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The Distribution of Wealth in Germany, 1895-2018*

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Abstract

This paper presents the first comprehensive study of the long-run evolution of wealth inequality in Germany. We combine tax data, surveys, national accounts and rich lists to study the distribution of wealth in Germany from 1895 to 2018. We show that the concentration of wealth in the hands of the top 1% has fallen by half, from close to 50% in 1895 to less than 25% today. The interwar period as well as World War II and its aftermath stand out as the great equalizers in 20th century German history. Since unification, two off-setting trends have shaped the German wealth distribution. Households at the top made substantial capital gains from rising equity valuations that were counterbalanced by large middle-class capital gains from rising house prices. Since 1993, wealth of the top 10% and of the middle class (50-90%) approximately doubled in real terms. However, these asset price induced gains in business and housing wealth almost entirely by-passed households in the bottom half of the wealth distribution who do not own these assets. Wealth of the bottom 50% of the population has stagnated since 1993 and their share in total wealth has nearly halved. The wealth gap between households in the bottom and the upper half has widened significantly. In 1993, households in the top 10% were about 50 times richer than households in the bottom half. Today, they are 100 times richer. Finally, we also show that official statistics underestimate privately held German business wealth and real estate wealth.

JEL Classification: D31, E01, E21, H2, N3

Keywords: Wealth inequality; wealth distribution; wealth tax.

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1 Introduction

This paper presents the first comprehensive study of long-run wealth inequality in Germany. We harmonize and combine several data sources – wealth tax data, survey data, Household Balance Sheets from national accounts and lists of large wealth holders – to compile a long-run series for the evolution of the wealth distribution in Germany from 1895 until today. We also study in greater detail the evolution of wealth inequality in Germany since unification in 1990.

Measuring wealth and its distribution is challenging in a country like Germany whose 20th century history has been marked by two World Wars and five different forms of government – the Kaiserreich, the Weimar Republic, the Nazi Regime, the Federal Republic and the German Democratic Republic. On top of this come three currency conversions, substantial changes in borders and in the composition of the population, marked by the expulsion and murder of the German Jews and the influx of refugees from the East. Even for countries with less dramatic political pathways through 20th century history, researchers still find it difficult to agree on measurements of the distribution of wealth. For instance, even in well-studied cases such as the U.S., researchers calculate wealth shares of the top percentile ranging from about 20% Kopczuk and Saez (2004) to 40% Saez and Zucman (2016).

Such large discrepancies in estimates for the wealth concentration are due to different wealth concepts, data sources and methodologies. For instance, tax data often record cadastral values of real estate, while survey data capture market values. Wealth tax data are often restricted to the very rich, while survey data are known to miss the very rich. Finally, also the estimation of aggregate wealth, not only of its distribution, poses a challenge in itself, because certain types of assets are recorded imperfectly. As the case in point, we will show in this paper that the aggregate wealth figures calculated by the German Federal Statistical Office (Destatis) substantially undervalue business and also real estate wealth.

We make three central contributions. First, we present an estimate of the long-run evolution of the top 1% wealth share in Germany that allows us to look at recent trends in a long-run perspective. The concentration of wealth in the hands of the top 1% has fallen by half, from close to 50% in 1895 to less than 25% today. Almost all of this decline

occurred in less than 40 years between the World War I and the early years of the Federal Republic. During this tumultuous historical period, the top 1% wealth share fell from 45% to 25%, and has fluctuated around that level since then. The largest contractionary impulses on the top 1% wealth share came from the collapse of business wealth in the Great Depression, and the substantial wealth tax that was levied in 1952 to share the war burden ("Lastenausgleich"). War destructions in World War II also reduced wealth at the top, but the quantitative effect was smaller than that of the other two factors.

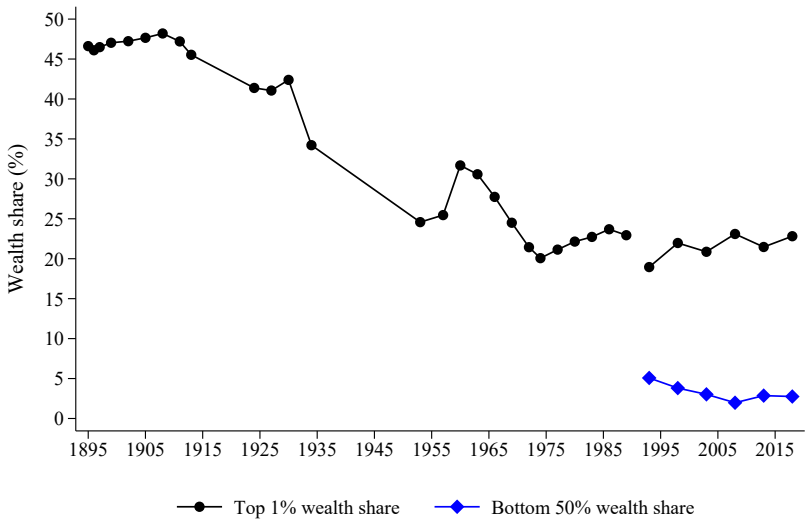
Our second main contribution is to harmonize and combine wealth tax data, survey data, Household Balance Sheets from national accounts, and wealth rankings to provide better and more detailed estimates for the evolution of the wealth distribution since reunification in 1990. We combine the Income and Expenditure Survey (EVS), the Socio-Economic Panel (SOEP), and the Household Finance and Consumption Survey (HFCS) to provide consistent estimates of the distribution of marketable wealth in Germany. We discuss the role of non-marketable wealth such as pension entitlements, but focus the analysis on balance sheet items that can be sold at market prices. We find that top wealth shares and the Gini coefficient for wealth inequality first increased from reunification to 2008, but then fell back somewhat in the past decade. The main reason for the relative stability of top wealth shares is the result of two off-setting factors. Thanks to rising house prices, middle-class households whose portfolios are highly sensitive to house price changes, have made substantial gains in housing wealth. These wealth gains have been of similar magnitude as the wealth increase from rising business wealth at the top of the distribution.

The upper half of the wealth distribution has effectively doubled their wealth in the past 25 years. However, the lower half of the distribution has not profited from the asset price boom in housing and equity markets. For the average household in the bottom 50%, real wealth has barely grown since 1993. As a consequence, their share in total wealth has nearly halved from 5% in 1993 to less than 3% in 2018. The gap between the "haves" and the "have-nots" has widened considerably: in 1993, the average wealth of households in the top 10% of the wealth distribution was 50 times higher than in the bottom half. In 2018, the gap has grown to 100 times.

Figure 1 summarizes these two central findings of our study. It shows the substantial decline of the top 1% share between World War I and the end of World War II, and the

relative stability of the top 1% wealth share since then. At the same time, the data point to a significant drop in the wealth share of the bottom 50% since unification. The aggregate wealth of all households in the bottom half of the wealth distribution only accounts for only 2.8% today.

Figure 1: Wealth share of the top 1% and bottom 50%, Germany, 1895-2018



Source: Own estimates based on wealth tax statistics and uprated and top-corrected EVS.

Our third main contribution is to present new series for the aggregate level and the composition of household wealth in Germany from the Kaiserreich until today. While our definitions and methods to estimate aggregate private household wealth are often in line with Piketty and Zucman (2014), we also undertake several modifications. Most importantly, we provide alternative estimates for the trajectory of aggregate household wealth since reunification in order to address well-known shortcomings of the official German balance sheet data that are constructed by the Statistical Office and the Bundesbank. The Statistical Office and the Bundesbank know about these shortcomings but have not yet embarked on a thorough revision.

Our new estimates of business and real estate wealth are considerably higher than existing time series suggest. We estimate that by international standards, official statistics undervalue German business wealth by close to 2,000 billion Euros. Real estate values are also underestimated. We calculate that the total value of German business wealth amounts to about 4 trillion Euros in 2018, and real estate wealth to more than 9 trillion. Put differently, Germany is considerably richer than official statistics show. Our corrected

wealth-income ratio is about 120% higher relative to GDP.

In particular, our new estimates for business wealth represent an improvement over existing series. While the value of publicly listed companies is accurately captured, the value of Germany's large number of private limited companies and quasi-corporations represents the main challenge. To arrive at a new estimate, we capitalize the earnings streams from private limited companies and quasi-corporations using corporate tax and income tax data. For the capitalization method, we follow the U.S. approach to use the earnings multiples and dividend-price ratios of publicly listed companies, applying a liquidity and risk discount.[1] We think of our estimate as being on the conservative side as we may well underestimate the profitability of non-listed corporations and the amount of retained earnings in these businesses that have contributed to the surge in corporate savings in the past decade.

The paper is structured as follows. Section 2 describes previous work and our data sources. We present and discuss the evolution of wealth concentration in Germany from 1895 to 1990 in the following Section 3. The next Section 4 zooms in on wealth trends in unified Germany where the greater data availability allows us to study wealth growth across the entire distribution. Section 5 explores the distribution of wealth growth since unification. In Section 6, we discuss our estimates of the wealth-income ratio and top wealth shares in a long-run perspective and compare long-term trends in German wealth inequality with those in other countries. Section 7 concludes.

2 Data and definitions

We start out by discussing the challenges involved in constructing long-run wealth estimates for Germany. We then present the core data sets that we used for the construction of our long-run wealth inequality series.

2.1 Measuring wealth inequality: methods and sources

The approach chosen to measure wealth inequality is typically presaged by the data sources, each carrying their own advantages and disadvantages. Recent studies on the

[1] We do not adjust the Bundesbank estimate of the value of the remaining non-corporate business sector, predominantly smaller shops and crafts.

long-run evolution of wealth concentration are based on administrative data such as wealth tax data, estate tax data and income tax data.

Wealth tax data can be used to estimate wealth concentration at the top of the distribution. Roine and Waldenström (2009) is an example for Sweden from 1873 to 2006. German studies using wealth tax data cover post-war West Germany up to 1980 (Baron, 1988) or up to 1995 (Dell, 2008). German (and other) wealth tax data face the limitation that not all assets are recorded at market values. Real estate and closely held businesses are often assessed according to the prevailing tax legislation. Valuation approaches can vary substantially, particularly with respect to their comparability to market values.

The analysis of estate tax data rests on the assumption that the wealth of the living can be inferred from the wealth of the dead. Examples are Kopczuk and Saez (2004) for the United States, Piketty et al. (2006) for France and Alvaredo et al. (2018) for the United Kingdom. For Germany, data on the estate at death do not exist, because the German inheritance tax is levied on the inheritance that each heir received – not on the estate as a whole.

Capitalizing incomes from income tax data is the most recent approach for the long-run study of wealth inequality, revived by Saez and Zucman (2016). Smith and Franklin (1974) is an early application to U.S. income tax data. Recent applications include Garbinti et al. (2016) for France, Lundberg and Waldenström (2018) for Sweden and Saez and Zucman (2016) for the United States. However, wealth shares derived from income tax data are sensitive to the capitalization factors and taxable income concepts. Bricker et al. (2016) and Kuhn et al. (2020) discuss the advantages and disadvantages of capitalization methods and survey data to measure assets and debt values. Most of the open questions relate to the very top wealth holders, however.

Household surveys including questions on household or personal wealth were initiated gradually over the past decades. In Germany, the Income and Expenditure Survey (*Einkommens- und Verbrauchsstichprobe* (EVS)) starts in 1978, the Socio-Economic Panel (SOEP) starting in 1984 incorporates wealth since 2002, and the Household Finance and Consumption Survey (HFCS) was initiated in 2010. The EVS has been used by Frick et al. (2010) and Fuchs-Schündeln et al. (2010). There are a number of challenges in using the EVS to gauge trends in wealth inequality

To start with, the definition of wealth recorded in the EVS is changing over the

years. Housing is only recorded in tax assessed values until the survey year 1993. Since 1993, EVS records market values. Tax assessed housing values in Germany were last updated in 1964 and show no systematic association with today's market values. This impedes intertemporal comparisons of housing wealth before and after 1993 using EVS. In addition, the EVS does not record business wealth in unincorporated businesses which makes statements about wealth inequality based on EVS data as in Stockhausen and Niehues (2019) problematic. In this paper, we use EVS data after 1993 only. Further, we impute business wealth in EVS using distributional information from SOEP.

The SOEP is used by Frick and Grabka (2007), Grabka and Westermeier (2015) and Grabka and Halbmeier (2019), but – as EVS and HFCS – struggles with the under-representation of rich households. Vermeulen (2018) and Bach et al. (2019) assume that the top of wealth distribution follows a Pareto distribution and impute top wealth in HFCS data using information from rich lists. We connect our paper to these papers using rich lists to complement the missing rich at the top. We will also compare our results to these papers.

By uprating our survey distribution to national aggregates, we also contribute to the literature on Distributional National Accounts that marries income distribution and national accounts data in order to measure the distributive effects of GDP growth. Pioneered by the case of the USA (Piketty et al., 2018), the DINA methodology has been applied to France (Garbinti et al., 2018), Russia (Novokmet et al., 2018), and China (Piketty et al., 2019).

2.1.1 Wealth tax data

Wealth tax data for Germany are available for 100 years from 1895 to 1995. For the period 1895-1914, we use wealth tax data from Prussia, which encompassed about 60% of the population of the German Reich. For the year 1913, we can estimate wealth concentration in the German Reich as a whole drawing on the *Wehrbeitrag* – a one-time wealth tax levied to fund Germany's military build up at the eve of World War I. Under the assumption that changes in Prussia are indicative of the evolution of inequality in all of Germany, we extrapolate the German benchmark estimate for 1913 backwards using the Prussian data. For the years 1924 to 1934, we can draw on the wealth tax, that equally applied to all German states. For post-war West-Germany, wealth tax data are available from

1953 until 1995. In 1995, the German Federal Constitutional Court judged the wealth tax as incompatible with the constitution's principle of equality.[2] Upon this decision, the German government decided to suspend the wealth tax rather than to reform the legislation.

Wealth tax data from 1895 to 1995 are available from the Statistical Office and its predecessors in the form of tabulations, that indicate the number of taxpayers between two brackets and their aggregate net wealth. During the period 1895-1935, wealth tax data cover the top decile of the population. From 1953 to 1995, wealth tax data capture the top percentile. After 1989, large exemptions for business wealth were introduced, so that large sums of business wealth are not recorded any more. This makes the two last wealth tax statistics from 1993 and 1995 of limited use for the study of top wealth shares, so that we use wealth tax statistics up to 1989. In the Data Appendix, we give a detailed description of the various wealth tax legislation and how we harmonized the wealth tax data over time.

2.1.2 Survey data

In our analysis, we use all three main German household surveys that document information on household wealth. The Income and Expenditure Survey (*Einkommens- und Verbrauchsstichprobe (EVS)*) was initiated in West Germany in 1962/3.[3] Since 1973 the survey was conducted every five years and was expanded in 1993 to include the new states of unified Germany. The focus of the survey is on income and expenditure of private households in Germany. Since 1978, questions on household wealth are also included. The Socio-Economic Panel (SOEP) includes a wealth questionnaire in 2002, 2007, 2012, and 2017. The European central banks' Household Finance and Consumption Survey (HFCS) was first released in 2011 and continued in 2014 and 2017.

Survey data are known to have some shortcomings for inequality measurement. First, surveys are known to miss the very wealthy at the top of the distribution which creates a downward bias for inequality measures (Bartels and Metzing, 2019; Schröder

[2] Following the wealth tax legislation, real estate wealth was evaluated at cadastral values and was, thereby, evaluated at systematically lower values than other asset types evaluated at market values. Cadastral values were last adjusted in 1964.

[3] According to the Statistical Office, the microdata of the survey years 1964, 1969 and 1973 have been destroyed and are therefore not available for research anymore. See Statistisches Bundesamt (2013) for further details on the survey methods and the implementation of the EVS.

et al., 2020). Second, the EVS data do not record business assets, but business assets represent a substantial share of the portfolio of the wealthy. This creates a downward bias for inequality measures as the German business sector mostly consists of closely held family firms, i.e., not publicly traded firms at the stock exchange. Third, aggregate household wealth recorded in survey is far below the macroeconomic aggregates from other data sources.

Our main source is the Harmonized Income and Expenditure Survey (EVS), which is constructed by Bönke et al. (2013) and Bartels et al. (2019). In the original EVS, variable definitions greatly vary from wave to wave. This applies, in particular, to the name and definition of financial assets. Therefore, Bönke et al. (2013) and Bartels et al. (2019) constructed consistently defined income, expenditure and wealth variables. Most importantly, the EVS includes four consistently defined wealth categories: real estate, financial assets, business assets, and debt. In the following, we briefly describe the main adjustments for these four wealth categories.

- Real estate in EVS is recorded with their tax- assessed, cadastral value until 2013 and, additionally, with market values since 1993. We use market values.

