Wealth and its Distribution in Germany, 1895-2021

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Motivation I

How did wealth inequality in Germany evolve over the past 120 years?

- Wealth inequality levels and trends are **highly controversial** in many countries
- due to the **variety of wealth concepts, data sources and methodologies**
- For example, top 1% wealth share in **Germany**:
  - $\sim$ 20% using survey data
  - $\sim$ 30% using survey data + Forbes list (Vermeulen, 2018; Bach et al., 2019)

Motivation II

What changes the distribution of wealth?

- **Evidence for recent decades: it's valuation changes**

  Housing booms $\rightarrow$ capital gains for the middle class $\rightarrow$ wealth inequality $\downarrow$
  Stock market booms $\rightarrow$ wealth concentration at the top $\uparrow$
  (Garbinti et al., 2020; Kuhn et al., 2019; Martinez-Toledano, 2020)

- Which factors were behind the **large shocks** that drastically **reduced wealth concentration during first half of 20C**?

- Our series for Germany covers three **currency conversions**, hyper**inflation**, substantial **border changes**, war **destruction**, influx of **refugees** from the East etc.

Challenges for measuring wealth inequality

- **Evaluation of wealth differs between data sources**:
  1. National accounts often record the replacement value ($\neq$ market value)
  2. Wealth tax data often record the cadastral value of real estate or unincorporated businesses ($<$ market value)
  3. Survey data rely on the respondents' estimate of the market value ($<$ or $>$ than the *true* market value)

- **Different populations covered by different data**:
  1. National accounts include the whole resident population
  2. Wealth tax data include the rich owning substantial wealth
  3. Survey data are known to miss the very rich

Our paper

We provide a **consistent long-run series of wealth and its distribution** and investigate **drivers of wealth inequality**.

For this,

1. we put together a **large macroeconomic dataset** on the **level and structure of private household wealth** and
2. **harmonize and combine all major German wealth data**:
   - National accounts (household balance sheets)
   - Wealth tax data
   - Household survey data (EVS, SOEP, HFCS)
   - Wealth rankings
3. so that we can assess the distribution of wealth across German households, **in line with national accounts** and **from the industrialization period until today**
4. and construct historical counterfactuals for the analysis of **wealth inequality drivers**.

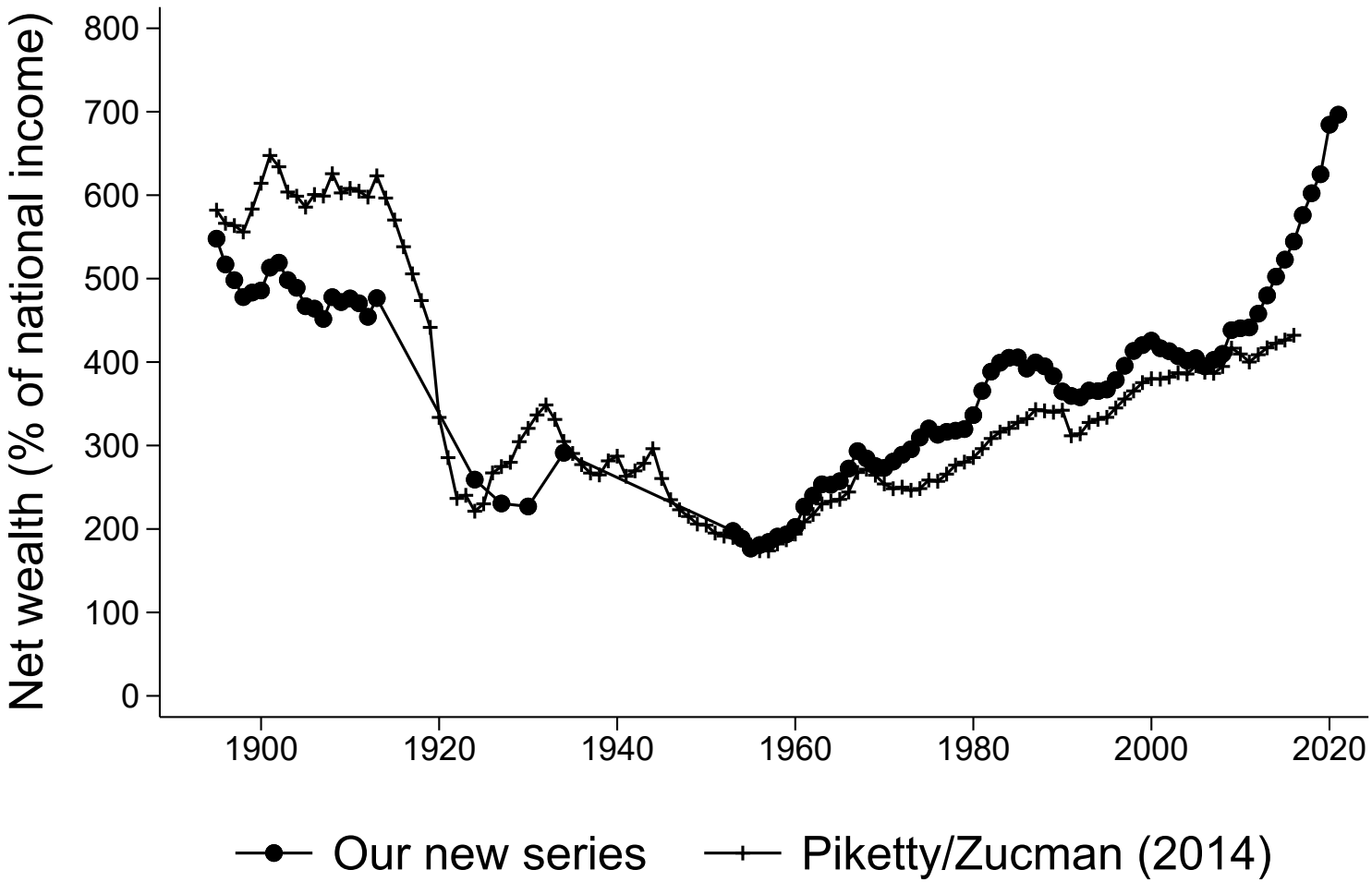
Data sources

Period	Aggregate	Distribution
1895-1914	Wealth tax and wealth levy, contemporary estimates, statistical yearbooks	Wealth tax (Prussia), Wealth levy 1913 (German Empire)
1924-1934	Wealth censuses, statistical yearbooks	Wealth tax (German Reich)
1953-1989	Financial Accounts, National Accounts	Wealth tax (FRG)
1993-2021	Financial Accounts, Household Balance Sheets, Corporate and personal income tax	EVS+, SOEP, HFCS, Manager Magazin rich-list

- Wealth = value of assets owned by **households** net of debt
- Assets include financial assets, such as savings deposits or life insurances, real assets, such as houses and farmland, and business assets.
- $\rightarrow$ only **marketable wealth**, i.e., no social security pensions

