

Bönke, Timm; Grabka, Markus M.; Schröder, Carsten; Wolff, Edward N.

**Article — Accepted Manuscript (Postprint)**

## A Head-to-Head Comparison of Augmented Wealth in Germany and the United States

The Scandinavian Journal of Economics

**Provided in Cooperation with:**

German Institute for Economic Research (DIW Berlin)

*Suggested Citation:* Bönke, Timm; Grabka, Markus M.; Schröder, Carsten; Wolff, Edward N. (2020) : A Head-to-Head Comparison of Augmented Wealth in Germany and the United States, The Scandinavian Journal of Economics, ISSN 0347-0520, Wiley, Hoboken, Vol. 122, Iss. 3, pp. 1140-1180,  
<https://doi.org/10.1111/sjoe.12364>

This Version is available at:

<https://hdl.handle.net/10419/232057>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

This is the peer reviewed version of the following article: *A Head-to-Head Comparison of Augmented Wealth in Germany and the United States*. Timm Bönke, Markus M. Grabka, Carsten Schröder, Edward N. Wolff. In: *The Scandinavian Journal of Economics* 122 (2020), 3, S. 1140-1180, which has been published in final form at <https://doi.org/10.1111/sjoe.12364>.

This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions."

## **A Head-to-Head Comparison of Augmented Wealth in Germany and the United States\***

Timm Bönke, Free University Berlin, 14195 Berlin, Boltzmannstraße 20, [tim.boenke@fu-berlin.de](mailto:tim.boenke@fu-berlin.de)

Markus M. Grabka, DIW Berlin, 10117 Berlin, Germany, [mgrabka@diw.de](mailto:mgrabka@diw.de)

Carsten Schröder, DIW Berlin, 10117 Berlin, Germany, [cschroeder@diw.de](mailto:cschroeder@diw.de)

Edward N. Wolff, New York University, New York, 10003, 19 West 4th Street, [edward.wolff@nyu.edu](mailto:edward.wolff@nyu.edu)

**Abstract.** We examine the composition of augmented household wealth, the sum of net worth and pension wealth, in the United States and Germany. Pension wealth makes up a considerable portion of household wealth of about 48% in the United States and 61% in Germany. When pension wealth is included in household wealth, the Gini coefficient falls from 0.889 to 0.700 in the United States and from 0.755 to 0.508 in Germany. If the wealth shares in Germany were the same as in the United States, this would lead to a 12.6% increase in the Gini coefficient in the augmented wealth distribution in Germany.

**Keywords:** augmented wealth, net worth, pension wealth, SCF, SOEP

**JEL codes:** D31, H55, J32I. **Introduction**

---

\* Markus M. Grabka, Carsten Schröder, and Edward N. Wolff thank the Deutsche Forschungsgemeinschaft under contract GR 3239/4-1 for financial support. We also like to thank Tobias Schmidt and participants in the 2016 IARIW conference in Dresden for valuable comments, and Deborah Anne Bowen for editing the paper.

The rising inequality observed in many advanced economies is widely considered one of the most serious problems facing the world today (see, e.g., Stiglitz 2012). Much of the current literature on the subject focuses on income inequalities, while wealth inequalities have received less attention, and rigorous cross-country studies remain scarce (exceptions include Wolff and Zacharias, 2009; Almås and Mogstad, 2012). This is not for lack of interest: what is lacking are comparable data.<sup>1</sup>

The literature to date has focused primarily on four wealth aggregates: real assets; financial assets; debts; and the difference between assets and debts, or net worth (e.g., Carroll et al., 2014; Brinca et al., 2016). Pension wealth<sup>2</sup> is often ignored in studies on wealth inequalities and is not even a standard item in household (wealth) surveys in continental Europe and Japan, despite the substantial interest in pension institutions in the economic research. Studies within this body of literature have looked at the role of pension institutions in portfolio choices and in savings (crowding-in/out effects) and retirement decisions.<sup>3</sup> This literature has also shown the responsiveness of private savings to the design of pension institutions—in terms of coverage, generosity, (expected future), and financial stability—and several studies have demonstrated that (public) pension wealth functions as a substitute for net worth.<sup>4</sup>

If pensions differ in generosity across countries, cross-country comparisons of net worth may yield biased estimates of average material wellbeing and the distribution of wellbeing across the population (see also Cowell et al., 2018, p. 352). A comprehensive measure that considers pension

---

<sup>1</sup> A recent data initiative by the European Central Bank aims at closing the data gap with its Household Finance and Consumption Survey (HFCS; see European Central Bank 2009, 2013, for an introduction), which has opened up new opportunities for empirical research (see Kaas et al., 2015).

<sup>2</sup> Pension wealth is the discounted expected present value of future entitlements from public, occupational, and private pension schemes (especially tax-sheltered retirement saving plans).

<sup>3</sup> Case studies on the role of social security institutions for wealth portfolios are Moffitt (1984), Gustman et al. (1997), and Wolff (2014); for private savings are Boyle and Murray (1979); Dicks-Mireaux and King (1984); Leimer and Lesnoy (1982); Gullason et al. (1993); Kennickel et al. (1997); Börsch-Supan et al. (2008).

<sup>4</sup> See, e.g., Attanasio and Brugiavini, 2003; Bosworth and Burtless, 2004; Samwick, 2000. Of course, pension wealth is only an imperfect substitute for other assets: It is not under the direct control of the policy holder and cannot be marketed directly or used as collateral (see Wolff, 2015b).

wealth in addition to net worth is augmented wealth (Wolff, 2015a,b; Bönke et al., 2016). The empirical literature on wealth inequalities that explicitly addresses social security wealth in a broad concept of (augmented) wealth is very limited, and cross-country comparisons based on harmonized data are scarce. A pioneering study on the subject is that of Wolff and Marley (1989).<sup>5</sup> Perhaps the closest paper to ours is Bönke et al. (2016), who derive a distribution of augmented wealth for Germany. In contrast to previous studies, which focused on particular sub-populations (e.g., retirees or married couples), they provide the distribution for the overall population.

Following Bönke et al. (2016), our estimates rely on the *accrual method* to derive pension wealth. The accrual value of pension wealth shows the value of each pension plan based on the individual's work history to date.<sup>6</sup> Our main reason for choosing the accrual method is consistency: like all other components of augmented wealth, pension wealth is measured in terms of today's and not (expected) future possessions. However, compared to Bönke et al. (2016), we make several innovations. First, this paper is comparative in nature, comparing augmented wealth distributions for the United States and Germany based on (ex post) harmonized survey data.<sup>7</sup> Second, the present paper provides the distribution of household rather than individual augmented wealth as in Bönke et al. (2016). Further, the wealth aggregate in the present paper is broader, as it additionally incorporates survivor pension entitlements in the household context. To our knowledge, this is a unique feature of the present work. Third, the inequality analyses are enriched through the use of

---

<sup>5</sup> Further studies are Jianakoplos and Menchnik (1997) and Wolff (2005, 2014) for the United States; Shamsuddin (2001) for Canada; Mazzaferro and Toso (2005) for Italy; Roine and Waldenström (2009) for Sweden; Maunu (2010) for Finland; and Frick and Grabka (2010, 2013) for Germany.

<sup>6</sup> An alternative to the accrual is the on-going concern method. The latter method assumes that employees continue to work at their place of employment until their expected date of retirement. Hence, the accrual method and the on-going concern treatment represent two extremes in the valuation of social-security wealth. The on-going concern method, however, relies on the stringent assumptions that (1) the firm or organization continues to remain in existence over time and (2) the employee continues working at the enterprise (in the same position, etc.).

<sup>7</sup> To our knowledge, only two papers to date have provided a comparative analysis of augmented wealth: Wolff (1996) for the United States and Canada, and Frick and Headey (2009) for retirees in Australia and Germany.

(a) factor decomposition to assess the contributions of different portfolio compositions for differences in inequalities across countries, and (b) DiNardo et al. (1996) decomposition (DFL decomposition) to assess how wealth differences between Germany and the United States can be explained by differences in the country-specific household type and age distributions.

The results of this first systematic “head-to-head” comparison of wealth distributions for the United States and Germany provides the following insights: The inclusion of pension wealth adds about 48% to average net worth in the United States and 61% in Germany. This reduces the wealth gap between the two countries: While the US-German-ratio of average net worth is about 1.9 in favor of the United States (US average: USD 338,000; German average: USD 182,000), it is just 1.4 for augmented wealth (US average: USD 653,000; German average: USD 472,000). The addition of pension wealth also reduces measured wealth inequalities: In the United States, the Gini coefficient drops from 0.889 for net worth to 0.700 for augmented wealth; in Germany from 0.755 to 0.508. The factor decomposition shows that if the wealth shares in Germany were the same as in the United States, this would lead to a 0.064 (about 12.6%) increase of the Gini coefficient in the augmented wealth distribution in Germany. The DFL composition shows that adjusting household structure and age of household head in Germany to those of US households further enlarges the wealth gap and increases the level of inequality in Germany.

The remainder of the paper is organized as follows. Section 2 discusses relevant aspects of the pension systems in Germany and the United States. Section 3 details the methods, explains the data, and discusses their cross-country comparability. Section 4 presents comparative results on German and US wealth distributions. Concluding remarks are given in Section 5.

## **II. Pension institutions in the United States and Germany**

Pension systems in both the United States and Germany are comprised of a social security, an occupational, and a private component. Although they share these common features, the two systems differ markedly with respect to generosity, coverage, entitlement receipt, type of financing, and other aspects. Below we provide a short description of pension institutions in both countries.

### *Pensions in the United States*

#### *Social security pensions*

Social security pensions in the United States are strictly earnings-related and mandatory for employees. The retirement (or “old age”) benefit is determined by formula. The formula has the following three features: First, eligibility is determined, with eligibility depending on the insurance period, contributions, and employment status (salaried employee or self-employed). In 2013, the year covered in our empirical analysis, 98% of all workers were eligible for a social security pension. Second, the person’s Average Indexed Monthly Earnings (AIME) is computed on the basis of their earnings history. Rules in 2013 stipulated that for eligibility, a worker must work a minimum of 40 quarters at a minimum earnings level in a job that is covered by social security. The worker’s AIME is then based on the highest 140 quarters of earnings over the lifetime of the worker. Third, the person’s Primary Insurance Amount (PIA) is derived from AIME.

In contrast to Germany, the formula is redistributive in that workers who earn less receive a higher percentage of their AIME in the computation of their PIA than higher-earning workers. For example, for 2014, the PIA is calculated by taking 90% of AIME under USD 816, 32% of AIME between USD 816 and USD 4,917, and 15% of AIME greater than USD 4,917.

The survivor benefit applies only to married couples. This is determined by the higher of two values: (1) the deceased spouse’s PIA and (2) the individual’s own PIA. The spousal benefit also

applies only to married couples. It is determined by the higher of (1) 50% of the spouse's PIA and (2) the individual's own PIA. For the survivor benefit, there are three possibilities:

1. One spouse (say the husband) worked throughout his adult life but the wife did not. In this case, the wife's survivor benefit is equal to the husband's benefit.
2. Both spouses worked but the wife earned less than the husband. When the husband dies, the wife's survivor benefit is set equal to the husband's. If there were no survivor benefit, the wife would be entitled to her own PIA. In this case, the true value of the survivor benefit (and the one we use) is equal to the difference between the husband's benefit and the wife's own PIA.
3. Both spouses work but the wife has a higher PIA than the husband. When the husband dies, the wife effectively receives no survivor benefit since she is already entitled to her own PIA.

#### *Occupational and private pension schemes*

Occupational pension plans are either defined benefit (DB) or defined contribution (DC) pension schemes. Pensions for government employees (federal, state, or local) are a special form of occupational pensions.

DC pension plans are the dominant form of occupational pension plans in the private sector. In 2010, almost 60% of those between 47 and 64 years of age held DC plans, while only 30% held DB plans (Wolff 2014). DC plans are employer-sponsored with an individual account for each participant, and contributions may stem from employee salary deferrals, employer contributions, or employer matching contributions (Internal Revenue Code Section 414/415). Examples of occupational pension plans are employer-sponsored 401(k) and profit-sharing plans, most of which enjoy tax-favored treatment (see OECD (2017) for details).