- Financial assets in EVS include regular savings, home purchase savings (*Bausparguthaben*), fixed term deposits (*Termingeld*), savings bonds (*Sparbriefe*), stock shares (*Aktien*), investment fonds, fixed-income securities (*festverzinsliche Wertpapiere*) and government bonds (*Staatsschuldpapiere*). Private pensions are included since 2003. Insurance assets are included in all years, but with an increasing degree of accuracy. From 1978 to 1993, insurance sums are recorded, which are converted to repurchase values in EVS (see Bartels et al. (2019)). We group financial assets according to official definitions of the European System of Accounting (ESA) 2010: *deposits* (F.2), *securities* (F.3), and *insurances* (F.6).

- Business assets in EVS only cover corporate equity held in shares and investment funds. Non-corporate business wealth (the equivalent to *other equity* (F.519) of overall *equity* (F.5)) is surveyed once in 1983. However, non-corporate business wealth represents the bulk of German business wealth. We impute business wealth in EVS building on the business wealth distribution observed in SOEP. For the EVS survey years 1993, 1998, 2003, 2008, 2013, and 2018, we use the SOEP distribution

of the SOEP survey years 2002, 2007, 2012, and 2017, respectively.

- Debt includes both consumer debt and mortgages, which we refer to as non-housing debt and housing debt in the text.

2.1.3 Lists of large wealth holders

Starting in the year 2000, the German business magazine *Manager Magazin* (MM) annually publishes a list of rich individuals and families. Journalistic wealth rankings such as the MM-list come with a number of uncertainties. First, net wealth is estimated based on a variety of data sources and the methods employed to bring these data sources together are not documented for the public. Hence, it is impossible to reconstruct and check these lists against alternative data sources, methods and assumptions. Second, net wealth can be overestimated because liabilities are often underestimated. However, this problem is probably of limited concern for Germany, where most firms are family-owned, often for generations, and traditionally rely on high equity-to-assets ratios.[4] Third, the important role of family-firms in Germany renders estimating net worth of businesses more complicated than in countries like the United States or China, where a large share of firms is listed at the stock exchange. Fourth, many entries of the MM-list refer to a large family and it is unclear, how many individuals or households a single family represents. With limited available data, it is difficult to research the number of shareholders of a family-owned firm. We assume that, on average, each entry represents about four households. From this assumption it follows that ca. 0.004 to 0.007% of German households are listed in the MM-list.

2.2 Macroeconomic aggregates

A central challenge for our study is to align differences in asset valuation methods across different sources. For example, the value of real estate is recorded according to the

[4]Comparing tax data of deceased persons with their fortunes documented in the *Forbes* list, Raub et al. (2010) find that net worth was overestimated by approximately 50 percent, primarily due to assessment difficulties, fiscal distinctions, and poor assessment of liabilities. The Forbes list mostly draws on information from the stock exchange. One should note however, that in the United States a substantially higher share of firms is listed at the stock exchange, which are more likely to take on debt. Given the small number of German firms listed at the stock exchange and their low level of indebtedness, the critique of Raub et al. (2010) may not apply to Germany and, in particular, to the German MM-list. On average, the equity ratio of the German *Mittelstand* was 30% in 2016 (Gerstenberger, 2018).

cadastral value in wealth tax data, according to the market value in household survey data and according to the replacement cost with a separate approximation of land values in Household Balance Sheets (HBS). In this section, we briefly discuss the data sources and our approach to combine the different data.

Household Balance Sheets that document both fixed and financial assets owned by private households, are published annually by the German statistical office (Destatis). However, while households' financial assets estimated by the German central bank (*Bundesbank*) are published annually since 1960, estimated of fixed assets are only available from 1992 onwards. In light of the fact that long-run series on aggregate household wealth are not available from the statistical authorities, we construct two series of aggregate household wealth according to fiscal definitions (1895-1989) and according to market values (1950-2018). We need the aggregate household wealth series according to fiscal definitions in order to estimate top wealth shares on the basis of wealth tax data.

Table 1: **Data sources**

Time period	Aggregate	Distribution
1895-1914	Own estimate following Biedermann (1918)	Wealth tax (Prussia), Wealth levy 1913 (German Empire)
1924-1934	Own estimate following Krelle et al. (1968), Baron (1988) based on wealth censuses	Wealth tax (German Reich)
1953-1989	Replication and extension of Baron (1988)	Wealth tax (FRG)
1993-2018	Own estimates based on Household Balance Sheets (Destatis), Financial Accounts (Bundesbank), Corporate and personal income tax, Returns from Jordà et al. (2017) Housing prices from Bulwiengesa	EVS, SOEP, HFCS, MM-list

Note: See Data Appendix for more details.

For the period 1895-1934, the fiscal definitions are very close to market values due to repeated wealth censuses.[5] For the period 1950-1989, fiscal definitions increasingly diverge from market values. Therefore, we first estimate aggregate wealth according to fiscal definitions and then adjust each asset type to market values in both aggregate wealth and wealth tax statistics following Baron (1988). This series according to fiscal definitions

[5]Where necessary, we make adjustments for certain assets or under-reporting in the tax statistics and wealth censuses. See Data Appendix for details.

is then used for the computation of top wealth shares based on wealth tax data prior to 1990. Table 1 summarises the main underlying data sources by time period.

3 The wealth distribution from 1895 to 1990

In this section, we track the evolution of German national wealth and its distribution from the Empire (Kaiserreich) to reunification. We discuss the impact of the wars, hyperinflation, currency reforms, and policies on the wealth distribution. While we can construct top wealth shares for West Germany, data for the wealth distribution in East Germany are extremely scarce and partly meaningless. Although some forms of private property continued to exist, the absence of market prices makes it virtually impossible to say much about its value.

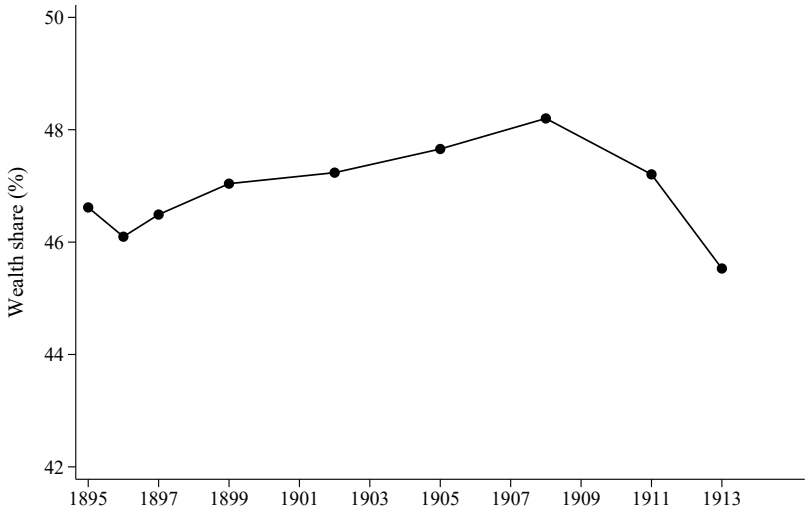
3.1 Kaiserreich, 1871-1918

As the Kaiserreich imposed a one-time levy in preparation for World War I and a wealth tax existed in Prussia since 1895, it is possible to produce reliable estimates of wealth and its distribution before World War I.[6] Both the wealth-income ratio and the top wealth share were at high levels in the Kaiserreich, consistent with the evidence from other countries and previous studies (Dumke, 1987; Piketty and Zucman, 2014). The share of the richest 1% in total wealth stood at around 45% and the top 10% share at around 80% (see Figure 2 and Appendix Figure A.6). In other words, one percent of the population held almost half of total private wealth. These numbers are high from today's perspective, but they are in line with the international evidence. At 500%, the German wealth-income ratio was at the same level as the U.S., but below French or British levels (see Figure 21).

The Prussian wealth tax data offer a number of interesting additional insights into the rural-urban divide of industrializing Germany. Prussian statisticians prepared the

[6] Prussia comprised about 55% of Germany's national wealth and about 60% of its population. Prussian changes in inequality and the total are thus taken as indicative and used to extrapolate the 1913 benchmark estimate backwards (see Data Appendix for the corresponding wealth and population estimates). We know very little about the levels of inequality for the period before 1895. Some studies exist and focus on merchant cities (see, for example, Schmoller (1895) on income inequality in Augsburg in 1471 and 1554.). In agrarian societies, land is the most important asset in the absence of other productive forms of capital investment. Its historically unequal distribution (Cinnirella and Hornung, 2016) suggests that wealth inequality was high in the first half of the 19th century.

Figure 2: The top 1% wealth share, Germany, 1895-1913



Source: Own estimates based on wealth tax statistics.

results of the wealth tax separately for urban and rural municipalities. The average wealth of those paying the wealth tax in urban municipalities was 83% higher than the one of their rural counterparts. Yet, only 10% paid the wealth tax un urban municipalities whereas 14.5% paid it in the rural areas.[7] Cities were richer, but they were also considerably more unequal.

This insight is also borne out by an auxiliary individual-level dataset on more than 8,000 Prussian millionaires for 1908. It contains the millionaires' names, addresses, wealth, income and extensive biographies for the very rich – corresponding to roughly 0.05% of all Prussian households.[8] About 75% of these millionaires, owning about 72% of all millionaires' wealth, lived in urban centers. Moreover, the origins of the millionaires' fortunes suggest a strong urban bias. Table 2 provides details on the origin, level, and profitability of the fortunes of the 100 richest Prussians. The old landowning elite makes about a quarter of all households. A part of this old elite was lucky in the sense that it owned land with coal deposits and hence indirectly profited from industrialization. By pure historical chance, these households turned old money into new money by running

[7]See Königlich Preussisches Statistisches Landesamt (1914, p. XXVII & XXXI) for the corresponding sources.

[8]The origin of our data is a historical curiosity. Prussian bureaucrat Rudolf Martin (1913) was what we would consider a whistleblower today. For publicizing the information, in the belief that this knowledge should be public, he lost his job and pension (Gajek, 2014). We digitized Martin's publication, which is based on the tax returns of the millionaires. All data references in the following paragraph are based on this novel millionaires dataset.

coal mines. However, actual entrepreneurs constitute the largest group among the richest 100 Prussians, not least because the return on capital was so much higher than for the other groups. By the eve of World War I, new money had largely replaced old money among the richest.

Table 2: **The 100 richest Prussians by origin of their fortune**

Origin of Fortune	Share in richest 100	Share of total wealth	Return on capital	Share nobility
Landowners without coal	15%	12%	4.12%	93%
Landowners with coal	8%	18%	5.20%	100%
Bankers & financiers	22%	22%	5.29%	82%
Merchants	10%	7%	5.99%	50%
Entrepreneurs	45%	40%	6.44%	47%

Source: Data comprises the richest 100 Prussians in 1908 as documented by Martin (1913). Data are based on official tax returns. We classified the millionaires according to the origin of their wealth using the short biographies provided by Martin. Rate of return is calculated as income divided by wealth, assuming negligible labour income. This ratio is then averaged across individuals within the respective group.

This, however, did not imply increasing wealth inequality as measured by the top 1% or top 10% share. Figure 2 suggests that the remaining 99% of the households kept up in the later phases of industrialization. The wealth share of the top 1%, like the top 10% share (see Appendix Figure A.6), does not seem to have moved much between 1895 and 1913. The reason for this stagnation of wealth shares that we observe in Germany and elsewhere (Figure 22) lies in the rising wealth of the bottom 90%. Typically, wealth outside the top-10% was held in small farms, small apartments,[9] and saving accounts in saving banks. As contemporaries pointed out,[10] the evolution of the latter provide a sensible way to track the wealth of the lower classes. Between 1895 and 1913 the number of savings accounts per households grew from 0.6 to 0.9. Deposits grew by more than 130% in real terms.[11] Significant wealth creation took place at the bottom of the distribution.

In sum, the level and concentration of private wealth before World War I were high. The relative stability of top wealth shares during the period 1895-1913 originated in the increasing wealth at the bottom of the distribution, which had been virtually without wealth previously. This stagnation, however, does not imply the absence of

[9] As the home-ownership of 25% in 1910 indicates (Kohl, 2017).

[10] See, for example, Biedermann (1918, p. 77).

[11] Own calculation based on savings data from Königliches Statistisches Bureau (1915, p. 346) and the consumer price index from Metz (2015). The growth rate looks similar if we exclude all deposits over 600 Marks and thus focus on the *very* poor.

change. Indeed, the novel millionaires data suggest that a new entrepreneurial elite had replaced the old landowning one. And more change was to come with World War I and its aftermath.

3.2 The Weimar Republic, 1919-1933

World War I and the ensuing hyperinflation mark a severe break in the evolution of wealth and its distribution in Germany. Like in other countries, the total private wealth-income ratio halved between the eve of World War I and the early 1920s (see Figure 21). In contrast, the the drop in the top percentile's wealth share was slightly less pronounced than elsewhere (see Figures 3 and 22).

Figure 3: The top 1% wealth share, Germany, 1924-1934

Source: Own estimates based on wealth tax statistics.

Among the very profiteers of World War I were those industrialists whose wealth was in war-related industries. This picture clearly emanates from the development of income inequality. According to Bartels's (2019) estimates, the top percentile's income share rose by 6 percentage points, driven by high capital returns. If the large changes in income inequality due to rising capital incomes are indicative,[12] it looks likey that the

[12]Whether the war led to more or less inequality has been subject to debate (Kocka, 1978; Ritschl, 2005; Baten and Schulz, 2005). These researchers typically analyse the functional income distribution, wartime profits, or a combination of the two. Analyzing the top 1% income share provides a direct way to assess the consequences for the personal income distribution. It is inconceivable that farmers increased their income substantially given war time regulations (Pierenkemper, 1998, p.77) and the lower land productivity (Helfferich, 1925, p.13). Likewise, the rising inflation during the war (p.15 Holtfrerich, 1980,

war itself increased the share of the top 1% in total wealth.

The distributional effects of the German hyperinflation remain debated. Holtfrerich (1980, p.275) argues that the hyperinflation amounted to a Jubilee year with respect to debts and society became more equal. In contrast, Bresciani-Turroni (1968, p.287) argues that wealth inequality could have even been accentuated. Such disagreement is best understood against the backdrop of heterogenous wealth portfolios across households that were affected differently by the inflation.

In the lower part of the national wealth distribution, portfolios of the urban and rural classes differed substantially. On the country side, small-scale farming was still very prevalent. More than 3 million farmers owned less than 2 hectares, which corresponded to about 59% of all farms (Statistisches Reichsamt, 1914, p.38).[13] The farms, of course, were not affected by the inflation and the hyperinflation lessened the mortgage burden (Bresciani-Turroni, 1968, p.299). This was in stark contrast to the "unemployment and pauperism [that] were swamping the cities and industrial areas" (Bresciani-Turroni, 1968, p.299). In the cities, at least 75% of households did not own property.[14] Urban tenant households owned savings accounts and cash, both of which were wiped out by the hyperinflation. Yet, while the urban poor were large in numbers, their wealth share was small even before the war and hyperinflation. This meant that the loss of their savings did not substantially alter the top 1% wealth share.

The effects on the middle class, upper middle class, and rich were heterogeneous. The value of the predominant middle class asset, real estate, was not affected by the hyperinflation and the hyperinflation wiped out mortgage debt.[15] A different part of the upper-middle and upper class, the *rentiers*, was less lucky as their holdings mainly comprised securities and bonds that became worthless during the hyperinflation. To some

for the corresponding inflation statistics) likely decreased the returns of the owners of real estate. It is thus likely that returns on equity in firms were higher relative to other assets, even if equity owners faced decreasing profits in absolute terms.

[13]These individuals would typically fall under the taxation threshold of 6,000 Marks as the average price of farmland (in Prussia) was about 1,400 Marks (Rothkegel, 1910, p.146). If we assume that they each owned about 2,800 Marks in 1914, the wealth share of these three million farmers accrued to about 4-5%.

[14]The home ownership for the rural and urban parts together stood at 27% in 1910 (Kohl, 2017). Homeownership must have been more common in rural than in urban areas. Assuming a homeownership rate of 25% for cities thus certainly constitutes an upper bound.

[15]See Cohen (1931) on rent regulation and the so-called *Hauszinssteuer*, which taxed rents for buildings built before 1918 and thus nullified some of the eradication of debt. The government also passed a tax on farmers, whose mortgage debt was nullified by the hyperinflation.

extent this also held true for those who had invested in equities. The valuations dropped by about 75% (Bresciani-Turroni, 1968, p.314). In light of their portfolio composition, it is likely that the richest part of the distribution lost somewhat relative to the middle class and a comparison of those paying wealth tax in 1913 and 1923 supports such a view (Holtfrerich, 1980, p.276). The top 1% share fell from 45.5 to 41.4% between 1913 and 1924. If the war itself, as argued above, did not lead to a significant drop of the top 1% wealth share, the hyperinflation likely depressed it somewhat. If we were able to compare the wealth losses of the bottom 50 % relative to the middle class and the top, however, different conclusions about the effects of the hyperinflation on inequality could also be possible.