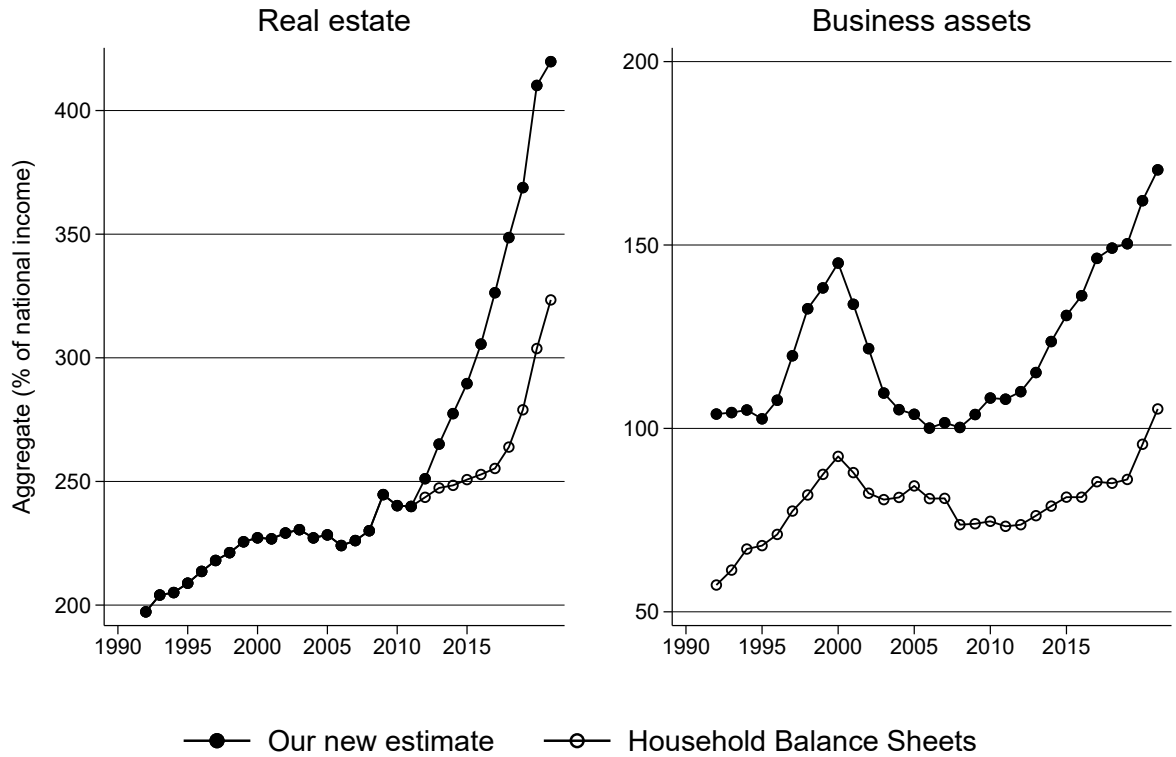
▸ Augmented wealth distribution

Aggregate wealth 1895-2018: Wealth-income-ratio



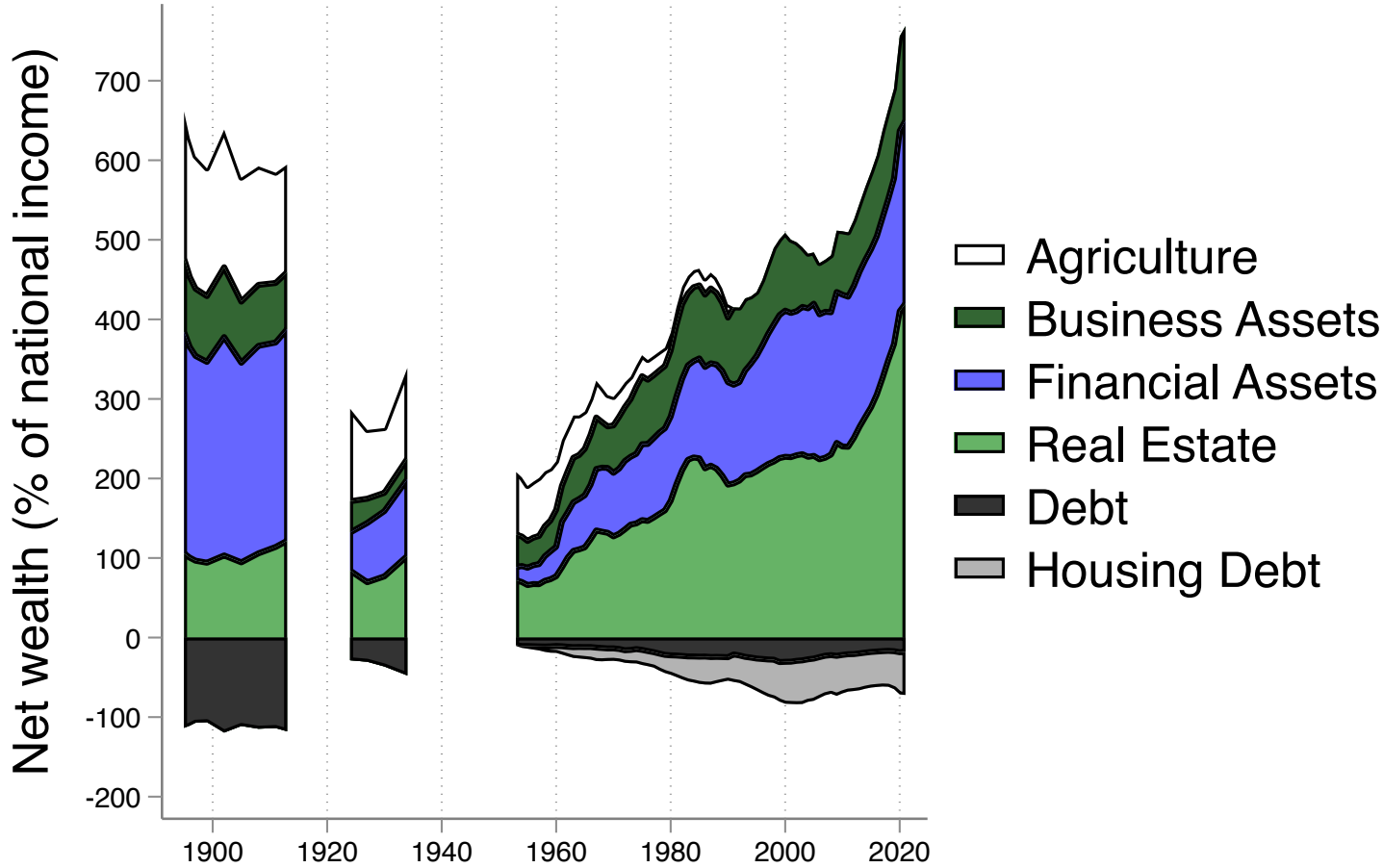
- Accurate valuation of land in early 20C→ Downward revision
- Real estate and business assets undervalued today → Upward revision

Revised aggregate wealth, 1993-2021



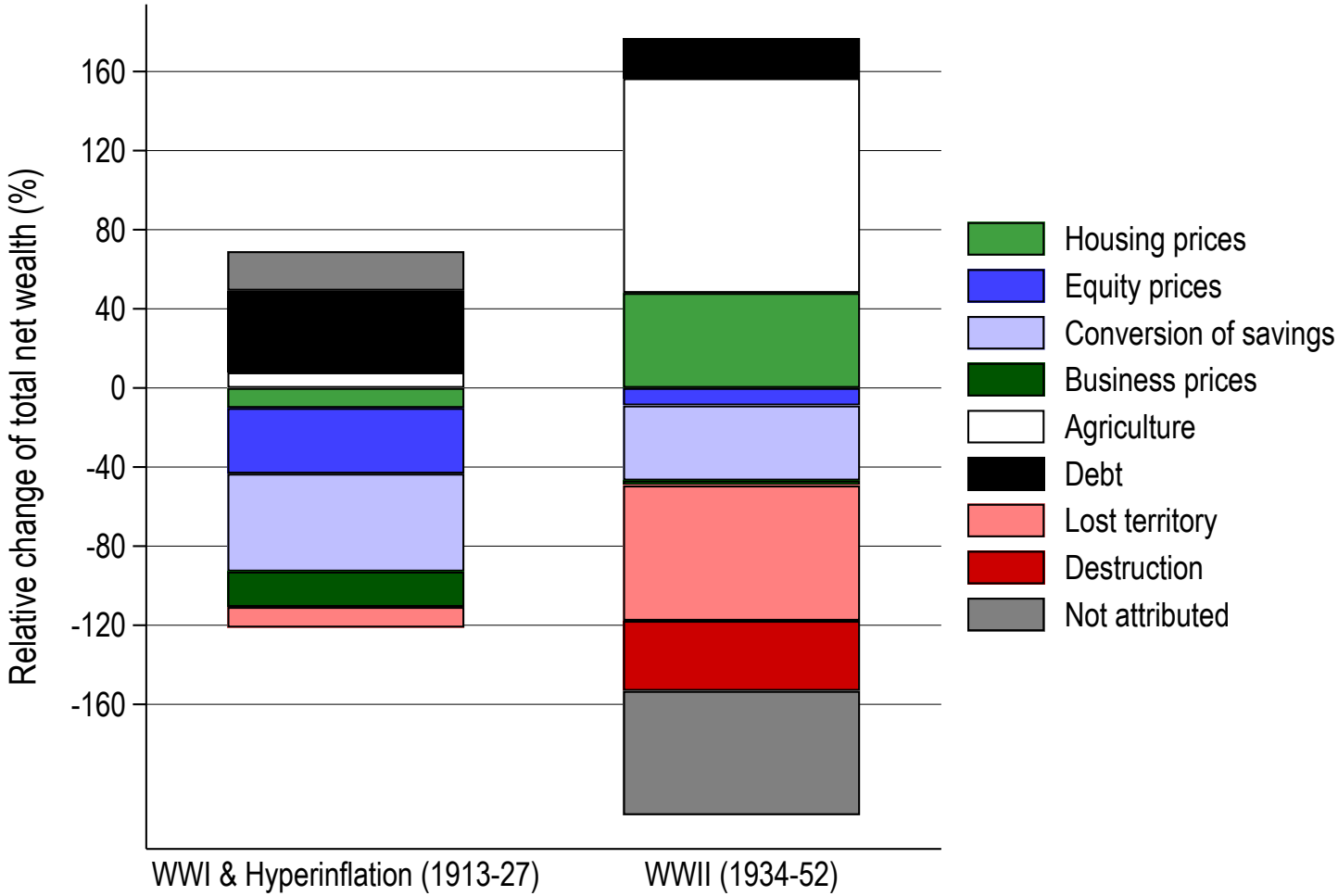
- + 2000 bn real estate extending 2011 HFCS aggregate using house prices and buildings costs (Davis/Heathcote, 2007).
- + 2000 bn business wealth when capitalizing profits of private limited companies and quasi-corporations like US Fed.
- Business wealth share rises from 16% (official HBS) to 32% (our revision); brings Germany in line with US (30%).

Aggregate wealth 1895-2018: Composition



- Financial assets greatly reduced after WWI and WWII
- Expansion of real estate after WWII

Aggregate wealth 1913-1952: Major shifts



- Financial assets ↓ because equity prices ↓
  & saving deposits after currency reforms ≈-90%
- Lost territory compensated by agriculture prices ↑

▸ Stock price index ▸ Germany's border changes

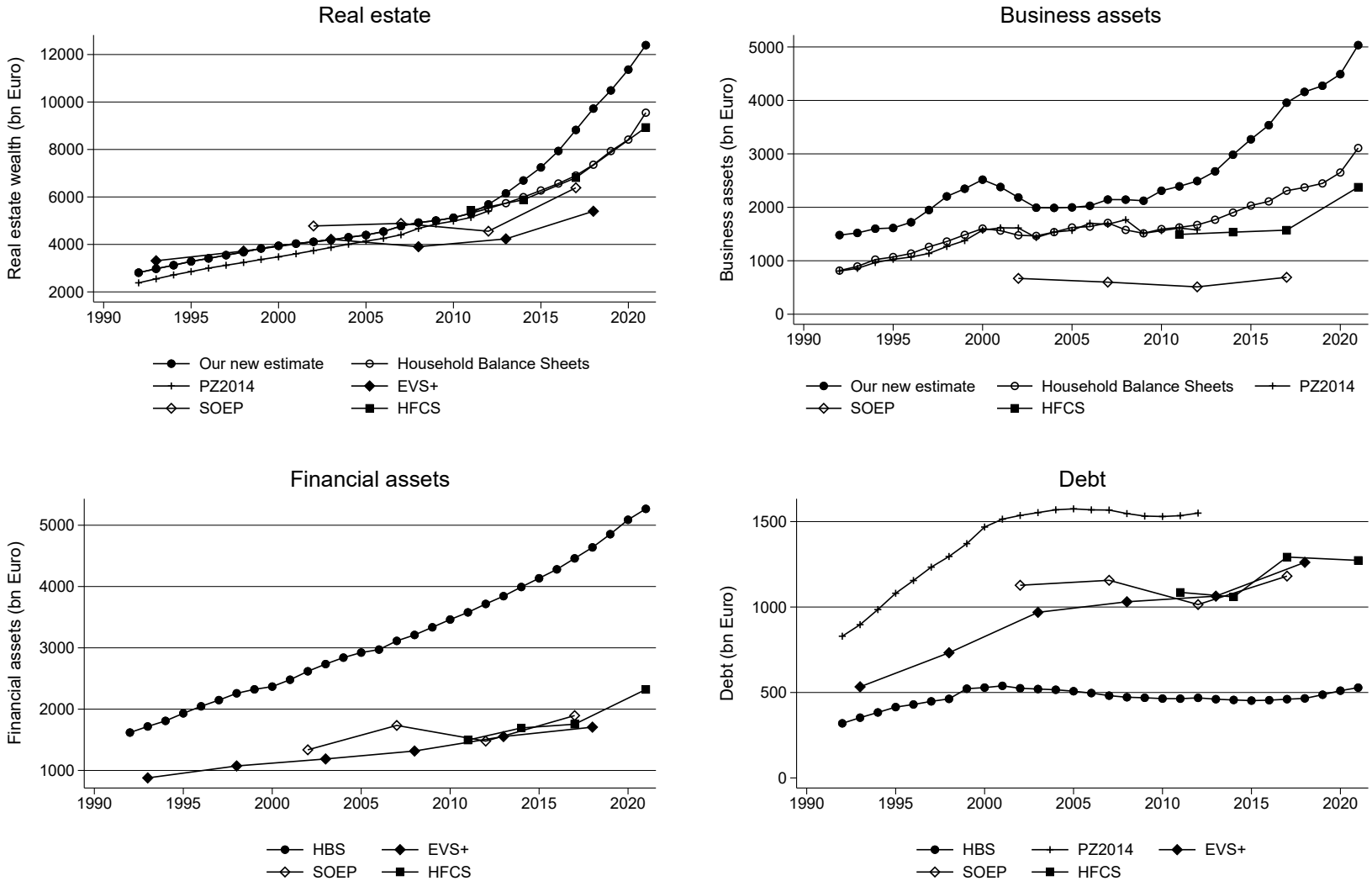
Distribution 1993-2021: Survey data and rich lists

