Wealth Inequality Dynamics in Europe and the United States: Understanding the Determinants*

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Abstract

This paper studies the interaction between the long-term dynamics of aggregate household wealth and the wealth distribution in Europe and the United States. We do so by building the first Distributional Wealth Accounts for Europe, including households' assets, liabilities, investment flows, and the wealth distribution for most European countries from 1970–2020. We find that although aggregate household wealth to income ratios have followed a similar increasing pattern in both Europe and the United States since 1970, wealth concentration has increased much faster in the United States. Using wealth accumulation decompositions and counterfactual simulations, we show that the weaker rise in labor income inequality and the stronger rise in house prices relative to financial assets in Europe versus the United States appear to explain why Europe has experienced a more moderate rise in wealth concentration since the mid-1980s.

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1 Introduction

Household wealth has grown faster than national income since the 1980s, with similar levels and trends across advanced economies (Piketty and Zucman, 2014). However, wealth concentration trends have diverged over the same period of time, rising, for instance, much faster in the United States than in continental Europe (Alvaredo et al., 2018; Chancel et al., 2022). Despite the recent progress made in documenting these trends for a few countries, the complex interactions between the long-run evolution of aggregate household wealth and its distribution remain poorly understood. This is partly due to the absence of homogeneous and consistent long-run estimates of aggregate household investment flows, assets, liabilities, and the wealth distribution, with which to analyze cross-country differences in wealth inequality dynamics.

We break new ground on these issues by building the first Distributional Wealth Accounts (DWAs) for Europe, including households' assets, liabilities, investment flows, and the wealth distribution for most European countries from 1970–2020.[1] We do so by extending the pioneering work of Saez and Zucman (2016) using personal income tax records and that of Batty et al. (2020) using the Survey of Consumer Finances (SCF) to build Distributional Financial Accounts (DFAs) in the United States. Our new database provides homogeneous and consistent long-run estimates of the European balance sheet and of the European wealth distribution. We use these new estimates to decompose the accumulation of wealth, so as to better understand the long-run determinants of wealth inequality, in particular, the disparities between Europe and the United States.

We use different data sources to build our historical database. First, to construct the European balance sheets, we rely on estimates from a wide range of macro-historical works, which use official and unofficial data sources to reconstruct the balance sheets of countries. We prioritize official balance sheets, which are generally published by central banks or national statistical offices, whenever these are available. Second, we obtain investment flows by asset class from official financial and non-financial accounts, which are also generally published by central banks or national statistical offices. Finally, to build wealth distributions, we rely on estimates from a large collection of academic works that use tax records to estimate the distribution of wealth. However, because they often use idiosyncratic concepts, which are typically tied to each country's specific tax laws, these estimates are rarely comparable. Hence, we engage in a widespread harmonization effort, using other available data sources (notably surveys), to account for missing assets and adjust the units of analysis. In line with the Distributional National Accounts (DINA) guidelines, we always ensure that our distributional estimates are fully consistent with

[1] The time frame covered varies across countries depending on data availability (see Table 1).

macroeconomic totals (Blanchet et al., 2021a).

The Distributional Wealth Accounts for Europe allow us to uncover two important facts. First, the evolution of aggregate wealth relative to national income has been quite similar in Europe and the United States, steadily increasing from 3 times national income in 1970 to nearly 5 and 6 times national income in the US and Europe in 2018, respectively. The wealth to income ratio has been slightly higher in Europe than in the United States in recent years, as the reduction in wealth after the global financial crisis—mainly due to the decline in house prices—was higher in the United States. Second, although aggregate household wealth has evolved similarly in Europe and the United States, the dynamics of wealth inequality have been strikingly different in both regions. After an equalizing period during the 1970s, we find that top 1% wealth concentration has risen in both regions since 1980, but much more moderately in Europe than in the United States. We perform several robustness checks using household surveys to make sure that our estimates based on the Distributional Wealth Accounts (DWAs) are credible in terms of levels and trends.

To study the determinants behind these novel facts, we rely on the asset-specific decomposition of wealth accumulation developed by Artola et al. (2021). This is an extension of the standard wealth accumulation decomposition used by Piketty and Zucman (2014) in which the two forces driving wealth accumulation are changes in asset prices (i.e., capital gains) or changes in savings (i.e., volumes). The asset-specific decomposition makes it possible to break down the composition of capital gains and volume effects by asset class (i.e., housing, financial assets, etc.), and thus better understand the drivers behind the dynamics of the wealth distribution. We find that volume effects have been larger in the United States, while price effects have been slightly more important in Europe. Prices have grown more in Europe than in the United States since the 2000s, due mainly to the lower decline in house prices in Europe during the global financial crisis. On the contrary, financial assets have gained slightly more in value in the United States than in Europe. Volume effects have been larger in the United States that in Europe, mainly due to the stronger increase in business investment in the United States relative to Europe.

To assess the relative importance of volume versus price effects in explaining the different wealth inequality trajectories across the two regions, we use the wealth distribution series and the asset-specific decomposition developed by Martínez-Toledano (2022) to run several counterfactual simulations for different wealth groups. The three forces shaping the wealth distribution are capital gain inequality, saving rate inequality and labor income inequality. Our simulations shut down one channel at a time, that is, we fix each force (i.e., capital gains, saving rates, or labor income shares) for every wealth group at its average of the pre-simulation period (1970–1985). For the benchmark simulations, we rely on France and not on the entirety of Europe, since France is the only country for which we have the joint income and wealth distribution since 1970. Nonetheless, we make sure our results

can be extrapolated to the rest of Europe by running the same set of simulations for a large set of European countries since 1995.

We find that saving rate inequality appears to be the main driver of the moderate rise in the top 1% wealth share in France since the mid-1980s. Instead, labor income inequality seems to have pushed wealth concentration down in France. Finally, asset price dynamics have only played a major role since the 2000s, pushing also wealth concentration down. This is largely explained by the out-performance of house prices relative to financial assets and the stronger importance of housing in the portfolios of middle and bottom wealth groups (Kuhn et al., 2020; Martínez-Toledano, 2022). In the United States, instead, all channels seem to have somehow contributed to rising top wealth concentration since the mid-1980s. Contrary to France, we find that asset prices and labor income inequality—and not only saving rate inequality—have contributed to the rise in the top 1% wealth share.

To better understand the different wealth inequality trajectories between Europe and the United States, we also assign the dynamics of asset prices and labor income shares of the top 1% wealth group in France to the top 1% wealth share in the United States. Labor income inequality has grown faster in the United States than in France over the period, thus explaining why the level of wealth concentration in the United States would have been lower with the labor income inequality trajectory of France. Wealth concentration in the United States would have also been lower with the asset price dynamics of France. This is largely due to the stronger rise in house prices relative to financial assets in Europe than in the United States, and the larger importance of housing in the portfolios of middle and bottom wealth groups. Our results can be extrapolated to the rest of Europe, as we find the exact same results when analyzing instead of France a large set of European countries since 1995. Taken together, both the different trajectories in asset prices and labor income inequality appear to explain why wealth concentration has risen much less in Europe than in the United States.

This paper contributes to two main strands of the literature. First, there is an empirical literature measuring the long-run evolution of aggregate wealth and its distribution across advanced countries (e.g., Acciari et al., 2020; Albers et al., 2022; Alvaredo and Saez, 2009; Anghel et al., 2018; Artola et al., 2021; Baselgia and Martínez, 2022; Davies et al., 2011; Garbinti et al., 2021; Iacono and Palagi, 2021; Kopczuk and Saez, 2004; Lundberg and Waldenström, 2017; Martínez-Toledano, 2022; Piketty and Zucman, 2014; Saez and Zucman, 2016; Smith et al., 2020; Vicq et al., 2022). Our work complements other international projects assembling individual household wealth series based on surveys, such as the Luxembourg Wealth Study (Sierminska et al., 2006) or the Global Wealth Report (Credit Suisse, 2020). We contribute to this literature by providing the first long-run comprehensive estimate of European aggregate wealth and the wealth distribution decomposed into its various components and consistent with national accounts.

Second, there is a nascent empirical household finance and theoretical macrofinance literature analyzing the determinants of wealth inequality dynamics (e.g., Bach et al., 2020; Benhabib and Bisin, 2018; Fagereng et al., 2019; Fagereng et al., 2020; Gomez, 2019; Hubmer et al., 2019; Kuhn et al., 2020; Martínez-Toledano, 2022; Nekoei and Seim, 2018; Palomino et al., 2021; Xavier, 2021). These studies focus their analysis on specific countries and—in most cases—on some specific channels. We build upon the tools developed by this literature—in particular, the wealth accumulation decompositions—to better understand the different wealth inequality trajectories between Europe and the United States in recent decades. Our analyses reveal that saving rate, rate of return and labor income inequality are all important channels behind wealth inequality dynamics and that there is a lot to be learned by carrying cross-regional analyses of wealth inequality dynamics.

The layout of the paper is as follows. Section 2 discusses the concepts, data and methodology used to construct the European balance sheet and the European wealth distribution. In Section 3, we first present the main stylized facts on the evolution of aggregate wealth and the wealth distribution in both Europe and the United States and we then rely on wealth accumulation decompositions and simulation exercises to understand the different wealth inequality trajectories between the two regions. Finally, Section 4 concludes. All aggregate wealth and distributional series for Europe have been made available on the World Inequality Database (WID.world) website: `http://wid.world/`.

2 Concepts, Data and Methodology

This section describes the concepts, data and methodology used to construct the Distributional Wealth Accounts for Europe over the period 1970–2020, which we will then use to compare the dynamics of aggregate wealth and wealth inequality between Europe and the United States. The concepts are similar to the ones ones used to build the Distributional Wealth Accounts for the United States (see Saez and Zucman, 2016 and Batty et al., 2020), and follow the guidelines for the compilation of distributional national accounts established by Blanchet et al. (2021a).

2.1 Aggregate Wealth: Concepts and Data Sources

The wealth concept we use follows the standards of the international System of National Accounts (SNA). We restrict ourselves to net household wealth, that is, the current market value of all financial and non-financial assets owned by the household sector (sector S14, in the SNA), net of all debts. In particular, we exclude non-profit institutions serving

households (NPISH, sector S15) whenever this decomposition is available.[2]

For net financial wealth, that is, for financial assets net of liabilities, we rely when available on the official country-specific financial accounts built under the guidelines of the SNA. Households' financial assets include equities (stocks, investment funds and financial derivatives), debt assets, cash, deposits, life insurance and pensions. Households' financial liabilities are composed of loans and other debts.[3]

For non-financial wealth, we also rely when available on the official country-specific non-financial accounts built under the guidelines of the European System of Accounts. Our definition of household non-financial wealth consists of housing and unincorporated business assets. We exclude consumer durables and collectibles, which amount to approximately 5% of total household wealth according to the HFCS, because they are not included in the definition of wealth by the SNA.[4]

Financial and non-financial accounts are usually made publicly available by National Central Banks or National Statistical Offices. There are some countries for which full households' financial and particularly non-financial information is lacking. In these cases, we rely on authors' country estimates using alternative official sources. Table 1 (column 1) lists the European countries and time frame for which we have been able to collect aggregate household wealth.[5] Note that the time frame covered varies across countries depending on data availability. Further methodological details about the specific data sources and computations regarding aggregate wealth can be found in Bauluz et al. (2021).

[2]NPISH represent a negligible fraction of household wealth. Some countries do not provide the decomposition between households (S14) and NPISH (S15), in which case we consider the combined sector S14+S15.

[3]Note that pension wealth excludes unfunded pensions (i.e., Social Security), since they are promises of future government transfers that are not back by any asset, and as such are not considered wealth by the System of National Accounts. According to the OECD (2021), the unfunded pension wealth to earnings ratio for the average earner is 46% higher in the European Union than in the United States. Unfunded pension is also distributed fairly equally (similarly to labor income). Therefore, differences in pension systems cannot explain the wealth inequality differences between Europe and the United States: including it would actually further widen the gap between the two regions.

[4]The household sector definition from the System of National Accounts (SNA) comprises all households and household firms, such as sole proprietorships and most partnerships that do not have an independent legal status. Hence, unincorporated business assets should only include the value of the businesses of sole proprietorships and partnerships. The US national accounts do not include sole proprietorships and partnerships as part of the household sector. We use the household wealth series of Piketty (2014) that do account for sole propietorships and partnerships to make sure that all countries use the same concept of household wealth.

[5]For the United States, we rely on the aggregate wealth series from Saez and Zucman (2020), which updated and improved the original data from Saez and Zucman (2016) to account for heterogeneous returns and the more prominent role of private business at the top.

2.2 Distribution of Wealth: Methodology and Data Sources

Our database on the distribution of wealth combines estimates from various sources, which we harmonize to obtain consistent concepts, measurements, and units of analysis. In this section, we review the critical methodological issues. We provide additional details, country-by-country, in the online appendix.

Overall Methodology To the extent that it is possible, we start from estimates based on administrative and tax records: depending on the situation in each country, these can be wealth registers, wealth tax data, inheritance tax data, or capital income tax data. These estimates usually come from separate studies made by several authors who worked directly with these sources, although we collect the data ourselves in some cases (e.g., Switzerland, Iceland). Compared to surveys, tax-based estimates are better at capturing the wealthiest people and are generally consistently available over more extended periods. However, they have several shortcomings. The unit of analysis (individuals or households) depends on the local legislation, leading to values that are not directly comparable across countries. They may exclude some (non-taxable) assets. Or they may focus on the top of the distribution and ignore the rest. Therefore, we rely on surveys to make adjustments and obtain consistent measurements. Finally, we anchor all of our estimates to macroeconomic balance sheet totals to improve the representativeness of the different asset classes and get evolutions that are consistent at the micro and the macro level. In countries with no tax data but survey data available, we use the surveys directly and rescale the different components to match the macroeconomic totals. While this approach is more limited in terms of time coverage and data quality, we find that it does reduce the gap between pure survey estimates and complete estimates in countries where both data sources are available.[6]

Estimates based on Tax and Register Data Estimates based on tax and register data come in three different categories. The most straightforward cases correspond to countries that directly record the distribution of wealth (e.g., Denmark, Netherlands, Switzerland) either because they tax wealth or because they record wealth administratively. However, in most countries, there is no direct administrative record of wealth. In such cases, it remains possible to infer the distribution of wealth from auxiliary information. The first approach is called the estate multiplier method (e.g., Kopczuk and Saez, 2004). It uses the distribution of wealth at death from inheritance tax data and reweights it

[6]See Figure A.15 in appendix. In practice, we find that rescaling surveys to national accounts reduces the gap compared to full series (i.e., rescaled series based on both taxes and surveys), but that the correction slightly overshoots and leads to higher inequality than full series. The differences we find, however, remain small compared to the gap between Europe and the United States, and if anything their direction imply that we would still underestimate the gap.

using individual mortality rates to infer the distribution of wealth among the living. The second approach is called the capitalization method (e.g., Saez and Zucman, 2016). It estimates wealth from the capital income flows that wealth generates, using asset-specific capitalization factors (the inverse of rates of returns) obtained from national accounts. The most appropriate method is a context-dependent question that depends on the salience and comprehensiveness of inheritance or capital income taxation (Zucman, 2019). We refer in the online appendix to the country-specific papers for discussion, comparisons, and robustness checks. Tax-based estimates are also available in tabulated form (rather than as microdata), and the brackets are different in each study. For those countries for which we rely on tabulations, we reconstruct complete estimates of the distribution using generalized Pareto interpolation (Blanchet et al., 2021b).

Survey Sources Surveys on household wealth used to be relatively rare in Europe, a situation that has improved in recent years under the impetus of the European Central Bank (ECB), which created the Household Finance and Consumption Survey (HFCS). This survey, which started around 2010, collects wealth data at the household level under a common framework. In countries with a preexisting wealth survey (e.g., France, Italy, Spain), the HFCS is a recoding of the existing survey. The HFCS constitutes our primary survey source. We complete it with other surveys for countries that are not part of the HFCS (e.g. the United Kingdom, which has its own wealth survey called the Wealth and Assets Survey, or WAS) or for countries with wealth surveys that predate the HFCS and thus provide more historical coverage (e.g., the Survey of Household Income and Wealth, or SHIW, in Italy).

These different surveys present significant differences, especially in their oversampling of the wealthiest households, which affect their comparability (Vermeulen, 2016). For this reason, we prefer to rely on tax-based estimates as our primary source. Wealth surveys are known to capture some types of assets better than others, so to improve the representativeness of each asset, we rescale them to macroeconomic totals.[7]

Adjustments for Missing Components Tax-based estimates typically exclude some tax-exempt assets (e.g., pensions, as in Switzerland or the United Kingdom). In such cases, we estimate the average amount of the asset by wealth percentile in the survey, rescale it to the macroeconomic total from national accounts, and distribute the resulting value to the percentiles of the tax-based estimate.

[7]Wealth surveys (e.g., HFCS) use by default a categorization of business wealth that is different from the UN SNA (which depends on whether the household works for the business, rather than on its legal form). Nonetheless, this is not a non-solvable problem since wealth surveys also generally include information on the legal form of the business, that we use to recategorize business wealth in accordance to the UN SNA.

Adjustments for the Statistical Unit Tax-based estimates report their measurement using either the household or the individual as its statistical unit. Our database uses equal-split adults as its benchmark (i.e., the statistical unit is the individual, with wealth split equally within couples), in line with the international distributional national accounts guidelines (Blanchet et al., 2021a).

Therefore, we must consider two types of correction: one to move from couples to equal-split adults, and the other to move from individuals to equal-split adults. To move from households to equal-split adults, we estimate a share of married and single people by percentile in the survey. Using this, we can divide the tax-based distribution into two tabulations of wealth by bracket: one for single individuals and the other for couples. We interpolate these tabulations separately using generalized Pareto interpolation (Blanchet et al., 2021b), divide wealth levels for couples by two, and combine them back into a single distribution. To move from individuals to equal-split, we estimate the ratio between the value of equal-split to individual wealth by percentile in the survey, and use these ratios to correct the tax-based distribution directly.

Inclusion of Missing Parts of the Distribution Some estimates based on inheritance taxes are limited to the top of the distribution due to exemption thresholds (e.g. the United Kingdom). In that case, we rely on the tax-based estimate for the top of the distribution and on the survey for the bottom. We do so by constraining the survey Lorenz curve at the bottom to match the tax-based estimates, using the procedure described by Blanchet et al. (2021a, section 7.2.3.2).

Estimation of the Wealth Composition and Its Calibration to Macroeconomic Totals We systematically calibrate our distributions of wealth and their composition to match macroeconomic totals. However, two different cases may arise when doing so, and each requires a different type of adjustment.

In the first case, the information on the overall distribution of wealth and its composition comes from the same source, so the discrepancies between the micro and macro totals reflect deficiencies both in the overall distribution of wealth and its composition. This case arises in particular in countries with only survey data. In that situation, we rescale each asset in the survey to match macroeconomic totals, changing the marginal distribution of wealth in the process. This adjustment is desirable, as it helps to fix the survey's well-documented tendencies to underrepresent certain types of assets (European Central Bank, 2013). That approach corresponds to an *unconstrained* calibration.

In the second case, the information on the wealth distribution and on its composition come from different sources. This case arises in countries where tax-based estimates (potentially augmented with survey data) provide a reliable measurement of the marginal distribution

of wealth, but where information on its composition is based on relatively lower-quality survey data. Hence, it would be undesirable to alter the marginal distribution of wealth based on the data on its composition. We thus proceed with a *constrained* calibration procedure. We do so by considering a matrix whose rows are brackets of the wealth distribution, whose columns are components of wealth, and whose cells constitute the total value of the component for the bracket. The goal is then to adjust the cells to match row totals (i.e., the marginal distribution of wealth) and columns totals (i.e., macroeconomic aggregate). We do so using a matrix scaling algorithm described in online appendix B.

2.3 Joint Distribution of Income and Wealth: Methodology and Data Sources

For all the countries in our wealth database, we also estimate the income distribution by wealth bracket, allowing us to analyze the role of income inequality dynamics in shaping wealth inequality, and to calculate saving rates out of income for each wealth group. For a few countries (e.g., France, the United States), that information is already available from the studies we rely on. In these cases, we directly use that information.

For the other countries, we produce our own estimates. First, we use data on income distribution from the World Inequality Database, which for European countries primarily comes from Blanchet et al. (2022). We then rely on the survey data (e.g., HFCS) to perform a statistical match between the wealth and the income distribution. The purpose of this procedure is to keep the marginal distributions of income and wealth from distributional national accounts estimates, while using the information from the survey for the dependency between income and wealth.

Assume that the survey has n distinct observations. Let w_i be the weight of observation i. We can sort observations in increasing order of wealth, and let (i) denote the i-th order statistic, i.e., the observation with the i-th largest wealth. We can similarly sort observations by income, and let $[i]$ denote the i-th order statistic in terms of income. From this, we can define the wealth rank $r_{(i)} \in [0, 1)$ and the income rank $s_{[i]} \in [0, 1)$ for each observation as:

$$r_{(i)} \equiv \frac{1}{N} \sum_{j=1}^{i-1} w_{(j)} \qquad\qquad s_{[i]} \equiv \frac{1}{N} \sum_{j=1}^{i-1} w_{[j]}$$

where N is the total sum of weights. Each observation (i) represents a range of wealth fractiles $[r_{(i)}, r_{(i+1)}]$, and similarly each observation $[i]$ represents a range of income fractiles $[s_{[i]}, s_{[i+1]}]$. Using generalized Pareto interpolation methods (Blanchet et al., 2021b), we attribute to each survey observation i the average wealth and income that matches the range of fractiles it represents. This procedure leaves us with a set of n weighted

observations that represent the joint distribution of income and wealth. By construction, the marginal income and wealth distributions match our estimates, while the copula (i.e., the joint distribution of the ranks) between income and wealth matches the survey data.

Then we group these observations by wealth percentile, and take the average income and wealth within each of these percentiles. This leads to our estimate of income by wealth percentile. Finally, we split our estimate between labor and capital income components. To that end, we use asset-specific rates of return using national accounts, and apply these rates of return to the average wealth by bracket. This gives us an estimate of capital income, and we obtain labor income as a residual.

2.4 Wealth Accumulation Decompositions

To better understand the determinants behind the dynamics of aggregate wealth and the wealth distribution in both Europe and the United States, we decompose the aggregate wealth series using the following transition equation:

$$W^r_{t+1} = (1 + q^r_t) \cdot [W^r_t + s^r_t \cdot I^r_t], \tag{1}$$

where W^r_t stands for the total real wealth of region r at time t, I^r_t is the total real income of region r at time t, q^r_t is the total rate of real capital gains of region r at time t and s^r_t the total saving rate of region r at time t.[8] By convention, savings are assumed to be made before the asset price effect q^g_t is realized. Hence, the three forces that can affect the dynamics of aggregate wealth are changes in income, savings and/or asset prices.

We follow the same approach as Garbinti et al. (2021) and Saez and Zucman (2020) and calculate the rate of capital gain that can account for the evolution of total wealth in each region r as a residual from the previous transition equation. This is a straightforward calculation since we observe variables W^r_t, W^r_{t+1}, I^r_t and s^r_t over time. We proxy saving for investment and calculate the saving rate out of income by collecting net investment flows for each country, year and asset class from national accounts. Table 1 (column 2) lists the European countries and time frame for which we have been able to collect aggregate investment flows.[9]

[8]Real capital gains are defined as the excess of average asset price inflation, given average portfolio composition of region r, over consumer price inflation.

[9]For the United States, we rely on the investment flows from the Bureau of Economic Analysis for non-financial assets and from the Flow of Funds for financial assets. Contrary to the System of National Accounts and the European System of Accounts, the national accounts of the United States do not consider sole proprietorships and partnerships as part of the household sector, but as part of the non-financial corporate sector. We account for the investment in non-financial assets by sole proprietorships and partnerships by applying to the total investment flow of the non-financial corporate sector the share of fixed assets held by sole proprietorships and partnerships from Saez and Zucman (2016).

If we divide both sides of equation (1) by W_t^r, we can express the full equation into growth rates, as follows:

$$(1 + g_{w,t}^r) = (1 + g_{q,t}^r) \cdot (1 + g_{s,t}^r), \tag{2}$$

where $g_{w,t}^r = \frac{W_{t+1}^r}{W_t^r} - 1$ is the wealth growth rate of region r between t+1 and t, $g_{q,t}^r = q_t^r$ is the capital gain growth rate of region r between t+1 and t, and $g_{s,t}^r = \frac{s_t^r \cdot I_t^r}{W_t^r}$ is the savings-induced wealth growth rate of region r between t+1 and t.

We also rely on the asset-specific wealth accumulation decomposition used by Artola et al. (2021) to break down the previous transition equation by asset class: net housing, business assets and financial assets. The transition equation is as follows:

$$W_{t+1}^r = W_{H,t+1}^r + W_{B,t+1}^r + W_{F,t+1}^r, \tag{3}$$

where

$$W_{H,t+1}^r = (1 + q_{H,t}^r) \cdot [W_{H,t}^r + s_{H,t}^r \cdot I_t^r] \tag{4}$$

$$W_{B,t+1}^r = (1 + q_{Bt}^r) \cdot [W_{B,t}^r + s_{B,t}^r \cdot I_t^r] \tag{5}$$

$$W_{F,t+1}^r = (1 + q_{F,t}^r) \cdot [W_{F,t}^r + s_{F,t}^r \cdot I_t^r] \tag{6}$$

This asset-specific wealth decomposition makes it possible to quantify not only the relative importance of each channel (i.e., income, savings and asset prices), but also the role played by each asset in explaining the aggregate saving dynamics in each region. This decomposition can also be expressed in growth rates, following the same procedure as for equation (2).

To better understand how we practically implement the wealth accumulation decompositions, let us focus on the following numerical example. Real net household wealth in the US amounts to 78.8 and 74.5 trillion USD in 2015 and 2014, respectively. Hence, the wealth growth rate between 2015 and 2014 is $g_{w,2014}^{US} = 78.8/74.5 - 1 = 0.058$. Real household net investment amounts to 1.6 trillion USD in 2014. Thus, the savings-induced wealth growth rate is $g_{s,2014}^{US} = 1.6/74.5 = 0.022$. We can then obtain the capital gain growth rate as a residual by rearranging equation (2) as follows: $g_{q,2014}^{US} = \frac{(1+g_{w,2014}^{US})}{(1+g_{s,2014}^{US})} = \frac{(1+0.058)}{(1+0.022)} - 1 = 0.036$. The exact same procedure is followed with the asset-specific wealth accumulation decompositions.

We also carry the same asset-specific wealth accumulation decompositions for each wealth group g using the following transition equations developed by Martínez-Toledano (2022):

$$W_{t+1}^{g,r} = (1 + q_t^{g,r}) \cdot [W_t^{g,r} + s_t^{g,r} \cdot (Y_{L_t}^{g,r} + r_t^{g,r} \cdot W_t^{g,r})], and \tag{7}$$

$$W_{t+1}^{g,r} = W_{H,t+1}^{g,r} + W_{B,t+1}^{g,r} + W_{F,t+1}^{g,r}, \tag{8}$$

where

$$W_{H,t+1}^{g,r} = (1 + q_t^{g,r}) \cdot [W_{H,t}^{g,r} + s_{H,t}^{g,r} \cdot (Y_{L_t}^{g,r} + r_t^{g,r} \cdot W_t^{g,r})] \tag{9}$$

$$W_{B,t+1}^{g,r} = (1 + q_t^{g,r}) \cdot [W_{B,t}^{g,r} + s_{B,t}^{g,r} \cdot (Y_{L_t}^{g,r} + r_t^{g,r} \cdot W_t^{g})] \tag{10}$$

$$W_{F,t+1}^{g,r} = (1 + q_t^{g,r}) \cdot [W_{F,t}^{g,r} + s_{F,t}^{g,r} \cdot (Y_{L_t}^{g,r} + r_t^{g,r} \cdot W_t^{g,r})] \tag{11}$$

In this case, we further decompose total income by wealth group g into labor income $Y_{L_t}^{g,r}$ plus capital income $r_t^{g,r} \cdot W_t^{g,r}$, where $r_t^{g,r}$ is the flow rate of return by wealth group g in each region r. We do so, as this allows us to also analyze another potential force behind wealth inequality: labor income inequality.

This decomposition relies on two important assumptions. First, the saving rate is *synthetic*, that is, it captures the saving flow that reconciles the change in the wealth of wealth group g between t and $t+1$ given the change in the price of assets held by this wealth group in t. This definition of saving is *synthetic* because the identity of individuals within wealth group g changes from year to year due to wealth mobility. If the identity of all individuals remained the same over time, *synthetic* saving would equal actual saving. Kuhn et al. (2020) and Martínez-Toledano (2022) also rely on *synthetic* saving rates to analyze the determinants of wealth inequality. They show high persistence of households/individuals within wealth groups. Hence, *synthetic* saving rates appear to be a good proxy of actual saving rates.