3.3 Great Depression and the 1930s

While the top percentile's share exhibits little movement during the Weimar years, it dropped substantially from 42% to 34% between 1930 and 1934 (Figure 3). The fall was more pronounced than in the United Kingdom and France and in line with that in the United States (Figure 22). While the 1934 data point falls into the time of the Nazi regime, it has little to do with Nazi economic policies. Instead, the Great Depression compressed the top-1% share. The Depression was more severe in Germany than in other European countries.[16] The significant change in the wealth distribution in the 1930s was driven by a revaluation of business wealth. Stock markets collapsed around the world and German business wealth fell by 50% in value. As business wealth is highly concentrated within the top 10%, wealth concentration fell.

Table 3 displays the portfolio of the top 1% and the rest of the households in 1927 along with the changes in the respective asset classes from 1927 until 1934. It illustrates how the crisis hit the different asset classes heterogeneously and strongly impacted on the distribution of wealth. Business and financial wealth dominated the portfolios of the richest percentile comprising about 65% of their net wealth.[17]

Compared to the fall in equity prices, the fall of the price of agricultural land was

[16] See Albers (2018) for a global comparison of the crisis. From 1929 to 1932, GDP dropped by 25%, unemployment tripled, and stock market prices fell by more than 60% (Crafts and Fearon, 2013, p.7).

[17] Moreover, our reconstruction of the wealth total and the wealth tax data jointly suggests that the top 10% virtually held all equities recorded in the statistics.

Table 3: **Portfolios & asset price developments, 1927-1934**

Portfolios in 1927

	Agricultural	Real estate	Business	Financial	Liabilities
Top 1%	23%	24%	19%	45%	-12%
Bottom 99%	47%	34%	9%	24%	-14%

Asset price changes 1927-1934

	Agricultural	Real estate	Equity	Liabilities
Change 1927-1934	-8%	-20%	-51%	0 %

Price-induced change in wealth 1927-1934 given 1927 portfolios

Top 1%	-40 %
Bottom 99%	-20% [-15% ;-27%]

Source: Data on equity prices are from Gielen (2013). The change in the prices of agricultural assets relies on the average value per hectare for a 50-100 hectare farm (Statistisches Reichsamt (1931, p. 14) and Statistisches Reichsamt (1939, p. 38)). Changes of prices in real estate refer to house prices, which are from Statistisches Reichsamt (1931, p. 42) and Statistisches Reichsamt (1939, p. 61). The estimates by Knoll et al. (2017) suggest a slightly sharper fall of about 30% based on an index for large cities. The above, in contrast, reflects all housing units in Germany. For the weighted changes of the bottom 99 %, we assume a 10% decrease in the value of their financial assets in the baseline estimate. Numbers in parentheses refer to scenarios where a) their financial assets do not decrease (e.g. all are savings) or b) their financial assets decrease in the same way as for the top 1% (all are equities). Of course, neither of the two scenarios is realistic. Instead, they provide absolute minimum and maximum bounds.

moderate. Real estate prices were less affected, dropping by 20% in nominal terms and remaining stagnant in real terms. This meant that the main asset of a upper-middle class – the home ownership rate was at 23% (Kohl, 2017) – was largely unaffected. The same was true for the most common financial asset of the lower-middle and lower classes: saving deposits gained substantially in real terms and relative to other asset classes.[18] Overall, we estimate that the valuation of the portfolio of the bottom 99% dropped only by 20% in nominal terms as compared to the 40% drop that the top 1% experienced.[19]

How did wealth concentration evolve in the subsequent Nazi period? Unfortunately, the available statistical material from the wealth tax records is scant. The effects of Nazi economic policies on wealth inequality can only be approximated through their effect on the income distribution and the development of wages.

[18]Indeed, the aggregate statistics suggest some flight into such non-equity financial assets. While the value of equity holdings dropped by around 14 billion Reichsmark, holdings in saving deposits, life insurances, and cash increased by 12.5 billion Reichsmark between 1927–1934. See Data Appendix.

[19]That the rich lost substantial amounts of their wealth was also noted by the macroeconomic and statistical unit of the Reichsbank as archival material suggest (Bundesarchiv R2501/ 6627, *Volkswirtschaftliche und Statistische Abteilung*, "Aufgliederung der Kapitalanlage", p. 5; see also Banken (2019), who located these materials).

Bartels (2019) documents a rise of the top percentile's income share from 11% to 17% between 1934 and 1938. According to her, three mechanisms drove this increase: a rebound effect from the Great Depression, high industrial profits which were in part due to rearmament, and wage controls. All of them are likely to have led to a concentration not only of income but also of wealth. First, even though the recovery of equity prices from the Depression slump remained incomplete – in 1938, they stood at 70% of their 1927 level – the revaluation of business wealth meant that the richest 1% of the households gained relative to the bottom 99%. Second, the recovery of equity prices was also a reflection of rising industrial profits, in particular in war-relevant industries. Finally, wage controls did not only mean falling living standards and worsening nutritional status (Baten and Wagner, 2003), but also lower savings. These three factors likely suggest that wealth inequality increased during the Nazi regime, an assessment supported by the little wealth tax data we have during this period.[20]

The persecution, expropriation, and ultimately murder of German Jews also affected the wealth distribution. Jews were strongly represented in the millionaires lists compiled by Martin (1913) before World War I and also in professions of high social status, such as lawyers, doctors and university professors. Aly (2011) famously argued that class envy was behind the Holocaust. This being said, the effects of the expropriations and persecution on the top 1% wealth share shall not be overstated for two reasons. First, a mid-level estimate puts Jewish net wealth at about 6.5 billion Marks in 1933 (Ritschl, 2019). This corresponds to about 5% of our 1934 estimate of total wealth of about 126 billion Marks.[21] Secondly, the beneficiaries of the persecution of the large Jewish fortunes were predominantly other rich households.

In sum, the fall in wealth inequality in the early 1930s was first and foremost a result of the Great Depression. Recovering equity prices likely increased wealth inequality during the Nazi period alongside with rising industrial profits, and wage controls. While these policies related to the war preparation increased wealth inequality, World War II itself and its political consequences would reverse this increase.

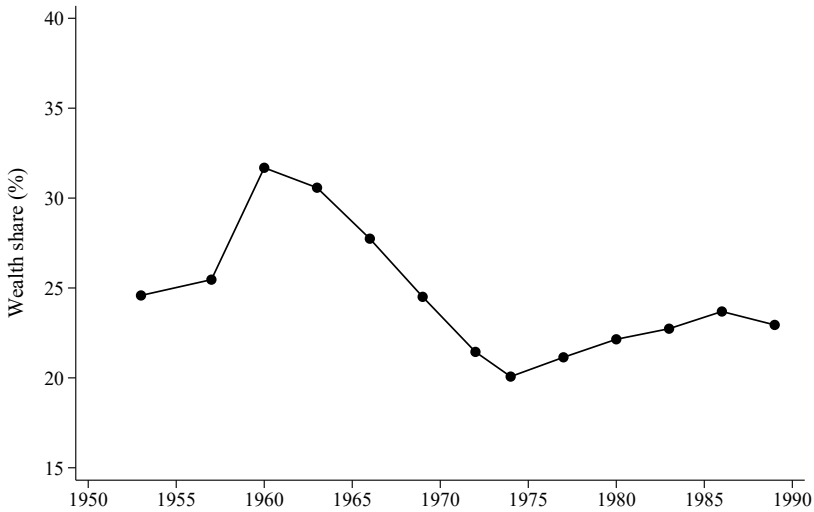
[20] There was a wealth tax assessment on January 1, 1940. Banken (2019, p.310) reports a single table that was produced by the Reichsamt. This table suggests that the top-wealth owners gained disproportionately to all other wealth classes, except for the lowest one. Banken interprets this as evidence that wealth inequality increased.

[21] The Jewish population share was around 0.8% (Ritschl, 2019, Table 10).

3.4 From World War II to the 1980s

This section discusses the evolution of wealth concentration from World War II to reunification. Between 1934 and 1952, the top 1% share in private wealth dropped by 9.6% in historical and 9% in constant West German Borders (Figure 3 and 4). After that, wealth concentration at the top increased briefly during the stock market boom of the late 1950s before falling back during the high growth period of the 1960s. The top 1% wealth share bottomed out in the 1970s and rose moderately in the 1980s. Yet overall, wealth concentration in West Germany remained relatively constant until reunification. We will also briefly discuss available data for wealth inequality in East Germany.

Figure 4: The top 1% wealth share, Federal Republic, 1953-1989



Source: Own estimates based on wealth tax statistics.

3.4.1 War destruction and new borders

World War II affected the distribution of wealth through three main channels. First, war destruction through air raids had heterogenous effects across real estate, industrial, and agricultural assets. Second, new borders did not only lead to territorial losses, but also to a large influx of refugees with virtually no assets. Third, drastic policy measures affected the distribution of wealth. Two of them stand out: On the one hand, the currency reform of 1948 reduced financial wealth in savings accounts thus affecting the primary asset of the lower classes. On the other hand, the West German government introduced heavy wealth taxation to share the burden of war destruction among the entire (West-) German

population and compensate the refugees.

The most obvious way in which World War II affected the level and distribution of wealth in Germany was the physical destruction caused by the war and, in particular, the air raids. The first wave of air raids mainly targeted industrial plants and transportation systems, whereas city centers became the main target in the second phase (Brakman et al., 2004, p.204). Thanks to a study by the *Deutsches Institut für Wirtschaftsforschung* in the 1970s (Cornelsen et al., 1974), the source material is sufficient to estimate the total level of destruction and its distribution across asset classes.

In terms of national income and wealth in 1934, the extent of war destruction was indeed substantial, totalling 33% and 11% respectively (Table 4). Of this total amount of destruction, most was concentrated on real estate assets (64%) as opposed to business and financial equity (34%) and agricultural (2%) assets. The bombings thus mainly affected the assets of the middle-class and the rich, whereas farmers were hardly affected.

What were the implications for the top 1% wealth share? The best we can do is the following: using 1934 as a reference year, we can allocate the total amount of destruction across the wealth distribution and calculate a counterfactual by removing the wealth in the respective asset classes (as if the destruction happened in 1934).[22] The difference between the counterfactual and the observed share for a given event or policy constitutes an estimate of its effect on the top 1% share.

Table 4 provides the summary of our estimates along with the total size of the affected wealth. We estimate that the wealth losses in housing and industrial capital reduced the top 1% wealth share by about 2.2 percentage points.

What was the effect of the border change on the distribution of wealth in the German society? As the structure and distribution of wealth were different within the borders of the Federal Republic than in the borders of Weimar Germany, the new geographic configuration might have well affected the wealth distribution. While the new territory of the Federal Republic did not include the rather poor and unequal agrarian territories in East, relatively rich and industrial Saxony was also excluded.[23] The overall effect of

[22] We focus only on the war destruction within the borders of the (later) Federal Republic. The counterfactual incorporates the fact that not all households are affected by splitting the wealth distribution into an affected (30%) and unaffected part (70%). See Data Appendix for details.

[23] In the light of recent regional GDP estimates for Germany (Rosés and Wolf, 2018), it seems plausible that border changes mattered little for the overall distribution of wealth.

Table 4: **Effects of war and policies on top 1% share**

Event		Affected assets in% of national income	Affected assets in% of private wealth	Mainly affected part of distribution	Effect on top 1 % share
War destruction		33%	11%	mostly middle class & rich	-2.2%
New borders	- Territorial change	94%	32%	Whole	-0.7%
	- Expellees			Bottom	+0.5%
Post-war wealth levies		15-19%	9-11%	Upper middle class & rich	-5.5%

Notes: Methodological details for the calculation of the affected assets can be found in the Data Appendix. We normalise these with the national income as provided by Piketty and Zucman (2014), applying historical borders in all cases. The reference year for the affected assets column is 1934 for the effect of war destruction and territorial change, whereas it is 1953 for the remaining two (expellees and post-war wealth levies). For details on the calculation of the effect on the top 1%, see text and Data Appendix. The lower value in the range given for the total affected wealth with regards to the post-war levies refers to the *Lastenausgleich* legislation proper. The upper range includes the emergency levies before 1952 (see text below for details). The effect on the top 1% is estimated by using the latter scenario.

these territorial changes was small, however. If anything, the top 1% wealth share slightly decreased because of them (Table 4).

The second effect of the new borders was a large influx of refugees into West Germany, which created a large new class of propertyless. We estimate that around 12% of the households in the new Federal Republic were refugees from the former German territories.[24] These new arrivals affected the income distribution through their effects on wages and the industrial structure (Braun and Mahmoud, 2014; Braun and Kvasnicka, 2014). However, they also affected wealth distribution mechanically. They found themselves at the bottom of the distribution and thus shifted the threshold for the top 1%. Assuming that each refugee household had assets in the net value of 1,000 marks in 1952, our estimate of the effect on the top 1% accrues to 0.5 percentage points (Table 4). In sum, compared to the effect of war destruction, the effects of the new borders and the associated influx of refugees on the top 1% wealth share were small.

[24]We focus on the refugees until 1952 as those coming later are likely related to the division rather than World War II. See Data Appendix for the corresponding calculations.

3.4.2 Postwar redistribution and the "Lastenausgleich"

A direct political response to the influx of refugees, the hardship through destruction, and the consequences of war more generally was the so-called *Lastenausgleich*, a large redistributive program of wealth taxation. It included substantial levies on private wealth and led to ongoing wealth transfers until reunification.[25] The wealth levy was paid by those whose fortunes either survived or increased during the war, for instance, through the eradication of debts due to the currency reform in 1948. The recipients were refugees or West-Germans whose assets were destroyed in the war. The name of the wealth tax law – the "equalization of burdens act" – thus captures the spirit of this policy quite well. Understanding its distributional consequences is key to explain the level shift in the top 1% wealth share after World War II.[26]

By 1952, when the main legislation came into law, the German government had already instituted some emergency wealth levies. We subsume all these levies, along with some smaller levies that were passed in 1952, under the label *Lastenausgleich* as is done elsewhere (Wiegand, 1992). The two economically smaller levies in this legislation, the "Kreditgewinnabgabe" and "Hypothekengewinnabgabe" aimed to undo some of the perceived injustice of the currency reform in 1948. Due to the currency reform, saving deposits and debts were converted from Reichsmark to Deutsche Mark in the relation 10:1. Not only had those with savings lost most of their deposits,[27] but those with mortgage debt had gained significantly (Wiegand, 1995, p. 83). The "Hypothekengewinnabgabe" ensured that these debts were reinstated and paid to the government. Correspondingly, the "Kreditgewinnabgabe" taxed the gains by companies that emerged through the currency reform.

The main levy had a distributional motivation by targeting those who still possessed significant fortunes. It levied quasi-flat 50% tax on the net wealth of households and companies as assessed in 1948. A small allowance of 5,000 Marks was made for those households owning less than 25,000 Marks, corresponding to the average annual gross

[25] There were indeed still some transfers paid after reunification, but their size was small (Hauser, 2011, p.115). See Wiegand (1992) for a detailed overview of all the policies associated with the Lastenausgleich.

[26] While a substantial historical literature on the *Lastenausgleich* exists, Frick et al. (2010, p.22) note that its effects on wealth concentration have never been systematically analysed.

[27] Unfortunately, it is difficult to quantitatively assess the importance of these losses for the the top 1% share.

income of industrial workers in 1955 (Statistisches Bundesamt, 1956, p.477).[28] What made such taxation both economically and politically feasible was a payment method that was developed after World War I, but never became relevant because of the hyperinflation Bach and Buggeln (2020). Instead of paying the full amount in 1952, households and companies made quarterly amortization payments including interest until 1979. The combined annual payment amounted to 4-6% of the total initial amount of 1948, depending on the asset type (Albers, 1989, p. 288). Put differently, the main levy thus corresponded to an annual wealth tax of 2-3% on the initially assessed net wealth in 1948. This implied that it could be paid from the returns of private wealth rather than its substance.

Not only did this *modus operandi* make the levy bearable for those paying it, it also allows us to estimate its effect on the top percentile's wealth share. From the accounting perspective of the households paying the *Lastenausgleich*, the future payments became a debt in 1952. Even though the main levy was payable in quarterly instalments between 1952 and 1979, its outstanding payments were deductible as a total from the general wealth tax in 1953. The wealth tax tabulations of 1953 record these deductions (and thus future payments) by wealth group. After distributing the levy paid by companies and some smaller levies in a reasonable manner across the distribution, we can analyze the inequality-reducing effect of them. We estimate that the wealth levies associated with the *Lastenausgleich* reduced the top 1% wealth share by about 5.5 percentage points. In terms of decreasing the top 1% wealth share, it was more than twice as important as the war destruction. Its effects were larger because it was aimed at the very top of the distribution. All in all, it was not the destruction of the war that was the main levelling factor in the post-war German wealth distribution. Instead, redistributive tax policies that followed can best explain why Germany came out of the war much more equal than it had entered it.