1. **Top-correct** survey data using wealth rankings
2. **Uprate** top-corrected survey data (1993-2021) to **macroeconomic aggregates** replacing real estate and business wealth of official national accounts

   ▸ Top-correcting and uprating ▸ Macroeconomic aggregates
3. Estimate inequality of top-corrected and uprated wealth distribution using **Generalized Pareto interpolation**

   ▸ Pareto interpolation

Aggregate vs. survey wealth, 1991-2021



Sources: Offical HBS, EVS+, HFCS, SOEP, PZ2014 denotes Piketty/Zucman, 2014.

$\rightarrow$ financial wealth 2020: 1600 bn current accounts, 500 bn deposits, 2500 bn insurances etc.

Distribution 1895-1989: Wealth tax tabulations

Vermögensgruppe					Steuerpflichtiges Gesamtvermögen: Zahl der Pflichtigen	Steuerpflichtiges Gesamtvermögen: Betrag in 1 000 RM
1					2	3
		bis	6 000	RM	280 683	1 545 717
über	6 000	»	10 000	»	747 323	5 871 958
»	10 000	»	20 000	»	746 022	10 525 113
»	20 000	»	30 000	»	278 618	6 805 145
»	30 000	»	50 000	»	216 726	8 292 303
»	50 000	»	100 000	»	136 837	9 353 172
»	100 000	»	250 000	»	58 143	8 616 003
»	250 000	»	500 000	»	13 446	4 587 112
»	500 000	»	1 000 000	»	4 912	3 339 167
»	1 000 000	»	2 500 000	»	1 870	2 724 823
»	2 500 000	»	5 000 000	»	325	1 071 270
»	5 000 000	»	10 000 000	»	107	708 717
»	10 000 000	RM	.....		33	633 122
				Summe a—n	2 485 045	64 073 623

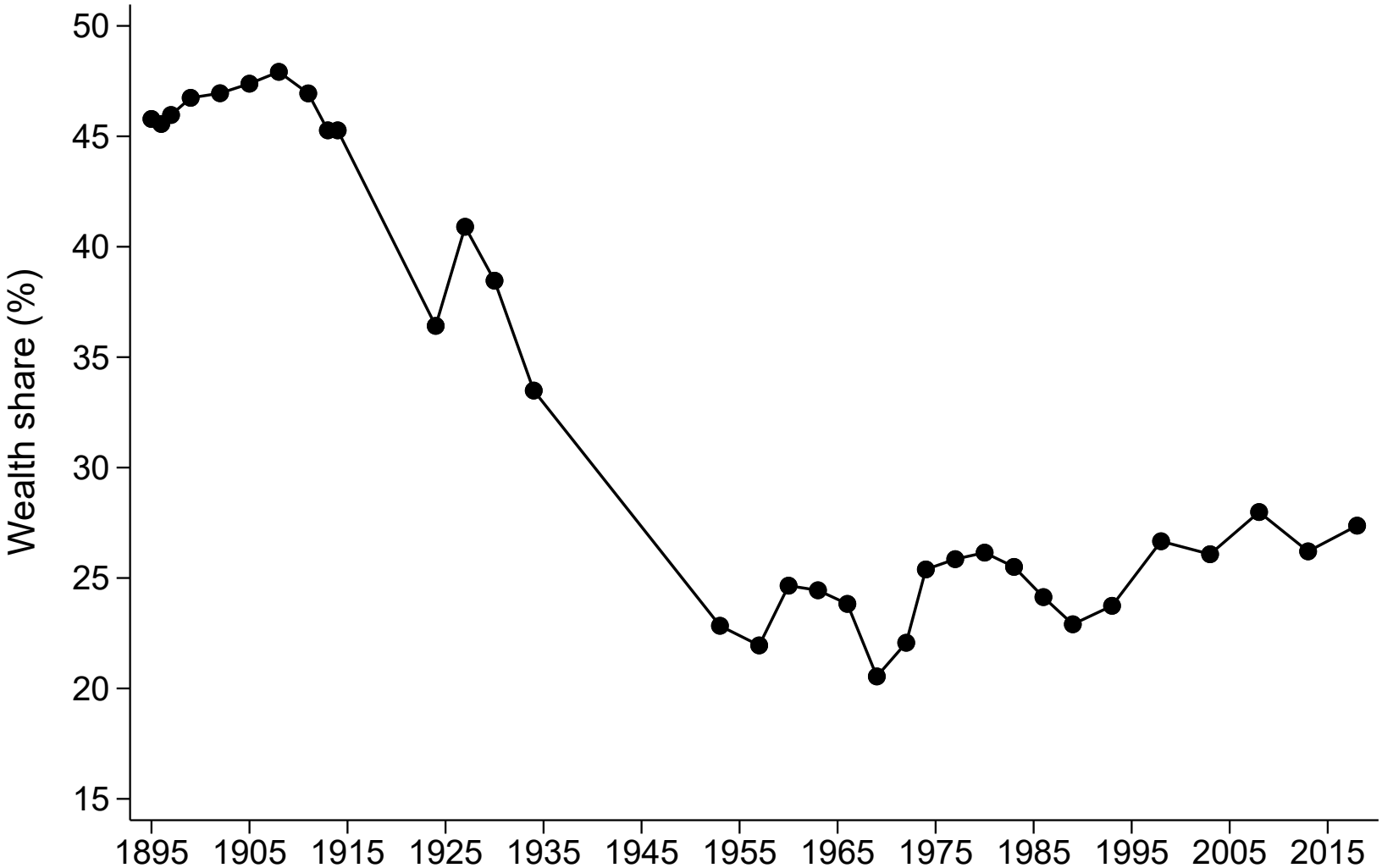
Source: Statistik des Deutschen Reichs - Band 357,
Statistik der Vermögensteuerveranlagung 1925.

Distribution 2018: Uprated and top-corrected surveys

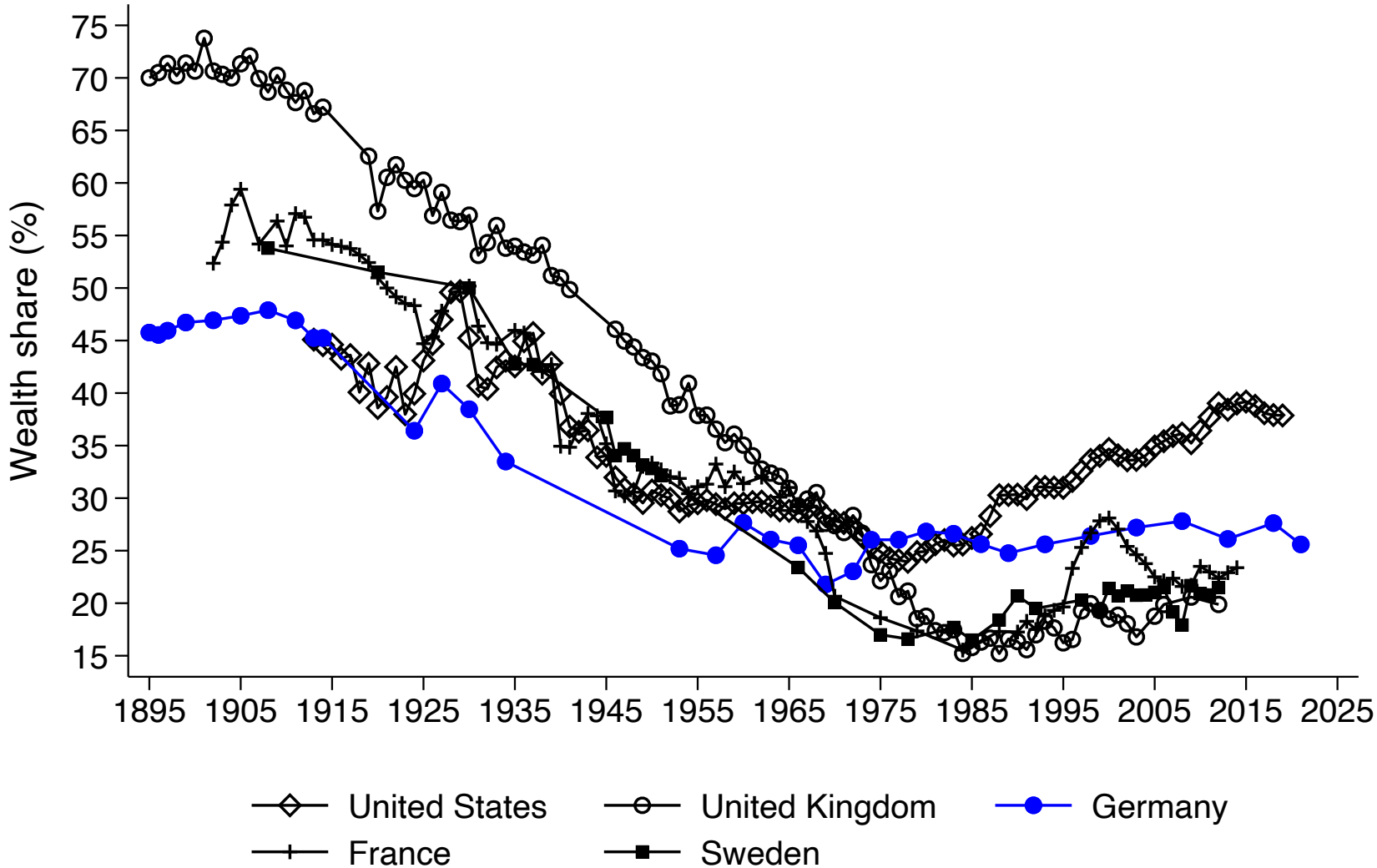
Quantile	SOEP	HFCS	EVS	MM-list
		Unadjusted		
P 50	60,000	62,300	46,126	
P 90	455,000	550,500	444,589	
P 95	681,300	862,700	647,081	
P 99	1.6 Mio.	2.4 Mio.	1.3 Mio.	
P 99.9	5 Mio	7 Mio.	2.9 Mio.	
P 99.99	13 Mio.	12 Mio.	5.5 Mio.	100 Mio.
		Uprated and top-corrected		
P 50	132,174	113,289	129,697	
P 90	788,260	865,419	946,431	
P 95	1.2 Mio.	1.3 Mio.	1.5 Mio	
P 99	3 Mio.	3.7 Mio.	4 Mio.	
P 99.9	13 Mio.	10 Mio.	8 Mio.	
P 99.99	88 Mio.	90 Mio.	90 Mio.	100 Mio.

