

Distributional Wealth Accounts for the Euro Area: Capturing the Right Tail

Nina Blatnik[†], Marco Felici[†], Jacobo Ferrer-Hernández[†]

1. Introduction: Overview of Distributional Wealth Accounts (DWA) for the euro area and the challenges of linking survey data and national accounts

Following the Global Financial crisis, and ever more after the exceptional recent changes in the economic environment, the demand for timelier, coherent, and consistent distributional information for the household sector has grown. To reflect this, the G20 Data Gap Initiative, launched in 2009 and further enhanced since then, includes recommendations to compile distributional information on income, consumption, savings, and wealth for the household sector. The OECD coordinates the work under the G20 Data Gap initiative and the European Central Bank (ECB) has been actively contributing to it. With respect to household wealth, the European System of Central Banks (ESCB) is developing Distributional Wealth Accounts, which aim to provide distributional information on the wealth of euro area households, by linking National Accounts with household survey data.

The ESCB compiles quarterly Sector Accounts (QSA) for all euro area (EA) and EU countries, and the EA as a whole, covering the main institutional sectors of the economy, including the household sector¹. In parallel, the ESCB has developed the Household Finance and Consumption Survey (HFCS), which provides information on the distribution of wealth among households in most EA countries². Distributional Wealth Accounts aim to link these two different datasets, with the objective to provide an assessment of the distribution of wealth across different household groups consistent with aggregates in QSA. While the HFCS and the QSA both measure the wealth of households, their different aim and scope lead to several generic differences between these datasets³. These differences concern the sources (counterpart data reported by financial corporations for QSA, individual household feed-back for the HFCS), the definition of household sector (the HFCS definition is more restrictive), the timeliness and periodicity of data release (QSA quarterly data are available no later than four months after the end of the quarter, HFCS is conducted every three years in most countries and has a longer lag to publication), the valuation

[†] External Statistics and Sector Accounts Division, Directorate General Statistics, European Central Bank. The paper has greatly benefited from the comments of Henning Ahnert and Pierre Sola. The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the European Central Bank or the Eurosystem.

¹ More information at: https://www.ecb.europa.eu/stats/macroeconomic_and_sectoral/sector_accounts/html/index.en.html

² More information at: https://www.ecb.europa.eu/stats/ecb_surveys/hfcs/html/index.en.html

³ A detailed description can be found at (Section 3): <https://www.ecb.europa.eu/pub/pdf/scpsps/ecb.sps37~433920127f.en.pdf>

of assets and liabilities (generally market prices for QSA, households' self-evaluation for the HFCS), the items composing household wealth (most but not all of the items can be matched across the two sources), and finally specific measurement issues (such as wrong sector classifications in the QSA, or sampling bias in the HFCS).

The challenge and objective of DWA is to overcome these differences by reconciling QSA and the HFCS to the extent possible, using the national accounts concepts and the aggregate results of the QSA as benchmark. The methodology used to bridge Sector Accounts and household surveys is composed of a series of steps⁴. First, to cover as much common ground as possible between QSA and the HFCS, a wealth concept specific to DWA is defined and individual items from both QSA and HFCS are adjusted accordingly. Then, for each HFCS release, the QSA data closest in time is matched, and the population scope in the HFCS is broadened to match that of QSA. Following this, adjustments are carried out for non-financial assets, to better harmonise the measures available in QSA and HFCS. Deposits, which tend to be considerably lower in HFCS than what one would expect from the QSA, are modified at this point, to adjust some micro-data identified as outliers. Because households at the top of the wealth distribution ("rich households") are difficult to capture in surveys, a crucial step in the DWA process involves estimating these missing rich households. In a final step, any gaps still remaining between the HFCS adjusted up to this point and QSA are allocated proportionately across households for each item composing the wealth concept. This paper focuses on the step estimating the missing rich households, to better capture the right tail of the wealth distribution. The motivation and methodology behind it will be first discussed, to then present preliminary results on the evolution over time of the right tail for the EA.

2. The shape of the right tail and the portfolio allocation of the added rich households

Household surveys aim to cover the whole population, but they generally face difficulties in adequately capturing the richest households. This is mainly because they are usually not sufficiently represented in the samples, and they tend not to reply to such surveys even if they are selected (unit and item non-response). Many countries have implemented measures to remedy this situation by oversampling the very rich in the HFCS. However, not all countries have managed to do so, as it is a costly procedure, and even where this could be implemented, the very top of the distribution is generally not fully covered. For this reason, estimating the wealth of these very rich households becomes a crucial step in the linking of the micro (HFCS) and macro (QSA) data. This is in quantitative terms the most significant of the reconciliation steps used in DWA after the final proportional allocation.

