The Wealth of Generations*

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Abstract

This paper uses microdata to study the life-cycle wealth accumulation across U.S. birth cohorts over the last six decades. We uncover two key trends: a marked steepening of the life-cycle wealth profile and increased dissaving among older adults. Using wealth accumulation decompositions and a theoretical model, we argue that the boom in asset prices since the 1980s is a key driver of the two trends: valuation gains led to higher life-cycle wealth and allowed households to consume in face of these gains in retirement. We then explore the implications for aggregate wealth and saving, comparing the role played by shifts in the life-cycle wealth and saving profiles with the secular increase in income inequality and the aging of the baby boom generation. Income inequality and life-cycle wealth both pushed the ratio of aggregate wealth to GDP to its historical peak. On the other hand, shifts in life-cycle saving and inequality have led to a new divide, with a sharp increase in saving among middle-aged rich individuals mirrored by a decline in saving among older adults. So far, demographic shifts seem to play a minor role in the evolution of the two trends.

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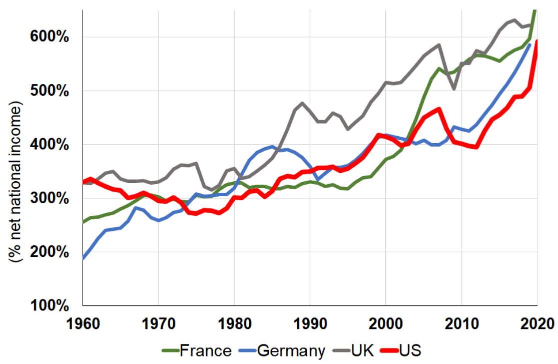
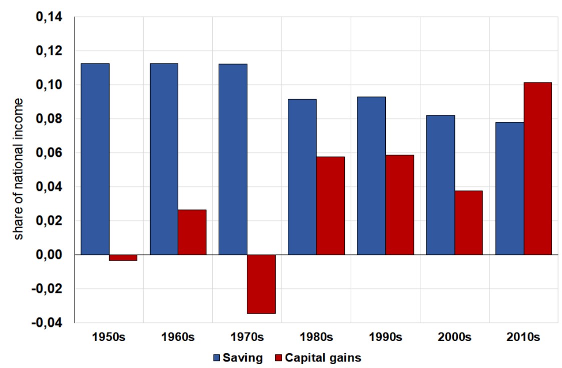
1 Introduction

Since the 1980s, rich countries have witnessed an increase in wealth-to-income ratios (Figure 1a), wealth inequality (Figure 1c), and a boom in asset prices (Figure 1b). While classic models put the life-cycle at the heart of wealth, saving and inequality (Modigliani 1986; De Nardi and Fella 2017), we know little about the long-run behavior of these trends in connection to the life-cycle of consecutive generations.

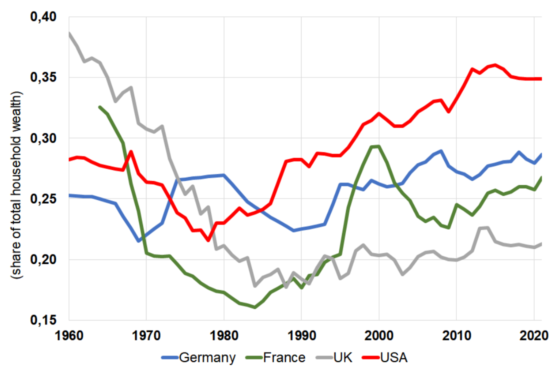
Figure 1: Aggregate wealth, sources of wealth growth and wealth inequality



(a) Aggregate household wealth



(b) Sources of wealth growth



(c) Top-1% wealth share

Notes: This figure shows results for the U.S. and the three largest European economies: France, Germany and UK. Panel (a) shows aggregate household wealth, expressed as % of national income (source: World Inequality Database). Panel (b) decomposes aggregate household wealth growth into private saving (i.e., household saving plus corporate saving accrued to households) and capital gains, expressed as a % of national income (source: Piketty and Zucman 2014, extended by Bauluz et al. 2022). The numbers displayed correspond to the unweighted average of the four countries. Panel (c) shows the share of household wealth owned by the wealthiest 1% individuals (source: World Inequality Database based on the works of Albers et al. (2020) for Germany, Garbinti et al. (2020) for France, Alvaredo et al. (2018) for the UK and Saez and Zucman (2016) for the USA).

This paper studies, for the first time, the life-cycle wealth accumulation of subsequent birth cohorts in the U.S., providing (i) new insights on the life-cycle of U.S. individuals in the past six decades as well as (ii) a micro view on the evolution of aggregate wealth and saving. We undertake this analysis using the Survey of Consumer Finances Plus ("SCF+"), which harmonizes modern waves of the Survey of Consumer Finances -covering the period 1983-2019- with archival data from historical waves available since the 1950s (Kuhn et al. 2020). The SCF+ is unique in that it provides detailed long-run microdata on household assets, debts and income, together with rich demographic characteristics, most importantly age. We construct a set of historical distributional financial accounts by harmonizing these series to make them consistent with national accounts (Alvaredo et al. 2021; Feiveson and Sabelhaus 2019; Batty et al. 2019). As a result, the distributional results of this paper (on wealth, saving, etc.) map to their corresponding macroeconomic aggregate.[1]

Our study is structured into three parts, each containing two main findings. Overall, our paper highlights that the 1980s were a turning point for the dynamics of the life-cycle wealth.

In the first part of the paper, we conduct a descriptive investigation to unveil the life-cycle wealth profile of U.S. birth cohorts born after 1900. Our analysis reveals a change in the life-cycle wealth profile of cohorts over time. The primary finding (finding 1.1) is a *marked steepening of the life-cycle wealth profile for more recent cohorts*. While all cohorts start with roughly comparable wealth around age 30, more recent cohorts retiring after the 1980s experience approximately 75% higher wealth by the age of retirement, rising from 5 to 6 times the cohorts' own income to 9 to 10 times.[2]

Notably, we identify that the steeper wealth profile occurs only in the top half of the within-cohort wealth distribution, particularly among the wealthiest top-10%, while the bottom-50% of recent cohorts instead reach progressively lower levels than their predecessors. As a result, each

[1]Another dataset with U.S. microdata on individual income, assets and debts is the one from Piketty et al. (2018), which is available on an annual basis since 1962. Unfortunately, the age variable only covers two large age groups until 1978 (20 to 64 and 65+) and three since 1979, not allowing the analysis of different generations over time with a focus on the pre and post-1980 periods, as we do in this paper.

[2]Throughout the paper, we normalize wealth numbers dividing them by the cohort's own income, making the cross-cohort analysis of life-cycle wealth quantitatively comparable. If, alternatively, we would compare the wealth levels of distant cohorts, we would reach the conclusion that the newer cohorts reach higher wealth, but this would conflate long-run income growth with changes in the life-cycle profile of the cohort.

new cohort is becoming internally more unequal than the previous ones: from the cohorts born in 1900-1919 to those born in 1960-79, the top-10% wealth share has increased by 14 percentage points, rising from 54% to 68%.[3] As a result, we document that wealth inequality between and within generations is currently at its peak since World War II.

Our second finding (finding 1.2) is the *stability of post-retirement wealth over time*, despite considerable variations in the level of wealth attained by the different cohorts when retiring. A well-documented phenomenon is the minimal decrease in individuals' wealth holdings after retirement in recent decades—a behavior that diverges from the fundamental predictions of the life-cycle model and has been extensively explored (De Nardi et al. 2016). Our analysis highlights that this behavior is not unique to contemporary cohorts, but rather persists across cohorts that lived in very different economic contexts.

The second part of the paper studies the drivers of these facts. We empirically decompose the life-cycle wealth growth of subsequent cohorts into subcomponents (saving, asset prices, and gifts and inheritances), and introduce a model that connects the changing role of these drivers across generations.

To distinguish the role of different drivers of life-cycle wealth, we rely on an accounting framework that divides wealth growth into saving, capital gains, and inheritances (Wolff 1999; Saez and Zucman 2016; Feiveson and Sabelhaus (2019)). This decomposition allows us to identify that the sources of the life-cycle wealth growth have varied markedly for different generations, revealing two key findings.

First, we find that *capital gains since the 1980s are a key driver of the steeper life-cycle wealth of recent cohorts* (finding 2.1). In contrast, older cohorts, who accumulated wealth before the 1980s, did so almost exclusively through saving. Through a counterfactual analysis that eliminates capital gains, we find that the life-cycle profiles of more recent cohorts are considerably closer to those of past generations. This highlights the pivotal role of asset prices in explaining the

[3] The increase in inequality across subsequent generations is even stronger than for the U.S. population as a whole, for which the top-10% wealth share increased by around 7 percentage points since 1980, from 65% to around 72% in recent years (e.g., Saez and Zucman 2016).

steeper wealth profile of recent cohorts post-1980s.

Second, we uncover a phenomenon we term as a *life-cycle saving reshuffling*, reflecting a *shift towards increased saving during middle age, followed by decreased saving in old age* (finding 2.2). Looking at old-aged individuals across cohorts, we observe minimal wealth reduction post-retirement, both before and after the 1980s. However, this does not imply a lack of dissaving among these individuals. In fact, we find that recent cohorts engage in substantial dissaving amid positive valuation gains, a stark contrast to the near zero saving experienced by the older cohorts post-retirement. Conversely, during middle age, our analysis reveals that newer cohorts display higher levels of saving compared to their older counterparts. In total, the overarching trend over recent decades points to increased saving in middle age and a substantial decline in saving during old age.[4] [5]

We study which mechanisms can generate those two findings through the lens of an overlapping-generations model, where the young save for retirement and the old dissave to consume. In the model, an increase in either longevity or inequality (with non-homothetic preferences) leads to a rise in the aggregate asset demand from the young, resulting in higher asset prices. The upswing in asset prices, in turn, incentivizes older individuals to consume the valuation gains by selling their assets, resulting in dissaving. In contrast, these assets are acquired by younger cohorts, who increase their saving to acquire them. As a result, the model generates an intergenerational wealth transfer from the young buyers to the old sellers in the form of higher capital gains. The overall effect is an increase in the wealth-income ratio of the younger cohorts, as well as a life-cycle saving reshuffling, consistent with the trends we document (i.e., findings 2.1 and 2.2). Note: the model is work in progress and not yet in the draft.

[4]We find that inheritances play a more modest role in the wealth accumulation of different cohorts, but their importance has increased over time. A note of caution on interpreting this result is needed, though. Inheritances in this study are a net flow (outflows minus inflows) for a given group. This means that specific individuals are net givers and others net receivers, with these transfers being sizable for some (see, for instance, Adermon et al. (2018), Feiveson and Sabelhaus (2018), Morelli et al. (2021), Black et al. (2022) or Ozkan et al. (2023)).

[5]Results looking at within-cohort wealth groups indicate that capital gains and saving shifted with different intensities for upper and bottom groups. Capital gains explain a greater share of the wealth accumulation for the bottom-90% in recent years while saving has become relatively more important for the top. This finding is consistent with Bauluz et al. (2022), who look at the cross-section of U.S. households instead of birth cohorts.

The third and last step of the paper connects the changing life-cycle wealth patterns with two macroeconomic aggregates: household wealth and private saving. The development of both indicators has been linked to key shifts in the evolution of relevant economic variables, such as the structural decline in natural interest rates or changes in the labor shares (e.g., Mian et al. 2021b; Auclert et al. 2021; Kopecky and Taylor 2022; Piketty and Zucman 2014).[6] We adopt a micro-view to examine their evolution and use a shift-share methodology to uncover the primary drivers behind the observed changes (Auerbach and Kotlikoff (1990) or Poterba (2001)).[7] Aggregate wealth or saving, when expressed as a percentage of national income, can be decomposed into three components: the life-cycle wealth or saving profiles (what this paper studies), the income distribution across and within age groups (i.e., income inequality) and the demographic structure (i.e., the age composition of the population).

Regarding aggregate wealth, we find that *the combined increase in income inequality and life-cycle wealth profiles explains most of the rise in the aggregate wealth-to-income ratio since 1980* (finding 3.1). In numbers, about half of the increase can be linked to growing income inequality and a third to steeper life-cycle wealth profiles. By contrast, changes in the age composition of the population explain around a sixth. Given the current population projections, we expect demographics to play a higher role in the future, but up to the present, the two key shifts behind the rise in aggregate wealth appear to be income inequality and the steeper life-cycle wealth profiles.[8]

Our analysis of private saving reveals an important contribution from middle-aged individuals in recent decades, predominantly among the middle-aged rich. In contrast, elderly households, both from the upper and lower ends of the wealth distribution, have experienced a notable shift towards increased dissaving. Overall, our study uncovers an *important trend emerging in the 1980s—a marked saving polarization—with rich-middle age individuals showing a substantial*

[6] Rachel and Smith (2015) provide an overview of the empirical literature investigating the structural decline in natural rates since the 1980s and its connection to the main theories explaining this phenomenon.

[7] The shift-share method to analyze aggregate wealth and saving has a long tradition: see, for example, Summers and Carroll (1987), Bosworth et al. (1991), Mankiw and Weil (1989) or recent work by Mian et al. (2021c) or Auclert et al. (2021).

[8] Given the current population projections (which predict low fertility in a context where the baby boom generation will almost entirely retire in the coming years), we expect demographics to play a higher role in the future, as predicted in Auclert et al. (2021).

rise in saving, while older individuals have engaged in substantial dissaving (finding 3.2).

Shift-share results point to the core drivers behind the observed saving polarization. Primarily, changes in life-cycle saving rates (i.e., the "life-cycle saving reshuffling" identified in this paper) account for nearly the entire decline in saving at advanced ages and approximately one-third of the heightened saving among the middle-aged rich. Additionally, the simultaneous surge in income inequality contributes to two-thirds of the remaining increase in saving among the middle-aged rich.

In essence, we find that (i) the "saving glut of the rich" since the 1980s (as previously documented by Mian et al. (2021b), Saez and Zucman (2016) and Bauluz et al. (2022)) is more accurately characterized as the "saving glut of the middle-aged rich" and (ii) dissaving by the old has emerged as a critical force exerting downward pressure on aggregate saving in recent years. It is worth noting, however, that this "asset market meltdown" of the elderly (a term popularized by Poterba (2001)), is not driven by a larger proportion of elderly individuals in the population but rather by a decrease in their saving rates.[9]

Our findings have implications for the future and for policymaking. In line with predictions from common life-cycle models, we show that life-cycle wealth and saving profiles shape broader macro-economic trends while redistributing resources across generations. The rise in capital gains since the 1980s appears at the core of the change in life-cycle profiles. Understanding their key driving forces (such as income inequality, life expectancy, capital regulation, or other relevant factors) becomes of prime importance going forward.

Literature. Our paper is related to four strands in the literature. First, our paper extends the body of research on wealth accumulation over the life-cycle, aiming to reconcile the life-cycle hypothesis (Modigliani 1986) with observed age-wealth profiles (as summarized, for instance, by Attanasio and Weber (2010)). Building on existing work focusing on life-cycle wealth and saving profiles for single cohorts (Shorrocks 1975; Blundell et al. 1994; Attanasio and Hoynes

[9] The "asset meltdown hypothesis" suggests that as societies age and the proportion of retired individuals increases, aggregate saving is likely to decline due to lower saving rates among the elderly (Poterba 2001; Abel 2001; Goodhart and Pradhan 2020).

2000; Gourinchas and Parker 2002; Fernández-Villaverde and Krueger 2007; Dynan et al. 2009; Feiveson and Sabelhaus 2019; Ozkan et al. 2023), we investigate how the life-cycle has evolved over six decades in the U.S.[10] To the best of our knowledge, only France has comparable long-run data on life-cycle wealth (which we display in the appendix). Closest to us is the contemporaneous work by Jaeger and Schacht (2022), which uses the SCF+ to study trends in the *median* wealth for cohorts born since the 1940s. In contrast, our analysis covers all cohorts born since 1900, explores within-cohort groups, employs a theoretical model, and establishes links between the life-cycle and aggregate wealth and saving.[11]

Our paper speaks to the literature on saving after retirement (De Nardi et al. 2016). Much discussion in the literature relates to the stability of wealth holdings in cohorts retiring in recent years (e.g., Love et al. 2009; De Nardi et al. 2010; Blundell et al. 2016; Poterba et al. 2018; Ameriks et al. 2020), an aspect that has been often interpreted as a lack of dissaving. Our contribution to this literature is threefold. First, we offer a comprehensive comparison of the behavior of distant cohorts, shedding light on the degree of persistence of this phenomenon. Secondly, we dissect the sources of post-retirement wealth growth into saving, inheritances, and asset prices (similar to Feiveson and Sabelhaus (2019), who focus on a single cohort), revealing their inherent instability in contrast to otherwise stable wealth changes.[12] Lastly, we present a theoretical framework that connects the changing roles of these drivers across cohorts, informing debates on post-retirement consumption behavior.

Our paper equally speaks to the ongoing debates on the dynamics of aggregate wealth and

[10]Looking at more recent years (starting in the 1990s or 2000s), various papers document life-cycle wealth profiles for cohorts in England (Cribb 2019 or Sturrock 2023), Germany (Bartels and Morelli 2021), Spain (Artola-Blanco et al. forthcoming), France (Bauluz and Meyer 2021) and the U.S. (Gale and Pence 2006; Dettling et al. 2014; Gale et al. 2020). Consistent with our long-run data for the U.S., these papers tend to find higher wealth around retirement for more recent cohorts.

[11]In the appendix, we also look at the evolution of wealth for different age groups and within-age groups over time (instead of following a given cohort over time). By taking a longer-run perspective, our results also inform recent debates about wealth differences between "millennials" and "baby boomers" (e.g., Gale et al. 2020; Sabelhaus and Volz 2022a; Paz-Pardo 2021). We show that the age-wealth gap emerged in the 1980s and is linked to the steepening of the life-cycle wealth profile.

[12]It is worth noting that the definition of saving and income we use is consistent with macroeconomic aggregates. Accordingly, withdrawals of funded pensions (e.g., a 401(k) pension plan) used for consumption are treated as dissaving (i.e., liquidation of existing assets) and not as an income flow (Bosworth et al. 1991); Piketty et al. 2018; Alvaredo et al. 2021.

saving, which are often linked to key economic trends such as the decline of natural interest rates or the fall of labor shares (e.g., Kopecky and Taylor 2022; Rachel and Summers 2019; Carvalho et al. 2016; Eggertsson et al. 2019; Gagnon et al. 2021; Mian et al. 2021b; Bauluz et al. 2022; Piketty and Zucman 2014; Karabarbounis and Neiman 2014; Goodhart and Pradhan 2020). Following a long tradition that uses a shift-share methodology to understand these two aggregates (Summers and Carroll 1987; Mankiw and Weil 1989; Auerbach and Kotlikoff 1990; Poterba 2001; Bosworth et al. 1991), we investigate how shifts in life-cycle wealth impact their longer-term evolution. Our study is closest to Auclert et al. (2021) and Mian et al. (2021c), two papers using the SCF+. While Auclert et al. (2021) examine the role of age groups on aggregate wealth, we extend this analysis by also considering shifts in income inequality and life-cycle wealth profiles. Additionally, compared to the analysis of aggregate saving by Mian et al. (2021c), we focus on distinct wealth groups within the age distribution (e.g., middle-aged top-10% vs. elderly top-10%). This differentiation proves important, as we uncover opposing trends in the behavior of the same wealth groups (e.g., the top-10%) before and after retirement, a major reason behind the post-1980s saving polarization documented in this paper.