Source: Top-corrected using Manager Magazine (MM), uprated to macroeconomic aggregates.

Top 1% wealth share, 1895-2018



Germany in international comparison



Source: wid.world and own calculations. Wealth tax until 1989, top-corrected and uprated EVS 1993-2018.

Explaining major wealth inequality shifts, 1913-1952 I

Method: **construct historical counterfactuals** for selected events, ceteris paribus, originally suggested by Fogel (1964)

- Choose **base year** and **event** (e.g., let hyperinflation happen in 1913 instead of 1923).
- Construct **counterfactual total wealth (W') and population (N')** based on historical sources (e.g., hyperinflation would have reduced W' by $\Delta W'$).
- Shock wealth distribution (e.g., with asset price changes), and calculate **counterfactual top 1%** using W' and N'
- **Partial effect of event** $=$
  Observed top 1% share - counterfactual top 1% share

Method II: Example (a)

Example: border changes after WWI

- Choose baseline **year** and **geography**
  1913; empire borders; $S_{top1\%} = 45.3$
- Choose counterfactual
  1913; Weimar borders
- Construct **counterfactuals**: W', N', $\{w_{i_{TP}}\}$
  use regional disaggregation
- Estimate: $f_{.99}(N', W', \{w_{i_{TP}}\}')$
  counterfactual $S'_{top1\%} = 45.0$
- Effect of event:
  $S'_{top1\%} - S_{top1\%} = -0.3$

Method II: Example (b)

Example: Hyperinflation/asset price shock WW I

- Choose baseline **year** and **geography**

  1913; $S_{top1\%} = 45.3$

- Choose counterfactual

  Apply observed price changes 1913-1927 to 1913 portfolios

- Construct **counterfactuals**: W', $\{w_{i_{TP}}\}$

  Challenge to impute household portfolios

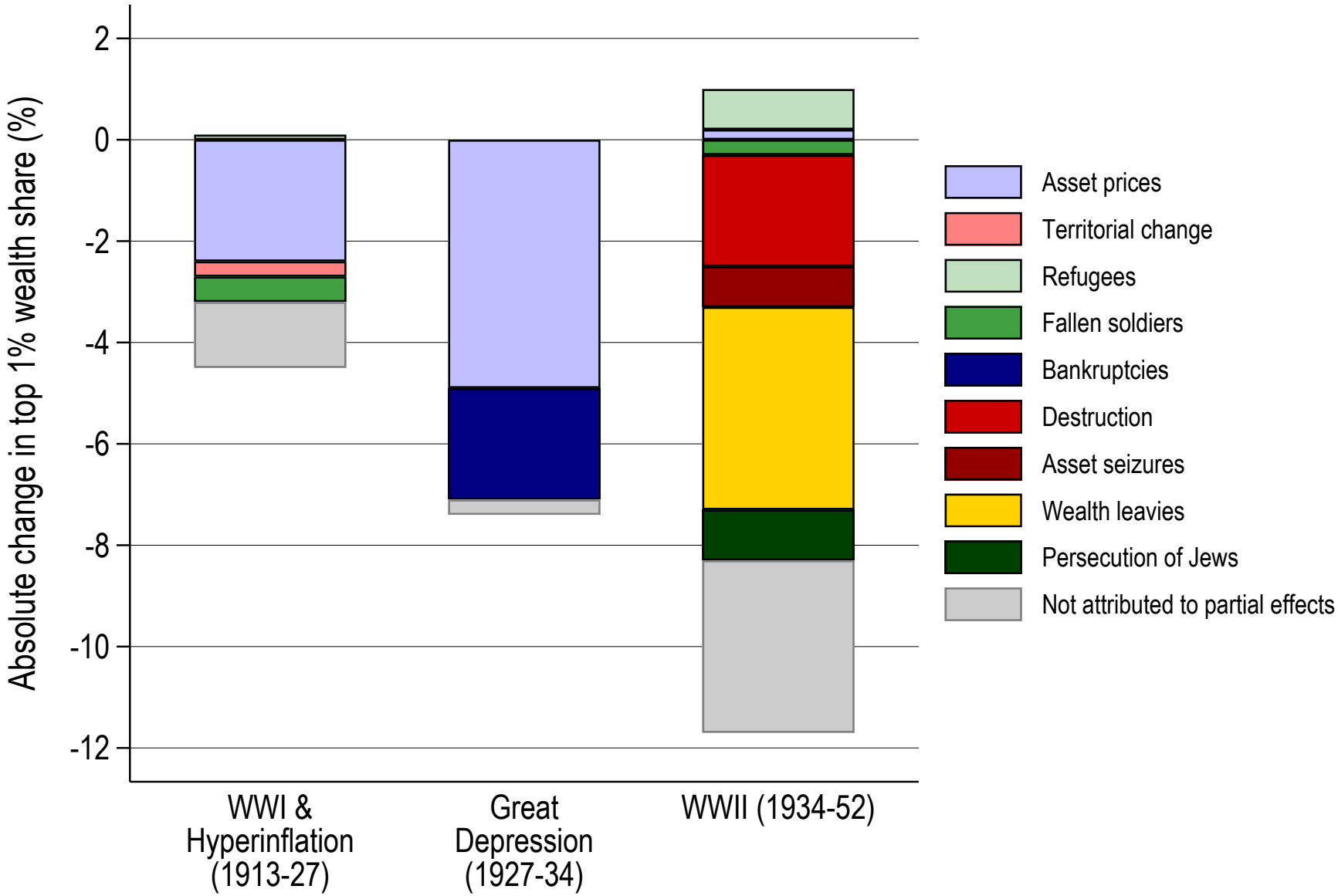
- Estimate: $f_{.99}(N', W', \{w_{i_{TP}}\}')$

  Counterfactual $S'_{top1\%} = 42.9$

- Effect of event:

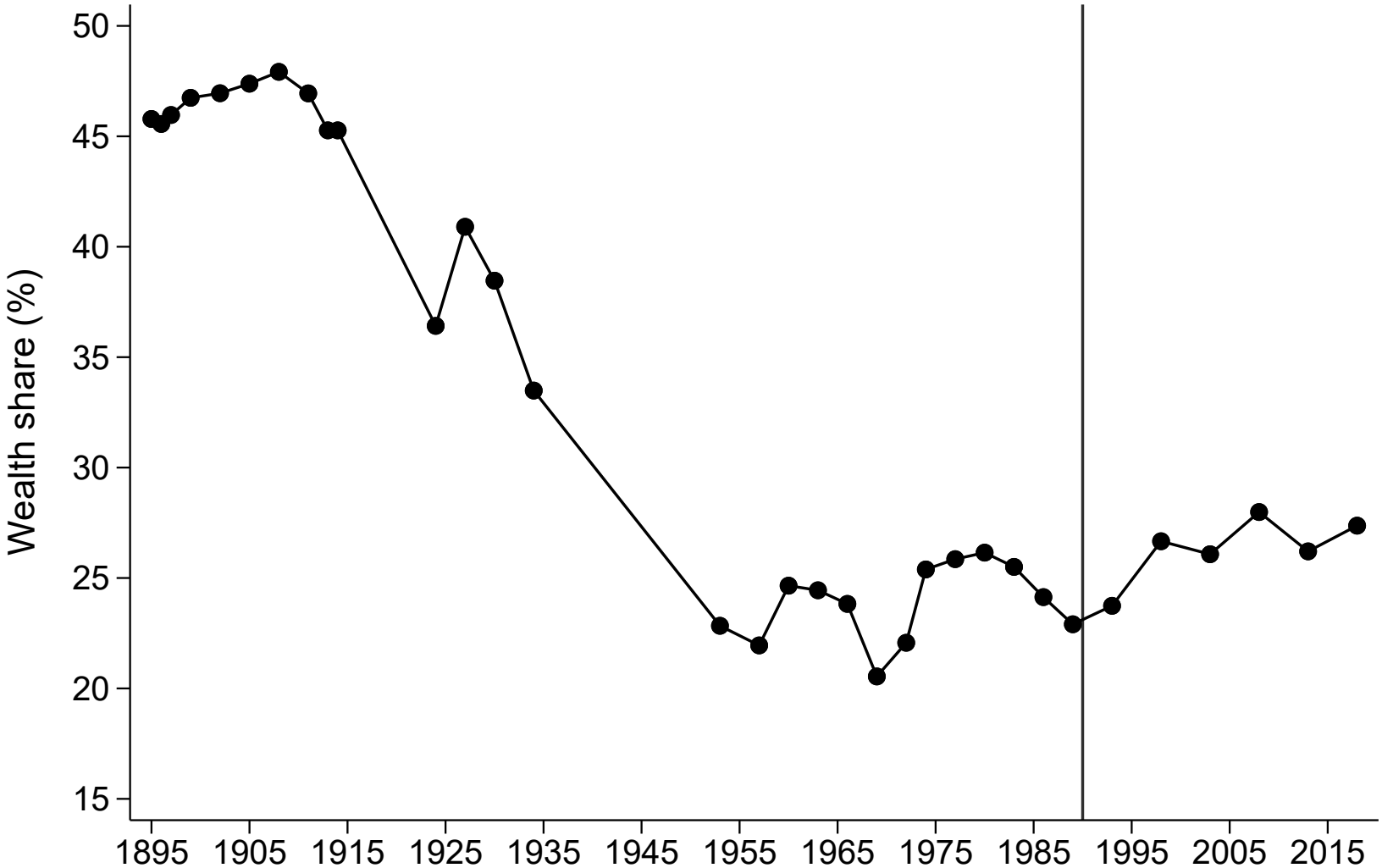
  $S'_{top1\%} - S_{top1\%} = -2.4$

Explaining major wealth inequality shifts, 1913-1952 II

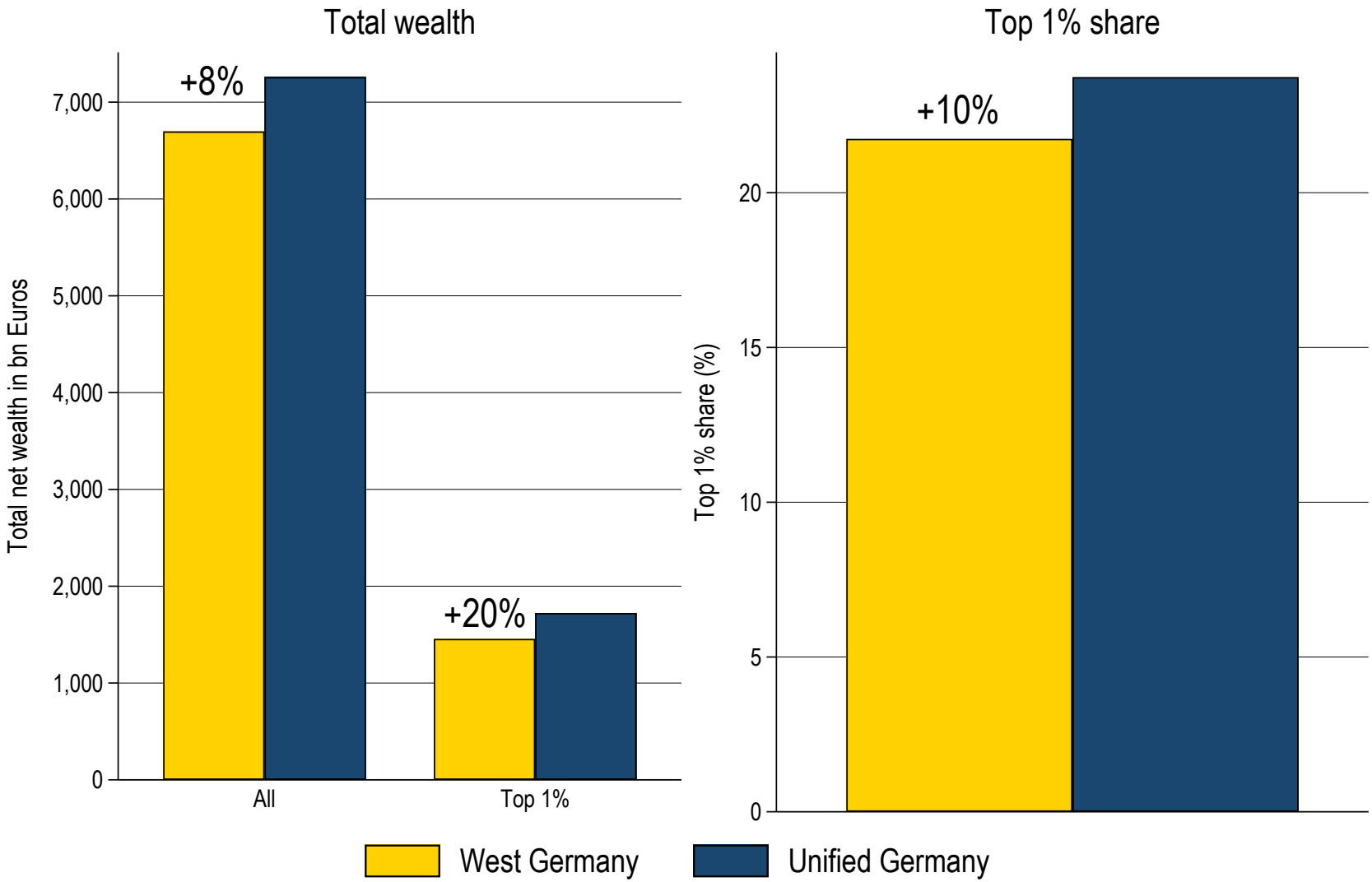


▸ Germany's border changes

The (missing) impact of unification I



The (missing) impact of unification II

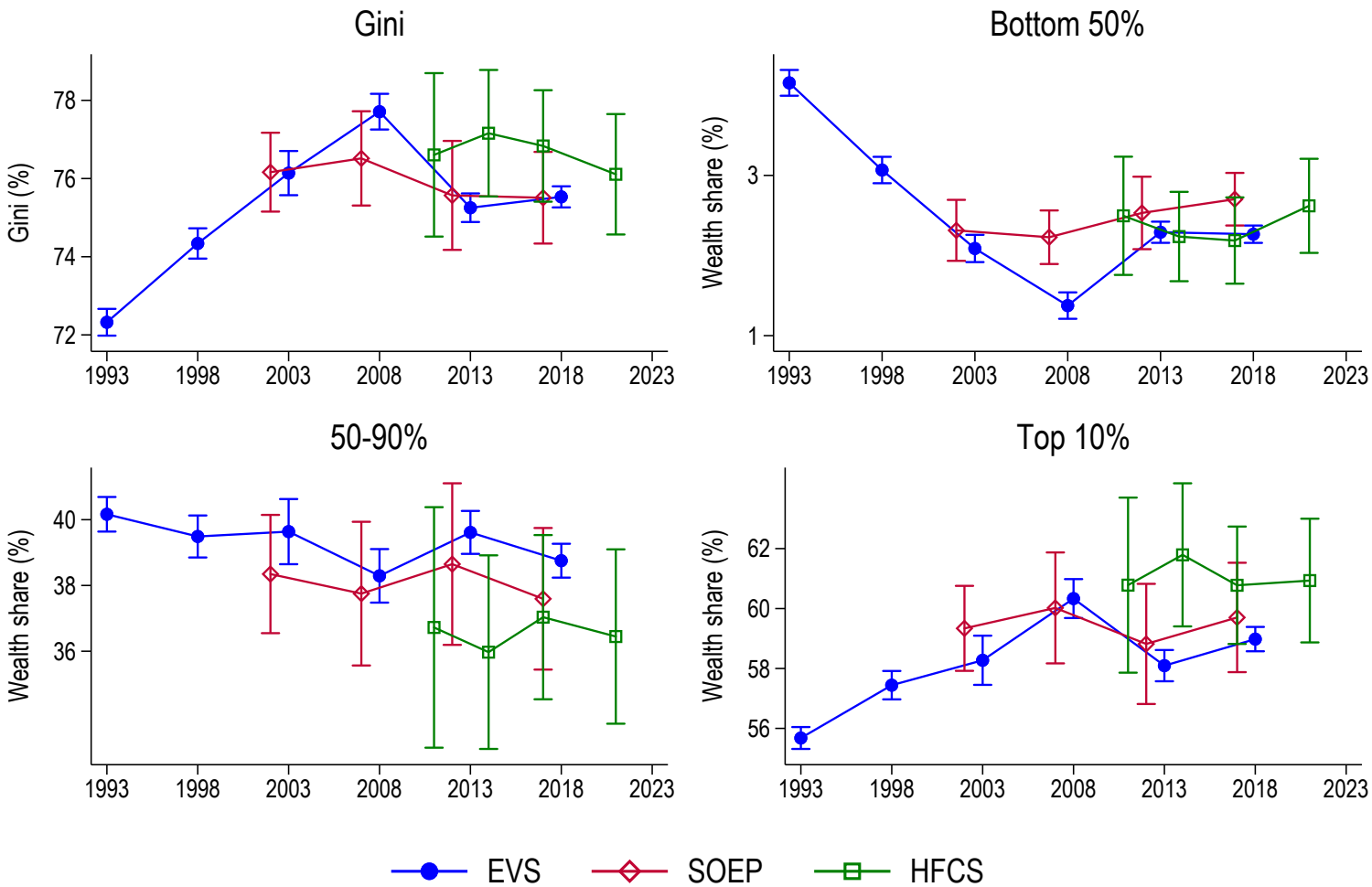


Source: Top-corrected and uprated EVS, survey year 1993.

