



Accounting for pension wealth, the missing rich and under-coverage: A comprehensive wealth distribution for Germany

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ABSTRACT

This study constructs a comprehensive wealth distribution for Germany to inform debate in Germany and internationally on the distribution of wealth including pension entitlements. We estimate the net present value of pension wealth in Germany in 2012 and 2017 using Socio-Economic Panel (SOEP) data. When including pension wealth, German households' wealth-income ratio increases from 570% to 850% in 2017; the wealth share of the bottom 50% increases from 2% to 9%; and the wealth share of the top 1% declines from 30% to 20%.

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1. Introduction

Comparing wealth between countries and within countries over time requires thorough conceptual harmonization. A country's institutional setting can create or reduce savings and investment incentives and thus affect the accumulation of wealth. A generous social security system or publicly funded higher education, for example, lower incentives to save. Adding the net present value of pension wealth to marketable wealth – to compute to what we refer to as augmented wealth – is an important step toward making wealth distributions more comparable between groups with differing levels of pension coverage or between countries with different institutional settings. Yet, because of the high data requirements to simulate social security pensions, only a few studies to date have estimated the net present value of pension wealth, for example, in Germany (Bönke et al., 2019) and the United States (Bönke et al., 2020).

This study calculates a comprehensive wealth distribution for Germany with the aim of informing German and international debate on the distribution of wealth including pension wealth.

We estimate the net present value of pension wealth in Germany in 2012 and 2017 based on the individual's work history to date (accrual value) recorded in Socio-Economic Panel (SOEP) data. We build on earlier work by Frick and Grabka (2010, 2013) and Bönke et al. (2019) who estimate German public pension wealth (typically pay-as-you-go) and occupational pension wealth (pay-as-you-go or funded) for the year 2012. The current market value of private pensions is recorded in SOEP.

To ensure international comparability, we also use state-of-the-art methods to deal with two well-known shortcomings of survey data: First, to address the undercoverage of assets like financial assets and businesses, we uprate the survey data to macroeconomic aggregates (Batty et al., 2019; Garbinti et al., 2021; Albers et al., 2022). Second, to address the underrepresentation of the rich, we top-correct the survey data with rich lists (Bricker et al., 2019) and apply the generalized Pareto interpolation method developed by Blanchet et al. (2022).

We find that including pension wealth increases the wealth-income ratio of German households from around 570% to 850% in 2017. Pension wealth is the most important wealth component for the bottom 50% of German households and represents around 70% of their augmented wealth portfolio, whereas it represents around 45% for the middle 40% (P50-90) and just 3% for the top 1%. The varying importance of pension wealth across the wealth distribution has an equalizing impact: The wealth share of the

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bottom 50% increases from 2% to 9%, while that of the top 1% declines from 30% to 20%.

Whether or not to include pension wealth is debated. Some argue that including pension wealth calls for including *all* promises of future government transfers. For example, [Saez and Zucman \(2016\)](#) state that “it is not clear where to stop, and such computations are inherently fragile because of the lack of observable market prices for these types of assets”. Appendix Figure A.1 illustrates the sensitivity of our pension wealth estimate with respect to the chosen discount rate. We see the inclusion of pension assets as the first step towards a fully comprehensive wealth concept, which would include other future social security entitlements like the monetary value of long-term care insurance. We argue, however, that future pension entitlements are the most immediate complement to standard wealth because they will flow with certainty after reaching retirement age. Claims on future health benefits are less straightforward to predict as their realization depends on the individual becoming sick and their magnitude depends on the (covered) cost of treatment. In general, their consumption value is very difficult to monetize. Providing an estimate for the distribution of pension wealth in Germany, we leave it to the individual researcher whether or not to include this estimate.

2. Data and methodology

2.1. Data

Our main data source is the SOEP, which is a representative survey of German households ([Goebel et al., 2019](#)). Along with information on socio-demographics, education, and labor market status, the SOEP questionnaire contains a module about individual and household wealth, which has been included in the questionnaire every five years since 2002. To measure total wealth, we draw on household balance sheets (HBS) published annually by the Federal Statistical Office (Destatis). To address the underrepresentation of the very rich, we use the rich list of the German business magazine *Manager Magazin*. The 2017 version contains 1001 entries, which roughly equals 0.01% of German households (assuming an average of four family members per entry). Individual and joint household survival rates are calculated from demographic tables from the Federal Statistical Office ([Statistisches Bundesamt, 2018, 2020](#)).