Finally, our paper relates to the literature studying the factors shaping the long-run dynamics of the wealth distribution in the U.S. We look at the U.S. post-1980s wealth boom (Piketty and Zucman 2014) and rise in wealth concentration (Saez and Zucman 2016; Kuhn et al. 2020; Smith et al. 2022; Bartscher et al. 2020; Greenwald et al. 2019; Blanchet and Martínez-Toledano 2023) from a cohort and within-cohort perspectives. We construct new series of cohort-specific household wealth that are consistent with aggregate wealth statistics (Batty et al. 2019; Piketty et al. 2018; Alvaredo et al. 2021). Furthermore, we provide a new database of saving, capital gains and inheritances in specific assets (housing, business assets, fixed-income assets, equity), for different cohorts and within-cohort groups. Importantly, the capital gains we compute are consistent with market data for returns on different assets Jordà et al. (2019).

The rest of the paper proceeds as follows. Section 2 introduces the key concepts, methods, and data sources being used. Section 3 presents new facts on the life-cycle profile of subsequent generations and on the distribution of wealth within cohorts. Section 4 decomposes generations' wealth growth across saving, capital gains and inheritances, and introduces a theoretical model that connects the evolving role of these drivers across generations. We examine the link between life-cycle wealth and trends in aggregate wealth and saving flows in section 5. Section 6 concludes.

2 Concepts, methodology and data

The main data source we rely on is the Survey of Consumer Finances (SCF) administered by the Federal Reserve Board. We consider all survey waves from 1989 and 2019 and also include the historical waves of the SCF covered by Kuhn et al. (2020). The modern version of the SCF (since 1989) is known to be very representative of U.S. household wealth as its sampling strategy takes the very concentrated wealth distribution into account.[13] While this sampling strategy is not used for the historical SCF,[14] our focus is not on the top percentiles of the wealth distribution, so this is not a strong limitation. Following Kuhn et al. (2020) we pool survey waves in the historical part of the SCF+ by three-year intervals to reduce noise in the data. In accordance with DINA guidelines(Alvaredo et al. 2021), only adults 20 and older are considered. We split wealth equally between couples. We only consider the survey waves after 1960, this also accounts for changes in household composition over time. This is because we find the age structure of households in the 1950s survey waves to be anomalous. It appears that the age variable in the early waves was not reported as a continuous variable but only available in discrete bins, which means we cannot construct synthetic cohorts.

2.1 Macro and Micro Wealth and Income concepts

In this section, we describe our wealth concept as well as the harmonization with national accounts. As this is the focus of our study, we first focus on wealth.

[13] The other major data source for the wealth distribution in the US, capitalized income tax data of Saez and Zucman (2016) only includes three broad age groups, so we do not make use of it for our study.

[14] Though Kuhn et al. (2020) correct for this.

Net wealth is the sum of assets less liabilities. We include all available asset and liability categories except vehicles and other non-financial assets, following the system of national accounts guidelines SNA 2008[15]. The historical SCF covers all major asset categories except defined benefit pensions, which are missing for the entire survey, and defined contribution pensions, which are missing before 1983. We impute defined benefit pensions using the procedure of Henriques Volz and Sabelhaus (2019) for the years 1989-2019. As we only consider the funded component of defined benefit pensions, we set the funded share of defined benefits to be consistent with the share of funded defined benefit pensions (of all defined benefit pensions) in the aggregate.

Before 1983, pension assets are imputed. We impute pension assets to these waves by using the age distribution of pensions in 1983. We roll this age distribution back following the change in life expectancy from earlier survey years to 1983 to account for changes in the age structure of the population. Before 1980 less than 10% of all household wealth was held in pension assets, so errors in this imputation would not affect our conclusions materially. We show the aggregate importance of pension wealth in the appendix figures F1a and F1b. Pension assets are one of the most components of the household wealth portfolio in recent years, precisely when our estimates of pension wealth are most reliable. Investment funds are also not recorded before 1971, but these only account for less than 1% of total wealth from 1950-1970, so we do not attempt to make a correction. We do not include social security payments as part of household wealth as these are not funded pensions and, hence, linked to existing assets. Previous work for the U.S. imputing social security pensions tends to find lower wealth inequality levels, with varying impact on the trends, depending on the specific analysis carried in the papers (Sabelhaus and Volz 2022b; Catherine et al. 2020; Bönke et al. 2020).

In a next step, we make the SCF consistent with macroeconomic totals from the Financial Accounts (FA) collected by Saez and Zucman (2016), which we also use to compute capital gains.

Making the SCF consistent with macroeconomic data is the goal of many studies, the most prominent being the Distributional Financial Accounts (DFA; Batty et al. 2019).[16] We match

[15]These assets represent, on average, three percent of net household wealth in the SCF

[16]See also the analysis of Henriques and Hsu (2014) comparing the SCF with the Flow of Funds Accounts.

asset and liability categories corresponding to the international system of national accounts (SNA 2008) guidelines, distinguishing six broad asset categories: Fixed income assets (bonds, deposits, currency), equity, investment funds, pension funds and life insurances, housing and business assets. Further, we distinguish two types of liabilities, short-term and long-term debt. Mapping the SCF asset categories to their SNA 2008 equivalents is straightforward; the precise matching can be seen in table A1 in the appendix. We then rescale the SCF components to be consistent with their aggregate counterparts. Batty et al. (2019) undertake a similar approach when reconciling the modern SCF with macroeconomic data, which they show to match well.

After making the SCF consistent with macroeconomic accounts for all waves, we further "unveil" the financial portfolio of households. In this step, we decompose intermediated financial assets into fixed income assets and equity. This is done by considering the asset allocation of both pension and investment funds as recorded in the Financial Accounts and then splitting them accordingly. This is important as increasingly large amounts of financial wealth are held in complex financial assets, such as pension and investment funds. Pension funds now constitute around half of the financial portfolio of U.S. households, and the capital gains through indirect equity holdings therein are a major source of wealth accumulation. Hence we are able to decompose the entire financial portfolio into fixed income assets and equity, which allows us to calculate capital gains accordingly.

We further harmonize income in the SCF+ with NIPA incomes in order to be able to determine saving rates out of income. The SCF+ distinguishes three types of income across years: Labor and business income (which are not always clearly distinguished), capital income and transfer income. We match these concepts to their NIPA equivalents while making some adjustments to the NIPA data to ensure comparability. This means removing components of national income that are not captured in the SCF, such as imputed rents of owner-occupiers or income received by NPISH. The exact details of this procedure can be found in Appendix A.2.

2.2 Synthetic Saving

In the first step we decompose the accumulation of personal wealth at the aggregate using asset-specific accumulation equations (Bauluz et al. (2022); Artola-Blanco et al. (2020)). We decompose the growth of a given asset class into a volume effect (saving) and a price effect (capital gains or losses). For a given asset type (e.g., housing, business assets, bonds and deposits, equity, debt), we decompose our series using the following equation:

$$A_{t+1} = A_t(1 + q_{t+1}) + S_{t+1,A}, \tag{1}$$

where A_{t+1} and A_t are the real value at time $t + 1$ and t of a given asset as recorded in the financial accounts. $S_{t+1,A}$ is the net-of-depreciation saving flow in asset-type A during year $t + 1$. Finally, q_{t+1} is the real capital gain or loss from asset-type A between time t and t+1. In the previous equation, the capital gain component is obtained as a residual, since we observe all the other components (i.e., annual stocks of assets and flows of saving) in the national accounts. The capital gains we obtain match external sources. Figures F2b and F2a compare our measures of asset price changes to those from the Jorda-Schularick-Taylor Macrohistory database Jordà et al. (2019), showing that they match up very closely.

We then aggregate the accumulation of each asset class and debt from equation 1 to decompose the accumulation of net wealth into saving and capital gains:

$$W_{t+1} = W_t(1 + q_{t+1}) + S_{t+1} \tag{2}$$

Where W is the sum of all asset categories, net of liabilities, and q the weighted average of the capital gains in each asset type and debt (where the weights are given by the share of each wealth component in total net wealth). The saving S_{t+1} we obtain aggregate private saving, as corporate saving will be included in the saving from equation 1 when considering equity.

We apply the same framework to analyze the accumulation of wealth of different generations. Concretely, we adapt the synthetic saving method (Saez and Zucman (2016)) to the analysis of different birth cohorts, in line with previous work from Wolff (1999). Specifically, for a given asset type A (for instance, housing, business assets...) and a generation g, we can decompose wealth accumulation by the transition equation

$$A_{t+1}^{g} = A_{t}^{g}(1 + q_{t+1,A}) + S_{t+1}^{g}. \quad (3)$$

Here A_t^g refers to the real holdings of asset A of generation g at time t. The variable $q_{t+1,A}$ is the real capital gain or loss of asset type A between time t and $t+1$. We observe A_t^g directly in the SCF+ on a triannual basis and then interpolate to construct values in between. [17] The capital gains $q_{t+1,A}$ on the other hand, are the ones constructed from macroeconomic accounts in equation 1. Then the saving of generations in a specific asset are defined as the residual $S_{t+1,A}^{g}$, so that the synthetic saving equation holds. This framework allows us to decompose aggregate private saving, obtained in 1 into the saving done by different age groups. Using this methodology allows us to accurately capture the rise in corporate saving (Bauluz et al., 2022; Chen et al., 2017), which account for a large fraction of aggregate saving in recent years. Our methodology assigns saving done by corporations to equity owners.

This accounting framework is widely used in the inequality literature to study wealth dynamics (Garbinti et al. (2020); Kuhn et al. (2020); Martínez-Toledano (2020); Piketty et al. (2018)). In these applications, one limitation is the lack of cohort stability, as households transition between cohorts. For our purpose, this is not a limitation as birth cohorts are made up by the same households over time - the only transition may be the exit of households through death, for which we account through our inheritance estimation. However, we will later also look at wealth groups within cohorts, for example, the top decile of wealth holders within a cohort. The extension of equation 3 to this setting is straightforward. Here the synthetic saving decomposition assumes that there is no transition between wealth groups between two years. In practice, there is always some mobility between wealth groups, but as the groups that we choose (bottom 50%, middle 40% and

[17] We interpolate the share of an asset component held by a given birth cohort. This means that we are consistent with aggregates also in the interpolated years.

the top decile) are large, the persistence within these groups is relatively high. We present evidence on wealth group persistence in the PSID in appendix C and show that it is generally high and comparable to magnitudes found in Kuhn et al. (2020).

Our decomposition assumes that different age groups experience the same capital gain for a given asset. With different portfolios, different cohorts may, however, still experience differing capital gains on their wealth. Whether capital gains for a given asset class vary substantially across age groups is an open question. While recent research suggests that returns vary systematically across wealth groups Fagereng et al. (2020), this variation in returns could be coming from either the income flow component of returns or the revaluation component. Available evidence from the U.S. Mian et al. (2021b) and Norway suggests Fagereng et al. (2020) that most variation comes from the income flow component.[18]

Finally, we aggregate these equations over all asset classes. We also amend the asset accumulation equations by adding the net inheritances and gifts[19] received by generation g in time $t+1$, which are denoted by I^g_{t+1}. Doing so reflects the fact that inheritances and gifts amount to transfers between generations. This yields a simple accumulation equation

$$W^g_{t+1} = W^g_t(1 + q_{t+1}) + S^g_{t+1} + I^g_{t+1} \tag{4}$$

in which W^g_t is the net wealth of a given generation and q_{t+1} are the aggregate capital gains. Again, the variables W^g_t and q_{t+1} are determined by the microdata (resp. macrodata). The estimation of I is more involved and is described in the next section. The saving S_{t+1} are "synthetic" in the sense that they are not computed directly from the data but rather as residuals of the accumulation equations.

[18]Since returns are the sum of capital gains and income flows, we asked the authors of Fagereng et al. (2020) if the capital gain component drives the observed variation in their returns. In an email exchange, the authors suggested that differences in asset-specific capital gains across wealth groups are fairly small, at least for housing and public equity (the two assets they could check). We are grateful to the authors for sharing this information.

[19]That is, the gifts and inheritances received by a generation less the gifts and inheritances given by a generation.

2.3 Estimation of Inheritances and Gifts

We estimate inheritances using the mortality multiplier approach (Alvaredo et al., 2017; Feiveson and Sabelhaus, 2019), complemented with estate tax and SCF data. Our estimates are constructed by using mortality rates and wealth holdings to forecast the bequests left by different households in a given year. In this section, we outline the estimation, details are given in Appendix B, where we also show that our estimates compare well to existing approaches in the literature. In the next sections, we will document that inheritances make up only a very small part of wealth accumulation, as is also found using detailed inheritance tax data from Norway (Black et al., 2022). Hence, even though our measure of inheritances and gifts is imperfect, we conclude that any changes in measurement are unlikely to affect results.

We take mortality rates from the Social Security Administration (SSA) and adjust for the mortality-wealth gradient using the adjustment of Saez and Zucman (2016). To those bequests, we make two further deductions, as in Feiveson and Sabelhaus (2019). We first subtract charitable giving and funeral costs from the inheritance flow, as this does not pass to the next generation. The amount of charitable giving follows the observed amounts in U.S. estate tax data.[20] Then we calculate the estate tax on the remaining estate and subtract it from the inheritance flow. To do so, we collect estate tax schedules since 1950. The total flow of inheritances compares well to available estimates from Feiveson and Sabelhaus (2019) and Alvaredo et al. (2017) as we show in figure B17 in the Appendix.

We distribute inheritances following the observed density of reported inheritance in the SCF. The SCF records inheritances in a separate module, which is available since 1989. The inheritances reported include only those received from outside of the households. In particular, inheritances from a deceased spouse will not be included in these reports. This means we need to take a stance on the share of inheritances going to the spouse and the share going to subsequent generations. We assume that inheritance go to surviving spouses if these exist and go to the next generation only when both partners die as in Feiveson and Sabelhaus (2019).

[20]Estate Tax Data is available at https://www.irs.gov/businesses/small-businesses-self-employed/estate-tax

Finally, inter-vivos transfers also transfer wealth between generations. We account for these in a similar way, taking the total amount of gifts given from the SCF after 1989 and assuming that the gift flow is 20% of the bequest flow before 1989 following Alvaredo et al. (2017).[21] We again distribute the gift flow following the observed density of gifts received in the SCF.

3 New stylized facts

This section investigates the life-cycle wealth accumulation of different birth cohorts in the U.S. since 1960.[22] To the best of our knowledge, we are the first to document these facts from a long-run perspective.[23] Wealth refers to net wealth (i.e., gross assets minus debts) and is measured on a per-adult level. We use eight birth cohorts: 1900-09, 1910-19, 1920-29, 1930-39, 1940-49, 1950-59, 1960-69 and 1970-79. We observe these birth cohorts throughout most of their working lives and they evenly split the 20th century. In appendix D, we document similar trends in life-cycle wealth accumlation in France.

Figure 2 plots the evolution of the average wealth, normalized by the cohort's average income at this age[24], from age 30 to 70 for the eight generations examined in this paper. This chart serves as a key finding. We identify a much steeper life-cycle wealth accumulation profile among more recent cohorts, reflecting a change in the accumulation pattern experienced across different generations. Although all cohorts start with roughly similar levels of wealth (equivalent to 1 time their income at age 30), the more recent cohorts, born in the period spanning the 1920s to 1950s, attain significantly higher levels of wealth by the age of retirement. In fact, these later cohorts reach approximately 50% higher wealth in old age compared to their predecessors (rising from 6

[21] The observed ratio of gifts to the bequest flow in the SCF is very close at 21 %.

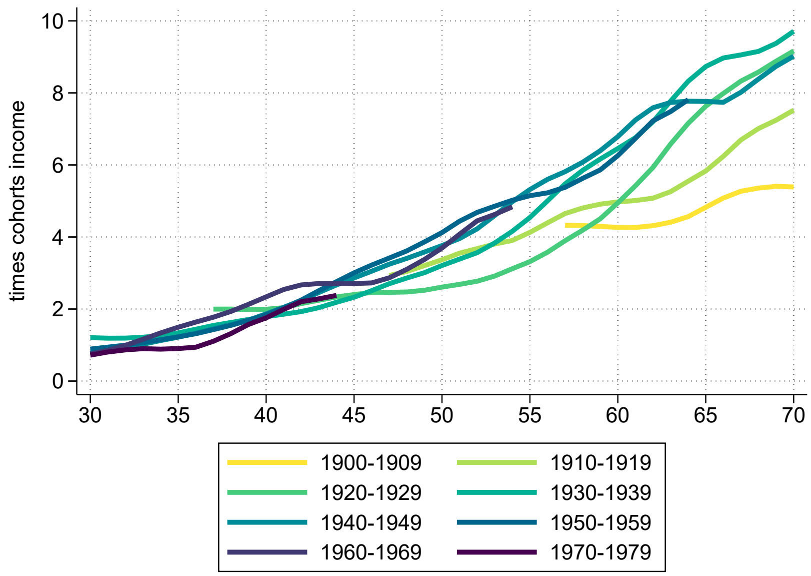
[22] While the SCF+ in principle starts in the 1950s, we exclude the first ten years, as reporting of age in the first 10 years is not exact. For details, see appendix A.3.

[23] Gale et al. (2020) document the evolution of wealth inequality across age groups in the U.S. since 1989. Bartscher et al. (2020) document the debt owed and housing owned by different U.S. generations since 1950.

[24] We show wealth as a percentage of the group's own income to account for economic growth (i.e., different cohorts experienced different income levels) to make the comparison of life cycle wealth trajectories meaningful. Otherwise, a simple comparison of wealth levels may merely reflect different income levels with no indications of different life-cycle behaviors in terms of wealth.

to 9 times the cohort's own income). Furthermore, we find a steady increase in all cohorts' wealth-income ratios throughout their life cycles, contradicting the anticipated decline predicted by the standard life-cycle model in older ages.

Figure 2: **Life-cycle wealth accumulation**



This Figure plots the average wealth of eight cohorts during their life cycles, expressed as a share of the cohorts' own average income. Series are 7-year averages.

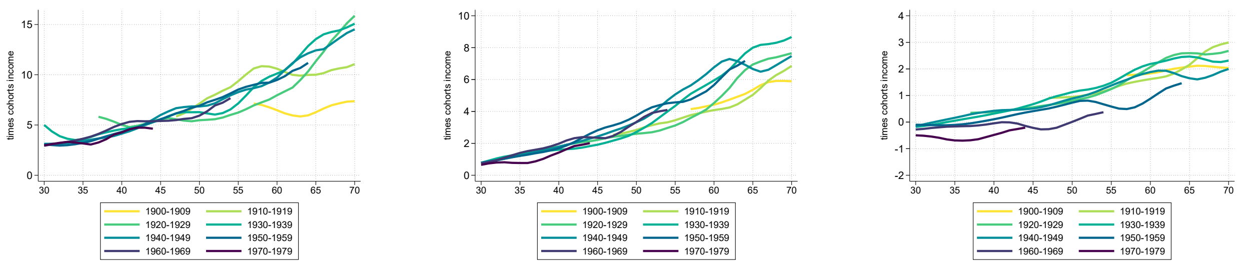
In line with Gale et al. (2020) and Jaeger and Schacht (2022), we also observe that the most recent birth cohorts (those born in the 1960s or 1970s) tend to underperform prior generations slightly. This is particularly visible around age 35-50 and is consistent with substantially larger leveraging of newer cohorts, who obtain larger mortgages (Bartscher et al. 2020). This is explicitly shown in Figure Appendix F3, which shows asset composition over cohorts' life-cycle.

Next, we consider the wealth accumulation of wealth groups within the birth cohorts in Figure 3. Looking at the life-cycle wealth profile *within* cohorts is equally essential as it is a well-established fact that income and wealth inequality widened substantially in the U.S. in recent decades (e.g., Piketty et al. 2018; Figure 1). We find that the steeper wealth accumulation for subsequent generations almost entirely reflects the development of the upper half of the within-cohort distribution. By contrast, the bottom-50% of each new cohort does worse than their predecessors.

Our results for subsequent generations align with findings in Bauluz et al. (2022), who show that the global wealth boom since the 1980s went to the top-10 and middle-40%, by-passing the lower half of the population.