Second, the asset-specific decomposition we use is additive, that is, the sum of the saving rates in equations 3-5 adds up to the total saving rate for region r. To reach additivity, we need to rely on wealth group-specific rates of capital gain (i.e., q_t^g). This could bias the fluctuations in the composition of saving rates, if group-specific rates of capital gain were different by asset class. Martínez-Toledano (2022) compares the results based on asset-specific wealth accumulation decompositions using wealth group-specific rates of capital gain (i.e., q_t^g) to the same decompositions using group-and-asset specific rates of capital gain (i.e., $q_{i,t}^g$, where i is the asset type) using Spanish wealth series. Results are very similar under the two specifications, suggesting there is no substantial difference between using one specification or the other.

3 Dynamics of Wealth in Europe and the United States

This section presents the main results of the paper. We start by describing the main stylized facts on the evolution of aggregate wealth and its distribution in Europe and the United States. We then use the wealth accumulation decompositions and counterfactual simulations to study the drivers of wealth accumulation and wealth inequality dynamics across the two regions.

3.1 Stylized Facts

Figure 1a compares the average household wealth to income ratios in Europe and the United States since 1970. The evolution has been quite similar, steadily increasing from 3 times national income in 1970 to nearly 5 and 6 times in 2018 in both the US and Europe, respectively. The wealth to income ratio is slightly higher in recent years in Europe than in the United States, as the latter experienced a large reduction in wealth after the global financial crisis—mainly due to the decline in house prices—which only happened across a few European countries (e.g., Ireland, Spain). The European average hides important heterogeneities, as there are countries which have reached levels of wealth that are more than 6.5 times the national income in the 2010s (e.g., Italy, Spain and Switzerland), and others for which wealth is lower than 2.5 times the national income (e.g., Lithuania, Poland and Romania). The wealth to income ratio in the US has increased much more rapidly than in Europe since the early 2010s, so that the US could likely reach the European levels in the coming years.

Figure 1b depicts the average evolution of the top 1% wealth share in Europe and the United States since 1970. For the United States, we rely on the wealth distribution series of Saez and Zucman (2016). Although aggregate household wealth has similarly evolved in Europe and the United States (except for the recent decade), the dynamics of wealth inequality have been strikingly different in both regions. After an equalizing period during the 1970s, top 1% wealth concentration rose since 1980 in both regions, but much more moderately in Europe than in the United States. The differential trend in the top 1% wealth share between the US and Europe is robust to the use of other alternative sources and methods for the US, such as those used by Kuhn et al. (2020) and Smith et al. (2020) (Figure 2). Interestingly, there is no single European country with the wealth concentration levels of the United States since the mid-1980s. Nonetheless, the European average hides important heterogeneities (Figure 3). Northern Europe had much lower wealth concentration levels than Western Europe in the 1980s. The gap has declined over time, as wealth concentration has increased faster in Northern than in Western Europe. Wealth concentration in Southern Europe was lower than in Western Europe and slightly higher than in Northern Europe during the 1990s and 2000s, but in the 2010s the levels of

wealth concentration have converged to those of Western Europe. Finally, Eastern Europe is the region with the highest average levels of wealth concentration in the 2010s.

The United States also differs from Europe in the composition of the top 1% wealth share. Figure 4 shows that net housing has become increasingly more important for the top 1% wealth share in Europe at the expense of financial assets. Moreover, net housing and business assets account for a larger share of total wealth for the top 1% in Europe than in the United States throughout the whole period of analysis. Financial assets are thus more important for the top 1% in the United States than in Europe and they have become increasingly more important over time.

3.2 Understanding the Determinants

To assess the relative importance of volume versus price effects in explaining the aggregate wealth trajectories across the two regions, we rely on the asset-specific wealth accumulation decompositions and the aggregate wealth, income and investment series.

Although wealth to income ratios have evolved similarly in both regions (except for the recent decade), the relative importance of volume versus price effects and of each asset class has not been the same. As shown in Figure 5a, total volume effects have been larger in the United States, while total price effects have been slightly more important in Europe. Prices evolved similarly in Europe and in the United States until the 2010s, but they have increased faster in Europe over the last two decades due mainly to the larger rise in house prices. Instead, volume effects have been larger in the United States than in Europe, mainly due to the stronger increase in business investment in the United States relative to Europe (Figures 5b, 5c, and 5d).

We perform several robustness checks to ensure that the different trajectories of price effects across the two regions are not driven by measurement error resulting from the wealth accumulation decompositions. Figures 6a and 6b compare the evolution of capital gains on housing resulting from our asset-specific wealth accumulation decompositions with the evolution based on the house price indices in both Europe and the US. We rely on the house price indices database published by the Bank of International Settlements. For Europe, the house price index is a weighted population average for those countries for which both series (i.e., capital gains on housing and house price indices) are available. The evolution is quite similar between both sources.

Figure 6c compares the evolution of capital gains on financial assets in the US with the evolution of a financial price index based on the weighted average of the S&P stock market price index from Shiller (2015) and the 6-month US Treasury bill index from the Federal Reserve Bank of St. Louis. The weights are the US annual portfolio shares on equities and fixed-income assets out of total financial assets, respectively. We rely on this weighted

index and not the stock market price index, as our financial assets category includes both stocks and fixed-income assets. Hence, it is more comparable. The evolution is also quite similar between the two sources. We do not compare the evolution of capital gains on financial assets with the evolution of country-specific stock market indices for European countries, as country-specific stock market price indices are unlikely to capture the evolution of country-specific capital gains on financial assets due to the international diversification of portfolios by investors.

The differences in price and volume trajectories between the US and Europe are also robust to the use of a balanced panel of countries (Figure 7) and to the inclusion of corporate savings as part of households' savings on financial assets (Figure 8).

To further assess the relative importance of volume versus price effects in explaining the different wealth inequality trajectories across the two regions, we run several counterfactual simulations using these asset-specific wealth accumulation decompositions and the DWAs. We rely for our benchmark analysis on France and not on the entirety of Europe, since France is the only country for which we have the joint income and wealth distribution since 1970. We present similar simulations including more European countries since 1995 at the end of the section.

Figure 9 compares the benchmark top 1% wealth share in France and the United States to the counterfactual wealth shares obtained by shutting down one channel at a time over the period 1986-2018.We do so by fixing for every wealth group each force (i.e., asset prices, saving rates, or labor income shares) to be the average of the pre-simulation period 1970-1985.

Figure 9a shows that saving rate inequality seems to be the main driver of the moderate rise in the top 1% wealth share in France since the mid-1980s. The reason is that absent changes in saving rates, the top 1% wealth share would have declined over time. Instead, labor income inequality seems to have pushed wealth concentration down, as absent changes in labor income disparities the top 1% wealth share would have been higher. Finally, asset prices seem to only have played a role since the 2000s pushing also wealth concentration down. This is largely explained by the outperformance of house prices relative to financial assets (Figure 10) and the increasing importance of housing for middle and bottom wealth groups (Figure 4).

Figure 9b shows that in the United States all channels seem to have somehow contributed to rising top wealth concentration since the mid-1980s. Contrary to France, asset prices and labor income inequality—and not only saving rate inequality—have contributed to the rise in the top 1% wealth share.

In order to better understand the different wealth inequality trajectories between Europe

and the United States, Figure 11 applies the dynamics of asset prices and labor income shares of the top 1% wealth group in France to the top 1% wealth share in the United States. Labor income inequality has grown faster in the United States than in France over the period, thus explaining why the level of wealth concentration in the United States would have been lower with the labor income inequality trajectory of France. Furthermore, the top 1% wealth share in the United States would have also been lower with the asset price dynamics of France. This is largely due to the stronger rise in house prices relative to financial assets in Europe than in the United States (Figure 10) and the larger importance of housing in the portfolios of middle and bottom wealth groups (Figure 4).

To make sure that the results between France and the United States can be extrapolated to the rest of Europe, we also run similar simulations for a weighted average of European countries since 1995.[10] Figure 12 applies the dynamics of asset prices and labor income shares of the top 1% wealth group in the United States to the top 1% wealth share in Europe. All simulations are in line with the ones using only the French distributional series. Labor income inequality has grown faster in the United States than in Europe over the period, thus explaining why the level of wealth concentration in Europe would have been higher with the labor income inequality trajectory of the United States. Moreover, the dynamics of asset prices seem to have pushed wealth concentration up in the United States and not in Europe, as wealth concentration in Europe would have increased much more with the asset price dynamics of the United States. All in all, this evidence indicates that the results for France seem to hold more broadly for Europe.

4 Conclusion

This paper combines national accounts, tax records and surveys to build the first Distributional Wealth Accounts (DWAs) for Europe over the period 1970-2018. Our new database reveals that aggregate wealth relative to national income has evolved similarly in Europe than in the United States, while wealth inequality has grown much faster in the United States than in Europe since the mid-1980s.

Using wealth accumulation decompositions, we find that both the weaker rise in labor income inequality and the stronger rise in house prices relative to financial assets in Europe relative to the United States appear to explain why Europe has experienced a more moderate rise in wealth concentration since the mid-1980s. Our analyses thus reveal that cross-regional comparisons can be powerful to understand the drivers of different wealth inequality trajectories and that the forces pushing wealth concentration up or

[10]Note that we start in 1995, as this is the first year for which we have distributional income and wealth series for a sufficient amount of European countries available.

down are quite heterogeneous across regions.

This paper has made some progress in better understanding the determinants of aggregate wealth and wealth inequality dynamics in Europe and the United States. We hope that our new and rich historical database on European aggregate household wealth and its distribution will open up new avenues for future empirical and theoretical research on the determinants of wealth inequalities. We also hope our work will encourage government agencies to collect and release more wealth information to better understand wealth inequality trajectories outside of the Western world.

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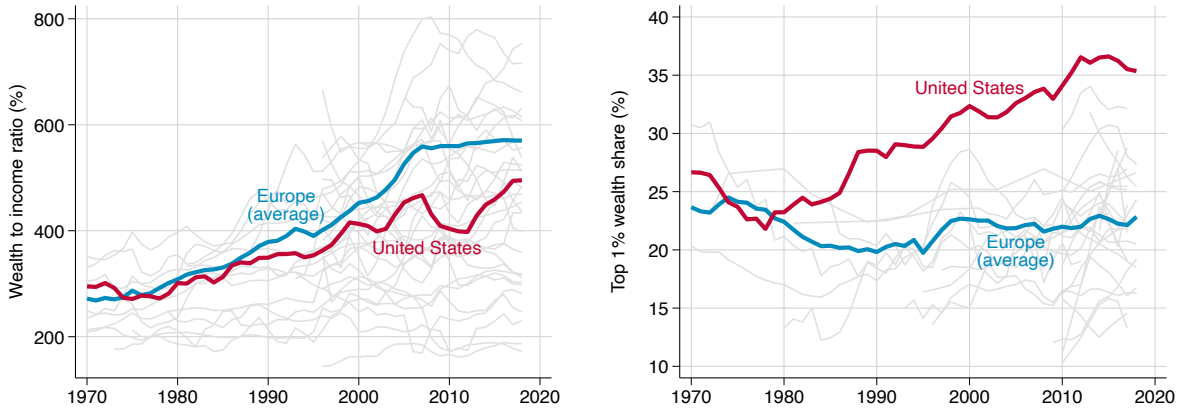
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Tables and Figures

	Aggregate wealth		Investment flows		Wealth distribution	
	Time coverage	Source	Time coverage	Source	Time coverage	Source
Austria	1981-2019	Financial assets and liabilities: Eurostat, Oesterreichische Nationalbank (OeNB). Non-financial assets: Eurostat (dwellings since 1996) and HFCS (business assets since 2010)	1976-2020	Financial assets and liabilities: Oesterreichische Nationalbank (OeNB) since 1981. Non-financial assets: Statistics Austria	2010-2017	HFCS
Belgium	1981-2020	Financial assets and liabilities, and non-financial assets (since 1996): National Bank of Belgium	1970-2020	Financial assets and liabilities (since 1980), and non-financial assets: National Bank of Belgium	2010-2017	HFCS
Bulgaria	1996-2019	Financial assets and liabilities: Republic of Bulgaria National Statistical Institute. Non-financial assets: Eurostat (only dwellings (since 1999) and produced business assets (since 2001)) and authors'own estimations of agricultural land using data on land prices and hectares provided by the National Statistical Institute (since 2004)	1995-2020	Financial assets and liabilities (since 1996), and non-financial assets: Eurostat		
Croatia	1996-2019	Financial assets and liabilities: Croatian National Bank. Non-financial assets: Eurostat (only dwellings). Business assets: HFCS (2017)	1995-2020	Financial assets, liabilities, and non-financial assets: Eurostat	2017	HFCS
Cyprus	1996-2019	Financial assets and liabilities: Eurostat. Non-financial assets: Eurostat (dwellings) and HFCS (business assets since 2010)	1995-2020	Financial assets, liabilities, and non-financial assets: Eurostat	2010-2017	HFCS
Czech Republic	1993-2020	Financial assets, liabilities, and non-financial assets: Czech Statistical Office	1995-2020	Financial assets, liabilities, and non-financial assets: Eurostat		
Denmark	1973-2020	Financial assets and liabilities: Jakobsen et al (2020) for the period 1973-1994, Statistics Denmark since 1995. Non-financial assets: dwellings (1973-1994 Jakobsen et al. (2020), 1995-onwards Statistics Denmark); all the rest (Jakobsen et al. (2020) for the period 1973-2014 and extended using growth rates in Eurostat series)	1981-2020	Financial assets and liabilities (since 1995), and non-financial assets: Statistics Denmark	1980-2017	Jakobsen et al. (2018)
Estonia	1996-2019	Financial assets and liabilities: Statistics Estonia. Non-financial assets: Statistics Estonia (dwellings since 1996) and authors' own estimations of agricultural land using data on land prices and hectares provided by Statistics Estonia and Eurostat (since 2004)	1995-2020	Financial assets and liabilities: Eurostat. Non-financial assets: Statistics Estonia	2013-2017	HFCS
Finland	1975-2020	Financial assets, non-financial assets and liabilities: Statistics Finland.	1970-2020	Financial assets and liabilities, and non-financial assets (since 1975): Statistics Finland	1980-2017	Statistics Finland (survey)
France	1970-2020	Financial assets, non-financial assets and liabilities: Garbinti et al. (2018) for the period 1970-1977, National Institute of Statistics and Economics Studies (INSEE) for the period 1978-2020	1970-2020	Financial assets, liabilities, and non-financial assets: INSEE since 1978, Garbinti et al. (2018) prior to 1978.	1970-2017	Garbinti et al. (2020)
Germany	1970-2020	Financial assets and liabilities: Bundesbank for the period 1999-2020. Non-financial assets: Destatis for 1999-2020. Financial assets, non-financial assets and liabilities before 1999 from Piketty and Zucman (2014)	1991-2020	Financial assets and liabilities: Bundesbank. Non-financial assets: Destatis.	1970-2017	Albers et al. (2022)
Greece	1996-2020	Financial assets and liabilities: Bank of Greece. Non-financial assets: Eurostat (dwellings) and HFCS (business assets since 2009)	1995-2020	Financial assets and liabilities (since 1998): Bank of Greece. Non-financial assets: Hellenic Statistical Authority.	2009-2017	HFCS
Hungary	1970-2020	Financial assets and liabilities: Central Bank of Hungary. Non-financial assets: Hungarian Central Statistical Office (dwellings and produced business assets since 1996) and authors' own estimation of agricultural land using data on land prices and hectares provided by the Hungarian Central Statistical Office and Eurostat (since 2001)	1970-2020	Financial assets and liabilities: Central Bank of Hungary. Non-financial assets (since 1995): Hungarian Central Statistical Office.	2014-2017	HFCS
Iceland	1997-2019	Financial assets, liabilities, and non-financial assets (only housing): Statistics Iceland	2000-2020	Financial assets and liabilities (since 2004), and non-financial assets: Statistics Iceland.	2010-2017	Statistics Iceland
Ireland	1996-2019	Daly and Morgan (2021)	1995-2020	Financial assets and liabilities (since 1999): Eurostat. Non-financial assets: Central Statistical Office.	2013-2018	HFCS
Italy	1970-2020	Financial assets and liabilities: Bank of Italy. Non-financial assets: Italian National Institute of Statistics (ISTAT) since 2001 and Brandolini et al. (2004) prior to 2001	1995-2020	Financial assets and liabilities: Bank of Italy. Non-financial assets: ISTAT.	1995-2017	Acciari et al. (2021)
Latvia	1996-2019	Financial assets and liabilities: Bank of Latvia. Non-financial assets: Eurostat (dwellings and produced business assets) and authors'own estimations of agricultural land using data on land prices and hectares provided by the Statistical Bureau of Latvia (since 2004).	1995-2020	Financial assets and liabilities: Eurostat. Non-financial assets (since 2000): Statistics Latvia.	2014-2017	HFCS
Lithuania	1996-2019	Financial assets and liabilities: Statistics Lithuania. Non-financial assets: Statistics Lithuania (only dwellings and produced business assets) and authors'own estimations of agricultural land using data on land prices and hectares provided by Statistics Lithuania and Eurostat (since 2004) and HFCS (2018)	1995-2020	Financial assets and liabilities: Bank of Lithuania. Non-financial assets: Eurostat.	2016	HFCS
Luxembourg	1996-2020	Financial assets and liabilities: Central Bank of Luxembourg. Non-financial assets: Eurostat (only dwellings and produced business assets) and authors'own estimations of agricultural land using data on land prices and hectares provided by STATEC and Eurostat.	1995-2020	Financial assets, liabilities, and non-financial assets: STATEC.	2010-2018	HFCS
Malta	1996-2020	Financial assets and liabilities: Central Bank of Malta. Non-financial assets: Eurostat (only dwellings and produced business assets) and authors'own estimations of agricultural land using data on land prices and hectares provided by Eurostat (since 2004)	1995-2020	Financial assets, liabilities, and non-financial assets: Eurostat.	2010-2016	HFCS
Netherlands	1993-2020	Financial assets, non-financial assets and liabilities : Statistics Netherlands.	1995-2020	Financial assets and liabilities: Dutch National Bank. Non-financial assets: Eurostat.	1993-2017	Statistics Netherlands
Norway	1979-2020	Financial assets (private sector) and liabilities: Statistics Norway (since 1980). Non-financial assets: Eurostat	1976-2020	Financial assets and liabilities, and non-financial assets (since 1978): Statistics Norway.	2010-2017	Statistics Norway
Poland	1996-2020	Financial assets and liabilities: Eurostat (1996-2002), National Bank of Poland (2003-2020). Non-financial assets: Eurostat (dwellings (since 1996) and produced business assets (since 2013)) and authors'own estimations of agricultural land using data on land prices and hectares provided by Eurostat (since 2004).	1995-2020	Financial assets, liabilities, and non-financial assets: Eurostat.	2013-2016	HFCS
Portugal	1970-2020	Financial assets and liabilities (since 1981): Bank of Portugal. Non-financial assets: housing from Menghini (2019) and business assets from HFCS (since 2010)	1995-2020	Financial assets and liabilities: Bank of Portugal. Non-financial assets: National Statistics Institute	2010-2017	HFCS
Romania	1996-2020	Financial assets and liabilities: National Bank of Romania. Non-financial assets: Eurostat (only dwellings (since 1996) and produced business assets (since 2001)) and authors' own estimations of agricultural land using data on land prices and hectares provided by Eurostat (since 2004)	1995-2020	Financial assets, liabilities, and non-financial assets: Eurostat.		
Slovakia	1996-2020	Financial assets and liabilities: National Bank of Slovakia. Non-financial assets: Eurostat (only dwellings (since 1996) and produced business assets (since 2001)) and authors' own estimations of agricultural land using data on land prices and hectares provided by Eurostat (since 2001).	1995-2020	Financial assets, liabilities, and non-financial assets: Statistical Office of the Slovak Republic.	2010-2017	HFCS
Slovenia	1996-2020	Financial assets and liabilities: Eurostat (1995-2005), Bank of Slovenia (since 2006). Non-financial assets: Republic of Slovenia Statistical Office (SiStat) (only housing) and HCFCS (business assets since 2010).	1995-2020	Financial assets and liabilities: Eurostat. Non-financial assets: SI-STAT	2010-2017	HFCS
Spain	1970-2020	Artola et al. (2021)	1970-2020	Financial assets and liabilities: Bank of Spain. Non-financial assets: National Statistics Institute.	1984-2017	Martínez-Toledano (2022)
Sweden	1970-2020	Waldenström (2017)	1970-2020	Financial assets, liabilities, and non-financial assets: Statistics Sweden.	2000-2017	
Switzerland	2000-2020	Financial assets and liabilities: Swiss National Bank. Non-financial assets: Swiss National Bank (only housing assets for the household sector).	1995-2020	Financial assets and liabilities (since 2000): Swiss National Bank. Non-financial assets: Federal Statistical Office.	1980-2017	Swiss wealth tax data + Swiss Household Panel (SHP)
United Kingdom	1970-2020	Financial assets and liabilities: Office for National Statistics (ONS) since 1988 and Piketty and Zucman (2014) prior to 1988 Non-financial assets: Office for National Statistics (ONS) since 1995 and Piketty and Zucman (2014) prior to 1995 (only agricultural land is taken from ONS since 1988)	1987-2020	Financial assets, liabilities, and non-financial assets: Office for National Statistics.	1995-2017	Alvaredo et al. (2018)

Table 1: Detailed Sources for our Database

Notes: This table summarizes the sources and time coverage for each country of the new database we have built to construct the Distributional Wealth Accounts (DWAs) for Europe.

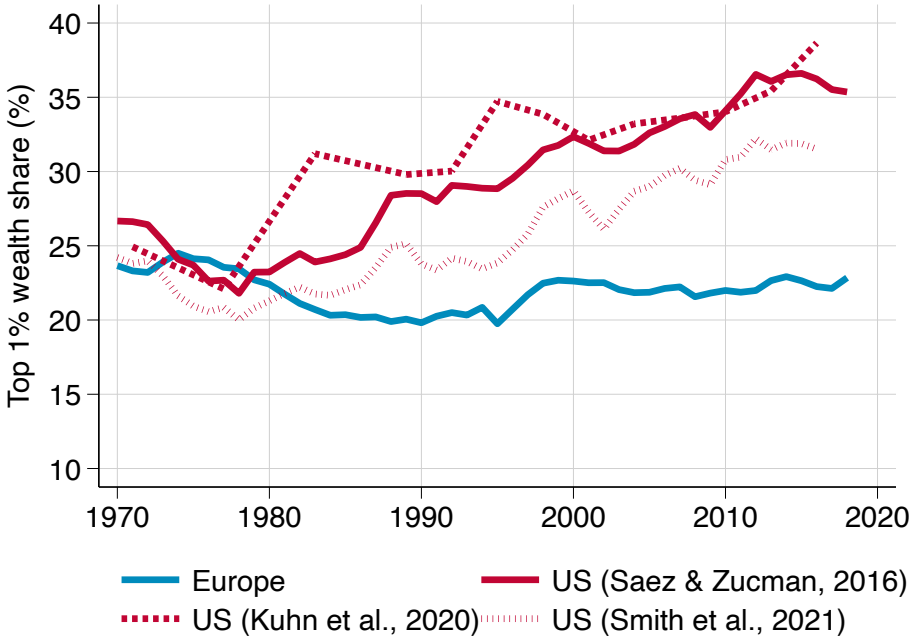


(a) Wealth to Income Ratios

(b) Top 1% Wealth Share

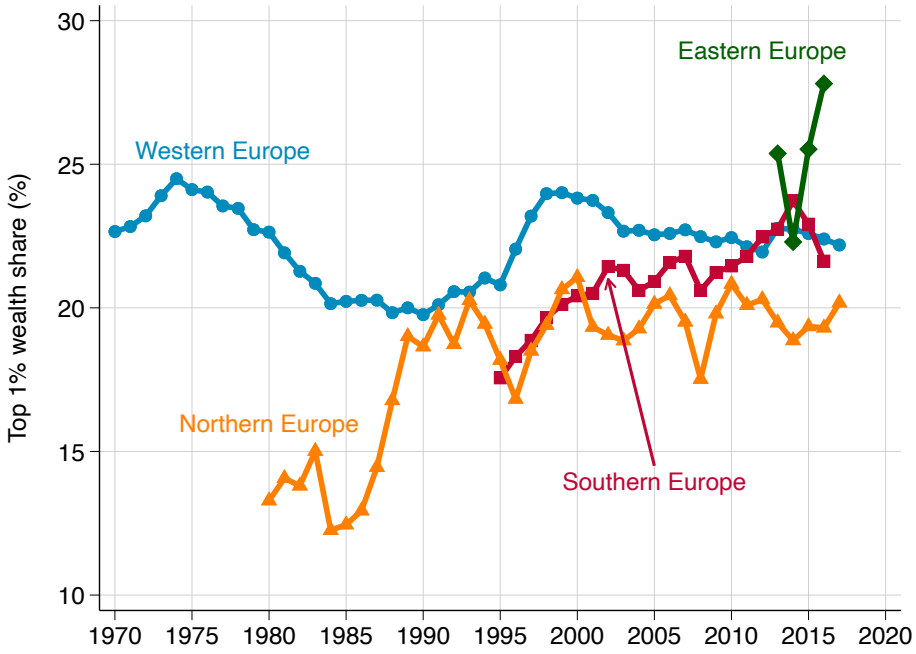
Notes: This figure depicts the evolution of aggregate wealth to income ratios (panel a) and of the top 1% wealth share (panel b) in both Europe and the United States using the Distributional Wealth Accounts (DWAs) for Europe and the United States DWAs of Saez and Zucman (2016). The gray lines depict the country-specific evolutions in Europe. The European estimate is based on a wealth-weighted average.

Figure 1: Aggregate Household Wealth and Top Wealth Concentration, 1970–2018: Europe and the United States



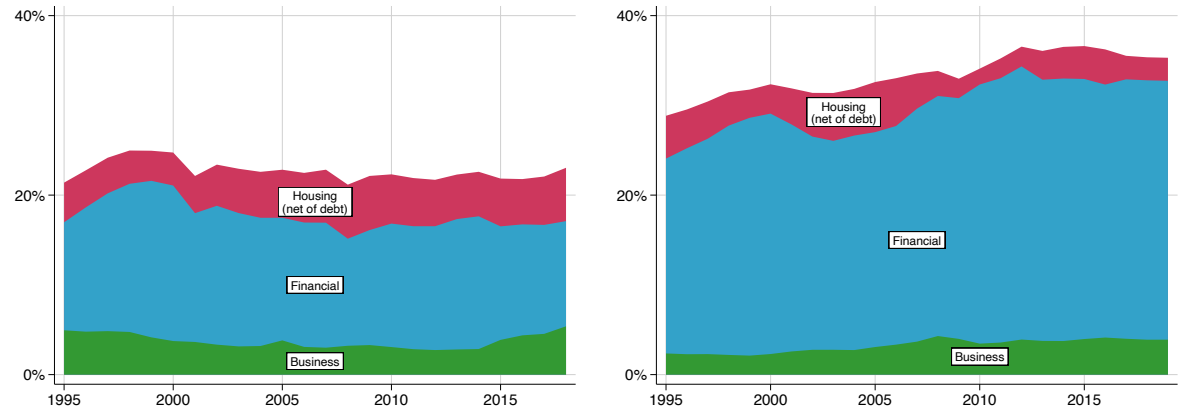
Notes: This figure compares the evolution of the top 1% wealth share in Europe over the period 1970-2019 to the evolution of the top 1% wealth share in the US using three alternative sources: Saez and Zucman (2016) and Smith et al. (2020) using tax and survey data, and Kuhn et al. (2020) using survey data. The European estimate is based on a wealth-weighted average.

Figure 2: Robustness Checks using Alternative US Top 1% Wealth Shares



Notes: This figure depicts the evolution of the top 1% wealth share across European regions using the Distributional Wealth Accounts (DWAs). *Eastern Europe*: Estonia, Hungary, Latvia, Lithuania, Poland. *Northern Europe*: Denmark, Finland, Iceland, Norway, Sweden. *Southern Europe*: Croatia, Cyprus, Greece, Italy, Malta, Portugal, Slovenia, Spain. *Western Europe*: Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherlands, Switzerland, United Kingdom. All estimates are based on a wealth-weighted average.