In the absence of full information on the top of the wealth distribution, the literature considers that a reasonable procedure is to derive the missing rich households by fitting a Pareto distribution

⁴ A detailed description can be found at:

<https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2687~a21d434d45.en.pdf?afe92295c43d4ce29c860501de64873a>

to the available data. It is a well-researched fact that the right tail of the wealth and income distributions follows a power law, such that the distribution of a quantity of interest, such as wealth, varies as a power of the cumulative distribution of households. In his seminal contribution, Vermeulen (2018)⁵ showed that even when a few very wealthy observations are added at the top of the sample data, the estimation improves considerably. Such observations are mostly available from “rich lists”, which in most cases come from public information collected by the press, such as Forbes World’s billionaires. The method to construct the DWA follows this approach by incorporating information from the “rich lists” and estimating further “missing rich households” by assuming that the wealth of households in between a certain threshold and the rich list follow a Pareto distribution.

The first step of this process involves estimating a Pareto shape parameter from the available data. The Cumulated Distribution Function of the Pareto distribution (Type I) is given by:

$$F(w_i) = P(W \leq w_i) = \begin{cases} 1 - \left(\frac{\tilde{w}_0}{w_i}\right)^\alpha, & \text{for } w_i \geq \tilde{w}_0 \\ 0, & \text{for } w_i < \tilde{w}_0 \end{cases}$$

where \tilde{w}_0 and α are the scale and shape parameters. The scale \tilde{w}_0 is defined as the lowest wealth value observed in the survey exceeding a threshold w_0 , currently assumed to correspond to “millionaires”⁶.

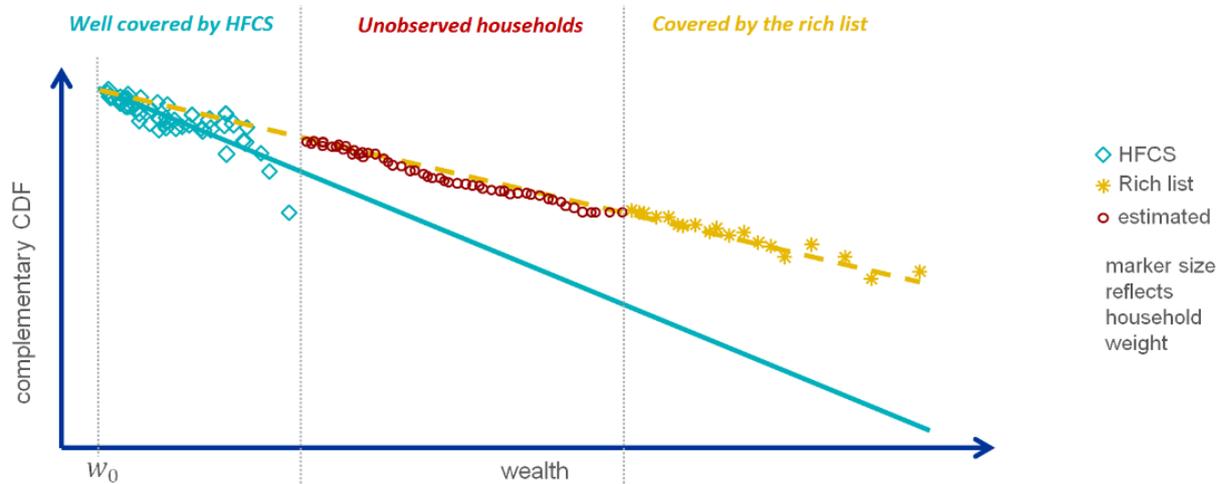
The shape parameter α is estimated from the sample composed of HFCS surveyed households whose wealth is higher or equal to \tilde{w}_0 and observations from “rich lists” where available. As described in Vermeulen (2018), we can estimate a power law distribution on samples from complex survey designs, so that by fixing the w_{min} to a reasonable value, it is possible to obtain the parameter of interest α via Ordinary Least Squares (OLS).

For many countries a large gap is observed between the richest household sampled in the HFCS and the “poorest” observation on the rich list. Since it is implausible that no households with wealth in this interval exist, synthetic households are sampled from the estimated Pareto distribution to fill the interval where no observations are available. In a few countries, due to the applied oversampling strategy, the least rich member of the “rich list” is nearly as rich as the richest household covered by the HFCS. For most cases, however, additional net wealth observations are drawn from the estimated Pareto distribution, effectively extending the rich list to bridge the gap with the top of the HFCS. The figure below shows a stylized illustration of the upper tail of the net wealth distribution enhanced with synthetic households where necessary. The solid line represents the Pareto distribution fitted solely on the HFCS data, while the dashed line represents the Pareto distribution fitted also on additional observations provided by the “rich list”.

⁵ Vermeulen, P. (2018). “How fat is the top tail of the wealth distribution?” *Review of Income and Wealth*, 64(2):357–387.