Unlike the destruction, the *Lastenausgleich* levies had a lasting inequality-decreasing effect for the years to come. The funds raised were used for a variety of measures to facilitate the assimilation of the refugees and provide funds for those who had lost most of their wealth due to war destruction. These included funds for refugees to buy inventory in the early 1950s, compensation for lost savings, pensions and living allowances, loans for

[28] See §29 Gesetz Ã¼ber den Lastenausgleich, 14. August 1952. The allowance for companies was 3,000 Marks.

re-building businesses, financial support for education, and social housing (Hauser, 2011, p.110). The most important of the policies, however, was a direct wealth transfer to those refugees who had lost their assets (*Hauptentschädigung*). The payouts, for which the verification of the claims often took many years, were degressive in nature. They ranged from about 100% if the total of lost assets did not surpass 4,800 Marks to 6.5% for assets beyond 1 million Marks (Hauser, 2011, p.112).[29] Yet, they were substantial. First, the limit for the full payout corresponded to the average gross income of industrial workers in 1955 (Statistisches Bundesamt, 1956, p.477). Second, between 1954 and 1990 more than 5 million individuals received wealth transfers through the *Hauptentschädigung* (Berié, 2014, Table 12.2.1). Third, the annual expenditure of the *Lastenausgleich* suggests that redistributive measures were significant in terms of national income. The expenditure of the *Lastenausgleich* fund averaged 2.2% of national income in the 1950s, 0.9% in the 1960s, 0.4% in the 1970s, and phased out in the 1980s. Throughout this period at least half of these expenditures were direct wealth transfers, pensions and living allowances.[30] It is thus clear that the *Lastenausgleich* decreased inequality not only through the wealth levy in the beginning of the period, but continued to compress the distribution throughout the Golden Age through substantial transfers of wealth.[31]

German post-war policies had strong redistributive elements beyond the *Lastenausgleich* and the general wealth tax. Average income tax rates increased substantially for the upper class and the rich, reaching 45% and 55% in 1989, respectively (Corneo, 2005).[32] Furthermore, public funds were also used to finance the *Kriegsopferfürsorge*, which included mainly pensions and living allowances paid to those, who were physically impaired or widowed due to the war. It averaged between 2% and 1% of national income from the 1950s until the late 1970s (see Berié, 2014, Table 12.1.3).

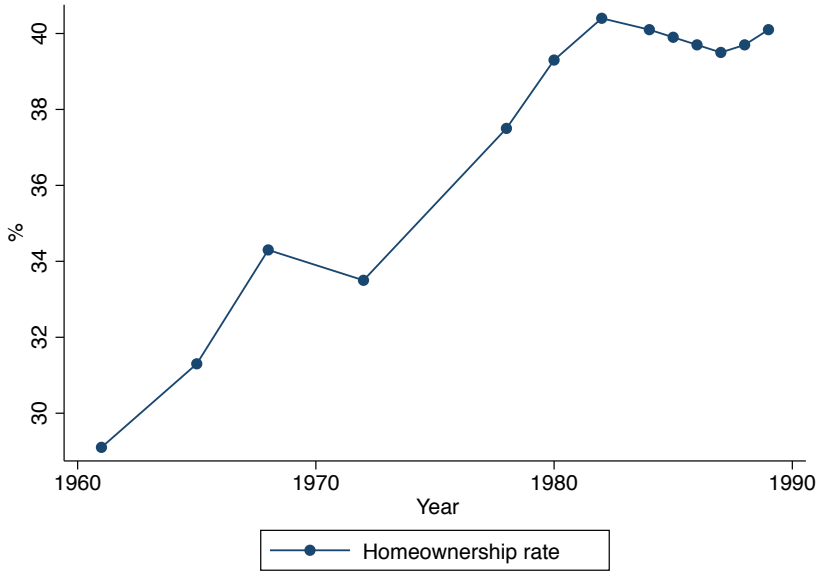
[29] These thresholds were changed to 6,200 and 2 million Marks in 1968 (Albers, 1989, p.288).

[30] See Berié (2014, Table 12.2.2).

[31] Given the source material and its *modus operandi* in terms of the payout, it is impossible to reliably estimate the effects of the payout on wealth concentration. Yet, given the large share in national income of these transfers, the effects must have been substantial. It is important to note that over the years, the *Lastenausgleich* was increasingly financed through public funds other than those raised through the wealth levy. In the initial decade, the revenue covered 60% of the annual expenditure, on average. This share dropped to 23% in the 1970s.

[32] The rich here are defined as individuals earning 50 times the GDP per capita. Upper class are defined as earning 5 times the GDP per capita.

Figure 5: Homeownership in West Germany, 1960-1990



Source: Data are from Kohl (2017).

3.4.3 Economic miracle and rising homeownership

Coupled with policies aimed at increasing homeownership[33] high growth rates favored increasing investment into housing. The homeownership rate rose from 29% in 1960 to 40% in the early 1980s, signalling the broadening of the middle class (see Figure 5). At the same time, the gap between capital returns and GDP per capita growth until the 1970s was relatively small (see Figure 24).[34]

This moderate downward trend was interrupted briefly in the 1960s when the share of the top percentile first increased by about 5% and dropped by the same amount shortly after. This period highlights the importance of asset prices. Unlike house prices, stock markets went through a boom and bust cycle. The stock market index tripled from 90 to 271 points between August 1959 and August 1961. It then dropped to 140 points in 1966 (Gielen, 2013). These movements are mirrored in the level of market market capitalization (Figure A.8 and Kuvshinov and Zimmermann, 2018). Because the top percentile holds a large share of the equities in the economy and its wealth portfolio relies heavily on them,

[33]See Tomann (1990) for a concise overview of the German housing market in the post-war period.

[34]For the 1950s and 1960s, Figure 24 does not provide portfolio-weighted estimate for the return on capital. However, a weighted average of bonds and equities returns from Jordà et al. (2019) suggests that r was, on average, close to g in the 1960s.

the top 1% wealth share reflects these ups and downs.[35]

3.4.4 After the boom: trends in wealth inequality in West Germany, 1970-1990

The period of rapid economic growth came to an end in the 1970s. In contrast to GDP per capita growth rates, returns on capital remained at a higher level. Figure 4 suggests that the subsequent growth slowdown coincides with a small but sustained increase of the top 1% wealth share until reunification. This moderate concentration was most likely due to two factors. First, the concentration of financial assets increased from the late 1970s until reunification while house and equity prices diverged during this period (Fuchs-Schündeln et al., 2010). Given the bias of the top 1% portfolio towards financial and business assets, the price-divergence and the concentration of financial wealth contributed to a moderate increase in their share in total wealth. Second, the increase in homeownership petered out at around 40% in the 1980s (see Figure 5). The growing access to real estate wealth for a larger part of the population that had been such an important feature of the previous 30 years came to an end.

Overall, the small increase in the top 1% share from the mid-1970s until reunification balanced out its moderate decrease during the Golden Age (Figure 4). As a result, West German wealth inequality in 1989, as measured by the top 1%, was virtually back to its 1952 level.

3.4.5 Wealth and wealth inequality in East Germany

Accumulation of private wealth in the GDR was possible through two forms of assets: savings deposits and housing. Firms with more than ten employees were socialized in 1972, limiting private business ownership to small craft workshops.

As consumption opportunities were restricted, the savings rate of East German households was comparably high and households were able to accumulate some financial wealth. The return on savings deposits was fixed at 3.25% in 1971 and remained unchanged thereafter. Savings deposits in East Germany in 1993 amounted to two thirds

[35] It is important to note that this swing in equity prices is also reflected in the raw tax returns. See, for example, the comments made by the statisticians in the early phases of the boom (Statistisches Bundesamt, 1964, p. 7f).

of West German average, while the overall average wealth in East Germany was roughly one third of West German average wealth (Deutscher Bundestag, 1995).

Land was socialized in 1961, while buildings remained private ownership. As a result, the owner of a house merely owned a usage right of the underlying land. The socialist regime pursued the aim to completely socialize housing. As a consequence, the share of public housing wealth increased from 38% to 58% between 1971 and 1990, while the share of private housing wealth decreased from 62% to 42%, accordingly. Private housing wealth comprised mostly single-family houses, because ownership of apartments in apartment buildings was inhibited. The share of owner-occupied housing amounted to about 25% (Deutscher Bundestag, 1995).

4 The wealth distribution since 1990

For unified Germany, the data sources become broader so that we can study wealth dynamics across the entire wealth distribution. The analysis will be mainly based on three different household surveys that provide information on the distribution of wealth: the EVS, the SOEP, and the HFCS, as discussed above. Each of these surveys comes with different strengths and weaknesses. What they all have in common is that they under-represent very rich households so that some further adjustments to the data are necessary. Like Bach et al. (2019), we will use the documentation of the wealth of the 1,000 richest Germans prepared by *Manager Magazi*n to account for wealth at the very top of the German distribution. At the same time, substantial data challenges remain with respect to aggregate wealth data. In particular, business wealth and real estate wealth that together constitute more than 60% of household wealth are underestimated in the official Household Balance Sheets, and we present improved estimates of those below.

4.1 Household wealth estimates

Household wealth recorded in surveys is typically below the macroeconomic aggregates. National accounts' Household Balance Sheets (HBS) are the standard reference for aggregate wealth of private households. However, the figures recorded in the national accounts are problematic in two respects.

First, housing wealth is mis-measured and current estimates do not necessarily reflect market price changes over time. Second, business wealth in enterprises other than public limited companies is likely underestimated. We will see that in both cases the mis-measurement reflects path-dependent peculiarities of German statistics and accounting rules that do not distinguish clearly between reporting of book and market values. Our approach in both cases will be to update the German concepts to international standards and value both at market prices.

4.1.1 Real estate wealth

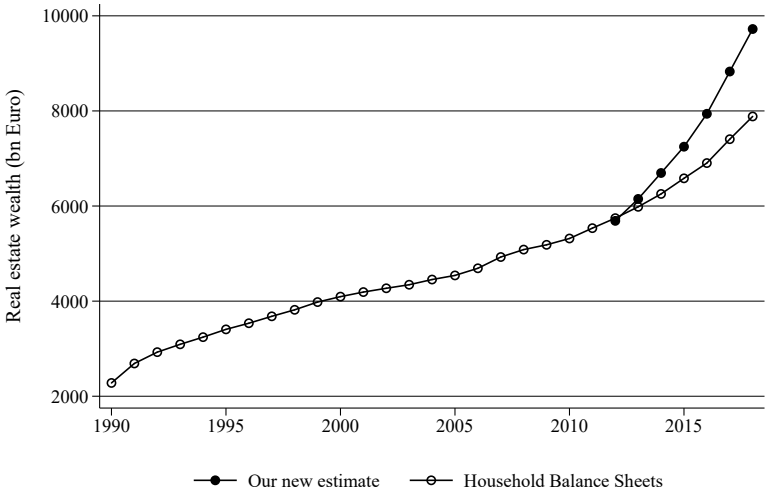
Real estate wealth is the most important form of wealth for most households. In 2018, about 53% of total gross wealth is residential real estate (according to the Household Balance Sheets). The valuation of housing wealth is challenging, particularly because of the changing value of land.

Many European countries like France and United Kingdom compute a total value of housing wealth based on market prices. In German data, housing structures and the underlying land are estimated separately. The series for housing wealth is perpetuated using housing investments while accounting for depreciation. The price of construction land is evaluated annually by a board of experts for each federal state reporting a single value of land for each federal state. It is the value for land that is downward biased, likely because the land price estimates are for available plots of land that are not in prime locations.

Figure 6 shows that the official housing wealth estimate increases rather smoothly over time and does not capture the housing boom since 2010 that is visible in surveys and in house price data. EVS, SOEP, and HFCS all show a marked increase since 2010 (see Figure A.1). We use the housing aggregate recorded in HFCS 2011 and extend the series forwards applying the method by Davis and Heathcote (2007). This method decomposes the aggregate value of the housing stock into buildings and land. The price of land is inferred from data on house prices and buildings costs.

Our preferred estimate puts the total value of residential real estate in Germany at close to 10 trillion Euros, or about 275% of GDP. By international standards this is not a particularly high value. Our estimate is close to 2 trillion Euros higher than

Figure 6: Real estate wealth of private households, 1990-2018



Note: See Data Appendix Tables.

the Household Balance Sheets suggest. As explained above, the main reason is that the house price increase implicit in the official numbers is too low and does not represent market prices. To be precise, the house price in the Destatis estimate from 2011 to 2018 is about 34%, or slightly more than 4% a year. The price index by Bulwiengesa that the Bundesbank also prefers as it is closer to actual market prices shows a more realistic house price gain of 62% from 2011 to 2018, almost twice as high. It is this number that we use here for our preferred estimate of the value of the German housing stock in 2018. In 2019, German house prices have continued their upward trend, but our data end in 2018.

4.1.2 Business wealth

Business wealth is the sum of equity in public limited companies (1), in other corporations and quasi-corporations (2)[36] and unincorporated business (3). While the estimated wealth in public limited companies (1) is generally judged as rather accurate, the estimation of wealth in other corporations and quasi-corporations (2) is more difficult, but particularly important in the case of Germany as a substantial part of the business sector and especially the successful "Mittelstand" is privately held.

With the transition to ESA 1995, the Bundesbank made a first attempt to esti-

[36]This includes private limited companies (*GmbHs*), cooperative societies, and quasi-corporations such as general partnerships (*Offene Handelsgesellschaft - OHG*) and limited parterships (*Kommanditgesellschaft - KG*).

mate the value of non-listed corporations and quasi-corporations stating: "Although such enterprises account for a substantial amount of equity capital in Germany given the particular structure of its business sector ... these figures are very tentative and only provide a somewhat more comprehensive picture of the overall level of equity financing in Germany" (Deutsche Bundesbank, 2010, p.12). The Bundesbank uses data from corporate financial statements statistics und the international investment position. Details on the method are not publicly available.

In 2018, the existing Household Balance Sheet denotes 1,000 billion Euros for shares (1),[37] 220 billion Euros for private limited companies (3) and quasi-corporations (4), and 770 billion Euros for non-corporate business wealth (4). Hence, corporations, quasi-corporations and non-corporate business wealth sum to a total of about 2,000 billion Euros according to national accounts data.

There are a number of good reasons to believe that privately held business wealth in corporations and quasi-corporations is under-recorded. In the following, we discuss the reasoning for our new benchmark estimate. First, the sum of corporate and quasi-corporate business wealth in the balance sheets of the household sector is only about one third of the net worth of non-financial corporations in the balance sheets of the corporate sector that amounts to 3,600 billion Euros in 2018. This gap can hardly be explained by large foreign or public holdings of the German business sector. Estimates show that about 90% of German firms are family owned (Stiftung Familienunternehmen, 2019). We will make generous adjustments for foreign holdings below, but most of the non-listed corporate sector likely belongs to German households.

Second, business income from quasi-corporations and non-corporate businesses is the second-largest income source in personal income tax statistics, exceeded only by employment income. Business income was four times higher than dividend and interest income in 2007.[38] This would mean non-listed business wealth is likely to be substantially higher than the 1,000 Billion in public companies.

Third, business income from quasi-corporations is the main income source for Germany's top income earners (Bartels, 2019), while dividends are of minor importance for

[37] This includes listed and non-listed shares in public limited companies and investment funds.

[38] A withholding tax on dividends and interest income (*Abgeltungssteuer*) was introduced in 2009, which reduced the amount of divided and interest income recorded in income tax statistics. Hence, our comparison refers to the year 2007.

this group. In 2007, business income from quasi-corporations and partnerships represented more than 70% of the income of the top 0.01%, while dividends and interest income represented less than 20%.

Fourth, international comparisons show that business wealth (both corporate and non-corporate) is about 30% of total private wealth in the United States (Saez and Zucman, 2016). The existing German data imply an unreasonably low business share of 16%, only about half as high as in the U.S.

Fifth, the *Manager Magazin* rich list of 2018 implies that the richest 1,000 hold a total wealth of 910 billion Euros. Most of this wealth is held in corporations or quasi-corporates. But, again, the total corporate and quasi-corporate wealth of all German households is only 620 billion Euros according to existing figures, only about two thirds of the total wealth that the *Manager Magazin* records for the richest 1,000 Germans alone.