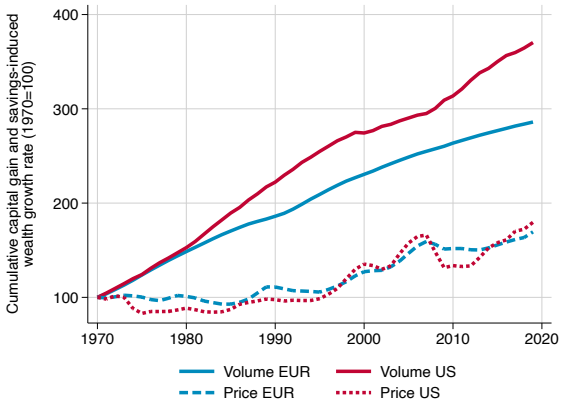
Figure 3: Wealth Concentration in Europe by Region, 1970–2018



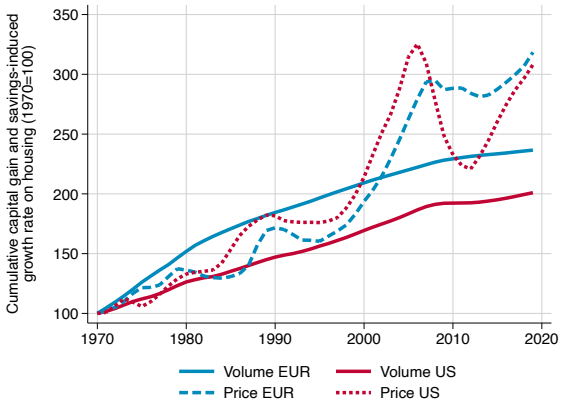
(a) Composition of top 1% wealth share in Europe (b) Composition of top 1% wealth share in US

Notes: This figure depicts the evolution of the asset composition of the top 1% wealth share in both Europe and the United States over the period 1970-2018. Total wealth is decomposed between housing (net of debt), financial assets and business assets using the Distributional Wealth Accounts (DWAs) for Europe and the United States DWAs of Saez and Zucman (2016). The European estimate is based on a wealth-weighted average.

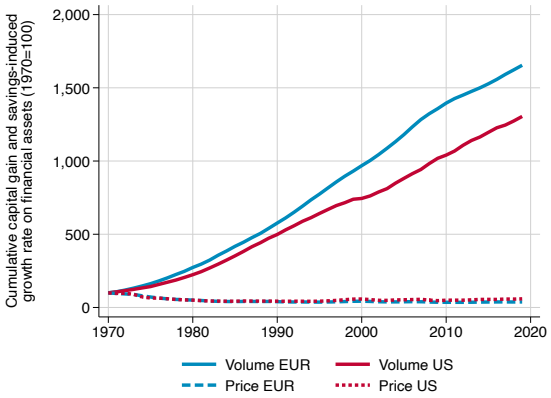
Figure 4: Composition of Top 1% Wealth Share, 1970–2018: Europe and the United States



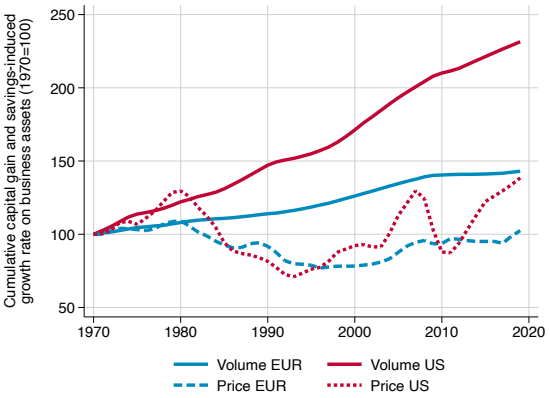
(a) Total wealth



(b) Housing



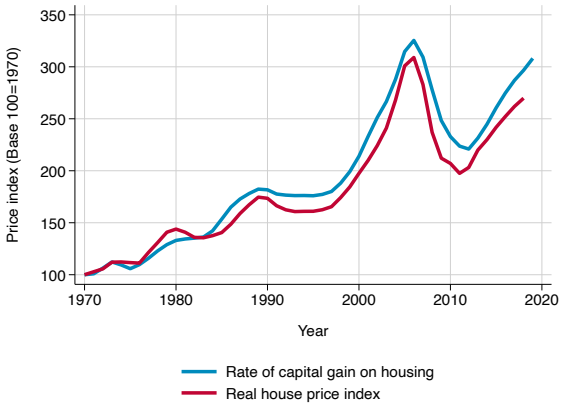
(c) Financial assets



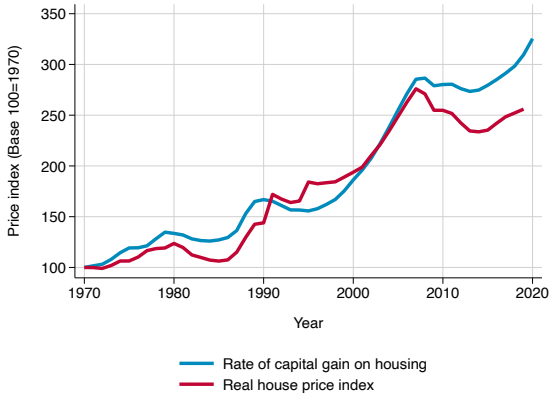
(d) Business assets

Notes: This figure depicts the evolution of volume versus price effects using the wealth accumulation decompositions described in Section 2.4. Panel (a) presents the volume and price effects for total wealth, while panels (b) to (d) present the volume and price effects for housing, financial assets and business assets, respectively. The series are normalized using 1970 as a base year. The European estimates are based on a wealth-weighted average.

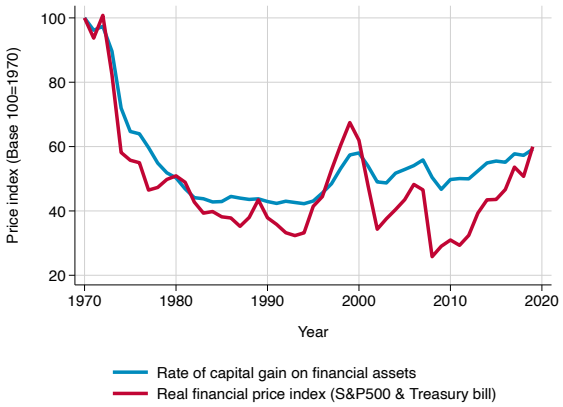
Figure 5: Aggregate Wealth Accumulation Decomposition, 1970–2018: Europe and the United States



(a) Evolution of house prices in the US



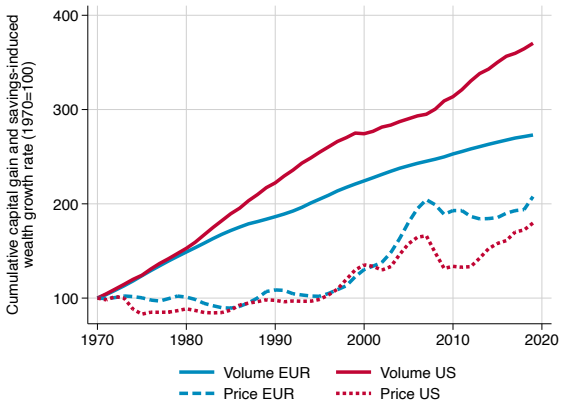
(b) Evolution of house prices in Europe



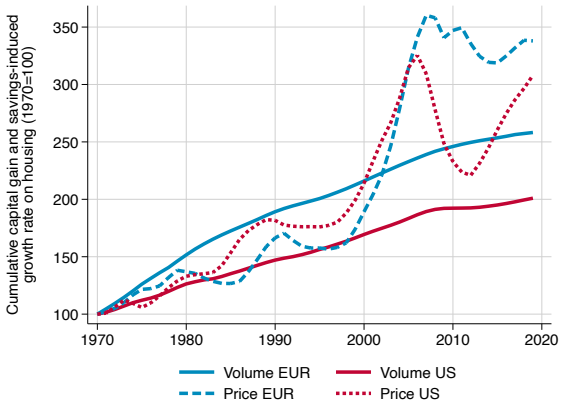
(c) Evolution of financial asset prices in the US

Notes: This figure compares the evolution of capital gains on housing and financial assets resulting from our asset-specific wealth accumulation decompositions with the evolution based on external sources in both Europe and the US. Panels (a) and (b) compare the evolution of capital gains on housing with the evolution of house price indices from the Bank of International Settlements (BIS). For Europe, the two series are based on a weighted population average for those countries for which both series are available. The only excluded European countries from our database for which no house price indices are available on the BIS database are Greece, Iceland and Slovenia. Panel (c) compares the evolution of capital gains on financial assets in the US with the evolution of a financial price index calculated as a weighted average between the S&P stock market price index from Shiller (2015) and the 6-Month US Treasury Bill index published by the Federal Reserve Bank of St. Louis. The weights are the US annual portfolio shares on equities and fixed-income assets out of total financial assets, respectively.

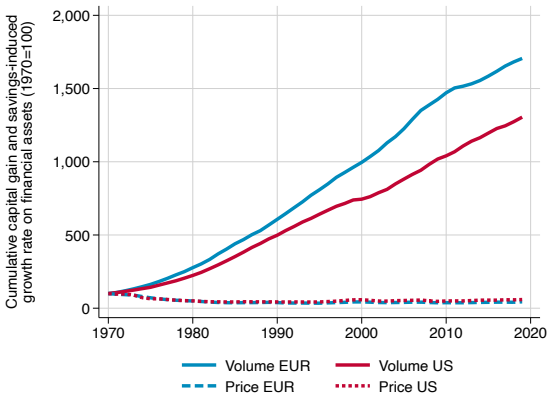
Figure 6: Robustness Checks for the Evolution of Capital Gains



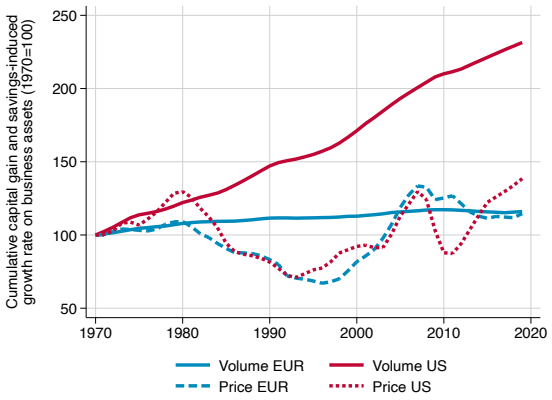
(a) Total wealth



(b) Housing



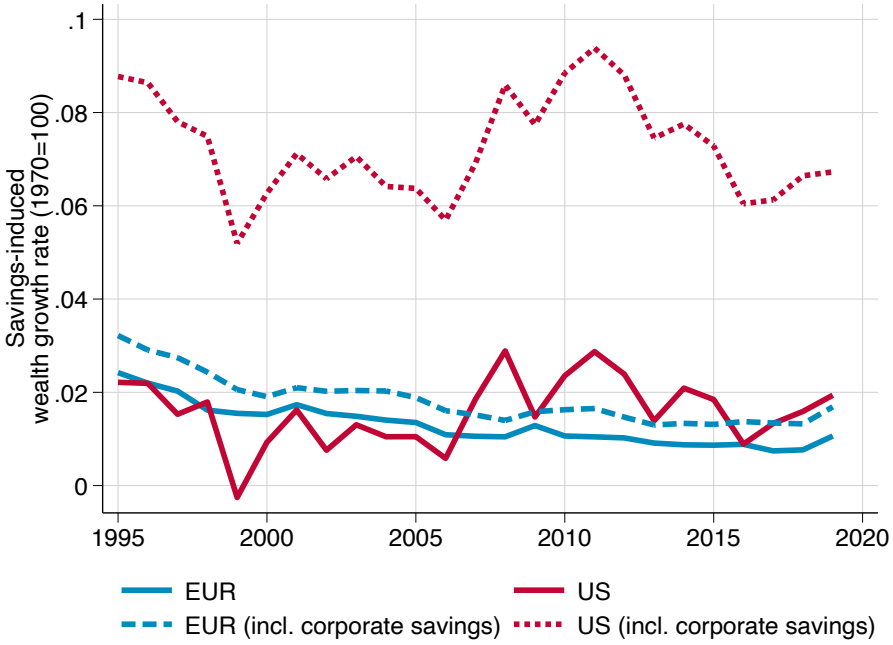
(c) Financial assets



(d) Business assets

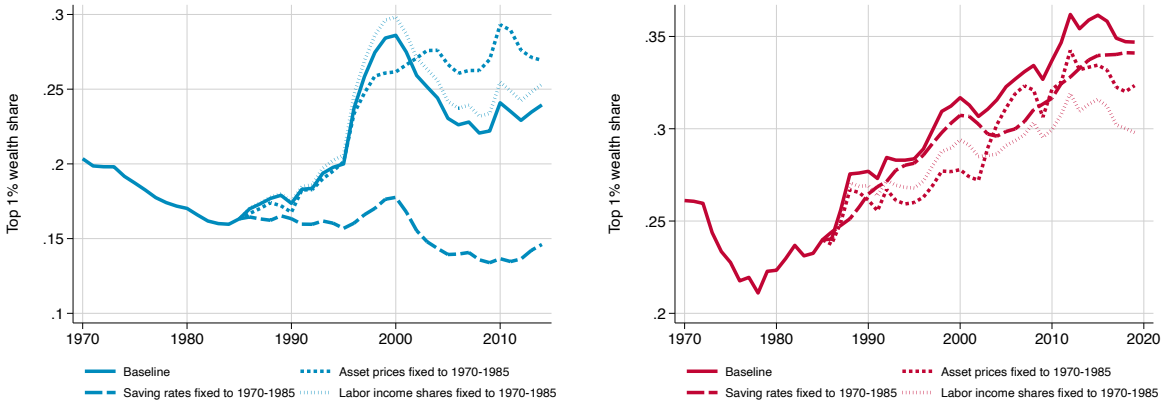
Notes: This figure depicts the evolution of volume versus price effects using the wealth accumulation decompositions described in Section 2.4. The only difference with respect to Figure 5 is that the European decomposition in this case is based on a balanced (instead of an unbalanced) panel of European countries. Panel (a) presents the volume and price effects for total wealth, while panels (b) to (d) present the volume and price effects for housing, financial assets and business assets, respectively. The series are normalized using 1970 as a base year. The European estimates are based on a population weighted average.

Figure 7: Aggregate Wealth Accumulation Decomposition, 1970–2018: Europe and the United States (Balanced sample)



Notes: This figure compares the evolution of the savings-induced wealth growth rate in Europe and the US over the period 1970-2019 to the evolution of the the savings-induced wealth growth rate accounting for corporate savings in the wealth accumulation decomposition. The European estimate is based on a wealth-weighted average.

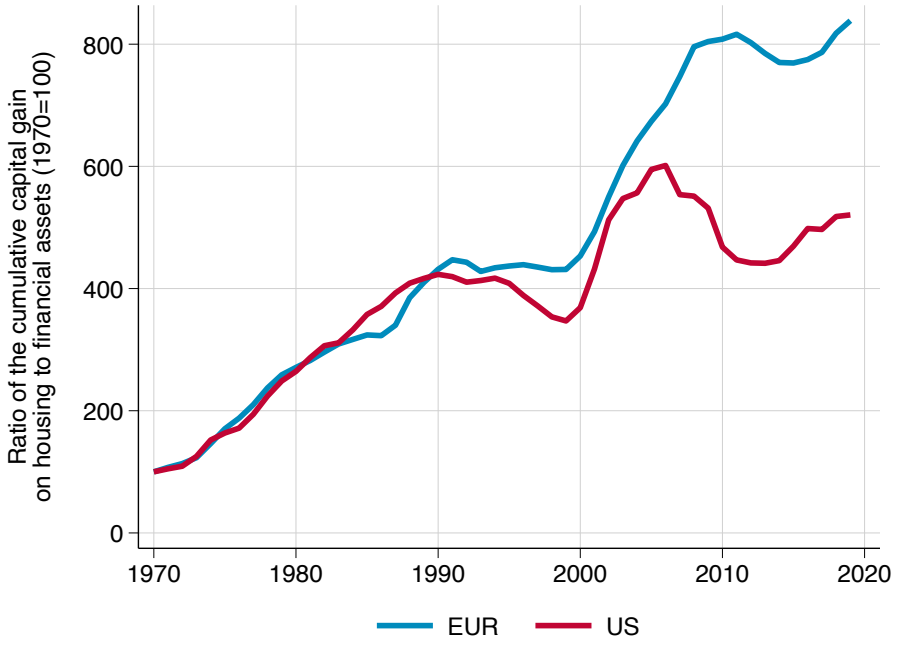
Figure 8: Robustness Checks accounting for Corporate Savings, 1970–2018: Europe and the United States



(a) Top 1% Wealth Share in France (b) Top 1% Wealth Share in United States

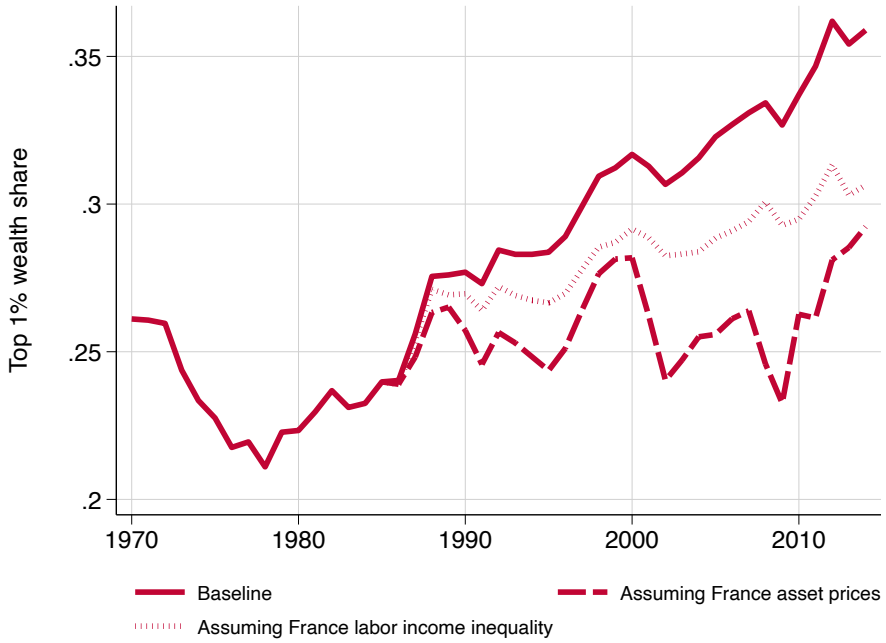
Notes: This figure compares the actual evolution of the top 1% wealth share in both France (1970-2014) and the United States (1970-2014) to the counterfactual evolution fixing either asset prices, saving rates or labor income inequality to their average between 1970-1985. For instance, for the simulation with fixed asset prices for France, we fix the rate of capital gain over the period 1986-2014 to be the average rate of capital gain over the period 1970-1985.

Figure 9: Top 1% Wealth Share Simulations, 1970-2019: France and the United States



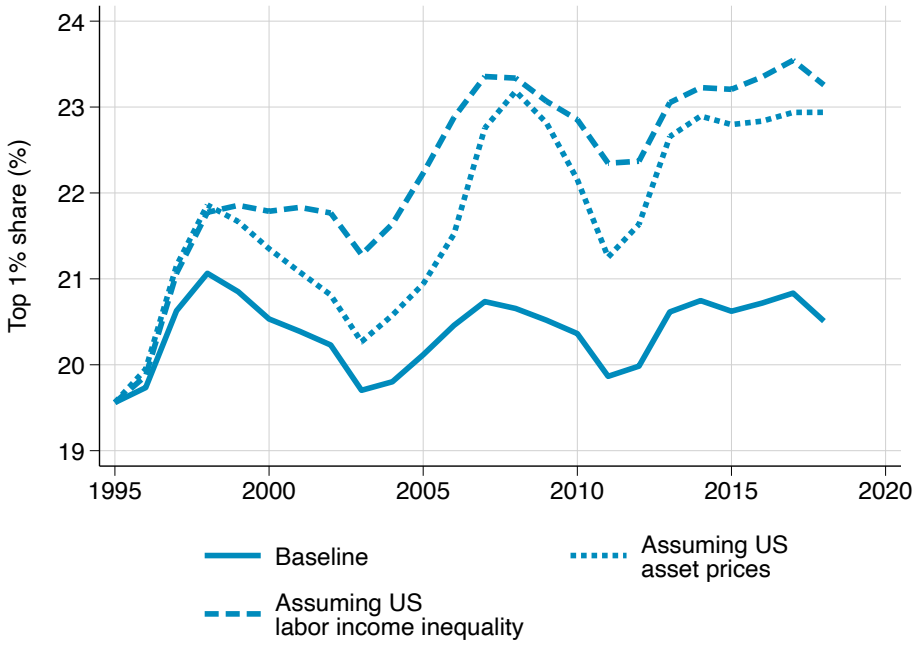
Notes: This figure compares the cumulative evolution of capital gains on housing and financial assets in Europe and the United States. The indicator that is depicted is the ratio of the cumulative gains on housing to the cumulative capital gains on financial assets normalized to 1970. The capital gains are derived from the wealth accumulation decomposition. The European estimate is based on a wealth-weighted average.

Figure 10: Cumulative Capital Gains in Europe and the United States: Housing vs. Financial Assets



Notes: This figure compares the actual evolution of the top 1% wealth share in the United States over the period 1970-2014 to the counterfactual evolution assuming either the asset prices or the labor income shares of the top 1% wealth group in France. The counterfactual simulations follow the methodology described in Section 2.4.

Figure 11: Counterfactual Evolution of Wealth Inequality in the United States using France Parameters



Notes: This figure compares the actual evolution of the top 1% wealth share in Europe over the period 1995-2018 to the counterfactual evolution assuming either the total asset price effects or the labor income share of the top 1% wealth group in the United States. The counterfactual simulations follow the methodology described in Section 2.4. "Europe" for this exercise refers to a population-weighted average of Germany, Denmark, Finland, United Kingdom, Italy, Netherlands, France and Spain. These are countries for which it is possible to obtain a balanced panel with a sufficiently detailed decomposition over the entire period.

Figure 12: Counterfactual Evolution of Wealth Inequality in Europe using United States Parameters

Wealth Inequality Dynamics in Europe and the United States: Understanding the Determinants

Online Appendix

Thomas Blanchet Clara Martínez-Toledano

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A Wealth Distribution Data

A.1 Denmark

In Denmark, the main source to study the distribution of wealth comes from various kinds of wealth taxation. Roine and Waldenström (2015) have used wealth tax information to study the historical evolution of wealth concentration in the 18th, 19th and 20th century. The Danish authorities continued collecting individual wealth information even after the abolition of the wealth tax in 1997. Jakobsen et al. (2020) exploit the Danish wealth registry to build wealth distribution series over the 1980-2012 period.

We use the wealth distribution series of Jakobsen et al. (2020), as they follow the exact same methodology that we use for the rest of countries we analyze in this paper. In particular, their series are fully consistent with National Accounts, they are based on equal-split adults and since they rely on tax records, they have a very good coverage of the top. The register-based data source for wealth has two limitations. First, it only includes individual information on private pension wealth from 2012 onward. They allocate funded pension wealth of workers proportionally to their wage incomes (winsorized at the 99th percentile) and the pension wealth of retirees proportionally to their pension benefits paid out of pension funds. Since they observe that in 2012 about 40% of pension wealth belongs to wage earners while 60% belongs to retirees, they split pension wealth belonging to wage earners and to retirees using the proportions of 2012 for the rest of the period. Second, the registry does not include assets not reported by third parties, in particular it excludes non-corporate business assets and unlisted equities. They compute non-corporate business assets by capitalizing business income (the capitalization rate equals the aggregate stock of business assets from the national accounts divided by the aggregate flow of business income from individual income tax returns) and unlisted equities by capitalizing dividend income.

We extrapolate the wealth distribution series of Jakobsen et al. (2020) forward up to 2020 by fixing the asset composition by percentile to 2012, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset composition from 1980 to 2020.[11]

A.2 Finland

In Finland, there are three different sources which have been used to measure the wealth distribution: wealth tax records, estate tax records and wealth surveys. Roine and

[11] Jakobsen et al. (2020) do not provide the wealth distribution by percentile, so that we use the Generalized Pareto interpolation method to obtain it.

Waldenström (2015) use wealth and estate tax records to estimate the wealth distribution in from 1800 up to 2005. Jäntti (2006) uses the wealth surveys from Statistics Finland to analyze the dynamics of wealth inequality in the 1980s and 1990s.

We rely on the same wealth surveys used by Jäntti (2006) to build our wealth distribution series. The surveys are available over the 1987-2016 period and since 2009 are also part of the HFCS. To ensure consistency with the rest of countries, we build the wealth distribution based on equal-split adults and rescale the survey wealth components so as to match national accounts. We finally extrapolate the wealth distribution series forward up to 2020 by fixing the asset composition by percentile to 2016, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset class from 1987 to 2020.

A.3 France

In France, there are three different sources which have been used to measure the wealth distribution: estate tax records, wealth surveys and income tax records. Piketty et al. (2006) use large samples of estate tax returns and the mortality multiplier method to construct series on wealth concentration in Paris and France from 1807 to 1994. Kessler and Wolff (1991), Cordier and Girardot (2007) and Durier et al. (2012) rely on the wealth surveys elaborated by *Banque de France* (*Enquêtes Patrimoine*), which are part of the HFCS since 2010, to study how wealth is distributed across French households. Finally, Garbinti et al. (2021) develop a new method combining income tax records with household surveys – hereinafter referred to as the Mixed Income Capitalization-Survey (MICS) method – to derive French wealth distribution series from 1970 up to 2014.

We use the wealth distribution series of Garbinti et al. (2021), as they follow the exact same methodology that we use for the rest of countries we analyze in this paper. In particular, their series are fully consistent with National Accounts, they are based on equal-split adults and since they rely on tax records, they have a very good coverage of the top. Garbinti et al. (2021) run several robustness checks and sensitivity tests with the estate tax records and wealth surveys and show that their method is very robust to estimate the wealth distribution.

We extrapolate the wealth distribution series of Garbinti et al. (2021) forward up to 2020 by fixing the asset composition by percentile to 2014, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We rely on the Generalized Pareto interpolation method to generate the wealth distribution by percentile.

We end up with fully homogeneous wealth distribution series by percentile and asset class

from 1970 to 2020.

A.4 Germany

In Germany, there are two different sources which have been used to measure the wealth distribution: wealth tax records and wealth surveys. Baron (1988) and Dell (2008) use wealth tax data to estimate the wealth distribution in West Germany since the end of the II World War up to 1980 and 1995, respectively. On top of the HFCS, Germany has two additional household surveys including information on wealth. The Income and Expenditure Survey (*Einkommens- und Verbrauchsstichprobe, EVS*) starts in 1978 and incorporates partial information on assets and liabilities and the Socio-Economic Panel (SOEP) starting in 1984 incorporates wealth since 2002. The EVS has been used by Frick et al. (2010) and Fuchs-Schündeln et al. (2010) and the SOEP by Grabka and Frick (2007), Westermeier and Grabka (2015) and Grabka and Halbmeier (2019).

Albers et al. (2022) combine tax data, surveys, national accounts and rich lists to study the distribution of wealth in Germany from 1895 to 2018. We rely on these series in this paper, as they ensure consistency with National Accounts and cover better the top than the available wealth surveys. The series up to 1989 are based on tax units and since 1993 on household units. To ensure consistency with the rest of countries, we adjust them so that they are based instead on equal-split adults.

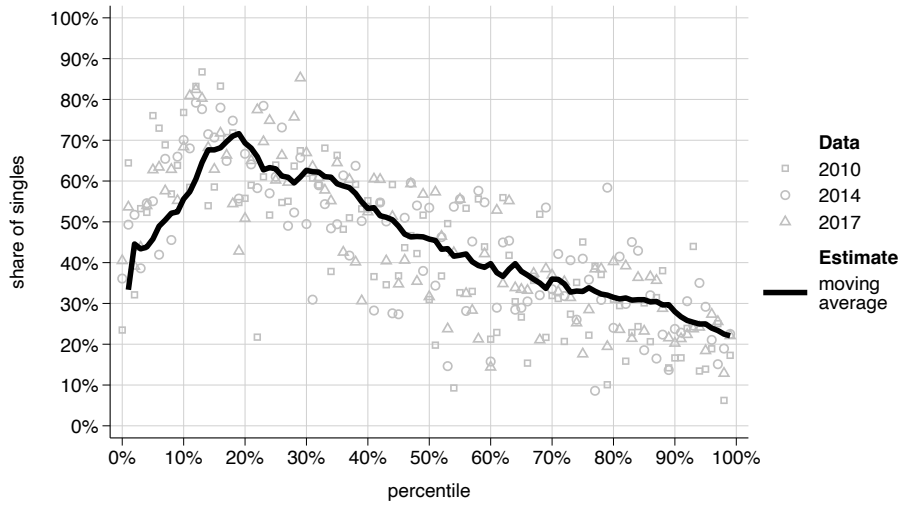


Figure A.1: Share of Singles by Household Wealth Percentile, Germany

To do so, we estimate the share of single by percentile of the wealth distribution raked by households in the German part of the HFCS survey (see figure A.1). Based on this estimate we split each g-percentile into singles and couples, a re-interpolate the resulting tabulations using generalized Pareto interpolation (Blanchet et al., 2021b).

We finally extrapolate the wealth distribution series of Albers et al. (2022) forward up to 2020 by fixing the asset composition by percentile to 2018, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset class from 1895 to 2020.

A.5 Italy

In Italy, there are two different sources which have been used to measure the wealth distribution: wealth surveys and inheritance tax records. Brandolini et al. (2006) and Cannari and D'Alessio (2018) rely on wealth surveys elaborated by *Banca d'Italia* (*Indagine sui bilanci delle famiglie italiane*)—which are available from 1965-2016 and are also part of the HFCS since 2010—to estimate the wealth distribution. Acciari et al. (2020) rely on inheritance tax records and the mortality multiplier method to estimate the wealth distribution between 1995 and 2016.