The wealth *levels* the different cohorts reach differ strongly, especially around the age of retirement. While the top-10% reaches as much wealth as 10 to 15 times their own income, the bottom-50% pf older adults barely get the equivalent of 2 to 3 times. In other words, half the U.S. population holds little wealth (Aguiar et al. 2020), even around retirement (Poterba et al. 2011).

Figure 3: Life-cycle wealth accumulation of the top-10%, middle-40% and bottom-50%-



(a) Wealth of the top-10% (b) Wealth of the middle-40% (c) Wealth of the bottom 50%

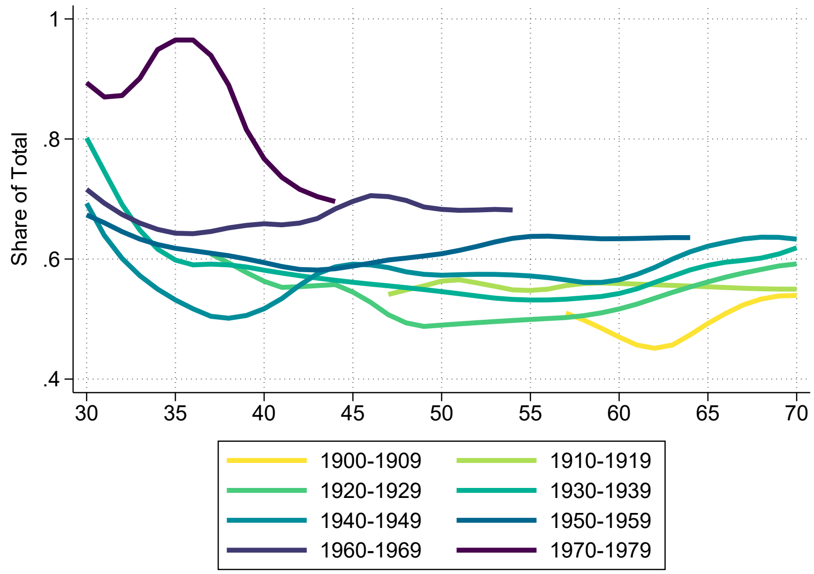
This Figure plots the average wealth of three within-birth cohort wealth groups (top-10%, middle-40% and bottom-50%) during their life cycles, expressed as a share of their own group's average income. Series are 7-year averages. For example, the average wealth of the top%10 at age 70 of the cohort born in 1910-19 is slightly above 10 times their own average income.

Concluding our analysis from a different perspective, we examine the within-cohort wealth inequality over the life cycles of the cohorts, presented in Figure 4. Specifically, we plot the share of wealth owned by the top 10% of each age group within each cohort.[25] Across all cohorts, we observe that wealth inequality tends to be somewhat higher during the early stages of their working age, gradually contracting thereafter. This pattern of higher inequality at younger ages aligns with well-established findings in the literature (e.g., Garbinti et al. 2020; Martínez-Toledano 2020). In line with the outcomes depicted in Figure 3, our analysis reveals that within-cohort inequality was lower for older cohorts and has increased for more recent cohorts.

Notably, we focus on the comparison of wealth concentration around the age of 50, which encompasses the majority of cohorts (with the exception of those born in 1900-1909 and 1970-

[25]Figure Appendix F4 shows the same results for the middle-40% and bottom-50%.

Figure 4: **Within-cohort top-10% wealth share over the life-cycle**



Notes: This Figure display the share of a cohort's wealth owned by the top-10% at a given age. For example, the share of the wealth of the cohort born in 1940-59 at age 50 owned by the richest top-10% of that age is approximately 60%.

1979, for which data is unavailable at that age). Examining this age group, we find that the top 10% of the cohorts born in 1910-1919 and 1920-1929 collectively own approximately 50-55% of the average wealth, while for the most recent cohorts, this figure approaches 70%. This represents an increase of around 15 to 20 percentage points, which is around twice the increase observed for the national top 10% since 1980 (i.e., the top 10% of all households, regardless of age or cohort; see, for instance, the 2022 update of Piketty et al. (2018)).

4 Deconstructing life-cycle wealth growth and inequality

Given the change in wealth accumulation across subsequent generations, it is natural to ask about the drivers of their life-cycle wealth growth. In this section, we do three things. First, we explore macroeconomic trends in wealth accumulation over the last decades. Second, we link them to the wealth accumulation of different generations. Third, we investigate the role of each component in explaining cohort-specific wealth-income ratios and wealth inequality. This decomposition, in turn, will allow us to investigate the main drivers of aggregate wealth and private saving in section 5.

4.1 Macroeconomic trends and their relationship to wealth accumulation

Two of the most important macroeconomic trends across rich countries since 1980 are the strong increase in household wealth-to-income ratios (as seen in figure 1a) and a boom in risky asset prices (e.g., Knoll et al. 2017; Kuvshinov and Zimmermann 2021). In this subsection, we establish the size of these trends for the U.S. and describe how they will be linked to the wealth accumulation of subsequent cohorts. We use an accounting framework (e.g., Piketty and Zucman 2014) to decompose wealth accumulation in the U.S. into two components: saving and capital gains. Our benchmark definition of saving is private saving, which sums corporate and personal saving as is standard in the literature (e.g., Saez and Zucman 2016; Mian et al. 2021b; Bauluz et al. 2022)[26]. Saving is net of depreciation.

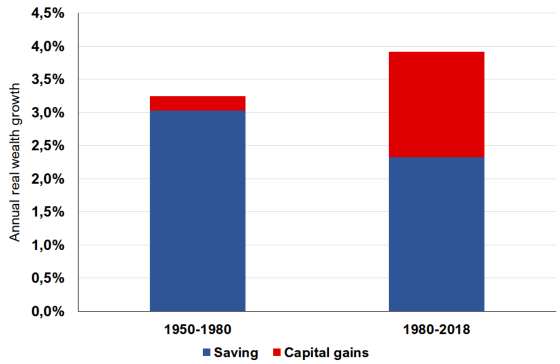
Figure 5a shows annual wealth growth decomposed into saving and capital gains for the periods from 1950 to 1980 and 1980 to 2018. There are two important things to notice. First, wealth growth rates have increased markedly between the two time periods, from around 3.2 percent to nearly 4 percent.[27]

Importantly, the nature of wealth growth has also changed between these time periods. Asset prices now play a central role in shaping aggregate wealth and account for nearly half of the increase since the 1980s. Before that, capital gains played a comparatively minor role. To have a better sense of the magnitude of saving and capital gains over time, we plot in Figure 5b the decennial average of aggregate saving and capital gains, expressed as a share of national income. Capital gains have been growing in importance in recent years and even surpassed the size of aggregate saving in the 1990s and the 2010s. Rising capital gains are linked to both an increase in

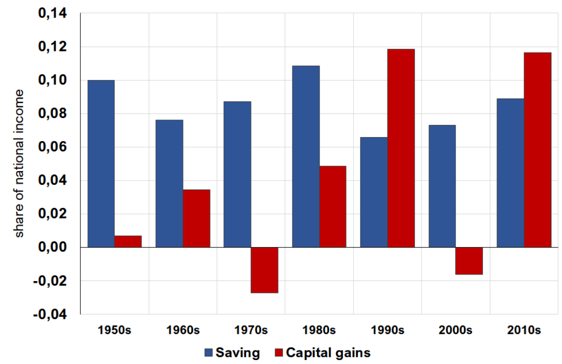
[26]More concretely, we include the share of corporate saving accrued to households as part of their saving in equity. As a result, our measure of equity capital gains does not include the increase that is due to retained earnings. See section 2.

[27]In particular, wealth growth has been stronger than income growth, as can be seen from the rising wealth-to-income ratios during this time frame.

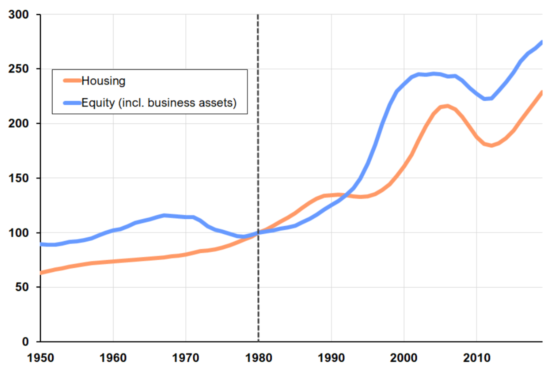
Figure 5: Macroeconomic trends in wealth accumulation, 1950-2019



(a) Annual household wealth growth: two periods



(b) Saving and capital gains (as a share of national income): decennial averages



(c) Capital gains index, 1980=100

Notes: Figure 5a decomposes the household sector's real average annual wealth growth into the contribution from saving and capital gains. Results are computed over the sub-periods 1950-1980 and 1980-2019. Figure 5b shows decennial averages for saving and capital gains expressed as a share of national income. Figure 5c shows the evolution of housing and capital gains over time, expressed as an index taking the value of 100 in 1980. Results in all cases use the asset-specific accumulation equations (see section 2).

housing and equity prices. As shown in Figure 5c, equity and housing capital gains have followed a sustained increase since 1980, in contrast with the mild increase that happened in the years before. In Appendix Figure F8 we also show capital gains on fixed-income assets. As the valuation of these assets largely depends on changes in consumer inflation, the moderation of consumer prices since the mid-1980s has implied less negative gains in these (largely nominal) assets. In the next subsection, we link these facts to the life-cycle accumulation of different cohorts.

4.2 Life-cycle wealth growth decomposition

The next step in our analysis is to investigate how life-cycle wealth accumulation evolved over time and how this impacted the distribution of wealth within generations. Given the consistency between our microdata and macroeconomic accounts (as detailed in section 2), any estimated distributional flow can be directly aligned with the corresponding macroeconomic aggregate (following the spirit of the Distributional National Accounts project of Alvaredo et al. (2021) and the Distributional Financial Accounts of Batty et al. (2019)). In addition to investigating the impact of saving and capital gains, we also assess the role of inheritances and gifts at the cohort level. While this flow cancels out at the aggregate household level, at the cohort level, there are net givers and net receivers.[28]

As shown in Figure 2, a key finding of our study is that newer cohorts are substantially wealthier than previous cohorts at the age of retirement.[29] To understand these results, we decompose life-cycle wealth growth across three components: saving, capital gains and inheritances. We use the accounting framework introduced in section 2 (Equation 4), previously used in the literature by Wolff (1999) or Feiveson and Sabelhaus (2019).[30]

Figure 6 shows the outcome of this exercise. Annual flows are shown as a percentage of the income earned by different cohorts at a given age to allow for an accurate cross-cohort comparison.[31] The Figure shows annual wealth growth (Figure 6a) and its three sub-components: saving rate (Figure 6b), capital gains rate (Figure 6c) and net inheritance flows (inheritance outflows minus inflows; Figure 6d). Note that, at a given age, annual wealth growth is the sum of the three components. To the best of our knowledge, no previous study decomposes the sources of wealth growth of different generations in the US.[32] This analysis is a core contribution of our paper.

[28]At the aggregate level, the flow of inheritances and gifts has increased in advanced economies in parallel with the rise in wealth-income ratios. See Alvaredo et al. (2017) for a comparison of the trends in the US, France, Germany and UK.

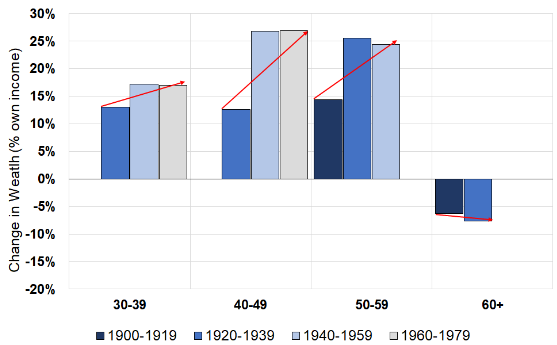
[29]This, in turn, generated a pronounced increase in the inequality across age groups since the 1980s, as we show in Appendix Figure F5.

[30]Subsequent work by Mian et al. (2021b) or Jaeger and Schacht (2022) do also use this accounting framework to decompose wealth growth at the cohort level.

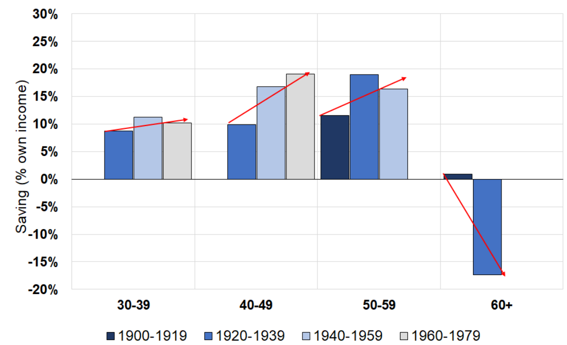
[31]This normalization is also consistent with the presentation in section 3

[32]In Feiveson and Sabelhaus (2019), a similar analysis is undertaken by pooling all adults in the modern waves of

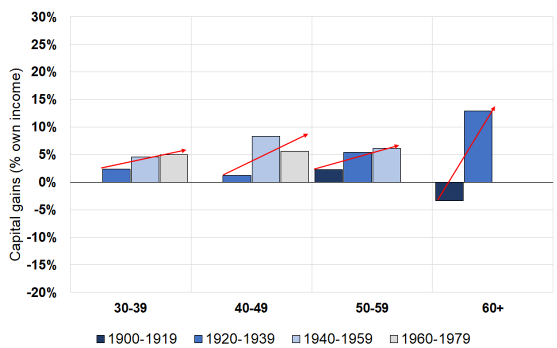
Figure 6: Life-cycle wealth growth and its decomposition (saving vs. capital gains vs. inheritances)



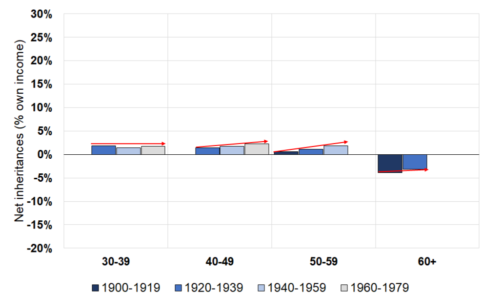
(a) Wealth changes over the life-cycle



(b) Saving rate over the life-cycle



(c) Capital gains over the life-cycle



(d) Net inheritances and gifts over the life-cycle

This Figure displays annual changes in wealth (Figure 6a) decomposed into the contribution of saving (Figure 6b), capital gains (Figure 6c) and inheritances and gifts (Figure 6d) along the life-cycle of four birth cohorts (born in 1900-19, 1920-39, 1940-59 and 1960-79) from age 25 to age 70. The flows are shown as a percentage of the average annual income of the cohort and are computed using the methodology outlined in section 2.

We note a number of new insights. First, all cohorts follow an inverted-U shape pattern of wealth growth (in line with basic predictions of the life-cycle model), with the highest growth happening in the middle ages (age 40-60). Importantly, we find that newer cohorts experience higher wealth growth at middle ages, consistent with the steeper wealth-income ratios for newer cohorts previously shown in Figure 2.

Saving is the most critical component of wealth accumulation, but it has experienced notable changes over time. We find that recent cohorts save more in the middle ages and dissave much more when old. We refer to this phenomenon as a "life-cycle saving re-shuffling", reflecting a

the SCF (i.e., from 1989 to 2016), hence, not comparing the wealth accumulation of different cohorts. Our results for the most recent cohorts (those captured in their study) are largely consistent with those in their paper.

lifetime rebalancing towards more saving in the middle ages and less when old. As we will discuss in section 5, this pattern has significantly impacted the evolution of aggregate saving, producing a marked polarization of saving.

Capital gains played an extremely limited role and were, in fact, negative for the oldest cohorts (e.g., those born in 1900-19). Not only were house and equity prices not growing in the 1960s and 70s, but inflation also led to a negative revaluation of nominal assets, explaining the negative capital gains. However, those born in the 1920s and onward experienced substantial capital gains during their lives. These cohorts spent their working lives and initial retirement in the post-1980 period, coinciding with the secular rise in asset prices (Figure 5a). In particular, newer cohorts saw large gains in their holdings of equity and housing. Moreover, the moderation of consumer inflation from the mid-1980s also reduced the negative capital gains in fixed-income assets.

Net inheritances, encompassing outflows minus inflows, including inter-vivos gifts, represent a consistent and steady source of wealth accumulation. However, in terms of magnitude, inheritances do not emerge as a primary driver of wealth accumulation for these cohorts. For example, our findings indicate that the net inflow amounts to approximately 2% of cohorts' income around age 40. Nevertheless, it is important to note that, on average, only 1 out of 50 individuals receive an inheritance in a given year. Consequently, an annual inheritance flow equivalent to 2% of a cohort's income reflects significant value for those individuals within the cohort who are recipients of such transfers. However when compared to saving and capital gains, the annual inheritance flows remain relatively small, consistent with previous studies conducted, for example, in Norway (e.g., Black et al. 2020; **?**).[33]

Interestingly, including capital gains in profiles of life-cycle wealth accumulation here explains to a large extent the observed deviations from theoretical Modigliani life-cycle smoothing (Modigliani 1986). The key empirical challenge to this has been the stable or only slightly declin-

[33] There is growing evidence that inheritances are important in shaping additional dimensions of economic welfare, such as income (Morelli et al. 2021). Inheritances are also much larger in absolute terms for rich heirs than for poorer ones, and the likelihood of receiving an inheritance increases with wealth (Elinder et al. 2018; Boserup et al. 2016; Nekoei and Seim 2022).

ing wealth after retirement, also called the 'retirement-saving puzzle' (De Nardi et al. 2016). Our analysis shows that distinguishing saving and capital gains can explain this puzzle. Namely, capital gains on existing assets go a long way in explaining why wealth growth is close to zero at the end of the life-cycle. These cohorts are, in fact, dissaving but still holding their wealth constant.

Why a similar pattern cannot be observed for the prior cohorts remains a puzzle. One possibility is that households at older ages do not aim to reduce their wealth holdings significantly and target a certain level of wealth (De Nardi et al. 2010). For the older cohorts (born in 1900-19), this was possible only by not dissaving significantly. The younger cohorts, by contrast, are able to dissave since this is compensated by sizable asset price gains.[34] Overall, our findings for the subsequent cohorts confirm a basic prediction of the life-cycle model regarding saving. That is, households save substantially more when they are in the middle of their working life and then reduce their saving significantly when they reach retirement age.

4.3 Decomposing cohort-specific wealth-income ratios and inequality

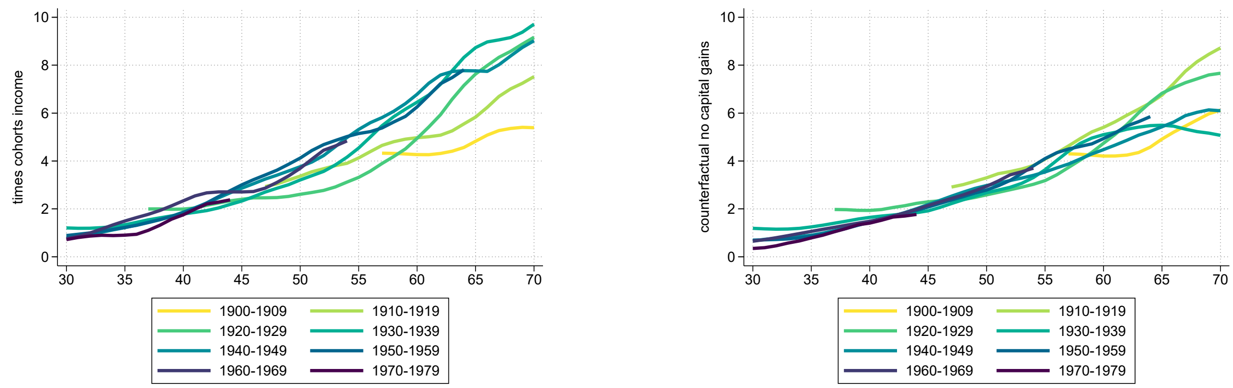
The previous decomposition allows us to shed further light on the drivers behind the change in lifecycle wealth accumulation documented in section 3. We investigate the role that saving, capital gains and inheritances had for subsequent cohorts in two dimensions: cohort-specific wealth-income ratios (Figure 7a) and within-cohort wealth inequality (Figure 4).