⁶ In practice, w_0 is set at 1 million euros for most countries.

Figure 1. Stylized representation of the DWA completion of the right tail of the wealth distribution



Source: author's elaboration.

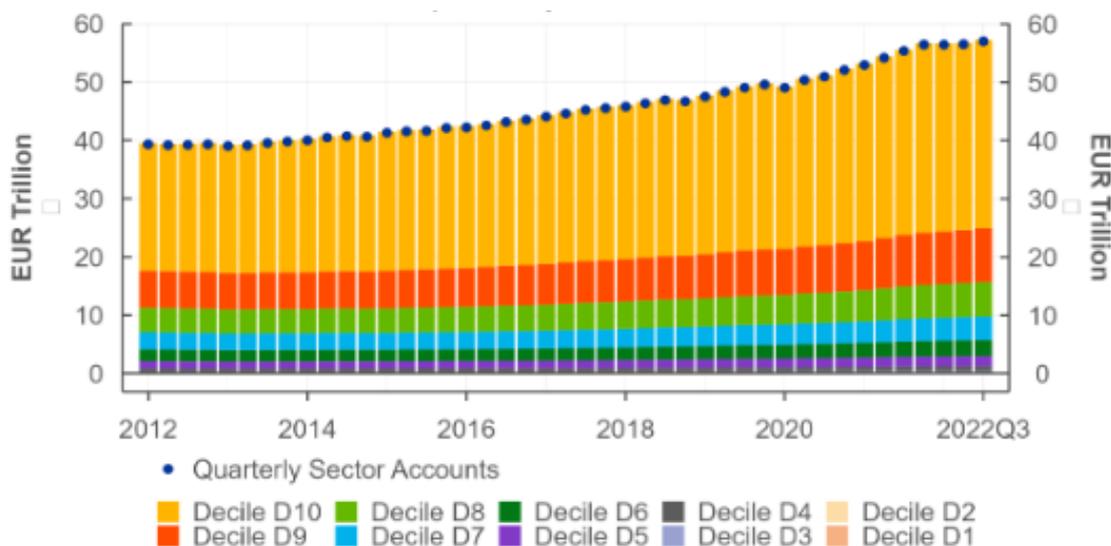
The observations from the rich list as well as the synthetic households are given in terms of their net wealth, but information on the complete portfolio is desirable. To estimate gross assets and liabilities of these households, two additional steps are taken. First, considering the empirical evidence on the tendency for the debt-to-asset ratios to decline as a function of net wealth, the liabilities of wealthy households are set to lay in the 5% to 10% range, and the added debt is allocated between mortgage debt and other debt in proportion to the corresponding gaps between HFCS and QSA. Second, the estimated total assets of the wealthiest households are allocated to the different instruments according to the gaps between the QSA and the HFCS for each instrument by country, as well as drawing from the portfolio information of 300 rich households provided by a survey run by UBS/Campden and published by The Economist. The sensitivity analysis have shown that the results are very stable, indicating that the process of filling the distribution with unobserved rich households not only plays an important role in closing the gap between QSA and the HFCS, but also corrects and complements the available information on how wealth is distributed in society across households, instruments, and demographic breakdowns, such as employment status or housing tenure.

3. DWA estimates for the euro area

Quarterly data on distributional wealth accounts enable in depth analysis of various inequality indicators as well as of the distribution of wealth across different household groups and its evolution, while at the same time ensuring consistency with the QSA aggregates. By estimating the rich households missing in survey data, explained in the previous section, DWA also closes a coverage gap and sheds light on the right tail of the wealth distribution. In other words, it allows for a comprehensive analysis of the entire population as well as supplementary analysis of households at the top of the wealth distribution.

Figure 2 shows the evolution of the distribution of net wealth for EA households split by net wealth deciles in the period from 2012Q1 to 2022Q3. The total net wealth for the EA is slowly increasing (mainly driven by the increase in housing wealth) for all net wealth deciles. This increase impacted more the top decile, not only in absolute but also in relative terms, whose net wealth increased by 48% since 2012Q1. On the other end, the net wealth of the bottom five deciles together increased by 41% in the same time period.