We use the wealth distribution series of Acciari et al. (2020), since they provide the best coverage of the top as they rely on tax records. In particular, they find higher wealth concentration levels after 2000 than Cannari and D'Alessio (2018) using wealth surveys. The series of Acciari et al. (2020) are built using individuals as unit of observation. To ensure consistency with the rest of countries, we adjust the series so that they are based instead on equal-split adults.

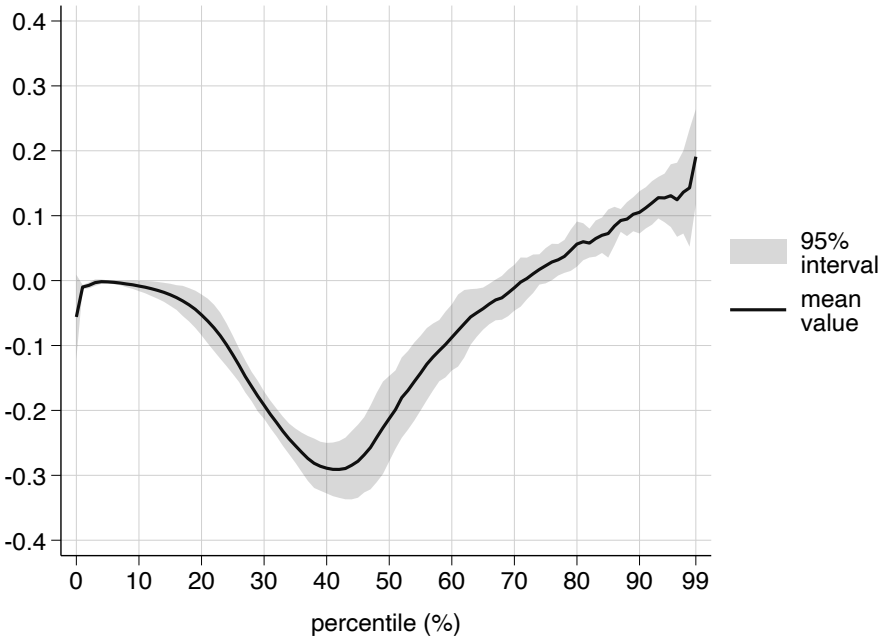


Figure A.2: Equal-split/Individuals Adjustment Factor by Percentile, Italy

To do so, we estimate an adjustment factor by percentile from survey data. We individualize

wealth in the Italian wealth survey following the recommendations of D'Alessio (2018). We then estimate, by percentile of wealth, the following quantity:

$$k_p = \text{ashin}\left(\frac{\text{wealth of percentile p, individuals}}{\text{average wealth}}\right) - \text{ashin}\left(\frac{\text{wealth of percentile p, equal-split}}{\text{average wealth}}\right)$$

which gives the profile shown in figure A.2. We then apply a adjustment factor to out wealth series as:

$$\frac{\text{wealth of percentile p, equal-split}}{\text{average wealth}} = \sinh\left[\text{ashin}\left(\frac{\text{wealth of percentile p, individuals}}{\text{average wealth}}\right) - k_p\right]$$

We arrive at the results show in figure A.3.

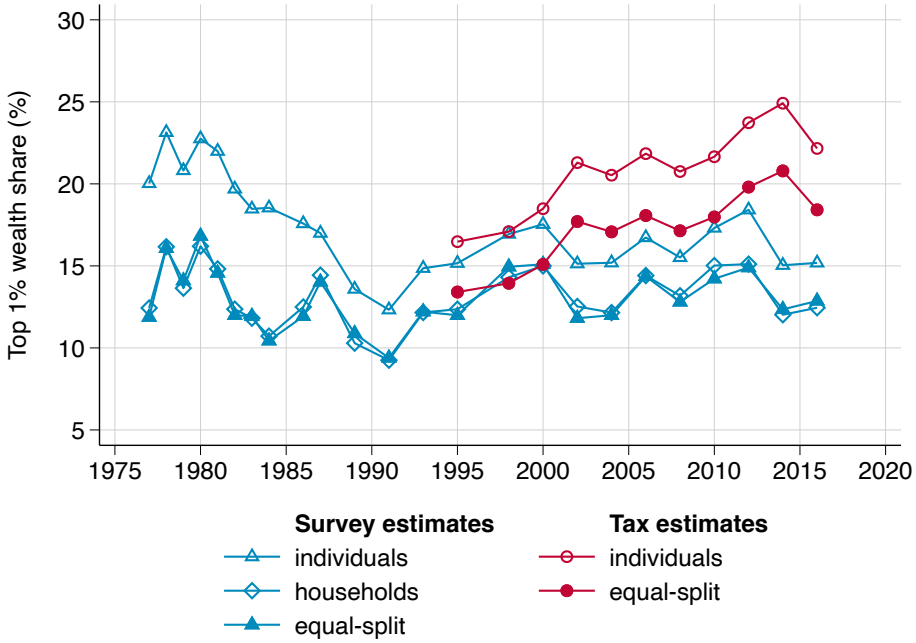


Figure A.3: Comparison of Statistical Units, Italy

We finally extrapolate the wealth distribution series of Acciari et al. (2020) forward up to 2020 by fixing the asset composition by percentile to 2016, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset class from 1995 to 2020.

A.6 Netherlands

In the Netherlands, there are two different sources which have been used to measure the wealth distribution: wealth tax records and wealth surveys. Roine and Waldenström (2015) rely on wealth tax records—including the wealth-tax based registry published since

1993 by Statistics Netherlands (CBS)—to estimate wealth concentration at the top from 1894 up to 2011. Van Bavel and Frankema (2017) use both wealth tax records and the Dutch Central Bank household surveys (DHS) which are available from 1993-2020 to study wealth inequality from 1950 to 2015. Vicq et al. (2022) also builds wealth distribution series using the wealth tax records from Statistics Netherlands for 1993-2019.

We use the wealth distribution series of Vicq et al. (2022), as they follow the exact same methodology that we use for the rest of countries we analyze in this paper. In particular, their series are fully consistent with National Accounts, they are based on equal-split adults and since they rely on tax records, they have a very good coverage of the top. One limitation of the register-based data source for wealth is that it does not include information on private pension wealth, so that funded pension wealth is imputed proportionally to wages and pension benefits.

We extrapolate the wealth distribution series of Vicq et al. (2022) forward up to 2020 by fixing the asset composition by percentile to 2019, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset class from 1993 to 2020.

A.7 Norway

In Norway, the main source to study the distribution of wealth comes from various kinds of wealth taxation. Roine and Waldenström (2015) have used wealth tax information to study the historical evolution of wealth concentration in the 18th, 19th and mid 20th century. Epland and Kirkeberg (2012) and Iacono and Palagi (2021) have used registered-based wealth information from wealth tax records to study the dynamics of wealth inequality since 2010.

We use the wealth distribution series of Iacono and Palagi (2021) covering the 2010-2019 period, as they follow the exact same methodology that we use for the rest of countries we analyze in this paper. In particular, their series are fully consistent with National Accounts, they are based on equal-split adults and since they rely on tax records, they have a very good coverage of the top. One limitation of the register-based data source for wealth is that it does not include information on private pension wealth. They impute funded pension wealth in Norway proportionally to wages and pension benefits.

We extrapolate the wealth distribution series of Iacono and Palagi (2021) forward up to 2020 by fixing the asset composition by percentile to 2019, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile from 2010 to 2020.

A.8 Spain

In Spain, there are three different sources which have been used to measure the wealth distribution: wealth tax records, wealth surveys and income tax records. Alvaredo and Saez (2009) use wealth tax returns and the Pareto interpolation method to construct long run series of wealth concentration for the period 1982 to 2007. Anghel et al. (2018) rely on the wealth surveys elaborated by *Banco de España* (*Encuesta Financiera de las Familias*), which are also part of the HFCS since 2010, to study how wealth is distributed across Spanish households between 2002 and 2014.[12] Finally, Martínez-Toledano (2022) combines income tax records with household surveys to build wealth distribution series for the 1984-2015 period using the Mixed Income Capitalization-Survey (MICS) method developed by Garbinti et al. (2021).

We use the wealth distribution series of Martínez-Toledano (2022), as they follow the exact same methodology that we use for the rest of countries we analyze in this paper. In particular, their series are fully consistent with National Accounts, they are based on equal-split adults and since they rely on tax records, they have a very good coverage of the top. Martínez-Toledano (2022) runs several robustness checks and sensitivity tests with the wealth surveys and shows that their method is very robust to estimate the wealth distribution.

We extrapolate the wealth distribution series of Martínez-Toledano (2022) forward up to 2020 by fixing the asset composition by percentile to 2015, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset class from 1984 to 2020.

A.9 Switzerland

Regarding the availability of wealth data in Switzerland, the situation is mixed. On the one hand, Switzerland is one of the rare country that levies a fairly comprehensive wealth tax, and has done so (albeit irregularly) over most of the 20th and 21st century (Dell et al., 2005). The tax authority publishes tabulations showing the number and wealth of taxpayers over about ten brackets, with the last bracket covering less than 0.5% of the population. This provides a solid basis on which to construct wealth inequality statistics, and which has been exploited before (Dell et al., 2005; Foellmi and Martínez, 2017).

On the other hand, Switzerland does not conduct any proper wealth survey. This creates problems because the wealth tax statistics exclude private pension wealth, bottom-code wealth at zero, and relate to tax units rather than individuals. Therefore, to create series

[12] There is a new wealth survey wave available for 2017.

that are comparable with other countries, we must perform corrections and adjustments that in principle require survey data. Furthermore the aggregate household balance sheets produced by Switzerland are incomplete, because they exclude business assets.

However, there are some surveys of Swiss residents that include information on wealth, even if these surveys are not wealth surveys in the sense that wealth measurement is their primary focus. Ravazzini et al. (2019) found three such surveys. They all have limitations that actual wealth surveys do not have, but they remain a useful piece of information. Two of these surveys measure wealth across the entire population, but include little or no evidence on how this wealth is decomposed between asset types: the Swiss Household Panel (SHP) and the Statistics on Income and Living Conditions (CH-SILC).[13] A third survey contains much more details on the decomposition of wealth, but only contains individuals aged 50 and older: the Survey of Health, Ageing and Retirement in Europe.

Our estimate of the wealth distribution in Switzerland are the result of a triangulation of the evidence included in the wealth tax statistics, the SHP and the SHARE data. This estimation is composed of four broad steps.

Step 1 We interpolate wealth tax statistics using the generalized Pareto interpolation method, which gives us the full distribution of taxable wealth across all tax units.

Step 2 We use the SHP data to get the number of couples and singles for each wealth percentile, and use it to transform the distribution of wealth across tax units into a distribution of wealth across equal-split individuals.

Step 3 We create a synthetic survey dataset of wealth and its decomposition between asset types. To create this dataset, we first isolate the 50 and older in the SHP sample. Then we match statistically this subsample to the SHARE data (which is already restricted to the 50 and older). We pool this data together with the SHP data of individuals below 50, and with survey data for the rest of Europe from the HFCS, and run regressions to impute the asset ownership patterns by asset type across the 50 and younger in Switzerland. This gives us a synthetic dataset that contains the decomposition of wealth for all individuals in Switzerland.

Step 4 We use this synthetic dataset to impute private pension wealth and negative wealth to individuals in the tax data, and to decompose their wealth.

We detail these four steps and their impact on the final estimates below.

[13] Note that CH-SILC is distinct from the EU-SILC survey, although the survey objectives are similar.

A.9.1 Step 1: Wealth Tax Data Interpolation

The wealth tax statistics are publicly available online through the tax authorities' website, annually since 2003 and at a lower frequency before that. These statistics cover the entire population of taxpayers, but in the form of tax units: i.e., two people who file jointly count as only one person. These statistics exclude private pension wealth, which is untaxed. Wealth is also bottom coded at zero, even though liabilities are deduced from taxable wealth, so that in principle some people can have negative wealth.

The data is published in tabulated form: taxpayers are grouped into about ten brackets, with the last bracket corresponding to tax units with more than 10 000 000 CHF of taxable wealth, or about 0.3% of all tax units in 2017.

We interpolate these data into a complete, continuous distribution using the generalized Pareto interpolation method (Blanchet et al., 2021b). This method is an improvement over the standard Pareto interpolation method (Piketty, 2003; Piketty and Saez, 2003) which yields better results and can be applied to the entire distribution, not only the top. Our results are extremely close to those of earlier work on this data (Dell et al., 2005; Foellmi and Martínez, 2017), but provide a view of the entire distribution.

A.9.2 Step 2: Adjusting the Statistical Unit

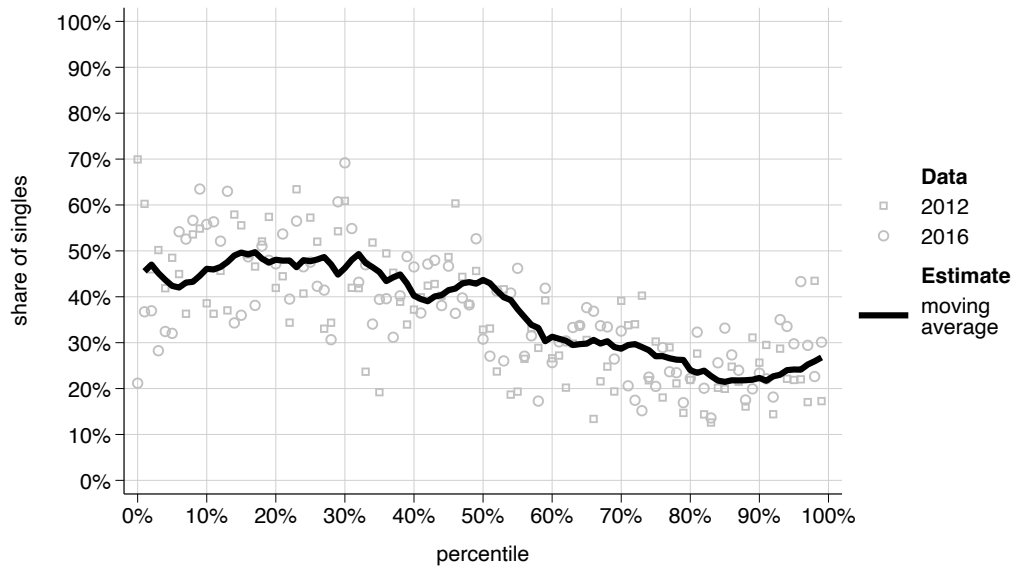
The Swiss wealth tax data relates to tax units (i.e., households). We transform that household distribution into an equal-split adults distribution using the two waves of the SHP that collected information on total wealth: 2012 and 2016.

First, we estimate a share of singles by percentile of household wealth, as shown in Figure A.4. We first estimate, separately for 2012 and 2016, the share of singles in each percentile of household wealth. We average this information over the two years of data available, and further smooth the estimate using a moving average with a window of nine percentiles.

Based on this estimate, we split the estimate of the distribution of wealth from Step 1 into two distributions: one for singles, and one for couples. We leave the distribution of wealth among singles unchanged. For couples, we divide their wealth and multiply their bracket size by two. We aggregate these distribution again, which yields an estimate of the wealth distribution among equal-split adults.

A.9.3 Step 3: Creation of Synthetic Survey Datasets

The creation of a synthetic survey dataset in Switzerland, which we can use to infer certain missing pieces of information, is the main challenge. To that end, we mobilize three different surveys. Two of them provide partial information for Switzerland: the SHP



Source: Author's calculations using the Swiss Household Panel (SHP) in 2012 and 2016. *Notes:* Data points are the shares by percentile obtained directly from the two survey waves. We estimate the moving average value by first averaging the raw over the two available years, and then performing a moving average with a window of nine percentiles.

Figure A.4: Share of Singles by Percentile of Household Wealth, Switzerland, 2012 and 2016

covers the full population with no information on the decomposition by asset type, while the SHARE contains a detailed decomposition but only for people aged 50 and older. The third one if the HFCS survey, which provide complete information for many European countries but not Switzerland.

We combine these three data sources to create an imputation model that estimates asset ownership patterns vary by country, marital status, education, income and total wealth. We then use that imputation model to distribute the different wealth components to individuals younger that 50 (assets for individuals 50 or older are directly observable in the SHARE survey).

Statistical Matching of SHARE and SHP We statistically match the SHP and the SHARE surveys to create a single sample sample out of both datasets. From each dataset, we select the following variables for every household: education of the reference person (ISCED classification), age of the reference person, gross household income, and total household wealth. We transform income and wealth using the inverse hyperbolic sine function (asinh), which is similar to the logarithm for high values, but also supports zero and negative values.

We center and standardize these variables in both datasets. For every household $i \in \{1, \ldots, n\}$ in the SHP, let $(z_{1i}^{\text{SHP}}, \ldots, z_{ki}^{\text{SHP}})$ be the set of these variables. Similarly, for

every household $j \in \{1, \ldots, m\}$ in SHARE, let $(z_{1j}^{\text{SHARE}}, \ldots, z_{kj}^{\text{SHARE}})$ be the set of these variables. We define a simple squared Euclidean distance between household i (in SHP) and j (in SHARE) as:

$$d_{ij} = \sum_{\ell=1}^{k} \left(z_{\ell i}^{\text{SHP}} - z_{\ell j}^{\text{SHARE}} \right)^2$$

and then we seek to find a way to match observations between the two datasets so as to minimize the overall distance (Ridder and Moffitt, 2007). That is, we solve the following optimization problem:

$$\min_{f_{ij}} \sum_{i=1}^{n} \sum_{j=1}^{m} f_{ij} d_{ij} \quad \text{subject to} \quad \begin{cases} \forall i \in \{1, \ldots, n\} & \sum_{j=1}^{m} f_{ij} = w_i^{\text{SHP}} \\ \forall j \in \{1, \ldots, m\} & \sum_{i=1}^{n} f_{ij} = w_j^{\text{SHARE}} \\ \forall i \in \{1, \ldots, n\} & \forall j \in \{1, \ldots, m\} \quad f_{ij} \geq 0 \end{cases}$$

where w_i^{SHP} and w_j^{SHARE} are the weights of households i and j in SHP and SHARE, respectively (we consider that the sum of these weights is the same in both samples). The matrix (f_{ij}) that solves the problem can be found using standard optimal transport algorithms (Schuhmacher et al., 2020). The resulting dataset is made of all nonzero entries of (f_{ij}), and the value f_{ij} is the weight of each corresponding observation. The solution is known to be sparse, so that the resulting matched dataset will have at most $m + n - 1$ observations.

We perform this operation for the two waves (2012 and 2016) of the SHP that contain wealth information. Because the SHP and the SHARE waves do not coincide exactly, we match the 2012 SHP with the 2013 wave of SHARE, and the 2016 SHP with the 2015 wave of SHARE. We separately match households made up of singles and of couples, and restrict the SHP sample to people aged 50 and older before matching it to SHARE (which is already restricted to that population). After matching, we pool the matched dataset with the SHP sample of people below age 50.

Estimation of Asset Ownership Patterns We pool the matched dataset with the HFCS data that covers the rest of Europe. (We use the second wave of the HFCS for the SHP 2012/SHARE 2013 dataset, and the third wave of the HFCS for the SHP 2016/SHARE 2015 dataset.) Then, we estimate statistical models that decompose asset ownership patterns as a function of countries, age, education, marital status, income and wealth. The idea is to use everything we know about Switzerland (for people 50 and older) and the rest of Europe (for the whole adult population) to infer what happens for people aged 50 and younger in Switzerland.

There are two dimensions of asset ownership: the extensive margin (do you own the asset or not?) and the intensive margin (how much of the asset do you own?) For the

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-5.69	5.99	6.69	7.60	8.38	9.02	9.70	10.26	10.67	11.04	11.42	11.80
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.93	0.40	0.26	0.14	0.10	0.03	0.00	-0.00	-0.06	-0.08	-0.17	-0.24
Switzerland	-0.28	0.34	0.42	0.52	0.62	0.65	0.72	0.76	0.82	0.91	1.06	1.20
Cyprus	1.37	-0.10	-0.09	-0.07	0.01	-0.04	-0.05	-0.03	-0.06	-0.00	-0.01	-0.03
Germany	0.04	-0.42	-0.33	-0.40	-0.37	-0.39	-0.34	-0.33	-0.30	-0.24	-0.19	-0.17
Estonia	2.13	-1.75	-1.58	-1.48	-1.42	-1.43	-1.43	-1.42	-1.39	-1.30	-1.14	-1.07
Spain	2.02	-0.22	-0.25	-0.29	-0.30	-0.35	-0.37	-0.40	-0.39	-0.39	-0.37	-0.42
Finland	1.51	-0.19	-0.21	-0.28	-0.30	-0.36	-0.37	-0.36	-0.37	-0.34	-0.34	-0.39
France	0.68	-0.02	-0.05	-0.10	-0.10	-0.16	-0.19	-0.21	-0.23	-0.21	-0.21	-0.25
Greece	1.62	-0.65	-0.74	-0.83	-0.87	-0.94	-0.99	-1.00	-1.01	-0.97	-0.93	-0.96
Hungary	2.74	-1.59	-1.59	-1.62	-1.67	-1.77	-1.80	-1.82	-1.81	-1.75	-1.75	-1.80
Ireland	2.17	-0.16	-0.16	-0.20	-0.20	-0.26	-0.25	-0.24	-0.22	-0.18	-0.14	-0.22
Italy	1.02	0.04	-0.02	-0.08	-0.09	-0.16	-0.17	-0.18	-0.17	-0.14	-0.11	-0.15
Luxembourg	0.71	0.97	0.88	0.82	0.82	0.78	0.78	0.77	0.77	0.77	0.77	0.74
Latvia	2.51	-2.55	-2.44	-2.33	-2.32	-2.32	-2.28	-2.31	-2.22	-2.04	-1.80	-1.57
Malta	1.42	0.16	0.05	-0.01	-0.01	-0.09	-0.11	-0.14	-0.16	-0.16	-0.14	-0.21
Netherlands	0.82	0.50	0.34	0.18	0.10	0.01	-0.01	-0.04	-0.03	-0.03	-0.09	-0.23
Poland	1.80	-0.73	-0.83	-0.95	-1.01	-1.05	-1.04	-1.03	-1.02	-0.97	-0.88	-0.92
Portugal	1.70	-0.67	-0.52	-0.52	-0.51	-0.58	-0.61	-0.63	-0.62	-0.60	-0.60	-0.68
Slovenia	1.64	-0.47	-0.53	-0.66	-0.69	-0.75	-0.78	-0.80	-0.83	-0.79	-0.77	-0.82
Slovakia	2.42	-0.98	-0.96	-1.06	-1.11	-1.23	-1.28	-1.32	-1.33	-1.33	-1.29	-1.38
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.84	-0.20	-0.19	-0.15	-0.15	-0.14	-0.13	-0.13	-0.16	-0.19	-0.19	-0.18
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.16	0.14	0.10	0.12	0.12	0.12	0.07	0.06	0.05	0.05	0.05	0.08
ISCED 3	0.19	0.10	0.11	0.09	0.12	0.15	0.09	0.11	0.11	0.13	0.16	0.21
ISCED 4	0.03	-0.02	0.00	0.04	0.09	0.13	0.08	0.10	0.13	0.14	0.19	0.23
ISCED 5	0.23	0.05	0.03	0.05	0.12	0.16	0.13	0.15	0.18	0.18	0.22	0.27
ISCED 6	-0.58	0.02	0.01	0.05	0.11	0.15	0.13	0.17	0.20	0.24	0.30	0.37
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	1.05	-0.06	-0.09	-0.03	0.02	0.11	0.08	0.09	0.13	0.15	0.23	0.28
40-49	1.60	0.19	0.14	0.14	0.14	0.14	0.13	0.10	0.11	0.11	0.14	0.14
50-59	1.77	0.30	0.24	0.25	0.25	0.25	0.24	0.23	0.25	0.24	0.26	0.26
60-69	1.87	-0.24	-0.00	0.38	0.43	0.28	0.39	0.35	0.49	0.42	0.38	0.57
70-79	1.98	0.41	0.38	0.40	0.41	0.42	0.43	0.42	0.46	0.47	0.55	0.59
>80	1.91	-0.08	-0.15	-0.10	-0.09	-0.09	-0.01	0.04	0.10	0.11	0.05	0.01
income and wealth												
asinh(income)	0.13	0.13	0.14	0.15	0.17	0.17	0.14	0.12	0.10	0.08	0.06	0.05
asinh(wealth)	0.25	0.28	0.24	0.17	0.11	0.07	0.05	0.04	0.04	0.03	0.03	0.03

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Main Residence, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-6.57	5.31	5.90	6.98	7.66	8.62	9.61	10.38	10.80	11.25	11.60	11.86
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	1.04	0.28	0.23	0.14	0.12	0.10	0.07	0.02	-0.00	-0.10	-0.18	-0.25
Switzerland	-0.13	0.17	0.33	0.56	0.72	0.87	0.98	1.03	1.11	1.16	1.26	1.34
Cyprus	1.19	-0.20	-0.04	-0.06	-0.06	-0.05	-0.06	-0.01	0.08	0.07	0.06	0.10
Germany	0.07	-0.32	-0.28	-0.24	-0.21	-0.16	-0.16	-0.16	-0.12	-0.15	-0.07	-0.09
Estonia	2.23	-1.55	-1.45	-1.30	-1.22	-1.19	-1.22	-1.28	-1.26	-1.23	-1.10	-1.10
France	0.78	-0.05	-0.04	-0.06	-0.06	-0.09	-0.14	-0.17	-0.17	-0.22	-0.21	-0.26
Greece	1.79	-0.86	-0.90	-0.95	-0.96	-1.03	-1.10	-1.14	-1.12	-1.19	-1.15	-1.15
Croatia	2.98	-0.93	-0.81	-0.81	-0.83	-0.91	-0.95	-0.98	-0.96	-0.96	-0.84	-0.82
Hungary	2.91	-1.26	-1.24	-1.31	-1.34	-1.41	-1.49	-1.54	-1.51	-1.56	-1.55	-1.59
Ireland	1.36	0.05	0.06	0.03	0.04	0.03	0.03	0.01	0.03	0.01	-0.00	-0.02
Italy	1.19	-0.04	-0.08	-0.17	-0.17	-0.20	-0.22	-0.24	-0.22	-0.28	-0.22	-0.23
Lithuania	3.96	-1.16	-1.05	-1.08	-1.09	-1.19	-1.24	-1.30	-1.28	-1.32	-1.24	-1.13
Luxembourg	0.76	0.84	0.81	0.78	0.78	0.83	0.88	0.87	0.91	0.83	0.82	0.76
Latvia	2.59	-1.88	-1.84	-1.79	-1.72	-1.76	-1.82	-1.91	-1.91	-1.95	-1.91	-1.77
Malta	1.49	-0.09	-0.02	-0.05	-0.07	-0.07	-0.07	-0.09	-0.05	-0.11	-0.08	-0.09
Netherlands	0.99	0.28	0.30	0.24	0.23	0.19	0.14	0.07	0.07	0.06	0.09	0.06
Poland	2.02	-0.75	-0.80	-0.92	-0.96	-1.05	-1.11	-1.15	-1.11	-1.12	-1.09	-1.11
Portugal	1.79	-0.38	-0.39	-0.41	-0.44	-0.50	-0.57	-0.62	-0.62	-0.67	-0.63	-0.66
Slovenia	1.98	-0.50	-0.46	-0.56	-0.60	-0.66	-0.71	-0.73	-0.72	-0.72	-0.68	-0.70
Slovakia	2.77	-0.75	-0.74	-0.81	-0.85	-0.93	-1.02	-1.10	-1.09	-1.13	-1.07	-1.10
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.82	-0.18	-0.16	-0.15	-0.13	-0.15	-0.19	-0.19	-0.19	-0.19	-0.19	-0.23
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.01	0.13	0.10	0.12	0.12	0.13	0.12	0.14	0.16	0.13	0.14	0.14
ISCED 3	0.20	0.17	0.18	0.18	0.19	0.21	0.22	0.24	0.25	0.21	0.22	0.23
ISCED 4	0.94	0.13	0.40	0.38	0.48	0.39	0.29	0.37	0.42	0.43	0.49	0.56
ISCED 5	0.22	0.27	0.31	0.33	0.33	0.36	0.39	0.43	0.46	0.47	0.50	0.53
ISCED 6	-0.59	-0.15	-0.05	-0.08	-0.01	0.06	0.06	0.15	0.19	0.08	0.16	-0.02
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.92	0.43	0.22	0.12	0.11	0.06	0.05	0.05	0.04	0.03	0.08	0.07
40-49	1.35	0.39	0.17	0.07	0.05	0.04	0.06	0.11	0.11	0.09	0.11	0.12
50-59	1.53	0.29	0.09	0.01	-0.02	-0.01	0.04	0.10	0.11	0.13	0.18	0.19
60-69	1.68	0.26	0.08	-0.00	-0.04	-0.03	0.02	0.09	0.12	0.13	0.18	0.20
70-79	1.67	0.24	0.08	-0.01	-0.03	-0.02	0.05	0.13	0.16	0.15	0.19	0.25
>80	1.68	0.25	0.02	-0.10	-0.10	-0.07	0.00	0.10	0.15	0.17	0.21	0.22
income and wealth												
asinh(income)	0.06	0.10	0.10	0.08	0.09	0.09	0.09	0.08	0.07	0.06	0.05	0.05
asinh(wealth)	0.40	0.35	0.34	0.29	0.25	0.19	0.12	0.07	0.05	0.05	0.04	0.04