Long-run conclusion

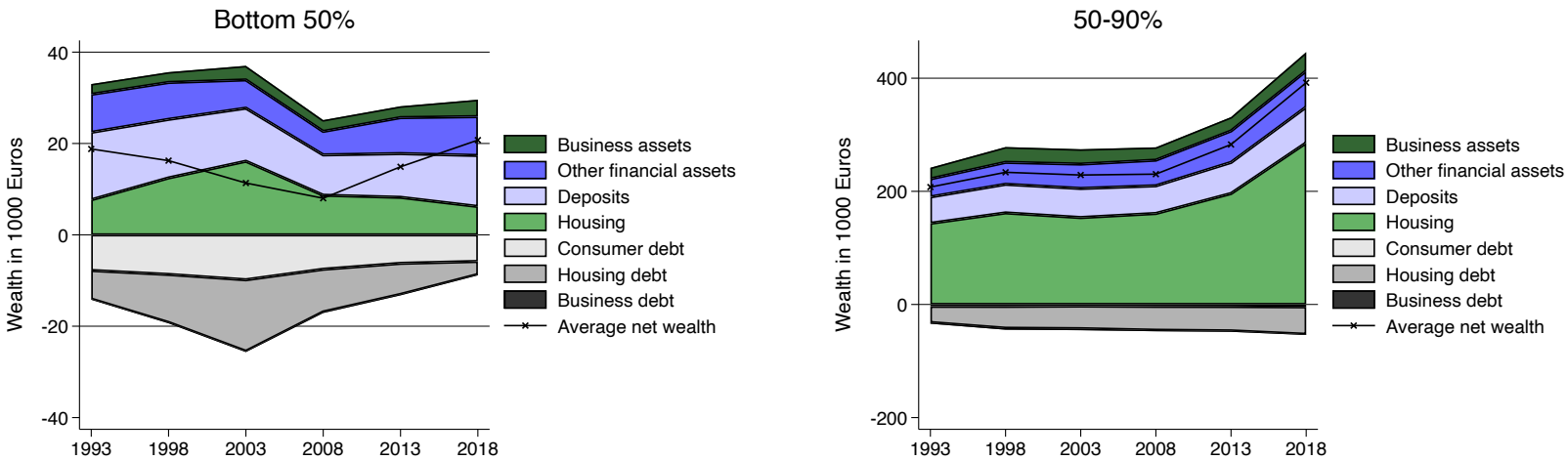
- Wealth concentration in Germany was extremely high in the industrialization period, when the top 1% captured almost half of total net wealth.
- The consequences of two World Wars greatly equalized the wealth distribution.
- Comparably small wealth inequality increase in recent decades.
- **Asset prices** account for the inequality decline following WWI and the Great Depression, while **wealth leavies** and destruction are behind the decline following WWII.

Wealth inequality, 1993-2021



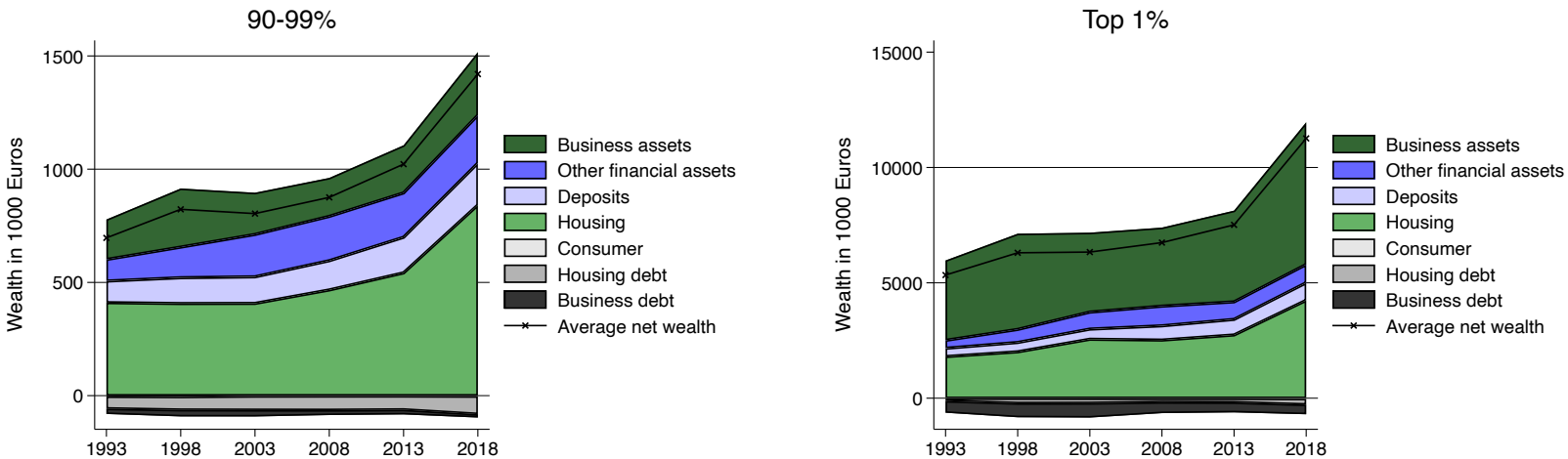
Source: Top-corrected and uprated survey data.

Heterogeneity of wealth portfolios, bottom 90%



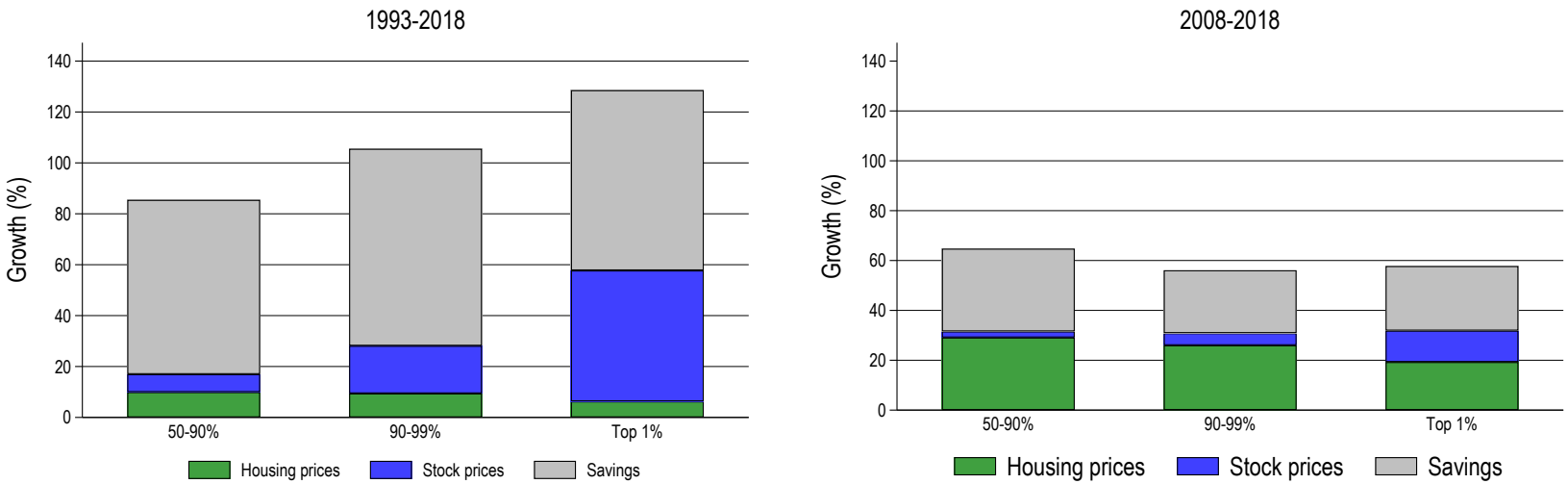
Source: Top-corrected and uprated EVS.

Heterogeneity of wealth portfolios, top 10%



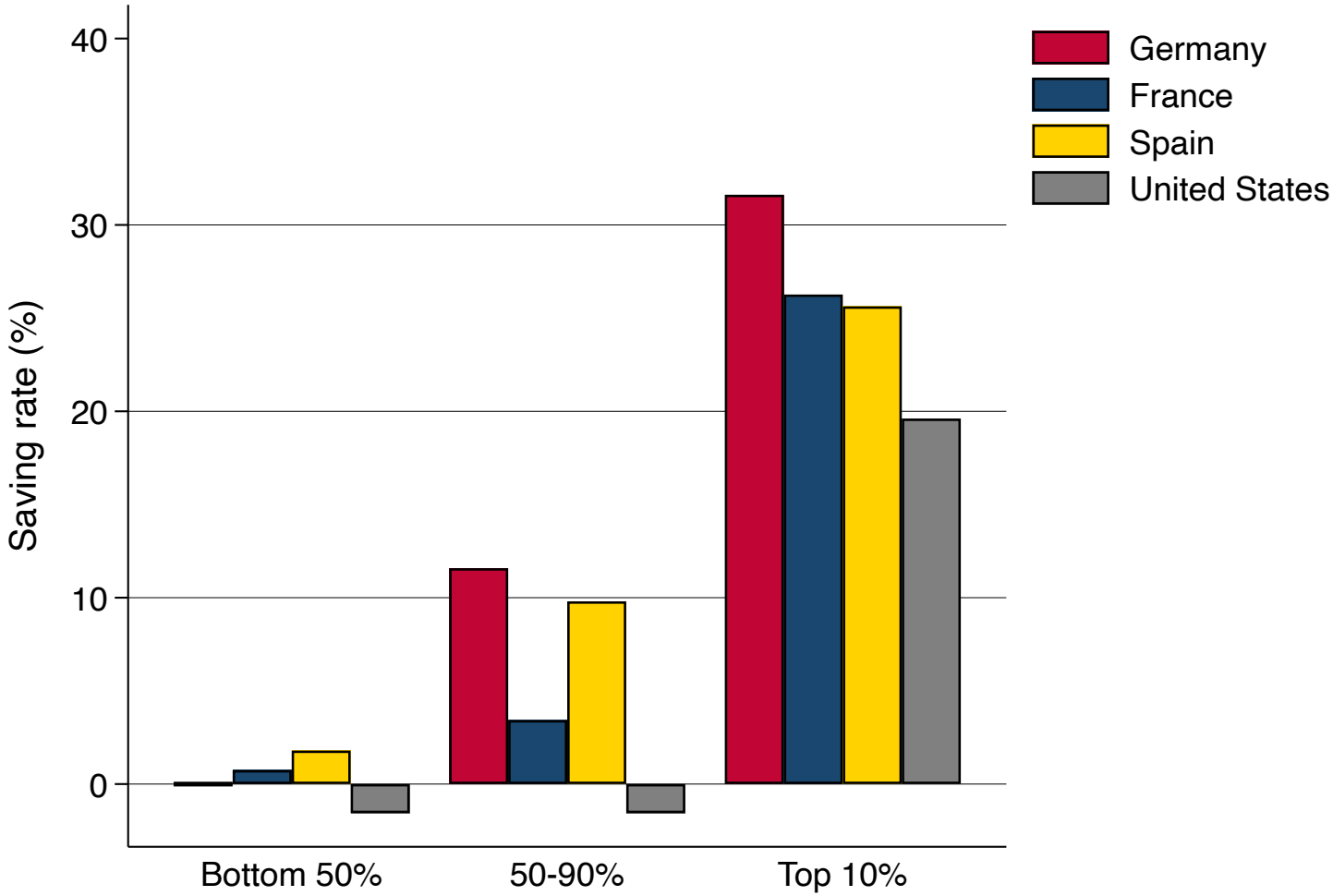
Source: Top-corrected and uprated EVS.

