily tax-favored up to 1986—has increased is similar proportions (from about 15% in the 1960s-1970s to 42% in 2012) with no trend break in 1986. Third, some of the profits of partnerships and S-corporations include a labor income component, so that part of the rise of the top 0.1% share reflects a rise of top entrepreneurial income rather than pure capital income. However, the concentration of pure capital income has also increased significantly. The share of corporate dividends earned by the top 0.1% dividend-income earners was 35% in 1962; it is 50% in 2012.[14] The increase is even more spectacular for taxable interest, from 12% to 47%. In brief, the tax data are consistent with the view that capital inequality has risen dramatically in the United States. As we shall see, however, the concentration of wealth has increased less than that of taxable capital income, in particular because of the rise of tax exempt pensions.

3.2   The Capitalization Technique

The second step of the analysis involves capitalizing the investment income reported by tax-payers. The capitalization method is well suited to estimating the US wealth distribution, for one simple reason. The US income tax code is designed so that capital income flows to individual returns for a wide variety of ownership structures, resulting in a large amount of wealth generating taxable income. In particular, dividends and interest earned through mutual funds, S-corporations, partnerships, holding companies, and some trusts end up being including in the "interest" and "dividends" lines of the ultimate individual owner's tax return, just as income from directly-owned stocks and bonds. Many provisions in the tax code prevent individuals from avoiding the income tax trough the use of wealth-holding intermediaries or exotic financial instruments. One of the most important one is the accumulated earnings tax—in force since 1921—levied on the undistributed corporate profits deemed to be retained for tax avoidance purposes (Elliott, 1970).[15] Similarly, the personal holding company tax—in place since 1937— effectively prevents wealthy individuals from avoiding the income tax by retaining income in holding companies. Imputed interest on zero-coupon bonds is taxed like regular interest. Admittedly, not all assets generate taxable income, and incentives to report income have changed over time. Notwithstanding, the capitalization method constitutes a reasonable starting point.

How the capitalization technique works.   There are nine categories of capital income in the tax data. We carefully map each of them (e.g., "dividends", "rents") to a wealth category

---

[14]See Appendix Table B23. At the very top of the distribution, the concentration of taxable dividend income is at an all-time high: 31% of taxable dividends accrue to 0.01% of tax units, which is more than in 1929 (26%), see Appendix Figure B11.

[15]Before 1921, shareholders could be directly taxed on the excessive retained earnings of their corporations.

in the Flow of Funds (e.g., households' "corporate equities", "tenant-occupied housing"). Then, for each category we compute a capitalization factor as the ratio of aggregate Flow of Funds wealth to tax return income, every year since 1913.[16] By construction, this procedure ensures consistency with the Flow of Funds totals. For example, in 2000 there is about $5 trillion of personal wealth generating taxable interest in the Flow of Funds—bonds except municipal securities, bank deposits, loans, etc.—and about $200 billion of reported taxable interest income. The capitalization factor for taxable interest is thus equal to 25, i.e., the aggregate rate of return on taxable fixed claims is 4%. The capitalization factor varies over asset classes—e.g., it is higher for rental income (37 in 2000) than for partnership profits (7 in 2000)—and over time.

For the post-1962 period, we impute wealth at the individual level by assuming that within a given asset class, everybody has the same capitalization factor. Before 1962, we impute it at the group level by capitalizing the capital income of top 1%, top 0.1%, etc., income earners.[17] In both cases, computing top wealth shares by capitalizing income essentially amounts to allocating the fixed income wealth recorded in the Flow of Funds to each group of the distribution based on how interest income is distributed, and similarly for each other asset class. This procedure does not require us to know what the "true" rate of return to capital is. For example, business profits include a labor income component, which explains why the capitalization factor for business income is small. But as long as the distribution of business income is similar to that of business wealth, the capitalization method delivers good results. (Section 4 provides a detailed discussion of the pros and cons of this method and evidence suggesting that it works well.)

How we deal with capital gains. In general there is no ambiguity as to how income should be capitalized. The only exception relates to equities, which generate both dividends and capital gains. There are three ways to deal with equities. One can first capitalize dividends only. In 2000 for instance, the ratio of Flow of Funds households' corporate equities to dividends reported on tax returns is 54, so equity wealth can be captured by multiplying individual-level dividends by

---

[16]In recent years, capitalizing income tax returns allows us to capture 8 asset classes: corporate equities (excluding S corporations), taxable fixed income claims (taxable bonds, deposits, etc.), tax-exempt bonds (i.e., municipale securities), tenant-occupied housing, mortgages, sole proprietorships, partnerships, and equities in S corporations. One tax-returns income category, "estate and trust income", does not correspond to any specific asset class (see below). In top of this, our analysis includes all other asset classes that do not generate taxable income: owner-occupied housing, non-mortgage debt, non-interest bearing deposits and currency, pensions, and life insurance (see below). Further back in time, the number of asset classes is somewhat more limited, but in all cases we each year cover 100% of wealth. The mapping process and construction of the capitalization factor is detailed in Appendix Tables A1 to A11. Our capitalization factors are displayed in Appendix Figures A13 to A19.

[17]Top 1% income earners are not exactly the same as top 1% wealth-holders, and we correct for such re-ranking. The margin of error here is limited, because prior to 1962 top income earners derived most of their income from capital rather than labor. See Appendix Tables for complete details.

54 and capital gains by 0. But realized gains also provide useful information on stock ownership, so that we could capitalize them as well. In 2000, the ratio of equities to the sum of dividends and capital gains is 10, so equity wealth can be captured by multiplying the sum of dividends and capital gains by 10. Realized capital gains, however, are lumpy. For example, a business-owner might sell all her stock once in a lifetime upon retirement so that we would exaggerate the concentration of equity wealth. A third method can be applied, whereby capital gains are ignored when ranking individuals into wealth groups but taken into account when computing top shares. To determine a family's ranking in the wealth distribution, dividends are multiplied by 54 in 2000, and to compute top shares both dividends and capital gains are multiplied by 10 in 2000.[18] This mixed method smooths realized capital gains.[19] Given that this third strategy uses all the available information and works best in situations where we can observe both income and wealth at the micro level, our baseline estimates rely on this mixed strategy.

Although our treatment of capital gains is imperfect—it could be improved, for instance, if we had long panel data that would enable us to attribute equities to taxpayers in the years preceding realizations—there is no evidence that it biases the results in any specific direction. In particular, whether one disregards capital gains, fully capitalizes them, or adopts the mixed method does not affect the results too much. The reason is that groups that receive lots of dividends also receive lots of capital gains, so that allocating the total Flow of Funds equity wealth on the basis of how dividends alone or the sum of dividends and gains are distributed across groups makes little difference. The top 0.1% wealth share was 7-8% in 1977 whatever way capital gains are dealt with. In 2012, the top 0.1% is equal to 21.6% when capitalizing dividends only, 23.6% when fully capitalizing gains, and 22.1% in the baseline mixed method.[20] Our baseline estimates are always close to those obtained by capitalizing dividends only.

3.3 Accounting for Wealth that Does not Generate Taxable Income

The third step of our analysis involves dealing with the assets that do not generate taxable income. In 2012, the most important ones are pensions and owner-occupied houses. Although

---

[18]This mixed method is similar to the mixed series of Piketty and Saez (2003) which exclude realized capital gains for ranking families but adds back realized capital gains to income when computing top shares.

[19]Aggregate realized capital gains also vary significantly from year to year due to stock prices (and tax reforms that create incentives to realize gains prior to tax hikes, as in 1986 and 2012). However, such spikes in realized gains do not create discontinuities in our estimates as the capitalization factor adjusts correspondingly.

[20]See Appendix Tables B1, B34, B36, and Appendix Figure B27. Capital gains are usually more concentrated than dividends (due to lumpy realizations at the individual level), so that top wealth shares obtained by fully capitalizing gains tend to be higher than those obtained by capitalizing dividends only—but only slightly so. The difference between the top 0.1% share including and excluding capital gains is higher today than in the 1970s because high dividend earners tend to realize large capital gains today while this was less true in the 1970s.

these assets are sizable, they do not raise insuperable problems, for two reasons. First, there is limited uncertainty on the distribution of pensions and main homes across families, as they are well covered by micro-level survey sources. We have conducted our imputations so as to be consistent with all the available evidence. Second, surveys, individual income tax returns (and estate tax returns) all show that pensions (and main homes) account for a small fraction of wealth at the top end of the distribution, so that any error in the way we allocate these assets across groups is unlikely to affect our top 1% or 0.1% wealth shares much.

Owner-occupied housing. We infer the value of owner-occupied dwellings from property taxes paid. These taxes are itemized on tax returns by roughly the top third of the income distribution. Using information on total property taxes paid in the NIPAs, and consistent with what Survey of Consumer Finances data show, we estimate that itemizers own 75% of homes. We assume that they all face the same effective property tax rate.[21] Property tax rates differ across and within States and our computations could thus be improved using existing tax data (e.g., by matching taxpayers' addresses to third-party real estate databases) and by explicitly accounting for year-to-year variations in the fraction of itemizers.[22] For our purposes, however, these problems are second-order, as about 5% only of the wealth of the top 0.1% takes the form of housing today. We proceed similarly for mortgage debt using mortgage interest payments; consistent with NIPA and SCF data, we assume that itemizers have 80% of all mortgage debt.

Life insurance and pension funds. Life insurance and pension funds—both individual accounts and defined benefits plans—do not generate taxable capital income. Pensions have been growing fast since the 1960s and now account for a third of total household wealth. Since many regulations prevent high income earners from contributing large amounts to their tax-deferred accounts, pension wealth is more evenly distributed than overall wealth. We allocate

---

[21]The amount of owner-occupied housing wealth in the Flow of Funds is usually about 100 times bigger than the amount of property taxes paid in the NIPAs, that is, the average property tax rate is usually about 1%, see Appendix Table A11. According to the SCF, however, property taxes are regressive: on average over 1989-2013 the effective property tax rate is equal to about 1% for the full population, but as little as 0.4% for households in the top 0.1% of the wealth distribution. Hence housing wealth is less concentrated in the SCF than in our series (see Henriques (2013) for a detailed analysis of the differences in trends and levels of housing wealth in the SCF and the Flow of Funds). Property tax rates could be mildly declining with wealth if rich taxpayers tend to live in low property tax States. Wealthy SCF respondents, on the other hand, might under-estimate the value of their houses. The flat rate assumption we retain seems the most reasonable starting point, although it ought to be improved. Another issue is that in recent years, itemized property taxes on tax returns have exceeded the amount of property taxes paid on main homes recorded in the NIPAs, which could be due either to errors in the NIPAs or to over-reporting by taxpayers, see Appendix Table A8.

[22]32% of tax units were itemizing in 2008, down from 37% in 1962. The fraction of itemizers declined in the early 1970s and again at the time of the Tax Reform Act of 1986 (from 37% in 1986 to 28% in 1988). We have checked, however, that accounting for these trends has only a negligible effect on our series.

pension wealth on the basis of how pension distributions and wages—that we both observe at the micro level—are distributed, in such a way as to match the distribution of pension wealth in the SCF.[23] We have also checked that the resulting distribution of pension wealth is consistent with information from the Statistics of Income on the distribution of individual retirement accounts, whose balances are automatically reported to the IRS, and which account for 30% of all pension wealth today.[24] Life insurance is small on aggregate and we assume that it is distributed like pension wealth. Just like in the case of housing, the way we deal with pensions could be improved—in particular if 401(k) balances were reported to the IRS like balances on IRAs—, but this would not affect much our top wealth shares because pension wealth accounts for only 5% of the wealth of the top 0.1% today. Better data on pensions would make it possible to have a more accurate picture of the distribution of wealth among the bottom 90%, though.

Non-taxable fixed income claims. Although interest from State and local government bonds is tax exempt, it has been reported on individual tax returns since 1987. Before 1987, we assume that it is distributed as in 1987, with 97% of municipal bonds belonging to the top 10% of the wealth distribution and 32% to the top 0.1%. Tax exempt interest might have been even more concentrated before 1987 when top tax rates were higher, but the margin of error is limited, as on aggregate tax exempt bonds amounted to only 0.5%-1.5% of household wealth from 1913 to the mid-1980s. The Statistics of Income division at IRS also produced tabulations in the 1920s and 1930s showing that tax exempt interest was always a minor form of capital income, even in very top brackets. Currency and non-interest deposits—which account for about 1% of total wealth today—as well as non-mortgage debt do not generate taxable income (or reportable payments) either. We allocate these assets across families so as to match their distribution in the SCF.[25]

---

[23]Specifically, we assume that 60% of pension wealth belongs to current pensioners and 40% to wage earners. For pensioners, we assume that pension wealth is proportional to pension distributions. For wage earners, we assume that it is proportional to wages but excluding tax filers with wage income in the bottom 50% of the wage distribution, as only about 50% of wage earners have access to pensions. Under these assumptions, the distribution of pension wealth is a bit more equal in our dataset than in the SCF (which is justified since the SCF excludes defined benefit pensions, which are relatively equally distributed) and follows the same time trend.

[24]End-of-year IRA balances are reported on 5428 information returns, see Bryant and Gober (2013). Aggregate IRA wealth is large in spite of small IRA contributions in part because many 401(k) plans end up being rolled over into IRAs (for example, when employees leave a firm). Over the 2004-2011 period, the top 1% IRA wealth-holders (defined relative to the full population, including those with zero IRA balances) own 36.1% of total IRA balances. The top 0.1% owns 10.2% and the top 0.01% owns 3.3%. The famous case of 2012 presidential candidate Mitt Romney with a huge IRA balance seems to be truly exceptional. In contrast to overall wealth, IRA concentration is stable from 2004 to 2011.

[25]Before 1987, non-mortgage interest payments were tax-deductible and so we can account for non-mortgage debt by capitalizing non-mortgage interest. See Appendix Tables B42 and B43.

Trust wealth. Our estimates fully incorporate the wealth held by individuals through trusts. Trusts are entities set to distribute income—and possibly wealth—to individual beneficiaries or charities. Trust income distributed to individuals flows to the beneficiaries' individual tax returns, directly to the dividend, realized capital gain, or interest lines for such income, and to Schedule E fiduciary income for other income such as rents and royalties. Retained trust income is taxed directly at the trust level. Total trust wealth decreased from 7-8% of household wealth in the 1960s to around 5% today, and the portion of trust wealth that generates retained income from 3-4% to 2%.[26] We allocate this wealth to families on the basis of how schedule E trust income is distributed. Up to the late 1960s, income taxes could be avoided by splitting wealth in numerous trusts, so that each would be subject to a relatively low marginal tax rate. Such splitting might account for part of the variations in top wealth shares we find in the early 1920s when trust splitting might have been used to avoid the high top tax rates of the period 1917-1924. Stronger anti-deferral rules were gradually put into place. Since 1987, retained trust income is taxed at the top individual tax rate above a very low threshold. Our estimates fully take into account that the use of trusts was more prevalent in the past.[27]

Offshore wealth. Last, we attempt to account for tax evasion. US financial institutions automatically report to the IRS dividends, interest, and capital gains earned by their clients, making tax evasion through US banks virtually impossible, but taxpayers can evade taxes by holding wealth through foreign banks. Zucman (2013, 2014) estimates that about 4% of US household net financial wealth (i.e., about 2% of total US wealth) is held in offshore tax heavens in 2013. There is evidence that the bulk of the income generated by offshore assets is not reported to the IRS.[28] Furthermore, the share of wealth held offshore has considerably increased in recent decades.[29] We account for offshore wealth in supplementary series by assuming that it is distributed as trust income (i.e., highly concentrated). We find that the top wealth shares rise

---

[26]See Appendix Tables A33 and A34, and Appendix Figures A29 to A34.

[27]Trusts remain useful to avoid the estate tax. The general idea is for wealthy individuals to keep control of the trust and its income while alive but give the remainder to their heirs. When such a trust is created (perhaps decades before death), the gift value is small and hence the gift tax liability is modest (the trust has zero value for estate tax purposes at death because the remainder has already been given).

[28]As documented in US Senate (2008, 2014), in 2008 about 90%-95% of the wealth held by US citizens at UBS and Credit Suisse in Switzerland is unreported to the IRS. Reporting, however, might improve in the future following the implementation of new regulations (the Foreign Account Tax Compliance Act) that compel foreign financial institutions to automatically report to the IRS the income earned by US citizens.

[29]Treasury International Capital data show that, from the 1940s to the late 1980s, the share of US corporations' listed equities held by tax-haven firms and individuals was about 1%. This share has gradually increased to close to 10% in 2013 (see Zucman (2014), and this paper's Appendix Figure A35). Only a fraction of these assets belong to US individuals evading taxes, but the low level of offshore wealth prior to the 1980s shows that offshore tax evasion was not a big concern then, presumably because it was harder to move funds abroad.

even more when including offshore wealth: the top 0.1% owns 23.0% of total wealth—instead of 22.1% in our baseline estimate—in 2012. This correction should be seen as a lower bound as it only accounts for offshore portfolio equities, bonds, and mutual fund shares, disregarding offshore real estate, closely held businesses, derivatives, cash, etc.

After supplementing capitalized incomes by estimates for assets that do not generate taxable investment income, we each year cover 100% of the identifiable wealth of US households. Due to data limitations, imputations are cruder prior to 1962.[30] At that time, however, pension wealth was small, so that the vast majority of household wealth (70-80%) *did* generate investment income, thus limiting the potential margin of error. To obtain reliable top wealth shares, accurately measuring the distribution of equity wealth and fixed income claims—which constitute the bulk of large fortunes—is key.

4   Pros and Cons of the Capitalization Method

To capture the distribution of equities, business assets, and fixed income claims, we capitalize the dividends, business profits, and interest income reported by taxpayers, assuming a constant capitalization factor within asset class. Here we discuss the pros and cons of this approach and provide evidence that it delivers accurate results, in particular by successfully testing it in three situations where both capital income and wealth can be observed at the micro level.

4.1   How Returns Heterogeneity May Affect our Estimates

Idiosyncratic returns.   The first potential problem faced by the capitalization method is that within a given asset class not all families have the same rate of return. How does that affect our estimates? Suppose there is a single asset like bonds and that individual returns r_i are orthogonal to wealth W_i. In that case, capital income $r_i W_i$ will be positively correlated with r_i and the capitalization method will attribute too much wealth to high capital income earners. If wealth is Pareto-distributed with Pareto parameter $a > 1$, then top wealth shares will be over-estimated by a factor r_a/r, where $r = Er_i$ is the straight mean rate of return and

---

[30]The Piketty and Saez (2003) top income series do not provide information on capital income for net housing wealth, pension wealth, tax-exempt muni bonds, non-interest bearing fixed claim assets (currency and current deposits), and non-mortgage debt. Therefore, we assume that the fraction of these assets held by each fractile of wealth is constant and equal to the average for 1962-1966. These components are small for the top 1% and above groups and hence this assumption has only a minimal impact of the estimates. Pensions are small overall before the 1960s. One could use Census data on home ownership and mortgages to try to improve upon our housing wealth series.

$r_a = (Er_i^a)^{1/a}$ is the power mean rate of return.[31] By Jensen inequality, $r < r_a$.

From a purely logical standpoint, such idiosyncratic returns cannot create much bias, for three reasons. First, since wealth is extremely concentrated, idiosyncratic variations in returns (say, from 2% to 4%) are small compared to variations in wealth (say, from \$1 million to \$100 million) and as a result r_a/r tends to be close to 1. To see this, start with the extreme case where the Pareto coefficient a is equal to 1, i.e., the very top virtually owns all the wealth. Then $r_a/r = 1$ and there is no bias. Now consider a wealth distribution with a realistically shaped fat tail, namely $a = 1.5$. Assume that individual returns r_i are distributed uniformly on the interval $[0, 2r]$. Then $r_a/r = 2/(1+a)^{1/a} = 1.086$, i.e., the capitalization method exaggerates top wealth shares by 8.6% only. A more realistic distribution of r_i more concentrated around its average r produces a smaller upward bias. Second, the presence of different asset classes—from which the above computations abstract—further dampens the bias. Third, equities are the only asset class for which returns dispersion might be large, because of capital gains. But as we have seen, our baseline estimates are very close to those obtained by ignoring capital gains and capitalizing dividends only, so this concern does not seem to be quantitatively important in practice.

Returns correlated with wealth. A more serious concern is that returns r_i not only differ idiosyncratically across individuals, they might also be correlated with wealth W_i. For instance, wealthy individuals might be better at spotting good investment opportunities and thus earn higher equity and bond returns, perhaps thanks to financial advice. This differential might even have increased over time with financial globalization and innovation.

The potential correlation of returns with wealth does not necessarily bias our estimates. First, returns can rise with wealth because of portfolio compositions effects. This will be the case, for instance, if the wealthy hold relatively more corporate equities and corporate equities have higher returns than other assets. Since our capitalization factors vary by asset class, our top wealth share series are immune to portfolio composition effects. Second, rates of return may rise with wealth because the rate of unrealized capital gains may rise with wealth. In that case, our top wealth shares will not be biased either, because what matters for the capitalization technique is that within each asset class *realized* rates of return be the same across wealth

---

[31]To see this, suppose the wealth distribution $F(W)$ is Pareto above percentile p_0 so that $Pr(W_i \geq W) = 1 - F(W) = p_0 \cdot (W_{p_0}/W)^a$ with W_{p_0} the wealth threshold at percentile p_0. Let $F_c(W)$ be the distribution of capitalized wealth defined as $W_i^c = (r_i/r) \cdot W_i$ where r_i is the individual rate of return (and r the average rate of return). Suppose $r_i \perp W_i$. Then $1 - F_c(W) = Pr(r_i W_i \geq rW) = \int_{r_i} Pr(W_i \geq (r/r_i)W|r_i) = \int_{r_i} p_0 \cdot (r_i/r)^a \cdot (W_{p_0}/W)^a = Pr(W_i \geq W) \cdot Er_i^a/r^a = (1 - F(W)) \cdot (r_a/r)^a$. This immediately implies that $W_p^c = W_p \cdot (r_a/r)$ and hence $sh_p^c = sh_p \cdot (r_a/r)$ where sh_p and sh_p^c are the share of wealth and the share of capitalized wealth owned by the top p fractile.

groups. One striking illustration is provided by the case of foundations.