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Main Residence, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-8.99	-0.19	2.72	2.21	3.01	4.30	5.99	6.83	8.04	9.32	9.75	10.52
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.22	-0.13	0.01	0.15	0.22	0.25	0.25	0.33	0.18	0.14	0.19	0.24
Switzerland	-0.03	-0.71	-0.03	0.38	0.61	0.65	0.70	0.77	0.85	0.89	1.15	1.13
Cyprus	2.05	-0.16	-0.01	0.10	0.36	0.44	0.44	0.53	0.58	0.63	0.88	1.01
Germany	0.76	-0.95	-0.75	-0.56	-0.33	-0.27	-0.26	-0.21	-0.17	-0.17	0.00	0.03
Estonia	1.89	-1.10	-1.45	-0.99	-0.78	-0.84	-0.95	-0.94	-1.05	-1.09	-0.92	-1.02
Spain	1.78	-0.15	-0.44	-0.18	0.05	0.05	-0.01	-0.01	-0.11	-0.13	-0.10	-0.16
Finland	1.31	-0.80	-0.45	-0.02	0.06	-0.01	-0.09	-0.14	-0.24	-0.31	-0.24	-0.33
France	0.91	-0.89	-0.73	-0.29	-0.05	-0.02	-0.00	-0.00	-0.06	-0.09	0.04	-0.07
Greece	1.95	-0.48	-0.64	-0.41	-0.32	-0.40	-0.49	-0.48	-0.53	-0.56	-0.41	-0.38
Hungary	1.55	-0.92	-1.29	-1.04	-0.93	-1.04	-1.17	-1.26	-1.44	-1.63	-1.57	-1.74
Ireland	0.94	0.99	0.82	0.66	0.67	0.70	0.75	0.86	0.84	0.82	0.87	0.75
Italy	0.89	-0.52	-0.56	-0.40	-0.22	-0.24	-0.22	-0.17	-0.25	-0.28	-0.23	-0.23
Luxembourg	0.45	0.11	0.36	0.63	0.73	0.69	0.70	0.83	0.83	0.99	1.18	1.33
Latvia	2.69	-1.06	-1.37	-1.20	-1.17	-1.35	-1.61	-1.62	-1.64	-1.77	-1.71	-1.72
Malta	1.33	0.02	-0.20	-0.24	0.04	0.09	0.03	0.06	-0.07	-0.05	0.13	0.00
Netherlands	-0.42	-0.34	-0.32	-0.26	0.01	0.13	0.22	0.14	0.25	0.45	0.51	0.46
Poland	0.99	-0.96	-1.18	-1.08	-0.86	-0.84	-0.95	-0.95	-1.05	-1.15	-1.12	-1.23
Portugal	1.65	-1.13	-1.07	-0.62	-0.36	-0.29	-0.30	-0.27	-0.41	-0.43	-0.31	-0.29
Slovenia	1.62	-1.79	-1.56	-1.29	-0.99	-0.90	-0.92	-0.80	-0.82	-0.88	-0.72	-0.82
Slovakia	1.08	-1.55	-1.72	-1.73	-1.72	-1.70	-1.67	-1.65	-1.50	-1.50	-1.52	-1.63
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.17	-0.04	-0.16	-0.05	0.06	0.13	0.05	-0.01	-0.08	-0.09	-0.14	-0.16
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.12	-0.61	-0.63	-0.40	-0.25	-0.25	-0.22	-0.22	-0.10	-0.08	0.09	0.13
ISCED 3	0.03	-0.40	-0.46	-0.24	-0.17	-0.18	-0.15	-0.16	-0.06	0.04	0.30	0.20
ISCED 4	0.18	-0.88	-0.54	-0.33	-0.23	-0.18	-0.15	-0.13	0.01	0.06	0.25	0.20
ISCED 5	0.33	-0.71	-0.64	-0.36	-0.22	-0.12	-0.08	-0.04	0.10	0.19	0.34	0.38
ISCED 6	-0.32	-0.55	-0.62	-0.39	-0.31	-0.20	-0.13	-0.07	0.09	0.16	0.43	0.49
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	-0.00	-1.62	-1.22	-0.88	-0.54	-0.38	-0.13	-0.07	0.13	0.20	0.49	0.58
40-49	0.17	0.12	0.12	0.32	0.33	0.28	0.22	0.30	0.24	0.13	0.07	0.16
50-59	0.48	0.12	0.08	0.30	0.42	0.40	0.40	0.42	0.35	0.30	0.27	0.36
60-69	0.57	1.09	1.16	0.75	0.55	0.33	0.21	0.03	0.29	0.09	0.20	0.27
70-79	0.46	0.23	0.25	0.42	0.57	0.57	0.58	0.62	0.58	0.57	0.55	0.67
>80	0.11	0.03	-0.18	-0.09	-0.15	-0.13	0.01	0.15	0.23	0.26	0.04	0.04
income and wealth												
asinh(income)	0.27	0.39	0.26	0.30	0.30	0.33	0.31	0.29	0.23	0.17	0.15	0.13
asinh(wealth)	0.30	0.45	0.39	0.39	0.33	0.23	0.14	0.11	0.09	0.07	0.06	0.05

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Other Real Estate, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-10.39	0.82	0.49	0.86	1.92	3.26	4.73	5.80	6.54	7.81	9.77	10.77
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.10	-0.28	0.14	0.21	0.25	0.23	0.26	0.29	0.19	0.06	-0.08	-0.28
Switzerland	-0.06	0.24	0.36	0.53	0.70	0.93	1.11	1.21	1.38	1.45	1.37	1.28
Cyprus	1.92	0.01	0.13	0.12	0.21	0.33	0.34	0.46	0.51	0.63	0.68	0.58
Germany	0.78	-0.87	-0.34	-0.45	-0.30	-0.12	-0.10	-0.07	-0.10	-0.19	-0.15	-0.39
Estonia	1.85	-1.02	-0.86	-0.79	-0.77	-0.79	-0.86	-0.86	-0.88	-0.99	-1.20	-1.38
France	0.79	-1.03	-0.56	-0.25	-0.04	0.02	0.01	0.01	-0.07	-0.19	-0.25	-0.50
Greece	2.13	-0.29	-0.12	-0.16	-0.25	-0.34	-0.42	-0.49	-0.57	-0.72	-0.81	-1.15
Croatia	1.45	-2.87	-1.80	-1.51	-1.29	-1.07	-0.94	-0.86	-0.75	-0.89	-0.82	-1.15
Hungary	1.40	-0.55	-0.46	-0.60	-0.73	-0.80	-0.95	-1.01	-1.05	-1.25	-1.44	-1.68
Ireland	0.31	0.83	0.83	0.55	0.54	0.59	0.62	0.63	0.56	0.52	0.59	0.27
Italy	0.69	-0.39	-0.37	-0.44	-0.30	-0.22	-0.14	-0.19	-0.27	-0.40	-0.39	-0.65
Lithuania	1.44	-1.16	-0.94	-0.99	-0.91	-0.90	-0.92	-0.80	-0.80	-0.69	-0.28	-0.84
Luxembourg	0.19	-0.06	0.34	0.34	0.48	0.55	0.61	0.68	0.67	0.71	0.80	0.84
Latvia	2.58	-0.61	-0.68	-0.76	-0.98	-1.11	-1.20	-1.19	-1.22	-1.37	-1.61	-2.03
Malta	1.22	-0.08	-0.27	-0.41	-0.34	-0.13	-0.12	-0.00	-0.01	-0.05	-0.07	-0.12
Netherlands	-0.81	-1.28	-0.91	-1.03	-0.50	-0.36	-0.29	-0.19	-0.20	-0.18	-0.38	-0.53
Poland	1.29	-0.88	-0.78	-0.92	-0.99	-0.94	-0.96	-0.98	-1.10	-1.30	-1.42	-1.76
Portugal	1.52	-1.12	-0.83	-0.58	-0.44	-0.39	-0.33	-0.30	-0.37	-0.49	-0.55	-0.87
Slovenia	1.45	-1.06	-0.90	-0.95	-0.92	-0.79	-0.73	-0.68	-0.72	-0.86	-0.96	-1.16
Slovakia	1.38	-1.51	-1.35	-1.28	-1.33	-1.31	-1.35	-1.39	-1.41	-1.47	-1.62	-1.88
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.11	-0.11	-0.05	-0.01	-0.00	0.01	-0.00	-0.03	-0.06	-0.06	-0.07	-0.10
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.03	0.25	0.32	0.30	0.28	0.10	0.17	0.30	0.25	0.28	0.20	0.22
ISCED 3	0.13	0.27	0.36	0.35	0.44	0.27	0.24	0.29	0.26	0.28	0.28	0.32
ISCED 4	0.27	0.63	-0.00	-0.29	0.26	0.12	0.09	0.37	0.76	0.59	0.47	-0.02
ISCED 5	0.41	0.72	0.58	0.60	0.65	0.54	0.51	0.53	0.54	0.56	0.62	0.63
ISCED 6	-0.34	-0.07	0.04	-0.30	-0.22	-0.48	-0.44	-0.26	-0.32	-0.39	-0.31	-0.40
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.15	-0.41	-0.26	-0.00	0.20	0.21	-0.04	-0.17	-0.01	-0.04	-0.21	0.05
40-49	0.48	-0.33	-0.26	-0.10	0.11	0.11	-0.10	-0.21	-0.05	-0.11	-0.17	0.07
50-59	0.62	-0.42	-0.27	-0.24	-0.05	0.07	-0.13	-0.23	-0.06	-0.06	-0.16	0.04
60-69	0.69	-0.47	-0.39	-0.27	-0.04	-0.01	-0.15	-0.20	0.02	0.09	0.04	0.17
70-79	0.66	-0.68	-0.45	-0.21	0.03	0.07	-0.09	-0.16	-0.03	-0.02	-0.09	0.13
>80	0.45	-1.80	-0.95	-0.48	-0.22	-0.20	-0.31	-0.25	0.02	0.06	-0.12	0.16
income and wealth												
asinh(income)	0.26	0.20	0.28	0.28	0.27	0.25	0.24	0.25	0.21	0.21	0.18	0.14
asinh(wealth)	0.40	0.50	0.48	0.49	0.43	0.37	0.31	0.23	0.23	0.16	0.08	0.07

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Other Real Estate, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-6.85	5.45	4.11	5.67	6.08	7.16	7.87	8.17	8.55	9.17	10.36	11.90
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	-0.47	-4.20	-2.38	-2.17	-1.91	-1.67	-1.59	-1.69	-1.56	-1.11	-0.69	-0.45
Switzerland	0.49	-8.51	-7.84	-4.23	-2.93	-2.18	-1.55	-1.11	-0.61	-0.35	-0.09	-0.12
Cyprus	0.32	-0.72	-1.01	-1.59	-1.41	-1.48	-1.32	-0.79	-0.38	-0.89	-1.34	-0.90
Germany	0.39	-2.14	-2.44	-2.04	-1.74	-1.65	-1.59	-1.47	-1.36	-1.54	-1.15	-1.10
Estonia	-0.49	-1.95	-2.61	-2.37	-2.19	-2.39	-2.54	-2.18	-1.98	-1.87	-2.25	-1.78
Spain	0.33	-0.72	-1.11	-1.29	-1.23	-1.37	-1.28	-1.27	-1.17	-1.35	-1.33	-1.54
Finland	-0.35	-2.65	-2.92	-2.90	-2.76	-2.93	-2.86	-2.78	-2.69	-2.72	-2.72	-2.88
France	0.24	-1.45	-1.55	-1.47	-1.42	-1.12	-1.02	-0.89	-0.53	-0.54	-0.77	-0.85
Greece	1.36	-0.62	-0.75	-1.25	-1.31	-1.52	-1.65	-1.61	-1.65	-1.93	-2.11	-2.34
Hungary	1.05	-2.51	-2.50	-1.76	-1.77	-1.96	-2.12	-2.21	-2.31	-2.61	-2.95	-3.19
Ireland	0.86	-0.60	-0.95	-1.29	-1.35	-1.44	-1.57	-1.59	-1.56	-1.77	-1.93	-2.16
Italy	0.97	-0.70	-0.80	-1.06	-1.06	-1.24	-1.39	-1.42	-1.37	-1.53	-1.59	-1.66
Luxembourg	-2.25	0.57	-0.84	-0.90	-0.89	-1.16	-0.03	-0.02	-0.01	0.28	0.14	0.70
Latvia	0.58	-2.91	-3.42	-4.03	-3.30	-3.08	-2.59	-2.27	-1.62	-1.43	-1.38	-2.01
Malta	0.83	1.63	0.65	-0.25	-0.59	-1.02	-1.29	-1.45	-1.59	-1.71	-1.65	-1.93
Netherlands	-1.28	-1.82	-2.42	-0.01	0.67	0.28	0.02	0.00	-0.05	-0.30	1.87	0.85
Poland	1.50	-0.63	-1.00	-1.19	-1.15	-1.25	-1.22	-1.14	-1.07	-1.42	-1.77	-2.11
Portugal	0.29	-1.37	-1.77	-1.93	-1.82	-1.88	-1.94	-1.74	-1.62	-1.62	-1.72	-1.76
Slovenia	0.65	-4.26	-3.11	-2.92	-2.64	-2.48	-2.19	-1.90	-1.60	-1.52	-1.57	-1.80
Slovakia	0.64	-6.75	-5.41	-3.95	-3.78	-3.72	-2.98	-2.82	-2.62	-2.65	-2.74	-2.62
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.56	0.30	0.20	-0.22	-0.11	-0.07	-0.02	-0.19	-0.38	-0.29	-0.12	-0.31
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.22	0.48	0.85	1.02	0.73	0.46	0.23	0.24	0.11	0.18	0.01	0.14
ISCED 3	-0.09	0.24	0.55	0.89	0.63	0.44	0.30	0.24	0.08	0.24	0.23	0.39
ISCED 4	-0.48	0.03	0.35	0.76	0.63	0.43	0.32	0.34	0.16	0.30	0.27	0.49
ISCED 5	-0.07	0.12	0.17	0.34	0.29	0.17	0.03	0.16	0.12	0.32	0.24	0.48
ISCED 6	-0.52	-2.71	-0.41	0.49	0.59	0.18	0.42	0.37	0.28	0.47	0.65	0.90
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.37	-0.22	-0.69	0.09	0.23	0.32	0.25	0.16	0.14	0.54	0.29	0.54
40-49	0.35	-0.11	-0.18	-0.18	0.14	0.16	0.19	0.15	0.15	0.16	0.03	0.16
50-59	0.30	-0.05	-0.05	-0.02	0.26	0.24	0.23	0.31	0.29	0.32	0.30	0.39
60-69	-0.43	7.20	5.68	3.69	2.87	1.77	0.94	0.34	0.86	0.60	-0.29	-0.67
70-79	-1.29	-0.41	-0.53	-0.43	-0.08	-0.18	-0.16	-0.08	-0.04	0.08	0.18	0.49
>80	-2.13	-0.88	-2.37	1.50	1.38	0.64	0.35	0.68	0.17	0.12	0.20	0.77
income and wealth												
asinh(income)	0.19	0.12	0.26	0.15	0.15	0.16	0.17	0.18	0.18	0.15	0.10	0.04
asinh(wealth)	0.19	0.12	0.17	0.20	0.20	0.16	0.14	0.13	0.14	0.14	0.15	0.11

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Other Non-financial Assets, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-7.43	4.31	3.16	2.42	4.00	5.32	6.82	7.32	8.05	8.98	10.92	11.63
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.11	-5.60	-2.65	-2.01	-2.43	-2.61	-2.46	-2.39	-1.75	-1.49	-0.94	0.55
Switzerland	0.70	-8.26	-7.27	-3.70	-2.84	-1.84	-1.36	-0.97	-0.46	-0.05	0.10	0.61
Cyprus	0.18	-3.12	-1.74	0.10	-0.16	0.07	0.09	-0.16	-0.01	0.19	0.45	0.89
Germany	0.40	-1.69	-1.59	-1.02	-1.37	-1.32	-1.46	-1.37	-1.33	-0.93	-0.93	-0.48
Estonia	-0.44	-1.91	-2.02	-1.92	-2.65	-2.29	-2.28	-2.33	-2.16	-2.38	-2.20	-1.43
France	0.32	-2.24	-1.79	-1.36	-1.74	-1.55	-1.48	-1.40	-1.20	-1.24	-1.21	-1.13
Greece	1.56	-0.08	-0.13	-0.10	-0.64	-0.86	-1.19	-1.34	-1.38	-1.55	-1.79	-1.79
Croatia	-0.80	-2.58	-1.01	-0.84	-1.30	-1.75	-1.91	-1.96	-1.67	-2.04	-2.40	-2.87
Hungary	0.80	-1.37	-1.47	-1.42	-1.98	-2.27	-2.68	-2.70	-2.66	-2.76	-2.83	-2.41
Ireland	0.75	0.16	-0.08	-0.28	-0.93	-0.92	-1.06	-1.10	-1.12	-1.28	-1.44	-1.30
Italy	0.93	-0.51	-0.44	-0.20	-0.70	-0.70	-0.96	-1.07	-1.10	-1.34	-1.60	-1.56
Lithuania	-0.26	-0.44	-1.27	-1.75	-2.03	-2.67	-2.99	-3.24	-2.22	-1.42	-0.02	-0.50
Luxembourg	-1.82	-6.47	-7.97	-0.69	0.31	0.24	0.24	-0.00	-0.20	-0.05	-0.36	0.85
Latvia	0.20	-7.94	-7.95	-3.35	-3.74	-4.27	-4.09	-3.73	-3.62	-2.90	-2.46	-2.70
Malta	0.44	0.27	-0.50	-0.35	-0.26	-0.36	-0.52	-0.74	-0.58	-0.33	-0.52	0.00
Netherlands	-0.63	-0.96	-0.77	-0.13	-0.63	-0.64	-0.54	-0.23	-0.12	-0.21	-0.51	-0.79
Poland	1.70	-0.11	-0.15	-0.08	-0.55	-0.75	-1.08	-1.19	-1.32	-1.63	-2.15	-2.19
Portugal	0.51	-1.67	-1.67	-1.22	-1.63	-1.78	-1.79	-1.76	-1.67	-1.75	-2.15	-1.56
Slovenia	0.69	-4.54	-3.69	-2.07	-2.16	-1.75	-1.91	-1.83	-1.72	-1.20	-1.21	-1.13
Slovakia	0.86	-6.81	-4.45	-3.76	-3.38	-3.06	-3.16	-3.24	-2.63	-2.41	-2.13	-2.18
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.28	-0.07	0.01	0.27	0.09	0.17	0.05	-0.04	-0.03	-0.04	0.02	-0.03
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.10	0.35	0.26	0.16	0.26	0.26	0.26	0.31	0.09	0.09	-0.21	-0.33
ISCED 3	0.00	0.15	-0.16	0.10	0.09	0.20	0.33	0.38	0.21	0.14	-0.05	-0.03
ISCED 4	0.28	1.61	1.51	2.17	2.14	1.32	0.68	0.37	0.85	1.61	0.40	0.92
ISCED 5	-0.07	-0.58	-0.62	-0.55	-0.38	-0.18	0.05	0.21	0.07	-0.01	-0.14	-0.10
ISCED 6	-0.59	0.13	0.14	-2.04	1.10	0.33	0.19	-0.31	-0.52	-0.43	-0.65	-1.24
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.41	-0.67	0.31	0.38	0.12	-0.11	0.13	0.32	0.25	0.21	0.18	0.24
40-49	0.37	-0.10	0.22	0.29	0.20	0.04	0.10	0.27	0.17	0.17	0.22	0.59
50-59	0.33	-0.28	0.17	0.17	-0.11	-0.16	0.02	0.33	0.26	0.27	0.37	0.54
60-69	-0.53	-0.63	-0.02	0.04	0.03	-0.07	0.08	0.30	0.24	0.22	0.37	0.62
70-79	-1.25	-1.81	-0.44	-0.28	-0.09	-0.36	-0.01	0.21	0.27	0.25	0.64	0.45
>80	-1.90	-2.25	-2.45	-3.74	-1.19	-0.98	-0.20	0.35	0.23	0.26	0.12	-0.15
income and wealth												
asinh(income)	0.13	0.22	0.20	0.26	0.24	0.20	0.16	0.12	0.12	0.11	0.08	0.04
asinh(wealth)	0.27	0.13	0.27	0.32	0.30	0.27	0.21	0.22	0.21	0.19	0.14	0.13

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Other Non-financial Assets, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-0.44	-4.07	-2.48	-0.78	0.43	1.62	2.64	3.57	4.43	5.31	6.11	7.12
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.41	-1.16	-1.00	-0.74	-0.58	-0.42	-0.35	-0.24	-0.10	0.03	0.14	0.15
Switzerland	0.14	-1.25	-1.05	-0.76	-0.46	-0.23	0.04	0.26	0.43	0.67	0.90	1.02
Cyprus	-2.25	-1.52	-0.95	-0.28	0.06	0.04	0.15	0.22	0.24	0.34	0.44	0.51
Germany	-0.22	-0.79	-0.84	-0.82	-0.69	-0.60	-0.47	-0.40	-0.26	-0.15	-0.02	0.14
Estonia	0.40	-3.78	-3.29	-2.77	-2.30	-1.98	-1.72	-1.51	-1.28	-1.21	-0.96	-0.86
Spain	-0.02	-1.05	-1.23	-1.17	-1.02	-0.91	-0.78	-0.54	-0.43	-0.27	-0.13	-0.09
Finland	1.05	-1.16	-1.18	-1.11	-0.97	-0.87	-0.75	-0.60	-0.53	-0.36	-0.18	-0.13
France	2.02	-0.52	-0.70	-0.73	-0.65	-0.54	-0.45	-0.34	-0.31	-0.27	-0.20	-0.25
Greece	-1.85	-3.14	-2.44	-2.03	-1.77	-1.63	-1.47	-1.34	-1.21	-1.11	-0.91	-0.85
Hungary	-1.36	-1.77	-1.83	-1.76	-1.45	-1.16	-1.03	-1.03	-1.13	-1.28	-1.32	-1.30
Ireland	-0.58	-1.59	-1.61	-1.39	-1.22	-0.98	-0.80	-0.61	-0.41	-0.25	-0.09	-0.01
Italy	-1.31	0.09	-0.22	-0.38	-0.44	-0.51	-0.55	-0.55	-0.59	-0.60	-0.55	-0.53
Luxembourg	-0.08	-0.86	-0.65	-0.57	-0.42	-0.22	-0.05	0.10	0.27	0.45	0.57	0.66
Latvia	-1.90	-3.02	-3.04	-2.93	-2.90	-2.93	-2.86	-2.80	-2.66	-2.32	-2.04	-1.82
Malta	-0.02	0.49	0.29	0.21	0.25	0.23	0.21	0.16	0.10	0.05	0.12	0.14
Netherlands	0.71	-0.53	-0.50	-0.44	-0.34	-0.26	-0.17	-0.08	-0.04	0.09	0.18	0.23
Poland	-1.54	-2.13	-2.02	-2.04	-2.08	-2.05	-1.99	-1.90	-1.80	-1.63	-1.47	-1.58
Portugal	0.62	-1.55	-1.30	-1.09	-0.98	-0.79	-0.60	-0.42	-0.27	-0.14	0.01	0.00
Slovenia	-0.77	-3.83	-3.62	-3.20	-2.84	-2.56	-2.25	-1.98	-1.73	-1.35	-0.97	-0.82
Slovakia	-1.32	-1.65	-1.59	-1.61	-1.57	-1.55	-1.39	-1.35	-1.39	-1.36	-1.37	-1.42
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.26	-0.01	-0.07	-0.15	-0.16	-0.15	-0.15	-0.18	-0.17	-0.15	-0.15	-0.16
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.09	-0.04	-0.08	-0.16	-0.20	-0.19	-0.13	-0.08	-0.07	0.02	0.12	0.15
ISCED 3	0.73	-0.33	-0.24	-0.27	-0.21	-0.20	-0.16	-0.12	-0.04	0.04	0.11	0.27
ISCED 4	-0.04	-0.31	-0.25	-0.29	-0.17	-0.10	-0.07	-0.01	0.11	0.22	0.41	0.52
ISCED 5	1.22	-0.05	0.00	0.03	0.07	0.18	0.24	0.30	0.39	0.49	0.68	0.72
ISCED 6	0.56	0.31	0.38	0.37	0.39	0.50	0.46	0.48	0.53	0.61	0.74	0.76
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	-0.73	0.64	0.68	0.64	0.66	0.75	0.69	0.71	0.74	0.79	0.90	0.88
40-49	-0.81	0.04	0.13	0.07	0.11	0.12	0.09	0.10	0.14	0.13	0.10	0.06
50-59	-0.82	0.54	0.53	0.55	0.52	0.53	0.46	0.43	0.44	0.40	0.37	0.31
60-69	-0.74	0.19	0.15	0.64	0.90	0.89	0.78	0.55	0.35	0.23	0.28	0.06
70-79	-0.69	0.96	1.01	1.02	1.05	1.06	1.01	0.99	0.97	0.93	0.84	0.82
>80	-0.86	-0.13	-0.03	0.03	0.08	0.14	0.15	0.05	0.04	-0.07	-0.09	-0.13
income and wealth												
asinh(income)	0.25	0.73	0.67	0.60	0.56	0.48	0.43	0.38	0.33	0.28	0.25	0.20
asinh(wealth)	0.12	0.21	0.19	0.18	0.15	0.15	0.13	0.12	0.12	0.11	0.10	0.09

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Deposits, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-0.10	-3.28	-1.89	-0.56	0.98	2.01	3.63	4.45	5.35	6.28	7.22	8.08
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	-0.05	-1.64	-1.21	-0.97	-0.70	-0.52	-0.39	-0.26	-0.09	0.05	0.15	0.15
Switzerland	1.16	-1.19	-0.91	-0.54	-0.17	0.13	0.39	0.65	0.88	1.12	1.36	1.50
Cyprus	-2.78	-2.26	-1.97	-1.74	-1.34	-0.81	-0.71	-0.64	-0.39	-0.23	-0.01	-0.13
Germany	-0.51	-0.93	-0.87	-0.67	-0.50	-0.43	-0.37	-0.22	-0.12	-0.06	-0.04	-0.10
Estonia	0.35	-3.47	-3.12	-2.39	-2.01	-1.64	-1.55	-1.27	-1.10	-0.95	-0.92	-0.95
France	1.05	-0.83	-0.92	-0.86	-0.75	-0.60	-0.48	-0.35	-0.23	-0.16	-0.20	-0.25
Greece	-0.63	-5.87	-5.08	-3.44	-2.78	-2.37	-2.22	-1.95	-1.69	-1.49	-1.40	-1.35
Croatia	-2.47	-3.83	-3.51	-2.93	-2.74	-2.47	-2.42	-2.25	-2.13	-1.93	-1.61	-1.37
Hungary	-2.12	-2.71	-2.59	-2.36	-2.32	-2.14	-2.06	-1.81	-1.43	-1.13	-0.89	-0.89
Ireland	-0.81	-2.33	-2.01	-1.68	-1.42	-1.22	-1.07	-0.92	-0.78	-0.58	-0.37	-0.25
Italy	-1.35	-0.23	-0.29	-0.40	-0.42	-0.46	-0.51	-0.49	-0.46	-0.44	-0.49	-0.51
Lithuania	-0.62	-2.71	-2.73	-2.39	-2.44	-2.27	-2.24	-2.00	-1.80	-1.69	-1.62	-1.67
Luxembourg	-0.38	-1.32	-1.01	-0.58	-0.39	-0.17	0.08	0.31	0.45	0.57	0.62	0.56
Latvia	-0.83	-5.90	-5.39	-3.96	-3.64	-3.47	-3.37	-3.20	-3.00	-2.77	-2.52	-2.50
Malta	0.09	-0.31	-0.18	-0.03	0.05	0.08	0.10	0.18	0.17	0.16	0.13	0.09
Netherlands	1.29	-0.27	-0.21	-0.08	0.03	0.10	0.13	0.19	0.31	0.35	0.41	0.42
Poland	-1.63	-1.45	-1.35	-1.28	-1.29	-1.22	-1.22	-1.11	-1.03	-1.01	-1.16	-1.31
Portugal	0.67	-1.48	-1.27	-1.14	-1.03	-0.87	-0.69	-0.51	-0.35	-0.22	-0.19	-0.17
Slovenia	-1.36	-3.20	-2.71	-2.39	-2.28	-2.08	-1.96	-1.67	-1.47	-1.28	-1.26	-1.16
Slovakia	-1.34	-2.23	-2.24	-1.90	-1.74	-1.59	-1.61	-1.54	-1.42	-1.35	-1.30	-1.29
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.28	-0.00	-0.07	-0.16	-0.16	-0.21	-0.26	-0.26	-0.24	-0.23	-0.22	-0.21
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.14	0.30	0.22	0.28	0.32	0.33	0.30	0.19	0.17	0.17	0.15	0.19
ISCED 3	0.79	0.53	0.55	0.54	0.63	0.62	0.59	0.50	0.49	0.53	0.49	0.51
ISCED 4	0.66	1.08	0.79	1.03	0.99	1.12	1.02	0.92	0.95	1.37	1.45	1.43
ISCED 5	1.41	1.09	1.08	1.02	1.11	1.13	1.16	1.05	1.03	0.99	0.94	1.03
ISCED 6	0.24	0.58	0.34	0.15	0.29	0.33	0.38	0.31	0.26	0.24	0.11	-0.01
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	-0.63	-0.64	-0.42	-0.28	-0.31	-0.20	-0.17	-0.02	-0.02	-0.01	0.14	0.20
40-49	-0.88	-0.66	-0.44	-0.31	-0.26	-0.21	-0.15	-0.02	0.04	0.10	0.28	0.32
50-59	-1.11	-0.70	-0.43	-0.31	-0.25	-0.19	-0.06	0.13	0.17	0.27	0.42	0.52
60-69	-0.98	-0.41	-0.13	0.03	0.10	0.19	0.27	0.43	0.44	0.53	0.70	0.75
70-79	-1.00	-0.11	0.06	0.18	0.23	0.30	0.39	0.49	0.49	0.53	0.67	0.76
>80	-0.96	-0.27	0.10	0.31	0.43	0.54	0.57	0.59	0.59	0.68	0.81	0.91
income and wealth												
asinh(income)	0.23	0.68	0.63	0.57	0.48	0.43	0.32	0.28	0.23	0.17	0.14	0.11
asinh(wealth)	0.13	0.24	0.20	0.19	0.18	0.16	0.14	0.13	0.13	0.12	0.11	0.10