Wealth growth from asset price changes



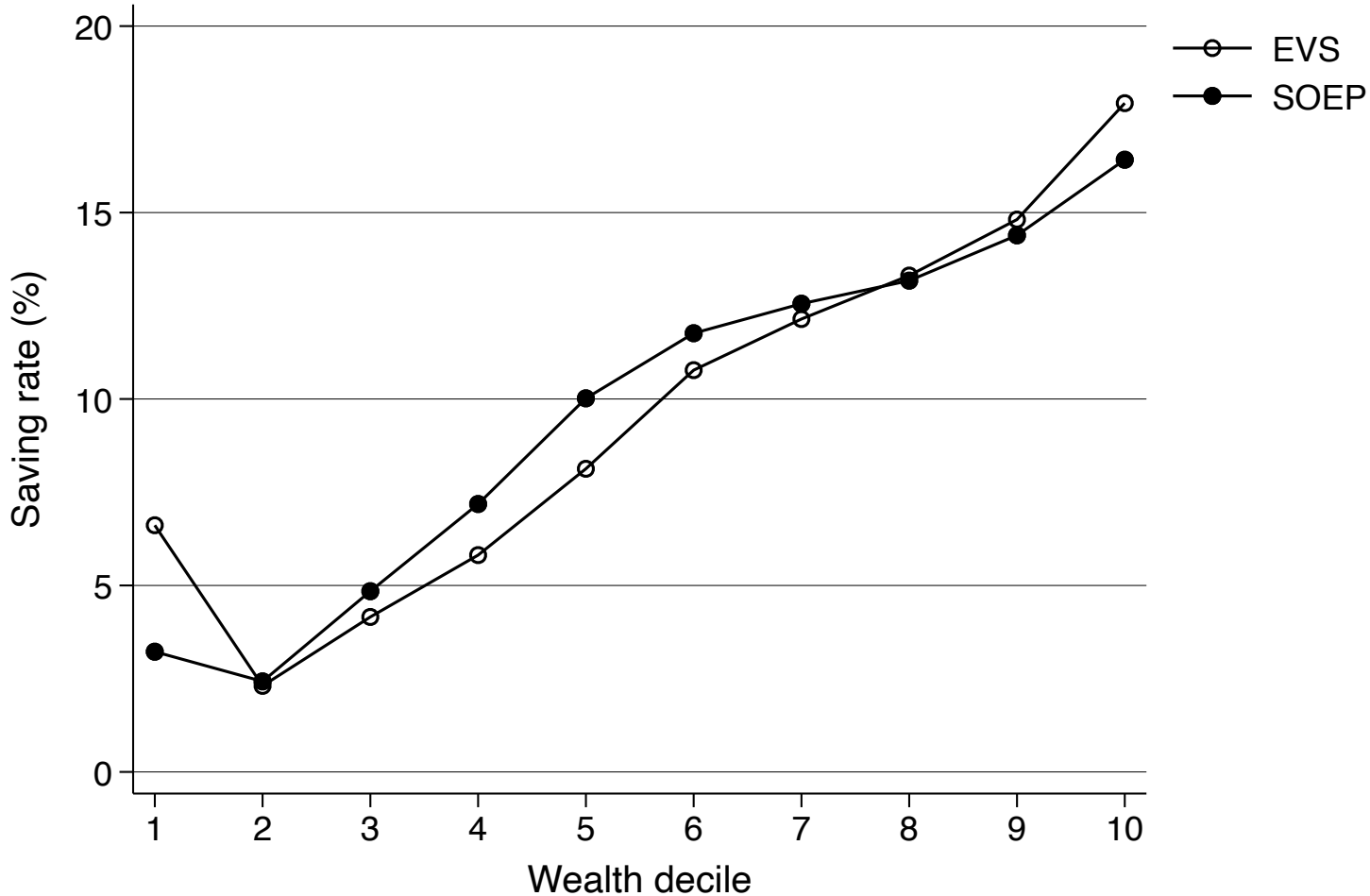
Source: Top-corrected and uprated EVS.

Strong savings of German middle class I



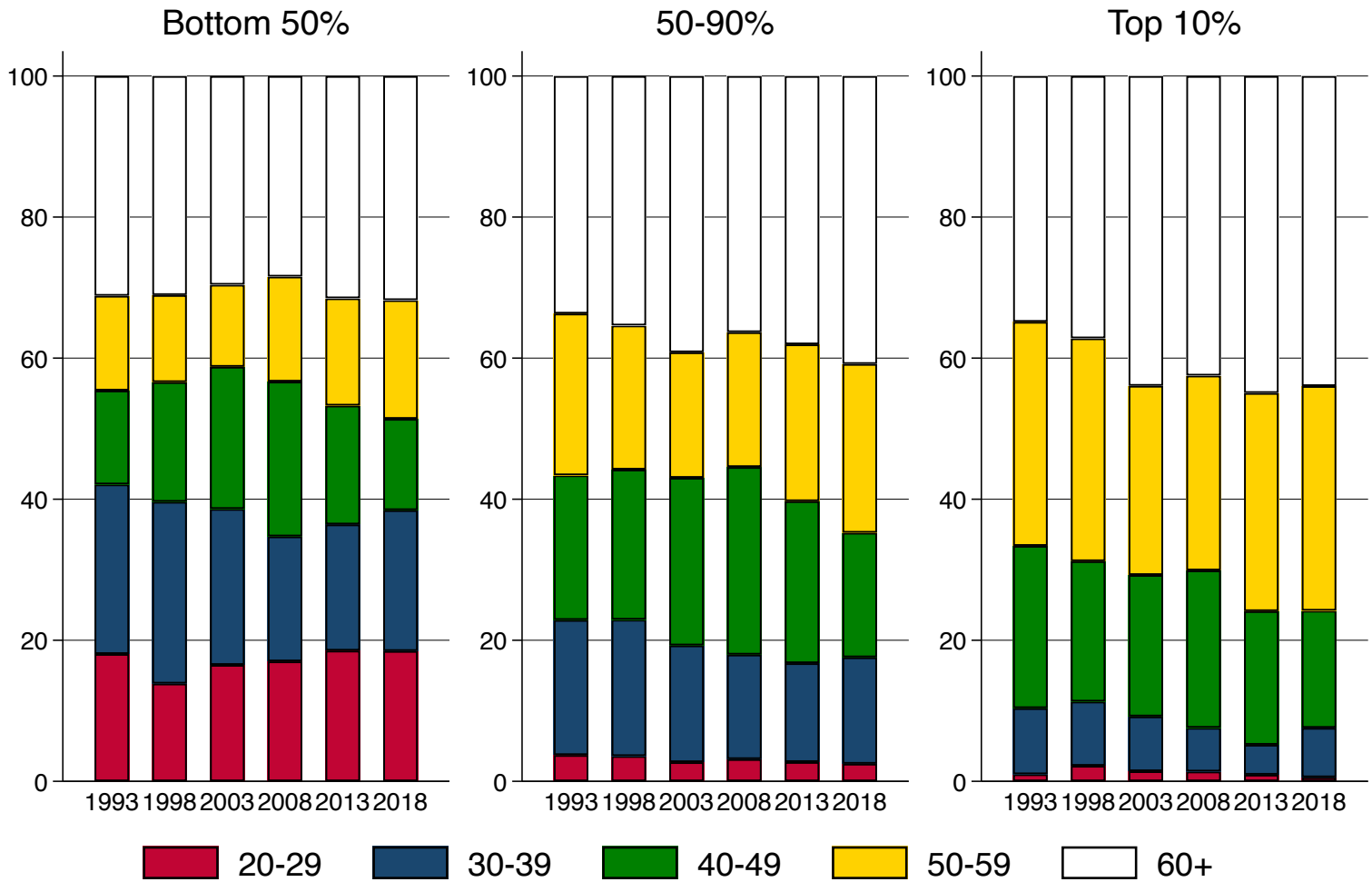
Source: Garbinti et al. (2021) for France, Martinez-Toledano (2020) for Spain and Saez/Zucman (2016) for United States.