A natural starting point is to investigate the extent to which higher wealth-income ratios reflect the boom in asset prices that happened since the 1980s. To estimate these effects, we consider a simple counterfactual exercise: suppose there had been no capital gains in assets since the 1960s; how would this have affected the documented wealth-income ratios?[35] This is depicted in Figure 7b. The left panel shows the observed wealth-income ratios (i.e., Figure 2) while the right panel displays the counterfactual results absent capital gains.

[34]The channel of saving through capital gains is also explored for Norway in Fagereng et al. (2021), where including capital gains significantly increase gross saving rates of rich households (where gross saving is defined as the sum of saving and capital gains).

[35]Needless to say, this does not consider general equilibrium effect. Still, given the sizeable rise in asset prices, it can be suggestive of their effect.

Figure 7: Life-cycle wealth accumulation of selected birth cohorts before and after excluding capital gains



(a) Observed series

(b) Counterfactual without capital gains

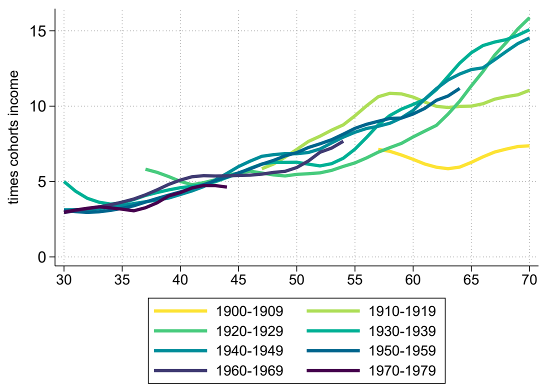
Notes: This Figure shows the average wealth-to-per adult national income ratios of four generations as observed (left panel) and in a counterfactual without capital gains since 1960 (right panel). See section 2 for details on the methodology. See Appendix Figure 7b for the same chart expressed as a share of the cohort's own income (instead of per adult income).

Absent capital gains, the wealth-to-income ratios of the generations born after 1920 change strongly. In fact, all cohorts' wealth-income ratios look very similar once capital gains are excluded from wealth accumulation. Especially after the age of 50, when many assets have been accumulated, the absolute effect of these capital gains is particularly striking. For the earlier cohorts (i.e., those born in 1900-19), eliminating capital gains makes little difference, as they mainly accumulated wealth during 1960-1980, when capital gains were generally low or even negative.

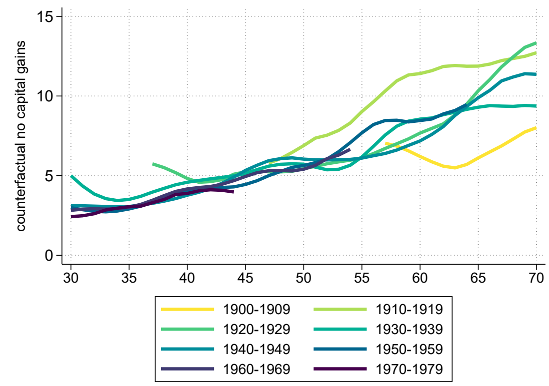
While the previous result is true for cohorts as a whole, it is not for all within-cohort wealth groups (Figure 8). Particularly, once we exclude capital gains, we find that differences for the bottom-50% across subsequent cohorts widen markedly (Figure 8f) instead of approaching. In the observed series (Figure 3c), the bottom half within birth cohorts holds progressively less wealth. However, their wealth would be reduced even further in the absence of positive capital gains. Our results indicate that for the bottom-50% of the cohorts born since the 1950s, wealth would be negative during their whole life-cycle if not for the rise in asset prices. By contrast, the top-10% from the newer cohorts still reaches higher wealth-income ratios than previous generations after excluding capital gains, reflecting the important role of saving in shaping the wealth growth of this group. These results are in line with Bauluz et al. (2022), who document a similar pattern for wealth groups but look at the cross-section of the total population (instead of individual birth cohorts).

Next, we turn to wealth inequality within cohorts. As we saw in section 3 (Figure 4), within-cohort wealth inequality has increased in recent decades, being higher in more recent cohorts than in those born in the first decades of the 20th century. In our microdata, we observe all four cohorts at age 45-55. In Table 1, we show the wealth share of the top-10% from within each generation at around age 50, making it possible to compare the development of inequality across the four cohorts at the same age. It reflects a marked increase in top-10% wealth shares over time, of around 14pp (from 54% to 68%). To put this number in perspective, it is nearly twice the increase observed in the population as a whole for the period 1980-2019 (see, for instance, the 2022 update of Piketty et al. 2018).

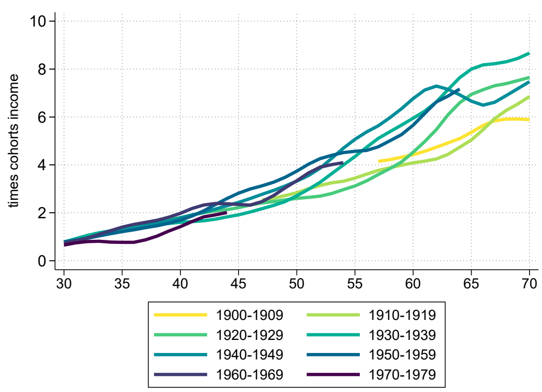
Figure 8: Life-cycle wealth accumulation of selected birth cohorts before and after excluding capital gains (within-cohort)



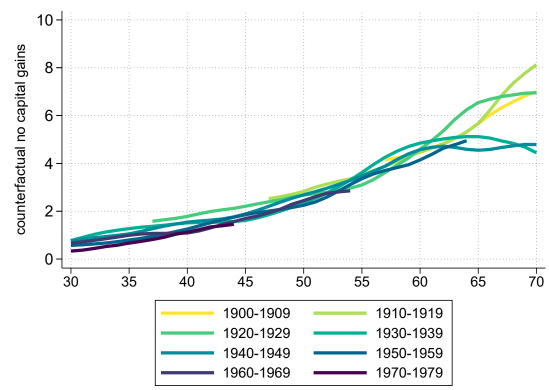
(a) Top-10%: observed series



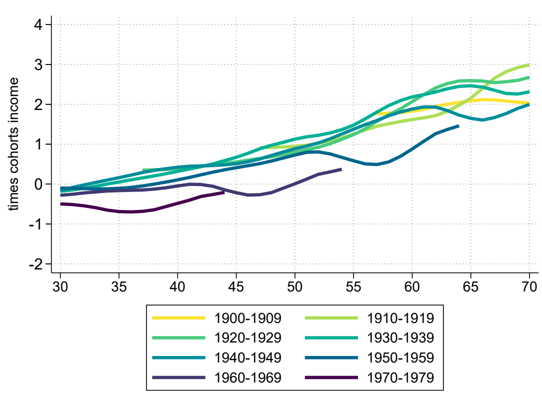
(b) Top-10%: counterfactual without capital gains



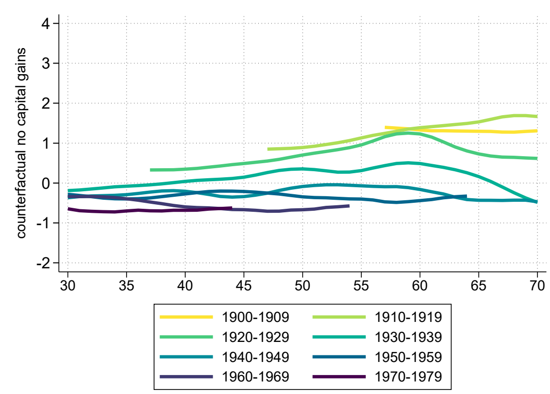
(c) Middle-40%: observed series



(d) Middle-40%: counterfactual without capital gains



(e) Bottom-50%: observed series



(f) Bottom-50%: counterfactual without capital gains

Notes: This Figure plots the average wealth of three within-birth cohort wealth groups (top-10%, middle-40% and bottom-50%) during their life cycles, expressed as a share of per adult income as observed (left panel) and in a counterfactual without capital gains since 1960 (right panel). See section 2 for details on the methodology.

Table 1: Observed and counterfactual wealth shares within birth cohorts

	Observed	Only savings	Only savings + inheritances
1900–1919	.54	.54	.54
1920–1939	.53	.57	.57
1940–1959	.58	.69	.68
1960–1979	.68	.82	.79

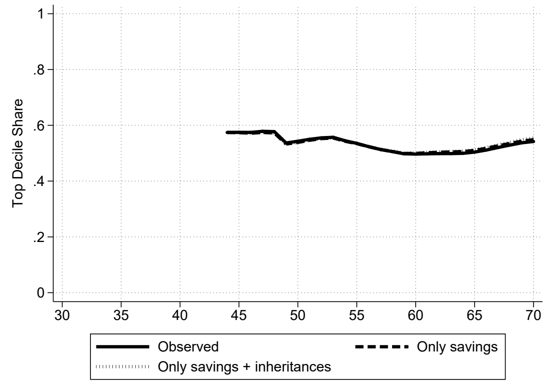
Notes: This table shows the top decile share of the 4 birth cohorts as observed (left column) and in two counterfactuals. The first counterfactual assumes that all wealth accumulation happens through savings, the second one assumes only savings and inheritances. Savings and inheritances are constructed as in section 2. We compute observed and counterfactual wealth shares between ages 45 and 55 as we observe all cohorts during most of these ages.

To understand the relative contribution of saving, capital gains and inheritances to within-cohort wealth inequality, we conduct a counterfactual exercise. More concretely, we simulate the evolution of wealth shares in two scenarios, where we simulate the accumulation of wealth for all within-cohort wealth groups based on: (i) saving only (e.g., assuming no inheritances or capital gains) and (ii) saving and inheritances only. We then compare these results with the observed series, which include saving, inheritances and capital gains. Results are presented at different life-cycle stages in Figure 9 and around age 50 in Table 1.

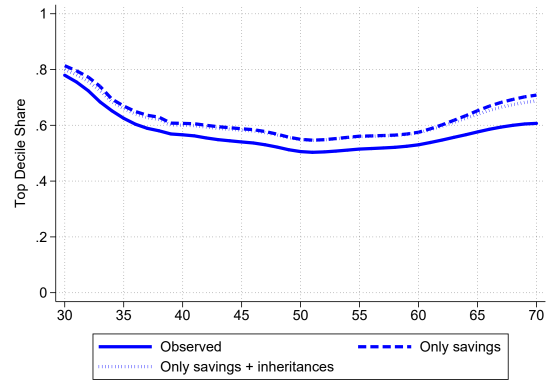
The most important result from this exercise is that saving has put upward pressure on wealth inequality in recent decades. The predicted top-10% wealth share based on saving only for the cohort born in 1960-79 is 82%, compared to 54% for those born in 1900-19. Taken at face value, this exercise predicts an increase in top-10% wealth shares of about 28pp, which is precisely twice as much as the actual increase of 14pp. This reflects the growing concentration of saving within the richest of the distribution (Mian et al. 2021b; Mian et al. 2021c; Bauluz et al. 2022). As we show in subsection 5.2, the higher top-10% saving of recent cohorts until the age of retirement largely reflects their growing household income share and no significant changes in their saving rates.

Inheritances, on the other hand, seem to have had a relatively limited role in shaping the evolution of wealth shares, as almost no difference is perceived between the counterfactual share based on saving only and the one with saving and inheritances. They have a slightly moderating

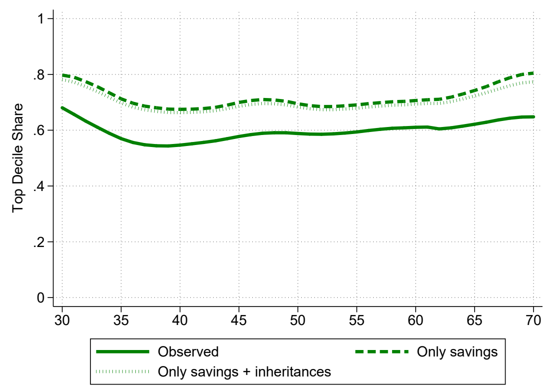
Figure 9: Top-10% wealth share within birth cohorts, over their life-cycle: counterfactual exercise



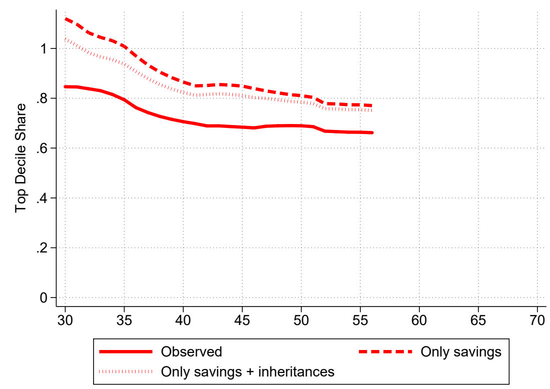
(a) Cohort born in 1900-19



(b) Cohort born in 1920-39



(c) Cohort born in 1940-59



(d) Cohort born in 1960-79

This Figure shows the top decile share during the life-cycle of the 4 birth cohorts as observed and in two counterfactuals. The first counterfactual assumes that all wealth accumulation happens through saving; the second one assumes only saving and inheritances. Saving and inheritances are constructed as in section 2. We compute observed and counterfactual wealth shares.

role in more recent years, due to the fact that the distribution of inheritances is less concentrated than the distribution of wealth among inheritors. A similar result is found in Sweden by Elinder et al. (2018). Capital gains are moderating relative wealth inequality, pushing downwards the predicted wealth inequality based on saving only. The growing gap between the counterfactual and observed wealth shares reflects the growing concentration of saving at the top and the importance of capital gains for the bottom wealth groups. This is driven by the higher exposure of bottom groups to housing (Kuhn et al. 2020), an asset that has increased substantially in value post-1980.[36]

[36]Appendix Tables F5 and F6 show the role of saving, capital gains, and inheritances for different cohorts and within-cohorts wealth groups during their life-cycles.

4.4 A joint interpretation of life-cycle and macro-finance trends

We now sketch an interpretation of our empirical results in the context of the macroeconomic trends referenced at the beginning of the paper, that is the rise in wealth to income ratios driven by increasing asset prices. The details of the model are given in appendix E, we summarize the main insights here.

In the model, a series of overlapping generations live for two periods each. In youth, the cohorts save for retirement, when they decumulate their savings. Cohorts save for retirement in an asset in inelastic supply. In equilibrium, therefore the young are buyers of the asset, while the old sell to the young to finance their consumption. Within this model, we show how to link the macroeconomic trends (rising asset prices and W-Y ratios) with the microeconomic trends documented in this paper. In particular, we focus on the steepening of the lifecycle-wealth profile and the lifecycle-saving reshuffling documented in this section.

We consider two big macroeconomic trends within our model. First, we study an increase in longevity, which is modeled as an increase of the share of life a cohort spends in retirement. This leads young cohorts to increase their asset demand. However, as the asset supply is inelastic, any increase in asset demand is fully absorbed by increases in the equilibrium asset price. As a result, wealth to income ratios rise due to elevated asset prices, and this is reflected in a steeper lifecycle-wealth profile. For the initially old, this constitutes a windfall game from higher asset prices. The old sell assets to the young to finance their consumption, so with their assets trading at higher prices they dissave more. This leads to a *lifecycle-saving reshuffling*.

Second, we consider a rise in within-cohort income inequality. Here, we extend the model to include non-homothetic preferences as in **??**. The implication is that as the rich earn a larger share of the total income, they will also increase their saving rate.[37] This triggers the same mechanism as an increase in longevity: Asset price rise, with the young purchasing assets at higher price and the old dissaving more.

[37] We show that, as first pointed out in **?**, with homothetic preferences, income inequality does not matter for aggregate outcomes in our model.

5 Aggregate wealth and saving

A key question in macroeconomics is what drives the decline in natural interest rates happened over the last decades (Holston et al. 2017; Rachel and Smith 2015). Two prominent explanations put forward are the rise in income inequality leading to an excess in saving from the rich (Mian et al. 2021a; Mian et al. 2021c; Klein and Pettis 2020) and demographic changes pushing upwards aggregate wealth-income ratios (Auclert et al. 2021; Kopecky and Taylor 2022) and private saving (Gagnon et al. 2021; Carvalho et al. 2016). However, a fundamental limit to studying the previous channels is the absence of microdata on saving and wealth holdings decomposed by population groups and covering a relatively long period.[38]

In this section, we provide a micro view of the rise in household-wealth national income ratios and the evolution of private saving since the 1960s. We follow a long tradition and adopt a shift-share methodology to identify the main drivers behind changes in wealth-income and saving-income ratios (e.g., Auerbach and Kotlikoff 1990; Bosworth et al. 1991; Poterba 2001; Mian et al. 2021c; Auclert et al. 2021).

5.1 Aggregate wealth-income ratios

A substantial body of research has investigated the rise in aggregate wealth-income ratios in recent years. Most works relies on decomposing aggregate wealth growth across saving and capital gains (Piketty and Zucman 2014; Waldenström 2017; Artola-Blanco et al. 2020) or on quantitative macro models (Grossmann et al. 2021; Brun and González 2017; Kopecky and Taylor 2022; Eggertsson et al. 2021). Our microdata allow us to enrich the previous analyses by decomposing the rise in aggregate wealth-income ratios across three components: (i) group-specific wealth-income profiles, (ii) income inequality and (iii) varying demographic structure. Namely, we defined the aggregate household wealth-to-national income ratio in the following form:

[38]Two important exceptions are Mian et al. 2021c and Auclert et al. 2021. We delineate our contribution relative to these studies in subsections 5.1 and 5.2, respectively.

$$\frac{W_t}{Y_t} = \sum_i \frac{\bar{w}_{it}}{\bar{y}_{it}} \cdot \frac{\bar{y}_{it}}{\bar{y}_t} \cdot \frac{N_{it}}{N_t} \tag{5}$$

Where $\frac{\bar{w}_{it}}{\bar{y}_{it}}$ is the group's-specific average wealth-to-average income ratio, $\frac{\bar{y}_{it}}{\bar{y}_t}$ is the ratio of the average income of the group-to-average income of all households (the income inequality component) and $\frac{N_{it}}{N_t}$ is the share of the group in the population of all adults (the demographic component).

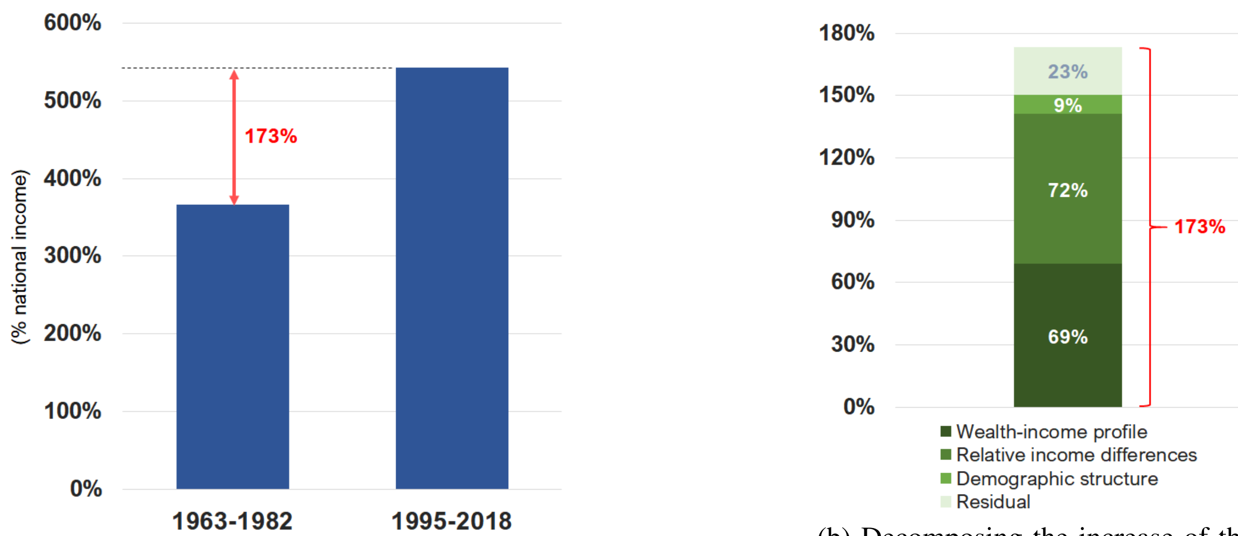
In their study, Auclert et al. 2021 investigate the role of demographics in the evolution of wealth-income ratios across various countries and the US. They conduct a retrospective analysis to understand the role of demographics in driving up the U.S. wealth-income ratio in recent decades. Still, their primary focus is on the projections from now on to 2100 (when population aging is expected to accelerate). On the other hand, our analysis aims to understand the role of demographic changes, group-specific wealth-income ratios and income inequality in explaining the observed increase in wealth-income ratios in the past 60 years.