Test with foundations. Foundations are required to annually report on both their wealth and income to the IRS in form 990-PF. These data are publicly available in micro-files created by the Statistics of Income that start in 1985. Our analysis first shows that total rates of returns—including unrealized capital gains—rise sharply with foundation wealth (see Appendix Figure C4), just like total returns on university endowments (Piketty, 2014, Chapter 12). On average over 1990-2010, foundations with assets between $1 million and $10 million (in 2010 dollars) have a yearly total real return of 3.9%. For foundations with $10-$100 million in assets the return is 4.5% and it is as high as 6.3% for foundations with more than $5 billion. But the positive correlation between foundation wealth and return is essentially due to the fact that unrealized capital gains rise with wealth (and to a mild portfolio composition effect).

As a result, despite the fact that total rates of returns rise with wealth, the capitalization method captures wealth concentration among foundations extremely well, as shown in the bottom Panel of Figure 5. On average over the 1985-2009 period, when using the direct wealth information, the top 1% foundations own 62.8% of wealth and the top 0.1% owns 36.2%. When capitalizing income, the figures are 62.2% and 35.5% respectively. The capitalization method also correctly captures the rising top 0.1% share.[32] The capitalization method works well because although total rates of returns rise with wealth, realized rates of returns are flat within asset class. Neither idiosyncratic return heterogeneity, nor the correlation of total returns with wealth prevents the capitalization method from delivering reliable results.

The foundation test is useful because wealthy foundations have portfolios that are not dissimilar to those of very rich families—both are often managed by the same private banks and investment funds. As shown in Appendix Figure C2, the top 1% foundations—about 1,000 entities that have assets above $80 million in 2010—own large portfolios of listed equities and bonds as well as a large and growing amount of business assets (through private equity and venture capital funds rather than directly as in the case of successful entrepreneurs). Cash, deposits, real estate, and other assets are negligible. This pattern is similar to the one found for top 0.01% families, which have more than $100 million in assets in 2012 (see Figure 8 below). There are two caveats, however. Foundations have minimum spending rules that might lead them to have different realization patterns than wealthy families, and they are tax exempt.

---

[32]In Figure 5, capital gains are disregarded for ranking foundations but included to compute top shares, just as we do for families. As shown in Appendix Figure C5, fully capitalizing capital gains would lead to overestimating foundation wealth concentration while capitalizing dividends only would slightly underestimate it. This provides further support to using the mixed method in our estimates.

4.2 How Tax Avoidance May Affect our Estimates

The third potential problem faced by our method is that within-asset class realized returns, although flat for foundations, might differ across households because of tax avoidance.

Tax avoidance might lead us to under-estimate top wealth shares. That would be the case if the rich own assets that generate relatively little taxable income in order to avoid the income tax. Because of tax progressivity, the incentives to do so are higher for wealthier individuals— what is known as tax clienteles effects in the public finance literature (see Poterba, 2002, for a survey). For instance, savers can invest in corporations that never pay dividends but retain all their profits. Retained earnings cause equity prices to rise and thus ultimately generate taxable capital gains. Yet when equities are transmitted at death, no capital gain is reportable by heirs because of a provision known as the "step-up basis at death." With careful tax planning, wealthy individuals might report little income, leading us to under-estimate their wealth.

Conversely, tax avoidance might lead us to over-estimate top wealth shares. The rich might have larger taxable rates of returns than average, as they might be able to re-classify labor income into more lightly taxed capital income. For instance, hedge and private equity fund managers are rewarded for managing their clients' wealth through a share of the profits made. This "carried interest" is usually taxed as realized capital gains although economically, it is labor compensation, since the fund managers do not own the assets that generate the gains. Capitalizing carried interest thus exaggerates the wealth of fund managers. A similar issue arises with some other compensation schemes, for instance with some forms of stock options.[33]

The biases due to tax avoidance might also have changed over time. Wealthy individuals might have owned a lot of wealth that did not generate much taxable income in the 1970s when ordinary tax rates were high, and the reduction in tax progressivity at the top in the 1980s (see e.g. Piketty and Saez, 2007) could then have led them to report more capital income. Conversely, in the 1970s, there were strong incentives to reclassify labor as capital gains, because gains were taxed at a much lower rate, while such shifting has been less advantageous since 1988.

We have dealt with these potential concerns in two steps. First, at the macro-level, we have

---

[33]The vast majority of stock options profits are taxed as wages. When they are exercised, the difference between the market value of the stock and the exercise price (the amount the stock can be bought for according to the option agreement) is reportable on forms W-2 as wage income. But a small amount of options (known as incentive or qualified stock options) are taxed as realized capital gains. More broadly, most forms of reclassification involve transforming labor income into capital gains rather than dividends or interest. For instance, private equity funds essentially realize capital gains, which in turn flow to the partners' individual income tax returns as a payment for their managing the fund (part of the carried interest of hedge fund managers can take the form of interest and dividend income, however). Since our top wealth shares are very close to those obtained by completely ignoring capital gains, reclassification of labor income into capital income is unlikely to play a big role in the rise of wealth concentration we document.

conducted a large-scale reconciliation exercise between tax data and national accounts income data from US Department of Commerce, Bureau of Economic Analysis (2014) 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.[34] 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). Second, at the micro-level, in situations where both personal wealth and taxable income can be observed, we show that the taxable return within asset class is approximately constant across groups and has remained flat over time, so that capitalizing taxable income generates the correct top wealth shares.

Test linking estates and income. The first situation where both personal wealth and taxable income can be observed at the micro level is matched estates and income tax data. There is a long tradition at the Statistics of Income Division of the IRS investigating the link between income and wealth using such matched estates-income returns; see notably Johnson and Wahl (2004), Rosenmerkel and Wahl (2011), Johnson et al. (2011), Johnson et al. (2013), and Bourne and Rosenmerkel (2014). Here, we rely on publicly available data: a sample of estates filed in 1977—80% of which are for individuals who died in 1976—matched to the decedents' 1974 individual tax returns (see Kopczuk, 2007, for a detailed presentation of the data). Since income tax returns sum the incomes of spouses, we focus solely on non-married individuals.[35] We analyze the two asset classes for which we have data on both wealth and income: corporate equities and fixed claim assets.

Within each asset class, top wealth and taxable capital income shares turn out to be extremely close. The top 1% stock-owners owned 69.5% of all the corporate stocks of decedents, and the top 1% dividend income earners had 68.6% of all dividends, as reported in Appendix Table C5. Similarly, the top 1% fixed claim assets share (37.8%) was almost the same as the top 1% interest income share (38.8%). Although taxable rates of returns varied at the individual level, they were roughly the same across wealth groups within each asset class. Strikingly, despite facing a 70% top marginal tax rate, wealthy individuals did earn a lot of dividends

---

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

[35]In the sample, there is a large outlier in terms of corporate equity ownership that skews the results at the very top and that we have excluded from the computations below.

(Figure 4, top panel). Dividends were large on aggregate—on average, the dividend yield of decedents was 5.1%—and important for wealthy individuals too: in the top 0.1% and 0.01% of the distribution of wealth at death the dividend yield was around 4.7%. Wealthy people were unable or unwilling to avoid the income tax by investing in non-dividend paying stocks: tax clientele effects were quantitatively small. One caveat, however, is that perhaps old people made different portfolio choices than younger individuals. To deal with this issue, one should ideally weight each individual observation by the inverse of the probability of death. Unfortunately, there are too few individuals dying young in the sample to meaningfully address the issue.

Today's rich may have different behaviors than wealthy individuals of the 1970s. Although we do not have comparable micro-data, the Statistics of Income division at IRS has published tabulations from matched estate-income returns for estates filed in 2008 (typically 2007 decedents matched to their 2006 income). As shown in the bottom Panel of Figure 4, the within asset class returns are still constant across wealth groups today. In each estate tax bracket, the interest yield is about 3% and the dividend yield close to 3.5%. When including realized capital gains, the total return on equities is about 8-9% across the board. This evidence is consistent with the more detailed analysis by Johnson et al. (2013) using systematic micro-level estate tax data of 2007 decedents matched to 2006 income tax returns. If anything, Johnson et al. (2013) find slightly decreasing rates of returns for some asset classes (see their Figure 2), suggesting that our capitalization method might actually slightly understate wealth concentration.

Overall, these findings suggest that the rising wealth concentration we document is not due to a rising gradient in taxable rates of return. Both in 1976 and in 2007, within asset class, taxable capital income and wealth are similarly distributed, which is the key condition for the capitalization method to deliver reliable results.

Test using the Survey of Consumer Finances. Another indication that the capitalization method works well comes from the SCF. In addition to wealth, SCF respondents are asked about their income as reported on their prior year tax return, for example: "In total, what was your (family's) annual income from dividends in 2012, as reported on IRS form 1040 line number 9a?" We capitalize SCF income and compare the resulting top shares to those obtained by looking at directly reported SCF wealth (Figure 5, top panel). Four categories of investment income are capitalized separately: taxable interest (generated by fixed income claims), tax-exempt interest (generated by state and local bonds), dividends and capital gains (generated by corporate equities), and business and rental income (generated by closely held businesses and non-home real estate). As in our baseline method, we exclude capital gains when ranking individuals but

take them into account when computing top shares. We disregard owner-occupied housing and pensions which, by construction, are benchmarked to the SCF in our series.

The capitalization method captures the level of wealth concentration in the SCF extremely well. On average over 1989-2013, when using the direct SCF wealth information, the top ten percent owns 87.7% of household wealth (excluding pensions and main homes), the top one percent has 50.8%, and the top point one percent has 20.3%. When capitalizing income, the figures are 89.0%, 48.8%, and 20.7%, respectively. Trends in wealth concentration are very similar as well: the top 10% and top 1% wealth shares increase slightly, while the top 0.1% is flat. There is no evidence that taxable rates of returns at the top tend to be systematically too high (e.g., as in the case of hedge fund managers) or too low (e.g., as in the case of savers investing in non-dividend paying equities and never realizing gains). On the contrary, taxable returns appear to be similar across groups. The last notable result is that in the SCF, the top 0.1% wealth share (either directly observed or obtained by capitalizing incomes) increases only modestly. This reflects the fact that capital income concentration increases less in the SCF than in tax data over the period 1989-2013, an issue we examine in detail in Section 7.

In brief, the main pitfall of the capitalization method we implement is that it is in principle sensitive to tax avoidance. If wealthy individuals were able to report abnormally high or low taxable returns in a systematic way, then assuming a constant capitalization factor within asset class would produce biased top wealth shares. The main advantage of the method is that in practice this concern does not seem important in the data. Although the relationship between taxable income and wealth is noisy at the individual level (see e.g. Kennickell, 2009a), taxable rates of returns appear to be roughly flat at the group level. We stress, however, that we cannot prove returns have been flat every year since 1913—the evidence we have is comprehensive since the late 1980s, less so before. Should new evidence show that taxable returns rise or fall with wealth, then it would become necessary to specifically account for this fact (and similarly when applying the capitalization technique to other countries). At this stage, the conclusion we draw from our investigation of the available data is that that within asset classes, taxable capital income usually appears to be distributed like wealth, which is the key condition for our simple capitalization method to produce unbiased top wealth shares.

5 Trends in the Distribution of Household Wealth

5.1 The Comeback of Wealth Inequality at the Top

Our new series on wealth inequality reveal a number of striking trends. To fix ideas, consider first in Table 1 the distribution of wealth in 2012. The average net wealth per family is close to $350,000, but this average masks a great deal of heterogeneity. For the bottom 90%, average wealth is $84,000, which corresponds to a share of total wealth of 22.8%. The next 9% (top 10% minus top 1%), families with net worth between $660,000 and $4 million, hold 35.4% of total wealth. The top 1%—1.6 million families with net assets above $4 million—owns close to 42% of total wealth and the top 0.1%—160,700 families with net assets above $20 million—owns 22% of total wealth, about as much as the bottom 90%. The top 0.1% wealth share is about as large as the top 1% income share in 2012 (from the results of Piketty and Saez (2003)). By that metric, wealth is ten times more concentrated than income today.

Top wealth shares have followed a marked U-shaped evolution since the early twentieth century. As shown by Figure 6, the top 10% wealth share peaked at 84% in the late 1920s, then dropped down to 63% in the mid-1980s, and has been gradually rising ever since then, to 77.2% in 2012. The rising share of the top 10% is uncontroversial. In the SCF, the top 10% share is very similar in both level and trends to the one we obtain by capitalizing income tax returns (Bricker et al., 2014; Kennickell, 2009b). According to our estimates, all of the rise in the top decile is due to the rise of the very top groups. While the top 10% wealth share has increased by 13.6 percentage points since its low point in 1986, the top 1% share has risen even more (+ 16.7 points from 1986 to 2012), so that the top 10-1% wealth share has declined by 3.1 points (Figure 7, top panel). In turn, most of the rise in the top 1% wealth share since 1986 owes to the increase in the top 0.1% share (+ 12.7 points from 1986 to 2012, see bottom panel of Figure 7) and in the top 0.01% wealth share (+ 7.8 percentage points from 1986 to 2012).

Wealth inequality has increased more than income inequality, but less than capital income inequality. Over the 1978-2012 period, the top 1% income share has gained 13.5 points, the top 1% wealth share 19 points, and the top 1% taxable capital income share 29 points. Wealth inequality has grown less than taxable capital income inequality because the concentration of housing and pension wealth—which do not generate taxable income—has increased less than that of directly held equities and fixed income claims.

Wealth concentration has increased particularly strongly during the Great Recession of 2008-2009 and in its aftermath. The bottom 90% share fell between mid-2007 (28.4%) and mid-2008 (25.4%) because of the crash in housing price. The recovery was then uneven: over 2009-2012,

real wealth per family declined 0.6% per year for the bottom 90%, while it increased at an annual rate of 5.9% for the top 1% and 7.9% for the top 0.1% (see Appendix Table B3).

At the very top end of the distribution, wealth is now as unequally distributed as in the 1920s. In 2012, the top 0.01% wealth share (fortunes of more than $110 million dollars belonging to the richest 16,000 families) is 11.2%, as much as in 1916 and more than in 1929. Further down the ladder, top wealth shares, although rising fast, are still below their Roaring Twenties peaks. The top 0.1% share is still about 2.8 points lower in 2012 than in 1929 (22.0% vs. 24.8%), and the top 1% share about 9.6 points lower (41.8% vs. 50.6%). Wealth is getting more concentrated in the United States, but this phenomenon largely owes to the spectacular dynamics of fortunes of dozens and hundreds of million dollars, and much less to the growth in fortunes of a few million dollars. Inequality *within* rich families is increasing.

The long run dynamics of the very top group we consider—the top 0.01%—are particularly striking. The losses experienced by the wealthiest families from the late 1920s to the late 1970s were so large that in 1980, the average real wealth of top 0.01% families ($44 million in constant 2010 prices) was half its 1929 value ($87 million). It took almost 60 years for the average real wealth of the top 0.01% to recover its 1929 value—which it did in 1988. These results confirm earlier findings of a dramatic reduction in wealth concentration (Kopczuk and Saez (2004)) and capital income concentration (Piketty and Saez (2003)) in the 1930s and 1940s. As these studies suggested, the most likely explanation is the drastic policy changes of the New Deal. The development of very progressive income and estate taxation made it much more difficult to accumulate and pass on large fortunes. Financial regulation sharply limited the role of finance and the ability to concentrate wealth as in the Gilded age model of the financier-industrialist. Part of these policies were reversed in the 1980s, and we find that top 0.01% average wealth has been growing at a real rate of 7.8% per year since 1988. In 1978, top 0.01% wealth holders were 220 times richer than the average family. In 2012, they are 1,120 times richer.

The growth of wealth at the very top is driven by both corporate equities and fixed income claims, as shown by the top panel of Figure 8. Business assets, pensions, and housing play a negligible role. The upsurge in the top 0.1% and top 0.01% wealth shares is robust to alternative capitalization techniques. In particular, the amount of corporate equities held by the top 0.01% rises similarly when we capitalize dividends only and ignore realized capital gains. In both cases, the corporate equities owned by the top 0.01% amount to 4.5% of total household wealth in 2012, up from 1.2% in the mid-1980s. Therefore, neither re-classification of wages into capital gains (like in the case of "carried interest"), nor changes in patterns of capital gains realization can explain the upsurge in the top 0.01% wealth share. Besides, the rise in the top 0.01%

owes even more to fixed income claims—for which reclassification issues and capital gains are irrelevant—than to corporate equities. In 2012, the fixed income claims—mainly bonds and saving deposits—owned by the top 0.01% amount to 5.4% of total household wealth, up from 1.0% in the mid-1980s. Although this increase cannot be explained by changes in tax avoidance behavior, it could be due to an increased interest rate differential between top wealth-holders and the rest of the population. Wealthy families might be able to earn 6% on their bond portfolio (e.g., by investing in foreign markets or in high return convertible bonds) while the rest of the population might earn 3% only, and that differential might have increased over time. However, neither matched estates-income tax returns, nor SCF data, nor foundation tax returns support the view that the interest rate rises with wealth. We have also checked the sensitivity of our results to this potential concern by capitalizing interest income at a lower rate for wealthy families. Even with sizable returns differentials (such as an interest rate twice as high for the top of the distribution than for the rest of the population) our results of surging top wealth shares remain (see Appendix Tables B40 and B41).

5.2   The Rise and Fall of Middle-Class Wealth

The second key result of our analysis involves the dynamics of the bottom 90% wealth share. The bottom half of the distribution always owns close to zero wealth on net.[36] Hence, the bottom 90% wealth share is the same as the share of wealth owned by top 50-90% families— what can be described as the middle class. Contrary to a widespread view, we find that despite the rise in pensions and home ownership rates, the middle class does not own a significantly greater share of total wealth today than 70 years ago.

The share of wealth owned by the middle class has followed an inverted-U shape evolution: it first increased from the early 1930s to the 1980s, peaked in the mid-1980s, and has continuously declined since then (Figure 8, bottom panel). The large rise in the bottom 90% share from 16% in the early 1930s to 35% in the mid-1980s was driven by the accumulation of housing wealth, and more importantly pension wealth. Pension wealth was almost non-existent at the beginning of the twentieth century. It first developed in the form of defined benefits plans, then from the 1980s in the form of defined contribution plans such as IRAs and 401(k)s. The decline in the bottom 90% wealth share since the mid-1980s owes to a fall in the net housing and fixed income (net of non-mortgage debt) components. The net housing wealth of the bottom 90% accounted for about 15% of total household wealth from the 1950s to the 1980s, while it now accounts for

---

[36]According to survey data, the wealth share of the bottom half of the distribution is 1.1% in 2010, the lowest point since the 1962 Survey of Financial Characteristic of Consumers (Kennickell, 2011, Table 5).

about 5–6% only. In turn, the decline in the net housing and net fixed income wealth of bottom 90% families is due to a rise in debts—mortgages, student loans, credit card and other debts. On aggregate, household debt increased from the equivalent of 75% of national income in the mid-1980s to 135% of national income in 2009 and, despite some deleveraging in the wake of the Great Recession, still amounts to close to 110% of national income in 2012. Since about 90% of (non-mortgage) debt belongs to the bottom 90% of the wealth distribution, the upsurge in debt has had a large effect on the bottom 90% wealth share. It has more than offset the increase of pension wealth, and as result, in 2012 the bottom 90% share is as low as in 1940.

Strikingly, average real wealth of bottom 90% families is no higher in 2012 than in 1986. As Figure 9 shows, the average bottom 90% wealth rose a lot during the late 1990s tech-boom and the mid-2000s housing bubble, peaking at $130,000 dollars (in 2010 prices) in 2006, but it then collapsed to about $85,000 in 2009. Middle-class wealth has not yet recovered from the financial crisis: in 2012 it is still as low—even slightly lower—than in 2009. Despite an average growth rate of wealth per family of 1.9% per year, for 90% of U.S. families wealth has not grown at all over the 1986-2012 period. This situation contrasts with the dynamics of the average wealth of the top 1%, which was almost multiplied by 3 from the mid-1980s (about $5 million) to 2012 ($14 million), fell by about 20% from mid-2007 to mid-2009, but quickly recovered thereafter.

5.3 The Age Composition of Wealth

In the overall population, the share of wealth held by elderly families is rising, but slowly. As shown by the top panel of Figure 10, elderly families—tax units where the primary filer (or his/her spouse when married) is aged 65 or more—own about one third of US wealth. This fraction was stable from 1962 to 2007 (around 30-33%) and has slightly increased since 2007 to about 37-38%. But that increase is small compared to the rise in the fraction of elderly families in the total population, from 18% in 1960 to 25% in 2010.[37] As a result, elderly families are relatively poorer today than half a century ago: they were about twice as wealthy as average in the 1960s but are now only 40% wealthier than average.

