ESM BRIEFS NO. 2 - TECHNICAL APPENDIX

A. HFCS DATA RESCALING AND UNVEILING

The Household Finance and Consumption Survey (HFCS) is a comprehensive dataset that provides detailed micro-level information on household balance sheets, income, and consumption patterns. The HFCS is conducted jointly by the ECB and national central banks of the euro area using harmonised data collection methods. It is designed to ensure cross-country comparability and national representativeness. This policy brief uses wave 4 of the survey, whose fieldwork took place between mid-2020 until 2022, with a concentration in 2021 (HFCN, 2023). For our analysis, we therefore take 2021 as reference year.

Our focus is on the distribution of safe assets—financial instruments characterised by low default risk and stable returns. The survey provides granular data on household assets and liabilities, enabling the classification of the following as *safe assets* in our analysis:

- Deposits, including current accounts, savings accounts, and term deposits held by households in financial institutions.
- Bonds, comprising debt securities issued by governments or corporations.
- Voluntary pension plans including life insurance policies, referring to supplementary retirement savings schemes voluntarily invested by households. They are distinct from mandatory public and occupational pension systems, which are not covered by the HFCS.

The HFCS data offer valuable insights into the distribution of safe assets across socio-economic dimensions in the wider population (Blatnik et al.). Our analysis relies on the household weights, which aim to align the totals of asset categories in the HFCS with national account aggregates at the country level.

We rescale total net wealth and its different asset categories so as to match the wealth macro aggregates from national accounts. For financial assets, we directly rely on the financial accounts of the household and nonprofit institutions serving households sector (S14+S15) published by Eurostat. Following Bauluz et al. (2023), we unveil households' indirect asset ownership through pension and investment funds. In particular, we use the asset portfolio of investment and pension funds to infer the assets owned indirectly by households through their holdings of pension assets and investment funds shares. The stock of pensions and investment funds can be obtained from official balance sheet for financial subsectors (e.g., SNA- 2008 subsectors S.124, S.128 and S.129). For non-financial assets, we rely on the country aggregates from the World Inequality Database (wid.world) as it provides additional estimates for the value of real assets (in particular, real estate) whenever official estimates are not available.

Figure 1. Average nominal holdings of safe assets by euro area households
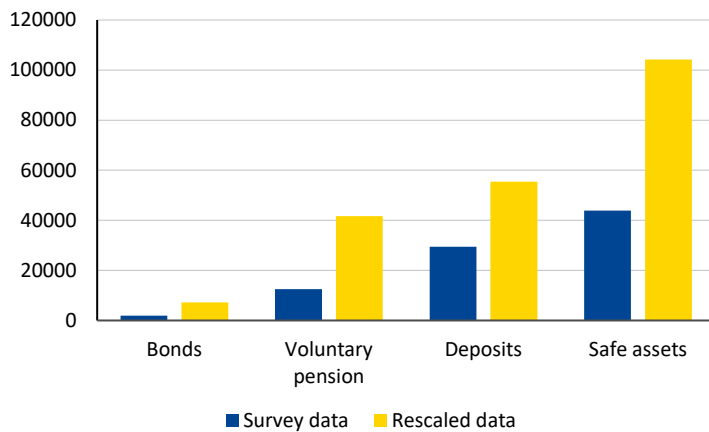
Notes: Figure 1 shows the average gross amount of safe asset instruments per household in the euro area. The averages are constructed using the sample weights and the yellow bars show values that are rescaled to match national account wealth aggregates.

B. ECONOMETRIC MODEL OF THE EFFECT OF AGE ON SAFE ASSET HOLDINGS

To investigate the relationship between the share of safe assets in households' portfolio and age, we estimate a fractional logit regression model:

$$\frac{safe\ assets_{ij}}{total\ assets_{ij}} = G\left\{\alpha + \beta_j + \sum_{p=1}^{11} \theta_p\, Age_i^p + \sum_{p=1}^{11} \gamma_p\, Wealth_{ij}^p + \sum_{p=1}^{11} \delta_p\, Income_{ij}^p \right.$$

$$\left. + \sum_{p=1}^{11} \rho_p\, Wealth_{ij}^p * Dev_{ij}^W + \sum_{p=1}^{11} \tau_p\, Income_{ij}^p * Dev_{ij}^I + X_{ij}\eta \right\} + \varepsilon_i$$