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Deposits, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-7.98	-1.48	-0.93	0.69	1.45	2.33	2.92	3.64	4.75	5.78	7.57	8.01
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	1.58	0.64	0.65	0.54	0.42	0.37	0.37	0.28	0.15	0.12	-0.25	-0.23
Switzerland	1.03	1.55	1.53	1.50	1.50	1.55	1.64	1.59	1.58	1.59	1.38	1.44
Cyprus	0.34	-0.91	-0.69	-0.45	-0.26	-0.01	0.20	0.36	0.49	0.94	0.49	0.59
Germany	1.93	0.24	0.24	0.36	0.40	0.40	0.51	0.40	0.38	0.30	-0.01	0.02
Estonia	0.87	-1.20	-0.76	-0.89	-0.99	-1.13	-1.08	-1.25	-1.40	-1.60	-2.08	-1.97
Spain	0.81	-0.38	-0.16	-0.11	-0.06	-0.02	0.10	0.00	-0.03	0.03	-0.03	0.28
Finland	0.65	-1.66	-1.22	-0.83	-0.67	-0.61	-0.50	-0.56	-0.59	-0.59	-0.86	-0.78
France	1.55	-0.81	-0.35	-0.06	0.07	0.13	0.31	0.31	0.37	0.45	0.32	0.56
Greece	-2.30	-1.12	-0.74	-1.44	-1.39	-0.64	-0.76	-0.55	-0.65	-0.86	-0.80	-0.84
Hungary	0.73	-0.04	-0.11	-0.04	-0.09	-0.09	-0.03	-0.24	-0.38	-0.57	-1.18	-1.19
Ireland	-0.47	1.57	1.31	1.25	1.36	1.38	1.43	1.31	1.28	1.35	1.03	0.92
Italy	-0.33	0.45	0.44	0.49	0.38	0.30	0.34	0.19	0.05	-0.06	-0.32	-0.35
Luxembourg	0.65	0.27	0.32	0.48	0.44	0.43	0.49	0.49	0.51	0.54	0.37	0.43
Latvia	0.07	-2.06	-2.25	-2.14	-2.46	-2.40	-1.96	-1.92	-1.92	-1.76	-2.01	-2.09
Malta	0.91	1.30	1.23	0.85	0.64	0.60	0.59	0.52	0.35	0.26	-0.05	-0.18
Netherlands	1.36	1.33	1.34	1.37	1.42	1.51	1.51	1.46	1.34	1.20	0.74	0.57
Poland	2.43	-0.68	-0.86	-1.25	-1.47	-1.64	-1.71	-1.97	-2.17	-2.37	-2.86	-2.98
Portugal	0.72	-0.78	-0.57	-0.63	-0.66	-0.64	-0.53	-0.60	-0.66	-0.62	-0.82	-0.63
Slovenia	0.34	-1.81	-0.90	-0.60	-0.58	-0.57	-0.59	-0.73	-0.85	-0.99	-1.34	-1.40
Slovakia	0.46	-0.75	-0.51	-0.51	-0.66	-0.72	-0.69	-0.77	-0.97	-0.91	-1.37	-1.36
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.17	0.39	0.21	0.05	0.03	0.00	0.05	0.01	0.01	0.01	-0.07	-0.10
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.01	0.21	0.25	0.41	0.33	0.34	0.31	0.42	0.36	0.22	0.30	0.25
ISCED 3	0.29	0.79	0.79	0.78	0.74	0.65	0.68	0.76	0.68	0.52	0.51	0.38
ISCED 4	0.13	1.04	1.03	1.05	0.97	0.95	0.94	1.04	0.94	0.78	0.78	0.52
ISCED 5	0.38	1.23	1.15	1.14	1.05	1.02	1.03	1.11	1.04	0.86	0.85	0.68
ISCED 6	0.08	1.02	0.98	1.02	0.90	0.92	0.91	1.11	1.07	0.89	1.01	0.74
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.30	0.97	1.00	1.18	1.11	1.01	1.03	1.18	1.13	1.21	1.19	0.90
40-49	0.42	-0.27	-0.18	-0.23	-0.18	-0.11	-0.17	-0.13	-0.04	0.05	0.11	0.09
50-59	0.45	0.03	0.08	0.15	0.14	0.13	0.07	0.15	0.17	0.22	0.27	0.26
60-69	-0.11	-0.09	0.32	0.38	0.42	0.48	0.24	0.42	0.53	0.65	1.09	0.90
70-79	-0.93	0.08	0.18	0.33	0.28	0.30	0.23	0.34	0.40	0.47	0.57	0.58
>80	-0.88	-0.54	-0.44	-0.35	-0.34	-0.26	-0.35	-0.28	-0.16	0.02	-0.01	0.10
income and wealth												
asinh(income)	0.44	0.56	0.54	0.44	0.42	0.39	0.37	0.32	0.27	0.23	0.14	0.16
asinh(wealth)	0.08	0.09	0.11	0.11	0.12	0.10	0.10	0.10	0.09	0.08	0.07	0.07

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Pensions and Life Insurance, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-8.72	-2.62	-0.35	-0.53	0.78	0.79	1.77	2.86	3.74	5.44	6.42	7.34
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	1.73	1.19	0.72	0.61	0.55	0.49	0.34	0.18	0.15	0.02	-0.08	-0.26
Switzerland	1.46	2.39	2.16	1.82	1.94	1.89	1.90	1.87	1.98	2.04	2.09	1.99
Cyprus	1.03	2.16	1.39	1.23	1.06	1.12	1.02	0.87	0.91	0.94	0.64	0.24
Germany	1.94	1.35	1.07	0.84	0.86	0.83	0.78	0.65	0.60	0.52	0.39	0.20
Estonia	0.94	-0.79	-0.90	-0.70	-0.70	-0.70	-0.79	-1.00	-1.08	-1.33	-1.43	-1.50
France	1.83	-0.29	-0.14	-0.01	0.19	0.31	0.34	0.33	0.49	0.52	0.59	0.61
Greece	-3.36	3.73	2.87	2.12	1.82	1.38	1.08	0.68	0.62	-0.01	-0.15	-0.52
Croatia	0.05	1.63	0.83	0.35	0.32	0.28	-0.01	-0.06	-0.05	-0.25	-0.62	-0.86
Hungary	-0.19	-0.02	-0.39	-0.41	-0.45	-0.40	-0.59	-0.70	-0.65	-0.83	-0.95	-1.18
Ireland	0.10	1.49	1.48	1.50	1.48	1.47	1.41	1.40	1.60	1.60	1.69	1.76
Italy	-0.17	0.96	0.52	0.47	0.46	0.41	0.37	0.29	0.22	0.02	-0.06	-0.24
Lithuania	0.46	0.98	0.05	0.07	-0.30	0.22	0.31	0.39	0.21	-0.27	-0.37	-0.43
Luxembourg	0.01	1.32	0.93	0.74	0.64	0.53	0.53	0.42	0.60	0.55	0.42	0.38
Latvia	1.54	-1.57	-1.64	-1.68	-1.80	-1.77	-1.80	-1.94	-1.94	-2.20	-2.08	-2.08
Malta	0.76	2.42	2.10	1.83	1.64	1.50	1.25	1.06	0.88	0.61	0.63	0.55
Netherlands	1.09	1.70	1.47	1.41	1.46	1.55	1.59	1.53	1.61	1.57	1.55	1.43
Poland	2.15	-0.07	-0.70	-0.86	-1.01	-1.10	-1.33	-1.59	-1.73	-2.06	-2.26	-2.47
Portugal	0.62	-1.28	-1.04	-0.65	-0.46	-0.53	-0.52	-0.63	-0.62	-0.72	-0.61	-0.83
Slovenia	0.76	-1.63	-2.09	-1.26	-0.70	-0.38	-0.35	-0.46	-0.43	-0.59	-0.45	-0.29
Slovakia	0.66	0.71	-0.01	-0.11	-0.20	-0.22	-0.43	-0.59	-0.68	-0.76	-0.90	-1.21
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.07	0.40	0.18	0.22	0.07	0.10	-0.03	-0.07	-0.09	-0.11	-0.04	-0.15
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	-0.05	-0.77	-0.67	-0.37	-0.31	-0.26	-0.07	-0.06	0.15	0.23	0.14	0.04
ISCED 3	0.22	-0.22	-0.29	-0.04	-0.08	-0.06	0.06	0.17	0.23	0.29	0.35	0.34
ISCED 4	0.18	0.15	-0.14	-0.17	0.13	0.05	0.51	0.51	1.01	0.98	0.96	0.96
ISCED 5	0.32	-0.08	-0.11	0.15	0.17	0.10	0.25	0.35	0.42	0.51	0.59	0.54
ISCED 6	-0.30	-0.37	-0.56	-0.45	-0.39	-0.44	-0.32	-0.12	-0.02	-0.05	-0.14	-0.05
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.19	0.34	0.65	0.44	0.44	0.48	0.52	0.52	0.58	0.38	0.24	0.39
40-49	0.31	0.68	0.86	0.79	0.90	0.84	0.91	0.93	0.97	0.81	0.76	0.88
50-59	0.36	1.08	1.29	1.15	1.18	1.12	1.25	1.29	1.33	1.18	1.09	1.21
60-69	-0.26	1.20	1.34	1.35	1.29	1.21	1.27	1.28	1.31	1.12	1.05	1.18
70-79	-0.86	1.27	1.03	1.28	1.30	1.21	1.32	1.28	1.35	1.17	1.16	1.30
>80	-0.90	1.37	1.23	1.40	1.33	1.20	1.53	1.58	1.67	1.42	1.35	1.69
income and wealth												
asinh(income)	0.50	0.60	0.46	0.52	0.46	0.49	0.43	0.38	0.32	0.22	0.18	0.16
asinh(wealth)	0.07	0.09	0.11	0.12	0.11	0.11	0.10	0.09	0.09	0.09	0.08	0.07

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Pensions and Life Insurance, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-7.02	-5.72	-3.79	-3.58	-3.78	-4.88	-2.63	-0.98	1.74	3.08	5.49	6.03
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.54	-0.29	0.63	0.40	0.36	0.33	0.54	0.61	0.77	0.91	0.86	0.60
Switzerland	0.13	0.63	0.89	0.80	0.72	0.69	0.88	1.04	1.37	1.56	1.66	1.71
Cyprus	0.66	-3.69	-3.43	-2.88	-2.34	-1.71	-0.55	0.04	0.29	0.67	1.34	1.84
Germany	0.73	-0.52	-0.57	-0.65	-0.61	-0.55	-0.48	-0.38	-0.11	-0.03	-0.03	-0.07
Estonia	0.50	-1.08	-1.11	-0.91	-0.79	-0.48	-0.42	-0.26	-0.04	0.40	0.50	0.46
Spain	0.42	0.48	0.57	0.46	0.48	0.64	0.61	0.72	0.78	0.91	0.89	0.68
Finland	1.11	-1.03	-0.82	-0.87	-0.90	-0.81	-0.77	-0.62	-0.42	-0.18	-0.17	-0.14
France	0.44	-1.43	-0.97	-0.67	-0.54	-0.35	-0.31	-0.24	-0.18	-0.06	-0.05	0.05
Greece	-1.33	-0.12	-0.35	-0.70	-0.68	-0.54	-0.46	-0.51	-0.62	-0.31	-0.68	-1.03
Hungary	1.83	-18.97	-18.92	-18.09	-17.33	-16.55	-16.27	-3.21	-1.85	-1.18	-1.03	-1.09
Ireland	0.04	-2.70	-1.76	-1.33	-0.85	-0.44	-0.27	-0.21	-0.09	0.02	0.06	0.03
Italy	0.84	-16.60	-16.33	-16.14	-15.80	-2.47	-0.48	-0.15	0.04	0.09	-0.18	-0.33
Luxembourg	0.01	-0.07	0.30	0.27	0.24	0.31	0.54	0.68	0.89	1.08	1.10	1.18
Latvia	-0.21	-1.14	-1.36	-1.63	-1.41	-0.88	-0.58	-0.47	-0.84	-0.60	0.25	0.09
Malta	1.00	1.27	1.37	1.15	1.01	1.05	0.87	0.75	0.70	0.78	0.49	0.33
Netherlands	0.85	-15.47	-14.93	-14.74	-14.09	-2.41	-1.33	-1.02	-0.69	-0.39	-0.01	-0.21
Poland	2.19	-18.16	-18.27	-18.45	-18.47	-18.19	-18.31	-18.28	-17.96	-4.37	-3.27	-3.11
Portugal	0.45	-1.74	-0.86	-0.36	0.26	0.63	0.52	0.57	0.60	0.90	0.87	0.87
Slovenia	0.23	-1.15	-0.92	-0.69	-0.60	-0.30	-0.42	-0.48	-0.53	-0.29	-0.36	-0.11
Slovakia	-0.21	-1.43	-2.07	-1.43	-1.04	-0.89	-0.91	-1.05	-1.08	-0.96	-0.85	-1.26
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	0.09	0.37	0.14	0.12	0.14	0.41	0.21	0.11	0.01	-0.04	-0.18	-0.22
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.21	0.06	-0.07	0.18	0.31	0.23	0.32	0.43	0.48	0.59	0.56	0.79
ISCED 3	0.43	0.08	-0.01	0.30	0.40	0.37	0.48	0.69	0.70	0.77	0.70	0.96
ISCED 4	0.45	0.44	0.25	0.66	0.89	0.81	0.91	1.04	1.02	1.09	1.07	1.25
ISCED 5	0.95	0.67	0.67	1.02	1.27	1.20	1.28	1.45	1.28	1.34	1.27	1.26
ISCED 6	0.08	0.94	0.87	1.10	1.46	1.50	1.61	1.76	1.59	1.57	1.41	1.46
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	-0.20	1.37	1.00	1.10	1.43	1.33	1.46	1.59	1.42	1.48	1.55	1.63
40-49	-0.12	0.08	0.24	0.21	0.37	0.40	0.29	0.30	0.29	0.28	0.30	0.34
50-59	-0.10	0.41	0.58	0.56	0.75	0.81	0.72	0.73	0.77	0.75	0.68	0.64
60-69	-0.01	1.07	0.85	0.97	1.02	0.98	0.71	0.69	1.15	1.33	1.27	0.78
70-79	-0.06	0.68	1.00	1.09	1.24	1.28	1.15	1.21	1.26	1.17	1.18	1.19
>80	-0.34	-0.11	-0.06	-0.24	-0.07	-0.25	-0.40	-0.35	-0.19	0.04	-0.06	-0.23
income and wealth												
asinh(income)	0.41	0.83	0.72	0.77	0.80	0.90	0.75	0.63	0.43	0.36	0.23	0.24
asinh(wealth)	0.07	0.14	0.13	0.12	0.12	0.15	0.14	0.14	0.14	0.13	0.13	0.13

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Other Financial Assets, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-5.65	-2.53	-1.59	-0.78	-0.46	-1.15	-3.38	-0.76	1.63	3.25	4.87	5.50
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.68	-0.87	-0.26	-0.00	0.11	0.39	0.51	0.67	0.82	0.88	0.83	0.63
Switzerland	0.68	2.01	1.84	1.55	1.64	1.67	1.57	1.90	2.15	2.42	2.82	3.39
Cyprus	0.58	-2.78	-2.54	-2.38	-1.56	-0.60	0.70	1.25	1.49	1.87	2.27	1.96
Germany	1.05	-0.37	-0.29	-0.63	-0.47	-0.30	-0.15	-0.02	0.08	0.17	0.21	0.10
Estonia	0.41	-1.70	-1.53	-1.39	-1.07	-0.86	-0.32	-0.13	-0.07	-0.06	0.58	0.90
France	0.54	-1.34	-0.89	-0.71	-0.44	-0.20	0.01	0.08	0.20	0.32	0.63	0.78
Greece	-1.27	0.29	-0.25	-1.12	-1.29	-0.87	-0.90	-1.02	-1.18	-0.74	-0.60	-0.65
Croatia	-0.12	-1.47	-0.66	-0.53	-0.24	0.04	0.10	0.23	-0.16	-0.10	0.49	0.55
Hungary	0.93	-15.75	-16.05	-16.44	-15.99	-14.86	-2.10	-1.40	-1.03	-0.79	-0.52	-0.51
Ireland	0.05	-2.60	-2.15	-1.47	-0.84	-0.51	-0.22	-0.05	0.21	0.32	0.45	0.51
Italy	1.04	-16.84	-16.66	-16.82	-16.43	-15.88	-2.49	-0.37	0.02	0.08	-0.11	-0.24
Lithuania	-0.39	-30.62	-1.59	-1.35	-0.98	-0.64	-0.12	-0.30	-0.51	-0.54	-0.15	0.16
Luxembourg	0.09	0.18	0.29	-0.01	0.36	0.65	0.61	0.82	0.98	1.20	1.23	1.63
Latvia	-0.63	-1.93	-2.12	-1.93	-1.67	-1.22	-0.50	-0.73	-1.24	-0.89	-0.40	-0.66
Malta	1.37	-13.87	-13.99	-3.56	0.29	0.75	1.12	1.17	1.00	0.82	0.70	0.87
Netherlands	1.13	-16.40	-16.14	-16.01	-15.39	-14.56	-2.62	-1.13	-0.49	-0.21	0.00	0.36
Poland	1.98	-17.95	-18.15	-18.52	-18.39	-18.09	-17.68	-17.70	-17.62	-16.74	-3.15	-2.79
Portugal	0.45	-14.92	-1.01	-0.27	0.08	0.63	1.18	1.05	1.14	1.17	1.22	1.54
Slovenia	0.25	-1.75	-0.96	-0.74	-0.44	-0.15	0.04	0.16	0.01	0.09	0.09	0.10
Slovakia	-0.17	-0.64	-0.31	-0.84	-0.34	-0.06	0.06	0.06	-0.03	0.09	0.45	0.43
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	0.14	0.48	0.27	0.12	0.07	0.07	0.20	0.06	-0.04	0.01	-0.03	-0.04
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.11	0.61	0.49	0.16	0.12	0.53	0.58	0.41	0.41	0.56	0.32	0.27
ISCED 3	0.42	0.52	0.65	0.50	0.59	0.85	1.36	0.84	0.80	0.84	0.74	0.77
ISCED 4	0.79	0.38	0.46	0.58	0.47	0.80	1.19	0.63	0.93	1.29	1.52	1.54
ISCED 5	0.83	1.15	1.28	1.12	1.35	1.64	1.96	1.45	1.42	1.49	1.29	1.35
ISCED 6	0.21	0.51	0.63	0.47	0.51	0.64	0.80	0.27	0.25	0.26	0.07	-0.49
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	-0.15	0.05	0.12	0.17	0.20	0.13	0.04	0.12	0.38	0.48	0.29	0.34
40-49	-0.17	0.24	0.42	0.31	0.45	0.45	0.30	0.50	0.75	0.83	0.59	0.78
50-59	-0.10	0.11	0.40	0.49	0.68	0.72	0.74	0.83	1.08	1.21	0.96	0.94
60-69	-0.12	0.09	0.50	0.63	0.88	1.01	1.10	1.11	1.37	1.43	1.14	1.00
70-79	-0.24	0.35	0.82	0.77	0.97	1.05	1.13	1.22	1.46	1.50	1.08	0.98
>80	-0.40	0.65	0.90	0.66	1.08	1.27	1.34	1.40	1.65	1.69	1.39	1.33
income and wealth												
asinh(income)	0.25	0.49	0.46	0.52	0.51	0.57	0.75	0.58	0.41	0.29	0.25	0.25
asinh(wealth)	0.09	0.17	0.15	0.14	0.13	0.14	0.15	0.16	0.14	0.15	0.15	0.15

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Other Financial Assets, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-3.49	-3.40	-1.19	0.14	1.32	2.99	4.18	5.60	6.52	8.08	9.01	10.36
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.78	0.88	1.18	1.21	0.88	0.78	0.59	0.40	0.34	0.27	0.19	0.06
Switzerland	1.04	2.49	3.23	3.17	2.86	2.79	2.58	2.38	2.16	1.88	1.48	1.21
Cyprus	1.25	1.08	1.52	2.02	1.70	1.48	1.30	1.14	1.17	1.04	1.16	1.05
Germany	0.42	-0.51	-0.10	0.22	0.10	0.19	0.18	0.18	0.16	0.18	0.16	0.04
Estonia	0.39	-3.78	-1.15	-0.76	-0.75	-0.70	-0.67	-0.65	-0.56	-0.67	-0.63	-0.79
Spain	0.94	1.31	1.48	1.48	1.26	1.15	0.93	0.71	0.63	0.49	0.31	0.01
Finland	1.09	1.09	1.30	1.25	0.99	0.90	0.77	0.62	0.53	0.38	0.24	0.07
France	0.79	0.40	0.63	0.66	0.54	0.54	0.53	0.44	0.41	0.31	0.23	0.06
Greece	-0.25	0.48	0.41	0.27	0.04	-0.04	-0.05	-0.13	-0.10	-0.13	-0.23	-0.52
Hungary	0.44	0.35	0.16	0.08	-0.16	-0.39	-0.51	-0.75	-0.86	-1.05	-1.14	-1.37
Ireland	0.72	0.26	0.30	0.53	0.65	0.84	0.87	0.83	0.89	0.74	0.57	0.40
Italy	-0.37	0.63	0.67	0.54	0.35	0.31	0.25	0.17	0.17	0.03	-0.02	-0.28
Luxembourg	0.86	1.12	1.33	1.28	1.14	1.28	1.23	1.14	1.15	1.03	1.06	0.95
Latvia	0.09	-0.46	-0.46	-0.69	-0.77	-0.87	-0.77	-0.69	-0.55	-0.50	-0.70	-0.89
Malta	0.51	-0.22	-0.44	-0.40	-0.06	-0.04	0.04	0.05	0.08	-0.08	-0.18	-0.26
Netherlands	1.26	0.79	1.54	2.10	1.92	1.76	1.61	1.37	1.23	0.99	0.86	0.61
Poland	0.30	-0.25	-0.52	-0.78	-1.16	-1.37	-1.47	-1.54	-1.39	-1.24	-1.02	-1.21
Portugal	1.02	1.19	1.46	1.81	1.55	1.36	1.10	0.80	0.66	0.38	0.17	-0.07
Slovenia	0.46	-0.25	-0.17	-0.36	-0.62	-0.77	-0.91	-1.07	-1.04	-1.09	-0.87	-0.84
Slovakia	0.27	0.42	-0.03	-0.41	-0.47	-0.67	-0.71	-0.87	-0.84	-0.84	-0.91	-1.13
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.65	-0.60	-0.60	-0.59	-0.50	-0.49	-0.53	-0.48	-0.38	-0.34	-0.31	-0.32
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.32	0.21	0.73	0.86	0.90	0.99	1.05	1.15	0.96	0.47	0.35	0.29
ISCED 3	0.65	0.32	0.68	0.87	0.78	0.76	0.78	0.89	0.73	0.32	0.24	0.28
ISCED 4	0.81	0.27	0.51	0.52	0.23	0.20	0.24	0.45	0.38	0.01	0.06	0.14
ISCED 5	0.80	0.11	0.39	0.26	-0.02	-0.17	-0.17	-0.01	-0.02	-0.32	-0.23	-0.08
ISCED 6	0.57	-0.67	-0.27	-0.18	-0.43	-0.49	-0.51	-0.32	-0.34	-0.70	-0.24	-0.23
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.64	-0.99	-0.72	-0.72	-0.97	-0.95	-0.53	-0.68	-0.76	-0.98	-0.66	-0.40
40-49	0.75	-0.27	-0.09	0.19	0.14	0.24	0.24	0.22	0.23	0.17	-0.03	0.01
50-59	0.44	0.07	0.14	0.41	0.35	0.40	0.40	0.36	0.39	0.29	0.09	0.10
60-69	-0.14	0.73	0.16	0.63	0.64	0.59	0.44	0.41	0.38	0.33	-0.03	-0.12
70-79	-0.82	0.43	0.74	1.08	0.96	0.94	0.89	0.83	0.77	0.61	0.39	0.47
>80	-1.84	0.34	0.29	0.40	0.24	0.25	0.28	0.18	0.19	0.11	-0.05	-0.03
income and wealth												
asinh(income)	0.30	0.85	0.66	0.58	0.56	0.45	0.40	0.31	0.27	0.23	0.22	0.14
asinh(wealth)	-0.10	-0.03	-0.02	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0.00	-0.00

Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Debt, 2012

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-3.07	-1.47	-1.07	0.11	0.78	2.36	3.84	5.51	6.77	7.84	9.55	10.65
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	0.91	0.87	0.97	1.13	0.95	0.84	0.77	0.69	0.37	0.17	0.15	0.05
Switzerland	1.27	3.50	3.55	3.60	3.20	3.01	2.84	2.69	2.40	2.09	1.75	1.49
Cyprus	1.26	0.85	1.14	1.63	1.61	1.47	1.35	1.18	0.93	0.84	0.91	0.69
Germany	0.57	-0.07	0.11	0.52	0.46	0.44	0.40	0.36	0.19	0.04	0.08	0.06
Estonia	0.96	-1.43	-0.83	-0.73	-0.85	-0.93	-0.94	-0.86	-1.00	-0.96	-0.90	-0.97
France	0.83	0.80	0.86	0.98	0.81	0.68	0.65	0.58	0.36	0.21	0.15	0.03
Greece	-0.63	0.39	0.19	0.30	0.47	0.56	0.42	0.24	0.09	0.04	-0.05	-0.14
Croatia	0.87	-0.22	-0.39	-0.33	-0.59	-0.90	-1.06	-1.20	-1.37	-1.41	-1.30	-1.50
Hungary	0.18	-0.56	-0.46	-0.39	-0.42	-0.56	-0.71	-0.96	-1.19	-1.27	-1.35	-1.51
Ireland	0.79	0.15	0.24	0.43	0.46	0.45	0.58	0.60	0.43	0.35	0.37	0.28
Italy	-0.33	0.97	0.74	0.77	0.59	0.33	0.27	0.20	0.03	-0.13	-0.16	-0.23
Lithuania	0.26	-0.17	-0.21	-0.55	-0.62	-0.54	-0.67	-0.72	-0.95	-0.97	-0.82	-0.89
Luxembourg	0.91	1.28	1.19	1.30	1.03	1.12	1.20	1.30	1.11	1.01	1.01	0.90
Latvia	0.55	-0.82	-0.85	-0.84	-1.03	-1.13	-1.07	-1.26	-1.31	-1.29	-1.19	-1.26
Malta	0.41	0.38	0.69	0.98	0.68	0.63	0.62	0.42	0.17	0.07	-0.08	-0.07
Netherlands	1.19	1.89	2.30	2.68	2.40	2.09	1.89	1.72	1.45	1.23	1.01	0.81
Poland	0.58	-1.62	-1.41	-1.33	-1.33	-1.42	-1.38	-1.30	-1.31	-1.34	-1.28	-1.37
Portugal	1.13	1.37	1.50	1.70	1.52	1.23	0.99	0.75	0.39	0.18	-0.03	-0.22
Slovenia	0.27	-0.59	-0.37	-0.25	-0.45	-0.67	-0.64	-0.73	-0.82	-0.83	-0.98	-1.03
Slovakia	0.28	0.06	0.30	0.33	0.18	-0.06	-0.16	-0.35	-0.58	-0.66	-0.75	-0.95
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-0.72	-0.39	-0.46	-0.34	-0.21	-0.22	-0.22	-0.25	-0.29	-0.27	-0.29	-0.25
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.32	0.58	0.33	-0.13	0.11	0.09	0.30	0.39	0.44	0.38	0.38	0.21
ISCED 3	0.57	0.75	0.62	0.34	0.38	0.43	0.52	0.58	0.60	0.53	0.48	0.40
ISCED 4	0.69	1.45	0.91	0.69	0.89	0.85	0.94	0.96	0.98	0.98	0.79	0.68
ISCED 5	0.77	1.40	1.47	1.11	1.06	0.99	1.01	1.01	1.01	0.90	0.86	0.82
ISCED 6	0.51	0.78	0.81	0.35	0.26	0.30	0.35	0.41	0.45	0.49	0.56	0.48
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.56	0.30	0.24	0.77	0.87	1.00	0.93	0.88	0.81	0.49	0.30	0.33
40-49	0.68	0.69	0.61	0.93	0.81	0.86	0.69	0.65	0.65	0.32	0.19	0.30
50-59	0.32	0.39	0.30	0.57	0.45	0.44	0.28	0.30	0.33	0.04	0.08	0.23
60-69	-0.29	0.16	0.12	0.24	0.12	0.13	-0.12	-0.22	-0.19	-0.40	-0.30	-0.12
70-79	-0.89	-0.05	-0.16	-0.05	-0.24	-0.32	-0.56	-0.64	-0.60	-0.78	-0.58	-0.33
>80	-2.08	-0.76	-1.03	-0.85	-1.10	-1.05	-1.11	-1.01	-0.82	-0.86	-0.58	-0.39
income and wealth												
asinh(income)	0.26	0.57	0.61	0.57	0.57	0.48	0.40	0.29	0.23	0.22	0.13	0.08
asinh(wealth)	-0.09	-0.00	0.00	0.01	0.03	0.03	0.04	0.04	0.04	0.03	0.01	0.00