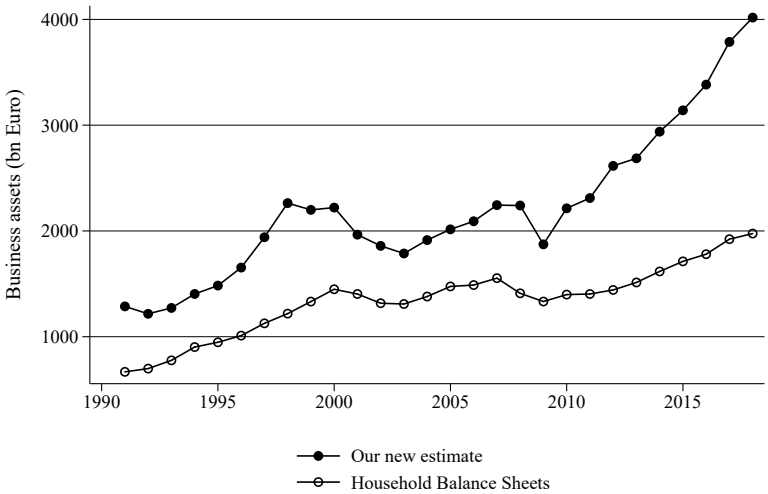
Our revision of German business wealth in private limited companies and quasi-corporations applies international valuation methods for non-listed corporate business wealth. In essence, we follow the procedures of the U.S. Federal Reserve to compute the market value of closely held corporate equity in the Financial Accounts of the United States (Ogden et al., 2016). We multiply the earnings of such businesses with the ratio of market value to revenue from publicly traded companies with a discount of 25% to reflect the lack of liquidity of closely held shares. The European System of Accounts (Eurostat, 2013, p.178) advises a similar strategy.

To estimate the earnings of private limited companies, we consult the corporate tax statistics and apply the earnings-price-ratio of listed companies, applying a 25% liquidity discount. For this part of the corporate sector, we also assume that 80% of German GmbH's are held domestically. The profits of GmbHs were around 100 billion Euros in 2014, according to corporate tax data. Conservatively, we estimate that the value of the equity claims of German households on these GmbHs is 880 billion. Corporate tax statistics are published with a lag such that the latest available year is 2015. Assuming that GmbH profits increased with GDP and using the increased earnings-price-ratio of 2018, we estimate GmbH equity of 1,660 billion in 2018.

For income from quasi-corporations such as KGs, OHGs and GmbH&Co KGs, we turn to income tax data. We assume that the recorded business income ("Gewerbeeinkommen") of the top 0.1% of households in the income tax statistics – hence of the very top of

the German income distribution – is derived from such quasi-corporations. The business income from these sources is about 40 billion Euros in 2014, we capitalize this using the dividend-price ratio of listed companies, again applying a 50% liquidity discount to arrive at a figure of 660 billion Euros. Income tax statistics are published with a lag such that the latest available year is 2015. Assuming that business increased with GDP and using the decreased price-dividend-ratio of 2018, we estimate quasi-corporate equity of 700 billion in 2018. For the remaining non-corporate business, we stick to the Bundesbank valuation of 770 billion.

Figure 7: Business wealth of private households, 1991-2018



Source: See Data Appendix Tables.

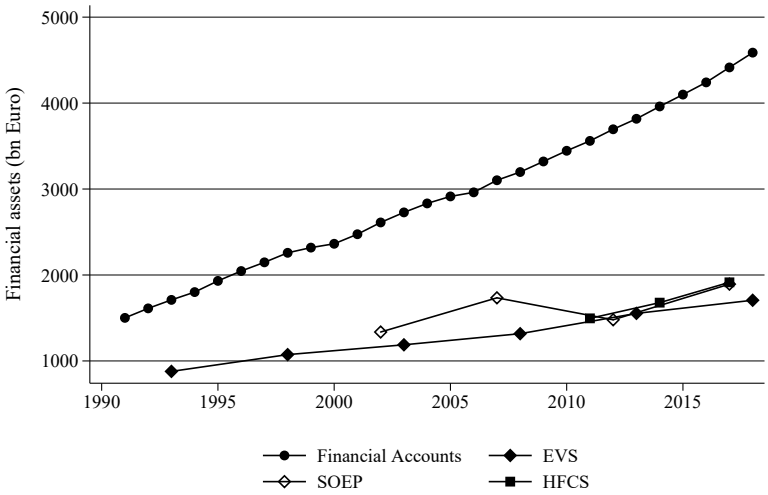
Adding up these different components yields an estimate for total business wealth owned by German households of approximately 4 trillion Euros in 2018. Figure 7 contrasts our new estimate with business wealth according to Household Balance Sheets. Note that the HBS figure includes *other equity* in quasi-corporations and non-corporate equity. Our estimated business wealth is about twice as high as the Household Balance Sheets' figure.

4.1.3 Financial assets

We classify financial assets according to the European System of Accounts (ESA) 2010, which includes deposits (F.2), debt securities (F.3), insurances (F.6), and other accounts receivable (F.7). Equities are excluded here as they form part of business wealth. Financial wealth aggregates are displayed in Figure 8. The survey aggregates show that surveys capture less than half of the financial wealth aggregate from the Bundesbank that forms

part of HBS.

Figure 8: Financial wealth of private households, 1991-2018

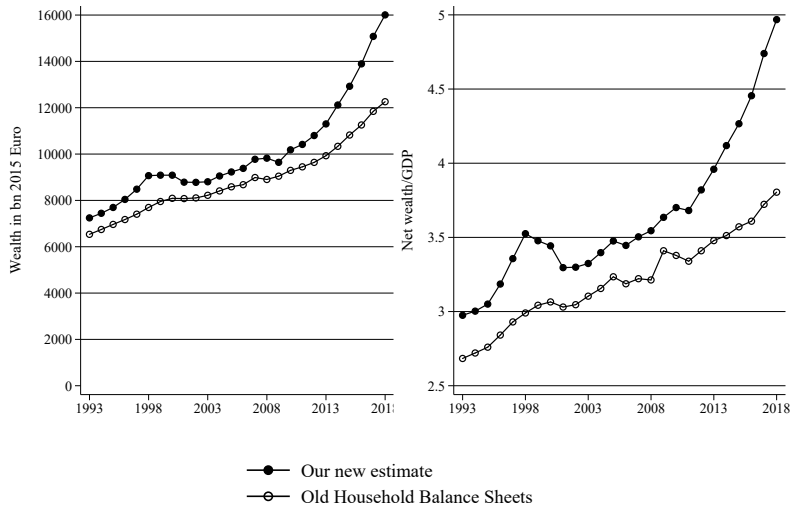


Note: See Data Appendix Tables.

4.1.4 How much do official Household Balance Sheets underestimate household wealth?

Figure 9 summarizes and contrasts our business and real estate estimates with the official Household Balance Sheets. The left-hand graph shows our new series and official HBS series. The right-hand graph shows the respective net wealth series with relative to GDP. In 2018, our estimate is around 4,000 billion Euros. Estimating real estate values with the method of Davis and Heathcote (2007), real estate wealth grows at a faster rate since 2010 than the official estimate. For 2018, our estimate is 2,000 billion Euros higher than the official one. In sum, our estimate of household net wealth in 2018 is about 4,000 billion Euros higher than the total indicated by the official Household Balance Sheets.

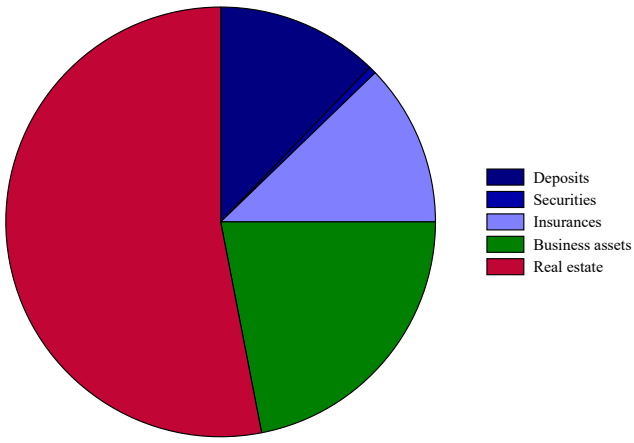
Figure 9: Aggregate household wealth: official HBS vs. corrected estimates



Note: See Data Appendix Tables. See Appendix Figure A.3 for the composition by asset type.

The resulting composition of German houshold wealth is presented in Figure 10. Total household wealth in 2018 was 17 trillion Euros. About half of German household wealth is invested in housing. Business assets represents almost a quarter of total wealth. Deposits and insurances each represent about 12%.

Figure 10: Composition gross wealth in 2018



Source: See Data Appendix Tables.
Note: Figures are in gross values, hence, debt is not included in this graph.

The wealth composition in 2018 is the result from very different growth rates. Between 1993 and 2018, equity grew by a factor of 5. Net real estate grew by a factor of nearly 4. In contrast, deposits only increased by a factor of 2.

4.1.5 Other household wealth

The focus of our analysis is on balance sheet items that can be sold in a market at market prices. This concept of marketable net wealth excludes claims on the public pension system.[39] Individual non-marketable wealth derived from social security pension claims is sizeable in Germany. Bönke et al. (2019a) estimate that pension wealth is 61% of *augmented* aggregate wealth. Frick et al. (2010) put this number at 43%. Including such pensions into wealth distribution reduces measured wealth inequality in Germany significantly. Across studies, the overall Gini coefficient is reduced by approximately one quarter.

Bönke et al. (2019a), Bönke et al. (2019b) and Frick et al. (2010) also incorporate employer-based pension schemes into their analyses of household wealth. 14.1 out of 25 million compulsorily insured employees aged 25 to 65 have entitlements to a company pension. Among current pensioners, 25% receive company pensions of ca. 420 Euros, on average. Bönke et al. (2019b) calculate that the overall quantitative importance of those claims is limited. More specifically, they estimate mean company pension wealth to be 10,200 with a median of 0 – compared to total mean pension wealth of 91,440 Euros and a corresponding median of 58,990 Euros. They conclude that employer-based pension schemes do not mitigate net wealth inequality in a major way.

4.2 The distribution of wealth since 1990

For the period 1993-2018, we construct the wealth distribution across the entire population by harmonizing and combining different data sources. In essence, our approach is to correct the survey data for missing observations at the top using information from wealth rankings. We also uprate the survey wealth distribution to the wealth aggregates that we discussed in the previous part.

Table 5 shows the need for top-correction of the survey data as the very top of the distribution is not captured well. German household survey data provide substantially lower top wealth thresholds than suggested by the list of the *Manager Magazin*, although with varying gaps. For example, net wealth of the top 0.001% is at least 7 million Euros

[39] Our study is also silent about other wealth like art and precious metals. They are neither included in Household Balance Sheets nor are they surveyed on a regular basis.

according to EVS, but above 71 or 21 million according to SOEP and HFCS, respectively, and more than 100 million according to the MM-list in 2018. EVS does not record business wealth which is a central reason for the overall lower wealth values in EVS.

Table 5: **Wealth thresholds in surveys and the MM-list 2017/2018**

Quantile	SOEP	HFCS	EVS	MM-list
P 50%	60,000	62,300	46,126	
P 90%	455,000	550,500	444,589	
P 95%	681,300	862,700	647,081	
P 99%	1.6 Mio.	2.4 Mio.	1.3 Mio.	
P 99.9%	5 Mio	7 Mio.	2.9 Mio.	
P 99.99%	13 Mio.	12 Mio.	5.5 Mio.	
P 99.999%	72 Mio.	21 Mio.	6.9 Mio.	100 Mio.

Note: SOEP data from 2017, EVS data from 2018, HFCS data from 2017.

Top-correction and uprating involves several steps. First, we compute each survey percentile's share $s_{p,a}$ in each asset's aggregate as

$$s_{p,a} = w_{p,a} / \sum_{p=0}^{p=99} w_{p,a} \tag{1}$$

where $w_{p,a}$ is total wealth of percentile p in asset category a. For EVS, we impute business wealth drawing on distribution recorded in SOEP. We use the SOEP's percentile's share of business wealth, $s_{p,business}$ of the nearest survey year (e.g., SOEP 2017 for EVS 2018) for our EVS adjustments. Second, we adjust $s_{p,a}$ above the 99th percentile upwards with the shares implied by the MM-list.[40]

In a third step, we distribute the aggregate wealth of each asset type across the distribution according to the top-corrected percentile shares $s^{tc}_{p,a}$. We do the same for debt. Lastly, we compute total net wealth tnw_p and average wealth of each percentile. Each percentile's total net wealth is then given as

[40]We choose to replace wealth above the 99th percentile for three reasons. (1) Looking at the wealth thresholds presented in Table 5, we can be reasonably confident that survey data are representative up to the 99th percentile. (2) The *income* share of the top 1% is typically underestimated by survey data when comparing survey and income tax data, while the income share of the P90-99 matches quite closely (Bartels and Metzing, 2019). (3) The top percentile of the income and wealth distribution consists of business owners while the middle class up to the 99th percentile largely draws on labor income and is mostly invested in owner-occupied housing (Bartels, 2019). Housing is well-captured by survey data, while only a small share of aggregate business wealth is captured in surveys (see Figures 6 and 7).

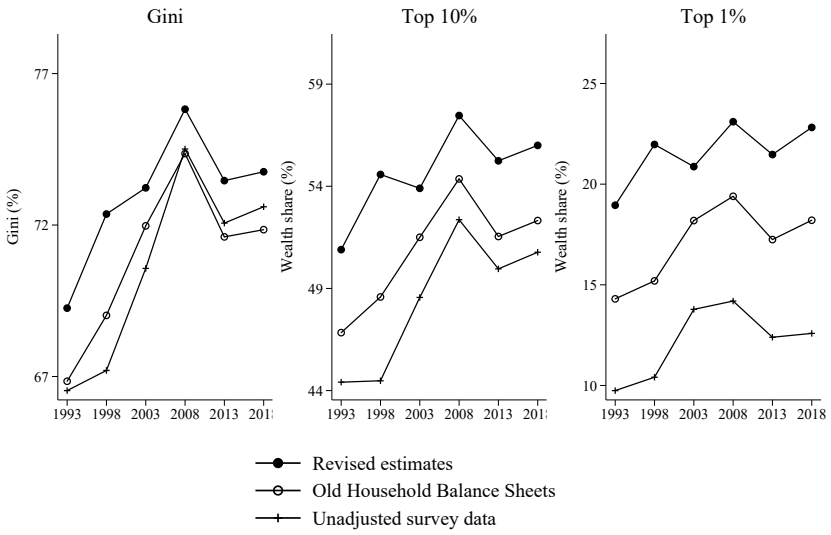
$$tnw_p = \sum^{a} s^{tc}_{p,a} \cdot T_a \tag{2}$$

where T_a denotes the macroeconomic aggregate of asset category a.

Our principal measure of inequality is a quantile's share in overall wealth, e.g., the wealth share of the top 1%, top 10%, 50-90%, or the bottom 50%. We estimate wealth shares using the (generalized) Pareto interpolation method established by Piketty (2001, 2003) and further developed by Blanchet et al. (2017).[41]

We now present new top wealth share estimates. As discussed in Section 4.1, the aggregate wealth recorded by national accounts' is critical. As we have seen, business and real estate wealth is underestimated and we use our improved series here. Figure 11 contrasts the effects of our adjustments on the Gini coefficient, the top 1% and the top 10% wealth share. Two results are worth noting.

Figure 11: Measures of wealth inequality, 1993-2018



Source: Top-corrected and uprated EVS.
Note: Revised Household Balance Sheets according to our preferred estimates, i.e., capitalized business incomes from corporate and income tax data and price-adjusted real estate.

First, the observed wealth inequality trends are rather robust against different ad-

[41] This method is traditionally applied in the literature on long-run series of top income and wealth shares. See, e.g., Bartels (2019) for an exposition of this method for the estimation of top income shares on the basis of German income tax data, 1871-2014. Importantly, the (generalized) Pareto interpolation method by Blanchet et al. (2017) allows the Pareto coefficient to vary at the top, as empirical top income and wealth distributions documented in administrative tax data show that the Pareto coefficient is not stable. Empirically, the Pareto coefficient seems to follow an inverse u-shape when moving towards the very top of the distribution. Consequently, Bach et al. (2019) and Vermeulen (2018) who estimate a single Pareto coefficient on the basis of rich lists in order to simulate the top of the wealth distribution, probably attribute too much mass to the wealthy that are not rich enough to be included in the rich lists.

justment procedures. Wealth inequality increased between 1993 and 2008 and then decreased. In 2018, the level of the top decile's and top percentile's wealth share is still somewhat higher than in 1993, but not by much.

The wealth inequality increase in the 1990s corroborates the results in Fuchs-Schündeln et al. (2010) who also use EVS data. The wealth inequality decline after the start of the house price increase after 2010 is also documented by SOEP and HFCS data (Grabka and Halbmeier (2019), also see Appendix Figure A.5). The substantial decline in top wealth shares in the 2017 HFCS data seems to be a measurement problem of the HFCS data, rather than an economic result: According to Deutsche Bundesbank (2019): "In the wave 2017 it appears, in particular, that business assets in the top tail of the distribution were under-recorded. In addition, fewer very wealthy households participated in the survey compared with the survey waves in 2010 and 2014."

Second, survey data uprated to the adjusted wealth aggregates show higher inequality levels than unadjusted survey data. Uprating EVS to macroeconomic aggregates, the Gini coefficient shifts upwards by five to ten percentage points, the top decile's wealth share by seven to ten percentage points and the top percentile's wealth share by ten to 13 percentage points. The different magnitude of these upward shifts reflects the top-sensitivity of the respective inequality measure, i.e., how strongly the measure changes when changing wealth at the top. Recall that we add business wealth to EVS data assuming the distribution recorded in SOEP data. Hence, our study is the first to produce inequality estimates based on EVS that are indeed comparable to SOEP and HFCS data.