2.2. Estimating pension wealth

The current value of private pensions is recorded in the SOEP and included in financial wealth. To conceptualize private wealth, we estimate the current value of pay-as-you-go public (employee and civil servant) pensions and occupational pensions. For both public and occupational pensions, entitlements are accumulated over the entire course of working life and are proportional to lifetime earnings (equivalence principle).

The SOEP collects in-depth information on individual pension entitlements in Germany for both the retired and non-retired population. For the retired population, entitlements are the sum of pensions from the survey year until death. For the non-retired, entitlements are the sum of pensions from retirement age to death based on accumulated remuneration points up to the survey year.¹

Using the accrual approach, pension wealth is the present value (PV) of the expected payments from entitlements accumulated up to the survey year ([Bönke et al., 2019; Wolff, 2015](#)).

¹ Pensions may be based on an individual's own contributions during working life or their derived rights, i.e., widow(er) pensions for married couples.

Pension wealth PV_t^p in year $t = 2012, 2017$ is the present value of future pension payments discounted at the commonly assumed rate $r = 3\%$ ²:

$$PV_t^p = \sum_{t=0}^{T-a} s_{a,t} \times \frac{1}{(1+r)^t} \times E_t^p \quad (1)$$

where $s_{a,t}$ denotes the probability of a person aged a surviving until year t , $T - a$ is the remaining maximum life span, and E_t^p is the pension payment from pension scheme p (regular employee, civil servant, or occupational pension). We look at gross pension wealth before taxes and social security contributions and conduct the estimation of expected present value of widower pensions analogously to the direct entitlements outlined in Eq. (1) but based on joint household survival functions ([Bönke et al., 2019](#)). We refrain from speculating about future taxes and contributions to estimate net pension wealth for two reasons. First, the direction of their impact is quite clear: Because of tax allowances for low-income pensioners and tax progressivity, net pension wealth would reveal an even greater equalizing impact on the wealth distribution than gross pension wealth. Second, not including future taxes and contributions also insures conceptual consistency and comparability regarding the other considered wealth components.

2.3. Upgrading and top-correction of survey data

Survey data like the SOEP are known to have two shortcomings for internationally comparable inequality measures. First, survey data only capture a fraction of total business and financial assets (mostly held by the rich) while capturing the majority of total real estate wealth (mostly held by the middle class) (see [Table 1](#)). To close this gap, we uprate all survey data to macroeconomic aggregates (see Section 2.3). Survey data are also known to miss the very wealthy, thus creating a downward bias for income and wealth inequality measures ([Bartels and Metzger, 2019; Schröder et al., 2020b](#)).

We follow the upgrading procedure of [Albers et al. \(2022\)](#) and [Batty et al. \(2019\)](#). First, we start with unadjusted survey data and compute each percentile's share in the survey aggregate of each asset. Second, we top-correct the distribution by adding the asset-specific share held by the top 0.01% recorded in the MM-list to the asset-specific shares of the top percentile and reduce the asset-specific shares held by the bottom 99 percentiles proportionately. In a third step, we uprate the distribution by multiplying the asset-specific shares by the respective macroeconomic aggregate. Note that this procedure implicitly assumes that the upgrading factor is constant across the distribution.

Comparing the survey data aggregates to macroeconomic aggregates from the HBS reveals different degrees of undercoverage, which results in different upgrading factors. The upper panel of [Table 1](#) shows the ratio of the SOEP aggregate and the HBS aggregate by asset type. Real estate wealth, consumer debt, and housing debt are covered reasonably well: The SOEP aggregate sums to around 80% of the HBS aggregate. In contrast, less than a third of HBS financial and business assets are captured in the SOEP.

Despite some households and individuals changing ranks, rank correlations between the unadjusted and the uprated wealth distribution are as high as 98% in both years ([Table 1](#)).