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Debt, 2016

	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-1.65	0.87	1.53	2.50	3.42	4.40	5.26	5.86	6.54	6.99	7.77	8.38
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	-0.10	-0.20	-0.20	-0.22	-0.19	-0.18	-0.13	-0.11	-0.07	-0.05	-0.00	-0.09
Switzerland	-0.62	-1.03	-0.99	-0.78	-0.67	-0.53	-0.40	-0.35	-0.29	-0.22	-0.21	-0.26
Cyprus	0.66	0.47	0.44	0.15	0.09	0.07	0.09	0.08	0.06	0.06	0.09	-0.06
Germany	-0.30	-0.45	-0.40	-0.35	-0.23	-0.13	-0.06	-0.05	-0.07	-0.01	0.03	0.04
Estonia	-1.32	-0.32	-0.39	-0.38	-0.43	-0.45	-0.46	-0.45	-0.48	-0.38	-0.32	-0.35
Spain	0.19	0.03	-0.09	-0.16	-0.17	-0.16	-0.15	-0.17	-0.18	-0.14	-0.11	-0.13
Finland	-0.29	0.05	-0.06	-0.10	-0.07	-0.01	0.03	0.03	0.04	0.10	0.10	0.05
France	17.86	0.57	0.61	0.58	0.54	0.53	0.53	0.49	0.48	0.54	0.56	0.50
Greece	-0.35	-0.22	-0.37	-0.42	-0.45	-0.43	-0.46	-0.48	-0.52	-0.47	-0.43	-0.43
Hungary	-1.44	-0.49	-0.51	-0.73	-0.83	-0.92	-0.94	-0.99	-1.06	-1.01	-1.01	-1.07
Ireland	1.24	0.12	0.07	0.08	0.06	0.07	0.11	0.09	0.10	0.19	0.22	0.21
Italy	2.16	0.31	0.26	0.25	0.21	0.15	0.10	0.04	-0.03	-0.04	-0.06	-0.15
Luxembourg	0.72	0.78	0.75	0.65	0.68	0.76	0.78	0.75	0.75	0.83	0.84	0.74
Latvia	-1.73	-0.84	-1.01	-0.97	-1.05	-0.99	-1.02	-1.05	-1.00	-0.96	-0.94	-0.94
Malta	0.50	0.11	-0.09	0.02	0.04	0.04	0.04	0.04	0.03	0.10	0.13	0.21
Netherlands	0.79	-0.67	-0.41	-0.20	-0.17	-0.11	-0.05	-0.06	-0.07	-0.08	0.00	-0.01
Poland	-0.80	-0.70	-0.79	-0.75	-0.79	-0.84	-0.89	-0.88	-0.89	-0.84	-0.82	-0.87
Portugal	0.07	-0.22	-0.31	-0.17	-0.10	-0.03	0.06	0.05	0.03	0.11	0.13	0.15
Slovenia	-0.08	-0.55	-0.60	-0.49	-0.39	-0.42	-0.39	-0.43	-0.45	-0.37	-0.40	-0.47
Slovakia	-0.78	-0.84	-0.88	-0.75	-0.78	-0.81	-0.78	-0.75	-0.81	-0.71	-0.70	-0.69
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-1.45	-0.67	-0.62	-0.60	-0.54	-0.51	-0.48	-0.43	-0.41	-0.38	-0.34	-0.34
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.28	0.02	-0.06	0.04	0.02	0.04	0.06	0.03	0.09	0.13	0.09	0.15
ISCED 3	0.97	-0.03	-0.09	0.03	0.04	0.08	0.12	0.08	0.12	0.15	0.12	0.19
ISCED 4	0.67	-0.10	-0.00	0.11	0.12	0.17	0.21	0.16	0.23	0.26	0.23	0.36
ISCED 5	1.21	-0.02	-0.05	0.06	0.11	0.16	0.20	0.17	0.21	0.28	0.29	0.37
ISCED 6	0.79	-0.16	-0.25	-0.17	-0.12	-0.06	-0.04	-0.04	0.05	0.17	0.20	0.39
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.42	-0.68	-0.69	-0.53	-0.53	-0.47	-0.32	-0.34	-0.28	-0.08	-0.05	0.06
40-49	0.45	0.42	0.32	0.38	0.35	0.37	0.37	0.33	0.28	0.32	0.30	0.24
50-59	0.40	0.70	0.60	0.59	0.56	0.55	0.54	0.50	0.47	0.49	0.46	0.41
60-69	0.09	0.41	0.56	0.46	0.34	0.52	0.42	0.33	0.35	0.49	0.54	0.34
70-79	-0.04	0.84	0.72	0.77	0.74	0.73	0.72	0.69	0.65	0.68	0.66	0.65
>80	-0.82	0.37	0.31	0.25	0.19	0.29	0.32	0.29	0.22	0.34	0.34	0.21
income and wealth												
asinh(income)	0.21	0.45	0.44	0.40	0.35	0.30	0.24	0.22	0.19	0.16	0.13	0.10
asinh(wealth)	0.07	0.05	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.03	0.03	0.03

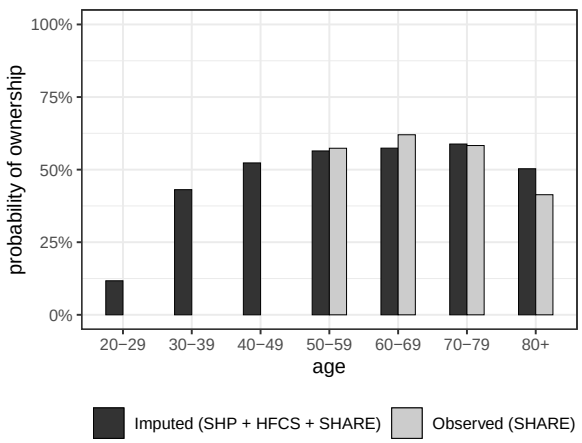
Source: Author's calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

Table A.4: Switzerland Imputation Model Coefficients, Consumer Durables, 2012

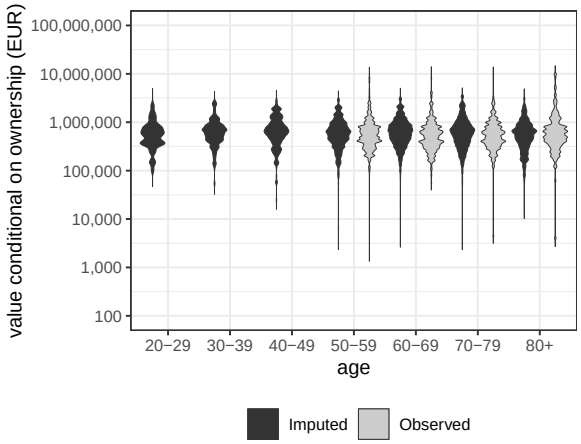
	$\mathbb{P}(>0)$	$\tau = 5\%$	$\tau = 10\%$	$\tau = 20\%$	$\tau = 30\%$	$\tau = 40\%$	$\tau = 50\%$	$\tau = 60\%$	$\tau = 70\%$	$\tau = 80\%$	$\tau = 90\%$	$\tau = 95\%$
Intercept	-1.27	0.47	1.51	2.44	3.77	4.49	5.04	5.70	6.50	7.13	8.05	8.56
country												
Austria	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Belgium	-0.20	-0.59	-0.61	-0.39	-0.26	-0.19	-0.20	-0.16	-0.10	-0.06	0.06	-0.13
Switzerland	-0.46	-1.20	-1.15	-0.95	-0.70	-0.54	-0.42	-0.30	-0.22	-0.13	-0.12	-0.25
Cyprus	0.93	0.39	0.31	0.21	0.13	0.16	0.10	0.07	0.03	0.02	-0.07	-0.20
Germany	-0.27	-0.43	-0.43	-0.38	-0.26	-0.18	-0.11	-0.03	0.00	0.07	0.08	0.01
Estonia	-1.40	-0.72	-0.98	-0.96	-0.93	-0.87	-0.85	-0.79	-0.79	-0.71	-0.65	-0.66
France	17.69	0.25	0.27	0.33	0.39	0.42	0.42	0.43	0.45	0.47	0.45	0.32
Greece	-0.36	-0.27	-0.41	-0.44	-0.50	-0.50	-0.54	-0.53	-0.52	-0.52	-0.53	-0.59
Croatia	-0.57	-0.35	-0.56	-0.41	-0.47	-0.45	-0.48	-0.49	-0.50	-0.46	-0.49	-0.56
Hungary	-1.42	-0.52	-0.72	-0.82	-0.88	-0.89	-0.90	-0.85	-0.87	-0.82	-0.74	-0.76
Ireland	1.14	0.08	0.07	0.07	0.20	0.30	0.36	0.43	0.46	0.54	0.53	0.42
Italy	1.72	0.01	-0.06	-0.02	0.01	0.06	0.05	0.06	0.03	-0.00	-0.10	-0.26
Lithuania	-0.60	-0.20	-0.43	-0.59	-0.76	-0.74	-0.72	-0.72	-0.70	-0.68	-0.69	-0.67
Luxembourg	0.55	0.70	0.61	0.61	0.64	0.65	0.66	0.71	0.78	0.81	0.83	0.78
Latvia	-1.52	-0.51	-0.77	-0.86	-0.92	-0.92	-0.87	-0.78	-0.77	-0.75	-0.80	-0.91
Malta	0.50	-0.19	-0.20	-0.09	-0.04	0.02	0.08	0.08	0.12	0.10	0.20	0.06
Netherlands	-0.13	-0.12	-0.22	-0.24	-0.16	-0.11	-0.11	-0.11	-0.06	-0.03	-0.01	-0.14
Poland	-0.71	-0.90	-0.96	-0.87	-0.91	-0.90	-0.89	-0.89	-0.89	-0.86	-0.89	-0.92
Portugal	0.06	-0.31	-0.32	-0.26	-0.18	-0.05	0.02	0.05	0.08	0.06	0.08	-0.06
Slovenia	0.02	-0.56	-0.62	-0.48	-0.40	-0.34	-0.32	-0.29	-0.29	-0.24	-0.28	-0.38
Slovakia	-0.92	-0.73	-0.85	-0.72	-0.71	-0.60	-0.54	-0.52	-0.48	-0.44	-0.34	-0.43
marital status												
married	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
single	-1.45	-0.72	-0.69	-0.58	-0.60	-0.53	-0.48	-0.45	-0.42	-0.40	-0.36	-0.31
education												
ISCED 0–1	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
ISCED 2	0.42	0.39	0.52	0.41	0.38	0.39	0.38	0.40	0.34	0.30	0.22	0.21
ISCED 3	0.98	0.83	0.83	0.70	0.66	0.67	0.64	0.63	0.61	0.53	0.49	0.43
ISCED 4	0.99	0.54	0.76	0.78	0.70	0.51	0.58	0.69	0.85	0.82	0.77	0.60
ISCED 5	1.25	0.86	0.91	0.81	0.79	0.81	0.78	0.76	0.74	0.67	0.64	0.61
ISCED 6	0.64	0.67	0.58	0.44	0.51	0.51	0.44	0.42	0.42	0.44	0.39	0.31
age												
20-29	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
30-39	0.37	0.10	0.12	0.15	0.12	0.07	0.10	0.08	0.09	0.09	0.09	0.03
40-49	0.38	0.15	0.16	0.19	0.16	0.10	0.19	0.15	0.13	0.13	0.11	0.16
50-59	0.34	0.09	0.17	0.15	0.16	0.15	0.19	0.19	0.23	0.21	0.23	0.25
60-69	0.32	0.27	0.28	0.27	0.24	0.21	0.25	0.23	0.25	0.24	0.26	0.26
70-79	-0.07	-0.04	0.06	0.09	0.05	0.03	0.11	0.11	0.14	0.15	0.20	0.22
>80	-0.58	-0.34	-0.32	-0.29	-0.30	-0.33	-0.29	-0.24	-0.18	-0.08	-0.01	0.08
income and wealth												
asinh(income)	0.18	0.46	0.41	0.40	0.31	0.28	0.25	0.23	0.18	0.15	0.12	0.11
asinh(wealth)	0.05	0.07	0.07	0.05	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The first column refers to the coefficients of the logistic regression that model the extensive margin (i.e., the probability of owning the asset or liability). The other columns refer to the coefficients of quantiles regressions for quantiles τ. The dependent variable in that regression is the logarithm of the value of the asset (or liability), in EUR.

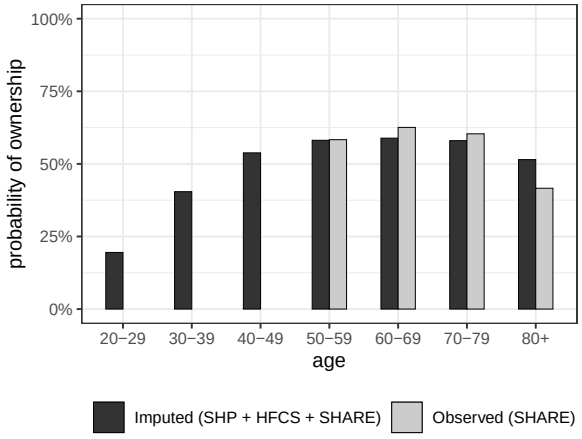
Table A.4: Switzerland Imputation Model Coefficients, Consumer Durables, 2016



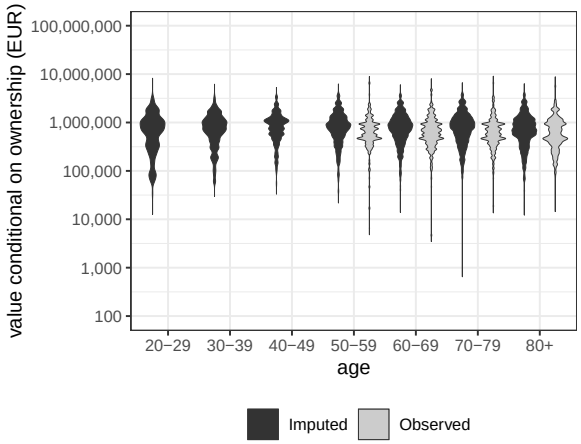
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



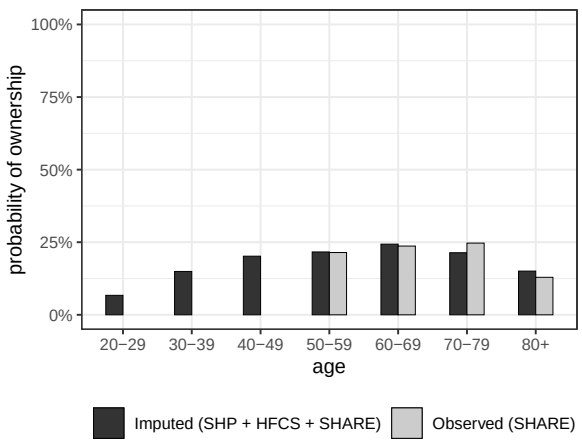
(c) Extensive Margin, 2016



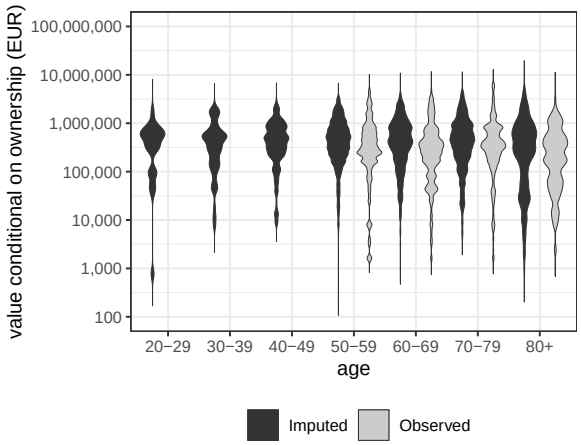
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

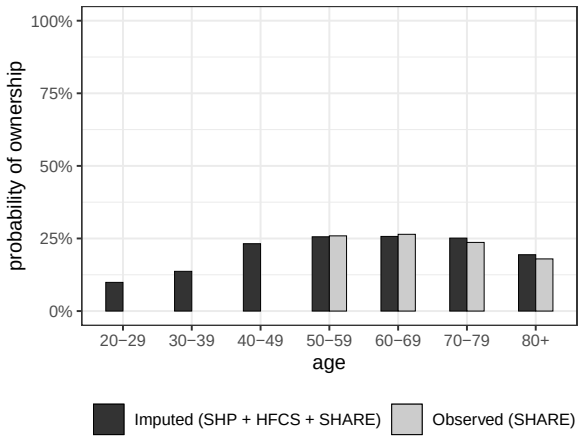
Figure A.5: Ownership of Main Residence, Switzerland, 2012 and 2016



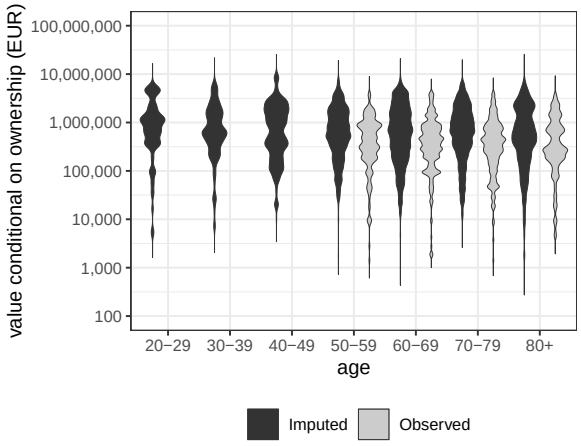
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



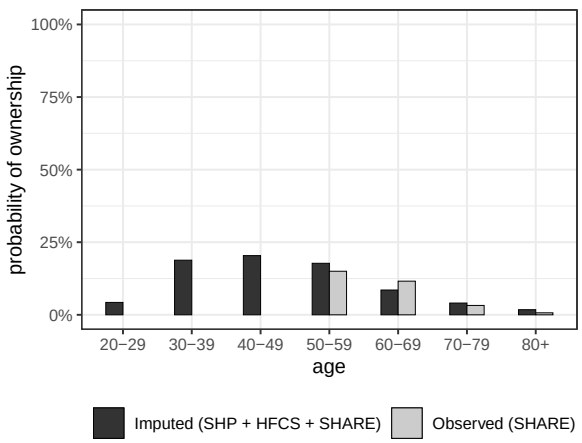
(c) Extensive Margin, 2016



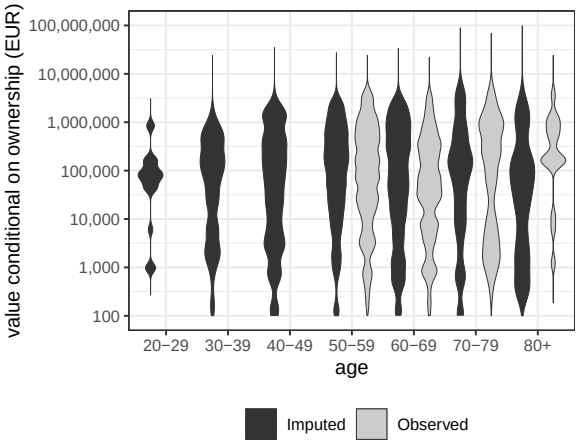
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

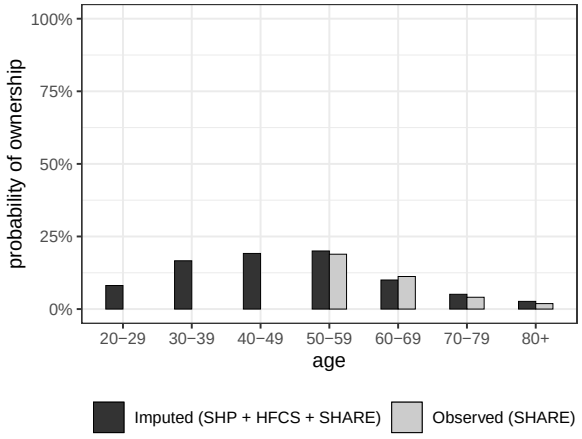
Figure A.6: Ownership of Other Real Estate, Switzerland, 2012 and 2016



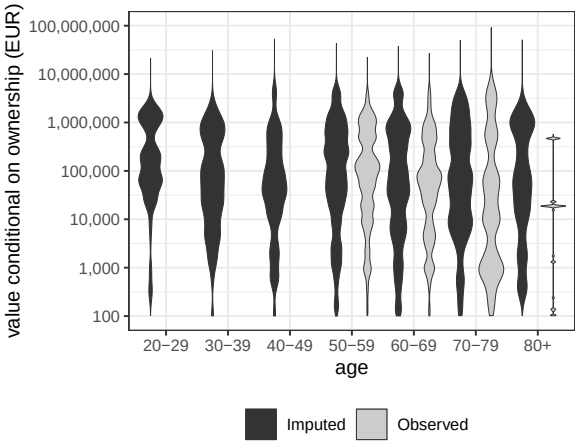
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



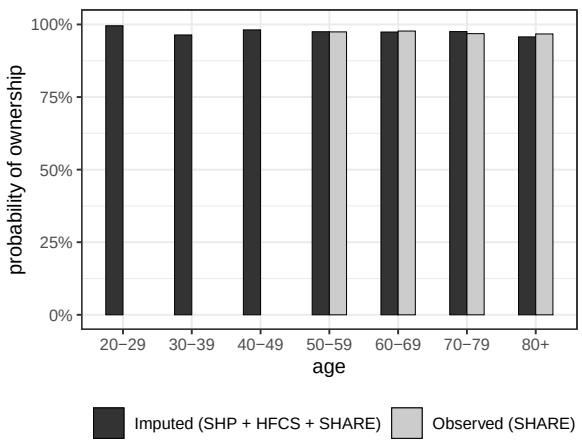
(c) Extensive Margin, 2016



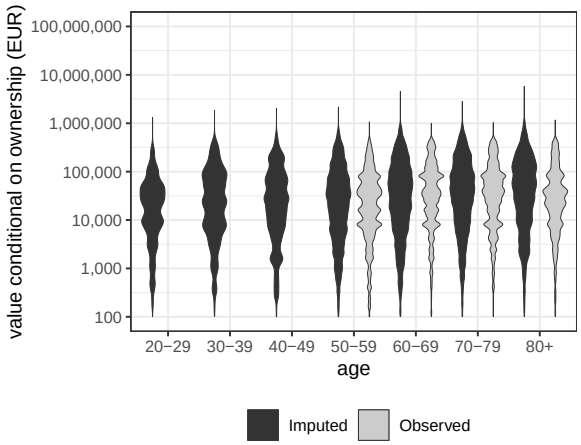
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

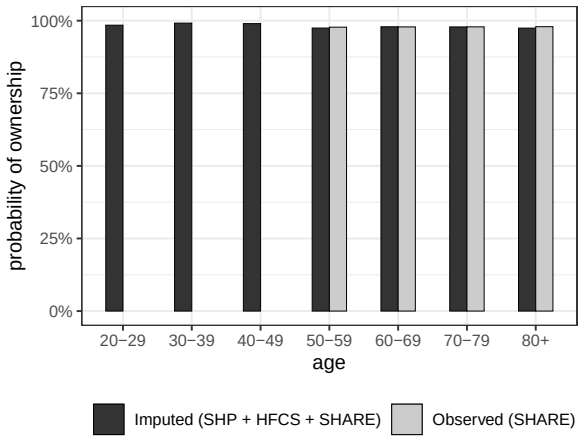
Figure A.7: Ownership of Other Non-financial Assets, Switzerland, 2012 and 2016



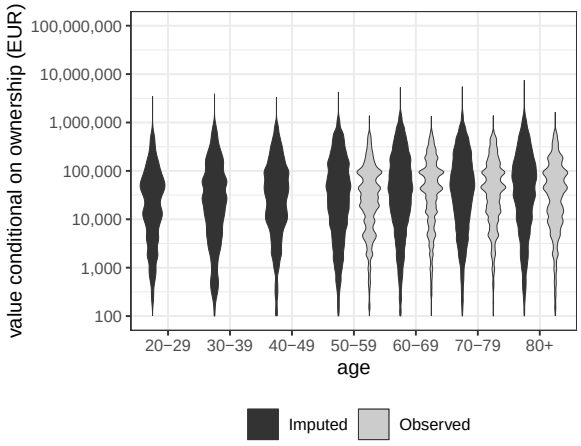
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



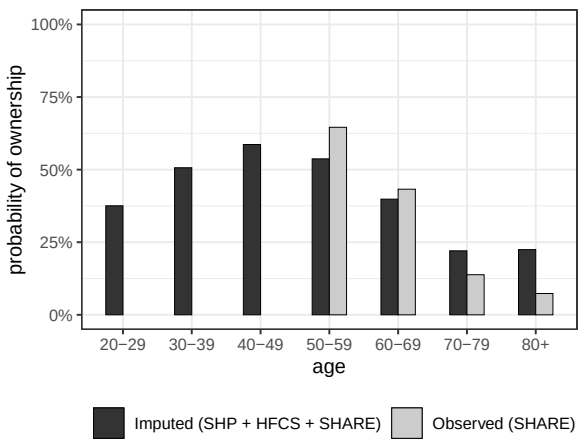
(c) Extensive Margin, 2016



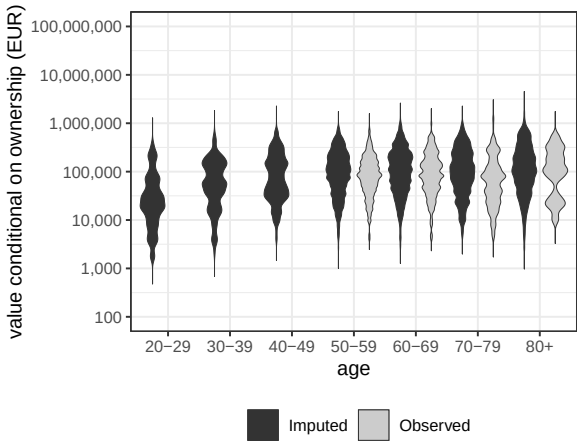
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

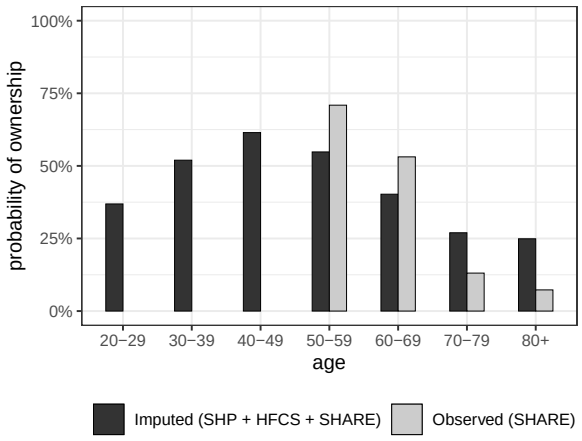
Figure A.8: Ownership of Deposits, Switzerland, 2012 and 2016