Overall, we find that the level of wealth inequality measured with EVS and SOEP is similar, but lower than in the HFCS (see Appendix Figure A.5). Our inequality results are also somewhat lower than results from the two studies that correct top wealth using Pareto imputation. Both Vermeulen (2018) and Bach et al. (2019) obtain a top percentile's wealth share of more than 30% for 2011, while our estimate based on EVS is about 23% for 2008 and 2013 and our estimate based on HFCS for 2011 is 26% (see Appendix Figure A.5). For 2018, we estimate that the top decile held 56% of total wealth and the top percentile 23%. We obtain a Gini coefficient of 0.74.

5 Wealth growth since unification

German wealth has grown by 11.4 trillion Euros since 1993. How were these gains distributed across different parts of the population? Looking at the distribution of growth offers a different perspective on wealth inequality because top wealth shares or the Gini depend strongly on changes in the wealth of households with sizable wealth. Standard measures of wealth inequality do not show much of a change between 1993 and 2018. This is because the wealth gains of the top 10% from rising business equity and the wealth gains of the middle class from rising housing markets were of equal size. While the first effect increased wealth inequality until 2008, the second effect decreased wealth inequality until 2018 (see Figure 11). The underlying reason is that gains in property prices, the main asset of the middle class, were on par with equity prices, the main asset of the top 1 %. However, top wealth shares and Gini are silent about the fact that half of the population did not benefit from the overall wealth growth, while the upper half nearly doubled their wealth.

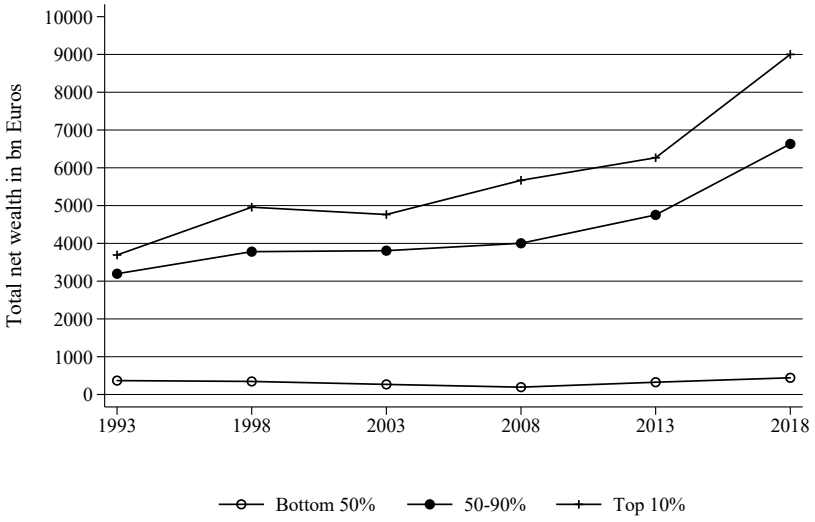
5.1 Wealth growth across the distribution

Since unification, the bottom 50% of the distribution increasingly fell behind with respect to wealth. Figure 12 shows that real net wealth of the bottom half barely grew between 1993 and 2018. On the other hand, net wealth of the middle 40% (50-90%) nearly doubled from about 3,000 billion to more than 6,000 billion Euros and real net wealth of the top 10% more than doubled from less than 4,000 million to 9,000 billion Euros (in constant 2015 Euros). As a result, the share of the bottom 50% in total German wealth fell by nearly half from more than 5% in 1993 to below 3% in 2018 (Figure 13). In other words, the bottom 50% own an even smaller share of total wealth than 25 years ago.

Figure 14 shows the high growth of average wealth for the upper and lower half of the wealth distribution. For the 50-90%, average wealth increased from about 200,000 in 1993 to about 400,000 Euros in 2018. For the top 10%, average wealth increased from 1 million in 1993 to more than 2 million Euros in 2018 (see left-hand graph of Figure 14). Hence, between 1993 and 2018, average wealth nearly doubled for the 50-90% and more than doubled for the top 10%, while average wealth remained nearly stable for the bottom 50% (see right-hand graph of Figure 14). For the bottom 50%, average wealth stagnated

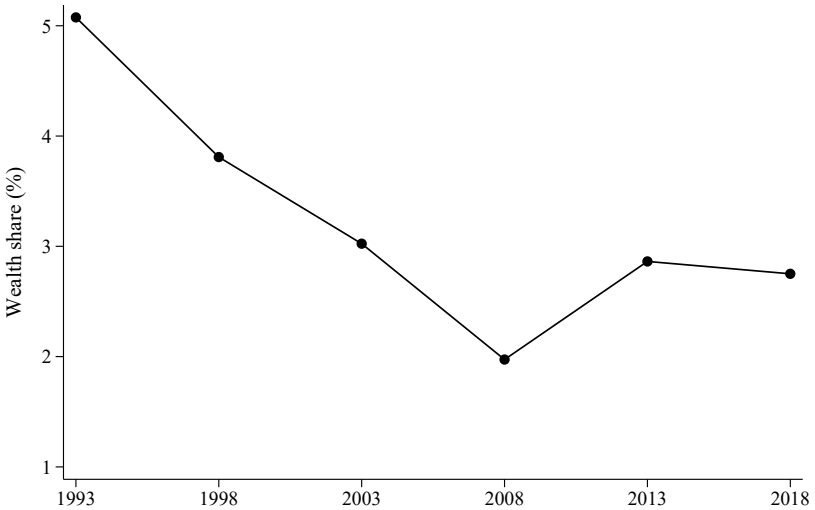
at about 20,000 Euros for the past 25 years.

Figure 12: Wealth growth for the bottom, middle and top, 1993-2018



Source: Uprated and top-corrected EVS.
Note: Total net wealth in 2015 Euros.

Figure 13: Wealth share of the bottom 50%, 1993-2018

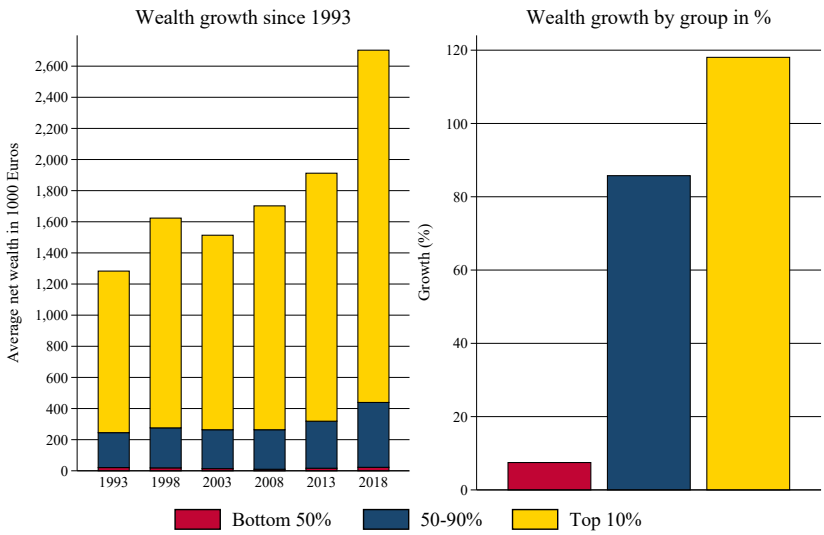


Source: Uprated and top-corrected EVS.

These trends are mirrored in the trajectory of median wealth for the different groups. The median wealth of the 50-90% (70th percentile) increased from about 200,000 Euros in 1993 to almost 400,000 Euros in 2018. Median wealth of the top 10% (95th percentile) increased from about 700,000 Euros in 1993 to almost 1,4 Mio. Euros in 2018 (see Figure 15).

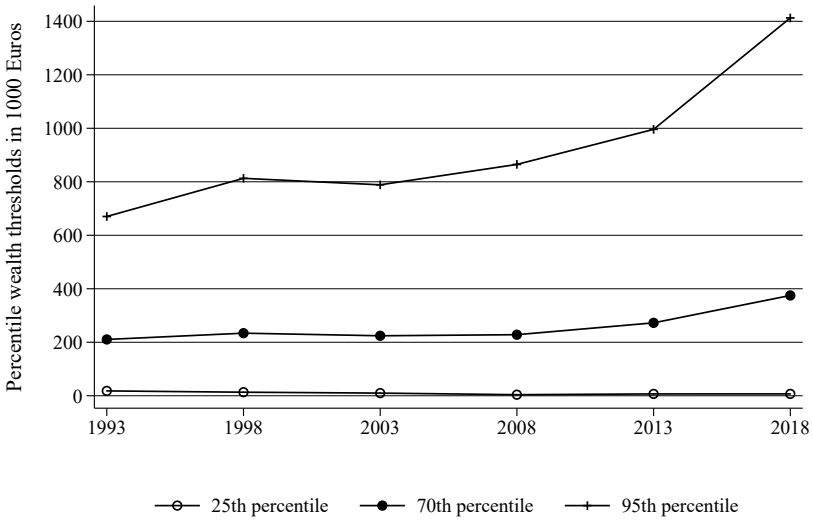
Figure 16 zooms in on the changing portfolios across the different parts of the wealth

Figure 14: Distribution of average wealth and growth, 1993-2018



Source: Uprated and top-corrected EVS.
Note: Left-hand graph displays average net wealth in 2015 Euros. Right-hand graph displays growth of average net wealth by group.

Figure 15: Wealth growth by percentile thresholds, 1993-2018



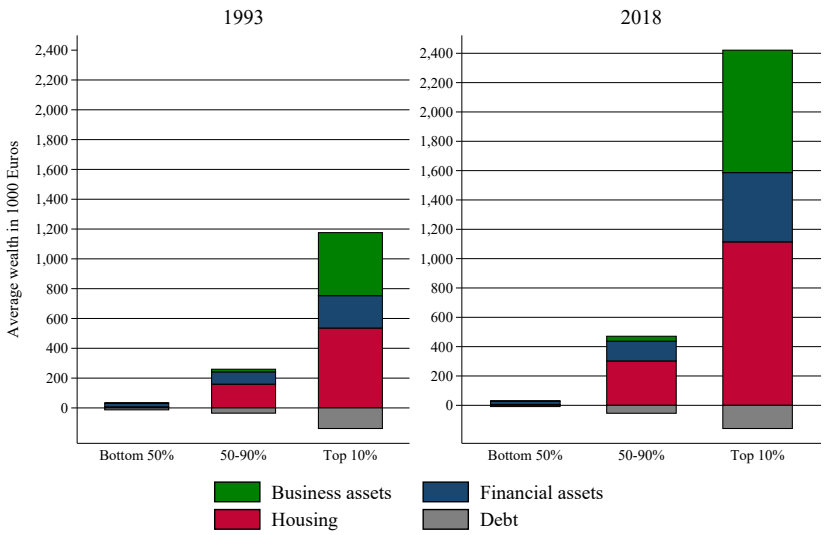
Source: Uprated and top-corrected EVS.
Note: Wealth thresholds of the respective percentile in 2015 Euros. I.e., net wealth of households at the 70th percentile of the wealth distribution in 1993 was about 200.000 Euros.

distribution. Real estate and financial assets such as deposits and life insurances represent assets typical for the German middle class. Business assets and corporate equity become only relevant when moving to the top of the wealth distribution.

Soaring house prices since 2010 and the expansion of financial assets since the 1990s have played an important role for wealth growth between 1993 and 2018. The right-hand graph of Figure 16 shows the change of asset types across the distribution. Average

housing wealth increased for the middle and top of the wealth distribution by a factor of 1.9 and 2.1, respectively. The share of the top decile in business wealth increased by a factor of 3.6. In contrast, the bottom 50% holds half of their financial assets as deposits and a third as insurances, which is mostly life insurance wealth (see Appendix Figure A.7).

Figure 16: Portfolio changes for the bottom, middle and top, 1993 and 2018



Source: Uprated and top-corrected EVS. *Note:* Average net wealth in 2015 Euros. Financial assets include deposits, securities, and insurances.

5.2 Wealth in East and West Germany

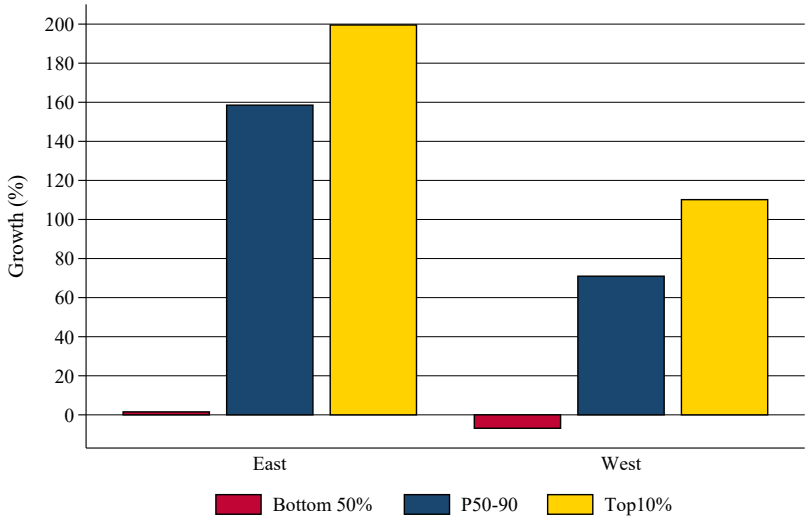
Almost three decades after unification, large discrepancies between East and West Germany persist. In 2018, average household wealth in West Germany amounts to almost 450,000 Euros, and in East Germany to 200,000 Euros. This means that the average household in West Germany is more than twice as rich as the average East German household. Grabka and Halbmeier (2019) come to similar conclusions analyzing individual wealth. Median household wealth in West Germany amounts to 140,000 Euros, and in East Germany to 64,000 Euros.

Unification increased the overall German population substantially. In 1993, East German households represented one fifth of all German households. However, only 8% of total German household wealth belonged to East German households in 1993. Home ownership was much lower in East Germany, so that housing wealth of the average East German household represented just one fourth of the average West German household.

However, savings deposits of the average East German household amounted to two thirds of the average West German household (Section 3.4.5).

Despite higher growth rates in East Germany over a period of 25 years, large wealth discrepancies persisted. As Figure 17 shows, the richest decile of East German households increased their wealth by 200% and the 50-90% by 60%, while the growth for the West German top decile was 110% and for the 50-90% 70%. On average, the richest decile of East German households owned about 1 million Euros in 2018 (in 2015 Euros), while the richest decile in West Germany owned more than 2.5 million Euros in 2018. The average middle class household owned 450,000 in West Germany and 230,000 in East Germany, while the average household within the bottom 50% had a net wealth of about 26,000 Euros in the West and about 12,000 Euros in the East.

Figure 17: Wealth growth of the bottom, middle and top by region, 1993-2018



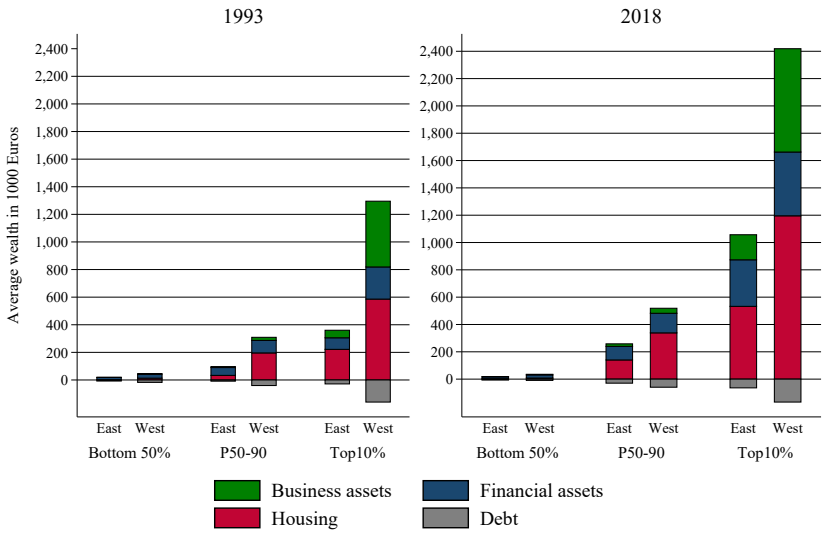
Source: Uprated and top-corrected EVS. *Note:* Growth of average net wealth in 2015 Euros.

The bottom 50% experienced near zero growth rates, both in East and West Germany. The small positive growth in all of Germany shown in Figure 14 was driven by East German households that are over-represented at the bottom of the German wealth distribution. When we analyze the East and West German wealth distribution separately, we see that the bottom half of the West German wealth distribution even experienced a small wealth loss in real terms, i.e., a negative growth rate. Overall, the graph confirms a much stronger wealth polarization in the East since reunification than in the West.