² Mechanically, pension wealth decreases with the assumed discount rate. [Bönke et al. \(2019\)](#) show for a reasonable range from 2 to 5% that an discount rate increase by one percentage point decreases median pension wealth by around 20 percent. Appendix Figure A.1 shows that choosing $r = 1\%$ results in a wealth-income ratio of ca. 390% in 2017, $r = 3\%$ of 280% and $r = 5\%$ of 215%.

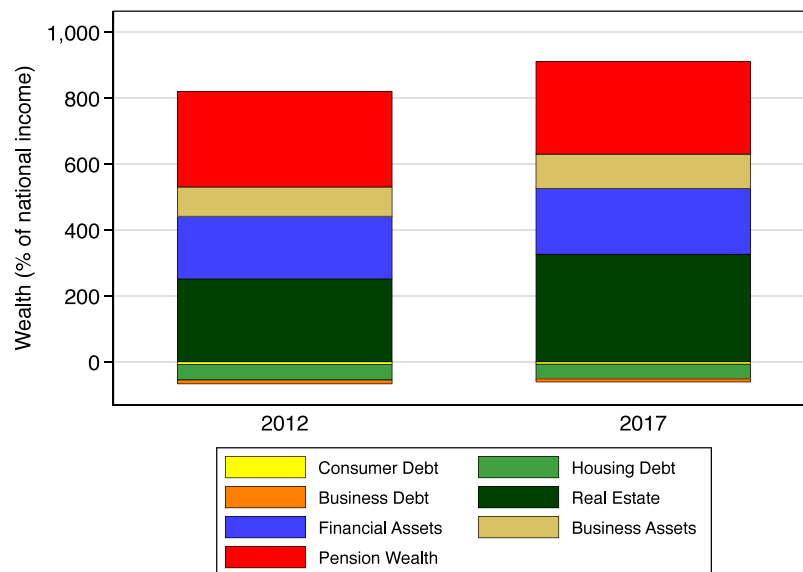


Fig. 1. Wealth-income ratio, 2012 vs. 2017. Notes: Pension wealth is calculated based on SOEPv36 top-corrected and uprated assuming a discount rate $r = 3\%$. For alternative discount rates see Appendix Figure A.1. National income is from the World Inequality Database (wid.world). Source: Total wealth (excl. pension wealth) is from Albers et al. (2022).

Table 1

Uprate factors and rank correlations.
Source: SOEPv36 and total wealth from Albers et al. (2022) who use HBS and revised aggregates for business assets and real estate.

	Ratio		Uprate factor	
	2012	2017	2012	2017
Real estate wealth	80.2	68.8	1.25	1.45
Housing debt	85.5	86.0	1.17	1.16
Consumer debt	84.0	81.2	1.19	1.23
Financial assets	35.0	33.6	2.86	2.98
Business assets	26.1	30.1	3.83	3.32
Spearman rank correlations				
Individual-level			0.98	0.98
Household-level			0.98	0.98

Notes: Lines 1–5 display the ratios of the SOEP wealth aggregates to HBS aggregates as well as the implicit uprate factors. Spearman's rank correlations between individuals' ranks in the net wealth distribution before and after the uprating procedure.

3. Results

3.1. Wealth-income ratio including pension wealth

Fig. 1 displays the wealth-income ratio in Germany by asset type in 2012 and 2017. We are the first to include an encompassing measure of pension wealth, which in 2017 adds up to around 280% of national income in Germany. Between 2012 and 2017, the house price boom in Germany led to a remarkable expansion of real estate wealth, while the importance of other asset types remained comparably stable. In international comparison, Germany's wealth-income ratio is high, even when not accounting for pension wealth (around 570%). In 2017, wealth-income ratios (only including funded pension wealth) stood at 500% in Sweden, 540% in the United States, 570% in France, and 640% in the United Kingdom (Albers et al., 2022). Including pension wealth brings the German wealth-income ratio from around 570% to 850% in 2017.

3.2. Wealth composition of different wealth groups

After having discussed the role of pension wealth for the aggregate composition of wealth in Germany, we now group households into four wealth groups that emerged as the new standard in recent wealth distribution studies (see, e.g., Garbinti et al., 2021; Kuhn et al., 2020): bottom 50%, middle class (P50–90), upper middle class (P90–99) and top 1%. Fig. 2 shows the composition of average wealth including pension wealth in 2012 and 2017 by wealth group. The trends in Fig. 2 replicate previous findings of a middle-class benefiting from house price growth (Albers et al., 2022).