Our analysis is based on six age-wealth groups: top-10% age 20-39, bottom-90% age 20-39, top-10% age 40-59, bottom-90% age 40-59, top-10 age 60+ and bottom-90% age 60+. As we have documented throughout the paper, these two dimensions (age and wealth) are good cuts to understanding wealth accumulation and saving. Appendix Figures F6, F9 and **??** show the evolution of each of the three components (wealth-income profiles, relative income and population shares) since 1960.

Figure 10 summarizes the results of this exercise. On the left panel (Figure 10a), we plot the observed household wealth-to-national income ratio across two representative sub-periods 1963-1982 and 1995-2019.[39] While aggregate wealth was 372% of national income in the earliest period, it has increased by 173pp to 546% in recent years. We next evaluate the role of each of the three sub-components of Equation 5 in driving the observed increase. Namely, we fix two sub-components in the first period (1963-1982) and let only one change according to its value in the

[39]These are also the two sub-periods used in Mian et al. (2021c)'s shift-share analysis of saving across age and income groups

Figure 10: Shift-share decomposition of the rise in aggregate wealth-income ratios: wealth-income profiles vs. income inequality vs. demographics



(a) Wealth-income ratio in two periods

(b) Decomposing the increase of the wealth-income ratio

Notes: The left panel of this Figure plots the average household wealth-to-national income ratio across two periods: 1963-1982 and 1995-2019. The difference between the average wealth-income ratio in 1995-2019 and 1963-1982 is 173pp. The right panel of the Figure decomposes the 173pp increase in wealth-income ratios using a shift-share approach based on Equation 5.

second period (1995-2018). On the right panel (Figure 10b), we decompose the increase in the wealth-income ratio across the three components of Equation 5 plus a residual component that captures the interaction of the three components changing simultaneously (hence, reinforcing the overall increase in the ratio).

This exercise provides new critical insights. Namely, we identify a prominent role in the increase of wealth-income ratios for income inequality of around 72pp. This is of the same magnitude as the increase due to varying group-specific wealth-income ratios, which the exercise quantifies in 69pp. Regarding population shares, we find a relatively limited role in driving the increase in the ratio in the recent decades, predicting an increase of 9pp. The fact that the strong increase in income inequality in the U.S. (e.g., Piketty et al. 2018) caused an increase in aggregate-wealth income ratios is intuitive but, to the best of our knowledge, was not quantified previously in the literature. All else equal, if those individuals with high wealth-income ratios (i.e., the top groups) obtain a higher income share, aggregate wealth-income ratios would increase.

5.2 Aggregate private saving

We next examine the evolution of the U.S. private saving rate (the sum of personal and corporate saving rates). Despite being the object of great scrutiny and debate in the last decades (e.g., Summers and Carroll 1987; Bosworth et al. 1991; Auerbach and Kotlikoff 1990; Mian et al. 2021b, etc.), it is still unclear which population groups and mechanisms drive trends in aggregate saving (Rachel and Smith 2015). We shed new light on this critical question.

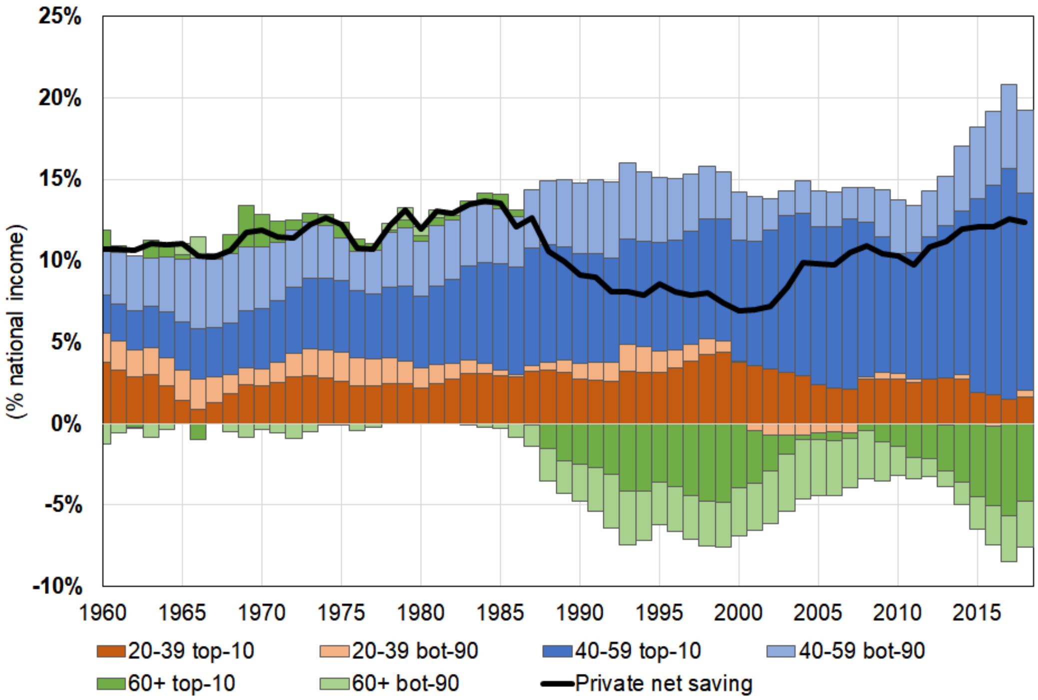
Our analysis is closest to Bosworth et al. (1991) and Mian et al. (2021c). These two studies analyze the evolution of the U.S. private saving rate, asking two essential questions: who saves more and less over time and why? These two papers follow a similar approach to ours to measure group-specific saving, and use a shift-share methodology to investigate potential mechanisms. We innovate in one specific dimension that turns out very important. Namely, we look separately at the top and bottom groups of different ages instead of comparing age groups, on the one hand, with top/bottom groups of all ages together on the other. We break down our data into six age-wealth groups: top-10% age 20-39, bottom-90% age 20-39, top-10% age 40-59, bottom-90% age 40-59, top-10 age 60+ and bottom-90% age 60+.

Figure 11 presents our results regarding the first of the two questions: who is saving more and less over time? It decomposes the U.S. private saving rate (straight line) across age-wealth groups (bars) since 1960. We define the private saving-to-national income ratio ($\frac{S_t}{Y_t}$) as the sum of the saving from each group i divided by national income: $\frac{S_t}{Y_t} = \sum_i \frac{S_{it}}{Y_t}$. As well-known, the aggregate private saving rate was high in the 1960s and 1970s, collapsed in the 1990s and 2000s, and increased again in recent years.[40]

This decomposition uncovers an important trend in the evolution of private saving since the 1980s. More concretely, we document the emergence of a marked saving polarization across population groups. We identify that saving from the middle-aged rich increased dramatically since the 1980s, mirrored by an even more spectacular saving decline from the elderly (both the elderly

[40]The collapse in private saving around the 1990s primarily reflects personal saving. Corporate saving, on the other hand, has trended upwards since the 1980s both in the U.S. and elsewhere (Chen et al. 2017; Bauluz et al. 2022).

Figure 11: **Private saving by age-wealth groups, 1960-2018**



Notes: This figure shows annual net saving of age-wealth groups expressed as a percentage of national income. All series are 7-year moving averages. See section 2 for details on the methodology.

rich and poor). In numbers, our results indicate that the middle-aged top-10% used to save the equivalent of 4% of national income in 1962-1983 and 9.3% of national income in 1995-2018, involving an increase of 5.3 pp of national income over time. In contrast, the saving from the elderly has declined by the equivalent of 6.3pp of national income across the two periods, from 0.4% to -6.2%.

We identify that (i) the "saving glut of the rich" since the 1980s (previously documented by Mian et al. 2021b, Saez and Zucman 2016 and Bauluz et al. 2022) is the "saving glut of the middle-aged rich" and (ii) the dissaving by the old is the most critical force putting downward pressure on aggregate saving in recent decades. The latter result is consistent with findings from Bosworth et al. (1991), who looked at a shorter period (1962-87).[41]

[41]The bottom-90% from the young and middle-aged groups reduced their saving throughout these two periods in the equivalent of 2.2 pp of national income, while the top-10% from the young increased it by 0.9 pp. While the dynamics of these groups are also important for aggregate saving, they experienced substantially less variation than those occurred for the rich middle-aged and elderly groups.

The second part of our analysis investigates the drivers of these previous trends. We follow a similar shift-share approach as in subsection 5.1 which allows us to evaluate the role of three factors: relative income differences across age-wealth groups, demographic trends, and saving rates out of income. Concretely, we define the aggregate private saving rate as:

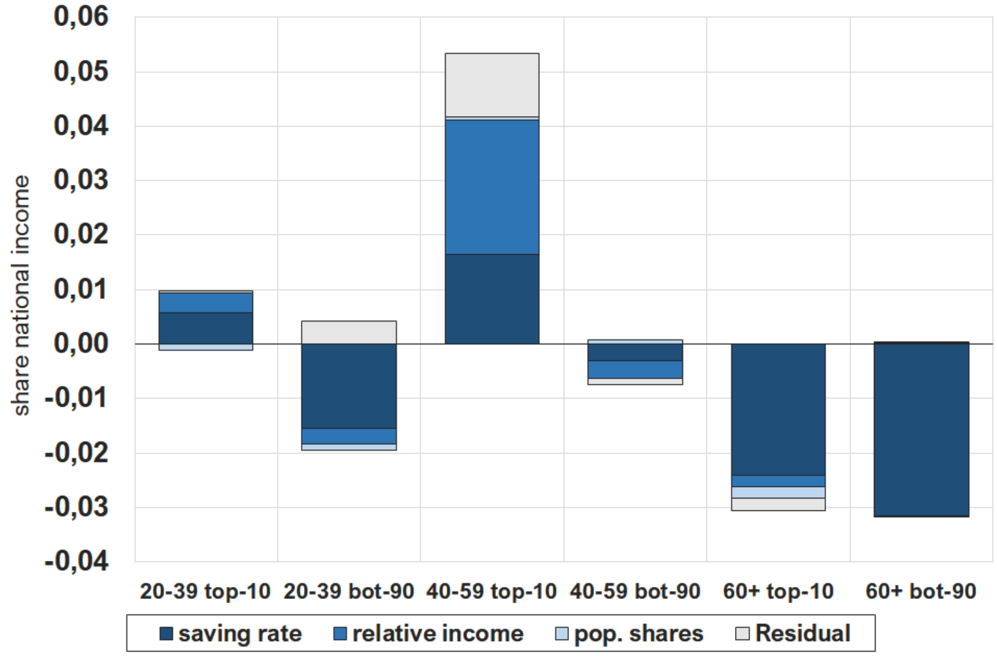
$$\frac{S_t}{Y_t} = \sum_i \frac{\bar{s}_{it}}{\bar{y}_{it}} \cdot \frac{\bar{y}_{it}}{\bar{y}_t} \cdot \frac{N_{it}}{N_t} \tag{6}$$

where $\frac{\bar{s}_{it}}{\bar{y}_{it}}$ is the group's-specific average saving-to-average income ratio (i.e., group i's saving rate), $\frac{\bar{y}_{it}}{\bar{y}_t}$ is the ratio of the average income of the group-to-average income of all households (the income inequality component) and $\frac{N_{it}}{N_t}$ is the share of the group in the population of all adults (the demographic component). The evolution of each of the three components for the six age-wealth groups is shown in Figures Appendix F10, F9 and **??**.

To evaluate the role of each sub-component of Equation 6 in driving changes in saving across age-wealth groups, we fix two sub-components in the first period (1963-1982) and let only one change according to its value in the second period (1995-2018). Figure 12 shows the results from this exercise.

Two main insights emerge. Regarding the rise in the middle-aged rich's saving, we find that the increase in the relative income of this group accounts for most of its saving boom. This result would be consistent with the mechanism posited by Mian et al. (2021a), according to whom the substantial increase in income inequality since 1980 caused a saving glut among the rich. However, we circumscribe it to the middle-aged rich. By contrast, the decline in the old's saving seems to reflect almost exclusively a reduction in saving rates (i.e., an increase in consumption propensities), as both the relative income and demographic components barely account for meaningful changes. The decline in the saving rates of the old is consistent with previous studies (e.g., Gokhale et al. 1996). Among the many reasons that could explain the fall in saving rates (e.g., out-of-pocket medical expenses), the boom in asset prices that happened since the 1980s would fit well with the observed trends (Poterba 2000; Chodorow-Reich et al. 2021). As we saw in Figure 6, the elderly in recent decades consume their assets (i.e., dissave) without reducing their wealth holdings

Figure 12: **Shift-share results, within-age wealth groups**



Notes: This Figure presents the results of the shift-share methodology as outlined in Equation 6 across the within-age wealth distribution. The Table reflects the change in a given group's saving between 1962-1983 and 1995-2018, expressed as a share of national income. For example, the Table indicates that the saving of the bottom-90% of the age 60+ has declined by approximately 3pp of national income and that the decline is almost exclusively explained by the saving rate component.

significantly, given that substantial valuation gains on their wealth holdings co-occur.

All in all, our analysis suggests that rising income inequality and the boom in asset prices are potentially important mechanisms behind the marked saving polarization happening since the 1980s.[42] This said, we do not take a strong stance on the specific force behind the observed trends. The main goal of this sub-section is to bring in new evidence on saving patterns across population groups in the US. Quantifying the relative importance of various potential channels is a much-needed and fruitful avenue for future research.

[42]It is also possible that the boom in asset prices has its root on the rise of income inequality, which would lower natural interest rates, raising asset prices (Mian et al. 2021a).

6 Conclusion

Wealth in the U.S. is aging. We uncover that this is strongly linked to a steepening of the age-wealth profile, mainly driven by booming asset prices in the past decades. We further find a shift in the saving profile of U.S. households, with more saving happening at middle ages and less when old. Household-lifecycle behavior differs strongly across the distribution, with the upper half being richer than previous generations and the lower half becoming poorer. We note several implications of the change in life-cycle behavior. It increases aggregate wealth, but the effects on aggregate saving are less clear, as two forces are at play. Our decomposition reveals that household saving are increasingly the saving of rich households at middle ages. Old households, both the rich and the poor are increasingly dissaving, pushing down aggregate saving.

A key question for future work is why the life-cycle of U.S. households has changed. Many factors may contribute here, such as changes in life expectancy, birth rates and bequest motives, the pension and health care system, the growing inequality of income or the asset price boom. Our analysis of drivers suggest that incorporating asset valuation is key to understanding the saving behavior along the life-cycle. Understanding their contribution will also help us forecast the consequences of the life-cycle for macroeconomic aggregates going forward. Is the changing age-wealth profile a function of one-off capital gains or here to stay?

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A Matching SCF to Macro Categories

A.1 Wealth

Table A1: **Matching SCF to Macro Categories**

	SCF asset categories	**Macroeconomic data category** [a]
Assets	Primary residence, Residential property excl. primary residence	Housing
	Businesses	Business assets
	All types of transaction account (Liq), Certificates of deposit, Savings Bonds, Directly held bonds	Fixed-income assets
	Directly held stocks	Equities (excluding held through funds)
	Directly held pooled investment funds	Investment funds[b]
	Cash Value of Life insurance, quasi-liquid retirement accounts	Pensions & Life insurance
Liabilities	Debt secured by primary residence, Debt secured by other residential property	Mortgages, tenant and owner-occupied
	Other lines of credit, credit card balances after last payment, installment loans, other debt	Non-mortgage debt

[a]Based on Saez and Zucman (2020), Table TB1
[b]See the Appendix of Saez and Zucman (2020), Sheet DataWealth, Column AU

A.2 Income

Our goal is to measure flows of saving, capital gains and interfamily transfers as percent of gross income. National income in NIPA and income recorded in the SCF differ from each other in some respects. Firstly, NIPA income includes incomes of both the household sector and the non-profit institutions serving households (NPISH) sector. We remove all income flows pertaining to the NPISH sector. Secondly, imputed rents of owner-occupiers are not recorded in the SCF, so we deduct them as well. In general, the SCF captures the evolution of national income quite well (Kuhn et al., 2020, Figure 3a). Some components of income, such as labor and business income, are captured extremely well (and even overrepresented in the survey), while others are captured poorly (capital income, transfers), see also the discussion in Feiveson and Sabelhaus (2019). The mapping is summarized in Table A2

Table A2: **Matching SCF to NIPA**

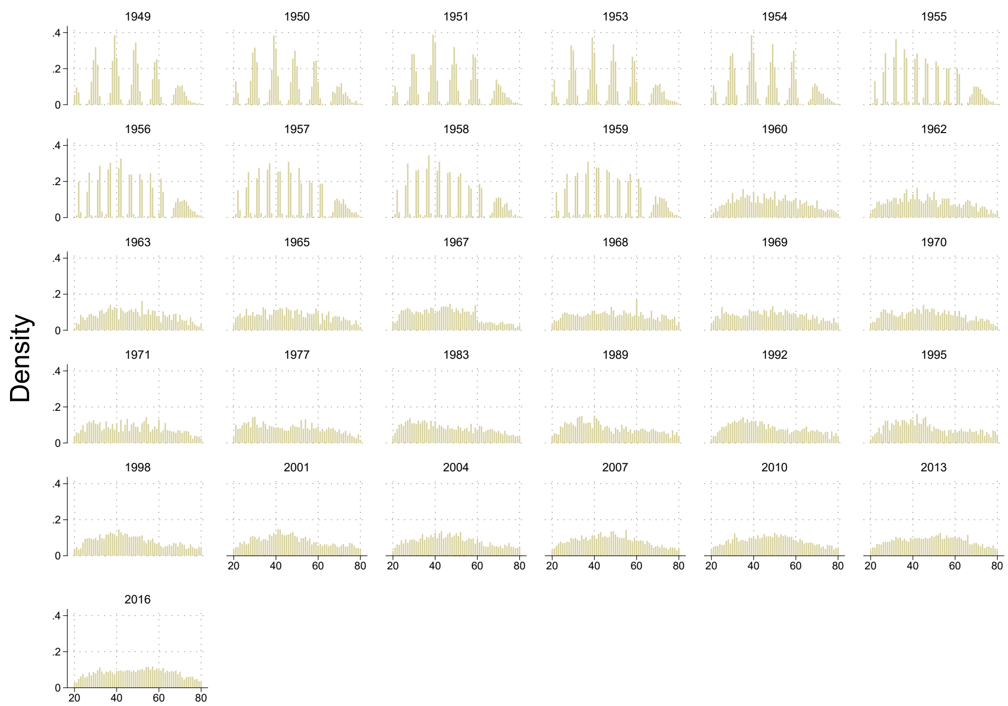
SCF+ income categories	**Macroeconomic Category**	**NIPA codes**
income from wages & salaries, self employment and professional practice	Wages and Salaries, Mixed (Business) income	Table 2.1, Line 3 + Table 2.1, Line 9
capital income	Capital income (including rental income of landlords), excl. imputed rents and capital income received by NPISH	Table 2.1, Line 12 - Table 2.9, Line 50 - Table 2.9, Line 51 + Table 7.9, Line 2
transfer, social security and other	Personal current transfer receipts	Table 2.1, Line 16 - Table 2.1, Line 25

A.3 The Age Structure in the SCF+

In general, the age structure in the SCF+ is quite close to the general population. One important exception is the 1950s when the age in the SCF+ is not reported exactly. We show this in figure A13, where it can be clearly seen that in this decade, the age of respondents spikes around certain peaks. Therefore we do not consider the 1950's waves for our analysis. After 1960, the age structure from the SCF is quite closely aligned with the general population. We show this explicitly in figure A14, which compares the population shares in the SCF+ and the U.S. census by decade.[43] The SCF+ tracks the population composition in the census closely.