Housing wealth explains a substantial part of the discrepancy between wealth growth for the poorer half in East and West Germany. Figure 18 shows the average portfolios for

the bottom 50%, the middle 40% (P50-90) and the top 10% in East and West Germany. The poorer half of East Germans accumulated some housing wealth between 1993 and 2018, starting from a low level. In contrast, the poorer half of West German households is less likely to own housing wealth in 2018 than in 1993. Savings deposits decreased in real terms for the bottom 50% in East and West Germany alike, but the returns were low.

Figure 18: Portfolios of the bottom, middle and top by region, 1993 and 2018



Source: Uprated and top-corrected EVS. *Note:* Average net wealth in 2015 Euros. Financial assets include deposits, securities, and insurances.

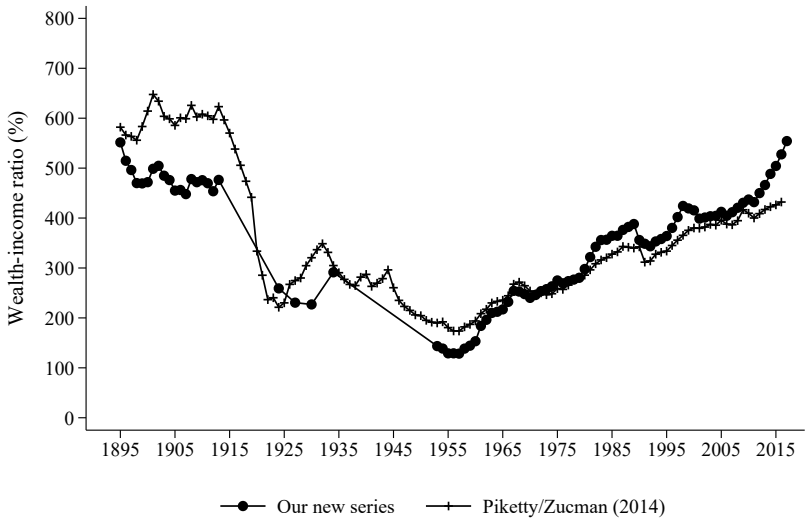
6 The German wealth distribution in the long-run

Against the backdrop of these insights about the evolution of the wealth distribution since reunification, we are now in a position to highlight several aspects about the trajectory of wealth inequality in Germany over the past 120 years. Due to data constraints for the pre-unification data, we shift our focus towards the top of the distribution. We start by summarizing the development of the private wealth-income ratio and top 1% share before viewing both of them in the international mirror. In the second part, we confront the question of how persistent wealth accumulation is at the top of the distribution by employing data on family businesses from the German rich list. Finally, we turn to the role of the heterogeneity of returns on capital across housing, equity, and safe assets.

6.1 The private wealth-income ratio in the long-run

Figure 19 tracks the development of the private wealth-income ratio for the period 1895 to 2018 in comparison to an earlier estimate by Piketty and Zucman (2014). Even though we diverge significantly from their methodology before 1950 and use additional data sources since 1990, our results align closely with theirs. The most notable difference is that our revision puts the ratio to around 500% at the eve of World War I rather than 600% as in Piketty and Zucman (2014). Most importantly, we confirm their finding of a U-shape pattern over the long run.

Figure 19: Private wealth-income ratio, Germany, 1895-2018



Source: See Data Appendix for the detailed description of the wealth estimate. National income is from `WID.world`. The Piketty and Zucman (2014) line refers to the updated version of their estimate from `WID.world`.

At the eve of World War I and after the rapid industrialization in the second half of the nineteenth century, the German wealth-income ratio reached 500%. By this time, business and financial assets had jointly reached the importance of the traditional assets of the pre-industrial era: real estate and agricultural wealth (see Appendix Figure A.4). The rapid capital accumulation was also reflected among the members of the economic elite, which now included a large share of entrepreneurs (see Section 3.1). From 1913 until 1925, the wealth-income ratio halved. As there had been no physical war destruction in Germany, the decrease in the wealth-income ratio reflects first and foremost valuation changes on existing assets and inflation-induced losses on nominal assets. The fluctuations of the interwar period in the private wealth-income ratio are only in part due to changes in private wealth. Instead the violent income swings in the German economy during this

period, reflected in the denominator, drive much of this variation.

World War II once again approximately halved the private wealth-income ratio according to our and the estimate by Piketty and Zucman (2014). Much of this was due to the war destructions as well as the role of post-war levies and the valuation of assets. The latter can also explain the rapid recovery of the ratio in the beginning of the 1960s when stock markets boomed for a short period of time (see Section 3.4.3). The private wealth-income ratio continued to grow until reunification when it dropped from a peak of 390% in West Germany in 1989 to 350% in unified Germany throughout the first half of the 1990s. This implies that the increase in private wealth due to the unification of East and West Germany was much lower than the increase in income. The wealth-income ratio returned to its old growth path by the 2000s and has been growing more rapidly since 2007. It has now surpassed its pre-World War I level, which is the result of both increasing asset prices (as captured in the numerator) and relatively sluggish growth in national income (the denominator).

6.2 The top 1% wealth share over the long run

While the wealth-income ratio has returned to its pre-World War I levels, the same does not hold true for the top percentile's share in private wealth. Figure 20 shows the long-run trajectory of the top 1% wealth share in Germany. It highlights the important role that the world wars and their aftermath have played for the evolution of the wealth distribution. Effectively, the top 1% wealth share halved in the 30 year period from the beginning of World War I to the end of World War II. Since then, it has hovered around 25%, with some ups and downs throughout the post-war period. It is currently close to its post-war average of 23%.

As discussed above, two factors drove the violent change in the top 1% share between World War I and the early years of the Federal Republic: asset prices and post-war wealth levies. The first large decline occurred during the Great Depression. Back then as today, the portfolio of the top 1% was strongly biased towards business assets and stocks whose value dropped substantially.

In contrast, the bottom 99% predominantly held agricultural and real estate assets in their portfolios. As the drop in prices was larger for equities than for the other asset

Figure 20: The top 1% wealth share, Germany, 1895-2018

Source: Own estimates based on wealth tax until 1989, top-corrected and uprated EVS survey data 1993-2018.

types, the Great Depression over-proportionately hit the top percentile (Section 3.3). This finding highlights the importance of asset prices for the dynamics of the wealth distribution, resonating with the international literature on wealth distributions (see e.g. Kuhn et al., 2020, on the post-war period in the U.S.).

The second important factor in decreasing the top percentiles' wealth share was World War II. While war destruction contributed to the decline, our estimates suggest a dominant role for the post-war wealth levies associated with the "Lastenausgleich". In comparison to the destruction, portfolios once again played an important role. As war destruction was heavily concentrated on real estate, it hit both the top 1% *and* the middle class. The wealth levies explicitly targeted the top of the distribution. Our estimates suggest that the levies were about twice as important as the destruction in reducing the wealth share of the top percentile (see Section 3.4).

After the big decline of the top 1% wealth share, a rapid increase during a stock market boom in the late 1950s and early 1960s followed. The stock market boom coincided with the re-opening of the German stock market after the war and the onset of the economic miracle. The equity price valuation affected the net wealth of the top percentile disproportionately and thus explains the hump during this period. During the high growth Golden Age period that ensued, the top 1% share dropped steadily. The broadening of the German middle class and rising home ownership rates (see Section 3.4) was a key driver

of this equalization. The initial decrease during the Golden Age, in turn, was reversed when wealth inequality began to increase from the mid-1970s until reunification. The ownership of business assets and financial assets became increasingly concentrated at the top of the distribution. Since reunification, the top-1% share has fluctuated around this level and remained fairly stable in light of the historical magnitude of changes. Overall, the concentration of wealth in the hands of the top of the distribution has increased from 19% in 1993 to 23% in 2018.

One might have suspected that the wealth distribution in East Germany was more equal than in the capitalist west. Unification of the two countries would then be expected to generate less wealth inequality in the unified Germany. However, our data show substantial wealth differences across the population in the former GDR in the 1990s. The home ownership rate was only about 25%. As soon as real estate wealth was valued at market prices, this created a substantial wealth gap between home owners and renters. At the same time, some households had accumulated noticeable amounts of savings that were exchanged at an average rate of 1.5 to 1 into Deutsche Mark (Hauser et al. 1996). According to standard inequality measures such as the Gini coefficient, the differences in wealth inequality between East and West Germany were not very large (Frick and Grabka 2009). However, wealth concentration at the top was indeed lower in East Germany because business wealth was to the largest extent publicly owned.

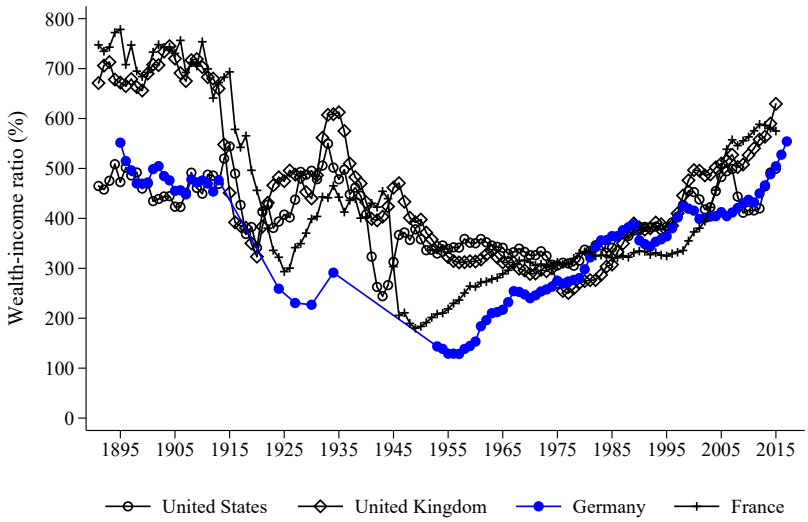
In sum, the historical evolution of the top percentile's wealth share was drivn strongly by valuation of assets. Economic policy played a major role in the aftermath of World War II, when the government taxed substantial amounts of wealth in order to compensate those affected by the war.

6.3 The evolution of wealth and its concentration in international perspective

How does the evolution of wealth and its concentration in Germany compare to other countries? In this part, we compare our estimates of the evolution of the German wealth-income ratio and the top percentile's share to the corresponding measures in France, the United Kingdom, and the United States. In spite of Germany's particular history, similarities with other countries exist. Overall, the long-run trends in Germany resemble

those of its international and European counterparts.

Figure 21: Germany in international comparison: Wealth-income ratio

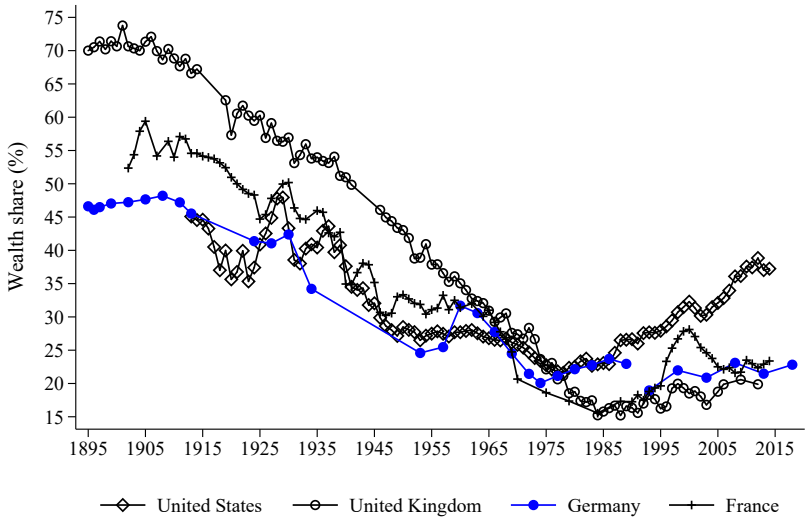


Source: Wealth-income ratios except for Germany are from `WID.world`, which extends the series by Piketty and Zucman (2014).

Figure 21 demonstrates that the German private wealth-income ratio evolved similarly to that of other countries. All countries in the sample experienced a sharp drop in the ratio between the eve of World War I and 1950. Together with the subsequent recovery, this created a U-shape pattern in various countries (Piketty and Zucman, 2014; Roine and Waldenström, 2015). Piketty and Zucman (2014, p. 1296) decompose the fall of the ratio between the eve of World War I and 1950 into three factors: capital losses and gains, lower savings, and destruction mattered in roughly equal parts for France and Germany, whereas capital losses and the lower savings explain virtually all of the fall of the wealth-income ratio in the United Kingdom.

Moving from the wealth-income ratio to waelth concentration, Figure 22 illustrates that the evolution of the top percentile's share in private wealth traces that of the above comparison group closely. All countries start at a high level of wealth concentration. The Great Depression affected the top 1% share more in the United States and Germany than in the other two, which is consistent with our knowledge of the relative depth of the Depression. After the sharp decline following World War II, wealth concentration exhibited a moderate downward trend during the Golden Age in all countries. The subsequent small increase of wealth concentration during the mid-1970s and 1980s is observable for Germany and the United States, but not in France and the United Kingdom.

Figure 22: Germany in international comparison: top 1% wealth share



Source: WID.world (international data) and own calculations (German data). Estimates from 1895 to 1989 are based on wealth tax data; uprated and top-corrected EVS 1993-2018.

Since the late 1980s, however, trends in wealth concentration, as measured by the top 1% wealth share, diverge significantly across countries. While the top percentile's share increased rapidly in the United States, the European group of countries does either not exhibit a clear trend or a very moderate increase up to this date. In Germany in 2018, the top percentile holds about a quarter of total wealth. This is close to the values observed in France (Garbinti et al., 2016), the United Kingdom (Alvaredo et al., 2018), and Sweden (Lundberg and Waldenström, 2018). The United States marks an exception: Saez and Zucman (2016) estimate the share of the top percentile to be about 40%. However, this number is debated. Bricker et al. (2016) and Kuhn et al. (2020) estimate a lower top wealth share.

6.4 The persistence of business wealth

The persistence of wealth across generations is a central topic for inequality research. Given the great role of family firms for the top tail of the German wealth distribution and their special treatment in inheritance taxation, we take a look at business wealth by the founding year of the family business, derived from data collected by the *Manager Magazin*.

Figure 23 visualizes that many among the most successful businesses in Germany have been held by families for more than 100 years. Companies founded in the period

Figure 23: Business wealth by founding year of the family business

Source: MM-list, additional information on founding years of the family businesses is kindly provided by Andreas Bornefeld (co-author of the MM-List 2017 and 2018).

of rapid industrialization between 1850-1914 remain the most valuable of the 700 family businesses today. Families owning these businesses have been successful to transfer and grow wealth across many generations. Despite Germany's violent history of economic and social change, significant entrepreneurial fortunes have persisted through time.

Importantly, new firms founded after the 1950s do not reach the value of those founded during the industrialization period. To some degree, inherited family business wealth remains a central feature of wealth at the very top of the German distribution. Compared to the U.S. and with some exceptions, the share of new entrepreneurial wealth at the very top of the distribution remains small. Put differently, a substantial share of German business wealth today cannot be traced back to new entrepreneurs, but to inherited wealth.

6.5 Returns on wealth and economic growth in Germany

The persistence of fortunes across generations raises the issue of long-run returns on wealth, as well as their relationship to economic growth. Over the long-run, returns on wealth in Germany have been healthy and on par with other countries Jordà et al. (2019). Table 24 shows average returns by asset class for the pre- and post-World War II periods, and the entire sample. German equity yielded lower average returns than housing before World War II (5% vs 10.8 %), but became more profitable than housing during the modern

era (11.9% vs. 5.3%). This pattern mirrors developments in other European economies as well as overseas. Over the long run, the return on business and real estate wealth in Germany were of similar magnitudes of about 8% in inflation-adjusted terms per annum.

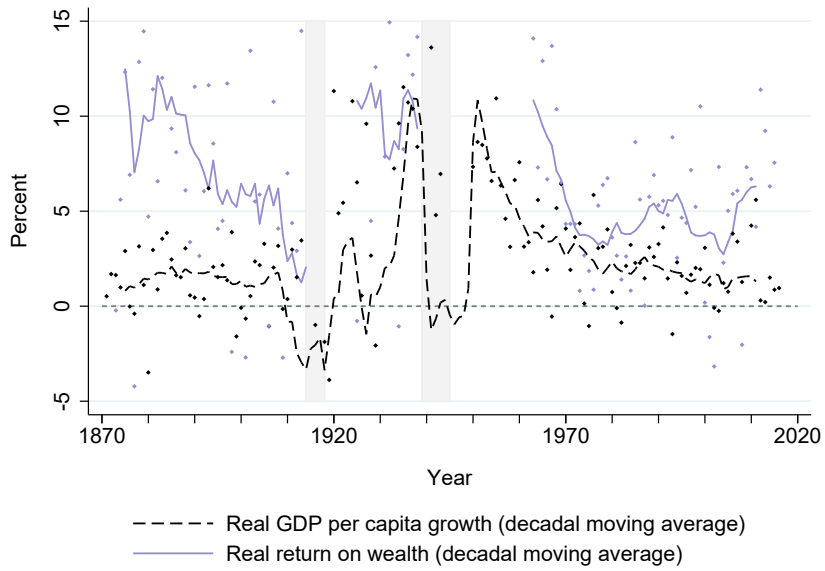
Table 6: Average real returns by country, asset class and period

	1870-1949			1950-2016			1870-2016		
	Equities	Housing	Safe	Equities	Housing	Safe	Equities	Housing	Safe
Germany	5.0	10.8	1.1	11.9	5.3	2.8	8.5	8.1	2.0
France	2.2	4.8	0.8	6.0	9.7	2.0	4.1	7.2	1.4
Sweden	6.7	9.2	5.0	11.4	8.9	1.8	9.0	9.0	3.4
UK	6.1	4.3	2.9	9.1	6.6	1.9	7.6	5.7	2.4
USA	8.6	7.1	3.9	8.9	5.8	2.1	8.7	6.3	3.0
Japan	10.9	7.2	1.4	9.1	6.7	2.1	9.9	6.8	1.8

Source: Jordà et al. (2019).