Bottom 50%. In 2017, the average augmented wealth of the bottom 50% amounts to around 95,000 euros. Pension wealth is the most important wealth component for these households, representing around 70% of their augmented wealth portfolio. Their average augmented wealth growth between 2012 and 2017 was comparably low (+8%).

Middle class (50%–90%). For the German middle class, pension wealth and housing are the most important wealth components. In 2017, their pension wealth accounts for around 45% and net housing wealth for around 33% of their average augmented wealth. Largely driven by rising real estate wealth, the average augmented wealth of the middle class increased by 18% between 2012 and 2017.

Upper middle class (90%–99%). When moving up the augmented wealth distribution to the upper middle class, we find that both financial assets and business assets are increasingly important. In contrast, while still forming a substantial part of the overall portfolio, pension wealth declines in relative weight to around 27%. Housing still represents the most important asset for the German upper middle class (41% of augmented wealth in 2017). Average augmented wealth increased by 20% between 2012 and 2017.

Top 1%. Business assets are the dominant asset class for the top 1%, amounting to around 43% of their average augmented wealth

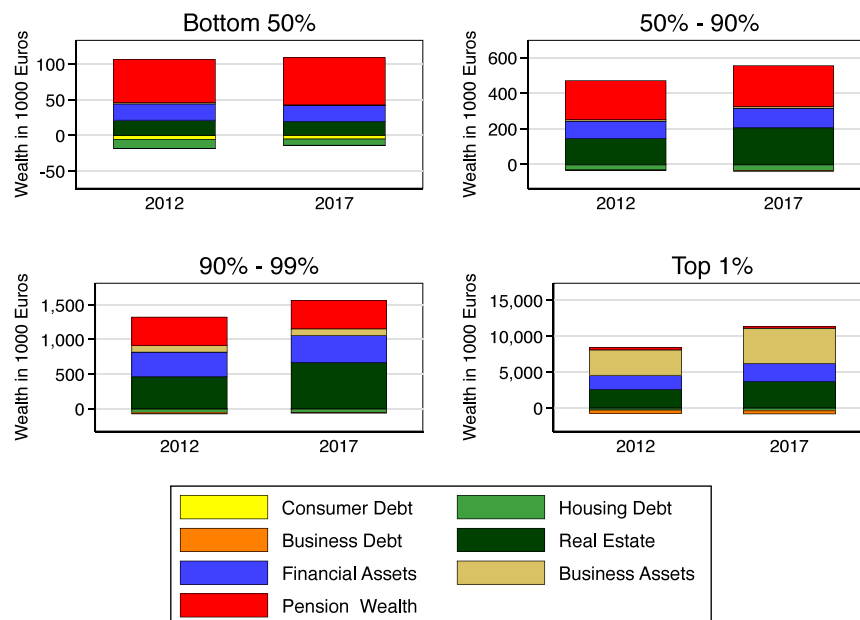


Fig. 2. Heterogeneity of portfolios for the bottom, middle, and top, 2012 vs. 2017. Notes: Composition of household wealth in 2015 euros. Source: SOEPv36 top-corrected and uprated, own calculations.

in 2017. Housing (31%) and financial assets (23%) are also important. In contrast to the other wealth groups, the relative weight of pension wealth is negligible for the top 1%. With an increase of 37%, the top 1% faced the highest growth in average augmented wealth among all wealth groups between 2012 and 2017. Their remarkable wealth growth is a result of both capital gains and savings (Albers et al., 2022), but is not related to pension wealth.

3.3. The distribution of wealth including pension wealth

How does the inclusion of pension wealth affect the wealth shares of the different wealth groups? The SOEP enables us to report both household and individual wealth shares.

Fig. 3 compares individual and household wealth shares of four wealth groups in 2012 and 2017 using different wealth concepts (net wealth vs. net wealth + pension wealth). Two findings are worth noting.