DB plans define the payment received upon retirement and encompass all pension plans that are not defined contribution and therefore do not have individual accounts (hence including hybrid pension plans such as cash balance plans and pension equity plans). Typically, DB plans offered by large

employers are final average pay plans. In this case, the monthly benefit is equal to the number of years worked multiplied by the member's salary at retirement and a factor known as the accrual rate. For unmarried participants, benefits are usually payable as a Single Life Annuity (SLA); married participants can receive a Qualified Joint and Survivor Annuity (QJSA).

Pure private pension plans may be either DC or DB. Typical examples are Individual Retirement Accounts (IRAs), Keogh or HR10 plans, solo 401(k) plans, and Roth IRAs. These retirement plans are mainly for self-employed people or small businesses. As is the case with IRAs or 401(k) plans, the funds can be invested in stocks, bonds, mutual funds, and other investment options.

#### *Benefit levels of pensions in the United States*

Table 1a shows a breakdown of the number of recipients and median pension amounts in 2014 for individuals aged 65 and older. According to the US Social Security Administration, almost 46 million individuals receive social security benefits with a median monthly pension of USD 1,480 (see also Table A1). Employer pensions also play an important role. Roughly 44% of the elderly receive employer pensions. Here, one can differentiate between government employee pensions and private pensions. More than 5.3 million individuals receive the former, and the median monthly amount is USD 1,453. More than 15% of the elderly have pension claims from a government pension scheme. Roughly 13 million receive private pensions and annuities with a median monthly amount of USD 833. However, these figures are not divided into DC and DB pension plans.



**Table 1a.** Pensions by pension scheme (persons 65 years and older) in the United States, 2014

Pension scheme	Number of recipients (in thousands)	Median pension (in 2014 USD / month)	Share of recipients (in %)	Relative to total money income (in %)
Retirement benefits			87.4	54.1
Social Security benefits	45,994	1,480	84.2	33.2
Employer pensions	15,174	1,200	43.8	20.9
Government employee pension	5,374	1,453	15.8	8.1
Private pensions or annuity	12,931	833	37.4	12.8
Total money income (earnings, pensions, assets, cash transfers, etc.)		2,516	100.0	100.0

*Note:* Employer pensions include pensions from railroad retirement schemes, government employee pension plans, and private pensions and annuities. Government employee pensions include payments from the federal government (civil service), military, and state or local governments. Private pensions and annuities include payments from companies or unions, annuities or paid-up insurance policies, individual retirement accounts (IRAs), Keogh, or 401(k) payments. *Source:* Social Security Administration (2016): Income of the Population 55 or Older, 2014. SSA Publication No. 13-11871 Released: April 2016.

## *Pensions in Germany*

### *Statutory social security pensions*

#### *Mandatory statutory pension scheme for dependent employees*

In 2014, about 78% (or 36.1 million) of the German working-age population (20-65 years) is insured through the social security pension scheme, the “statutory pension insurance” (Deutsche Rentenversicherung Bund, 2015). These compulsorily insured employees must be distinguished from civil servants, who are covered by a separate pension scheme (see Section 2.2.2).

An individual is vested in their pension plan after having contributed for five years, or 60 months. The key factor in determining statutory pension entitlements is the “equivalence principle,” which means that the sum of earnings subject to compulsory insurance during working life is directly proportionate to pension entitlements after retirement (the actual pension entitlement is defined by the “pension formula” detailed in the Social Security Code, Book VI, Section 4). Several types of statutory pensions are granted to pension-policy holder, with regular old-age pensions and pensions

for the long-term insured being the most frequent types. Other pension types include pensions for people with a reduced earnings capacity, pensions for the long-term unemployed, disability pensions, and special pensions for women. For further details on the statutory pension system in Germany, see Bönke et al. (2016).

The German system not only provides pensions to insured individuals themselves but also grants survivor pensions to widows, widowers, and orphans (about 4.78 million widow pensions and 0.574 million widower pensions were granted in 2012, BMAS 2012a). The level of a widow(er) pension depends on the actual pension of the deceased partner as well as the financial situation of the widow(er). Widow(er) pensions in the statutory pension scheme for dependent employees are determined based on the following basic rules:

1. The marriage must have lasted for at least 12 months.
2. A widow(er) pension is granted if the deceased partner was insured for at least five years.
3. A “large” widower pension is granted if the widow(er) is age 47 or above, has a reduced earnings capacity, or if children below age 18 are living in the household. A “small” widow(er) pension is a temporary transfer for a widow(er) of working age.

#### *Entitlements from compulsory pension schemes of liberal professional associations*

The liberal professions (e.g., architects, chartered accountants, dentists, lawyers, notaries, pharmacists or physicians) are not covered by the *mandatory statutory pension scheme for dependent employees* but by 85 independent pension schemes, each of which have their own, highly individual rules. In 2014, about 1.4 million persons had entitlements from the liberal professions pension scheme (ABV 2016). Like the *mandatory statutory pension scheme*, this scheme provides old-age pensions, disability benefits, and survivors’ benefits.

### *Occupational and private pension schemes*

*Occupational pension schemes* are granted to compulsorily insured employees working for private and public<sup>8</sup> companies, and comprise both DB and DC pensions, with highly individual contributions and benefit rules. About 56% (14.1 out of 25 million) of these employees aged 25 to 65 in 2011 were covered under these schemes (BMAS 2012b). The basic regulations pertaining to survivor pensions in occupational pension plans are very similar to those in the statutory pension plans for employees. In line with the rules of the statutory pension system for employees, the widow(er) pension is reduced if the surviving partner has their own income.

The *pension scheme for civil servants* is unique to Germany. Civil servant pensions fall into the category of DB schemes. In the spirit of the equivalence principle, civil servant pensions depend primarily on the overall number of years of work as a civil servant and average salaries in the last position that the individual held for at least two years. In 2011, roughly 2.9 million civil servants had entitlements from the scheme. For each year of full-time service, a civil servant collects 0.0179375 “replacement points,” with the regular maximum replacement rate being a maximum of 0.7175. The annual pension entitlement for civil servants is the product of the replacement rate times the average annual salary (particular deduction rules apply if an individual receives both a civil servant and a statutory pension). Survivor pensions generally follow the same basic rules as social security pensions (for further details, see Appendix: Basic rules for the determination of survivor civil servant pensions).

*Private pension savings plans* in Germany include standard non-subsidized life insurance and similar financial products but the most important form is subsidized private pension plans. For the

---

<sup>8</sup> Note that not all employees in the public sector are civil servants, but many of them are compulsorily insured employees. Civil servants are entitled to civil servant pensions, while the compulsorily insured employees are entitled to statutory pensions and supplementary benefits (Versorgungsanstalt des Bundes und der Länder, VBL). These supplementary benefits are the functional equivalent to company pensions in the private sector.

latter, financial aid and tax subsidies are granted to encourage private saving for retirement purposes. In 2002, the “Riester” and 2005 the “Rürup” pension saving programs were introduced, which in principle follow the same logic as the IRA or 401k in the United States. About 15 million people have signed a Riester pension contract, and another approximately 2 million a Rürup pension contract.

#### *Benefit levels of the German pension system*

For the retired population aged 65 or older, average monthly pensions vary widely in Germany. By far the most important scheme is the statutory pension insurance, which covers 90% of the retired population and provides an average of USD 1,197 in gross monthly retirement pay (Table 1b). In contrast, only 5% of the population is entitled to civil servant pensions, with a mean value of USD 3,649.<sup>9</sup> Fifteen percent of the retired population is entitled to private-sector company pensions and receive an average of USD 660 per month. Another 10% are entitled to public-sector company pensions amounting to an average of USD 424 per month. About one percent of retirees are covered by one of the liberal profession schemes and receive an average of USD 2,877 monthly.

Table 1b also provides information about survivor pensions for females 65 years and older. Again, the majority of female survivor pensioners receive pension from the statutory pension insurance averaging a gross of USD 949/month. The highest pension awarded in Germany to survivors is granted under the civil servant pension system, with a mean pension of USD 1,916 per month. The incidence and average level of survivor pensions from the other systems are noticeably lower.

---

<sup>9</sup> One key reason for the higher average pension levels of civil servants is that they usually have a fairly uninterrupted work history, without unemployment spells, as well as higher educational qualifications. Additionally, the replacement rates under the civil servant pension scheme are more generous than under the statutory pension scheme.

**Table 1b.** Pensions by pension scheme (retired or widowed 65 years and older) in Germany, 2011

Pension scheme	Mean gross pension (in 2013 PPP USD / month)	Share of recipients <sup>1</sup> (in %)	Mean gross pension (in 2013 PPP USD / month)	Share of recipients (in %)
	Own entitlement		Female survivor pensions <sup>2</sup>	
Statutory pension	1,197	90	949	89
Civil servant	3,649	5	1,916	8
Liberal professions	2,877	1	1206	1
Company pensions				
- private sector	660	15	401	13
- public sector (VBL)	424	10	333	7
Total money income (earnings, pensions, assets, cash transfers, etc.)	2,061	100		

*Note.* To derive PPP-adjusted USD in 2013, EUR amounts are multiplied by  $1.02 \times 1.015/0.77$ . <sup>1</sup> Relative to all retired individuals 65 and older in Germany. <sup>2</sup> Reliable information for male survivor pension recipients is not available. However, only 6% of males 65 and older are receiving GRV survivor pensions. *Source:* BMAS (2012a: 82). Shares add up to more than 100% because individuals may receive multiple pensions.

### III. Data and definitions of wealth aggregates

#### *German and US data sources*

In both countries, there are several population-wide surveys providing information on household wealth that could potentially be used in a study like ours.

In Germany, the candidates are the Income and Expenditure Survey conducted by the Federal Statistical Office, the Private Households and Finances survey conducted by the German Bundesbank, and the Socio-Economic Panel (SOEP). We rely on SOEP, as it is the only database providing all the information on statutory pension entitlements that we need. SOEP is an ongoing longitudinal survey of approximately 21,000 adult respondents, conducted annually since 1984 (see Wagner et al., 2007). SOEP consists of a number of sub-samples, including several random samples (drawn in different survey years) and also migrant and high-income samples. Information about

private wealth was surveyed four times, in 1988, 2002, 2007, and 2012.<sup>10</sup> Our computations rely on SOEP respondents in private households who participated in the 2012 and 2013 waves and who were aged 18 or older in 2013.<sup>11</sup> Altogether, our working sample for Germany encompasses 8,546 households.

In the United States, the two most prominent surveys are the Panel Study of Income Dynamics (PSID), conducted by the Institute for Social Research at University of Michigan, and the Survey of Consumer Finances (SCF), conducted by the Federal Reserve Bank. We use the SCF as it covers the upper tail of the wealth distribution more fully and provides more detailed information on wealth portfolios. The SCF started in 1962/63 and has been conducted as a cross-sectional survey since 1983 at three-year intervals. Each survey consists of a core representative household sample combined with a high-income supplement (for more information about the sampling process, see Kennickell, 2008). Here we rely on the 2013 SCF survey data. The population used in the analysis consists of individuals at least 18 years of age in 2013, and all wealth information refers to 2013. The SCF working sample encompasses 6,015 households and is thus smaller than the German sample. Sample size, per se, should not be an issue in the reliable description of the wealth distributions in either of the two countries.<sup>12</sup>

### *Defining wealth aggregates*

Our analyses rely on three main wealth aggregates: net worth, pension wealth, and augmented wealth. These aggregates are based on ex-post harmonized data.

---

<sup>10</sup> For documentation on the wealth information in the SOEP, see Grabka and Westermeier (2015).

<sup>11</sup> The two-year participation restriction is imposed because standard wealth variables are collected every five years, most recently in the 2012 wave (with asset values for the interview month), while current pension entitlements were collected in 2013 (retrospectively for the previous year). We exclude observations lacking valid information. In particular, we exclude Sample M (the migration sample) and Sample K, as respondents in these samples did not provide information on wealth in 2012. Additionally, we exclude all observations with individual weighting factors of zero. An appropriate weighting scheme is available in SOEP to account for these exclusions. This leaves a sample of 8,546 households, representing a total weighted number of about 38.7 million households.

<sup>12</sup> See also the discussion in Chapter 4.2.