How do these wealth growth rates compare to the rate of growth of the economy? Following Piketty's (2014) book "Capital in the 21st Century", the larger the gap between returns on capital (r) and economic growth (g), the more pronounced wealth concentration at the top is likely to becomes. How did the gap develop in German historically?

Figure 24: Real return on aggregate wealth and real GDP per capita growth.



Source: Data are from Jordà et al. (2019). Wealth returns obtained as a weighted average of bonds, bills, equity, and housing.

We can turn to recent research by Jordà et al. (2019), to study the evidence for r vs. g in Figure 24. The lines represent decadal averages, whereas the dots are the underlying

annual data. The moving averages suggest that the gap was larger before World War II than in the postwar era. However, the wedge fluctuated over the last 150 years in cycles spanning several decades. Overall, the returns of wealth have outpaced real GDP growth by 2.4 percentage points annually since 1950, and by an even large 4.2 percentage points for the full sample Jordà et al. (2019).

7 Conclusion

By drawing on a wide range of data, this study provides the first comprehensive analysis of the evolution of wealth and its distribution in Germany from 1895 to 2018. Taking a long-run perspective is important for two reasons. First, the historical perspective allows us to gauge the significance and size of much-debated changes in the distribution of wealth in recent decades. Second, studying the movements in wealth inequality in the past leads to a better understanding of the factors driving the wealth distribution today.

A central insight is that in Germany, as in other countries, changes in the valuation of existing assets and not savings flows played a major role for changes in the wealth distribution over extended periods. Household portfolios differ across the distribution so that relative prices changes in equity and real estate markets revalue the entire stock of assets and thereby affect the overall wealth distribution in quantitatively important ways. The equalizing collapse of business valuations in the Great Depression is a case in point, as is the recent real estate boom that lifted the fortunes of house owners.

German history also offers important insights that policies matter and can affect the wealth distribution. In particular, the substantial wealth tax associated with the "Lastenausgleich" after World War II played a role in equalizing the wealth distribution. With the "Lastenausgleich" Germany became one of the most equal countries before her postwar economic miracle took off.

For the past 70 years, the top 1% wealth share has fluctuated around its postwar level. Since reunification, the concentration of wealth at the very top has risen moderately only. The main reason for the stability is that the middle-class made substantial gains in real estate wealth mitigating concentration at the very top. However, a substantial part of the population does not own assets, and hence did not profit from rising stock or house prices altogether.

Between 1993 and 2018, the gap between the "haves" and the "have-nots" has widened significantly. In the lower half of the distribution, wealth has barely grown at all while both the top 10% and the 50-90% of housholds roughly doubled their wealth. As a consequence, a household in the top 10% of the wealth distribution is now 100 times richer, on average, than a household in the bottom half. 25 years ago, the gap was 50 times.

Finally, this study highlights the importance of high quality data to study trends in the distribution of wealth (and income). Germany lags behind in the quality of micro data and with respect to plausible estimates of aggregate household wealth. The improved estimates of business and housing wealth that we present in this paper result in a wealth-income ratio that is 120 percentage points higher than when estimated with the official data. Germany is considerably richer than official statistics show.

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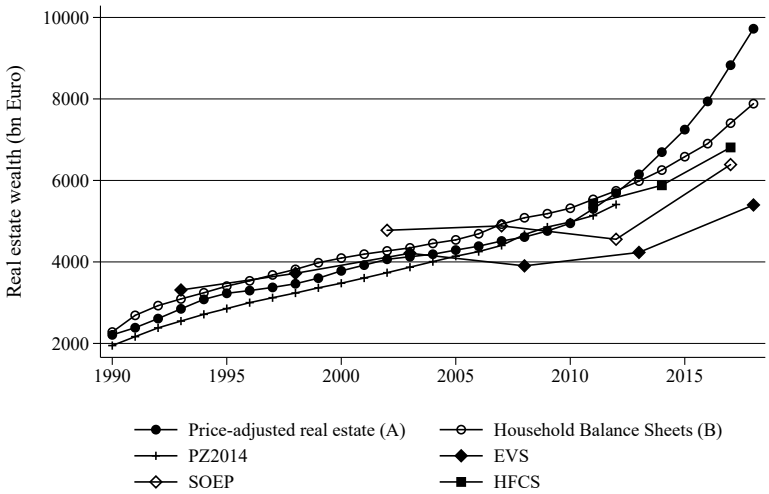
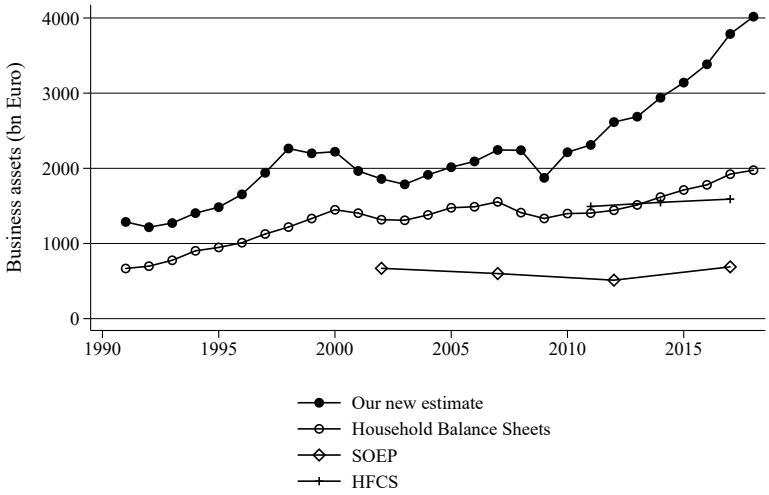
A Appendix Figures

Figure A.1: Real estate wealth of private households, 1990-2018



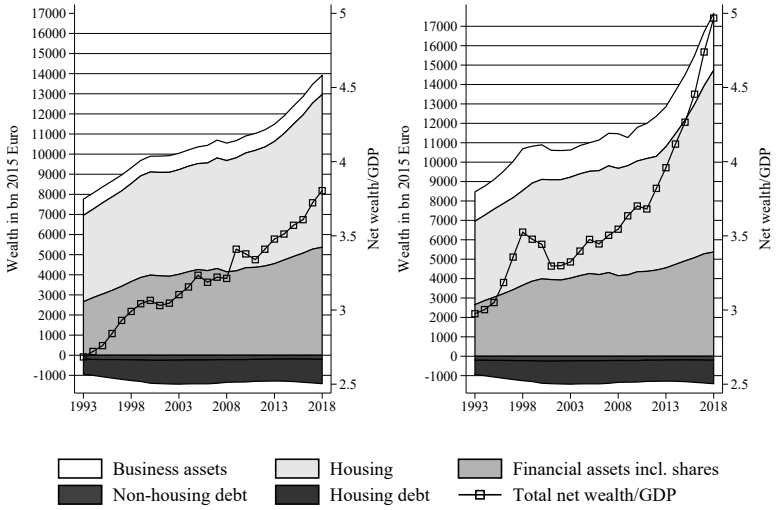
Source: See Data Appendix Tables.
Note: PZ2014 is Piketty and Zucman (2014).

Figure A.2: Business wealth of private households, 1990-2018



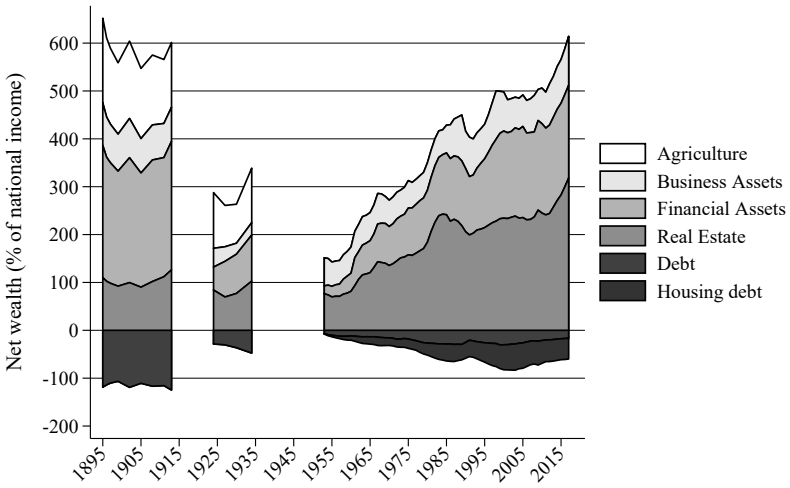
Source: See Data Appendix Tables.

Figure A.3: Aggregate household wealth: official HBS vs. corrected estimates



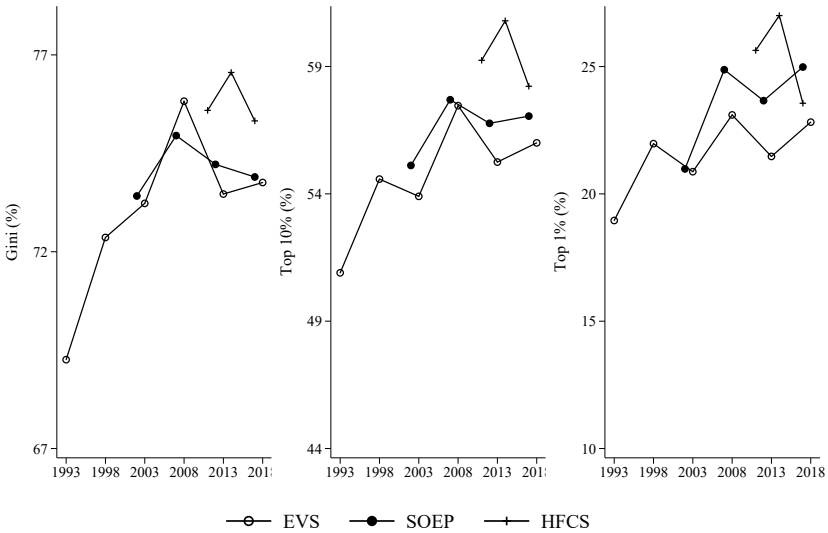
Source: See Data Appendix Tables.
Note: Shares and investment funds are included in financial assets as we take these from HBS without further adjustments.

Figure A.4: Total wealth and its composition



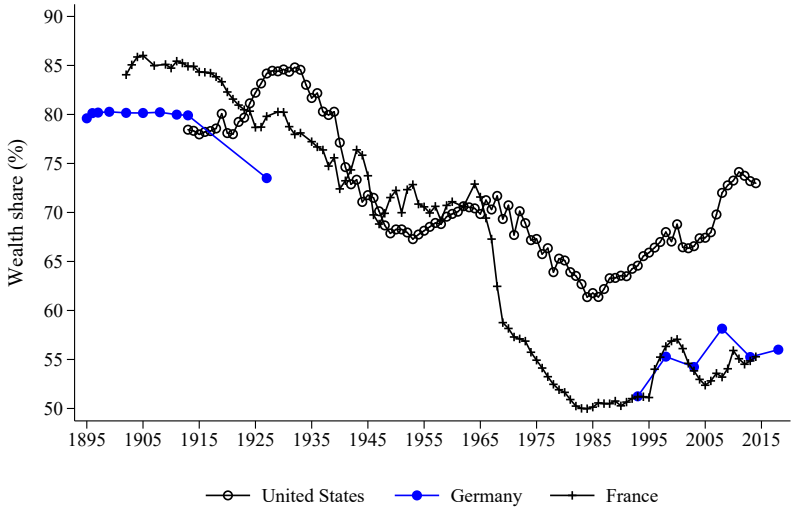
Source and Notes: See Data Appendix Tables. National income is from `WID.world`. From 1950 to 2018, agriculture is included in business assets. Wealth definitions are according to estimate AC.

Figure A.5: Wealth inequality by data source



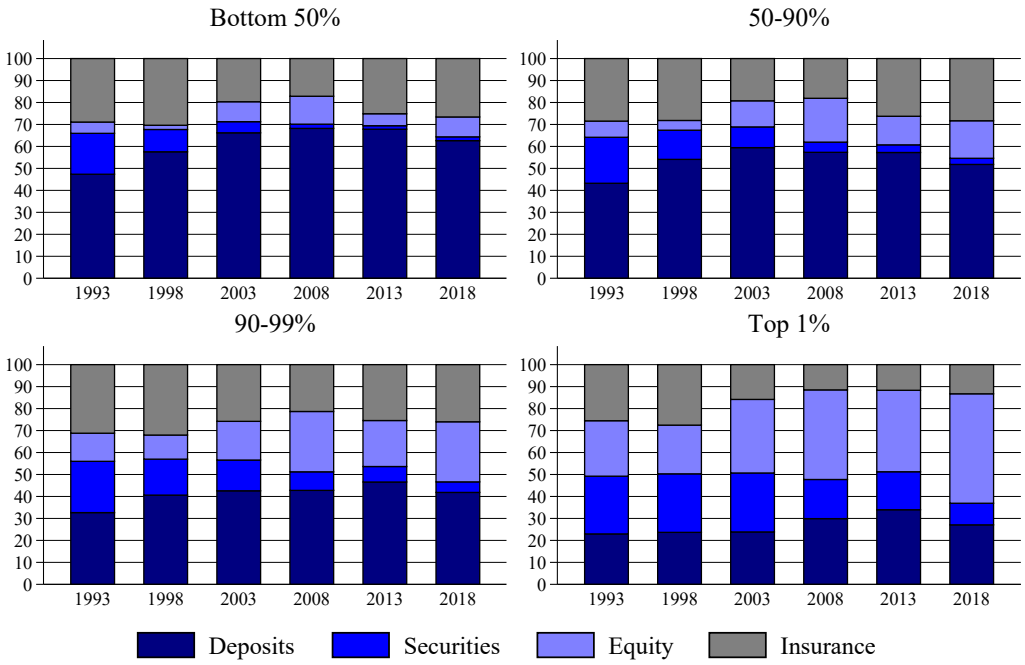
Source: Top-corrected and uprated survey data.
Note: Top-corrected survey data uprated to estimate AC.

Figure A.6: Germany in international comparison: top 10% wealth share



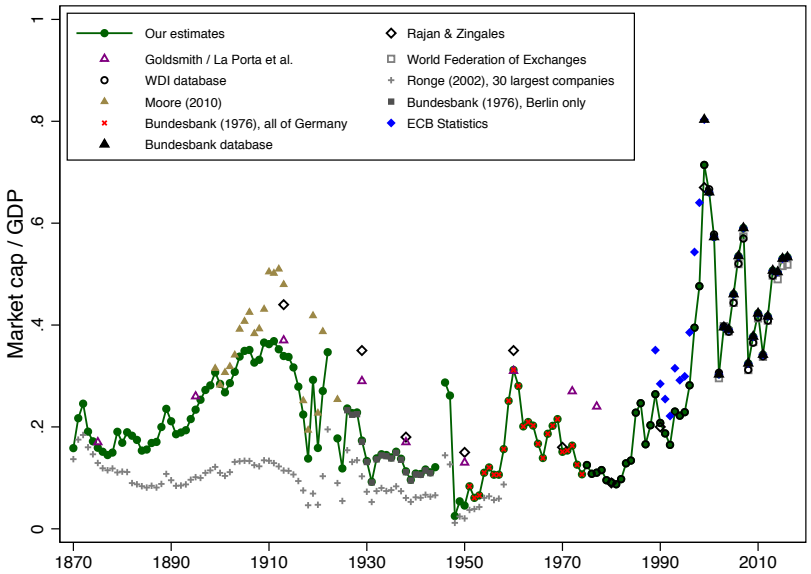
Source: WID.world and own calculations.
Note: Estimates from 1891 to 1930 are based on wealth tax data; uprated and top-corrected EVS 1993-2013.

Figure A.7: Financial portfolios, 1993-2018



Source: Top-corrected and uprated EVS.

Figure A.8: Market capitalization



Note: Data are from Kuvshinov and Zimmermann (2018).