[43]The U.S. census is conducted once per decade. We linearly interpolate the age structure in between census years.

Figure A13: **Age Density in the SCF+**



Notes: This figure presents the density of ages in the SCF+ for all survey waves.

B Construction of Inheritances and Transfers

In this appendix, we give further details on the construction of inheritances and gifts. First, we describe more closely the mortality multiplier method used to construct inheritances.

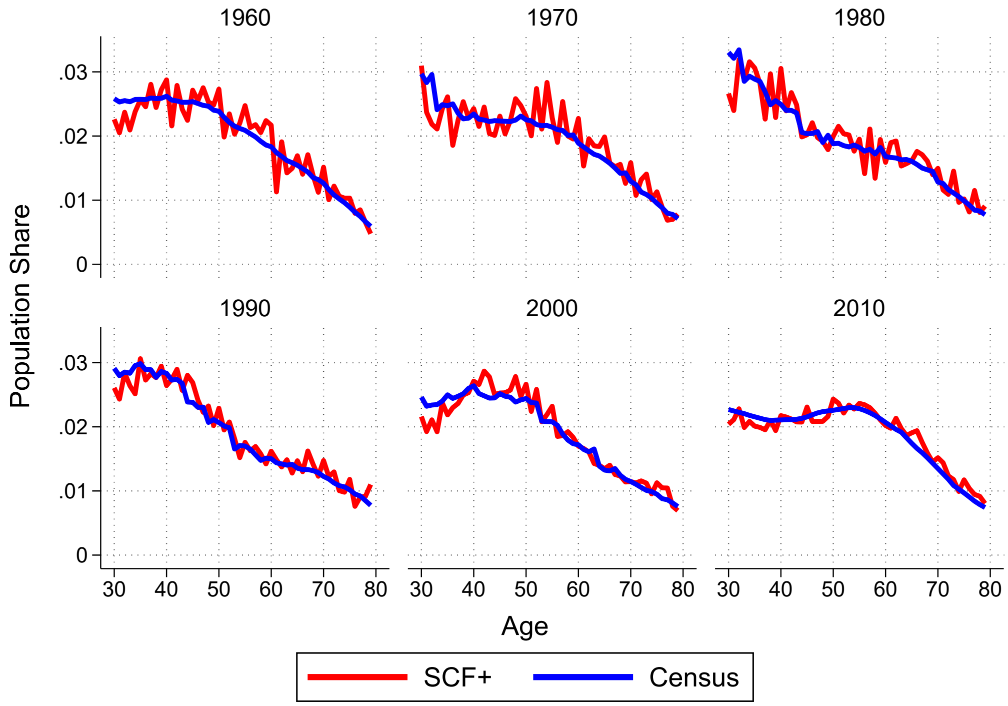
We use death rates from the Social Security Administration by age, sex and gender since 1900[44]. Then the bequests B_t in a given year t can be estimated via

$$B_t = \sum_{i \in I} w_{i,t} d(s_i, a_i, t),$$

where I is the set of adults, $w_{i,t}$ is their wealth in t and s_i, a_i refer to the sex and age of individual i. Following US tax law, estates with negative net wealth are dropped, as debts can't be inherited. For those estates with positive net wealth we consider net wealth instead of gross wealth as tax

[44]These are available at https://www.ssa.gov/OACT/HistEst/Death/2020/DeathProbabilities2020.html

Figure A14: **Age Density in the SCF+**



Notes: This figure compares the population composition in the SCF and the census.

regulation require an estate to settle its own debts, so debts of the deceased are deducted from the amount transferred to the inheritors.

Next we refine this method by correcting for differential mortality, estate taxes and other deductions from the estate and adding gifts. Applying uniform mortality rates overstates the mortality of the rich, who tend to live longer lives (Chetty et al., 2016). Therefore we adjust mortality rates $d(s_i, a_i, t)$ by multiplying with a mortality multiplier $\alpha(x_{i,t})$ where $x_{i,t}$ is a vector describing other characteristics of the household (such as income, wealth etc.). We use the mortality multipliers of Saez and Zucman (2016) to correct for differential mortality of top wealth holders.[45]

We next apply estate taxes and deductions to the estate. The US estate tax is applied to net wealth, including all community property. Hence we compute the tax flow by considering the

[45]Using other multipliers, such as the ones of the Congressional Budget Office yields very similar results, which can be seen from the fact that our numbers are close to (Feiveson and Sabelhaus, 2019). We choose the multipliers of Saez and Zucman (2016) as they also go back in time, reflecting changes in differential mortality.

household as a unit. From this, costs that pertain to the death (such as funeral and attorney costs) and charitable contributions are deducted from the estate before applying the estate tax. We deduct these in a procedure following Feiveson and Sabelhaus (2019), that is based on the publically available tax files of the IRS and the deductions recorded in them.

Finally, we apply the estate tax after making the deductions outlined above (charitable bequests and funeral costs). The estate tax has been a topic of hot debate in the US for many years. For the past 50 years tax rates have been lowered and the exemption increased. This is especially true for the top marginal tax rate, which has declined from 77% (in the period of 1940 to 1977) to only 40% today. But not only the extremely wealthy have seen a lowering of their estate taxes. Thresholds have been lowered, such that fewer estates are taxed in total. We collect precise estate tax schedules since 1946 and apply the tax to all inheritances not passed to the spouse, as these are tax free. Adding all deductions and taxes reduces the flow of inheritances by on average 20%, with yearly values ranging from 15-25%. There is no trend in the size of these deductions.

As we first estimate a total flow and then distribute according to the observed distribution of bequests received we must decide which parts of the inheritance go to the spouse and which parts go to subsequent generations. This is because the SCF survey module only records inheritance received from outside of the households, so that bequests received from the spouse will not be recorded. We assume that deceased spouses with a surviving partner leave all of their inheritance to their spouse (as in Feiveson and Sabelhaus (2019); Mian et al. (2021c). This would be consistent with tax exemptions made for surviving spouses. If both spouses die, then the inheritances flows to the next generation. Hence intergenerational bequests B_t^{intergen} (those passing to the next generation) are defined as

$$B_t^{\text{intergen}} = \sum_{i \in I_{\text{single}}} w_{i,t} d(s_i, a_i, t) + \sum_{i \in I_{\text{married}}} w_{i,t} d(s_{i_1}, a_{i_1}, t) d(s_{i_2}, a_{i_2}, t). \tag{7}$$

and are comprised of bequests from single and married households in which both partners die. Note that now $w_{i,t}$ represents household wealth (after taxes and deductions), which also fits the

SCF framework more closely. For those bequests that flow to the spouse it is clear from the microdata how they redistribute wealth across generations as we observe the age of the spouse to which the inheritance flows.

Wealth can also be passed between households by inter-vivos transfers. These are significantly harder to estimate than bequests, since they don't ocurr at a fixed point in time. Instead we make use of the gift module in the SCF to study the size of the inter-vivos gifts flow. In this module both transfers received and transfers given by the household are recorded.[46] In the aggregate, households in the SCF report that they gave more transfers than they received. This indicates that gifts received are underreported in the survey and the gifts given are the more reliable estimate. In turn, we use the aggregate gifts given in the SCF for the size of our gift flow. Before 1989 we cannot rely on the SCF to tell us about the aggregate of gifts. Following Alvaredo et al. (2017) we estimate the flow of inter-vivos gifts to be 20% of all bequests. This is an approximation that is validated by the gift flow since 1989, which is on average 21% of the total bequest flow.

Distribution of Bequests and Gifts. We distribute gifts and inheritances following observed densities from the SCF. Recall that we only distribute those bequests that flow to the next generation from equation 7 using these densities, the rest of the bequests goes to the spouse. We know the age of the spouse from the SCF for the modern SCF waves so it is clear how bequests to spouses redistribute wealth across generations. For the historical period we assume marriages to be between mixed sex partners of the same age. Inheritances are only reported sparsely, with only 25% of households in the SCF reporting ever receiving an inheritance. Given this, we pool the survey waves since 1989 to produce more robust densities.[47] The SCF asks respondents about all inheritances they ever received. As our goal is to capture only the distribution in a given year, we only include inheritances received in the past 3 years.[48] We show the distribution of inheritances received in figure B15. As the population ages, the distribution of inheritance recipients has moved

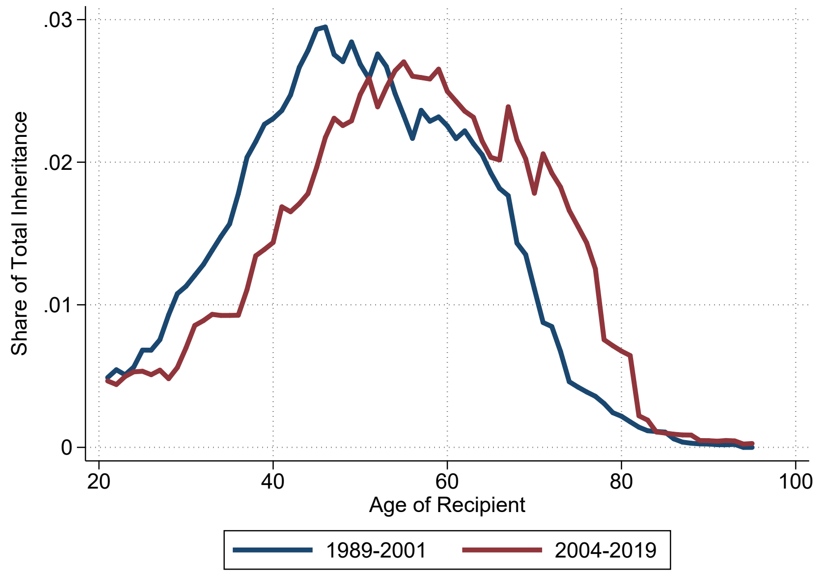
[46]The precise question is: During the past year, did you (or anyone in your family living here) provide any (other) financial support for relatives or friends who do not live here? The interviewer is asks respondents to also include any substantial gifts given in the answer to this question

[47]Specifically, we distinguish 2 time periods: 1989-2001 and 2004-2019.

[48]In practice, in the public use files of the SCF, the exact year is often not given for confidentiality reasons, but the year reported as a 5-year interval. We then use the closest interval.

upwards. Many inheritances are now reported by people over the age of 60. While this may seem surprising, many respondents in the survey also report receiving inheritances from siblings.

Figure B15: **Distribution of inheritances received**

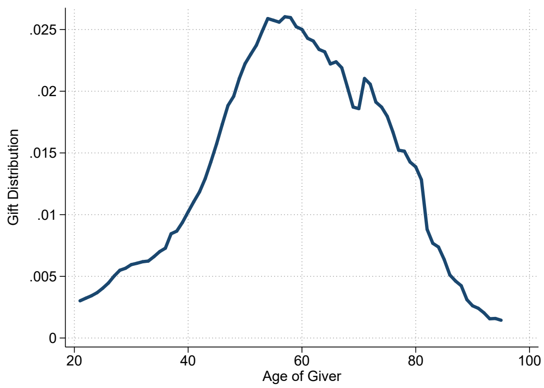


Notes: This figure shows the distribution of the inheritances in the SCF received by the age of the recipient over the two periods considered.

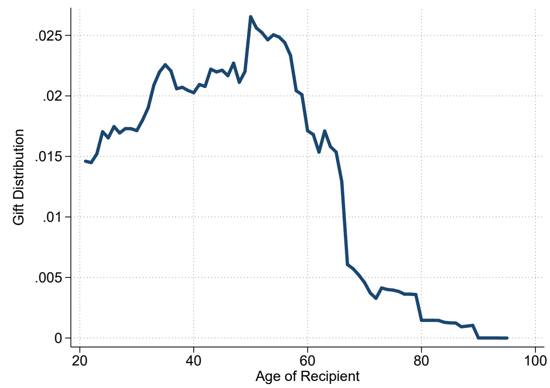
For gifts we follow a similar procedure. The biggest difference is that, unlike for inheritances, we do not have a 'predicted outflow' of gifts. We could use the SCF question on gifts given to assign a gift outflow to each age group. However, as gifts are even rarer than inheritances, we choose to pool the survey waves since 1989 to compute the distribution of gift outflows. We then apply this distribution to the total flow of gifts. We compute the distribution of gift inflows similarly. Both are shown in figure B16. Gifts seem to be primary way of distribution wealth from parents to grown up children. Many gifts are given by around 60-year olds and received by those under the age of 40.

We further use the SCF to distribute gifts and inheritances to wealth deciles within these age groups. To do so, we pool all survey waves to get the distribution of gifts and inheritances. There is no trend in the distribution of inheritances or gifts received across wealth deciles. Given the small amount of inheritance and gifts we pool all survey waves. In general, the distribution of gifts and

Figure B16: Distribution of Gifts in the SCF



(a) Age Distribution of Gift Givers



(b) Distribution of Gift Recipients

Notes: This figure shows the age distribution of gift givers and gift recipients in the SCF, pooling all survey waves since 1989.

inheritances is slightly more equal than the distribution of wealth in general. This fact underlies our result that inheritances have an equalizing effect on within-cohort wealth shares. Although inheritances are very unequally distributed, as long as their distribution is more equal than wealth in general they will have an equalizing impact.

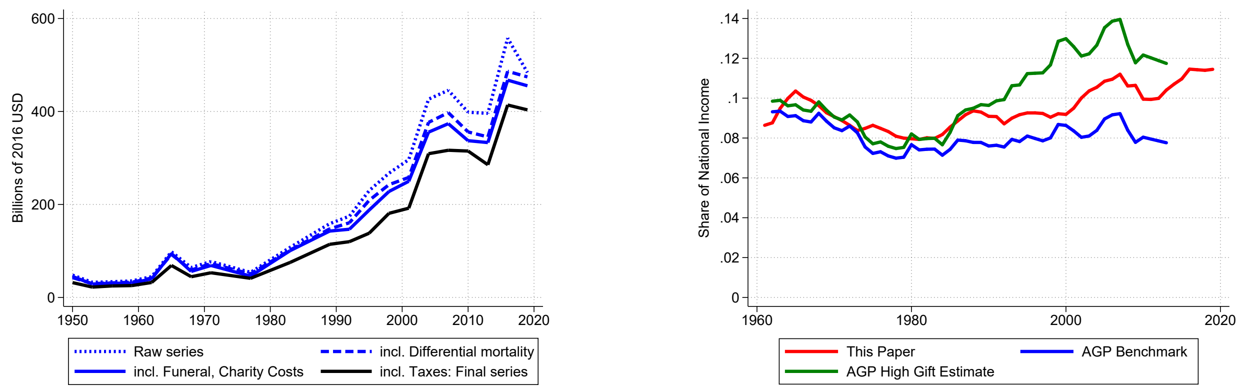
Unfortunately, the historical part of the SCF (before 1989) does not include data on inheritances or gifts. Therefore, we assume that the distribution of inheritances and gifts along age groups is shifted downward following changing life expectancy.[49]

Discussion. Unfortunately, there is very little evidence on the size of the aggregate inheritance flow in the US. This is due to the fact that the estate tax is only levied on very few estates (though the estate tax on these estates can be substantial, up to 40 % in recent years). We compare our estimates to existing numbers from Feiveson and Sabelhaus (2019) and Alvaredo et al. (2017) in figure B17. The paper by Feiveson and Sabelhaus (2019) is closest to our methodology. They report the aggregate inheritance flow only for a few select years. We show our inheritance flow in 2016 dollars in figure B17a, in addition to the effect the corrections we make to the flow. The flow we is quite close to the numbers in Feiveson and Sabelhaus (2019), but it is a bit lower. We also compute the flow of bequests and gifts as calculated by Alvaredo et al. (2017), who exclude

[49]We take life expectancy data from FRED: https://fred.stlouisfed.org/series/SPDYNLE00INUSA

taxes and deductions. It also does not distinguish between bequests going to the spouse or going to the next generation. When comparing, we hence also do not include taxes and other deductions. The comparison is shown in figure B17b. Our estimates are a bit lower in the early years but in between the benchmark and the high-gift estimate for the later years. The difference between the benchmark and the high gift estimate in their paper is that in the high-gift estimate the flow of gifts is growing over time and up to 80% of all inheritances in recent years, based of French data.

Figure B17: Inheritance and Gift Flow



(a) Impact of Adjustments for Inheritance Flow

(b) Comparison with Alvaredo et al. (2017)

Notes: The left figure shows the flow of inheritances flowing to the next generation in billions of 2016$. The black line represents our benchmark number, the blue lines show the impact of the various corrections we make. The right figure shows the total inheritance and gift flow as a fraction of national income. It compares our estimate to that of Alvaredo et al. (2017).

Table C3: Wealth Persistence in the PSID

Birth cohort	bottom 50	middle 40	top 10
1920-39	87%	77%	67%
1940-59	85%	76%	68%
1960-79	80%	72%	68%

This table shows the wealth persistence for the different within cohort wealth groups we consider. Wealth persistence in the PSID is computed as the fraction of households in a wealth group in $t+1$ that were in the same wealth group in t. Numbers shown are averages over PSID survey waves. Following Kuhn et al. (2020), we restrict ourselves to the SRC sample.

C Wealth Group Persistence

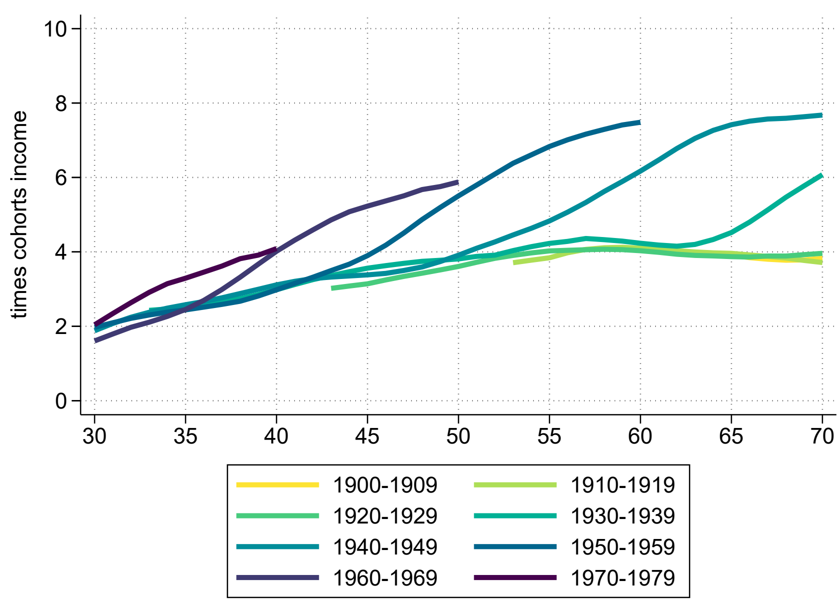
When we apply the synthetic savings method to wealth groups within birth cohorts, we follow the literature by making the assumption that wealth group persistence is high. We test this assumption by computing persistence in the PSID as in Kuhn et al. (2020), who compute this persistence not within birth cohorts but a across population. Table C3 shows for the three wealth groups we consider within birth cohorts the probability that a household belongs to a wealth group, conditional on belonging to the same within cohort wealth group in the last survey wave. Persistence is relatively high, especially for the bottom 50 percent and the middle 40 percent, with our numbers comparable to those found by Kuhn et al. (2020). Persistence for the bottom half of the within cohort wealth distribution is generally above 80%. For the middle 40 it is around 75% and for the top decile around 68%. On closer inspection of the data we find that there are some respondents located at the 'fringes' of the wealth groups that we define. These switch a lot between wealth groups and account for a good part of the nonpersistence.