While wealth is getting older on aggregate, in the top 0.1% of the distribution wealth is getting younger: the share of top 0.1% wealth held by elderly households is lower in 2012 (39%) than in 1962 (46%). In 1962, top wealth was significantly older than average, while today it

---

[37]US Statistical Abstract 2012, Population Table 62, online at `https://www.census.gov/compendia/statab/2012/tables/12s0062.pdf` for 2010 numbers and `http://www.census.gov/hhes/families/data/households.html` for 1960 numbers. In the Census, elderly families are defined as families with head of household aged 65 or more. This is not exactly the same definition as in the tax data but is very close as, in the vast majority of cases, the head of household is the oldest member of the couple.

is about as old as average. This finding is consistent with the results of Edlund and Kopczuk (2009) showing that there were relatively more widowed women in top wealth groups in the 1960s than in the 1990s.

Today's rich also have more labor income than in the past. In the bottom panel of Figure 10 we depict the share of total labor income in the U.S. economy accruing to top 0.1% wealth holders; labor income is equal to compensation of employees (including fringe benefits) plus the labor share of non-corporate profits, before any tax. Before 1970, top 0.1% wealth holders earned slightly less than 0.5% of all labor income (5 times the average labor income) while in 2012, they earn 3.1% (31 times the average labor income). In the 1960s, the rich were not very likely to be working, often because they were retired, or widowed from a rich husband. Today, they are younger and more likely to earn high wages. They also have much more income from capital, so that the share of total (labor plus capital) pre-tax income earned by top 0.1% wealth-holders has surged, from about 3% in 1960 to 8% in 2012.

At first glance, the facts that wealthy families tend to be younger than half a century ago and earn more labor income suggest that much of the rise in wealth inequality may owe to the creation of new self-made fortunes rather than a revival of dynastic wealth. But a lot of care is needed when interpreting these facts. First, from a purely logical standpoint, the increase in the number of young, wealthy individuals could in principle partly be due to a rise in large inheritances: there may be more Mark Zuckerbergs at the top of the wealth distribution than in the 1960s, but also more Paris Hiltons—the evidence in Figure 10 does not directly address this issue. Second, the share of labor income earned by top 0.1% wealth-holders seems to have peaked in 2000 and has slightly decreased since then. In other words, the share of self-made wealth at the top might be stabilizing: the retired rich and their offsprings may be starting to replace the working rich.[38] Relatedly, in recent years, a large fraction of the increase in top wealth shares is due to the sharp growth of fixed income claims rather than increases in business assets or equities (Appendix Table B11)—and similarly much of the increase in capital income concentration comes from interest income. These observations suggest that entrepreneurial wealth might already be in the process of being diversified into established wealth. Last, the rise in the labor share of top wealth-holders does not simply capture the fact that wealthy individuals are more likely to be working today than in the past; it also reflects the mechanical

---

[38]In principle, one could use the capitalization method to analyze the intra- and intergenerational mobility of wealth. Matching income tax data to gift and estate tax data could also shed light on the fraction of wealth coming from inheritances (as opposed to self-made). These important extensions are left to future research. Chetty et al. (2014b) analyze intergenerational income mobility using US tax data; Boserup et al. (2014) use Danish wealth data from tax records to estimate intergenerational wealth mobility in Denmark.

effect of growing labor income inequality. To see this, consider the following fact: in the early 1960s, about 15% of the families in the top 0.1% of the wealth distribution were also in the top 0.1% of the labor income distribution, and while this fraction increased to a third in the early 1980s, it is still equal to a third in 2012. In other words, all of the increase in the share of total labor income earned by top 0.1% wealth-holders since the 1980s is due to the rise in the concentration of labor income at the top, not to an increase in the fraction of individuals who belong to the top of both the wealth and the labor income distributions.

6 Decomposing Wealth Accumulation

What is driving the rise of the top wealth shares and the decline of middle-class wealth? At the individual level, the dynamics of wealth accumulation can be written as

$$W_{t+1}^i = W_t^i \cdot [1 + r_t^i \cdot (1 - \tau_K^i) + q_t^i] + Y_{Lt}^i \cdot (1 - \tau_L^i) - C_t^i, \tag{1}$$

where upper script i denotes individual i, W_t^i is wealth of individual i in year t, r_t^i the yield on wealth, q_t^i the price effect on assets (real capital gains or losses), τ_K^i the average tax rate on capital income,[39] Y_{Lt}^i labor income, τ_L^i the average tax rate on labor income, and C_t^i is consumption (net of gifts made and inheritances received).

As this equation makes clear, there are three forces that can push toward higher wealth concentration: more income inequality, more saving rate inequality, and more rate of return inequality. All else equal, the more unequal post-tax labor incomes $Y_{Lt}^i \cdot (1 - \tau_L^i)$ are (either because of more inequality in pre-tax labor incomes or because of a fall in tax progressivity), the more concentrated wealth will tend to be. In turn, rising wealth inequality leads to rising capital income concentration, which contributes to further increasing the top income and wealth shares. This snowball effect of wealth accumulation can be significant at the top of the distribution where capital income is a large fraction of income (always above 50%). Second, for a given distribution of income, wealth inequality will tend to grow if the consumption C_t^i of poor households becomes larger and larger compared to their income while rich households keep saving. Last, a higher differential between the post-tax rates of return $1 + r_t^i \cdot (1 - \tau_K^i) + q_t^i$ earned by wealthy and less wealthy individuals mechanically makes top fortunes grow faster than average. In this section, we attempt to quantify the relative importance of each channel in the observed dynamics of the distribution of US wealth.

---

[39] τ_K^i includes taxes on realized capital gains as well. These originate from current and past price effects q^i.

6.1 The Role of Income, Saving, and Returns in Wealth Dynamics

Let us start by briefly outlining our conceptual framework. We define individual saving S_t^i as the net increase in wealth W_t^i that is not due to changes in asset prices:

$$W_{t+1}^i = (1 + q_t^i) \cdot (W_t^i + S_t^i),$$

where, by convention, savings are assumed to be made before the asset price effect is realized, so that capitalized savings $(1 + q_t^i)S_t^i$ are equal to net-of-tax capital income plus labor income minus consumption:

$$(1 + q_t^i)S_t^i = r_t^i \cdot (1 - \tau_K^i) \cdot W_t^i + Y_{Lt}^i \cdot (1 - \tau_L^i) - C_t^i.$$

We define the *synthetic* savings S_t^p of fractile p (e.g., the top 1%) as

$$W_{t+1}^p = (1 + q_t^p) \cdot (W_t^p + S_t^p), \tag{2}$$

where S_t^p is the average savings of all individuals in fractile p in year t, W_t^p is average wealth in fractile p, $1 + q_t^p = \sum_{i \in p}(1 + q_t^i)W_t^i / \sum_{i \in p} W_t^i$ is the average asset price effect (weighted by wealth) for wealth held in year t by fractile p.

In words, synthetic saving S_t^p is the saving flow in year t needed for wealth W_t^p of fractile p in year t to translate into wealth W_{t+1}^p of fractile p in year $t+1$ taking into account the real price effect $1 + q_t^p$ on the portfolio of assets held by fractile p individuals in year t. This definition of saving is synthetic because the identity of individuals in fractile p changes from year to year due to wealth mobility. If fractile p individuals remained the same over time, synthetic saving would equal actual saving. This is the case when the fractile p represents the full population.

We then define the synthetic saving rate of fractile p in year t as the ratio of the synthetic average saving of fractile p to the average income in fractile p: $s_t^p = S_t^p / Y_t^p$.[40]

The wealth accumulation (2) of fractile p becomes:

$$W_{t+1}^p = (1 + q_t^p) \cdot (W_t^p + s_t^p \cdot Y_t^p), \tag{3}$$

We denote $sh_{Yt}^p = |p|Y_t^p/Y_t$ the share of income earned by fractile p in year t, where Y_t is the average income in the full population and $|p|$ is the fraction of the population in fractile p (e.g., $|p| = .01$ when fractile p is the top 1%). Similarly, we denote $sh_{Wt}^p = |p|W_t^p/W_t$ the share of

---

[40]Note that we define the saving rate based on pre-tax income Y_t^p (that we compute making full use of the available information of the distribution of taxable and non-taxable income). Hence, for a constant saving rate out of disposable income, if taxes increase for fractile p, disposable income falls, and our saving rate decreases. Conversely, if transfers increase for fractile p, our saving rate increases (keeping the saving rate out of disposable income the same).

wealth owned by fractile p. Using these definitions and the fact that, at the aggregate level, $W_{t+1} = (1 + q_t)(W_t + s_t Y_t)$, the wealth accumulation of fractile p can be rewritten as

$$sh^p_{Wt+1} = \frac{1 + q^p_t}{1 + q_t} \cdot \frac{sh^p_{Wt} + sh^p_{Yt} \cdot \frac{s^p_t}{s_t} \cdot \frac{s_t Y_t}{W_t}}{1 + \frac{s_t Y_t}{W_t}}. \tag{4}$$

This equation shows the dynamics of the wealth share of fractile p as a function of the relative asset price $\frac{1+q^p_t}{1+q_t}$, the relative synthetic saving rates s^p_t/s_t, the share of income earned by fractile p, and the aggregate wealth formation ratio $s_t Y_t / W_t$.

In steady-state, top wealth and income shares are stable, and relative saving rates are stable; if there are no differential asset price effects, equation (4) becomes

$$sh^p_W = sh^p_Y \cdot \frac{s^p}{s}. \tag{5}$$

That is, in steady-state, the wealth share of fractile p is simply equal to the income share of fractile p times the relative saving rate of fractile p. If saving rates rise with wealth, then wealth will be more concentrated than income. Equation (5) can be understood as a generalization of the economy-wide steady-state equation $\beta = s/g$ where $\beta \equiv W/Y$ is the ratio of aggregate wealth to income and g the growth rate of income.[41]

Starting from a steady state with $sh^p_W = sh^p_Y \cdot \frac{s^p}{s}$, the share of wealth owned by fractile p will increase if there is a shock to relative prices favoring fractile p, or a positive shock to its income share sh^p_Y, or a positive shock to its relative saving rate s^p/s. If the shock is permanent, fractile p's wealth share will reach a new steady state. For example, if the income share of top 1% wealth holders doubles, then the top 1% wealth share will also double in the long-run, assuming their saving rate does not change. If the saving rate of the bottom 90% decreases relative to the average saving rate, then the long-run bottom 90% wealth share will fall even if the bottom 90% income share does not change.

Equation (5) was derived under the assumption of no differential asset price effects. This assumption, however, is not always verified. In the short run, there can be sizable relative price effects due to differences in portfolio composition: the wealthy tend to have more equities, which can increase more in value than, say, housing assets. In addition, there might be within-asset class differential price effects, even in the long run. Wealthy households may have more ability to pick the corporate stock of companies which will grow fast, for instance by investing

---

[41]This formula is discussed extensively in Piketty and Zucman (2014a), Piketty and Zucman (2014b), and Piketty (2014). In steady-state, for each fractile p it must be the case that $W^p/Y^p = s^p/g$ (as all income and wealth groups grow at the same rate g). Taking ratios, we have $(W^p/W)/(Y^p/Y) = s^p/s$ which is equivalent to equation (5).

in non-publicly traded stocks through private equity funds. If private equity funds tend to spot good investment opportunities (such as the future Google or Facebook), then they will generate relatively large capital gains for their investors. The broader public can invest in such companies only after they go public at which time premium price effects may have run their course.[42] Similarly, the wealthy tend to live in cities such as New York or San Francisco where real estate prices tend to rise faster than average because of limited supply of land and restrictions on development. Last, there might be size effects in portfolio management enabling large fortunes to get higher rates of capital gains.

Let's denote by $1 + dq^p = (1 + q^p)/(1 + q)$ the asset price effect premium of fractile p in the long-run. In that case, equation (5) becomes:

$$sh_W^p = sh_Y^p \cdot \frac{s^p}{s} \cdot \frac{1 + dq^p}{1 - dq^p \cdot \frac{W}{s \cdot Y}}. \tag{6}$$

If $dq^p > 0$, it is as if the saving rate s^p of fractile p were augmented by a factor $(1 + dq^p)/(1 - dq^p \cdot \frac{W}{s \cdot Y}) > 1$. This factor can be substantial. Suppose that top 1% wealth-holders can pick assets whose real price increases 1% faster per year than average ($dq^p = 1\%$). If the growth rate of the economy g equals 2%, a 1% annual price effect is equivalent to a doubling of the saving rate s^p for the top 1%.[43]

6.2   Trends in Saving Rates and Income Shares Across Wealth Groups

Saving rates.   Using the observed annual wealth, income, and price effects of each wealth group, we can compute each group's annual synthetic saving rate using equation (3). The top panel of Figure 11 plots the synthetic saving rates for the top 1%, the next 9%, and the bottom 90% since 1913.[44] These saving rates include all the saving made by households, either directly or indirectly through the corporations they own.

Two results are worth noting. First, saving rates tend to rise with wealth. Bottom 90% wealth holders save around 3% of their income on average, the next 9% save about 15% of their income, while the top 1% save about 20-25% of their income. The main exception is the

---

[42]This phenomenon might have become stronger in recent decades with the development of private equity funds, combined with the fact that firms tend to have their initial public offering at a later stage of development than a few decades ago.

[43]In the long-run steady-state with no aggregate price effects, $W/(s \cdot Y) = 1/g$ where g is the real growth rate of the economy. With $dq^p = 1\%$ we would have $1 - dq^p \cdot \frac{W}{s \cdot Y} = 1 - dq^p/g = 1 - 1/2 = 1/2$ so that equation (6) becomes $sh_W^p = sh_Y^p \cdot \frac{2.02 \cdot s^p}{s}$. In the long-run, the denominator $1 - dq^p \cdot \frac{W}{s \cdot Y}$ in equation (6) cannot fall below zero. If the wealth share of fractile p reaches 100%, then the price effect on fractile p is the same as the economy wide price effect so that $1 + q^p = 1 + q$ and $dq^p = 0$. In other words, dq^p depends on sh_W^p and falls to zero when sh_W^p converges to one.

[44]Complete results are reported in Table B33.

decade 1930-1939: during the Great Depression the top 1% saving rate was negative, because corporations had zero (or even negative) profits yet still paid out dividends, so that they had large negative saving. This decade of negative saving at the top greatly contributed to the fall in top wealth shares during the 1930s (see below). As equation (5) shows, the fact that saving rates sharply rise with wealth implies that long-run top wealth shares will be substantially higher than long-run top income shares (when ranking individuals by wealth).

Second, saving rate inequality has increased in recent decades. The saving rate of bottom 90% families has sharply fallen since the 1970s, while it has remained roughly stable for the top 1%. The bottom panel of Figure 11 zooms in on the annual saving rate of the bottom 90%, which fell from around 5%-10% in the late 1970s and early 1980s to around -5% in the mid-2000s, and bounced back to about 0% after the Great Recession. The long period of negative saving rate for 90% of the population from 1998 to 2008, due to massive increases in debt (in particular mortgages) fueled by an unprecedented rise in housing prices (see e.g. Mian and Sufi, 2014), is particularly striking. Even more striking is the fact that while bottom 99% saving fell a lot in the years preceding the Great Recession, top 1% families continued to save at a high rate. As a result, the relative saving rate s^p/s of the bottom 90% and of the next 9% fell. As equation (4) makes clear, the sharp fall in the relative saving rates of these groups means that their share of wealth would have fallen even if their income share had remained the same.

Income Shares. On top of rising saving rate inequality, what role did increased income inequality play in the dynamics of the wealth distribution? Figure 12 examines the shares of income held by the bottom 90% and top 1% wealth holders. Income is defined to match pre-tax national income in the national accounts. Families in the bottom 90% of the wealth distribution have a significantly higher fraction of income (around 70%) than wealth (around 30%), consistent with the fact that their relative saving rate s^p/s is well below 1. The share of income earned by the bottom 90% fell from 70% in the early 1980s to 60% in 2012. While this fall is significant, it is smaller than the decline in the bottom 90% wealth share (from 36% to 23%). The dynamics of the bottom 90% wealth share is thus primarily explained by the sharp fall in its relative saving rate. As Figure 12 shows, if the bottom 90% had been saving 3% of its income per year over the 1986-2012 period, then all else equal it would own 30% of US wealth in 2012 instead of the current 23% (see Appendix Table 33c). Rising income inequality did nonetheless matter for the dynamics of middle-class wealth. First, the fall in bottom 90% saving might itself partly be a consequence of the increase in income inequality and the lackluster growth of middle-class income (Bertrand and Morse, 2013). Second, as Figure 12 shows, if in addition to saving 3%

31

per year the bottom 90% had also kept a constant share of income, then its wealth share would have declined very little since the mid-1980s—according to our simulations, it would be equal to about 33% in 2012. In any case, if the bottom 90% continues to save very little, then its wealth share is bound to continue falling in the future.[45]

Rising income inequality does matter a lot for the dynamics of the top 1% wealth share. The share of income earned by families in the top 1% of the wealth distribution has doubled since the late 1970s, to about 16% in recent years. This increase is slightly larger (in relative terms) than the increase in the top 1% wealth share, suggesting that the main driver of the increase in the top 1% wealth share is the upsurge of their income.

Table 2 summarizes the relative importance of income, saving and returns in explaining the dynamics of the wealth distribution. We divide 1913-2012 into three periods corresponding to increasing, decreasing, and then increasing again wealth concentration. Over the 1986-2012 period, the wealth of top 1% wealth holders grew at 3.9% per year on average, much more than average wealth (1.9%) and bottom 90% wealth (0.1%). The growth of income was also unequal, but not as much. The annual saving rate of the bottom 90% has been extremely low since 1986 (0% on average) while the saving rate of the top 1% has been very high (36% on average). Asset price effects were positive across the distribution, but roughly neutral. These results underscore that the key drivers of the rise in wealth inequality have been the surge in income inequality combined to an increase in saving rate inequality—and in particular the collapse of the saving rate of the bottom 90%. The last 25 years contrast with the 1929-1986 period when wealth and income were growing much more slowly in the top 1% than in the bottom 90%. In that period, the saving rate of the bottom 90% was significant (6% on average) and price effects were slightly more favorable to the bottom 90% (-0.2% per year instead of -1.1% per year for the top 1%).

7   Comparison with Previous Studies

A number of previous studies have attempted to measure the distribution of US wealth. In some cases our results are consistent with earlier estimates, while in other cases they differ. In this Section, we attempt to understand the source of these discrepancies. In addition to capitalized income tax returns, there are three main sources to analyze US wealth inequality in the modern era: survey data, estate tax data, and named lists of rich individuals.[46]

---

[45]About 90% of the income of the bottom 90% wealth holders is labor income, with only 10% from capital income so that the fall in their wealth share has only a fairly small effect on their income share.

[46]Lindert (2000) provides a survey of earlier historical estimates often based on probate records. Davies and Shorrocks (2000) survey more recent estimates.

7.1 Survey of Consumer Finances

The Survey of Consumer Finances is available on a triennial basis from 1989 to 2013. It is a very high quality survey that massively over-samples wealthy individuals.[47] In spite of a different source and methodology, the top 10% wealth share in the SCF is close in both level and trend to the one we obtain by capitalizing income (Figure 6). It rises markedly, from 67% in 1989 to 75.3% in 2013 (Bricker et al., 2014; Kennickell, 2009b, 2011; Wolff, 2012).

Things, however, differ when one zooms into the top percentile and above. The top panel of Figure 13 depicts our top 0.1% wealth share along with the top 0.1% wealth share estimated with the SCF following the same definition and methodology as Kennickell (2009a, 2011).[48] The SCF top 0.1% wealth share is very close in level in 1989 but, in contrast to our estimates, it rises only modestly from 1989 to 2013 (from 10.8% to 13.5%). As a result, the wealth share of families between the top 10% and top 0.1% rises substantially in the SCF, while it is about flat according to our estimates.[49] How can we explain this difference?

There are three notable differences in terms of definitions between our estimates and the SCF baseline estimates. First, we use tax units while the SCF uses households to define each fractile. There are about 25% more tax units than households (as unmarried partners, a parent with an adult child, or two roommates living together form a single household but two tax units). Second, the SCF and Flow of Funds aggregates differ by asset class.[50] The SCF baseline estimates include the value of vehicles, art, antiques that are excluded from the Flow of Funds. The SCF baseline estimates also exclude funded DB pension wealth. Third, the SCF excludes by design the Forbes 400 richest individuals. In appendix Table C4b, we correct for these discrepancies sequentially. Figure 13 also depicts the SCF adjusted estimates (SCF adjusted) that use tax units to define fractiles, re-weight wealth by asset class to match our denominator based on Flow of Funds, and add back the Forbes 400. It shows a higher increase in wealth concentration than the baseline SCF estimates although still smaller than our capitalized estimates.

As with all surveys, it is a challenge for the SCF to accurately capture wealthy individuals

---

[47]Earlier SCF surveys are available for 1962, 1983, and 1986 but are not directly comparable due to differences in sampling. See Kennickell (2011) for a detailed description.

[48]Because a handful of top wealth holders are removed from the publicly available SCF, we first estimate the top 1-0.1% using the public use SCF data and obtain the top 0.1% by difference with the Kennickell top 1% estimates. The difference with the directly estimated top 0.1% wealth share from the public use SCF is minor, typically around 0.2 percentage points.