The dependent variable is the share of safe assets, defined as the proportion of deposits, bonds, and voluntary pension and life insurance policies out of total assets held by the household. Our main explanatory variable is age, captured as a series of age dummies that are equal to 1 if the household reference person belongs to a given age bracket. Age brackets span five years, starting with the bracket of 20-24 year-olds up to 80-84 year-olds. A final bracket groups together all households of ages 85 and above.

In addition, the estimation controls for:

- **Economic and financial characteristics**: households' position in the national income and wealth distribution, and the deviations of their income and wealth from the country median values.
- **Standard socio-economic characteristics**, including education, marital status, household size, sex, employment and homeownership status.
- **Country-specific fixed effects**.

The model allows us to calculate the average marginal effect on safe asset holdings as households age and move across the age distribution. As the model is non-linear, the marginal effect of age depends

on the values of all covariates. For ease of interpretation, marginal effects at average values of the covariates are calculated post-estimation.

Figure 2. Average marginal effect of age on safe asset share
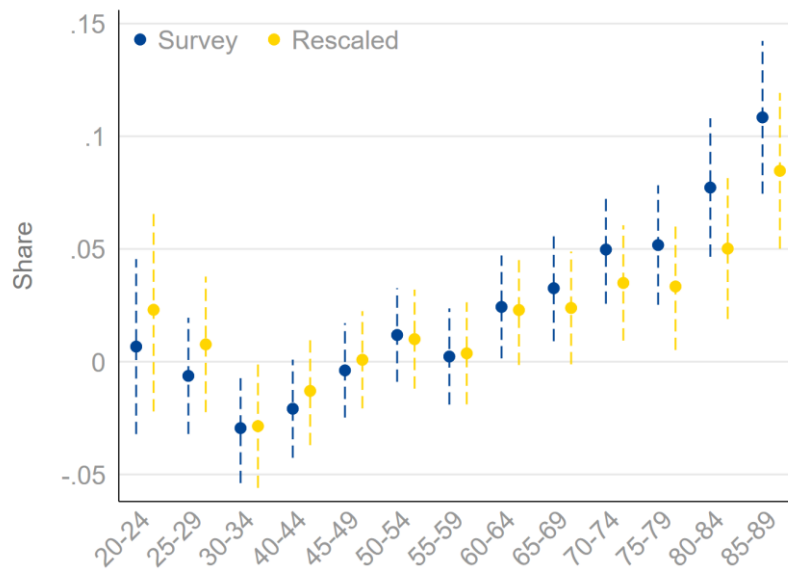
Note: The chart shows the average marginal effect of each age bracket on the share of safe assets in households' asset portfolios. The marginal effect is from the fractional logit model of households' safe asset shares. The base category is 35-39 year-olds. The markers show point estimates, and the dotted lines show the 95% confidence interval.

C. USING POPULATION PROJECTIONS TO PREDICT SAFE ASSETS IN 2050

Our analysis aims to understand the demographic shift towards an ageing population, using the EUROPOP2023 population projections. Figure 3 shows the share of each age bracket in the total population, both for the year 2021 (captured in the HFCS) and for the year 2050. The yellow bars show the difference in the population share for each age bracket.