Both surveys provide the basic components of net worth. Based on the raw survey data, we have constructed nine sub-aggregates of net worth (Table 2): owner occupied property (w1); other real estate (w2); tangible assets (w3); business assets (w4); financial assets plus building society savings agreements (w5); total gross wealth (w6; the sum of w1-w5); mortgage debts for owner-occupied property (w7), debts for other real estate (w8); and consumer debts (w9). The sum of total gross wealth (w6) minus the three debt components yields net worth (w10). Pension wealth (w14) is the sum of social security pension wealth (w12), occupational pensions (including civil servant pensions), and the value of private pension wealth (w13). Social security pension wealth consists of statutory pension wealth from personal entitlements (w11) and entitlements from survivor benefits (w11s). Finally, augmented wealth (w15) is the sum of net worth and pension wealth.

Our definition of net worth is narrower than the concept of survey net worth that additionally includes private pension plans (see Table 3.2 in OECD 2013). In the SCF, private pension wealth includes capital funded occupational pensions and private savings plans. In SOEP, private pension wealth only includes private savings plans, while capital funded occupational pensions from capital pension funds are contained together with PAYG (pay-as-you-go) occupational pensions in the variable occupational pension plans. Hence, private pension plans and survey net worth cannot be derived consistently from the two surveys. With regard to pension wealth, we therefore decided to construct a broader aggregate that includes occupational and private pension wealth.

The concept of augmented wealth is recommended in the OECD guidelines on micro statistics for household wealth (2013: 67ff.) as a comprehensive wealth measure (see also Eursostat 2013). The European System of National Accounts also recommends documenting private and public pension claims and obligations (European Union 2013). However, due to data limitations, usually only private-sector pension claims and obligations are separately listed in national accounts. However, entitlements from public pensions are documented only on an irregular basis in annexes tables

within the national account framework. The narrower concept complies with the aggregates w10 and w13. In our empirical analysis, wealth is measured at the household level (with no equalization using an equivalence scale or per capita in the households; for robustness, per capita estimates are provided in Tables A5 and A6) in 2013-USD and is PPP-adjusted (factor 0.7773 as provided by OECD).

**Table 2.** Wealth aggregates

<b>Acronym</b>	<b>Variable</b>
w1	Owner-occupied property
w2	Other real estate
w3	Tangible assets (collectables such as jewelry, arts, etc.)
w4	Business assets
w5	Financial assets + building society savings agreements.
<b>w6</b>	<b>Total gross wealth (sum w1 to w5)</b>
w7	Mortgage debts – owner-occupied property
w8	Mortgage debts – other real estate
w9	Consumer debts
<b>w10</b>	<b>Net worth (w6 - (w7 + w8 + w9)) except private pension plans</b>
w11	Statutory pension wealth without survivor benefits
w11s	Statutory pension wealth from survivors benefits
<b>w12</b>	<b>Social security pension wealth (w11 + w11s)</b>
<b>w13</b>	<b>Occupational and private pension wealth</b>
<b>w14</b>	<b>Pension wealth (w12 + w13)</b>
<b>w15</b>	<b>Augmented wealth (w10 + w14)<sup>1</sup></b>

Note: survey net worth      Net worth (w10) plus private pension plans

*Note:* <sup>1</sup>The accounting scheme differs in two ways from Wolff (2015a,b): First, net worth here excludes DC pension plans (the comparable variable in Wolff, 2015a,b, is NWX). Second, the term “pension wealth” here refers to the sum of DB pension wealth, DC pension wealth, and also public pensions.

### *Deriving pension wealth*

Pension wealth is defined as the sum of social security pension wealth, civil servant pension wealth, company pension wealth, and private insurance contracts, including any survivor benefits. For particular pension components, the surrender value can be taken directly from the data. In Germany, this is the case for private insurance contracts, and in the United States, for defined contribution (DC) plans, including Individual Retirement Accounts (IRAs), 401(K) plans, and the



like. If the surrender value is not provided, we take the gross present value of future expected pension entitlements accumulated until 2012. *Gross* means that pension entitlements are considered before taxes and social security contributions.

All present values,  $PV^p$ , of future pensions from a particular pension scheme,  $p = \textit{statutory, civil servant, company pensions}$ , are adjusted for real interest rates and survival probabilities.<sup>13</sup> The present value is defined as,

$$PV^p = \sum_{t=0}^T \frac{1}{(1+r)^t} \times \sum_p E_t^p \quad (1)$$

with:

1.  $T$ : end of life, here the year in which the individual turns 99.
2.  $r$ : constant discount rate (here 2%, for the impact of alternative interest rates on substantive findings, see Bönke et al. (2016), Table A1).
3.  $E_t^p$ : expected value of all individual pension entitlements in period  $t$  from system  $p$ .

In a household, a retired person (including those with pensions for individuals with reduced earning capacity) receives the pension from period  $t = 0$  (year 2012) onward. A non-retired person receives the pension starting in a future period  $t > 0$ , defined by the person's age and the official retirement age.

There are important differences between the United States and Germany in widow(er) pensions. In Germany, a widow(er) pension is granted to the surviving married partner. The main function of a

---

<sup>13</sup> In the case of the United States, official survival probabilities are provided by the US Center for Disease Control (CDC) through age 99. The CDC provides survival probabilities by age, gender, and race (white versus African-American). African-American survival rates are systematically lower than the corresponding rates for whites. We use the racial breakdown in our calculation of US pension wealth. For Germany, the mortality rates differ by sex and birth year only. Few papers also empirically estimate differential mortality with respect to economic variables such as income or wealth. For studies dealing with the United States, see Chetty et al. (2016) or Attanasio and Hoynes (2000); for Germany see von Gaudecker and Scholz (2007). These studies rely on different methods and are not comparable. Delavande and Rohwedder (2011) undertake a comparison for both countries, but it relies on subjective assessments of survival probabilities.

widow(er) pension is to provide for spouses of deceased pension recipients in old age, while orphans' pensions act as child support. In the United States, spouses may be eligible for their own pension from retirement age onward depending on their partner's entitlements, but no additional widow(er) pension is granted. This has implications for the computation of expected pension wealth. In the United States in general and for non-married individuals in Germany, the expected value of a type  $p$  pension in period  $t$  is,

$$E_{t,i}^p = \sum_t d_{t,i}^p \times pension_{t,i}^p \times \sigma_{t,g,c}. \quad (2)$$

Here,  $d_{t,i}^p$  is a dummy variable with value 1 if person  $i$  is eligible for the pension in period  $t$ ,  $pension_{t,i}^p$  is their pension entitlement, and  $\sigma_{t,g,c}$  is the probability that the person (gender  $g$  from birth cohort,  $c$ ) is still alive in  $t$  (survival probability) up to age 99.

In Germany, because of widower pensions, we must differentiate the following states for married couples

1. Both partners are alive in  $t$ . Then each partner receives their own individual pension. The probability of the first state is the joint survival probability of the male ( $g = m$ ) and female partner ( $g = f$ ),  $\sigma_{t,m,c} \times \sigma_{t,f,c}$ .
2. The male partner is deceased but the female partner is alive. Then the male partner's pension entitlements are zero and the female partner receives her own pensions plus a widow pension (if eligible). The probability of the second state is,  $(1 - \sigma_{t,m,c}) \times \sigma_{t,f,c}$ .
3. The female partner is deceased but the male partner is alive. Then the female partner's pension entitlements are zero and the male partner receives his own pensions plus a widower pension (if eligible). The probability of the third state is,  $\sigma_{t,m,c} \times (1 - \sigma_{t,f,c})$  (household survival rates for Germany are provided in Figure A1).

The above procedure for determining the present value of current pension entitlements is based on the “*accrual method*” (or accumulated benefit obligation method). Current entitlements are based on the biography up to the present day and do not include projected entitlements for future employment (see Wolff 2015).<sup>14</sup> When interpreting the present values, it should be noted that entitlements from the liberal professions pension scheme in Germany are not included in present values for the non-retired population, but only for the retired.

### *Comparability of data sources*

#### *Sampling at the top*

An important difference between the SCF and SOEP is the over-sampling of top wealth holders in the SCF and high-income households in SOEP.<sup>15</sup> Since net income does not correlate perfectly with wealth, and the SOEP income threshold is relatively low, we would expect that the SCF describes the wealth distribution at the top better.<sup>16</sup>

The different oversampling strategies have implications for the composition of the two samples at the top of the wealth distribution. There was no household in the SOEP in 2012 beyond a threshold of USD 50 million. However, there are billionaires living in Germany, as documented by the Forbes List. In the SCF, 216 households hold more than 50 million USD, and the wealthiest household holds a net worth of more than USD 1.3 billion. This evidence supports our expectation above that

---

<sup>14</sup> The figures reported in Wolff (2015a,b) rely on the “ongoing concern / projected benefit obligation” method. It assumes that employees continue to work at their place of employment until their expected date of retirement. The value of pension wealth is estimated as of the date of expected retirement.

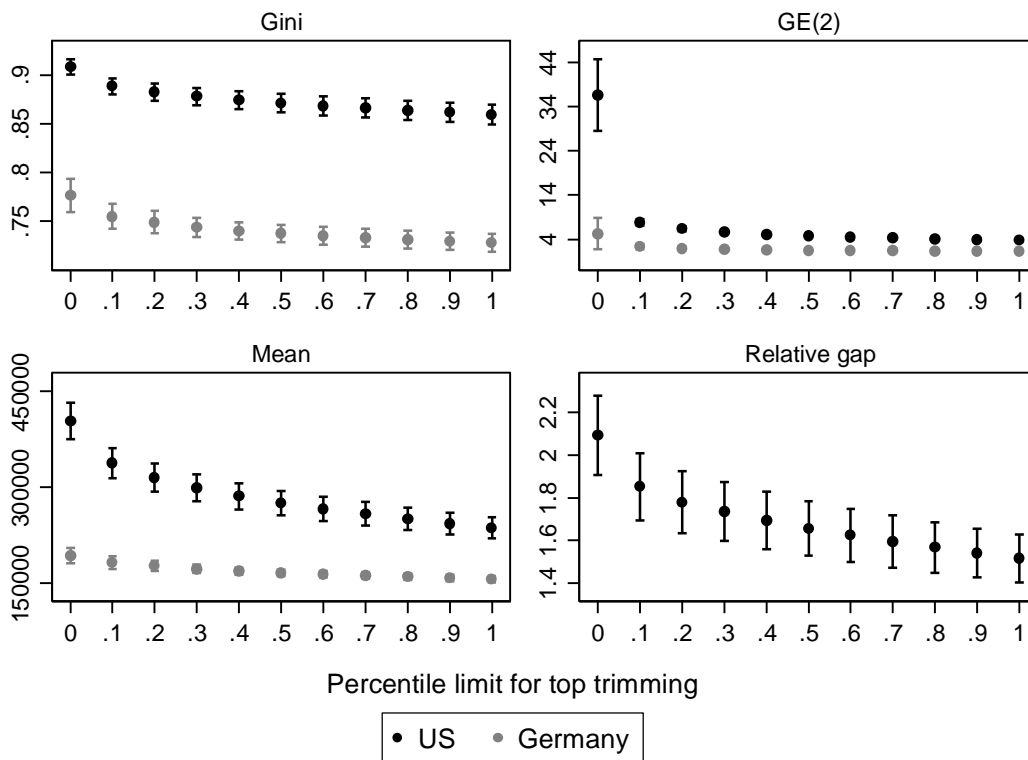
<sup>15</sup> See Saez and Zucman (2016) for a discussion of the efficacy of oversampling in SCF.

<sup>16</sup> In contrast to SOEP, the SCF makes use of specially edited individual income tax returns developed by the Statistics of Income Division (SOI) to over-sample wealthy households. This is known as the “list sample”. In a first stage, observations in areas are selected for the area probability sample, while in a second stage, the remaining cases are stratified using a model of wealth conditional on the variables in the SOI data. As a result, about 98% of the entire SCF sample with at least USD 5 million in net worth in 2004 consists of observations from the list sample (see Kennickell, 2008).

the SCF better describes the top wealth percentiles than the SOEP. This might contribute to higher measured levels of and inequalities in wealth in the United States compared to Germany.