[49]In the SCF, the top 10-1% wealth share rises modestly from 37.0% in 1989 to 38.5% in 2013, while by our estimates it declines modestly from 37.2% to about 35.4% in 2012. In the SCF, the top 1-0.1% wealth share rises from 19.3% in 1989 to 22.3% in 2013, while by our estimates it increases from 16.3% in 1989 to 19.8% in 2012; see Appendix Table C4 and Appendix Figures C6 and C7.

[50]Antoniewicz (2000); Henriques and Hsu (2013) analyze this issue and Henriques (2013) focuses specifically on housing whose value has grown faster in the SCF than the Flow of Funds since 2001.

because of limited sample size and low response rates at the very top (see Kennickell, 2009a). The SCF has substantially improved its sampling design in 2001 by using more information on capital income reported on tax returns to create its high wealth sample target list (see Kennickell, 2001). Therefore, it is useful to directly compare the capital income distribution from tax data and capital income reported on the SCF. The top panel of Figure 14 compares the top 0.1% income share of SCF respondents to that in the full population, as computed from exhaustive tax data. In both cases, income is defined in the exact same way as total income reported on tax returns excluding social security and unemployment insurance benefits. Remember that SCF respondents are asked about the income reported on their prior year tax return. As Figure 14 shows, however, although the top 0.1% income share in the SCF is usually close to the top 0.1% share in the full population, it has grown less. The trends are much closer in the period after 1998 when the SCF sample design was improved. This discrepancy could be due to the fact that the Forbes 400 are excluded from the SCF or that, within the top income strata, the response rate varies by income. The bottom panel of Figure 14 shows that the discrepancy in trends is also present when considering top capital incomes. In the SCF, the top 0.1% capital income share increases modestly from 28.0% in 1988 to 30.4% in 2012 while it increases sharply from 24.2% to 41.7% in the tax data. The discrepancy in trends in also much smaller after 1998.[51] Hence, the residual discrepancy between the SCF and the tax data for top wealth shares in Figure 14 is likely due to this difference in capital income concentration trends.

The value added of our estimates relative to the SCF estimates is that they cover a much longer period, are annual, and naturally include the top 400 richest. They are also an alternative way to estimate the wealth distribution. We view the two approaches and datasets as complementary. Indeed, the SCF sampling is based on capital income reported on tax returns and hence a systematic comparison of our estimates with SCF estimates can help both improve SCF sampling and improve further our estimates. For example, using capital income from multiple years with longitudinal tax data could be helpful to assess the robustness of our capitalization method. The SCF is also essential to obtain precise wealth estimates for asset categories such as housing and pension wealth (and indeed our own estimates for housing and pension wealth are calibrated using the SCF).

---

[51]We define top income shares in the SCF based on households. In appendix Table C2, we also report top income and capital income shares in the SCF defining fractiles based on tax units (assuming that for top fractile households with multiple tax units, all the household wealth belongs to the tax unit which includes the head of the household). The estimates are slightly higher in level but the trend is virtually the same.

7.2 Estate Multiplier Method

A large body of work has used the estate multiplier method where wealth-at-death is weighted by the inverse probability of death (conditional on age and gender). Lampman (1962) is the classic US study, and it has been followed by many studies, including the official personal wealth estimates from the Statistics of Income (see Johnson, 1994, 2011, for a compendium of these studies). Kopczuk and Saez (2004) have produced top wealth shares for the full 1916-2000 period using the estate multiplier method.[52]

The estate based estimates and our estimates are remarkably similar in level and trend over the period 1916 to 1976, as the top panel of Figure 13 shows. The similarity of the estimates using totally different sources and methods gives further credibility to the finding that a large decrease in wealth concentration took place in the first half of the 20th century. However, there is a large discrepancy for the recent period after 1976. While our estimates show a sharp increase in wealth concentration since the late 1970s, the estate-based estimates display only a modest increase in the top 0.1% wealth share since the 1970s. As a result, by 2000 (the latest year the top 0.1% estate-based wealth share is available), a significant gap has opened between the two series. How can we explain this discrepancy?

Recall that the estate-multiplier method re-weights estate tax returns based on the inverse probability of death. The probability of death is based on mortality tables by age and gender along with a correction to take into account that the wealthy live longer than the average population. In Kopczuk and Saez (2004), the corrective term is obtained from external data on mortality rates of college graduates (a rough proxy for the wealthy) relative to mortality rates of the full population from Brown et al. (2002). Kopczuk and Saez (2004) use the same correction factors for all years hereby assuming that the mortality gradient by wealth has not changed overtime. A number of recent studies have documented a growing mortality differential by socio-economic status. Most notably, using social security data, Waldron (2007) finds that the top half of the average relative earnings distribution has experienced faster mortality improvement than has the bottom half. For example, male workers born in 1941 who had average relative earnings in the top half of the earnings distribution and who lived to age 60 would be expected to live 5.8 more years than their counterparts in the bottom half. For the 1912 cohort, the corresponding difference was only 1.2 years. A number of earlier studies in the United States have found evidence of widening of mortality differential by socio-economy status (either life-time earnings, or educational achievement).[53]

---

[52]The more recent studies by Johnson and Raub (2005) and Raub (2008) provide estimates for 2001 and 2004.

[53]See e.g., Duleep (1989), Feldman et al. (1989), Pappas et al. (1993), Waldron (2004).

Using the SOI individual income tax samples for tax years 1979 to 2008 which have information on age and date of death (up to the end of 2013), we can estimate the mortality rates by age, gender, and wealth class. We estimate mortality rates over a five year horizon (and annualizing reported estimates). We illustrate the key features of these statistics on Figure 15. The top two panels report the mortality rate of males (left panel) and females (right panel) by wealth group and age groups relative to the full population in the same gender and age group. Computations are based on tax data for years 1999 to 2008. The Kopczuk-Saez series is the mortality rate of college goers used to correct the estate multipliers in Kopczuk and Saez (2004). The top panels shows that, for males (left) and females (right), the mortality correction for the top 10% overall is very close to the mortality correction used by Kopczuk and Saez (2004). However, this is a clear mortality gradient within the top 10%. The top 10% live less long than the top 1% who in turn live less long than the top 0.1%. The bottom panels plot the mortality rates by wealth group relative to the full population for men aged 65 to 79 over time from 1979 to 2008 (averaged by groups of 5 years to reduce noise) for men (left panel) and women (right panel) separately. Both graphs show an increasing gradient of mortality with wealth over time. This trend is especially pronounced for men and consistent with the studies discussed above. It implies that the estate multiplier method with a fixed mortality differential used in Kopczuk and Saez (2004) will create a growing downward bias over time.

To test for such a bias directly, we estimate top wealth shares using our capitalization method for the subset of individuals who die the following year. This mimics the sample of decedents used by the estate multiplier method. We re-weight individuals using the same weights as the estate multiplier method of Kopczuk and Saez (2004): the weight is equal to the inverse of the probability of death by age×gender×year (obtained from population wide mortality tables) times the socio-economic mortality correction factor (based on age and gender) from Kopczuk and Saez (2004). Note that this mortality correction factor is invariant by year. Therefore, such series isolate the level and trend effects of the mortality gradient by wealth class. Appendix Figure C9 depicts the top 1% wealth shares based on the full sample, the top 1% wealth share based on the subsample of decedents, and the top 1% wealth shares obtained by Kopczuk and Saez (2004) from estate tax data. All three series are fairly close in the period 1979-1984 suggesting that the Kopczuk and Saez (2004) mortality correction works for that period. But in contrast to our main series where the top 1% increases sharply, the top 1% wealth share based on the decedents sample does not and stays flat, just like the Kopczuk and Saez (2004) series. Hence, the estate tax multiplier method fails to capture the increase in top wealth shares because of a sharply widening mortality gradient by wealth class. Our capitalization method

could be used to obtain more precise mortality correction factors by wealth class in order to improve estate multiplier estimates. We see the two approaches as complementary.[54]

7.3 Forbes 400 List

The Forbes 400 list have been used to estimate very top wealth shares (see e.g. Kopczuk and Saez, 2004). As displayed on Figure 13, the Forbes 400 richest list from Forbes Magazine shows a sharp increase in the share of total wealth going to the top 400 (normalized for population growth) from 1% in the early 1980s to over 3% in 2012-3. Hence, the top 400 accounts for 2 percentage points of the increase in the top wealth shares.[55] As shown in the figure, this tripling is roughly on par with the tripling of our top 0.01% wealth share from 3.5% to 11% over the same period. We have also found that the top 400 wealthiest taxpayers based on our capitalized income method have a wealth level comparable to the Forbes 400 in recent years. For 2004-2008, the top 400 average capitalized wealth is 103.3% of the Forbes 400 average wealth. In contrast, the top 400 wealthiest households in the public use SCF in 2010 have an average wealth of $645m, while average Forbes 400 wealth is $3.4bn. Hence, SCF top 400 wealth is only 19% of the Forbes 400 in 2010 (and was only 16% in 2007).[56] Similarly, the Kopczuk and Saez (2004) series based on estates produce a top 400 average wealth that is only a small fraction (around 25%) of the Forbes 400 top wealth in 2000 (see footnote 57, p. 480 in Kopczuk and Saez, 2004).

While it is possible that the Forbes 400 list overestimates wealth (for example, debts of wealthy individuals might be harder to measure than assets), it seems unlikely that it would over-estimate wealth by a factor 4 or 5. Hence, at the very very top, our capitalization method seems to produce much more realistic results than the SCF or the estate multiplier method.

8 Conclusion

Our new wealth distribution series reveal three trends. First, wealth inequality appears to have followed a U-shape evolution since 1913, with a marked increase since the 1980s. By our estimates, virtually all the increase in the top 10% and top 1% shares over the last three decades is due to the rise in the top 0.1% share, from 7% in the late 1970s to 22% in 2012. Second,

---

[54]Since 2010, the estate tax exemption threshold has been above $5 million so that estate tax data will cover less than the top .5% of the wealth distribution. Hence, the capitalization method appears as the only way moving forward to have long run, yearly series that cover the full distribution including the very top groups.

[55]As explained above, by design the SCF does not include any of the Forbes 400 and hence misses these 2 points of top wealth share increase.

[56]Based on the difference between the top 1% wealth shares from the internal SCF files (Kennickell, 2009a, 2011) and the public use file, the high wealth records excluded from the public use SCF are only about 0.2 percentage point of total wealth and hence represent a very small portion of the gap.

the wealth share of the bottom 90% has followed an inverted-U evolution: from a low point of 15% in the late 1920s and at the beginning of the Great Depression, it steadily rose to 35% in the mid-1980s—thanks to rising pension and housing wealth—but then dropped to 23% in 2012 because of an increase in mortgage and other debts. Third, the increased concentration of wealth at the top seems driven by surging top incomes. The combination of increasing income inequality with increasing saving rate inequality is fueling wealth inequality.

The relative decline of middle-class wealth was apparent in survey data, but the rapid growth of fortunes of dozens of millions of dollars was not. Only the tip of the iceberg was visible from rich lists such as the Forbes 400. Yet accurate inequality measures are important to inform the public debate and calibrate tax policy. While the capitalization method sheds new light, we feel much more could be done to better measure trends in wealth concentration.

Improving wealth and savings data. Additional tax data could be used to refine our estimates for recent years. The value of homes could be estimated using address information in tax data matched to third-party home price databases. IRA account values are already available at the individual level (Bryant and Gober, 2013), and the value of employer pensions—both defined benefits and defined contributions—could be estimated at the individual level using matched employer-employee data, and past individual employment status and contributions. The value of businesses such as partnerships and S-corporations could be estimated by matching individual returns to business tax return balance sheets.

Enhanced information reporting would also enable researchers and the government to improve wealth distribution estimates. The cost of collecting extra information would be modest, because a lot of information is already generated by financial institutions to manage the accounts of their clients. Some additional data reporting could also help better enforce taxes, and thus would not require congressional action. The most important step would be to require financial institutions to report year-end wealth balances on the information returns they currently send to the IRS about capital income payments. For example, mortgage balances could be reported on form 1098 that currently reports interest payments.[57] This requirement could be extended to student loans (which already generate information tax reports) and other forms of consumer credit (which do not currently generate information tax reports). Forms 1099-INT for interest income could also report the outstanding balance on the account (and could be extended to non-interest paying accounts as well). Forms 1099-DIV for dividend income would report the

---

[57]This would help enforce the $1 million mortgage debt limit for interest deductions. This change has been recommended by the US GAO (2009) and has been under consideration by Congress.

market value of the corresponding stock holdings (and this requirement could be extended to non-dividend paying stock as well). The current universal balance reporting requirement of IRAs through forms 5498 could be easily extended to all defined contribution plans such as 401(k)s. Pension distribution forms 1099-R could report whether the distribution is an annuity (so as to be able to compute the value of defined benefits pensions for current pensioners).[58]

Saving rates are poorly measured in existing US data. From the extra information reporting discussed above, it is only a relatively small additional step to collect data needed to compute saving. A sale of asset already generates a 1099-B form for taxing realized capital gains. A purchase of asset could correspondingly generate a tax information form.[59] Comprehensive information on sales and purchases of assets would make it possible to compute saving at the individual level, an information needed to evaluate or implement a progressive consumption tax.

Obtaining systematic administrative information on income, wealth, and saving is not utopian in an advanced economy like the United States. Indeed, foundations and other charitable organizations (including in particular universities) are already required to provide all this information to the IRS. A number of these organizations hold large endowments, comparable to the net worth of the wealthiest individuals, and they also use sophisticated portfolio management techniques. These self-reporting requirements could serve as a working model for self-reporting by wealthy individuals. Third-party information reporting would however remain necessary to efficiently administer a progressive wealth tax.[60]

Reducing wealth disparity. How could wealth disparity be reduced (or its increase slowed)? Since wealth inequality is fueled by both rising income and rising saving rate inequality, policies need to address both trends. Progressive income taxation can reduce wealth concentration by limiting the ability of rich households to accumulate wealth. Estate taxation is critical to prevent self-made fortunes from becoming inherited wealth. Progressive wealth taxation affects wealth inequality by diminishing the rate of return on wealth at the top (see Piketty, 2014, Chapters 14 and 15 for a detailed discussion). The historical experience of the United States and other rich countries suggests that progressive taxation can powerfully affect income and

---

[58]The value of Defined Benefits for workers not yet getting benefits is harder to evaluate both conceptually and practically and could be estimated approximately as discussed above.

[59]This purchase of asset information is now already stored by financial companies as forms 1099-B require, since 2011, to state the basis price when the asset is sold. Net savings in year t on regular accounts can be inferred by differencing end-of-year balances in year t and year $t-1$ (less interest earned during year t) with no additional reporting requirement.

[60]Interestingly, such third-party reports of balances are systematically implemented by Danish tax authorities even after Denmark eliminated its wealth tax in 1996. Such balance information has proved useful for income tax enforcement and of great value for research (see e.g. Chetty et al., 2014a).

wealth concentration (Atkinson et al., 2011, see). Yet tax policy is not the only channel. Other policies can directly support middle class incomes—such as access to quality and affordable education, health benefits cost controls, minimum wage policies, or more generally policies shifting bargaining power away from shareholders and management toward workers.

Encouraging saving for the bottom 90% could also boost middle-class wealth by reducing the growing inequality in saving rates. The best policy to encourage middle-class saving depends on the reasons for the observed drop in the saving rate of bottom 90% families. Middle-class saving might have plummeted because of the lackluster growth in middle class incomes relative to top incomes, fueling demand for credit to maintain relative consumption (see e.g., Bertrand and Morse (2013)). In that case, policies to boost middle-class incomes would probably boost saving as well and powerfully affect the bottom 90% wealth share. Financial deregulation may have expanded borrowing opportunities (through consumer credit, home equity loans, subprime mortgages) and in some cases might have left consumers insufficiently protected against some forms of predatory lending. In that case, greater consumer protection and financial regulation could help increasing middle-class saving. Tuition increases may have increased student loans, in which case limits to university tuition fees may have a role to play.

Yet the fall in the bottom 90% saving rate might also owe to growing behavioral biases in the saving decisions of middle-class households; many individuals, for instance, do not know how to invest optimally and end up spending too much on servicing short-run debt at high interest rates (see e.g. Thaler and Sunstein, 2008). To address these biases, recent work in behavioral economics shows that nudges are more effective than tax incentives (see e.g. Chetty et al., 2014a). A good model for building wealth among the bottom 90% might therefore have three components: (1) nudged long-run savings, (2) directed investment, (3) ability to borrow against oneself. First, a fraction of earnings (e.g., 3 or 4% of pay up to $100,000 of annual earnings) could be directed by default to individual tax-deferred savings accounts that can only be used for retirement, home purchase downpayment (to build housing wealth), and education expenses (to build human capital) as in the existing automatic IRAs proposals. Second, such accounts could be invested in a broad fund delivering a rate of return r close to the global return on capital, ensuring that even modest accounts earn substantial returns. Third, individuals would be allowed to borrow (up to some level) against their savings account for any expense at an interest rate above r, but interest payments would be credited back to the account so that individuals effectively borrow against themselves (Mullainathan and Shafir, 2013). Tax refunds (or extra tax withholding) could be used to ensure repayment and keep default to a minimum.[61]

---

[61]Many 401(k) pension plans already allow such a borrowing option. Estimating whether this option reduces

Appendix

A complete set of Appendix Tables and Figures supplementing this article is available online at `http://eml.berkeley.edu/~saez` and `http://gabriel-zucman.eu/uswealth`. The Appendix is organized as 4 Excel files:

(i) **Appendix Tables A** (file AppendixTables(Aggregates).xlsx): presents our aggregate series on wealth, income, saving, and returns. Starting from the publicly available Flow of Funds, National Income and Product Accounts, and Integrated Macroeconomic Accounts series, we present each step of the data construction process.

(ii) **Appendix Tables B** (file AppendixTables(Distributions).xlsx): reports our results on the distribution of US household wealth, saving, and rates of return, as obtained by capitalizing income tax returns. We provide baseline estimates and a number of supplementary robustness checks.

(iii) **Appendix Tables C** (file AppendixTables(OtherEstimates).xlsx): presents estimations of the distribution of wealth and of rates of returns obtained in other datasets: the Survey of Consumer Finances, estates tax returns, foundation tax returns, etc.

(iv) **Appendix Figures** (file AppendixFigures.xlsx): reports a number of supplementary figures constructed from the above Appendix Tables.

---

the use of high-interest credit would be very valuable (see Li and Smith, 2009, for a discussion).

References

AABERGE, R., ATKINSON, A., KONIGS, S., AND LAKNER, C. 2014. Wages, capital and top incomes. Unpublished paper, not completed.

ANTONIEWICZ, R. 2000. A Comparison of the Household Sector from the Flow of Funds Accounts and the Survey of Consumer Finances. Federal Reserve Board of Governors Survey of Consumer Finances Working Paper.

ATKINSON, A. AND HARRISON, A. 1978. Distribution of Personal Wealth in Britain. Cambridge University Press, Cambridge, UK.

ATKINSON, A., PIKETTY, T., AND SAEZ, E. 2011. Top incomes in the long run of history. *Journal of Economic Literature* 49:3–71.

BERTRAND, M. AND MORSE, A. 2013. Trickle-down consumption. Working Paper 18883, NBER.

BOSERUP, S., KOPCZUK, W., AND KREINER, C. 2014. Intergenerational wealth mobility: Evidence from danish wealth records of three generations. University of Copenhagen Working Paper.

BOURNE, J. AND ROSENMERKEL, L. 2014. Over the top: How tax returns show that the very rich are different from you and me. Statistics of Income, IRS Working Paper.

BRICKER, J., DETTLING, L., HENRIQUES, A., HSU, J., MOORE, K., SABELHAUS, J., THOMPSON, J., AND WINDLE, R. 2014. Changes in U.S. family finances from 2010 to 2013: Evidence from the Survey of Consumer Finances. Board of Governors of the Federal Reserve System.

BROWN, J., LIEBMAN, J., AND POLLET, J. 2002. Estimating life tables that reflect socioeconomic differences in mortality, pp. 447–457. *In* M. Feldstein and J. Liebman (eds.), The Distributional Aspects of Social Security and Social Security Reform. University of Chicago Press, Chicago and London.

BRYANT, V. AND GOBER, J. 2013. Accumulation and distribution of individual retirement arrangements, 2010. Internal Revenue Service: Statistics of Income Bulletin, Washington D.C.

CHETTY, R., FRIEDMAN, J., LETH-PETERSEN, S., NIELSEN, T., AND OLSEN, T. 2014a. Active vs. passive decisions and crowd-out in retirement savings accounts: Evidence from Denmark. *Quarterly Journal of Economics* 129:1141–1219.

CHETTY, R., HENDREN, N., KLINE, P., AND SAEZ, E. 2014b. Where is the land of opportunity? the geography of intergenerational mobility in the united states. *Quarterly Journal of Economics* 129.

DAVIES, J. AND SHORROCKS, A. 2000. The Distribution of Wealth, pp. 605–675. *In* A. Atkinson and F. Bourguignon (eds.), Handbook of Income Distribution, volume 1. Elsevier/North Holland, Amsterdam; New York.

DULEEP, H. 1989. Measuring socioeconomic mortality differentials over time. *Demography* 26:345–351.

EDLUND, L. AND KOPCZUK, W. 2009. Women, Wealth and Mobility. *American Economic Review* 99:146–78.

ELLIOTT, H. 1970. The accumulated earnings tax and the reasonable needs of the business: A proposal. *William and Mary Law Review* 12:34–50.