This is reassuring, especially given the limitation of wealth coverage in the PSID: Many wealth variables are imputed, which induces sampling error into our persistence computation. The top of the wealth distribution is also not covered well, which likely accounts for part of the lower persistence in the top decile. Finally, the PSID only covers wealth every five years at the beginning of our sample and only later covers it biannually.

D Comparison with Other Countries

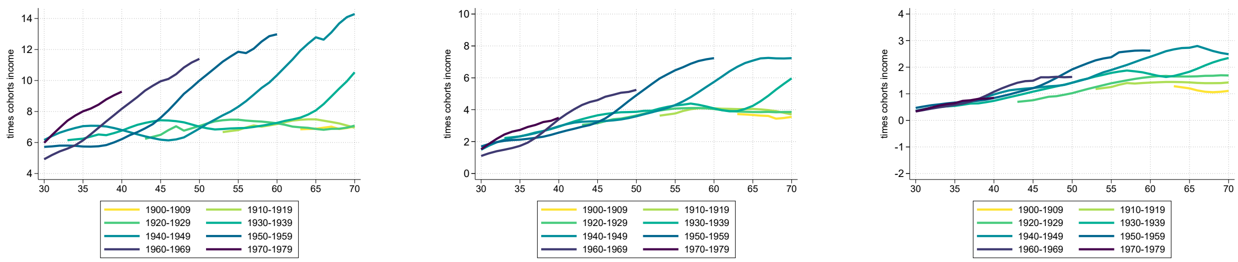
Our key stylized facts hold not only in the US, but also in other countries. In this appendix, we present results for France using Distributional National Accounts produced by Garbinti et al. (2020). The data starts in 1970, so earlier cohorts are not captured as well. In other work subsequent to the first version of our paper, Sturrock (2023) and Bartels and Morelli (2021) document similar trends for the UK and Italy and Germany respectively. In figure D18 we present life-cycle wealth profiles for French cohorts. We observe a similar steepening of wealth profiles in France. In figure D19, we study life-cycle wealth profiles across the within-cohort distribution. The trend towards steeper life-cycle wealth profiles holds across the groups in the wealth distribution, in contrast to the US, where this steepening is only observed for the top half. Nevertheless, the steepening of life-cycle wealth profiles is more pronounced at the top of the distribution.

Figure D18: Life-cycle wealth Accumulation in France



This Figure plots the average wealth of birth cohorts during their life cycles, expressed as a share of the cohorts' own average income. Series are 7-year averages.

Figure D19: Life-cycle wealth accumulation of the top-10%, middle-40% and bottom-50% in France



(a) Wealth of the top-10% (b) Wealth of the middle-40% (c) Wealth of the bottom 50%

This Figure plots the average wealth of three within-birth cohort wealth groups (top-10%, middle-40% and bottom-50%) during their life cycles, expressed as a share of their own group's average income. Series are 7-year averages.

E Theoretical Framework

We build a simple overlapping generations (OLG) model to interpret our empirical results. This model serves to describe the channels we describe more formally, without a full quantification. In the main text we identified two key trends in life-cycle wealth profiles (i) a steepening of the life-cycle wealth profile and (ii) a life-cycle saving reshuffling amid high capital gains.

Consider an OLG model in which households live for two periods and there is only one long-lived asset. At each year $t \geq -1$, a new cohort is born. Every cohort lives for two periods and only earns income Y_t in the first period. The utility function of the initially young is given by

$$U(c_t, c_{t+1}) = (1 - \beta) \log c_t + \beta \log c_{t+1},$$

where c_{t+1} denotes consumption when old. The only vehicle for saving is the long-lived asset, of which there are N units available and which trades at the endogenous price P_t. Therefore, the full problem for the initially young becomes

$$\max(1-\beta)\log c_t + \beta \log c_{t+1} \qquad \text{s.t.}$$
$$c_t + P_t N = Y_t$$
$$c_{t+1} = P_{t+1} N.$$

The young will find it optimal to consume a fraction $(1-\beta)$ of their income.

The old find it optimal to dissave all assets in the last period. Hence, market clearing in the asset market requires that

$$\underbrace{N_t P_t}_{\text{Sales of the old}} = \underbrace{\beta Y_t}_{\text{Desired saving}},$$

so that the equilibrium price is equal to $P_t = \frac{\beta Y_t}{N}$. Hence we get that the savings rate of the young (out of income) is equal to β. Increasing longevity β leads to an increase in asset prices and to an increasing saving rate of the young. For the initially old this manifests as a windfall gain, which leads them to decumulate more wealth and decrease their saving rate. The young are born without any initial wealth, so the steepness of their life-cycle wealth profile is given by $N_t P_t / Y = \beta$. The life-cycle wealth profile also gets steeper, driven by increases in asset prices, not because the young are purchasing more assets, as these are held in fixed supply.

Non-homothetic preferences. We now consider a rise in permanent inequality. We now show how this effect works in our simple model augmented with non-homothetic preferences (**??**).[50] We show in this setting that an increase in permanent income inequality can trigger the changes in life-cycle profiles we document. The model adds core features of **?** to our setting and illustrates their implications.

Consider now that all households have utility ν when old. Later, these preferences will generate non-homothetic saving behavior, such that households with higher permanent incomes

[50] These preferences capture the fact that savings rate increase in permanent income, for evidence on this see **?** and the references therein.

will tend to save more, a prediction true in the data. Further now assume that there are types of households in each cohort: A rich one, who makes up a share μ of all households earning a share $\gamma \geq \mu$ of total income and a poor household earning the rest.[51] The optimization problem of the rich household then becomes, with the poor household having the symmetric problem

$$\max_{N_t}(1-\beta)\log\left(\frac{\gamma Y - N_t P_t}{\mu}\right) + \beta\nu\left(\frac{N_t P_t}{\mu}\right)$$

We define $\eta(a) := a \cdot \nu'(a)$, the deviation of the marginal utility from log. Note that when ν is equal to log, then η is constant and equal to 1. The first order condition of the rich household is

$$\frac{(1-\beta)P_t/\mu}{P_t N_t - \gamma Y} = -\frac{\beta}{N_t}\eta(P_t N_t).$$

Therefore, the saving demand of the rich household solves the equation

$$N_t(1 + (\eta(P_t N_t) - 1)\beta) = \frac{\beta\gamma Y}{P_t}.$$

Note that for $\eta \equiv 1$, we are back to the baseline case laid out in the last section. In total, given an asset supply of $\overline{N}$ of the elderly, the equilibrium holdings of the rich, poor, and the equilibrium asset price are pinned down by the following equations

$$\begin{aligned} N_t^{\text{rich}}(1 + (\eta(P_t N_t^{\text{rich}}) - 1)\beta) &= \frac{\beta\gamma Y}{P_t}, \\ N_t^{\text{poor}}(1 + (\eta(P_t N_t^{\text{poor}}) - 1)\beta) &= \frac{\beta(1-\gamma) Y}{P_t}, \\ N_t^{\text{rich}} + N_t^{\text{poor}} &= \overline{N}. \end{aligned}$$

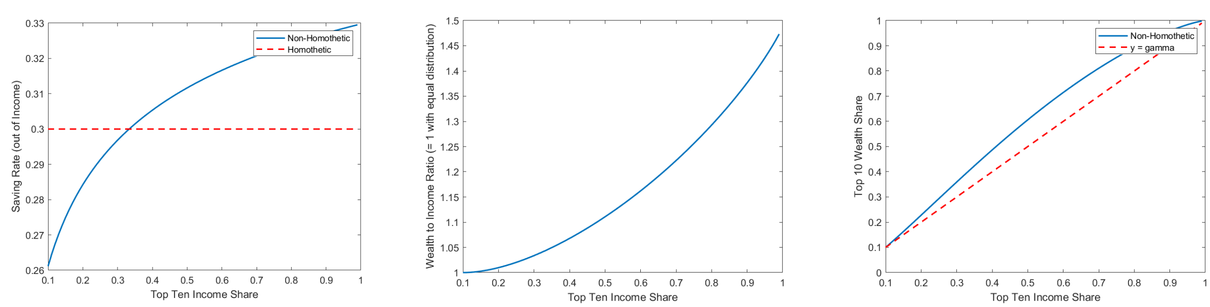
We now investigate how the saving of the rich, poor and the elderly will change with an increase in inequality γ. For this, we specify $\nu(a) = \frac{(a)^{1-\sigma}-1}{1-\sigma}$. We choose $\sigma > 1$, so that the saving rate of the rich is increasing in their income.[52]

[51] Both households have the same non-homothetic preferences.

[52] This is a deviation from **?**, in which there is a distinction between the short and long-run savings supply schedule.

We summarize the illustrative model calibration in table E4. Figure E20 presents the impact of increasing inequality. In panel (a) we show how the saving rate of the rich increases with income, in a partial equilibrium exercise in which the asset price is fixed. The non-homotheticity leads to a saving rate that increases in income, consistent with the empirical evidence. In panels (b) and (c) we solve for the equilibrium for different levels of income inequality γ. Panel (b) presents the wealth to income ratio. With an increase in income inequality, the saving supply of affluent households rises, leading to an increase in the equilibrium asset price. This pushes up the wealth-to-income ratio through rising asset prices (the asset supply is held fixed). As young cohorts accumulate this wealth, their saving rate rises, while the older cohorts, who sell the assets, experience dissaving. Panel (c) illustrates the effect on wealth inequality. With non-homothetic preferences, wealth inequality is larger than income inequality.

Figure E20: Economy with non-homothetic preferences



(a) Saving Supply (b) Wealth to Income Ratio (c) Wealth Inequality

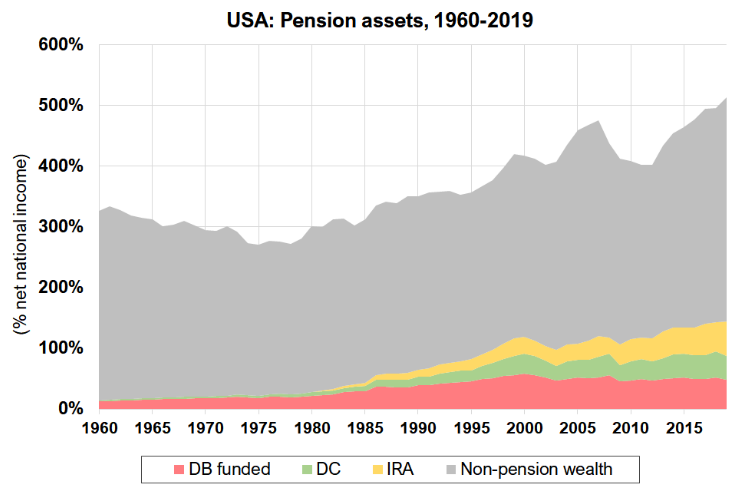
Table E4: Calibration of Model Parameters

Parameter	**Value**
β (Share of life when old)	0.3
y (Total income)	1
μ (Population share of the rich)	0.1
$\bar{N}$ (Total asset supply)	1
σ (Non-homotheticity)	1.3

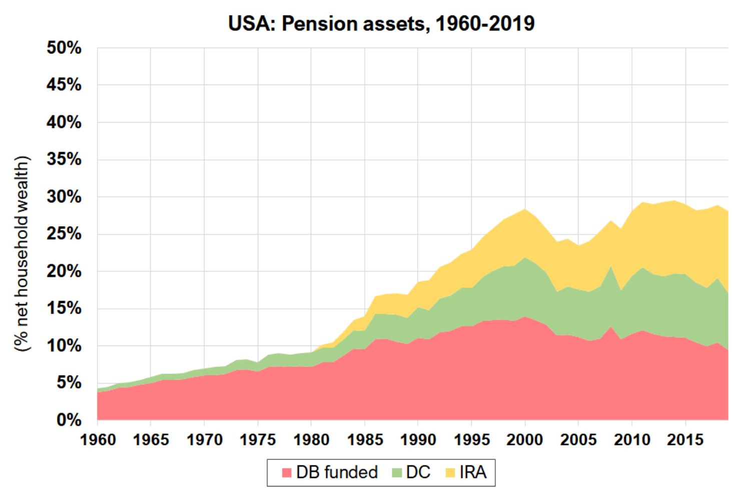
In our model, there is no such distinction, as each household is assumed to live for two periods only. The savings supply of the young should be interpreted as the savings rate out of their lifetime income.

F Appendix Figures and Tables

Figure F1: Pension assets



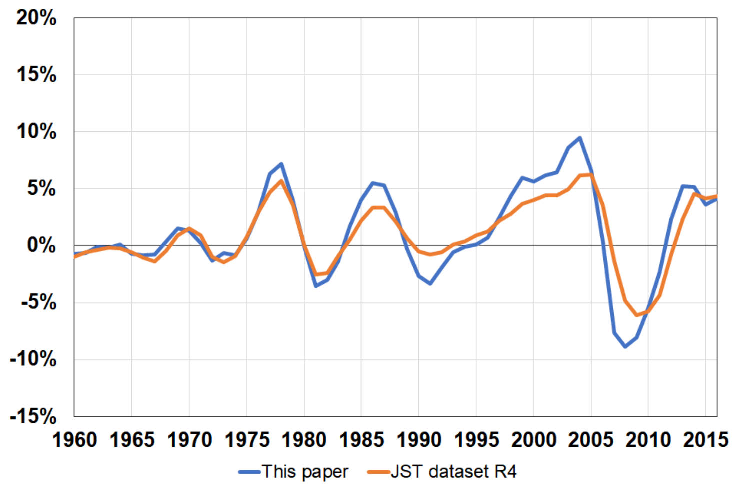
(a) Pensions (% nat. income)



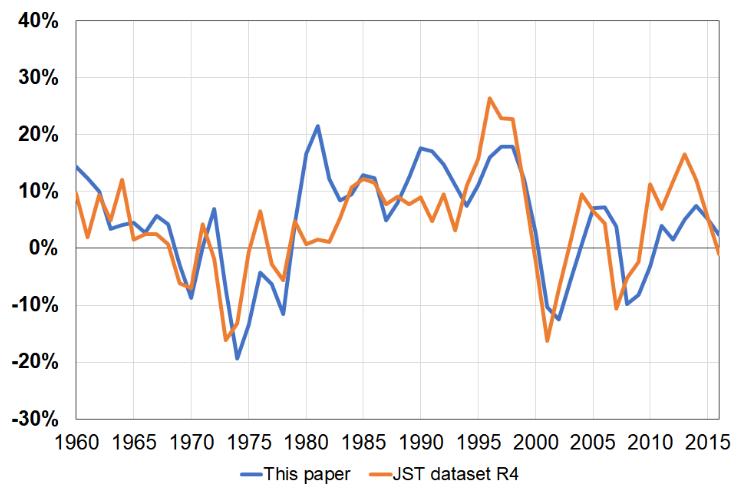
(b) Pensions (% household wealth)

Notes: This figure shows funded pensions decomposed into three types: Define Benefit (DB funded", Defined Contribution (DC) and Individual Retirement Arrangement (IRA). Pensions are expressed as a percentage of national income (Figure F1a) and as a percentage of aggregate household wealth (Figure F1b).

Figure F2: Housing and equity capital gains: alternative estimates



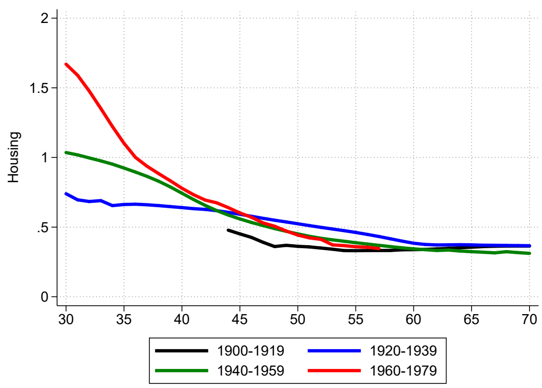
(a) Housing capital gains



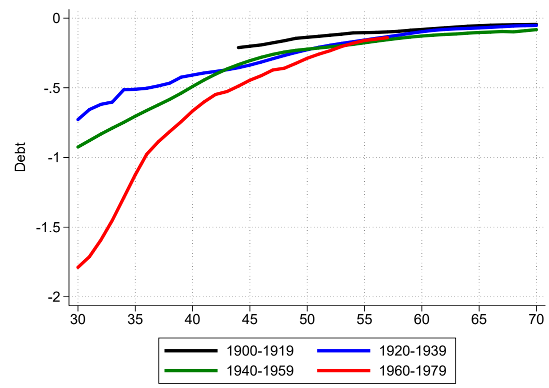
(b) Equity capital gains

Notes: This Figure compares the annual real capital gains in housing and equity in this paper with those from the Jordà-Schularick-Taylor Macrohistory Database (JST Macrohistory Database). Note that equity capital gains from JST refer to listed firms and include valuation changes due to corporate retained earnings. By contrast, equity capital gains in this paper are net of valuation changes driven by corporate saving and cover both listed and unlisted firms. Series are 3-year moving averages.

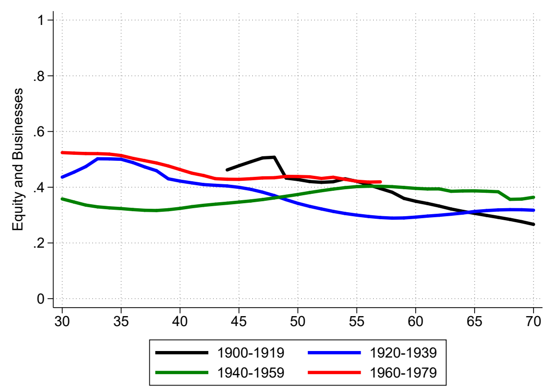
Figure F3: Portfolio shares over the life-cycle across birth cohorts



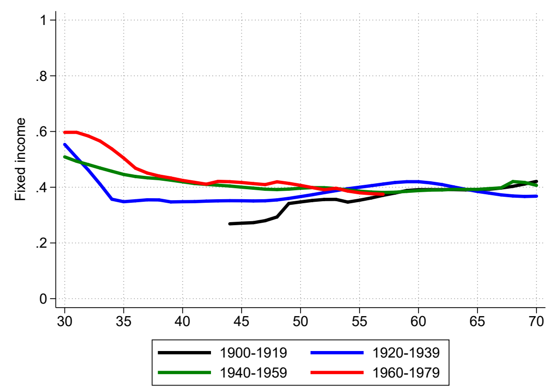
(a) Housing (out of wealht)



(b) Liabilities (out of wealth)



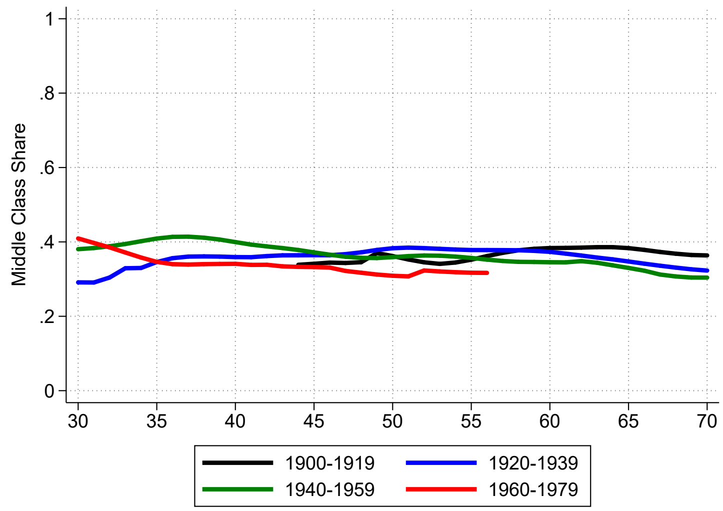
(c) Equity and business assets (out of wealth)



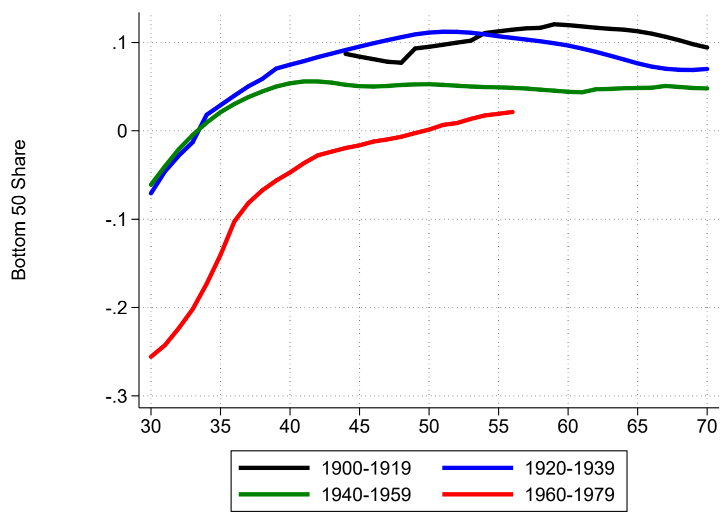
(d) Fixed-income assets (out of wealth)

Notes: This figure shows the share of three assets (housing, fixed-income assets, and equity (including businesses)) and liabilities in the wealth of various cohorts at different points of their life-cycles. The figure shows that, e.g., housing owned by cohorts born in 1960-79 accounts for around 1.6 times their own wealth by age 30.