To get an impression of what the different sampling strategies imply for our results, we impose different top-trimming thresholds for net worth, with thresholds ranging from the 99.9th to the 99.0th percentile, and then derive four statistics for the distributions of net worth and augmented wealth: Gini, half the square of the coefficient of variation<sup>17</sup> (GE(2)), arithmetic mean, relative wealth gap between United States and Germany. Figure 1a provides the results for net worth, Figure 1b for augmented wealth.

**Figure 1a.** Effect of top-trimming on net worth

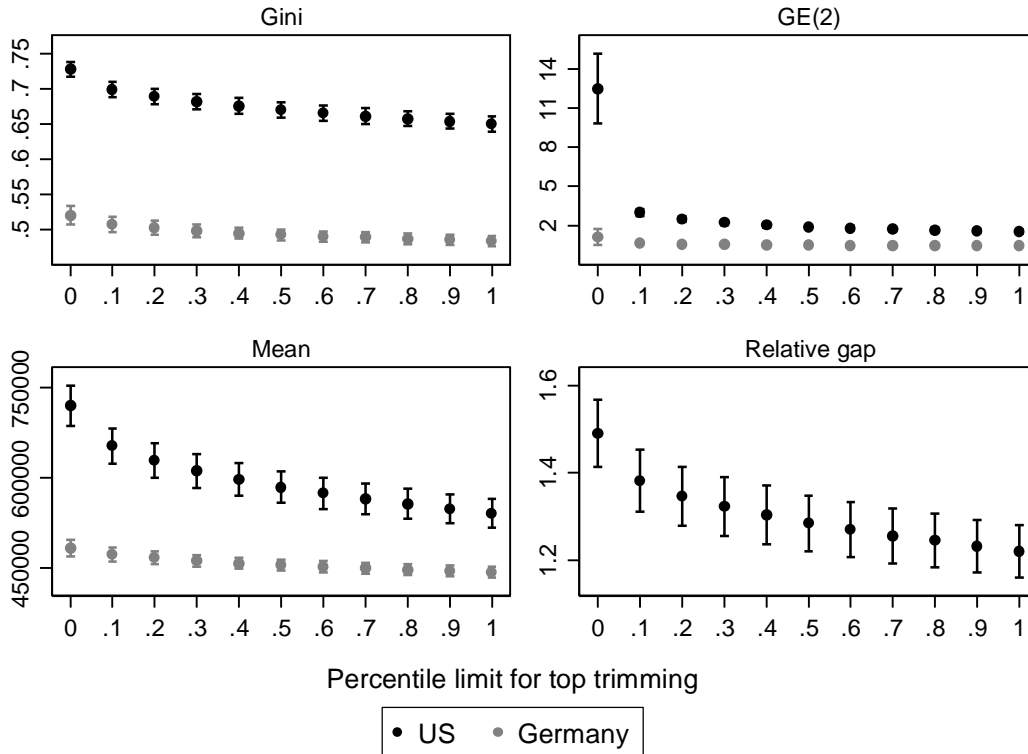


Note: All results based on multiple imputations, bootstrap 95% confidence interval indicated by bars. Source: SCF 2013 and SOEP v30/v31, own calculations.

<sup>17</sup> Half the square of the coefficient of variation is a special case of the generalized entropy index with parameter  $\theta$  equal to 2. The generalized entropy index is,  $GE(\theta) = \frac{1}{\theta^2 - \theta} \left[ \frac{1}{n} \sum_{i=1}^n \left[ \frac{y_i}{\bar{y}} \right]^\theta - 1 \right]$  with  $\theta \neq 0, 1$ .

For the Gini coefficient, the effects of different thresholds are minor, especially once the top 0.01 percent have been discarded from the sample. For GE(2), which is sensitive to changes at the top, particularly the trimming at the 99.9th percentile has a strong downward effect in the United States. Excluding more observations at the top of the distribution changes the statistic only slightly. For the mean and the relative wealth gap between the United States and Germany, we again find the most pronounced effect when the top 0.1 percent are excluded and only minor changes thereafter. In sum, irrespective of the trimming thresholds, we find higher inequalities and higher net wealth levels in the United States than in Germany. These results also hold true for augmented wealth. Based on this evidence, we decided to apply a trimming threshold at the 99.9th percentile based on the country-specific distributions of net worth and a corresponding 0.1 percentile threshold for bottom-trimming. Furthermore, the statistics we provide, except for the mean, place little emphasis on the extremes of the wealth distribution (see also Bover, 2010).

**Figure 1b.** Effect of top-trimming on augmented wealth



*Note:* All results based on multiple imputations, bootstrap 95% confidence interval indicated by bars. *Source:* SCF 2013 and SOEP v30/v31, own calculations.

### *Comparability of wealth aggregates*

*For all surveyed wealth aggregates,* the explicit formulations in SCF and SOEP reflect country-specific particularities. Most importantly, it is common in the US for households to use credit cards to cover consumer spending or take up student loans. In Germany, debit cards are the main means of payment, so consumption expenditures directly reflect changes in financial assets. University fees are much lower in Germany, meaning that student loans are less common. These components are therefore collected explicitly only in the SCF, but we have not made an adjustment for the differences in the formulations. Vehicles are another issue. Their value is surveyed in the SCF, but not in the SOEP, so we did not include their value in “tangible assets.” Furthermore, in contrast to the standard definition of financial assets, our definition does not include capital-funded

occupational and private pensions. This is for two reasons. First, we want to investigate pension wealth separately. Second, in the SOEP we cannot distinguish capital-funded from PAYG occupational pensions; in the SCF, in some cases we cannot distinguish private pension plans from capital-funded occupational pensions. For these reasons, we have constructed a broader aggregate “occupational and private pensions” that includes all forms of occupational and private pensions. Finally, for consistency reasons, we have assigned civil servant pensions in Germany, although per-se social security-type entitlements, to the aggregate of occupational pension plans.

*Regarding pension wealth*, the SCF questionnaire asks how many occupational and private pension plans husband and wife hold. Pension plans are provided for each spouse’s current job (or jobs) and up to five past jobs. SOEP asks each household member if they have occupational pension or private pension plans. Consistently, both surveys ask the respondent what their pension benefit will be, based on their work history to date, as provided by the insurers in the regular information about future pension claims. Because we are interested in accrual values, we can use this information directly in the computation of present values without forecasting future labor force participation, income levels, or retirement decisions.<sup>18</sup> For cross-country comparability reasons, we consider only the entitlements of each household’s head and spouse (if present). Two issues pose challenges to comparing pension wealth between the SCF and the SOEP: First, the SCF probably underestimates pension wealth if a person had more than five jobs. Second, the SOEP underestimates pension wealth due to the single-shot questions on total entitlements if respondents forget (minor) entitlements.<sup>19</sup> The resulting low level of comparability is probably more of an issue, however, for

---

<sup>18</sup> The SCF questionnaire also indicates whether the pension benefit is fixed in nominal terms over time or is indexed for inflation. This information is needed for the present value calculation.

<sup>19</sup> It is known from the experimental literature that respondents have a tendency to judge the probability of the whole to be lower than the probabilities of the parts (see Tversky and Koehler, 1994 and Hilbert, 2012). This phenomenon is called subadditivity. In our context, an analogous phenomenon could arise: that the level of differentiation of wealth components impacts the total value of reported wealth.

individuals with multiple job changes and highly complex pension plans (e.g., senior management).<sup>20</sup>

*Regarding the valuation of all wealth aggregates*, differences in transaction costs, convertibility into cash, and (deferred) taxation should be noted. These differences may also be country-specific. For example, neither country imposes a general wealth tax, but both impose property taxes on real estate or personal property. Tax tariffs differ, however, between the United States and Germany. We refrain from computing net values, given that this requires numerous assumptions about income composition, family status, etc. For all wealth positions provided as present values, such a computation would be even more demanding, requiring the modelling of complete future horizons for financial resources, family status, tax schedules, etc. In sum, net worth and augmented wealth are comprised of wealth components with different transaction costs, different degrees of convertibility into cash, and (deferred) taxation—issues that, for the aforementioned reasons, are not reflected in the subsequent analysis. Thus, all reported values are gross and do not directly mirror the material ability to consume.

## **IV. Empirical findings**

The subsequent comparative empirical analysis for the United States and Germany addresses three aspects: the level and composition of household wealth, wealth inequalities, and the role of country-specific household and age structures in differences in the two countries' wealth distributions.

### *Wealth levels in the United States versus Germany*

Table 3 provides information on different wealth aggregates for the United States and Germany. At first glance, wealth levels differ substantially between the two countries. For net worth, the

---

<sup>20</sup> We would like to thank an anonymous referee for their very insightful remarks.



mean value of about USD 182,000 in Germany is only 54% of the mean value in the United States, about USD 338,000. The gap for median net worth, however, is much smaller, and the median is even slightly higher in Germany: almost USD 50,000 compared to USD 40,000 in the United States. For the 75th percentile, we find a similar result: a small difference in favor of German households (about USD 229,000 versus USD 199,000 in the United States). In both countries, net worth for the 25th percentile is zero. These numbers suggest that net worth in the United States is more concentrated at the top of the distribution.

We decompose pension wealth into two components: social security and the sum of occupational and private pension wealth. Due to the compulsory nature of social security pension contributions in both countries, about 95% of the total population holds social security pension wealth. In Germany, average social security pension wealth amounts to about USD 200,000, which is 25% higher than the value in the United States, about USD 161,000. Social security wealth can be divided further into personal entitlements and wealth from survivor benefits. As expected, in both countries, about 90% of total social security wealth comes from own entitlements.

In both countries, about 60% of the population has entitlements from occupational and private pension schemes. However, mean values are 1.7 times higher in the United States, at USD 153,000 compared to only USD 90,000 in Germany. There is also a substantial gap in the levels of augmented wealth: The average US household possesses about USD 653,000, and thus 1.4 times the wealth of an average German household (about USD 472,000). This difference is mainly driven by the higher net worth of US households at the top of the augmented wealth distribution. Up to the 75th percentile, however, households in Germany possess larger assets than US households: For example, the 25th percentile value of augmented wealth is about USD 149,000 in Germany versus USD 86,000 in the United States.

**Table 3.** Basic descriptive statistics by wealth aggregate

Wealth aggregate	Mean (SE)	P25	P50	P75	Fraction > 0 (SE)
<b>United States</b>					
Net worth	337,570 (5,351)	0	40,001	198,800	73.14 (0.28)
Social security pension wealth	161,481 (,806)	64,486	124,938	227,458	96.49 (0.13)
- personal entitlements	149,267 (,754)	59,428	117,294	211,562	96.49 (0.13)
- survivor benefit	12,214 (,103)	0	3,496	18,960	56.29 (0.33)
Occupational and private pension wealth	153,453 (2,227)	0	13,000	140,000	61.68 (0.30)
Augmented wealth	652,504 (6,710)	86,311	246,663	608,473	95.83 (0.14)
Note: Survey net worth	392,152 (6,048)	0	46,080	232,000	74.25 (0.28)
<b>Germany</b>					
Net worth	182,329 (2,287)	0	49,623	228,528	71.64 (0.23)
Social security pension wealth	200,424 (,923)	68,620	162,780	296,048	93.17 (0.15)
- personal entitlements	178,598 (,853)	58,345	141,354	264,895	92.88 (0.15)
- survivor benefit	21,826 (,263)	0	0	19,443	27.44 (0.21)
Occupational and private pension wealth	89,648 (1,116)	0	13,059	78,352	64.24 (0.23)
Augmented wealth	472,401 (2,761)	149,128	326,990	630,784	98.38 (0.07)
Note: Survey net worth	200,335	1,306	62,682	257,910	77.07 (0.22)

*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. All results based on multiple imputations; bootstrap standard errors accounting for multiple imputations in parentheses. Nonlinear estimates (P25, P50, P75) based on first imputation only. *Source:* authors' calculations from the SCF 2013 and SOEP v30/v31.

Details on household portfolios including different kinds of debt are given in Table 4. The table is subdivided into three panels. The top panel provides the composition of household total gross

wealth. The second panel provides the composition of household debt. The third panel provides debt-to-wealth and debt-to-income ratios.