Feldman, J., Makuc, D., Kleinman, J., and Cornoni-Huntley, J. 1989. National trends in education differentials in mortality. *American Journal of Epidemiology* 129:919–933.

Forbes Magazine 2014. The Forbes 400: The Richest People in America. September, annual since 1982.

Goldsmith, R., Brady, D., and Mendershausen, H. 1956. A Study of Saving in the Unites States, volume 3. Princeton University Press, Princeton.

Greenwood, D. 1983. An estimation of US family wealth and its distribution from microdata, 1973. *Review of Income and Wealth* 29:23–43.

Henriques, A. 2013. Are homeowners in denial about their house values? Comparing owner perceptions with transaction-based indexes. Federal Reserve Board of Governors Working Paper.

Henriques, A. and Hsu, J. 2013. Analysis of wealth using micro and macro data: A comparison of the Survey of Consumer Finances and Flow of Funds Accounts. Federal Reserve Board of Governors Working Paper.

Hollenbeck, S. and Kahr, M. 2014. Individual foreign-earned income and foreign tax credit, 2011. Internal Revenue Service: Statistics of Income Bulletin, Washington D.C.

B. Johnson (ed.) 1994. Compendium of Federal Estate Tax and Personal Wealth Studies. Number 4–94. Department of Treasury, Internal Revenue Service, Statistics of Income.

B. Johnson (ed.) 2011. Compendium of Federal Estate Tax and Personal Wealth Studies, volume 2. Department of Treasury, Internal Revenue Service, Statistics of Income.

Johnson, B. and Moore, K. 2008. Differences in income estimates derived from survey and tax data. IRS Statistics of Income Working Paper Series.

Johnson, B., Moore, K., and Rosenmerkel, L. 2011. The income-wealth paradox: Connections between realized income and wealth among America's aging top wealth-holders. *In* B. Johnson (ed.), Compendium of Federal Estate Tax and Personal Wealth Studies, volume 2. Department of Treasury, Internal Revenue Service, Statistics of Income.

Johnson, B., Raub, B., and Newcomb, J. 2013. A new look at the income-wealth connection for america's wealthiest decedents. IRS Statistics of Income Working Paper Series.

Johnson, B. and Wahl, J. 2004. The mismeasurement of man's well-being: Refining realized income measures with wealth, portfolio, and mortality information. IRS Statistics of Income Working Paper Series.

Johnson, B. W. and Raub, B. 2005. Personal wealth, 2001. *Internal Revenue Service: Statistics of Income Bulletin* pp. 120–146.

Kennickell, A. 2001. Using income data to predict wealth. FEDS Working Paper, Board of Governors of the Federal Reserve System.

Kennickell, A. 2009a. Getting to the top: Reaching wealthy respondents in the SCF. FEDS Working Paper, Board of Governors of the Federal Reserve System.

Kennickell, A. 2009b. Ponds and streams: Wealth and income in the US, 1989 to 2007. FEDS Working Paper, Board of Governors of the Federal Reserve System.

KENNICKELL, A. 2011. Tossed and turned: Wealth dynamics of US households 2007–2009. FEDS Working Paper, Board of Governors of the Federal Reserve System.

KING, W. 1927. Wealth distribution in the continental United States at the close of 1921. *Journal of the American Statistical Association* 22:135–153.

KING, W. 1930. The National Income and Its Purchasing Power. National Bureau of Economic Research.

KOPCZUK, W. 2007. Bequest and tax planning: Evidence from estate tax returns. *Quarterly Journal of Economics* 122:1801–1854.

KOPCZUK, W. AND SAEZ, E. 2004. Top wealth shares in the United States, 1916–2000: Evidence from estate tax returns. *National Tax Journal* 52:445–487.

KUZNETS, S. 1941. The National Income and Its Composition, 1919–1938. National Bureau of Economic Research.

LAMPMAN, R. 1962. The Share of Top Wealth-Holders in National Wealth, 1922–56. Princeton University Press, Princeton.

LI, G. AND SMITH, P. 2009. New Evidence on 401(k) Borrowing and Household Balance Sheets. FEDS Working Paper, Board of Governors of the Federal Reserve System.

LINDERT, P. 2000. Three centuries of inequality in Britain and America, pp. 167–216. *In* A. Atkinson and F. Bourguignon (eds.), Handbook of Income Distribution, volume 1. Elsevier/North Holland, Amsterdam; New York.

MIAN, A., RAO, K., AND SUFI, A. 2014. Household balance sheets, consumption, and the economic slump. *Quarterly Journal of Economics* . Forthcoming.

MIAN, A. AND SUFI, A. 2014. House of Debt. Chicago University Press, Chicago.

MULLAINATHAN, S. AND SHAFIR, E. 2013. Scarcity: Why Having Too Little Means So Much. Times Book.

PAPPAS, G., QUEEN, S., HADDEN, W., AND FISHER, G. 1993. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New England Journal of Medicine* 329:103–109.

PIKETTY, T. 2014. Capital in the 21st Century. Harvard University Press, Cambridge.

PIKETTY, T., POSTEL-VINAY, G., AND ROSENTHAL, J.-L. 2013. Inherited vs. self-made wealth: Theory and evidence from a rentier society (1872-1927). *Explorations in Economic History* 51:21–40.

PIKETTY, T. AND SAEZ, E. 2003. Income inequality in the United States, 1913–1998. *Quarterly Journal of Economics* 118:1–39.

PIKETTY, T. AND SAEZ, E. 2007. How progressive is the US federal tax system? A historical and international perspective. *Journal of Economic Perspectives* 21:3–24.

PIKETTY, T. AND ZUCMAN, G. 2014a. Capital is back: Wealth-income ratios in rich countries, 1700–2010. *Quarterly Journal of Economics* 129:1255–1310.

PIKETTY, T. AND ZUCMAN, G. 2014b. Wealth and inheritance in the long run, pp. 167–216. *In* A. Atkinson and F. Bourguignon (eds.), Handbook of Income Distribution, volume 2. Elsevier/North Holland, Amsterdam; New York.

POTERBA, J. 2002. Taxation, risk taking, and household portfolio behavior, pp. 1109–1171. *In* A. Auerbach and M. Feldstein (eds.), Handbook of Public Economics, volume 3. Elsevier/North Holland, Amsterdam; New York.

RAUB, B. 2008. Personal wealth, 2004. *Internal Revenue Service: Statistics of Income Bulletin* pp. 282–308.

ROSENMERKEL, L. AND WAHL, J. 2011. Crossing the bar: Predicting wealth from income and estate tax records. *In* B. Johnson (ed.), Compendium of Federal Estate Tax and Personal Wealth Studies, volume 2. Department of Treasury, Internal Revenue Service, Statistics of Income.

SAEZ, E. AND ZUCMAN, G. 2014. Who Benefits from Tax Expenditures on Capital? Evidence on Capital Income and Wealth Concentration. Working Paper Series, IRS Statistics of Income.

STEWART, C. 1939. Income capitalization as a method of estimating the distribution of wealth by size group. *In* Studies in Income and Wealth, volume 3. National Bureau of Economic Research, New York.

THALER, R. AND SUNSTEIN, C. 2008. Nudge: Improving Decisions about Health, Wealth, and Happiness. Yale University Press, New Haven.

UNITED NATIONS 2009. System of national accounts 2008. European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank.

US BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM 2014. Z.1 Financial Accounts of the United States, Fourth Quarter 2013. Downloaded, March 6, 2014.

US DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS 2014. National income and product accounts of the United States, 1929–2013.

US GAO 2009. Home mortgage interest deduction. Report to the Joint Committee on Taxation, GAO-09-769.

US SENATE 2008. Tax haven banks and us tax compliance. Staff Report of the Permanent Subcommittee on investigations.

US SENATE 2014. Offshore tax evasion: The effort to collect unpaid taxes on billions in hidden offshore accounts. Staff Report of the Permanent Subcommittee on investigations.

US TREASURY DEPARTMENT, INTERNAL REVENUE SERVICE, S. O. I. 1916–2012. Statistics of income: Individual income tax return.

WALDRON, H. 2004. Heterogeneity in health and mortality risk among early retiree men. ORES Working Paper Series, No. 105.

WALDRON, H. 2007. Trends in mortality differentials and life expectancy for male social security covered workers, by average relative earnings. ORES Working Paper Series, No. 105.

WOLFF, E. 1989. Trends in Aggregate Household Wealth in the United States, 1900–1983. *Review of Income and Wealth* 35:1–29.

WOLFF, E. 2012. The Asset Price Meltdown and the Wealth of the Middle Class. NYU Working Paper.

ZUCMAN, G. 2013. The Missing Wealth of Nations, Are Europe and the US net Debtors or net Creditors? *Quarterly Journal of Economics* 128:1321–1364.

ZUCMAN, G. 2014. Taxing across borders: Tracking personal wealth and corporate profits. *Journal of Economic Perspectives* 28. Forthcoming.

Table 1: Thresholds and average wealth in top wealth groups, 2012

Wealth group	Number of families	Wealth threshold	Average wealth	Wealth share
A. Top Wealth Groups				
Full Population	160,700,000		$343,000	100%
Top 10%	16,070,000	$660,000	$2,560,000	77.2%
Top 1%	1,607,000	$3,960,000	$13,840,000	41.8%
Top 0.1%	160,700	$20,600,000	$72,800,000	22.0%
Top .01%	16,070	$111,000,000	$371,000,000	11.2%
B. Intermediate Wealth Groups				
Bottom 90%	144,600,000		$84,000	22.8%
Top 10-1%	14,463,000	$660,000	$1,310,000	35.4%
Top 1-0.1%	1,446,300	$3,960,000	$7,290,000	19.8%
Top 0.1-0.01%	144,600	$20,600,000	$39,700,000	10.8%
Top .01%	16,070	$111,000,000	$371,000,000	11.2%

Notes: This table reports on the distribution of household in the United States in 2012 as obtained by capitalizing income tax returns. The unit is the family (either a single person aged 20 or above or a married couple, in both cases with children dependents if any). Fractiles are defined relative to the total number of families in the population. Source: Appendix Table B1.

Table 2: Rates of growth, saving and return by wealth group

	Real growth rate of wealth per family	Real growth rate of income per family	Private saving rate (personal + retained earnings)	Real rate of capital gains	Total pre-tax rate of return
	g_{wf}	g_{yf}	$s = S/Y$	q	$r + q$
1917-1929					
All	**1.8%**	0.5%	10%	0.9%	9.0%
Bottom 90%	**-0.4%**	0.0%	1%	0.2%	7.9%
Top 10%	**2.3%**	1.2%	23%	1.0%	9.2%
Top 1%	**3.6%**	1.4%	28%	1.5%	10.5%
1929-1986					
All	**1.5%**	2.0%	12%	-0.6%	6.6%
Bottom 90%	**3.0%**	2.3%	6%	-0.2%	6.2%
Top 10%	**1.0%**	1.4%	24%	-0.9%	6.8%
Top 1%	**0.3%**	0.5%	24%	-1.1%	7.2%
1986-2012					
All	**1.9%**	1.3%	9%	0.9%	7.5%
Bottom 90%	**0.1%**	0.7%	0%	1.3%	7.5%
Top 10%	**2.7%**	2.3%	22%	0.7%	7.5%
Top 1%	**3.9%**	3.4%	36%	0.9%	7.9%

Notes: Nominal values are deflated by using the GDP deflator. Saving rates are expressed as a percentage of NIPA national income accruing to each group. Pre-tax rates of returns are gross of all taxes (including the fraction of product taxes that falls on capital).

Top 0.1% wealth share in the United States, 1913-2012
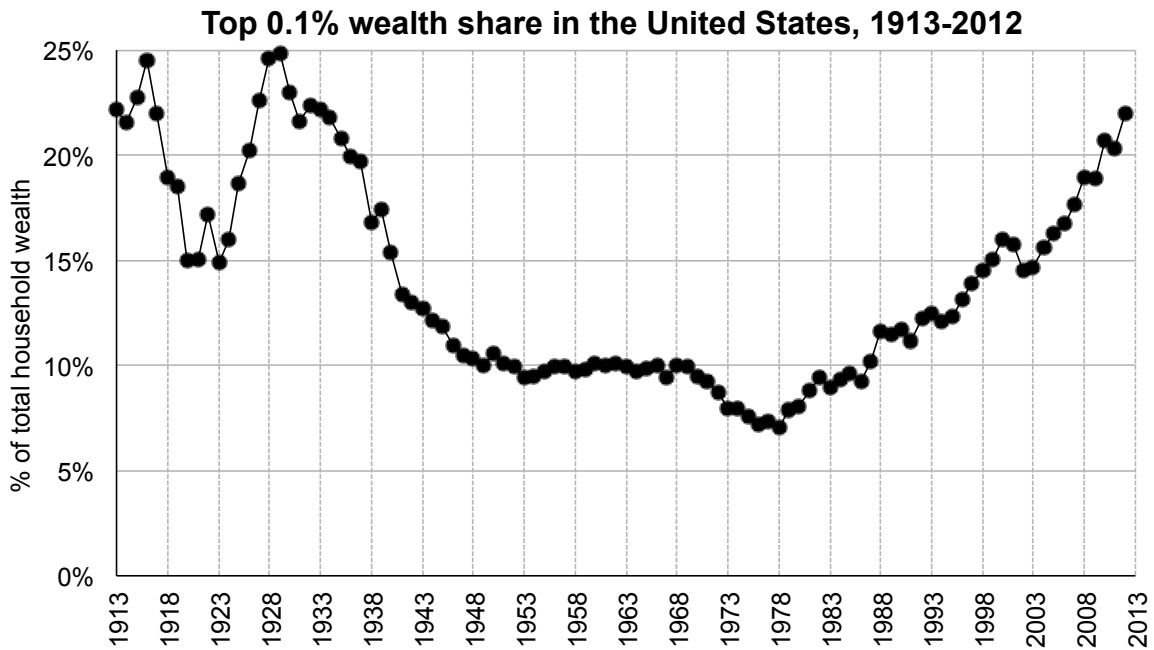
This figure depicts the share of total household wealth held by the 0.1% richest families, as estimated by capitalizing income tax returns. In 2012, the top 0.1% includes about 160,000 families with net wealth above $20.6 million. Source: Appendix Table B1.

Top wealth shares: decomposing the top 1%
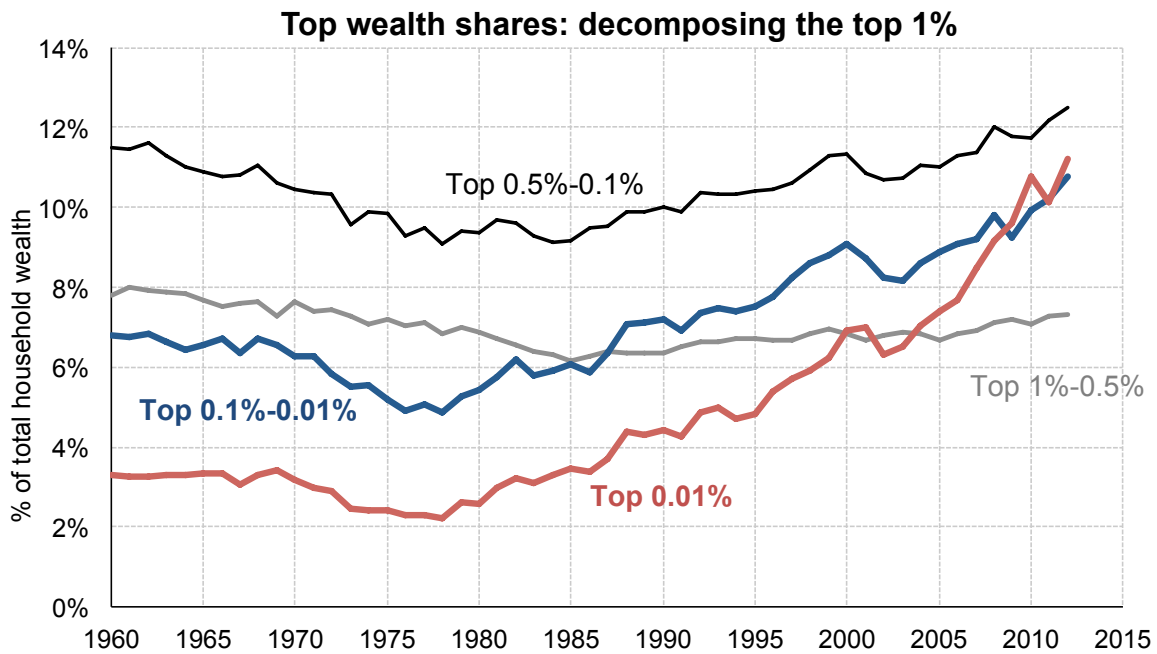
Figure 1: Top Wealth Shares in the United States, 1913-2012

Notes: The top panel plots the top 0.1% wealth share in the United States from 1913 to 2012. The bottom panel decomposes the top 1% into four groups: top 1% to 0.5%, top 0.5% to 0.1%, top 0.1% to 0.01%, and top 0.01% from 1960 to 2012. The unit is the family (either a single person aged 20 or above or a married couple, in both cases with children dependents if any). Fractiles are defined relative to the total number of tax units in the population. Source: Appendix Table B1.

The composition of household wealth in the U.S., 1913-2013
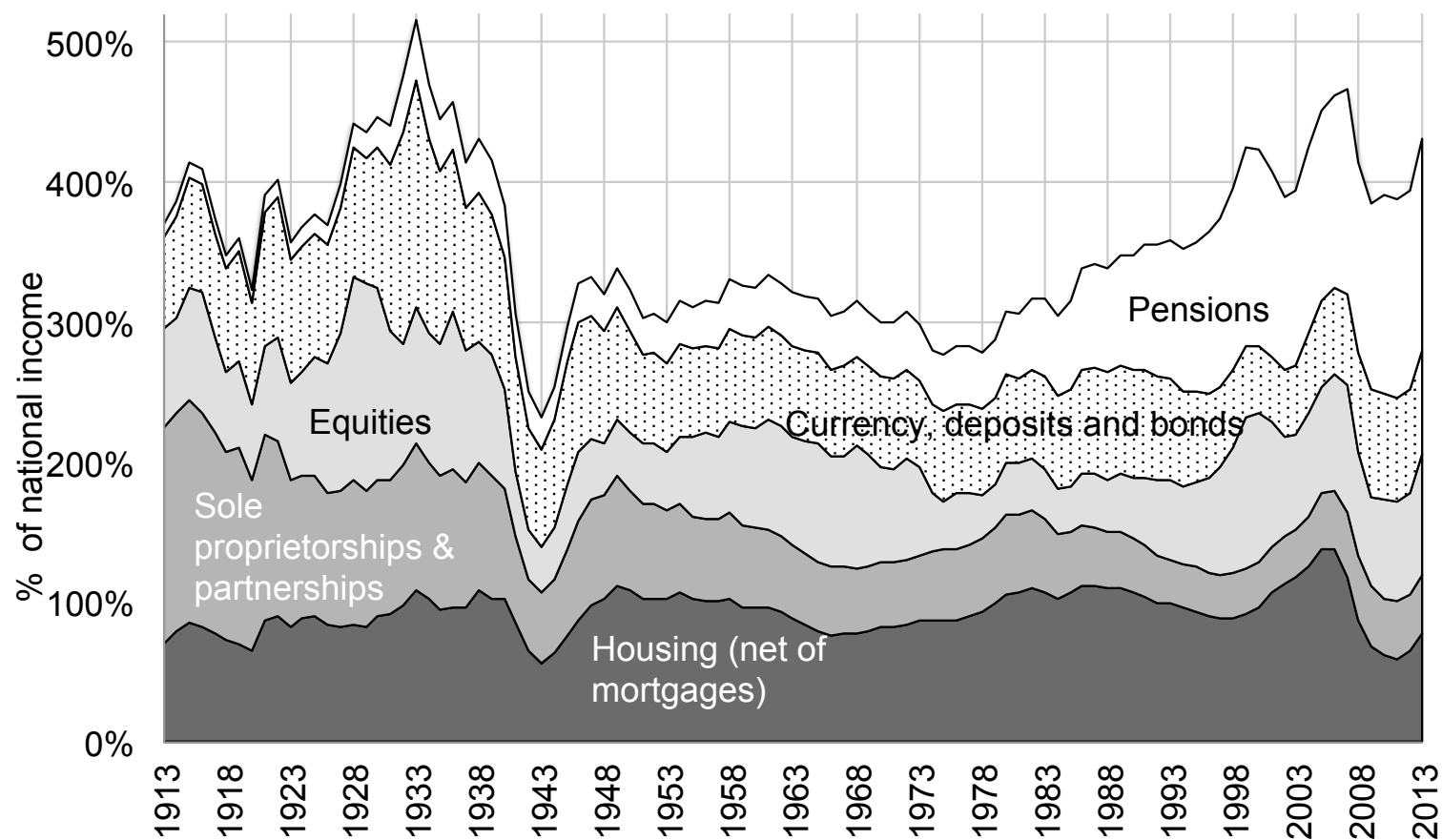
This figure depicts the evolution of the ratio of total household wealth to national income. This ratio has followed a U-shaped evolution and the composition of wealth has changed markedly since 1913. Source: Appendix Table A1.