Figure F4: Within-cohort middle-40% and bottom-50% wealth shares over the life-cycle



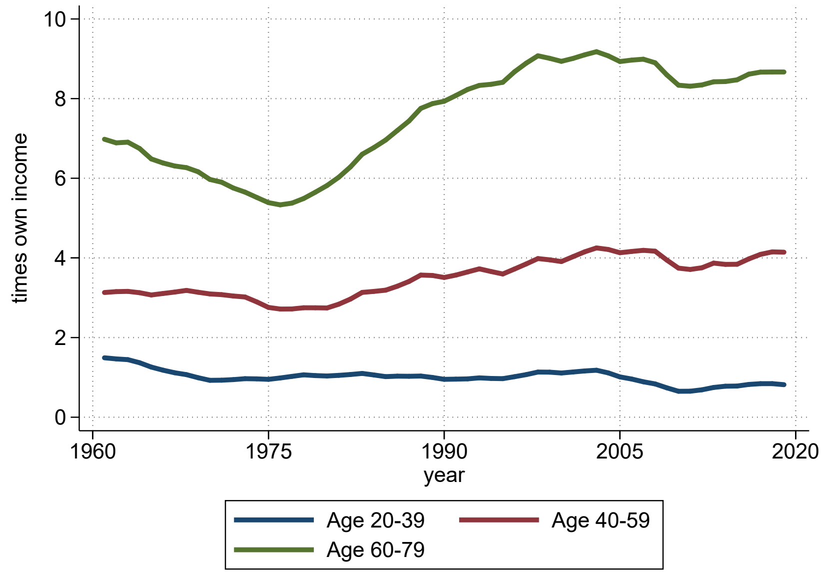
(a) Middle-40%



(b) Bottom-50%

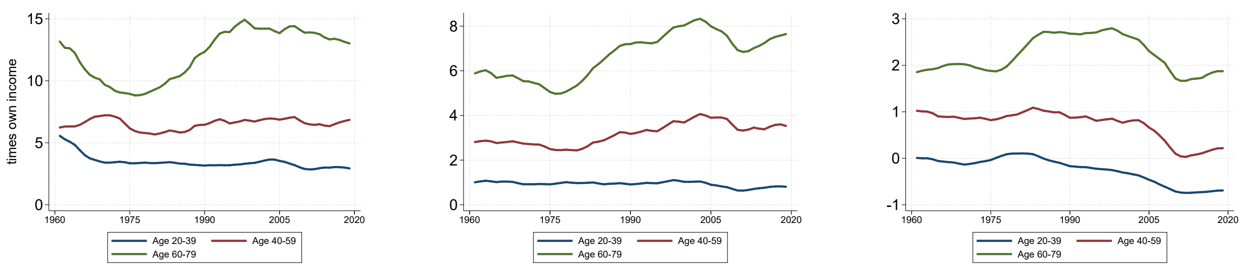
Notes: This Figure display the share of a cohort's wealth owned by the middle-40% (Figure F4a) and bottom-50% (Figure F4b) at a given age. For example, the share of the wealth of the cohort born in 1920-39 at age 50 owned by the bottom-50% of that age is approximately 10%.

Figure F5: **Wealth-income ratios of selected age groups**



Notes: This figure shows the ratio of the average wealth of selected age groups over their own average income. Series are 7-year averages.

Figure F6: Wealth-income ratios of selected age-wealth groups



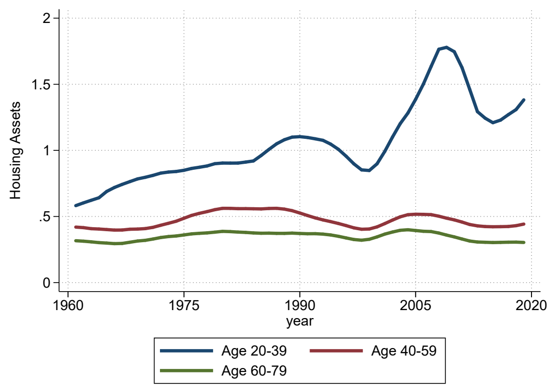
(a) Wealth of the top-10%

(b) Wealth of the middle-40%

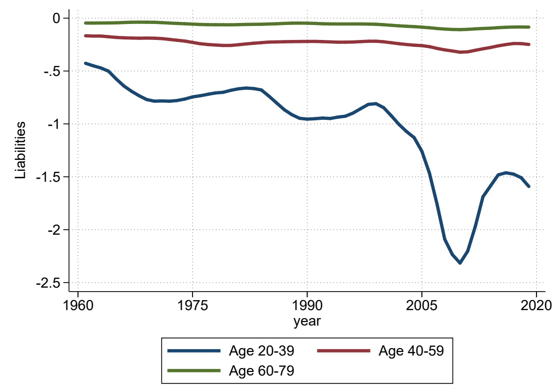
(c) Wealth of the bottom 50%

Notes: This Figure shows the ratio of the average wealth of selected within-age groups (e.g., top-10% age 20-39, middle-40% age 20-39, etc.) over their average income. Series are 7-year averages.

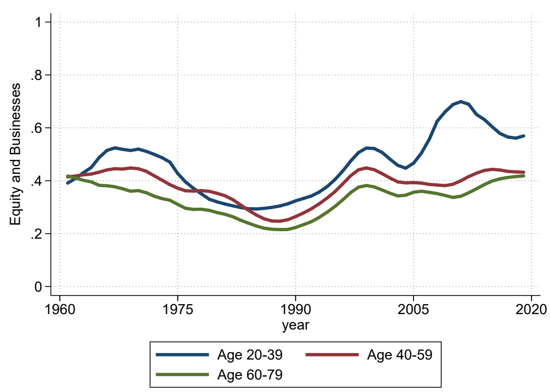
Figure F7: Portfolio shares across age groups over time



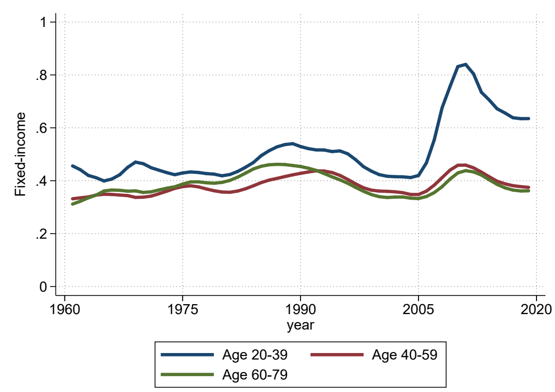
(a) Housing (out of wealth)



(b) Liabilities (out of wealth)



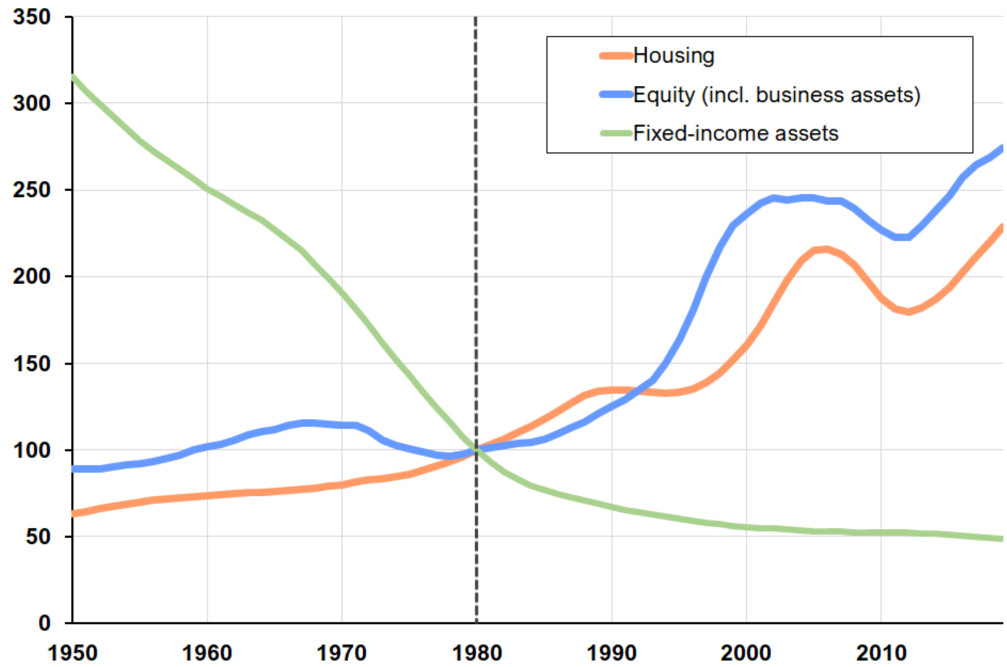
(c) Equity and business assets (out of wealth)



(d) Fixed-income assets (out of wealth)

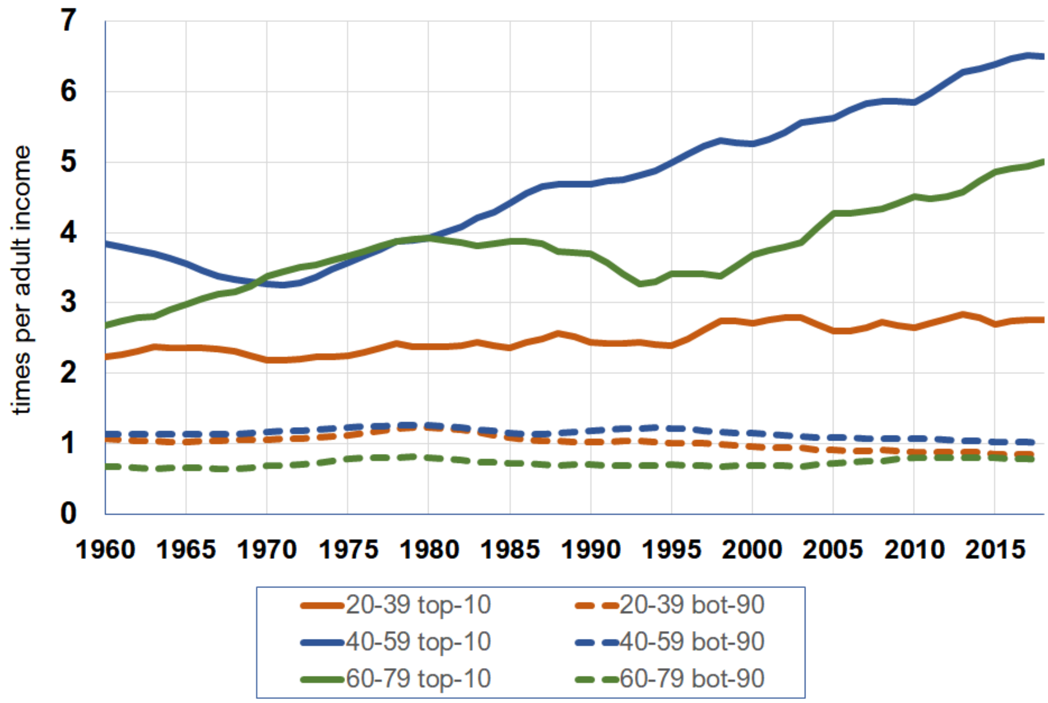
Notes: This figure shows the share of three assets (housing, fixed-income assets, and equity (including businesses)) and liabilities in the wealth of different age groups over time. The figure shows that, e.g., housing owned by the age group 20-39 accounts for around 1.4 times their own wealth in 2018.

Figure F8: **Capital gains index: 1950-2018**



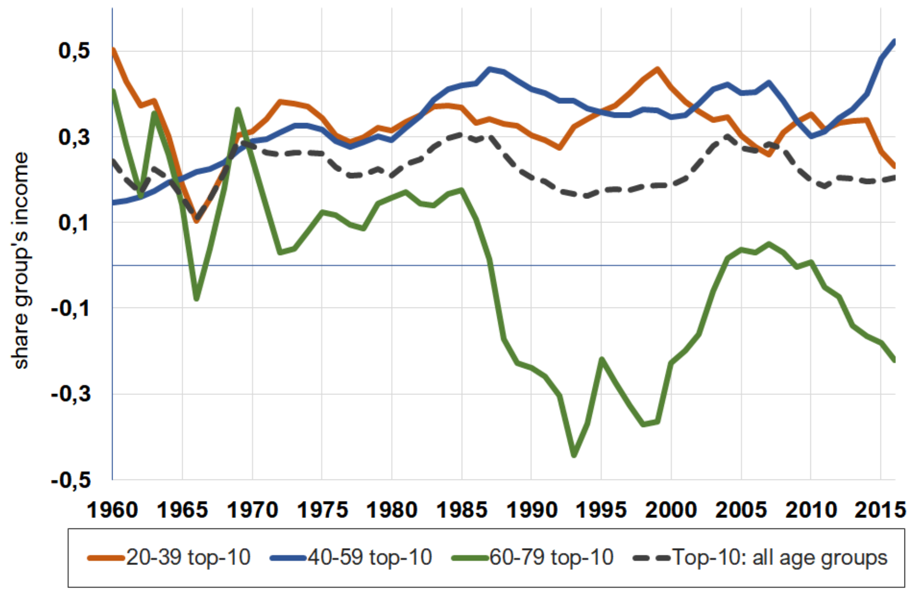
Notes: This Figure shows the evolution of capital gains in the U.S. for the following asset classes: housing, equity (including business assets), and fixed-income assets. Results are expressed as an index, taking a value of 100 in 1980 and are obtained using the asset-specific accumulation equations (see section2).

Figure F9: **Relative income differences, 1960-2018**

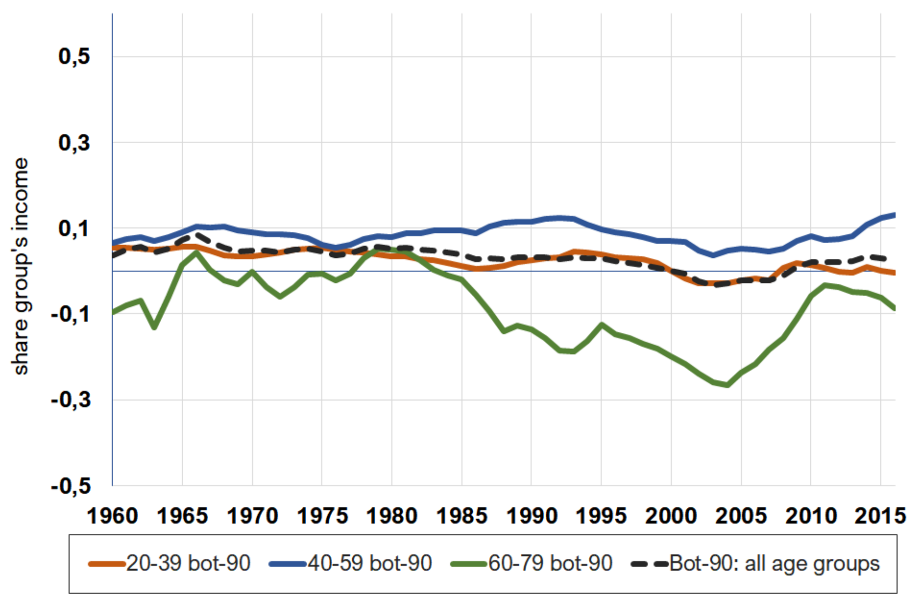


Notes: This Figure shows the income of various wealth groups as a share of per adult income. The wealth groups are the top-10% (Figure F10a) and the bottom-90% (Figure F10a) from within-age groups (20-39, 40-59, 60+). Series are 7-year averages.

Figure F10: Saving rate of within-age wealth groups: top-10% and bottom-90%, 1960-2016



(a) Top-10%



(b) Bottom-90%

Notes: This Figure displays the saving of top-10% (Figure F10a) and the bottom-90% (Figure F10a) from within-age groups (20-39, 40-59, 60+, all combined) as a share of the group's income (i.e., the group-specific saving rate). Series are 7-year averages.

Table F5: Sources of wealth growth by birth cohort and wealth decile, **age 30-50**

	Change in Wealth	Saving	Capital Gains	Inheritances
1920–1939	14.6	9.8	3.1	1.7
Bottom 50	5.3	1.9	3.1	.3
Middle 40	15.1	11.1	2.4	1.6
Top 10	30.1	21.8	4.3	4.1
1940–1959	22.5	14.3	6.6	1.5
Bottom 50	4.4	-1.2	5.3	.3
Middle 40	19.8	11.9	6.6	1.4
Top 10	48.3	37	8	3.4
1960–1979	20.9	14.3	4.7	2
Bottom 50	2.6	-2.2	4.4	.4
Middle 40	16.9	10.2	4.7	2
Top 10	43.4	34.3	5.5	3.6

Notes: This table shows the average contribution of each component to wealth growth between age 30 and age 50 for those cohorts that we observe during these ages. The numbers are as given as a percentage of the groups' income. Numbers are given for each birth cohort and for wealth groups within those birth cohorts (bottom 50% of wealth holders, the middle 40 and the top decile). The construction of saving, capital gains and inheritances is as described in section 2.

Table F6: Sources of wealth growth by birth cohort and wealth decile, **age 50-70**

	Change in Wealth	Saving	Capital Gains	Inheritances
1900–1919	4.6	8.9	-3.7	-.6
Bottom 50	.1	1.5	-1.1	-.3
Middle 40	3.5	7.3	-2.7	-1.1
Top 10	12.8	21.3	-8.3	-.2
1920–1939	14.8	4.3	9.7	.8
Bottom 50	.5	-5	5.4	.1
Middle 40	9.2	.2	8.2	.8
Top 10	31.4	15.9	13.9	1.6
1940–1959	14.9	6.9	6.3	1.7
Bottom 50	2.4	-2.9	4.9	.5
Middle 40	9.6	1.7	6.4	1.5
Top 10	27.3	16.9	7.8	2.6

Notes: This table shows the average contribution of each component to wealth growth between age 50 and age 70 for those cohorts that we observe during these ages. The numbers are as given as a percentage of the groups' income. Numbers are given for each birth cohort and for wealth groups within those birth cohorts (bottom 50% of wealth holders, the middle 40 and the top decile). The construction of saving, capital gains and inheritances is as described in section 2.