With regard to the composition of household total gross wealth, the most important difference between the two countries pertains to owner-occupied property. In Germany, this wealth component contributes nearly 60% to total gross wealth, and only about 40% in the United States. There are also important differences in the relative contributions of business assets as well as financial assets and building society savings agreements. Business assets contribute only about 8% to total gross wealth in Germany and as much as 19% in the United States. For financial assets and building society savings agreements, the respective figures are 28% in the United States and 17% in Germany.

Total household debt in the United States is about USD 91,000 on average, 2.5 times higher than in Germany (USD 36,000). Mortgage debt on owner-occupied property makes up the largest relative portion in both countries: 74% in the United States and 61% in Germany. Debt ratios in the United States are also higher than in Germany with respect to both income and net worth (see panel 3 of Table 4). While the total debt-to-net-worth ratio is 7 percentage points higher in the United States, the total debt-to-income ratio for the United States exceeds Germany's ratio by almost 75%. Indeed, indebtedness measured by the total debt to household income ratio is higher in the United States across all age groups (Table A2a-d). Young and middle-aged households exhibit particularly high debt ratios in comparison to their German counterparts (Tables A2a and A2b). This reflects that in the United States, it is the young who typically have high consumer debt and/or student loans. Overall, the willingness to go into debt is much higher in the United States, and access to credit markets (with fewer constraints) appears to be easier than in Germany.

**Table 4.** Overall portfolio composition

	United States		Germany	
	(1) Composition of total gross wealth			
	Mean (USD)	Share (%)	Mean (USD)	Share (%)
Total gross wealth	427,397 (6,031)	100.00 (0.00)	218,222 (2,722)	100.00 (0.00)
Owner-occupied property	168,568 (1,536)	39.44 (0.42)	126,213 (949)	57.85 (0.63)
Other real estate	56,768 (1,592)	13.28 (0.27)	35,531 (875)	16.28 (0.32)
Tangible assets	3,730 (186)	0.87 (0.04)	2,183 (72)	1.00 (0.03)
Business assets	80,625 (2,494)	18.86 (0.46)	16,705 (1,835)	7.65 (0.76)
Financial assets and building society savings agreements	117,707 (2,773)	27.54 (0.42)	37,591 (509)	17.23 (0.23)
	(2) Composition of total household debt			
	Mean (USD)	Share (%)	Mean (USD)	Share (%)
Total household debt	90,761 (896)	100.00 (0.00)	35,709 (619)	100.00 (0.00)
Mortgage debts - owner occupied property	67,108 (720)	73.94 (0.36)	21,857 (363)	61.22 (1.00)
Mortgage debts - other real estate	8,168 (301)	9.00 (0.29)	8,375 (445)	23.44 (1.00)
Consumer debts	15,485 (265)	17.06 (0.28)	5,477 (283)	15.34 (0.70)
	(3) Debt ratios (aggregate level)			
	Ratio	(s.e.)	Ratio	(s.e.)
Total debt/net worth	0.27	(0.01)	0.20	(0.00)
Total debt/household income	12.94	(0.13)	7.44	(0.12)

*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. All results based on multiple imputations; bootstrap standard errors accounting for multiple imputation in parentheses.

*Source:* Authors' calculations from the SCF 2013 and SOEP v30/v31.

Table 5 provides the distribution of wealth aggregates by net worth deciles (columns 1-4): net worth, occupational and private and social security pension wealth, as well as augmented wealth. Columns 5-7 provide the relative contributions of the respective wealth components to augmented wealth in the respective net worth decile.

The table confirms and sheds further light on the higher concentration of net worth in the US: Up to the eighth decile, net worth is slightly higher in Germany than in the United States. In the top decile, however, net worth is markedly higher in the United States: USD 2.6 million versus USD

1 million in Germany. Regarding social security pension wealth, the comparison shows a similar pattern. Up to the ninth decile, social security pension wealth is higher in Germany than in the US, at USD 60,000 versus USD 30,000, respectively, reflecting the greater generosity of the German pension system, at least for the majority of the population. Only in the top decile does social security pension wealth in the US exceed that in Germany.

The mean values for occupational and private pension wealth are relatively similar in the two countries for the lower half of the net worth distribution. Beginning with the sixth net worth decile, differences increase in favor of the United States. The difference is most pronounced in the top decile, where it amounts to USD 380,000. Finally, with regard to augmented wealth, the pattern across the distribution is similar to that for net worth. In the lower eight deciles, German households possess more wealth than US households, while the opposite holds for the top two deciles. The absolute difference for the lower eight deciles ranges between USD 10,000 in the eighth decile to USD 80,000 in the fourth decile. In the top decile, the difference amounts to roughly USD 2 million in favor of US households.

With regard to the relative contributions of net worth and pension wealth to augmented wealth across deciles of net worth (column 5-7 in Table 5), we find similar patterns in the two countries: In the bottom deciles, social security pension wealth makes up the largest relative portion of augmented wealth, but this declines over the net worth distribution. For example, in the United States (Germany), it falls from about 84% (91%) in the second to 50% (58%) in the sixth to 8% (17%) in the tenth decile. At the same time, in both countries, the portion of net worth increases over the deciles: from about -8% (0%) in the second to 19% (22%) in the sixth to 74% (66%) in the tenth decile. The relative contributions of occupational and private pension wealth show a comparable pattern. In the US, the share decreases from the first to the third decile. It then rises up to the fifth decile and stays at this level up to the ninth decile. In Germany, it starts at 24% in the

first decile and decreases to 9% in the second decile, then rises to around 20% in the fourth decile and stays at this level up to the ninth decile.

**Table 5.** Distribution of wealth by net worth deciles

Decile	Mean (USD)			As share of augmented wealth (%)			
	Net worth	Social security pension wealth	Occupational and private pension wealth	Augmented wealth	Net worth	Social security pension wealth	Occupational and private pension wealth
<b>United States</b>							
1	-54,895	111,837	45,634	102,575	-53.54	109.06	44.48
2	-9,834	99,656	28,338	118,160	-8.33	84.35	23.98
3	-475	92,368	12,820	104,713	-0.45	88.21	12.24
4	3,096	98,678	22,548	124,323	2.49	79.40	18.11
5	23,019	133,302	64,015	220,336	10.45	60.51	29.05
6	60,258	158,975	96,844	316,077	19.06	50.30	30.63
7	112,655	188,726	140,886	442,267	25.47	42.67	31.86
8	201,994	210,158	183,346	595,498	33.92	35.29	30.79
9	404,283	237,251	312,760	954,293	42.37	24.86	32.77
10	2,640,869	284,192	628,391	3,553,452	74.32	8.00	17.68
Overall	337,570	161,481	153,453	652,504	51.73	24.75	23.52
<b>Germany</b>							
1	-21,740	146,487	40,373	165,120	-13.17	88.74	24.43
2	-7	159,434	16,725	176,152	0.00	90.51	9.49
3	637	132,446	17,343	150,426	0.43	88.10	11.48
4	6,843	157,260	39,287	203,390	3.37	77.33	19.31
5	28,439	193,480	56,294	278,214	10.23	69.55	20.22
6	75,747	196,495	65,158	337,401	22.45	58.24	19.31
7	142,832	219,765	110,979	473,576	30.17	46.40	23.43
8	233,723	250,577	122,909	607,210	38.49	41.27	20.24
9	364,854	276,377	180,085	821,317	44.43	33.65	21.92
10	998,484	253,276	250,442	1,502,202	66.46	16.86	16.67
Overall	182,329	200,424	89,648	472,401	38.60	42.43	18.98

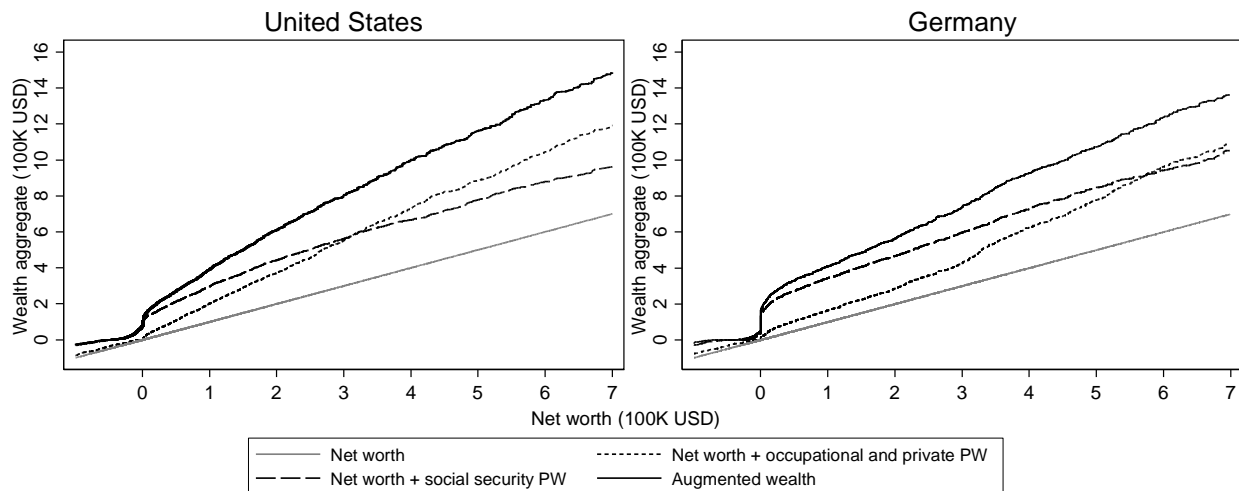
*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. All results based on multiple imputations. Deciles refer to the distribution of net worth. *Source:* authors' calculations from the SCF 2013 and SOEP v30/v31.

## Wealth inequality in the United States versus Germany

We measure wealth inequalities with two indices: the Gini index and half the square of the coefficient of variation (GE(2)). The GE(2) belongs to the generalized entropy class of inequality indices, and is particularly sensitive to changes at the top of a distribution, whereas the Gini is more responsive to changes at the bottom.

QQ plots in Figure 2 provide information on the correlation between different wealth aggregates and net worth. In both countries, the gap between augmented wealth (solid line) and net worth (grey line) continuously widens in net worth. This is due primarily to the increasing role of occupational and private pension wealth (dotted line), which plays a negligible role in the bottom of the net worth distribution. In contrast, social security pension wealth (dashed line) is an about constant amount for households with non-negative net worth. As a result, social security pension wealth is higher than occupational and private pension wealth up to a net worth of about USD 300,000 in the United States and about USD 600,000 in Germany.

**Figure 2.** QQ plots for different wealth aggregates



*Note:* Households with negative net worth below -USD 100,000 and positive net worth above USD 700,000 are not depicted. All results based on multiple imputations. *Source:* authors' calculations from the SCF 2013 and SOEP v30/v31.

Table 6 presents Gini coefficients for the different wealth aggregates in the two countries. Because indices are difficult to interpret if the distribution includes households with negative wealth, we have re-run the analysis for the total population with a bottom-coding of the wealth component at zero. To shed light on the inequalities among households with positive wealth, we have also derived all indices excluding all households with zero or negative wealth. We first comment on the results for the overall population. Pertaining to net worth, our results confirm the previous finding of markedly higher inequality in the United States. The Gini index (for the GE(2), see Table A3) is 0.889 as opposed to 0.755 in Germany. Adding social security pensions without survivor benefits to net worth reduces inequality. For example, the Gini index drops by about 20% (to 0.710) in the United States. In Germany, the reduction is even larger (31% to 0.520) due to the greater importance of social security pension wealth. Adding social security pensions from survivor benefits further reduces inequality, but to a smaller extent. For the United States, for instance, the decrease is 0.008 Gini points.

When adding occupational and private pension wealth to net worth, the magnitude of the inequality-reducing effect is smaller than when adding social security pension wealth. In both countries, the Gini index declines by about 7%. From all five of the wealth aggregates considered here, inequality in augmented wealth is the smallest: the derived Gini index for US households shrinks by 21% to 0.700. It is even greater in Germany, decreasing by 33% to 0.508.

Bottom-coding at zero has a quite minor effect on measured inequalities. Excluding households with zero or negative wealth yields markedly lower inequality indices. Neither of the two adjustments changes the aforementioned general findings.