Figure 2: Aggregate US Household Wealth, 1913-2013

Notes: The figure depicts the level and composition of aggregate household wealth from 1913 to 2013 expressed as a percentage of national income. Net housing includes owner- and tenant-occupied housing net of mortgage debt. Business assets include sole proprietorships, farms including land and equipment, partnerships, and intellectual property products. Corporate equities cover both publicly traded and closely held corporations, and include shares of S-corporations. Fixed income claims include bonds, saving and current deposits, and currency, and are net of non-mortgage debt. Pensions include individual retirement accounts, defined contribution pensions funds such as 401(k)s, funded defined benefits pensions, and life insurance reserves, but exclude unfunded defined benefit entitlements and Social Security. Pensions are typically invested in both fixed income claims and corporate equities. Source: Appendix Table A2.

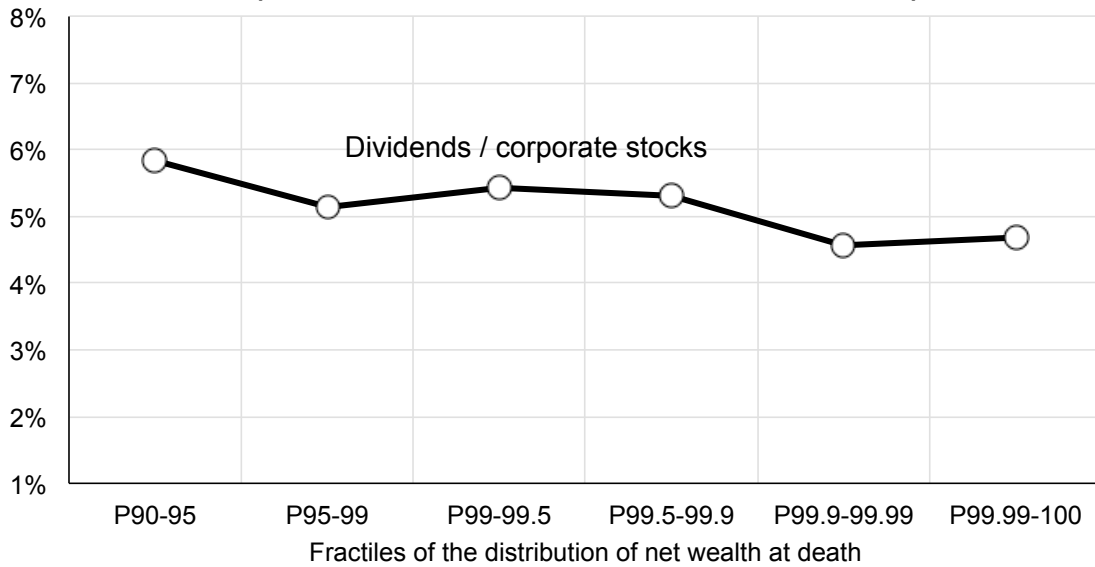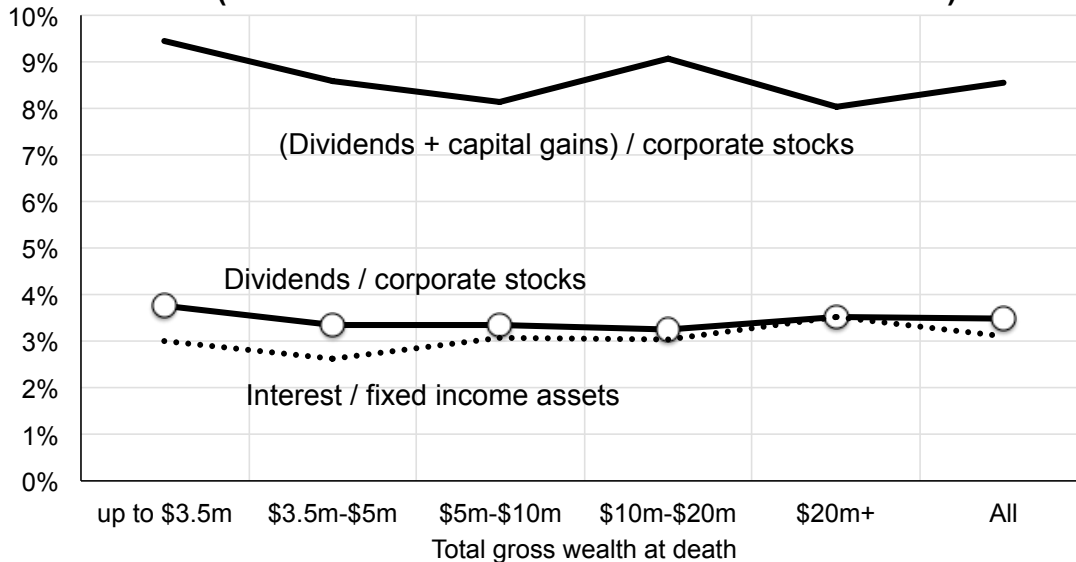# The top 0.1% taxable capital income share
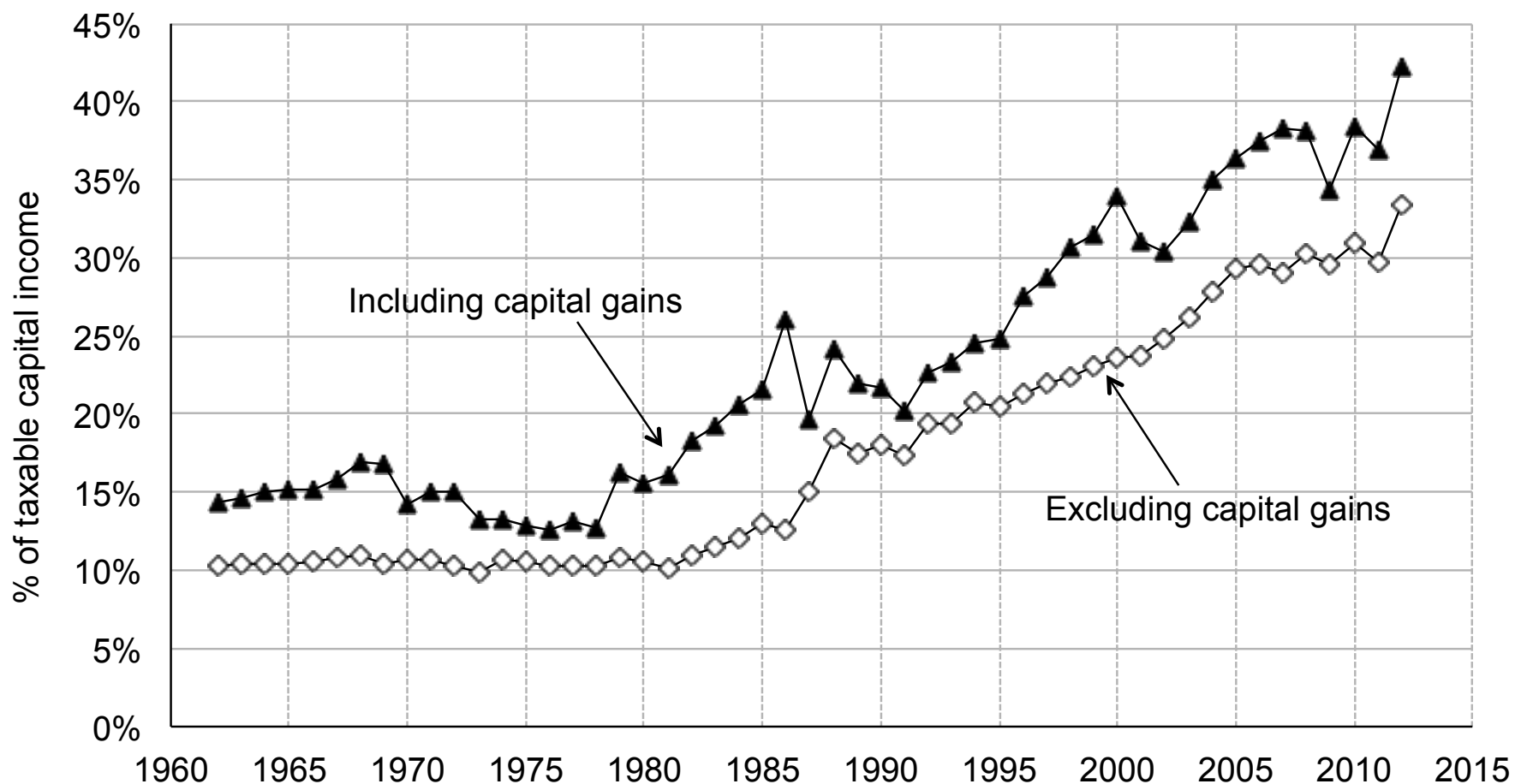
Figure 3: The Top 0.1% Taxable Capital Income Share in the United States, 1962-2012

Notes: The figure plots the top 0.1% taxable capital income share in the United States from 1962 to 2012. Taxable capital income includes dividends, taxable interest, positive rents, estate and trust income, as well as the positive profits of S-corporations, sole proprietorships and partnerships (negative profits and negative rental income are disregarded). It excludes tax exempt interest paid by state and local bonds (munis). The top curve includes positive realized capital gains. The unit is the family (either a single person aged 20 or above or a married couple, in both cases with children dependents if any). Source: Appendix Tables B21 and B22.

**Dividend yield by wealth class, 1976
(matched micro estate and income tax data)**

Dividends / corporate stocks

Fractiles of the distribution of net wealth at death

**Returns by asset and wealth class, 2007
(matched tabulated estates and income tax data)**

(Dividends + capital gains) / corporate stocks

Dividends / corporate stocks

Interest / fixed income assets

Total gross wealth at death

The figure reports returns for various assets classes by size of gross worth using matched estate and prior year income tax data for 2008 estate tax filers (mostly 2007 decedents), excluding joint filers. Source: Appendix Table C6.

Figure 4: Rates of Returns by Wealth

Notes: The figure displays how rates of returns vary across the distribution of wealth at death, using estate tax returns matched to prior year income tax returns of non-married filers. The top panel uses a micro-dataset of estates filed in 1977, 80% of which are for individuals who died in 1976. Fractiles are defined relative to the full population of adults (aged 24+) decedents in 1976. 11% of all 1976 adult decedents filed an estate tax returns. The bottom panel uses tabulated data for estates filed in 2008 (typically 2007 decedents). Individuals are ranked by their size of gross wealth at death. In all cases, within-asset class returns appear to be fairly stable across wealth groups. Source: publicly available tax data, see Appendix Tables C5 and C6.
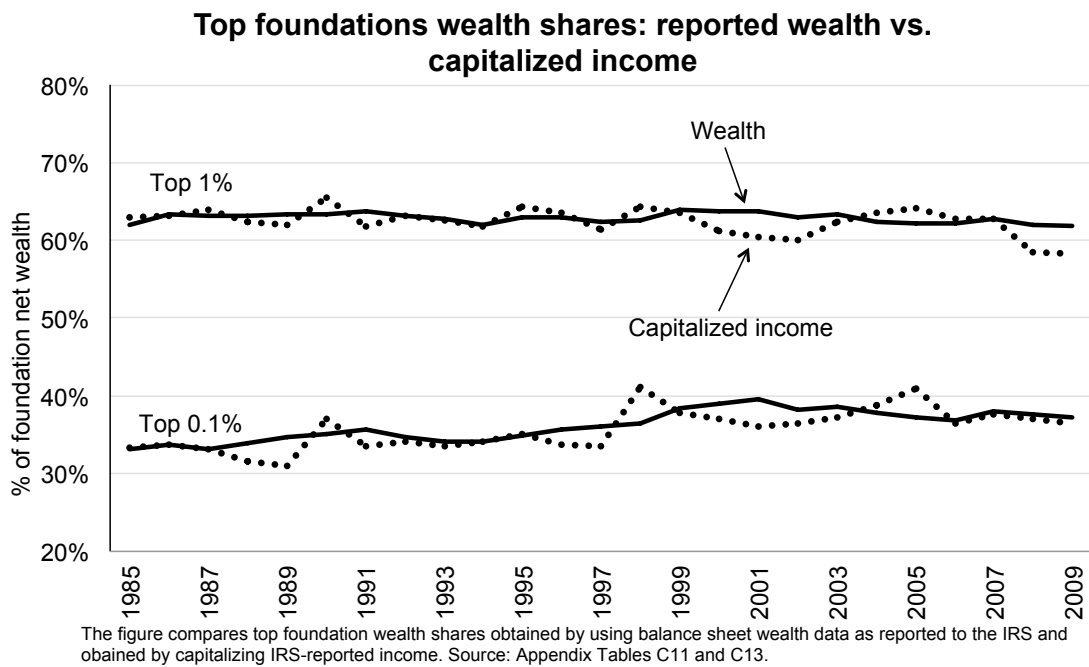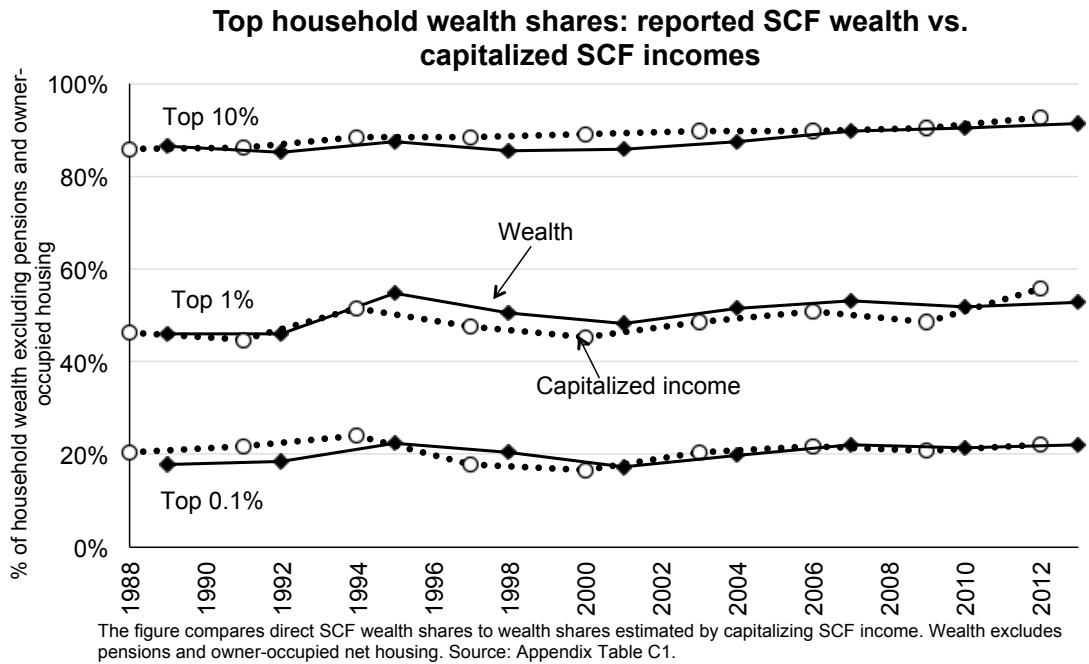
Top household wealth shares: reported SCF wealth vs. capitalized SCF incomes

The figure compares direct SCF wealth shares to wealth shares estimated by capitalizing SCF income. Wealth excludes pensions and owner-occupied net housing. Source: Appendix Table C1.

Top foundations wealth shares: reported wealth vs. capitalized income

The figure compares top foundation wealth shares obtained by using balance sheet wealth data as reported to the IRS and obained by capitalizing IRS-reported income. Source: Appendix Tables C11 and C13.

Figure 5: Testing the Capitalization Method using SCF and Foundation data

Notes: The top panel depicts top household wealth shares using the reported wealth (solid line) and the capitalized incomes (dashed line) of Survey of Consumer Finances respondents. Wealth includes fixed income claims (savings, checking, money market, and call accounts, certificates of deposits, holdings of savings bonds, direct holding of taxable bonds, and holdings of taxable bonds through mutual funds), corporate equities (held directly and through mutual funds), business assets, rental real estate, and miscellaneous financial assets. It excludes the net value of owner-occupied houses and pension wealth. For the SCF of year t, wealth is measured in t but capital income is measured in year $t-1$. Sources: SCF micro-data, see Appendix Table C1. The bottom panel depicts top foundation wealth shares using balance sheet wealth (solid line) and foundations' capitalized incomes (dashed line). Since income from bonds and stocks is lumped together on form 990-PF, we only capitalize dividends and interest on the one hand and rents on the other. Sources: publicly available Statistics of Income tax data, see Appendix Tables C11 and C13.

Top 10% wealth share in the United States, 1917-2012
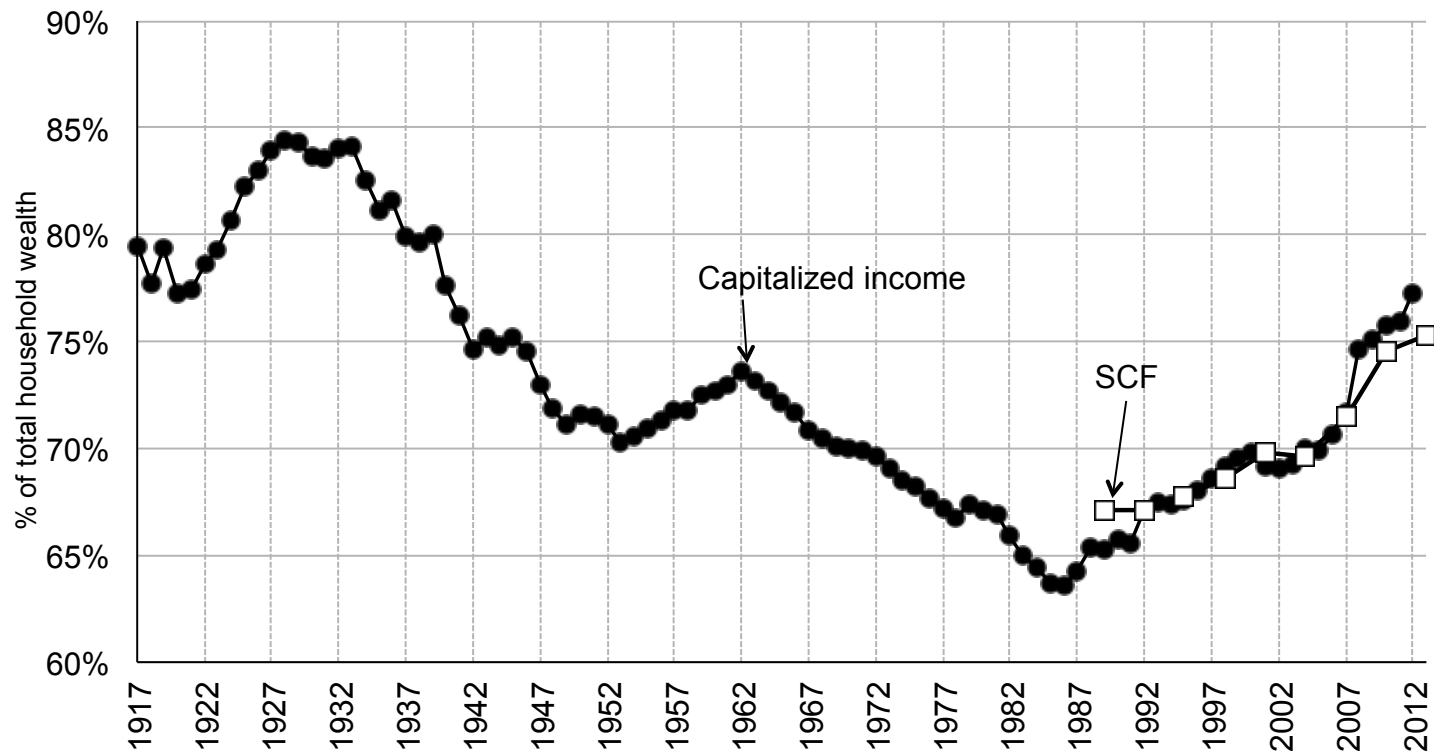
The figure depicts the share of total household wealth owned by the top 10%, obained by capitalizing income tax returns versus in the Survey of Consumer Finances. The unit of analysis is the familly. Source: Appendix Tables B1 and C4.
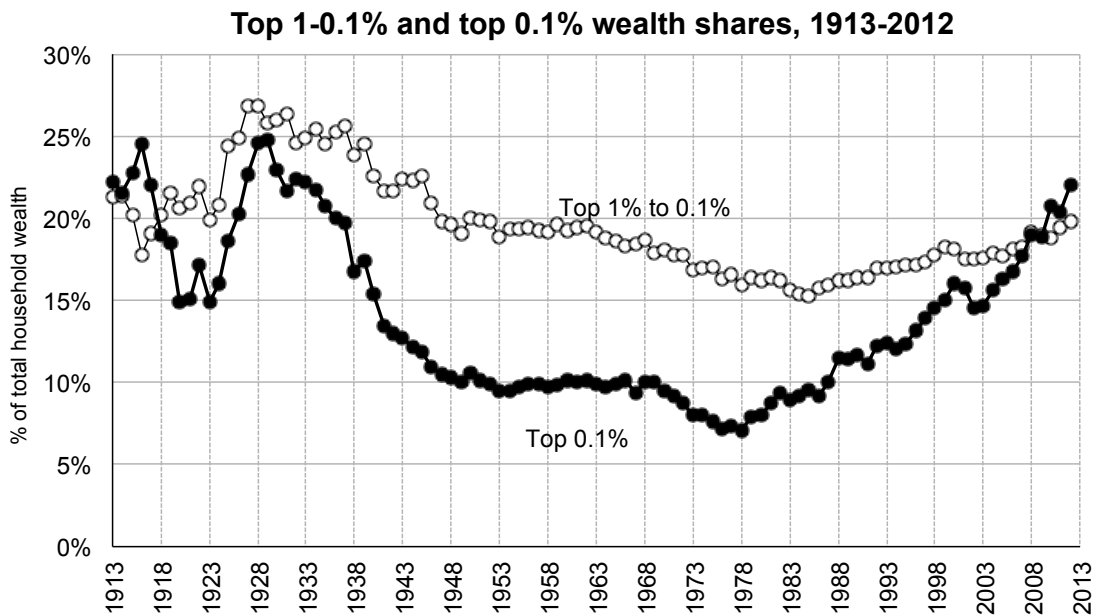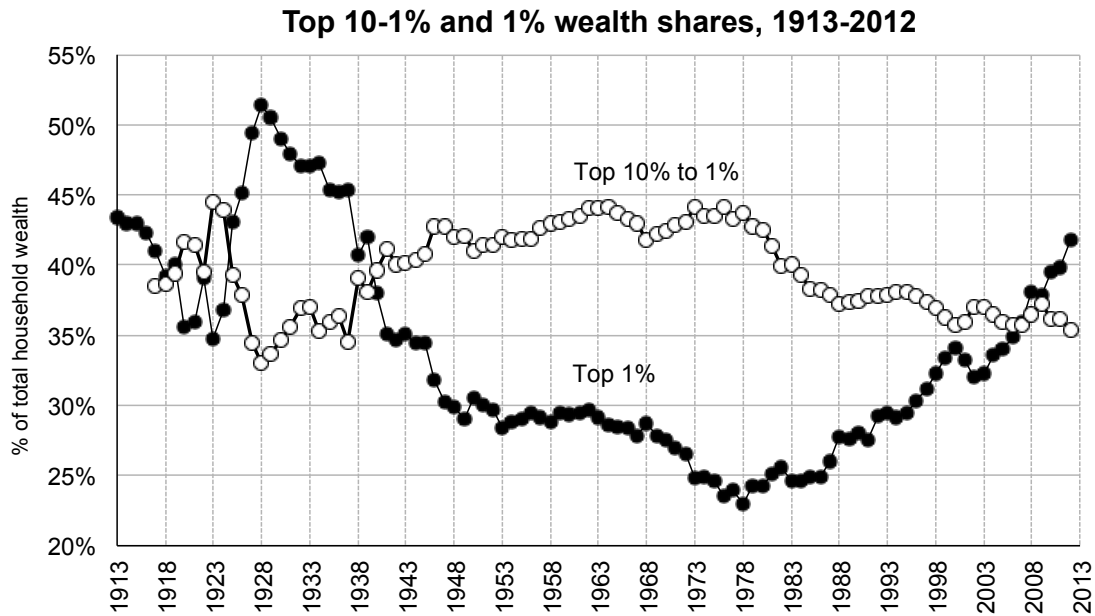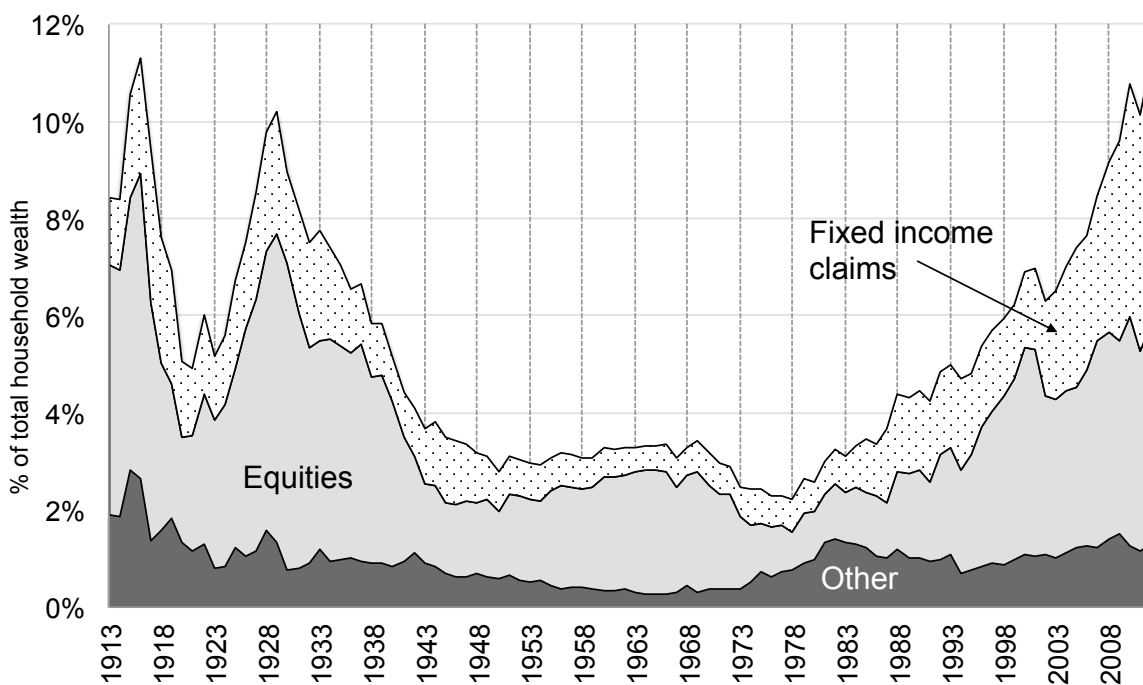
Figure 6: The Top 10% Wealth Share in the United States, 1917-2012