Figure 3: Percentage of population by age group with current and 2050 population projections
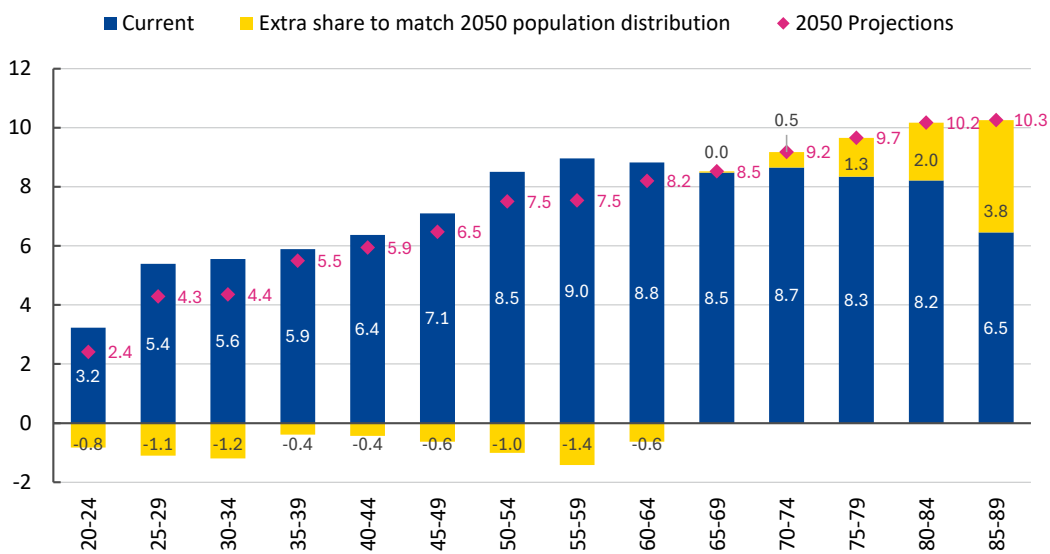
Notes: The chart shows the percentage of the population within each age bracket using EUROSTAT population projections and HFCS data.

Consider the 20-24 age bracket. In the current population of the euro area the blue bar in Figure 3), this group represents 3.2% of the total population. According to EUROPOP2023 projections, this age bracket is projected to shrink to only 2.4% of the population by 2050 (the purple diamond). To account for this shift, we order all households in the HFCS by age. We keep 2.4% of the households in this age bracket but move 0.8% of households into the next age bracket. Including the newly shifted households, the age bracket of 25-29 now encompasses 6.2% (5.4% + 0.8%), which is too high—its projected share is only 4.3%. So we again keep only 4.3% of households in this bracket, and shift 1.9% into the next age bracket of 30-34 year-olds. This process repeats for each age bracket, with the subtracted shares redistributed to the next older group. By construction, the sum of the shares subtracted from the young categories exactly match the shares added to the elderly brackets.

To calculate the nominal amounts of safe assets for each household, we use wealth-to-income ratios. First, we assume that the wealth-to-income ratio for each country j remains stable at level μ_j (for the euro area as a whole, the ratio has remained broadly stable since the global financial crisis):

$$\left(\frac{w_{j,2021}}{y_{j,2021}}\right) = \left(\frac{w_{j,2050}}{y_{j,2050}}\right) = \mu_j$$

where w_j is total gross wealth (the rescaled aggregate total wealth in the HFCS) in country j in 2021 and 2050, and $y_{j,}$ is nominal GDP in country j in 2021 and 2050. To calculate nominal GDP in 2050, we use

- latest observed annual GDP for 2023
- long-run growth and inflation forecasts from the EC's Potential Output Working Group and Ageing Report (European Commission, 2024)

For each country j, nominal GDP increases according to:

$$y_{j,2050} = y_{j,2023} * \left[\left(1 + g_j\right) * \left(1 + \pi\right)\right]^{(2050-2023)}$$

Total wealth $w_{j,2050}$ is then equal to $\mu_j * y_{j,2050}$. At the household level, total assets $A_{i,j}$ grow at the same rate as total assets for the entire economy:

$$A_{i,2050} = A_{i,2021} * \left(\frac{w_{j,2050}}{w_{j,2021}}\right)$$

We predict the *safe asset share* for each household i using the regression results in Section B and the new predicted age distribution for the year 2050. Finally, using the *predicted safe asset share*, we derive *predicted nominal safe assets*:

$$safe\ assets_{ij} = \left(\frac{\widehat{safe\ assets_{ij}}}{total\ assets_{ij}}\right) * A_{i,2050}$$

Bibliography:

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Bauluz, Luis, Thomas Blanchet, Clara Martinez-Toledano, and Alice Sodano et. 2021. "Estimation of global wealth aggregates in WID.World." World Inequality Lab—Technical Note 13.

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