**Table 6.** Gini coefficient by wealth aggregate

Wealth aggregate	Total population		Total population, bottom coding at 0		Population with positive wealth component	
<b>United States</b>						
Net worth	0.889	(0.029)	0.855	(0.028)	0.801	(0.031)
Net worth + own social security pension wealth	0.710	(0.034)	0.694	(0.035)	0.690	(0.035)
Net worth + social security pension wealth	0.702	(0.035)	0.750	(0.033)	0.683	(0.035)
Net worth + occupational and private pension wealth	0.826	(0.031)	0.807	(0.030)	0.761	(0.033)
Augmented wealth	0.700	(0.033)	0.689	(0.033)	0.684	(0.034)
<b>Germany</b>						
Net worth	0.755	(0.036)	0.735	(0.037)	0.629	(0.043)
Net worth + own social security pension wealth	0.520	(0.038)	0.515	(0.038)	0.507	(0.038)
Net worth + social security pension wealth	0.507	(0.037)	0.563	(0.039)	0.494	(0.037)
Net worth + occupational and private pension wealth	0.705	(0.034)	0.695	(0.034)	0.627	(0.037)
Augmented wealth	0.508	(0.034)	0.504	(0.034)	0.499	(0.034)

*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. All results based on multiple imputations; bootstrap standard errors accounting for multiple imputation in parentheses.

*Source:* Authors' calculations from the SCF 2013 and SOEP v30/v31.

### *Factor decomposition for the United States versus Germany*

We continue the inequality analysis with a factor decomposition suited to studying the contribution of each wealth component to the inequality of augmented wealth. The aim of such a factor decomposition “is to learn how changes in particular income sources will affect overall income inequality,” everything else held constant (see Lerman and Yitzhaki, 1985, p. 152).

To keep the empirical analysis tractable and for more intuitive interpretation, we restrict our attention to the Gini index. Following Lerman and Yitzhaki (1985), the Gini index of country  $k \in \{US, Germany\}$  can be decomposed as follows:

$$Gini_k = \sum_{f=1}^F r_{f,k} \times Gini_{f,k} \times s_{f,k} = \sum_{f=1}^F C_{f,k} \times s_{f,k} = \sum_{f=1}^F O_{f,k}. \quad (3)$$

Here,  $Gini_k$  denotes the Gini index of augmented wealth in a country;  $r_{f,k}$  the Gini correlation between wealth component  $w_{f,k}$  (with  $f = 1, \dots, F$ ) and augmented wealth;  $Gini(w_{f,k}) = Gini_{f,k}$  the Gini index for wealth component  $f$ ; and  $s(w_{f,k}) = s_{f,k}$  the share of component  $f$  in augmented wealth. The Gini correlation  $r(w_{f,k}) = r_{f,k}$  measures the dependence between two random variables. Its properties are a mixture of Pearson's and Spearman's correlations. For any given marginal distribution, the range of the Gini correlation is  $[-1, 1]$  (for references and details, see Schröder et al., 2014). The concentration coefficient of a wealth component  $C(w_{f,k}) = C_{f,k}$ , ( $= r_{f,k} \times Gini_{f,k}$ ), builds on the distribution sorted by augmented wealth. A smaller concentration coefficient of a given wealth component compared to the concentration coefficient of augmented wealth indicates that this wealth component is more prominent in the lower part of the distribution and vice versa. The product  $O_{f,k} = r_{f,k} \times Gini_{f,k} \times s_{f,k}$  can be interpreted as the overall absolute contribution of a particular wealth aggregate to overall inequality in augmented wealth, while  $o_{f,k} = \frac{O_{f,k}}{Gini_k}$  gives the relative contribution.

We also compute how the Gini coefficient of augmented wealth changes ( $\Delta G_k$ ) due to an equi-proportional marginal 1% increase of a particular wealth component, holding all other wealth components constant.

Table 7 summarizes the results from the factor decomposition. As pointed out above, net worth is the key driver of augmented wealth inequality. Its relative contribution ( $o_f$ ) is about 63% in the United States and 52% in Germany. In the United States, the second most important driver is occupational and private pensions at almost 25%, followed by social security pensions without survivor benefits at 11%. In Germany, social security pensions without survivor benefits and

occupational and private pensions are of similar magnitude with relative contributions of roughly 23%. In both countries, social security pensions from survivor benefits make only a small relative contribution of 1% in the United States and 3% in Germany.

The wealth-component-specific inequalities have already been addressed in Table 6. Of interest, however, are the Gini correlations. The correlation is highest for net worth—around 0.9 in Germany and even higher in the United States—indicating a rather strong statistical association between net worth and augmented wealth. Gini correlations for social security pension wealth without survivor benefits are lower, at 0.785 in the United States and 0.650 in Germany. Correlations for occupational and private pension wealth differ in a similar fashion: The correlation is 0.902 in the United States and 0.778 in Germany, suggesting that the statistical association between occupational and private pensions and augmented wealth is lower in Germany. A potential explanation for the lower correlation in Germany might be Riester pensions, a subsidized voluntary private savings scheme for retirement that is designed to facilitate savings for low-income parents, who usually do not hold significant net worth (see Corneo et al., 2015). There is also evidence that the Riester scheme crowds out savings in non-subsidized savings schemes (see Corneo et al., 2009 and 2010). Other potential explanations are differences between wealthy and non-wealthy households in risk and time preferences, financial literacy, or access to financial products. The lowest Gini correlation can be found for social security pensions from survivor benefits, whose value is 0.573 in the United States and 0.368 in Germany. In neither country is the Gini correlation negative. Hence, none of the three wealth components is negatively associated with augmented wealth. Finally, the concentration coefficient for net worth and occupational and private pension wealth is higher than that for augmented wealth in both countries, i.e., both wealth components are more important in the upper part of the augmented wealth distribution.

**Table 7.** Inequality decomposition using the Gini coefficient

Wealth aggregate	Components				Contribution		$\Delta G_k$
	$r_{f,k}$	$s_{f,k}$	$Gini_{f,k}$	$C_{f,k}$	$O_{f,k}$ (absolute)	$O_{f,k}$ (relative, %)	
<b>United States</b>							
Net worth	0.960 (0.039)	0.517 (0.008)	0.889 (0.166)	0.853 (0.160)	0.441 (0.082)	63.06 (1.20)	0.113 (0.008)
Social security pension wealth without survivor benefit	0.785 (0.019)	0.229 (0.005)	0.440 (0.081)	0.345 (0.064)	0.079 (0.015)	11.30 (0.46)	-0.116 (0.003)
Social security pension wealth from survivor benefit	0.573 (0.023)	0.019 (0.000)	0.691 (0.127)	0.396 (0.074)	0.007 (0.001)	1.06 (0.05)	-0.008 (0.000)
Occupational and private pension wealth	0.902 (0.040)	0.235 (0.006)	0.811 (0.153)	0.731 (0.138)	0.172 (0.033)	24.59 (0.99)	0.011 (0.007)
Total inequality (augmented wealth)			0.700	0.700	0.700	100.00	0.00
<b>Germany</b>							
Net worth	0.899 (0.032)	0.386 (0.007)	0.755 (0.119)	0.678 (0.110)	0.262 (0.043)	51.56 (1.39)	0.130 (0.009)
Social security pension wealth without survivor benefit	0.650 (0.017)	0.378 (0.005)	0.464 (0.069)	0.302 (0.045)	0.114 (0.017)	22.48 (0.86)	-0.153 (0.006)
Social security pension wealth from survivor benefit	0.368 (0.025)	0.046 (0.001)	0.836 (0.128)	0.307 (0.047)	0.014 (0.002)	2.80 (0.22)	-0.018 (0.002)
Occupational and private pension wealth	0.778 (0.028)	0.190 (0.005)	0.796 (0.130)	0.620 (0.100)	0.118 (0.019)	23.17 (1.04)	0.042 (0.007)
Total inequality (augmented wealth)			0.508	0.508	0.508	100.00	0.00

*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. All results based on multiple imputations; bootstrap standard errors accounting for multiple imputation in parentheses.

*Source:* Authors' calculations from the SCF 2013 and SOEP v30/v31.

The last column of Table 7 shows how the Gini coefficient of augmented wealth changes due to an equi-proportional marginal 1% increase in a wealth component (all other components held constant). We find similar patterns in the two countries. While a marginal increase in net worth leads to a surge in augmented wealth inequality (0.113 Gini points in the United States vs. 0.130 in Germany), the opposite is true for social security pension wealth. A marginal change in occupational and private pension wealth, however, has only a minor inequality-increasing effect

on augmented wealth. The magnitude for social security pension wealth from survivor benefits is also small, although survivor benefits tend to decrease inequality.

The results from the decomposition can be used to derive counterfactual distributions by swapping coefficients between countries. We study two counterfactuals:

1. The first counterfactual seeks to investigate how between-country differences in wealth shares alter overall inequality (share effect). The share effect is estimated by replacing the wealth shares in country  $k$  with the shares from country  $k'$  is  $Share_k = \sum_{f=1}^F C_{f,k} \times S_{f,k'} - \sum_{f=1}^F C_{f,k} \times S_{f,k}$ .
2. The second counterfactual seeks to investigate how the difference in two countries' concentration coefficients for a particular wealth component alters overall inequality (concentration effect). For component  $w_{f,k}$ , the effect is:  $Concentration_{f,k} = (C_{f,k'} - C_{f,k}) \times s_{f,k}$ . The total concentration effect is the sum of all wealth components' concentration coefficient:  $\sum_{f=1}^F Concentration_{f,k}$

Table 8 summarizes the share and concentration effects. In the case of the United States, the share effect is negative: If the wealth shares in the United States were the same as in Germany, this would lead to a 0.083 (about 11.9%) reduction of the Gini coefficient in the augmented wealth distribution in the United States. In Germany, the share effect has the inverse sign and is smaller in absolute terms (12.6% increase). The country-specific total concentration effects over all wealth aggregates, in absolute terms, are larger than the share effects, meaning that the inequality gap between the United States and Germany, as measured by the Gini difference, is mainly driven by cross-country differences in wealth-aggregate-specific inequalities. The overall concentration effect results from differences in inequalities of net worth in both countries (-0.090 in the US versus 0.067 in

Germany). Besides this, the concentration effect for each wealth aggregate is, in all cases, rather small and negative (positive) for the US (Germany).

**Table 8.** Share and concentration effects from counterfactuals

	United States	Germany
Share effect	-0.083	0.064
Total concentration effect	-0.128	0.109
Concentration effects by wealth aggregate		
Net worth	-0.090	0.067
Social security pension wealth without survivor benefits	-0.010	0.017
Social security pension wealth from survivor benefit	-0.002	0.004
Occupational and private pension wealth	-0.026	0.021

*Note:* Effects computed from point estimates in Table 7.

### *Decomposition by age and household type*

So far, we have applied a factor decomposition as a statistical tool to understand the differences in wealth distributions. Here we apply the reweighting method suggested by DiNardo, Fortin and Lemieux (1996), henceforth DFL, to assess how differences in age and household structures in the United States and Germany contribute to differences in the two countries' wealth distributions. As shown in Bover (2010), these two factors play an important role in cross-country wealth comparisons.

Like the above factor decomposition, the DFL is a statistical decomposition. However, household structure and age distributions are relatively persistent and can be viewed as exogenous, at least in a shorter time horizon (see Bover, 2010). In this sense, the DFL is not only a “statistical-descriptive” (Bover, 2010, p. 265) tool, but also reveals insights about the linkages between household age structures and wealth distributions.