Notes: The figure plots the top 10% wealth share in the United States from 1917 to 2012 using the capitalization method. The unit is the family (single adult person with or without children dependents, or married couple with or without dependents). We also report the top 10% wealth shares estimates from the SCF for the period 1989-2013 from Kennickell (2009b, 2011) and Bricker et al. (2014). Sources: Appendix Tables B1 and C4.

Top 10-1% and 1% wealth shares, 1913-2012

Top 1-0.1% and top 0.1% wealth shares, 1913-2012

Figure 7: Top Wealth Shares in the United States, 1913-2012

Notes: The top panel plots the top 1% and next 9% wealth shares in the United States from 1913 to 2012. The bottom panel plots the top .1% and next .9% wealth shares in the United States from 1913 to 2012. The unit is the family (single adult person with or without children dependents, or married couple with or without dependents). Source: Appendix Table B1.

Composition of the top 0.01% wealth share, 1913-2012

Fixed income
claims

Equities

Other

% of total household wealth

Composition of the bottom 90% wealth share

Pensions

Equities & fixed claims
(net of non-mortgage debt)

Business assets

Housing (net of mortgages)

% of total household wealth
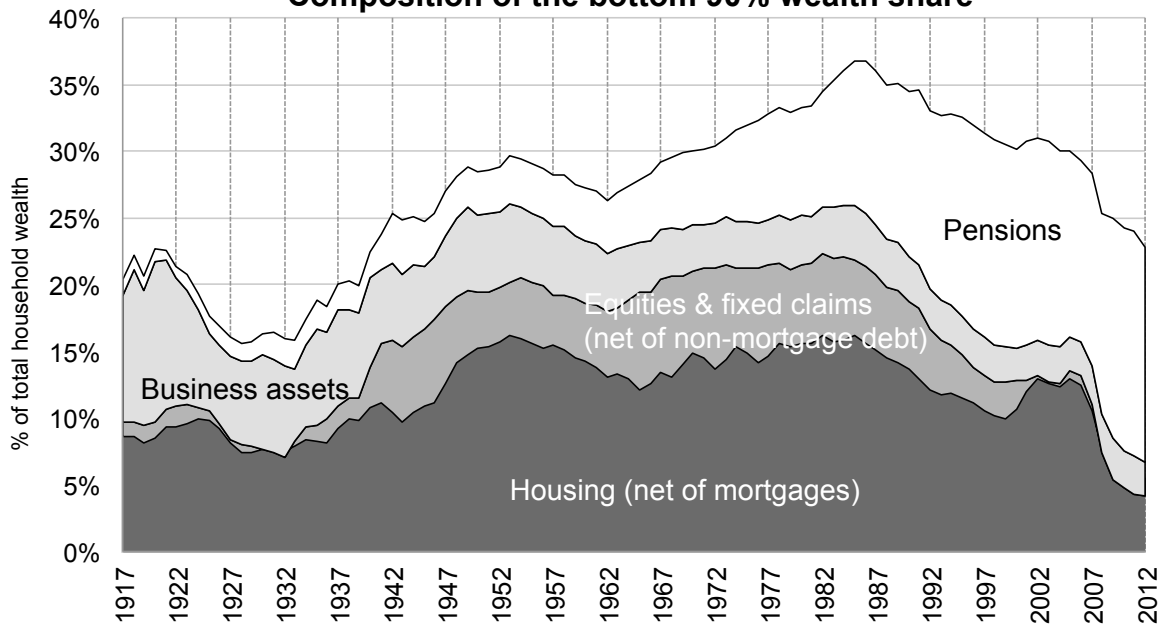
Figure 8: The Top .01% and Bottom 90% Wealth Share Composition

Notes: The top panel plots the top .01% wealth share and its composition from 1913 to 2012. The category other includes business assets, net housing wealth, and pension wealth. The bottom panel plots the bottom 90% wealth share and its composition from 1917 to 2012 lumping together the category of equities, fixed claim assets, and non-mortgage debt. Source: Appendix Table B5.

Figure 9: Real average wealth of bottom 90% and top 1% families

Notes: The figure depicts the average real wealth of bottom 90% families (right y-axis) and top 1% families (left y-axis) from 1946 to 2012. Wealth is expressed in constant 2010 US dollars, using the GDP deflator. Source: Appendix Tables B3.
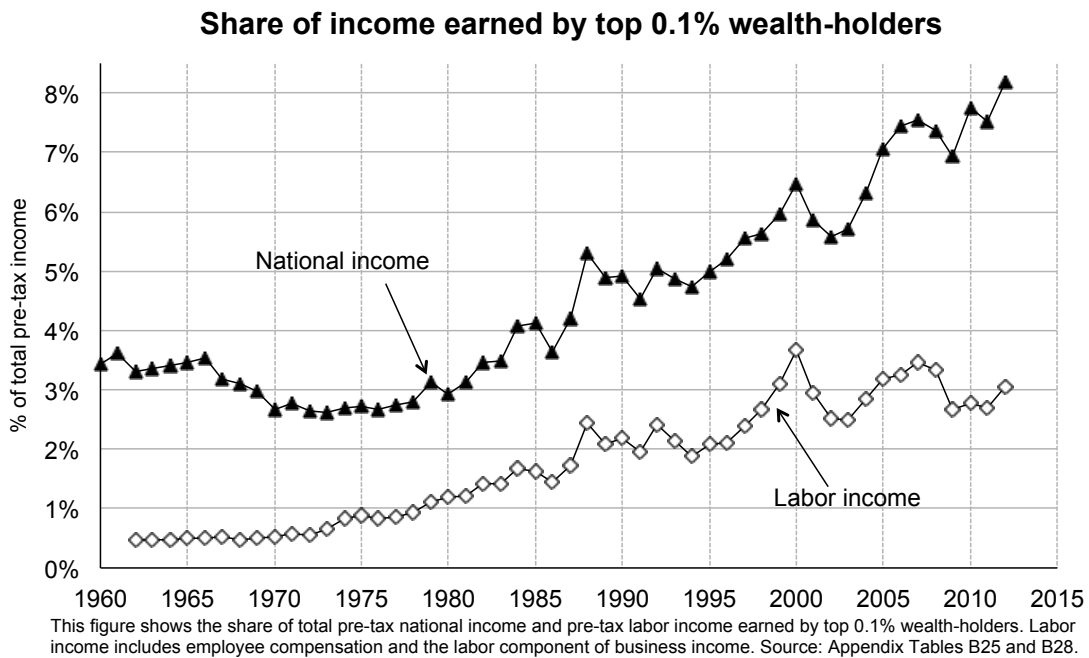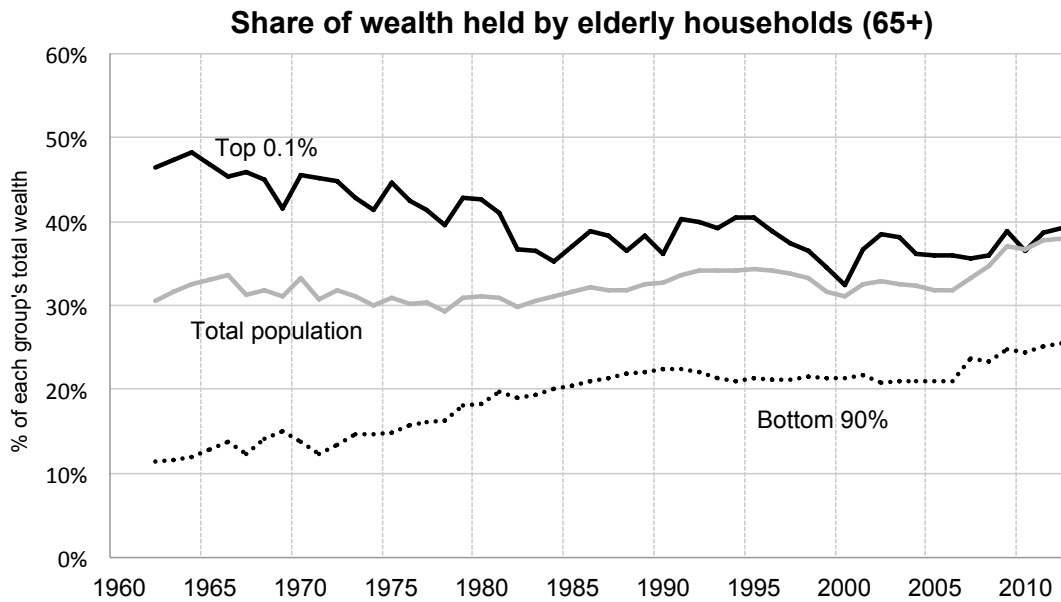
Share of wealth held by elderly households (65+)

Share of income earned by top 0.1% wealth-holders

This figure shows the share of total pre-tax national income and pre-tax labor income earned by top 0.1% wealth-holders. Labor income includes employee compensation and the labor component of business income. Source: Appendix Tables B25 and B28.

Figure 10: Share of Wealth Held by Elderly Households and Share of Income of Top 1% Wealth

Notes: The top panel depicts the fraction of wealth held by elderly families for 3 groups : (1) the full population, (2) the bottom 90%, and (3) the top 0.1%. An elderly family is defined as a tax unit where either the primary filer or the secondary filer (for married tax units) is aged 65 or more. The series covers 1962 to 2012, years for which this information is available. The bottom panel depicts that share of total national income and total labor income in National income accruing to top .1% wealth holders from 1960 to 2012. Source Appendix Tables B4, B25, and B28.

Saving rates by wealth class (decennial averages)
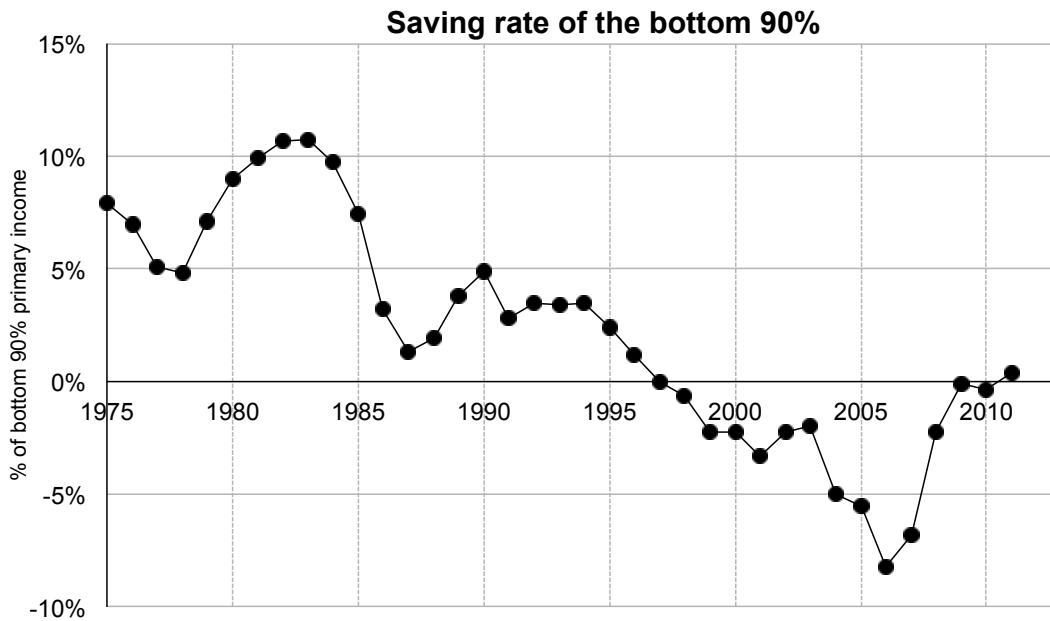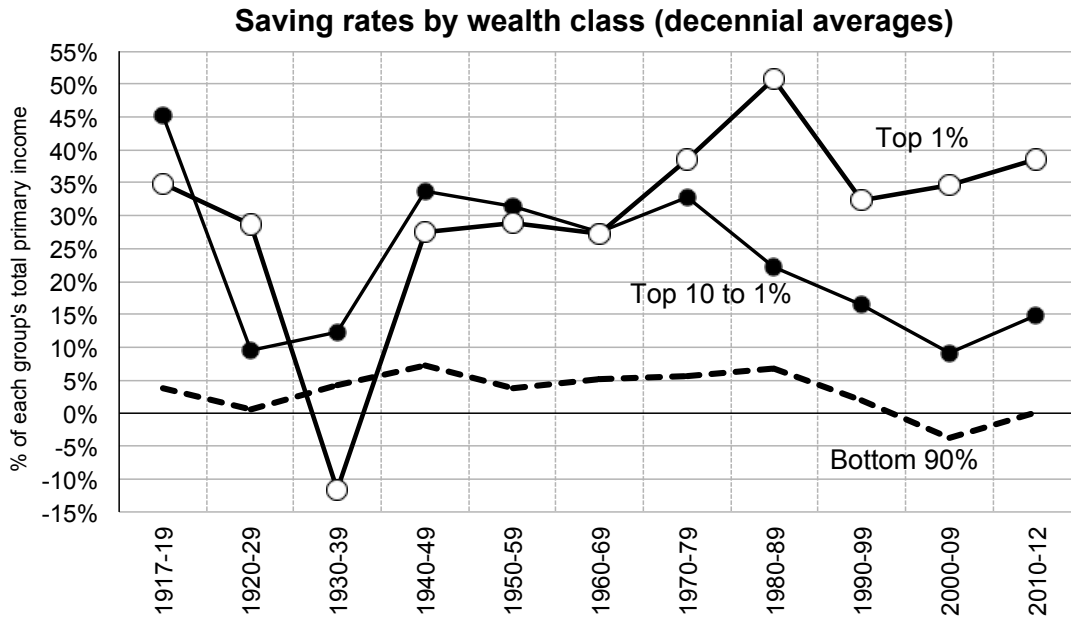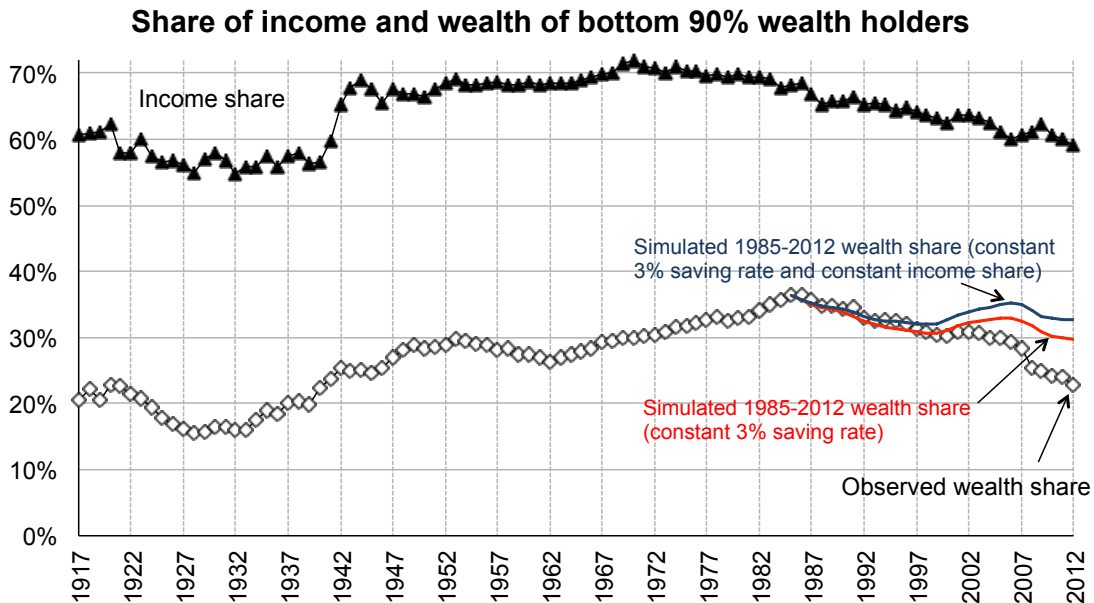

Saving rate of the bottom 90%

Figure 11: Synthetic saving rates by Wealth Group

Notes: The top panel plots the synthetic saving rates for the top 1%, the top 10-1% (next 9%), and the bottom 90% averaged by decade from 1913 to 2012 (the first dot includes only 3 years 1917 to 1919 while the last dot includes only 3 years 2010 to 2012). Synthetic saving rate s_t^p for fractile p in year t are defined so that $W_{t+1}^p = (1 + q_t^p)[W_t^p + s_t^p Y_t^p]$ where W_t^p is wealth of fractile p in year t, $1 + q_t^p$ the price effect based on fractile p wealth holding in year t, and Y_t^p pre-tax income of fractile p. The average private (household + corporate) saving rate has been 11.4% over 1913-2013, but the rich save more as a fraction of their income, except in the 1930s when there was large dis-saving through corporations. The bottom panel plots the annual saving rate for the bottom 90% since 1975. The saving rates of families in the bottom 90% of the wealth distribution has sharply declined since the 1970s. Source: Appendix Table B33.