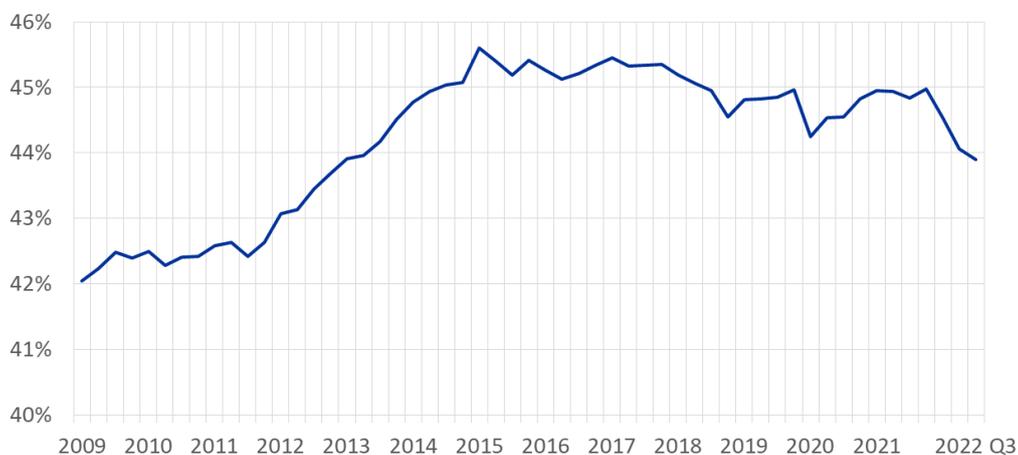
Figure 2. Distribution of net wealth for Euro Area households



Source: ECB DWA estimates.

When looking closer at the right tail of the distribution for the EA, it can be observed that the richest decile obtained 56.7% of total wealth in the EA in 2022Q3, most of it being concentrated in the holdings of the top 5% wealthy households, which obtained 43.9% of total wealth in the same period. As seen from Figure 3, the share of wealth held by the top 5% households was increasing until 2015Q1 and has remained broadly stable since then. At the other end of the distribution, the bottom 50% households in the EA held only 4.9% of total net wealth in 2022Q3.

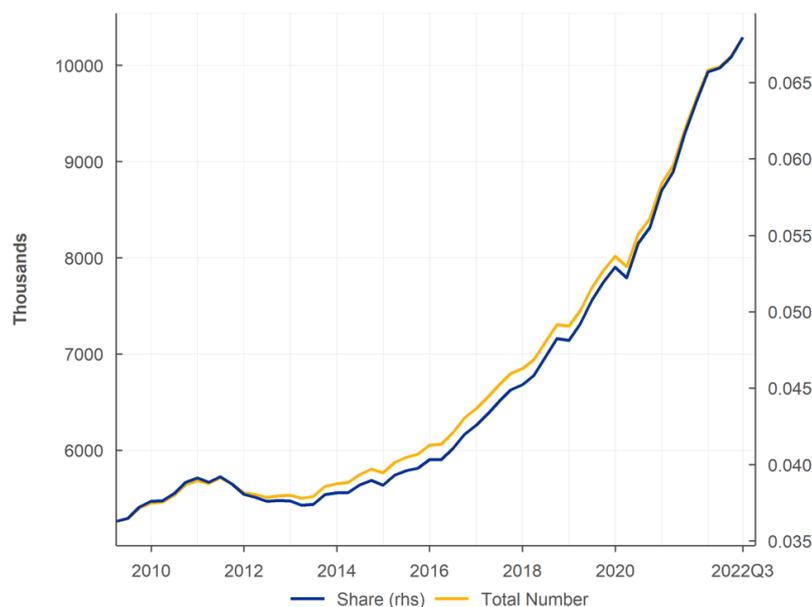
Figure 3. Wealth share of the top 5% households in the Euro Area



Source: ECB DWA estimates.

According to DWA estimates, there were about 10 million households in the EA with net wealth above EUR 1 million in 2022Q3, which represents approximately 7% of all households in the EA. The number and share of millionaires, presented in Figure 4, are rapidly increasing in the recent periods, which is driven by the increase of total net wealth as presented above, in particular due to valuation gains on housing and financial assets.

Figure 4. Number (LHS) and share (RHS) of EA households with net wealth above EUR 1 million



Source: ECB DWA estimates.

4. Conclusions and outlook

The policy relevance of constructing households' wealth distributional information that is consistent with national accounts is gaining ever greater momentum. National accounts aggregates on income and wealth play a key role in the economic analysis of the ECB, and distributional information that is aligned to these aggregates provides a clear added value. The ECB's work on DWA is not the only case, as the example of the Distributional Financial Accounts⁷, compiled by the Federal Reserve, testifies. This paper introduced the main challenges in reconciling survey data on households with Sector Accounts, describing the procedure to obtain DWA that are consistent with both. The focus of the paper is on a specific step in the procedure, which estimates "missing rich" households, to capture the right tail of the wealth distribution that is generally absent in surveys alone. The paper also illustrates some preliminary results on the evolution over time of this right tail for the EA. Looking ahead, the envisaged release of EA experimental DWA to the public, the related work of many countries under the G20 Data Gaps Initiative and the future integration of accounts for wealth, income, consumption and savings represent a particularly noteworthy development in the policy and academic landscape on inequality.

⁷ More information at: <https://www.federalreserve.gov/releases/z1/dataviz/dfa/>