Let each household be characterized by a vector,  $(w, z, c)$  comprising a continuous variable,  $w$  (here: net worth or augmented wealth), a vector of attributes,  $z$  (here: age and household structure), and a country identifier,  $c$ . The joint distribution of wealth and attributes in a country is  $F(w, z, c)$ , while  $F(w, z|c)$  denotes the conditional distribution. Following DiNardo, Fortin and Lemieux (1996), the density of wealth in a country,  $f_c(w)$ , can be written as,

$$f_c(w) \equiv f(w; c_w = c, c_z = c). \quad (4)$$

For example, while  $f(w; c_w = DE, c_z = DE)$  denotes the actual density of wealth in Germany (DE),  $f(w; c_w = Germany, c_z = US)$  is the counterfactual density of wealth in Germany had the distribution of attributes been like those in the United States.<sup>21</sup>

Assuming the two countries' wealth distributions are independent, the hypothetical counterfactual density,  $f(w; c_w = DE, c_z = US)$  can be written as,

$$\begin{aligned} f(w; c_w = DE, c_z = US) &= \int f(w|z, c_w = DE) dF(z|c_z = US) \\ &\equiv \int f(w|z, c_w = DE) \psi_z(z) dF(z|c_z = DE), \end{aligned} \quad (5)$$

with  $\psi_z(z)$  denoting the reweighting function,

$$\psi_z(z) \equiv \frac{dF(z|c_z = US)}{dF(z|c_z = DE)} = \frac{\Pr(c_x = US|z)}{\Pr(c_x = DE|z)} \times \frac{\Pr(c_x = DE)}{\Pr(c_x = US)}. \quad (6)$$

The probability of being a resident of country  $c$ , given individual attributes  $z$ , can be estimated with a probit model,

$$\Pr(c_z = c|z) = \Pr(\epsilon > -\beta'H(z)) = 1 - \phi(-\beta'H(z)). \quad (7)$$

---

<sup>21</sup> As explained in DiNardo et al. (1996, p. 1011) the interpretation ignores the impact of changes in the distribution of attributes on the structure of wealth in general equilibrium.

where  $\phi(\cdot)$  is the cumulative normal distribution and  $H(z)$  is a vector of covariates.

We split the total population into 20 subcategories with four age groups (< 30 years, 30–50 years, 50–65 years, and 65 years and older) defined by age of household head, and five household types (single, lone parent, couple without children, couple with children, and other households).

We provide three decompositions: by household type; by age group of household head; and by household type and age group. The respective probit specification complies with the decomposition exercise.<sup>22</sup>

Before providing the results from the decomposition, Table 9 first tabulates the country-specific shares of household types (defined by composition and age of household head) and their average wealth positions. Regarding the household composition, there is a considerably larger number of one-member households in Germany compared to the United States: About 44 percent of German households are singles compared to about 25 percent of US households. Perhaps the most striking difference is in the percentage of single households aged 65 and above in the United States and Germany, at 10% and 19%, respectively. Another marked difference concerns lone parents, who make up 9% of the US population and 6% of the German population.

Concerning the average net worth positions, most household types are richer in the United States than their German counterparts. The wealth gap for couples without children in the 50–65 and over-65 age groups is particularly striking: here, US households hold more than USD 350,000 more wealth than German households. Another interesting finding is the systematic increase in the nominal wealth gap with the age of the household head over the first three age brackets and lack of a clear pattern for the fourth bracket. Take singles, for example. In this group, the nominal wealth gap is almost zero in the first, about USD 11,500 in the second, about USD 173,000 in the third,

---

<sup>22</sup> Results of the probit estimations are provided by the authors upon request.



and about USD 102,500 in the fourth bracket. For other household types in the second to fourth age bracket, we find a positive wealth gap in favor of German households, but the share of this household type is small, particularly in the German population, meaning that the result should be interpreted with care.

For augmented wealth, we find about the same basic patterns as described above. However, the inclusion of pension wealth has ambiguous effects on the household-type-specific nominal wealth gaps. For example, it remains approximately constant for singles in the highest age category, but increases by about USD 130,000 for childless couples in the third age bracket, and decreases by about USD 26,500 for lone parents in the second age bracket. For the other household types in the second to fourth age brackets, the inclusion of pension wealth further increases the nominal wealth gap in favor of German households.

Table 10 provides statistics on the original country-specific distributions and on the three DFL-decompositions. We provide decomposition results for the mean, median, the 75<sup>th</sup> percentile, the Gini, and GE(2). We comment on net worth first. If Germany had the same household structure as the United States, the mean and the two percentile values would increase, and the wealth inequality would decrease. If Germany had the same age structure of household heads, the finding would be reversed: the mean and the two percentile values would decrease, and the wealth inequality would increase. Adjusting for both structure and age, the age-induced effect dominates: Compared to the actual situation, the mean and the two percentile values would decline, and inequality would slightly increase.

The findings for augmented wealth are qualitative similar. Applying the US household structure to Germany increases wealth levels and slightly reduces inequalities; applying the age structure decreases wealth levels and increases inequalities; applying both age and household structure leads to a decrease in wealth levels and higher inequalities.

In sum, adjusting German to US household structure implies higher wealth levels and lowers inequality, both for net worth and augmented wealth. Adjusting for differences in age structure has the opposite effect. Adjusting for both characteristics simultaneously worsens the wealth positions of German households and increases inequality.

**Table 9.** Shares of different household types and their average wealth positions in the United States and Germany

HH-Type	Population share			Mean of net worth			Mean of augmented wealth		
	US	DE	$\Delta^{share}$	US	DE	$\Delta^{net\ worth}$	US	DE	$\Delta^{aug\ wealth}$
				Point (s.e.)	Point (s.e.)	Point (s.e.)	Point (s.e.)	Point (s.e.)	Point (s.e.)
age < 30									
single	0.027	0.036	-0.008	9,188 (4,675)	8,559 (1,222)	629 (4,943)	25,360 (4,868)	26,563 (1,921)	-1,203 (5,388)
lone parent	0.018	0.002	0.016	1,823 (1,798)	7,734 (5,232)	-5,912 (5,570)	19,958 (2,398)	21,316 (5,043)	-1,358 (5,616)
couple no children	0.023	0.006	0.017	67,496 (17,186)	13,619 (3,965)	53,878 (17,497)	124,905 (18,185)	63,377 (8,520)	61,528 (19,506)
couple with children	0.029	0.003	0.026	24,406 (6,484)	14,637 (3,236)	9,769 (7,467)	64,170 (6,517)	58,036 (5,130)	6,134 (8,628)
other	0.021	0.002	0.019	38,184 (10,035)	8,722 (1,377)	29,461 (10,353)	50,884 (10,185)	25,158 (4,967)	25,727 (11,363)
30>= age < 50									
Single	0.052	0.094	-0.043	84,757 (8,400)	73,252 (4,409)	11,505 (9,771)	201,056 (9,976)	175,868 (5,488)	25,188 (11,910)
lone parent	0.057	0.032	0.024	73,395 (15,073)	47,541 (4,271)	25,854 (15,413)	141,979 (15,536)	142,685 (5,906)	-706 (16,336)
couple no children	0.053	0.037	0.016	157,107 (9,554)	181,318 (32,451)	-24,210 (33,377)	371,565 (12,732)	368,004 (32,367)	3,561 (34,208)
couple with children	0.176	0.130	0.047	314,366 (11,842)	158,917 (5,782)	155,449 (12,944)	531,879 (13,425)	345,998 (6,214)	185,881 (14,470)
other	0.016	0.004	0.013	111,998 (22,824)	190,526 (29,485)	-78,529 (38,208)	201,687 (24,075)	320,360 (27,774)	-118,673 (36,649)
50>= age < 65									
single	0.078	0.112	-0.034	271,695 (16,786)	98,966 (3,452)	172,730 (17,137)	534,904 (18,799)	340,207 (5,358)	194,697 (19,720)
lone parent	0.015	0.017	-0.002	117,539 (16,899)	102,358 (6,950)	15,181 (18,303)	319,390 (21,832)	322,442 (11,672)	-3,052 (24,894)
couple no children	0.126	0.089	0.037	610,718 (22,281)	236,899 (5,811)	373,819 (23,179)	1,251,611 (27,281)	747,276 (10,139)	504,335 (29,931)
couple with children	0.047	0.066	-0.018	618,356 (32,700)	346,503 (11,072)	271,854 (34,532)	1,098,120 (37,868)	745,183 (12,338)	352,937 (40,202)
other	0.023	0.005	0.018	152,117 (15,368)	202,557 (32,406)	-50,440 (36,180)	374,654 (18,222)	481,139 (39,458)	-106,485 (43,512)
age >= 65									
single	0.096	0.193	-0.097	274,823 (13,182)	172,320 (3,980)	102,503 (13,433)	534,675 (16,996)	433,202 (4,927)	101,472 (17,401)
lone parent	0.005	0.005	0.001	152,050 (14,699)	250,254 (21,372)	-98,204 (25,250)	393,617 (22,995)	483,782 (33,656)	-90,164 (39,930)
couple no children	0.108	0.153	-0.045	860,025 (26,181)	317,456 (4,696)	542,569 (26,568)	1,626,671 (36,909)	855,454 (6,037)	771,217 (37,379)
couple with children	0.007	0.009	-0.002	389,105 (71,486)	396,487 (36,514)	-7,382 (76,397)	974,238 (106,518)	959,426 (42,727)	14,811 (109,211)
other	0.019	0.003	0.016	199,788 (16,158)	233,906 (24,087)	-34,118 (28,611)	419,339 (20,586)	645,612 (37,573)	-226,272 (43,173)

*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. All results based on multiple imputations; bootstrap standard errors accounting for multiple imputation in parentheses. Point: point estimate accounting for multiple imputations. Delta symbols denote difference between the United States and Germany. *Source:* Authors' calculations from the SCF 2013 and SOEP v30/v31.

**Table 10.** Results of a DFL decomposition by age and household type for net worth and augmented wealth

		Original country distributions			US household structure		US age structure		US household and age structure	
		$Stat_{US}^{US}$	$Stat_{DE}^{DE}$	Ratio	$Stat_{US}^{DE}$	Ratio	$Stat_{US}^{DE}$	Ratio	$Stat_{US}^{DE}$	Ratio
Net Worth	mean	337,570	182,329	1.85	193,435	1.75	162,733	2.07	171,658	1.97
	p50	40,001	49,623	0.81	62,682	0.64	32,647	1.23	40,431	0.99
	p75	198,800	228,528	0.87	252,033	0.79	202,149	0.98	218,081	0.91
	Gini	0.889	0.755	1.18	0.743	1.20	0.781	1.14	0.768	1.16
	GE(2)	7.865	2.348	3.35	2.204	3.57	2.739	2.87	2.515	3.13
Augmented Wealth	mean	652,504	472,401	1.38	493,194	1.32	419,652	1.55	445,330	1.47
	p50	246,663	326,990	0.75	344,861	0.72	270,221	0.91	298,287	0.83
	p75	608,473	630,784	0.96	662,461	0.92	564,477	1.08	606,482	1.00
	Gini	0.700	0.508	1.38	0.502	1.39	0.540	1.30	0.528	1.33
	GE(2)	2.999	0.645	4.65	0.621	4.83	0.760	3.95	0.704	4.26

*Note:* The sample is top- and bottom-trimmed at the 0.1th and 99.9th percentile. *Source:* Authors' calculations from the SCF 2013 and SOEP v30/v31.

## V. Conclusion

We find that in 2013, average net worth in the United States is USD 338,000, about twice as high as in Germany, while net worth is higher in Germany than in the United States up to the eighth decile. We also find that pension wealth makes up a sizeable portion of household wealth: 48% on average of augmented wealth in the United States and 61% in Germany. Average social security pension wealth in dollar terms is higher in Germany than the United States—USD 200,000 versus USD 161,000—but the reverse is true for occupational and private pension wealth—USD 90,000 versus USD 153,000. Average total pension wealth is therefore higher in the United States: USD 315,000 versus USD 290,000 in Germany. Including pension wealth also alters the relative positions in average and median wealth in the two countries. At USD 653,000, average augmented wealth in the United States is 1.4 times higher than in Germany but the median is higher in Germany: USD 327,000 versus USD 247,000, which underscores the relative importance of pension wealth in Germany.

In both countries, the inclusion of pension wealth in the household wealth portfolio reduces measured wealth inequalities, but more in Germany than in the United States. With regard to net worth, our results confirm the previous finding of markedly higher inequalities in the United States, where the Gini index is 0.889 compared to 0.755 in Germany. Adding social security pension wealth to net worth reduces inequality. The Gini index drops by 21% (to 0.710) in the United States, while in Germany, the reduction is even greater (33% to 0.508) due to the higher importance of social security pension wealth. Adding occupational and private pension wealth to net worth also reduces inequality, but the magnitude of the effect is smaller. In both countries, the Gini index declines by about seven percent. Adding social security and occupational and private pension wealth to net worth results in augmented wealth. Here, the respective Gini index in the United

States shrinks by 0.189 points to 0.700, and in Germany by 0.247 points to 0.508 (a reduction of 33%). The redistributive impact of pension wealth is therefore greater in Germany. The primary effect is brought about by social security pension wealth, which reflects the higher level of social security pension wealth in Germany in both dollar and relative terms.