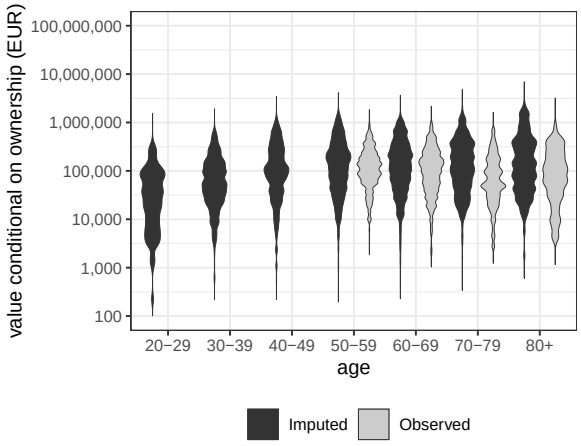
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



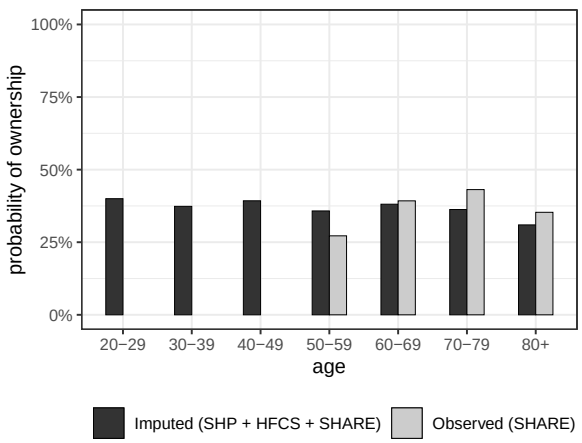
(c) Extensive Margin, 2016



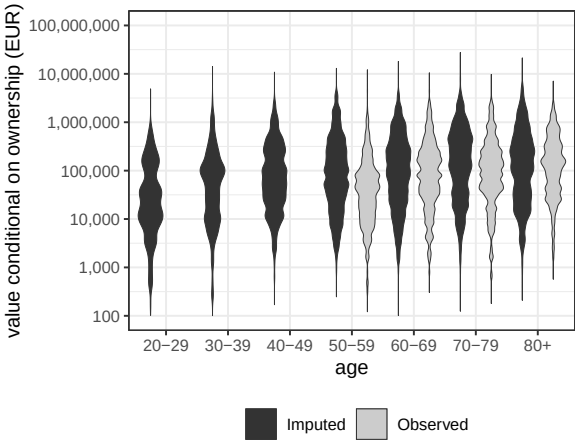
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

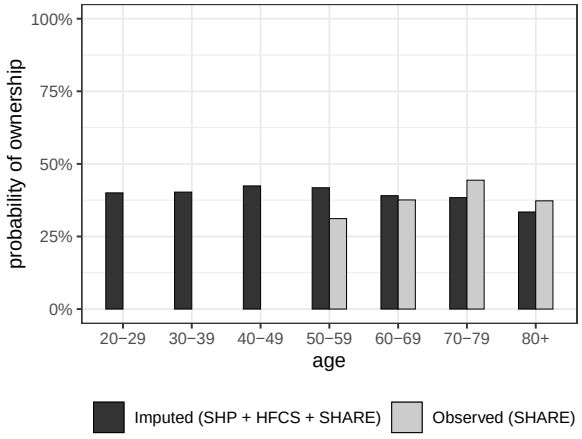
Figure A.9: Ownership of Pensions and Life Insurance, Switzerland, 2012 and 2016



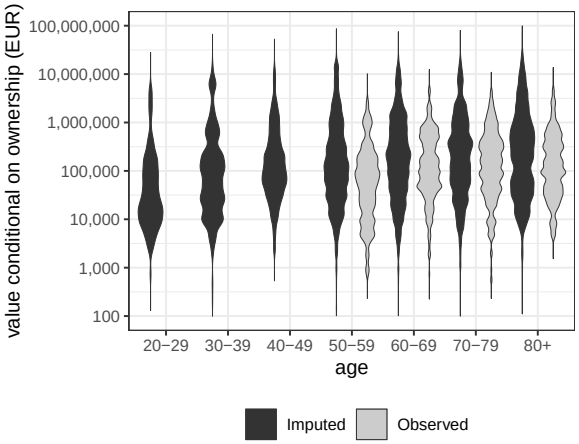
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



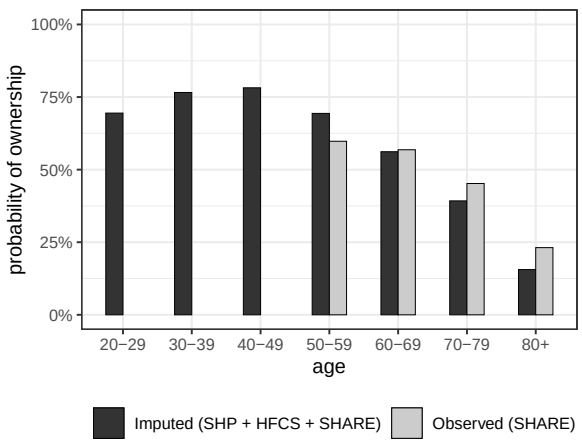
(c) Extensive Margin, 2016



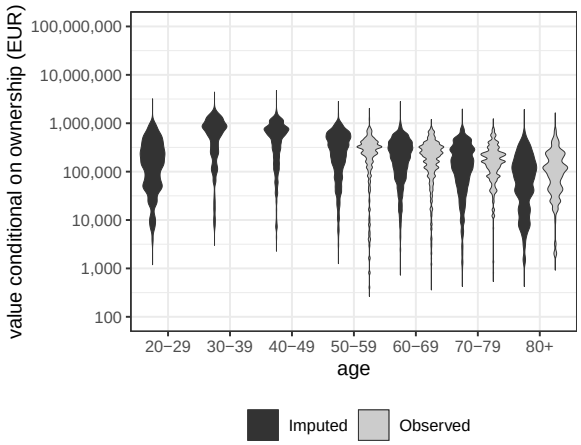
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

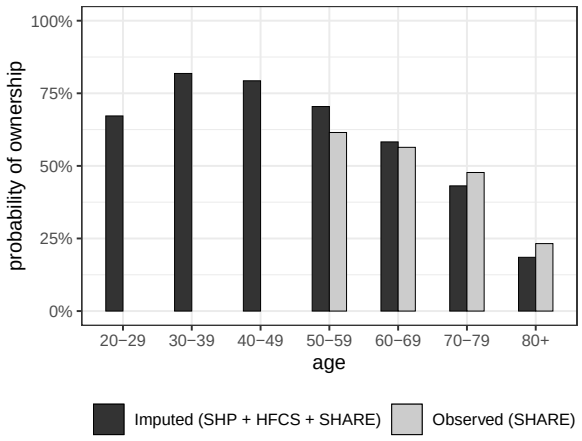
Figure A.10: Ownership of Other Financial Assets, Switzerland, 2012 and 2016



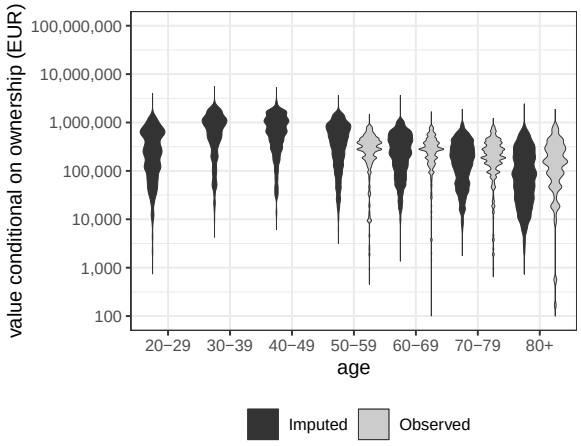
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



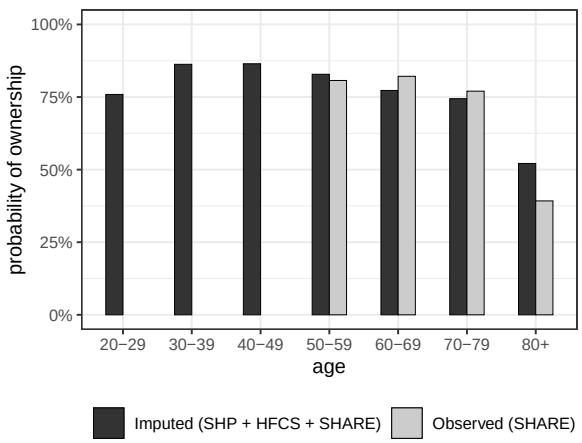
(c) Extensive Margin, 2016



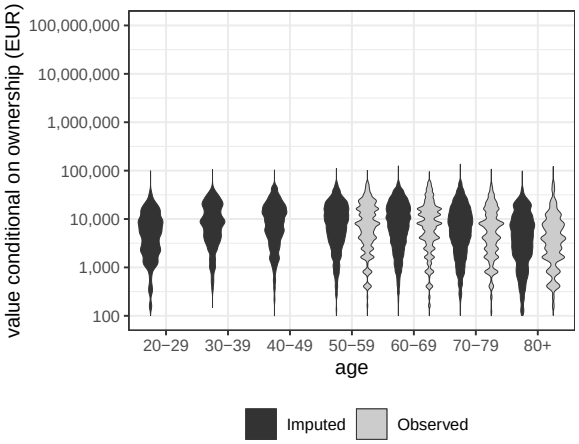
(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

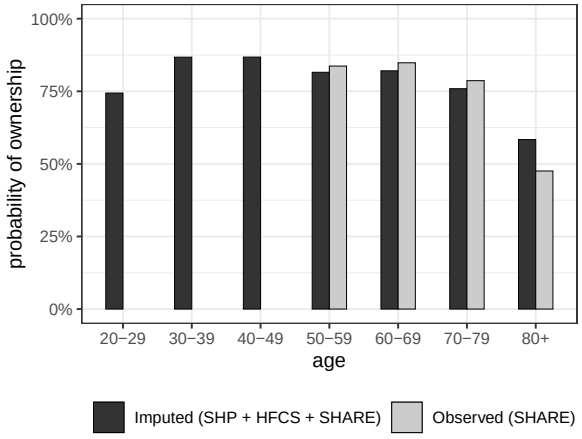
Figure A.11: Ownership of Debt, Switzerland, 2012 and 2016



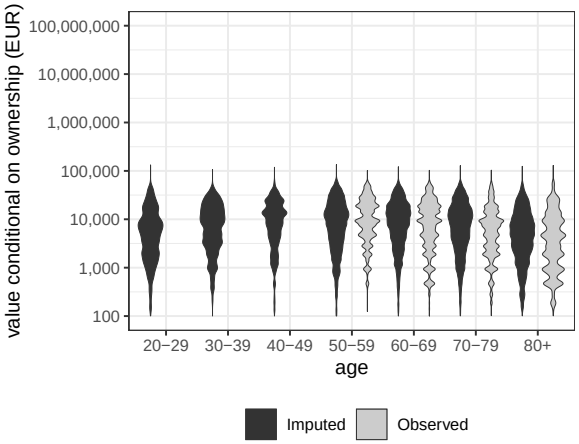
(a) Extensive Margin, 2012



(b) Intensive Margin, 2012



(c) Extensive Margin, 2016



(d) Intensive Margin, 2016

Source: Authors' calculations using SHARE, SHP and HFCS. *Notes:* The extensive margin captures the probability of owning a given asset (or liability). The intensive margin captures the value of the asset (or liability) for those who own it. The observed distributions come from the SHARE data and are only available for people aged 50 and older. The imputed distributions are estimate for the whole distribution (but only used for people below 50), and combine information from SHARE, the SHP and the HFCS (see main text for the imputation procedure).

Figure A.12: Ownership of Consumer Durables, Switzerland, 2012 and 2016

extensive margin, we perform a logistic regression of whether an household holds the asset as function of the explanatory variables. For the intensive margin, we perform quantile regressions of the log-transformed value of the asset (for the subsample of people that own the asset). We perform the quantile regression for every ventile, from $\tau = 5\%$ to $\tau = 95\%$. We fit the model separately for the two waves of survey data. We consider eight asset categories: main residence, other real estate, other non-financial assets, deposits, pensions and life insurance, other financial assets, debt and consumer durables. Tables A.4 to A.4 summarize the coefficients for every model.

To impute the assets, we first simulate the extensive margin by drawing at random from a binomial variable according the predicted probability of owning the asset for every household. Then, we deal with the intensive margin by selecting one of the predicted ventile from the quantile regressions at random, at choosing it at the the value of the asset for the household, assuming it owns the asset. Following the basic inverse transform principle (Robert and Casella, 2004), the simulated variable will (approximately) follow the desired distribution.

How well does the imputation procedure performs? Figures A.5 to A.12 address that question. Given that the information for Switzerland is missing for all people 50 and younger, the key question is whether results are consistent for the different age groups. We present, side-by-side, how well we reproduce the distributions of the extensive and the intensive margins with our imputations for the different age groups in Switzerland. For people younger than 50, we only present the imputation since there is no observed. We are able to reproduce observed patterns fairly well. The simulated probabilities of ownership are close to reality. The quantile regression model can reproduce the general dispersion of asset values too. But the imputation isn't perfect, in particular in the tails, so that the synthetic survey dataset probably shouldn't be used to measure inequality directly. But we will use sparingly in our estimates, always making sure that results are meaningful, and to that end it constitutes a useful resource.

We then extend the survey dataset to the entire period covered by the national accounts. To that end, we make identical copies of the 2012 dataset for years before 2012, and identical copies of the 2016 dataset for the years after 2016. For the years between 2012 and 2016, we mix the two dataset in proportion of their proximity to each of the two years. We age those datasets by rescaling the different wealth variables to their macroeconomic totals in each year.

A.9.4 Step 4: Distribution of Nontaxable Wealth

We distribute the aggregate amount of private pensions from the national accounts to individuals in the the tax data using the distribution from the synthetic survey datasets.

We rank survey observation by their wealth (excluding pensions) and attribute to them the wealth of the corresponding rank in the survey data. We rescale pension wealth and wealth excluding pensions to their macroeconomic totals and sum them at the individual level. This gives us the new wealth distribution.

A.9.5 Discussion and Comparison with Foellmi and Martínez (2016)

According to the tax data alone, the concentration of wealth in Switzerland seems extremely high, especially by European standards. But accounting for nontaxable assets makes a very sizable difference on the level of wealth inequality, even though the trends are not meaningfully affected. This conclusion is in line with the findings of Foellmi and Martínez (2017). Figure A.13 describes these findings in more details.

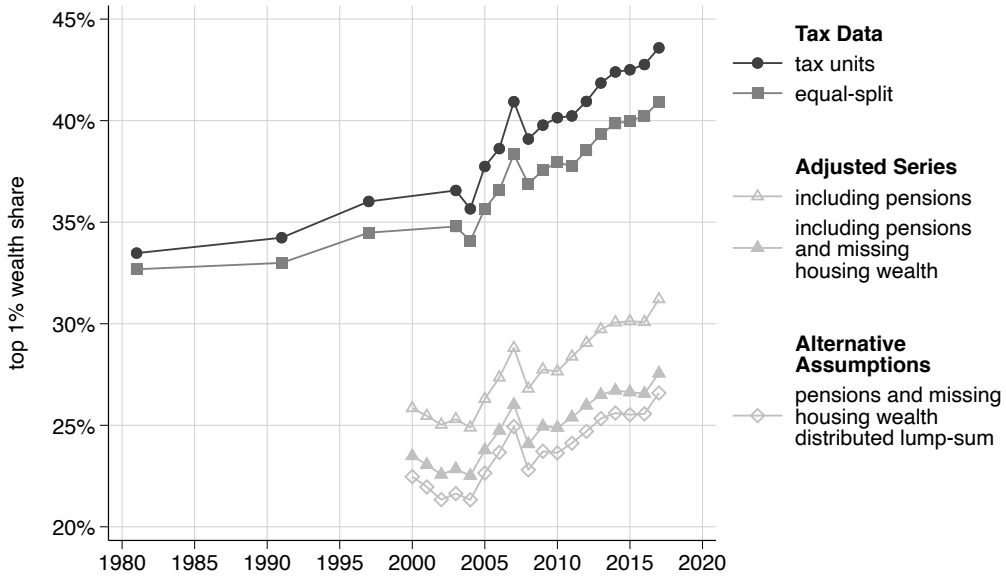


Figure A.13: Top 1% Wealth Shares in Switzerland

Moving from tax units to equal-split individuals reduces the top 1% wealth share by about 2.5 pp in 2017. Adding private pension wealth has the largest effect and reduces it by 10 pp. Finally adding missing real estate wealth further reduces it by 3 pp. Overall, the top 1% wealth goes from 43.5% to 27.5%.

Our results are extremely close to Foellmi and Martínez (2017) (especially to their "average" variant), even though we use fairly different data. However, the reasons why we arrive at our result are slightly different.

There are three main sources of discrepancy between the tax data and national accounts. First, private pension wealth is not included in the tax data. Second, business wealth is included in the tax data, but not measured by the Swiss national accounts. Third, real estate wealth is undervalued in the tax data, because real estate is valued at between 70%

and 100% of its market value (Foellmi and Martínez, 2017).

We tentatively value business assets at 5% of total wealth based on our synthetic survey dataset to complete the national accounts. Then, we get that the wealth tax only captures about 45–50% of total household wealth. Private pension wealth represents about 30% of household wealth. Assuming, following (Foellmi and Martínez, 2017), that real estate in the tax data is valued at 80% of its true value, the real estate wealth missing from the tax data represents 10% of total wealth. This leaves 10% to 15% of wealth unaccounted for, possibly due to tax evasion.

For their estimate, Foellmi and Martínez (2017) focus on pension wealth: they distribute the aggregate amount of pension wealth to the tax data. They do not explicitly account for types of missing wealth. As a result their estimate includes a higher proportion of pension wealth than the national accounts.

We, on the other hand, distribute both private pensions and missing real estate wealth. We also rescale observed taxable wealth to its corresponding amount in the national accounts. Assuming this gap is due to tax evasion, this probably lead us to understate inequality somewhat: see Alstadsæter et al. (2019).

As a robustness check, we compare our benchmark result (based on our synthetic survey dataset) with a simpler method that distributes all pension wealth and missing real estate wealth lump-sum. This arguably constitutes a lower bound on wealth inequality. Figure A.13 shows that this variant has the same trend as our benchmark, and is only a few percentages point lower.

A.10 United Kingdom

In the UK, there are three different sources which have been used to measure the wealth distribution: estate tax records, income tax records and wealth surveys. Lindert (2000) use scattered samples of probate records and occasional tax assessments to estimate the wealth distribution in 1740, 1810 and 1875. Harrison, Atkinson, et al. (1978) rely on both estate tax records and the mortality multiplier method and on income tax records and the capitalization method to estimate the wealth distribution in 1911-1913. Atkinson et al. (1989) also use estate tax records to build wealth distribution series for the period 1923-1977. Alvaredo et al. (2018) use the same historical estate tax records and the recent estate tax records published by Inland Revenue Statistics available since 1978 to study the dynamics of wealth inequality from 1895-2013.

There exist two surveys including information on wealth: the British Household Panel Survey (BHPS) and the Wealth and Assets Survey (WAS). The BHPS is a survey carried out at the Institute for Social and Economic Research of the University of Essex. It

contains annual information on individual and household income and employment as well as a complete set of demographic variables between 1991 and 2008. In 1995, 2000 and 2005 the BHPS survey included an individual wealth module. Banks et al. (2003) use the 1995 BHPS to estimate the wealth distribution. The WAS is a biennial longitudinal wealth survey which has been conducted between 2006-2018 by the Office for National Statistics (ONS). Advani et al. (2021) rely on all the WAS waves to study the evolution of wealth inequality in the UK between 2006-2018. We combine the series of Alvaredo et al. (2018) and the WAS surveys to built harmonized full wealth distribution series for 1995-2020.

To that end, we apply the following steps:

- We use the WAS survey to estimate a ratio between equal-split and individual wealth for each percentile in the top 10%, and use that ratio to transform tax-based series and estimates from individual to equal-split.
- We rescale wealth components of the WAS to national accounts. Then we combine that rescaled survey (for the bottom 95%) and the tax data (for the top 5%) be stitching Lorenz curve together, following the "constrainting" procedure described in Blanchet et al. (section 7.2.3.2 2021a)
- We distribute (funded) pension wealth (which is absent from the tax data) to each percentile assuming the share of pension wealth held by each percentile is the same as in the survey.
- We perform one last rescaling of each component to national accounts totals.

Figure A.14 shows how our final series compare to that Alvaredo et al. (2018).

A.11 Household Finance and Consumption Survey

We finally rely on the Household Finance and Consumption Survey (HFCS) to cover the rest of countries for which we do not have tax records or previous solid estimates consistent with our methodology. The HFCS is built and administered by the European Central Bank and it collects information on the assets, liabilities, income and consumption of households for a wide set of European countries. The fieldwork took place for most countries in 2010 and 2011 for the first (2010) wave, between 2013 and the first half of 2015 for the second (2014) wave and in 2017 for the third (2017) wave.

The countries for which we use the HFCS are the following: Austria (2010, 2014, 2017), Belgium (2010, 2014, 2017), Cyprus (2010, 2014, 2017), Croatia (2017), Estonia (2013, 2017), Greece (2009, 2014, 2018), Hungary (2014, 2017), Ireland (2013, 2018), Latvia (2014, 2017), Lithuania (2016), Luxembourg (2010, 2014, 2018), Malta (2010, 2013, 2016),

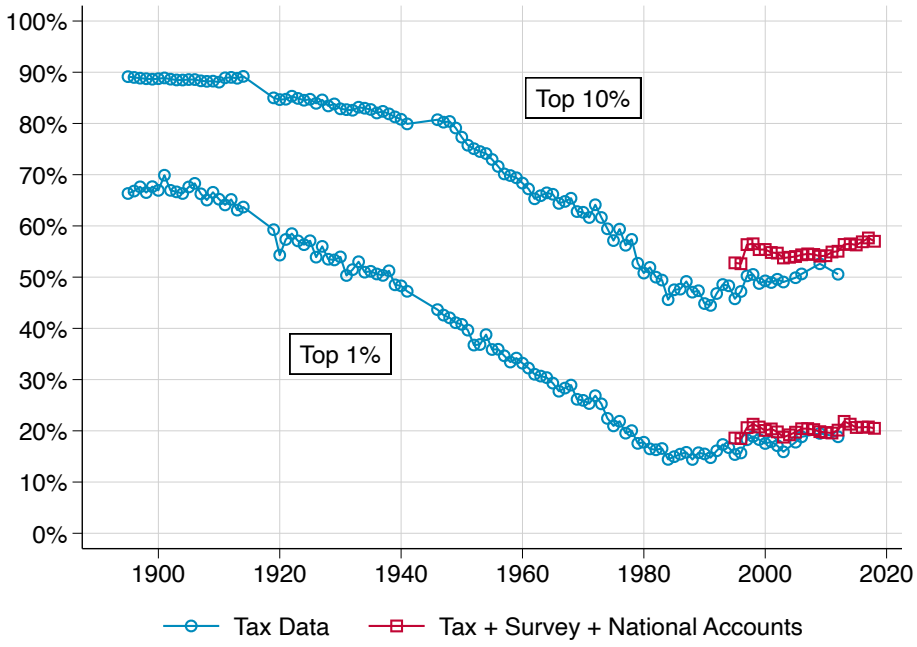
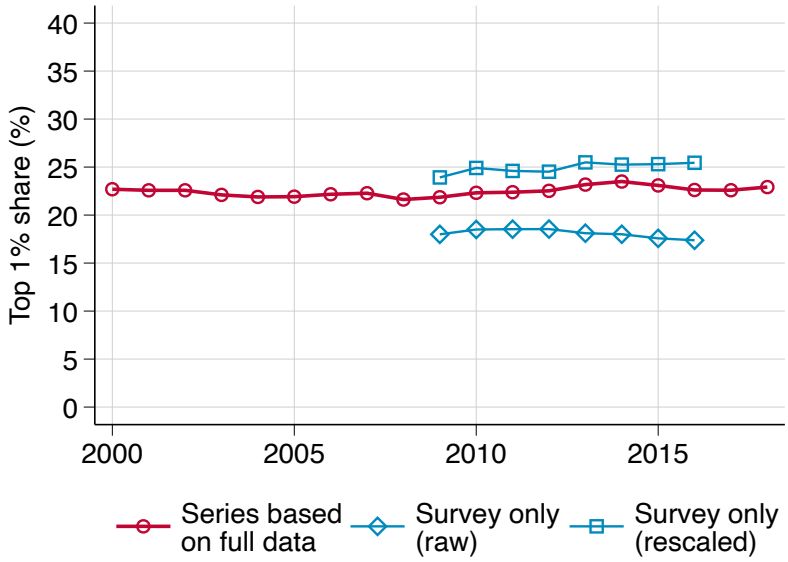


Figure A.14: Comparison of Pure Tax-based and DINA Series, United Kingdom

Poland (2013, 2016), Portugal (2010, 2013, 2017), Slovakia (2010, 2014, 2017) and Slovenia (2010, 2014, 2017).

To ensure consistency with the methodology used for the rest of countries, we rescale the wealth components so as to match the macroeconomic aggregates from national accounts. The HFCS is based on household units. We individualize the survey and split the wealth equally across household members so that our results are based on equal-split units. We extrapolate the wealth distribution series forward up to 2020 by fixing the asset composition by percentile to the last available year of data, so that changes in portfolio composition over time only come from changes in the composition of aggregate wealth. We end up with fully homogeneous wealth distribution series by percentile and asset class from 2010 to 2020.

To evaluate the quality of that approach, Figure A.15 compares the complete data series with the ones constructed from surveys where both sets of data are available. The series based on surveys only (not rescaled to national account totals) underestimate the top 1% by 5pp. in recent years. After rescaling the gap is reduced to 2.5pp., although this correction also overshoots and thus finds higher inequality than the full series. That would suggest that our inclusion of survey-based series might make us underestimate the gap between Europe and the United States by a small amount.



Note: This figures compares the top 1% share for our full series (red circle) with the series from survey data only (blue diamonds) and the series from survey data rescaled to national accounts (blue squares). The data correspond to a wealth-weighted average of European countries for which both full series and survey-based series can be calculated: Italy, France, Germany, Span, Norway, Netherlands, Denmark and United Kingdom.

Figure A.15: Comparison: Full Series vs. Survey-Based Series

B Calibration of Asset and Liability Decomposition

We often face the following issue: we have the distribution of overall net wealth from one source, the macroeconomic amount of each asset from a second source, and a decomposition of net wealth by wealth bracket and by asset type from a third source. For example, the distribution of net wealth may come from tax data that does not decompose wealth, the macroeconomic asset totals may come from the national accounts, and the decomposition by percentile and asset type may come from survey data.

In general, there will be discrepancies between these three sources. To ensure consistency and improve accuracy, we need to adjust them. The complexity of the problem comes from the two sets of related constraints. We can rescale the asset decomposition to the amount of net wealth in each percentile, but then the total amount of each asset will not match the macroeconomic aggregates. Or we can rescale the asset decomposition to the macroeconomic aggregates, but then the total amount of net wealth in each bracket will not match the tax data. To correctly solve the problem, we need to consider the two sets of constraints simultaneously.

Partition the wealth distribution into n brackets, and decompose net wealth into m assets (or liabilities). Let x_{ij} be the aggregate amount of asset j held by bracket i (liabilities can

be coded as an asset with a negative value). Let y_i be the total wealth held by bracket i, and let z_j be the aggregate amount of asset j in the economy. In principle, we must have:

$$\forall i \in \{1, \ldots, n\} \qquad \sum_{j=1}^{m} x_{ij} = y_i \tag{12}$$

$$\forall j \in \{1, \ldots, m\} \qquad \sum_{i=1}^{n} x_{ij} = z_j \tag{13}$$

To perform the adjustment, we solve the following optimization problem:

$$\min_{x^*_{ij}} \sum_{i=1}^{n} \sum_{j=1}^{m} \frac{(x^*_{ij} - x_{ij})^2}{|x_{ij}|} \tag{14}$$

subject to the equality constraints (12) and (13), and to the inequality constraints that $x_{ij} \geq 0$ if j is an asset, and $x_{ij} \leq 0$ if j is a liability. The values x^*_{ij} that are solution of that problem for the new wealth decomposition by bracket and asset type. Note that we set up the distance in (14) so that deviations from the original values of x_{ij} are more heavily penalized for smaller x_{ij}, so that the method seeks adjustments that are somewhat uniform in relative terms.

The problem (14) is a sparse quadratic programming, which we solve using the algorithm of Stellato et al. (2020), as implemented in R (R Core Team, 2020) by Stellato et al. (2019).

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