Share of income and wealth of bottom 90% wealth holders

Income share

Simulated 1985-2012 wealth share (constant 3% saving rate and constant income share)

Simulated 1985-2012 wealth share (constant 3% saving rate)

Observed wealth share

Since the 1980s the share of total household wealth owned by families in the bottom 90% of the wealth distribution has fallen proportionally more than the share of total pre-tax national income earned by these families. Source: Appendix Tables B1, B25 and B33c.
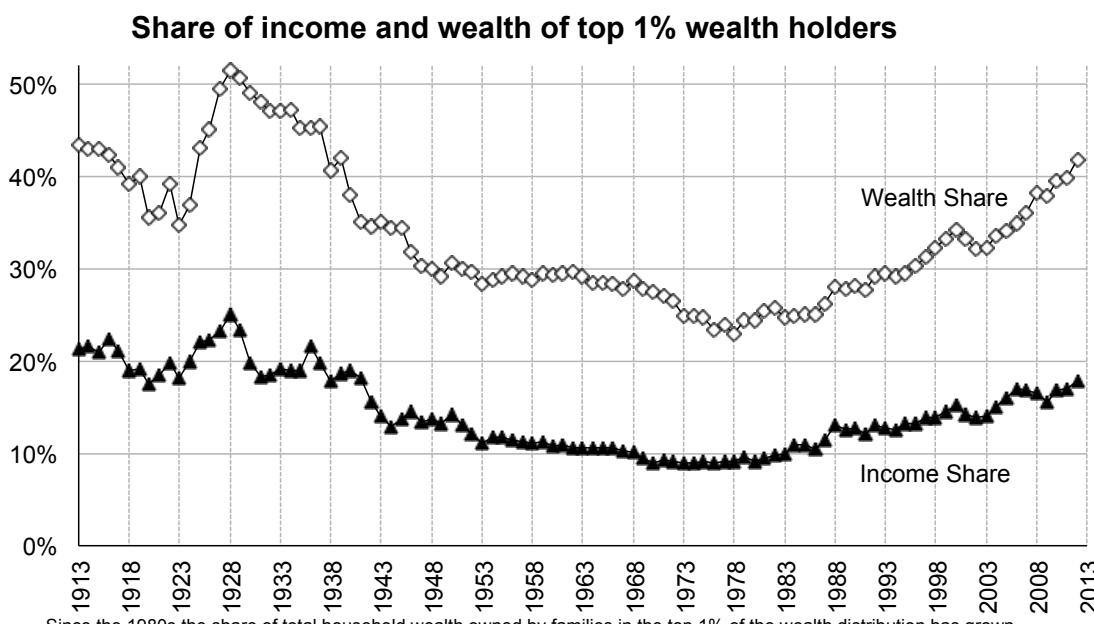
Share of income and wealth of top 1% wealth holders
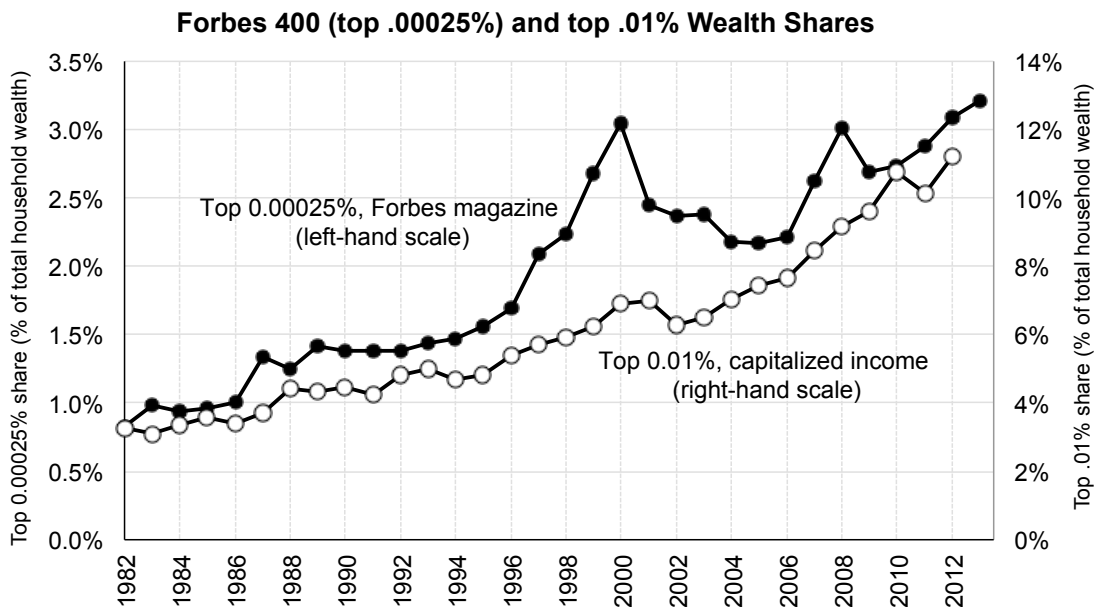

Wealth Share

Income Share

Since the 1980s the share of total household wealth owned by families in the top 1% of the wealth distribution has grown proportionally less than the share of total pre-tax national income earned by these families. Source: Appendix Tables B1 and B25.

Figure 12: Income and Wealth Share of Bottom 90% and Top 1% Wealth Holders

Notes: The top panel plots the share of wealth and income of the bottom 90% wealth holders. The bottom panel plots the share of wealth and income of the top 1% wealth holders. Income is defined so as to match (pre-tax) national income in the national accounts. In steady-state, the wealth share of fractile p (sh_W^p) is equal to the income share of fractile p (sh_Y^p) times the ratio of the saving rate of fractile p (s^p) to the aggregate saving rate s: $sh_W^p = sh_Y^p \cdot (s^p/s)$. If the bottom 90% saving rate had been equal to 3% every year from 1985 to 2012, then all else equal (in particular keeping top 10% saving constant) the bottom 90% wealth share would be 29.7% in 2012 instead of 22.8% in the data. If in addition the income share of the bottom 90% had remained equal to 70% (its 1970-1985 average value) then the bottom 90% wealth share would be 32.7% in 2012. Source: Appendix Table B1, B25, and B33c.

Top 0.1% wealth share: comparison of estimates
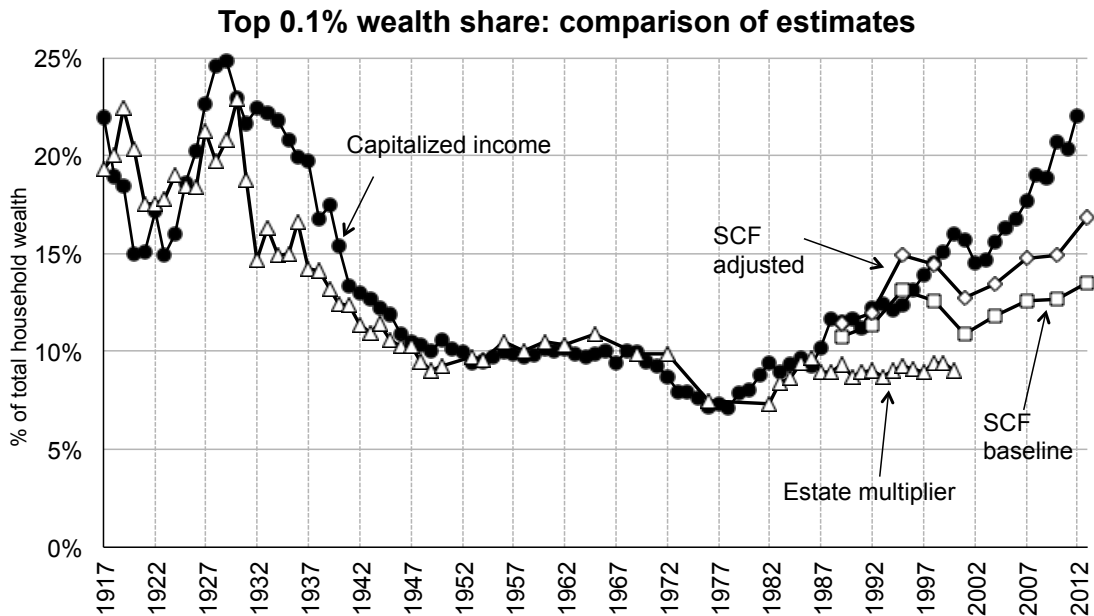
The figure depicts the top 0.1% wealth share obained by capitalizing income, by using the Survey of Consumer Finances (SCF baseline and adjusted), and by using estate tax data (Kopczuk and Saez, 2004). Source: Appendix C4 and C4b.

Forbes 400 (top .00025%) and top .01% Wealth Shares

The figure depicts the top .00025% wealth share as estimated from the Forbes 400 list on the left axis. For comparison, the figure reports our top 0.01% wealth share obtained by capitalizing income tax returns (on the right axis). Source: Appendix Table C3.

Figure 13: Comparing our Top Wealth Shares with Other Estimates

Notes: The top panel compares our top .1% wealth share estimates with top wealth shares estimates from using estate tax returns by (Kopczuk and Saez, 2004) and the Survey of Consumer Finances (SCF). We present two sets of SCF estimates. SCF baseline follows Kennickell (2009b, 2011). SCF adjusted makes three adjustments to match more closely our estimates: (1) fractiles are defined relative to total tax units instead of households, (2) individual wealth components are re-weighted for each asset class to match our Flow of Funds aggregates by asset class, (3) we add back the Forbes 400 that are excluded by design from the SCF. The bottom panel depicts on the left y-axis the wealth share held by the Top 400 richest Americans from Forbes magazine normalized for population growth. The figure effectively plots the share held by the top .00025% (about 400 families in 2012). For comparison, the bottom panel also depicts on the right y-axis our top .01% wealth share series. Note that the scales are not the same. The two series about triple over the period. Source: Appendix Tables C3 and C4 and C4b.
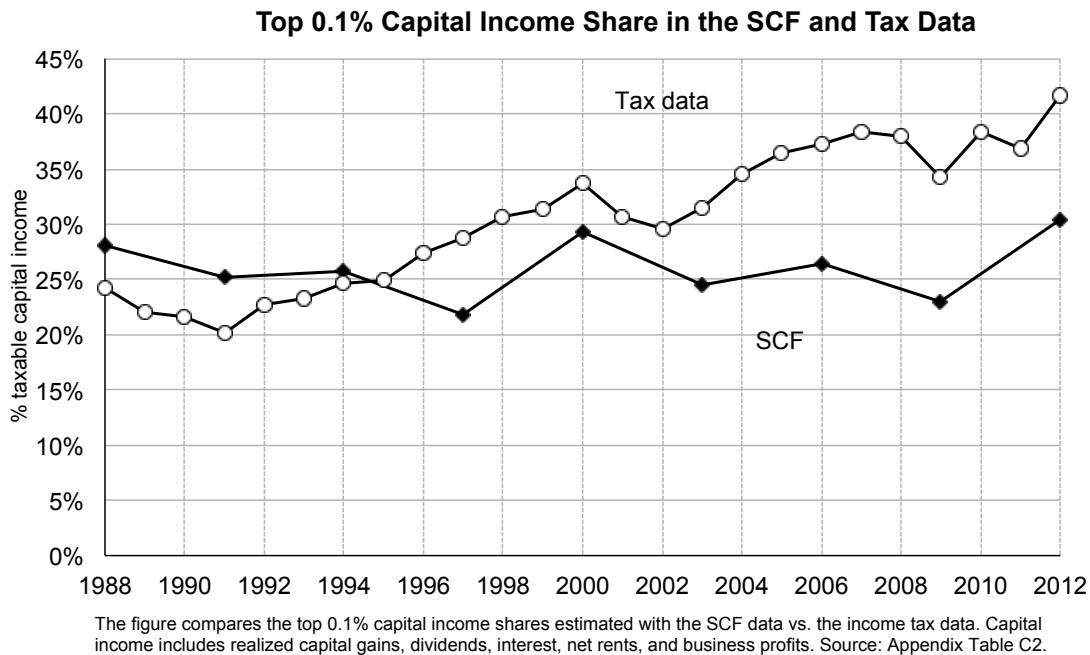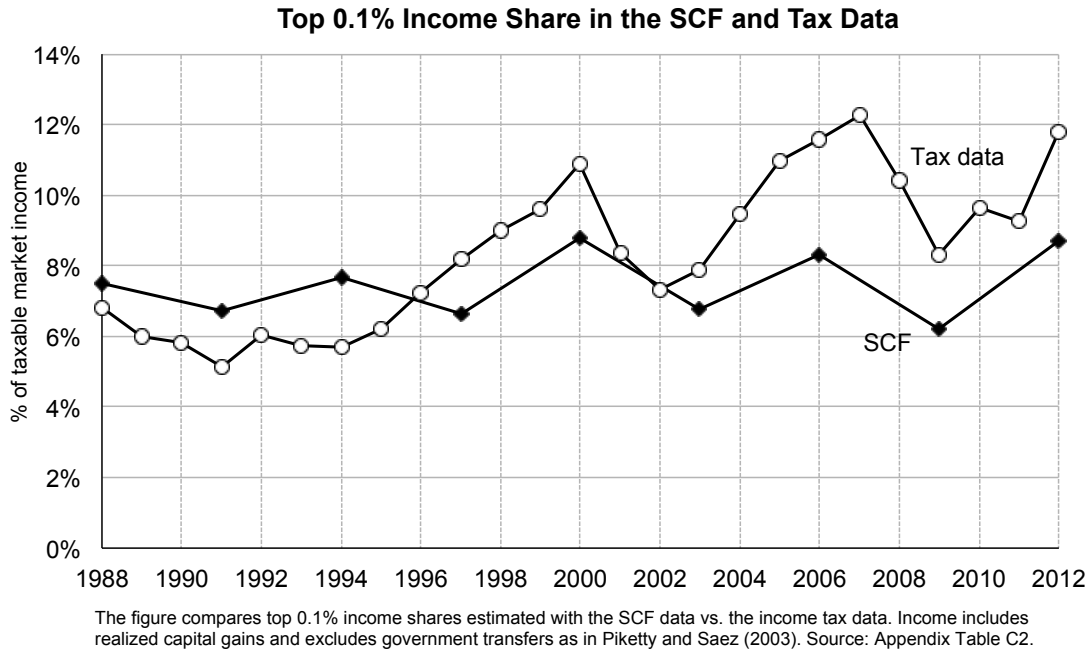
Top 0.1% Income Share in the SCF and Tax Data

The figure compares top 0.1% income shares estimated with the SCF data vs. the income tax data. Income includes realized capital gains and excludes government transfers as in Piketty and Saez (2003). Source: Appendix Table C2.

Top 0.1% Capital Income Share in the SCF and Tax Data

The figure compares the top 0.1% capital income shares estimated with the SCF data vs. the income tax data. Capital income includes realized capital gains, dividends, interest, net rents, and business profits. Source: Appendix Table C2.

Figure 14: The Distribution of Taxable Income in the SCF vs. Tax Data

Notes: This Figure compares the top .1% income shares (top panel) and the top .1% capital income shares (bottom panel) estimates from the SCF and the tax data. In both cases, we use exactly the same definition of income and capital income (as the SCF reports income following the lines of the income tax return). Income is total income reported on tax returns excluding social security and unemployment insurance benefits. Capital income is defined as the sum of (taxable) interest income, dividends, realized capital gains, profits from sole proprietorships, partnerships and S-corporations, rents, royalties (schedule C and schedule E income). Source: Appendix Table C2.

**Relative Mortality by Age and Wealth Group, Men, 1999-2008**
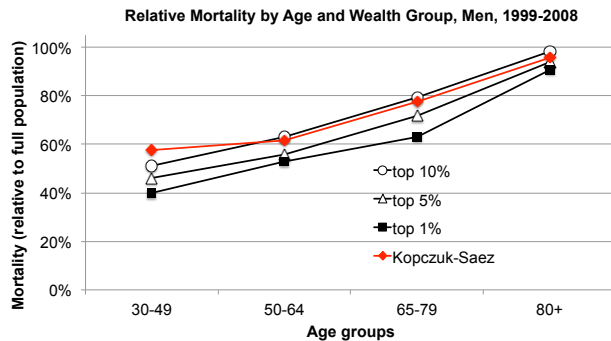
The figure depicts the relative mortality rate by age and wealth group for men in 1999-2008. E.g., male top 1% wealth holders aged 30-49 mortality rate is 40% of males aged 30-49 population wide. Kopczuk-Saez is based on the mortality of white college goers relative to population in the 1980s. The graph shows that mortality decreases with wealth (even within the top 10%) and that the wealth mortality advantage decreases with age. Source: Appendix Table C7.

Relative Mortality by Age and Wealth Group, Women, 1999-2008
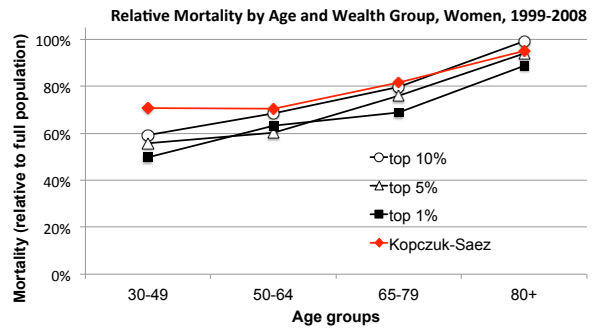
The figure depicts the relative mortality rate by age and wealth group for women in 1999-2008. E.g., female top 1% wealth holders aged 30-49 mortality rate is 48% of females aged 30-49 population wide. Kopczuk-Saez is based on the mortality of white college goers relative to population in the 1980s. The graph shows that mortality decreases with wealth (even within the top 10%) and that the wealth mortality advantage decreases with age. Source: Appendix Figure C7.

Evolution of Mortality Advantage, Men, Aged 65-79
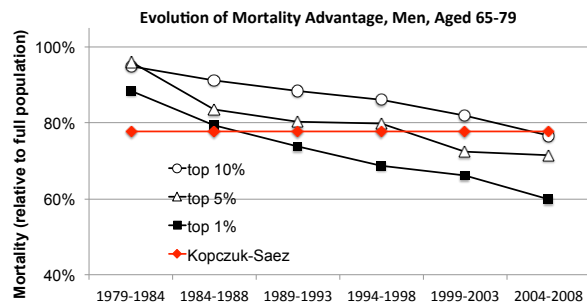
The figure depicts the relative mortality rate for men aged 65-79 by wealth group and period. E.g., male top 1% wealth holders aged 65-79 mortality rate is 90% of males aged 65-79 population wide in 1979-1984. Kopczuk-Saez is based on the mortality of white college goers relative to population in the 1980s. The graph shows that the wealth mortality advantage increases overtime and more so for the top 1% wealthiest. Source: Appendix Figure C7.

Evolution of Mortality Advantage, Women, Aged 65-79
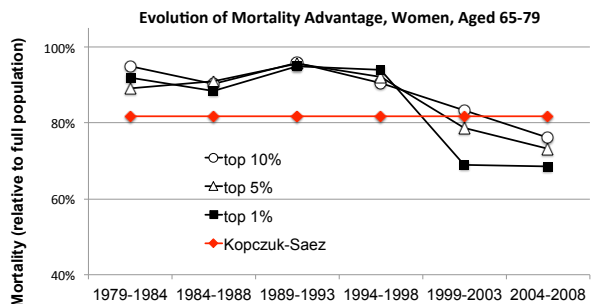
The figure depicts the relative mortality rate for women aged 65-79 by wealth group and period. E.g., female top 1% wealth holders aged 65-79 mortality rate is 90% of females aged 65-79 population wide in 1979-1984. Kopczuk-Saez is based on the mortality of white college goers relative to population in the 1980s. The graph shows that the wealth mortality advantage increases overtime and more so for the top 1% wealthiest. Source: Appendix Figure C7.

Figure 15: Mortality Gradients by Wealth Group

Notes: The top two panels report the mortality rate of males (left panel) and females (right panel) by wealth group and age groups relative to the full population in the same gender and age group. The Kopczuk-Saez series is the mortality rate of college goers used to correct the estate multipliers in Kopczuk and Saez (2004). The top panel shows that, for males, the mortality correction for the top 10% overall is very close to the mortality correction used by Kopczuk and Saez (2004). However, this is a clear mortality gradient within the top 10%. The top 10% live less long than the top 1% who in turn live less long than the top .1%. Computations are based on tax data for years 1999 to 2008. The bottom panels plot the mortality rates by wealth group relative to the full population for men aged 65 to 79 over time from 1979 to 2008 (averaged by groups of 5 years to reduce noise) for men (left panel) and women (right panel) separately. Both graphs show an increasing gradient of mortality with wealth over time. The trend is especially pronounced for men. This implies that the bias of the estate multiplier method used in Kopczuk and Saez (2004) is going to grow over time. Source: Appendix Table C7.