The main result from the factor decomposition is that if the wealth shares in Germany were the same as in the United States, this would lead to higher wealth inequalities in Germany. The DFL composition shows that adjusting German household structure and age of the household head to those of US households further enlarges the wealth gap and increases the level of inequality in Germany.

Putting the results in a broader perspective, we would have expected that the wider social safety net in Germany relative to the United States would imply that middle-class and poor Germans would need to save less for job loss, sickness, and old age than corresponding Americans. We would expect this primarily because of the higher pensions in Germany. Also, university education is free in Germany, which means that unlike Americans, Germans do not need to save or go into debt for university tuition. In general, one would think that a wider social safety net would mean less need for precautionary savings. However, net worth is actually higher in Germany than in the United States up to the eighth decile, a surprising result. Yet adjusting the German age structure to that in the United States yields a counterfactual wealth distribution that reverses the result of the comparison.

Finally, our research has shown that a cross-country comparison of wealth is sensitive to the choice of the wealth aggregate. Augmented wealth may give a more accurate picture of the welfare positions of households in different countries than net worth. Nevertheless, interpretations should be made with caution because of the limited convertibility of social security pension wealth in marketable wealth.

## Supporting Information

The following supporting information can be found in the online version of this article at the publisher's web site.

### Online Appendix

## References

Almås, I., Mogstad, M. (2012), Older or Wealthier? The Impact of Age Adjustment on Wealth Inequality, *Scandinavian Journal of Economics*, 114, 24-54.

ABV (Arbeitsgemeinschaft berufsständischer Versorgungseinrichtungen e.V.) (2016), *Daten und Fakten (data and facts)*. <http://www.abv.de/verlaessliche-struktur.html>.

Attanasio, O., Brugiavini, A. (2003), Social security and households' saving, *Quarterly Journal of economics*, 118, 1075-1119.

Attanasio, O., Hoynes, H. (2000), Differential Mortality and Wealth Accumulation, *The Journal of Human Resources*, 35 (1), 1-29.

Bosworth, B., Burtless, G. (2004), Pension Reform and Saving, *National Tax Journal*, 57, 703-727.

Bover, O. (2010), Wealth Inequality and Household Structure: U.S. vs. Spain, *Review of Income and Wealth*, 56(2), 259-290.

Boyle, P., Murray, J. (1979), Social Security Wealth and Private Saving in Canada, *The Canadian Journal of Economics*, 12, 456-468.

Brinca, P., Holter, H.A., Krusell, P., Malafry, L. (2016), Fiscal Multipliers in the 21st Century, *Journal of Monetary Economics*, 77, 53-69.

BMAS (Bundesministerium für Arbeit und Soziales; Federal Ministry of Labour and Social Affairs) (2012a), *Ergänzender Bericht der Bundesregierung zum Rentenversicherungsbericht 2012 gemäß § 154 Abs. 2 SGB VI (Alterssicherungsbericht 2012)* (supplemental report of the

federal government to the pension report 2012 conformable to law § 154 Abs. 2 SGB VI (*old-age provision report 2012*).

BMAS (Bundesministerium für Arbeit und Soziales; Federal Ministry of Labour and Social Affairs) (2012b), *Verbreitung der Altersvorsorge 2011. Endbericht (prevalence of old-age provisions 2011, final report)*), Federal Ministry of Labour and Social Affairs.

Bönke, T., Grabka, M.M., Schröder, C., Wolff, E.N., Zyska, L. (2016), The joint distribution of net worth and pension wealth in Germany, *SOEPpapers on Multidisciplinary Panel Data Research*, 853.

Börsch-Supan, A., Reil-Held, A., Schunk, D. (2008), Saving incentives, old-age provision and displacement effects: Evidence from the recent German pension reform, *Journal of Pension Economics and Finance*, 7(3), 295-319.

Carroll, C.D., Slacalek, J., Tokuoka, K. (2014), The Distribution of Wealth and the MPC: Implications of New European Data, *The American Economic Review*, 104(5), 107–111.

Chetty, R., Stepner, M., Abraham, S., Lin, S., Scuderi, B., Turner, N. Bergeron, A., Cutler, D. (2016), The Association Between Income and Life Expectancy in the United States, 2001-14, *Journal of the American Medical Association* 315(16), 1750-1766.

Corneo, G., Keese, M., Schröder, C. (2009), The Riester Scheme and Private Savings: An Empirical Analysis based on the German SOEP, *Schmollers Jahrbuch: Journal of Applied Social Science Studies*, 129(2), 321-332.

Corneo, G., Keese, M., Schröder, C (2010), The Effect of Saving Subsidies on Household Saving – Evidence from Germany, *Ruhr Economic Papers*, 170.

Corneo, G., König, J., Schröder, C. (2015), Distributional effects of subsidizing retirement savings accounts: Evidence from Germany, *School of Business & Economics Discussion Paper*, 2015/18.



- Cowell, F., Karagiannaki, E., McKnight, A. (2018): Accounting for Cross-Country Differences in Wealth Inequality, *Review of Income and Wealth*, 64(2), 332-356.
- Delavande, A., Rohwedder, S. (2011), Differential Survival in Europe and the United States: Estimates Based on Subjective Probabilities of Survival, *Demography*, 48(4), 1377–1400.
- Deutsche Rentenversicherung Bund (2015), Rentenversicherung in Zahlen 2015.
- Dicks-Mireaux, L., King, M. (1984), Pension Wealth and Household Savings: Tests of Robustness, *Journal of Public Economics*, 23, 115-139.
- DiNardo, J., Fortin, N. M., Lemieux, T. (1996), Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach, *Econometrica* 64(5), 1001–1044.
- European Central Bank (2013), The Eurosystem Household Finance and Consumption Survey Results from the first wave, *Statistics Paper Series*, 2.
- European Central Bank (2009), Housing Finance in the Euro Area, *Occasional Paper Series*, 101.
- Eurostat (2013), European system of accounts ESA 2010.
- European Union (2013), European system of accounts. ESA 2010. Luxembourg.
- Federal Statistical Office (2015): Survivor Tables for Germany, Model Calculations for the Birth Cohorts 1896-2009, Wiesbaden.
- Frick, J.R., Headey, B. (2009), Living Standards in Retirement: Accepted International Comparisons are Misleading, *Schmollers Jahrbuch: Journal of Applied Social Science Studies/Zeitschrift für Wirtschafts-und Sozialwissenschaften*, 129, 309-319.
- Frick, J.R., Grabka, M.M. (2010), Old-age Pension Entitlements Mitigate Inequality—but Concentration of Wealth Remains High, *DIW Berlin Weekly Report*, 8, 55-64.
- Frick, J.R., Grabka, M.M. (2013), Public Pension Entitlements and the Distribution of Wealth, in: Janet C. Gornick and Markus Jäntti (eds.). *Income Inequality: Economic Disparities and the Middle Class in Affluent Countries*, Stanford University Press, 362-388.

Grabka, M.M., Westermeier, C. (2015), Editing and Multiple Imputation of Item Non-response in the Wealth Module of the German Socio-Economic Panel. *SOEP Survey Papers Series C – Data Documentation*, 272.

Gullason, E.T., Kolluri, B.R., Panik, M.J. (1993), Social Security and Household Wealth Accumulation: Refined Microeconomic Evidence, *The Review of Economics and Statistics*, 75, 548-551.

Gustman, A.L., Mitchell, O.S., Samwick, A.A., Steinmeier, T.L. (1997), Pension and Social Security Wealth in the Health and Retirement Study, *NBER Working Paper Series*, 5912.

Hilbert, M. (2012), Toward a synthesis of cognitive biases: How noisy information processing can bias human decision making, *Psychological Bulletin*, 138(2), 211–237.

Jianakoplos, N.A., Menchik, P.L. (1997), Wealth Mobility, *The Review of Economics and Statistics*, 79(1), 18-31.

Kaas, L., Kocharkov, G., and Preugschat, E. (2015), Wealth Inequality and Homeownership in Europe, *CESifo Working Paper No. 5498*, September.

Kennickell, A.B. (2008), *Survey of Consumer Finances*. The Role of Over-Sampling of the Wealthy in the Survey of Consumer Finances. [https://www.federalreserve.gov/econresdata/scf/files/index\\_kennickell.html](https://www.federalreserve.gov/econresdata/scf/files/index_kennickell.html).

Kennickell, A.B., Starr-McCluer, M., Sunden, A.E. (1997), Family Finances in the U.S.: Recent Evidence from the Survey of Consumer Finances, *Federal Reserve Bulletin*, 83.

Leimer, D.R., Lesnoy, S.D. (1982), Social Security and Private Saving: New Time-series Evidence, *Journal of Political Economy*, 90, 606-629.

Lerman, R.I., Yitzhaki, S. (1985), Income Inequality Effects by Income, *The Review of Economics and Statistics*, 67(1), 151-156.

- Maunu, T. (2010), The distribution of pension wealth in Finland, *Finnish Centre for Pensions Working Papers*, 3.
- Mazzaferro, C., Toso, S. (2005), The Effects of Social Security on the Distribution of Wealth in Italy, *Centre for Household, Income, Labour and Demographic Economics Working Paper*, 11.
- Moffitt, R.A. (1984), Trends in Social Security Wealth by Cohort, in: NBER books, *Economic Transfers in the United States*, Chapter 6, 327-358.
- OECD (2017), Pensions at a Glance 2017: OECD and G20 Indicators, OECD Publishing, Paris.
- OECD (2013). OECD Guidelines for Micro Statistics on Household Wealth. OECD publishing.
- Roine, J., Waldenström, D. (2009), Wealth Concentration over the Path of Development: Sweden, 1873–2006. *The Scandinavian Journal of Economics*, 111(1), 151-187.
- Saez, E., and Zucman, G. (2016): Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data, *Quarterly Journal of Economics*, 131(2), 519-578.
- Samwick, A.A. (2000), Is Pension Reform Conducive to Higher Saving? *Review of Economics and Statistics*, 82, 264-272.
- Schröder, C., Golan, J., and Yitzhaki, S. (2014), Inequality and the time structure of earnings: evidence from Germany, *Journal of Economic Inequality*, 12(3), 393-409.
- Shamsuddin, A.F.M. (2001), Public Pension and Wealth Inequality in Canada, *Applied Economics Letters*, 8, 315-320.
- Stiglitz, J.E. (2012), *The Price of Inequality - How Today's Divided Society Endangers Our Future*, New York: Norton.
- Tversky, A.; Koehler, D.J. (1994), Support theory: A nonextensional representation of subjective probability, *Psychological Review*, 101(4), 547–567.
- Von Gaudecker, H.M., Scholz, R.D. (2007), Differential mortality by lifetime earnings in Germany. *Demographic research*, 17(4), 83-108.

Wagner, G.G., Frick, J.R., and Schupp, J. (2007), The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements, *Schmollers Jahrbuch (Journal of Applied Social Science Studies)*, 127(1), 139-169.

Wolff, E.N. (1996), International Comparisons of Wealth Inequality, *Review of Income and Wealth*, 42(4), 433-451.

Wolff, E.N. (2005), Is the Equalizing Effect of Retirement Wealth Wearing Off? *Economics Working Paper Archive wp\_420*, Levy Economics Institute.

Wolff, E.N. (2014), Household Wealth Trends in the United States, 1983–2010. *Oxford Review of Economic Policy*, 30(1), 21-43.

Wolff, E.N. (2015a), U.S. Pensions in the 2000s: The Lost Decade? *Review of Income and Wealth*, 61, 599–629.

Wolff, E.N. (2015b), *Inheriting Wealth in America: Future Boom or Bust?* Oxford: Oxford University Press.

Wolff, E.N., Marley, M. (1989), Long-Term Trends in U.S. Wealth Inequality: Methodological Issues and Results, NBER Chapters, in: *The Measurement of Saving, Investment, and Wealth*, 765-844.

Wolff, E.N., Zacharias, A. (2009), Household wealth and the measurement of economic well-being in the United States, *The Journal of Economic Inequality*, 7, 83-115.