First, a comparison of households to individuals shows that the wealth share of the bottom 50% increases at the expense of the top 1%, which loses in relative terms. This phenomenon occurs because individuals living together do not perfectly sort by their individual wealth. In other words, poor individuals live with richer individuals, which reduces household wealth at the top and increases household wealth at the bottom of the distribution. This pattern holds for both net wealth and augmented wealth.

Second, the bottom wealth share increases substantially when adding pension wealth. Due to the fact that pension wealth is the dominant factor in the wealth portfolio of the bottom 50% of households (see Fig. 2), their wealth share in 2017 increases from 2% when only considering net wealth to 9% when also accounting for their pension wealth. In contrast, the wealth share of the top 1% declines from 30% to 20% due to the inclusion of pension wealth. Schröder et al. (2020a) find a similar individual top 1% wealth share of around 35% using SOEP data with a top-wealth sample and MM list in 2019.

4. Conclusion

In this paper, we have provided a comprehensive wealth distribution for Germany to inform the policy debate on the distribution of wealth including pension wealth. We found that including pension wealth increases the wealth-income ratio of German households from 570% to 850%. The relevance of pensions compared to national income not only indicates the importance and generosity of a country's pension system; it is also informative about the current obligations and sustainability of welfare states in times of demographic change and declining growth rates.

Because of the varying importance of pensions across the wealth distribution, pension wealth plays an equalizing role: The wealth share of the bottom 50% increases from 2% to 9% when including pension wealth, whereas that of the top 1% declines from 30% to 20%.

Adding pension wealth to net wealth is an important step towards making wealth distributions more comparable between groups with differing levels of public pension coverage (e.g. self employed vs. employees) or between countries with different institutional settings for at least two reasons. First, future pension benefits, next to standard wealth, determine consumption opportunities during retirement. Second, these benefits provide a safety net that helps mitigate financial risks like outliving one's savings. Hence, public pensions schemes have immediate incentives for private wealth accumulation and not including pension wealth may bias comparisons and underestimate capabilities.

Data availability

The data that has been used is confidential.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.econlet.2023.111299>.

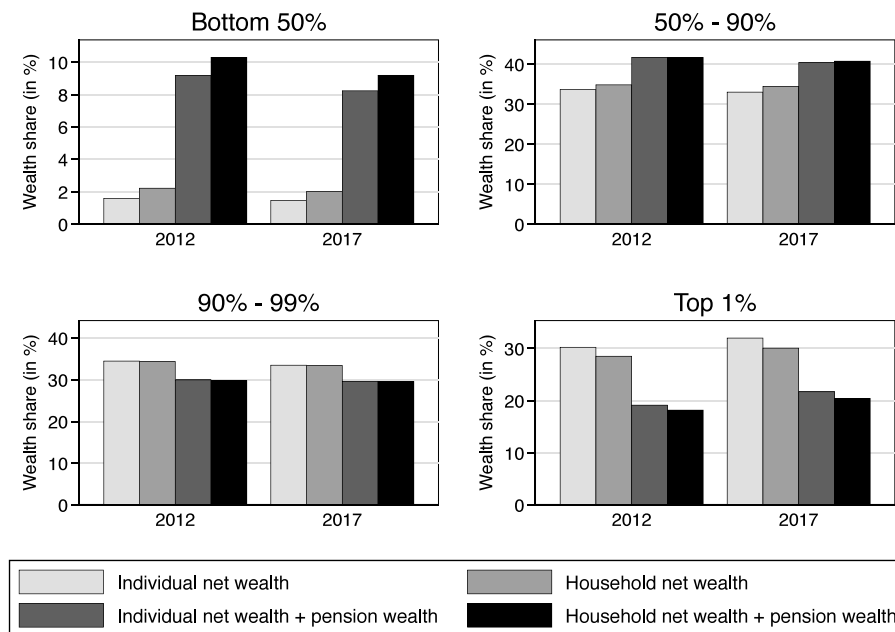


Fig. 3. Shares of individual and household net wealth, 2012 vs. 2017. *Notes:* Net wealth is the sum of business wealth, real estate wealth, and financial assets minus consumer debt, housing debt, and business debt.
Source: SOEPv36 top-corrected and uprated, own calculations.

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