Strong savings of German middle class II



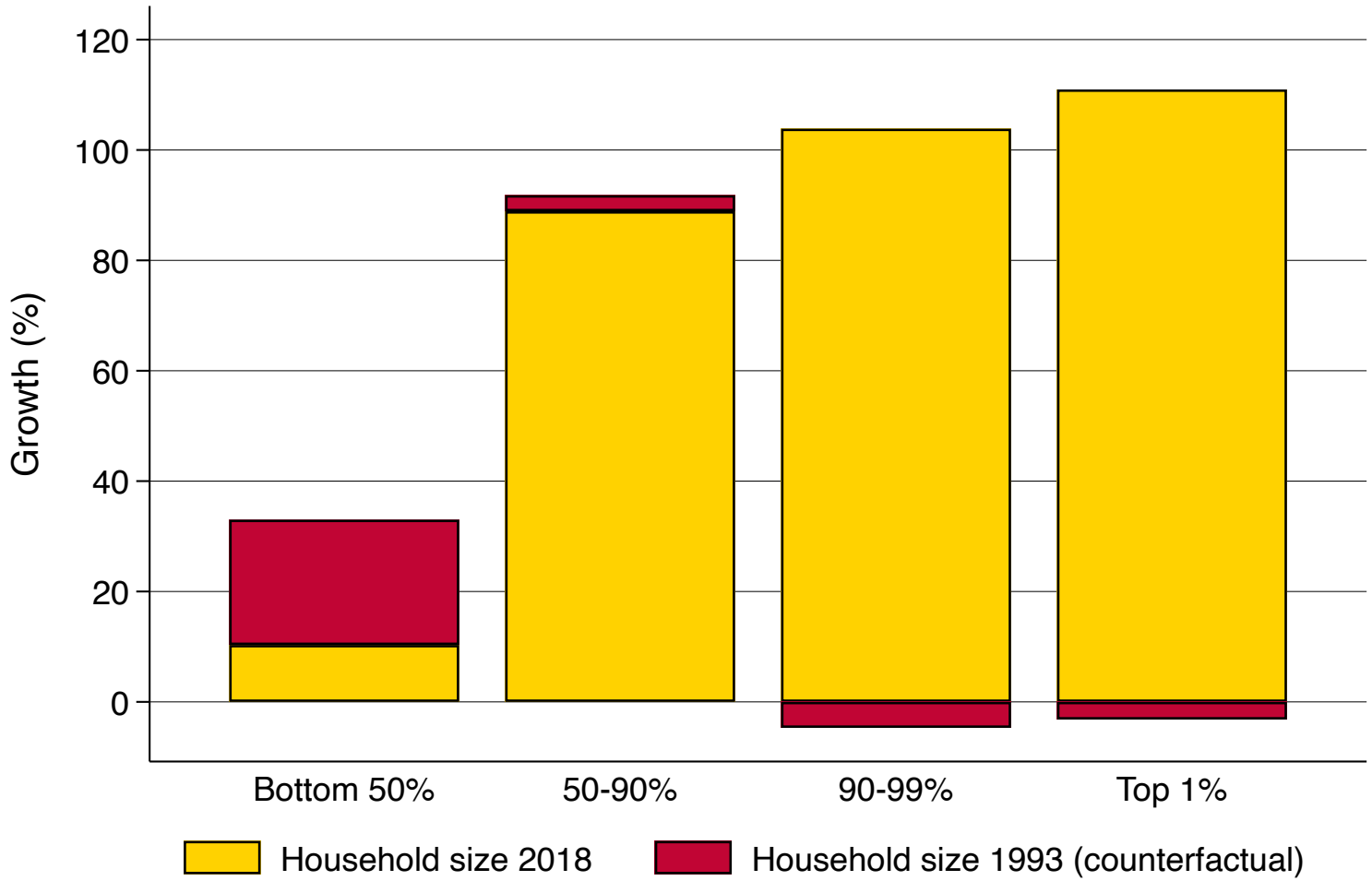
Sources and Notes: Saving rates are defined as annual savings relative to annual disposable income as recorded in EVS 2013 and SOEP 2012. Using EVS, savings are computed as the difference between a household's disposable income and its consumption. Using SOEP, savings are taken from the question asking for the amount of monthly savings plus mortgage repayment.

Limited role for mobility over the life-cycle



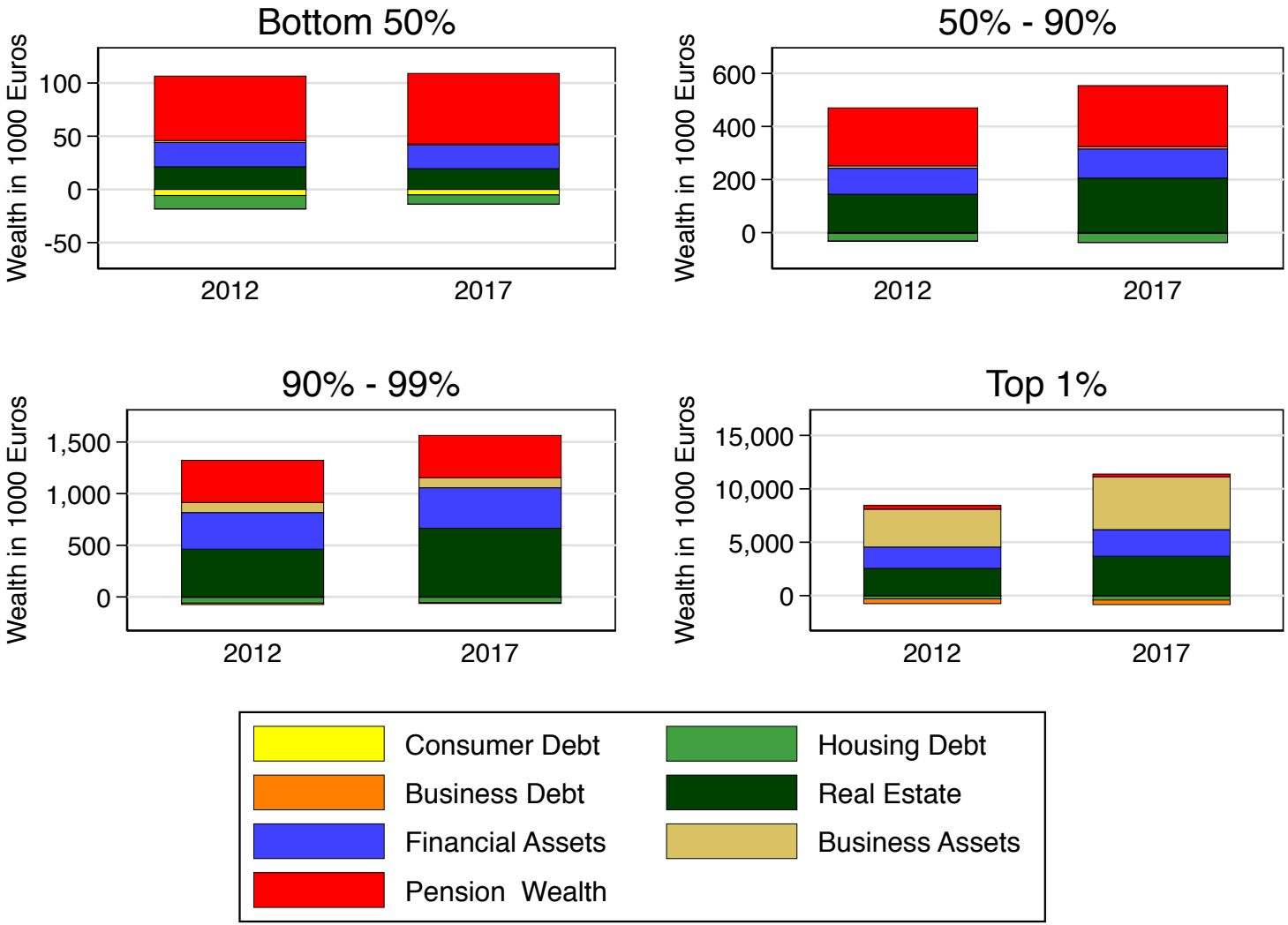
Source: Top-corrected and uprated EVS.

Accounting for decreasing household size and aging, 1993-2018



Source: Top-corrected and uprated EVS.

Distribution of pension wealth



Source: Bartels/Bönke/Glaubitz/Grabka/Schröder (2023)

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Conclusion

- **Wealth concentration** in Germany (and other countries) measured by top 1% wealth share **halved between 1900 and 1950**.
- Widening gap between lower and upper half of the wealth distribution in since German unification in 1990.
- Both **rising real estate prices** and **large savings of the middle class** have moderated wealth inequality in Germany in recent years.
- **Asset prices** central for changes in wealth distribution in 20C
- **Savings** important for lower and middle classes to compensate for missing capital gains

Thank you for your attention!

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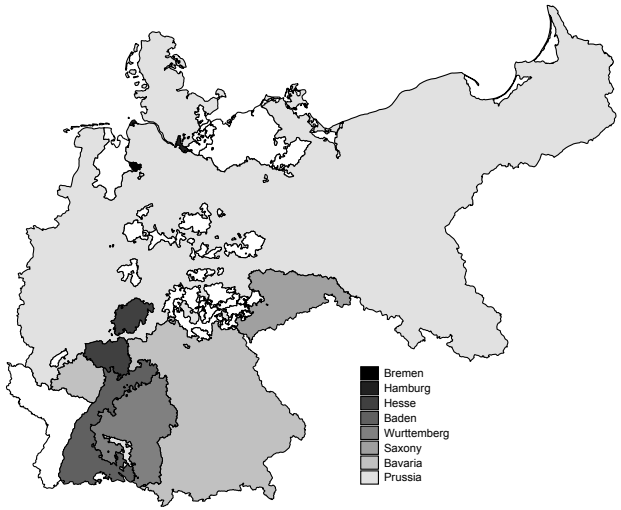
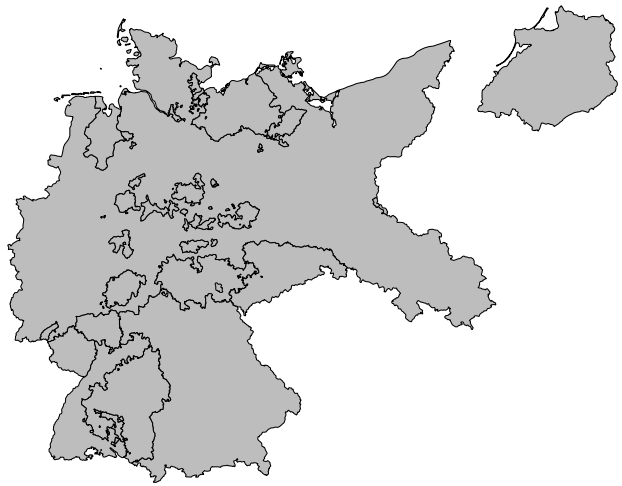
Germany's borders, 1871-2018

1871-1919

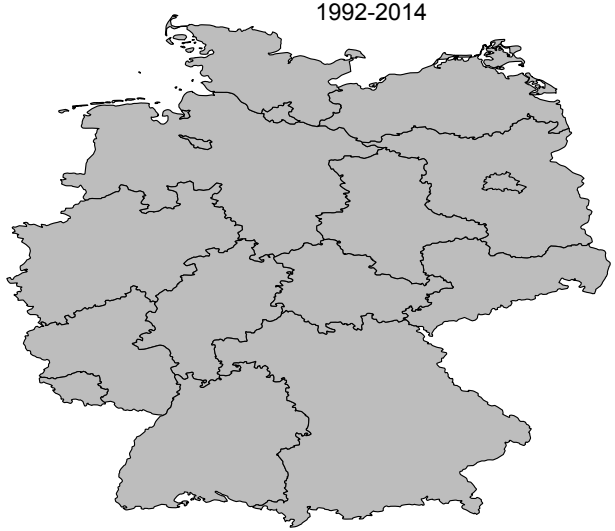


1925-1938



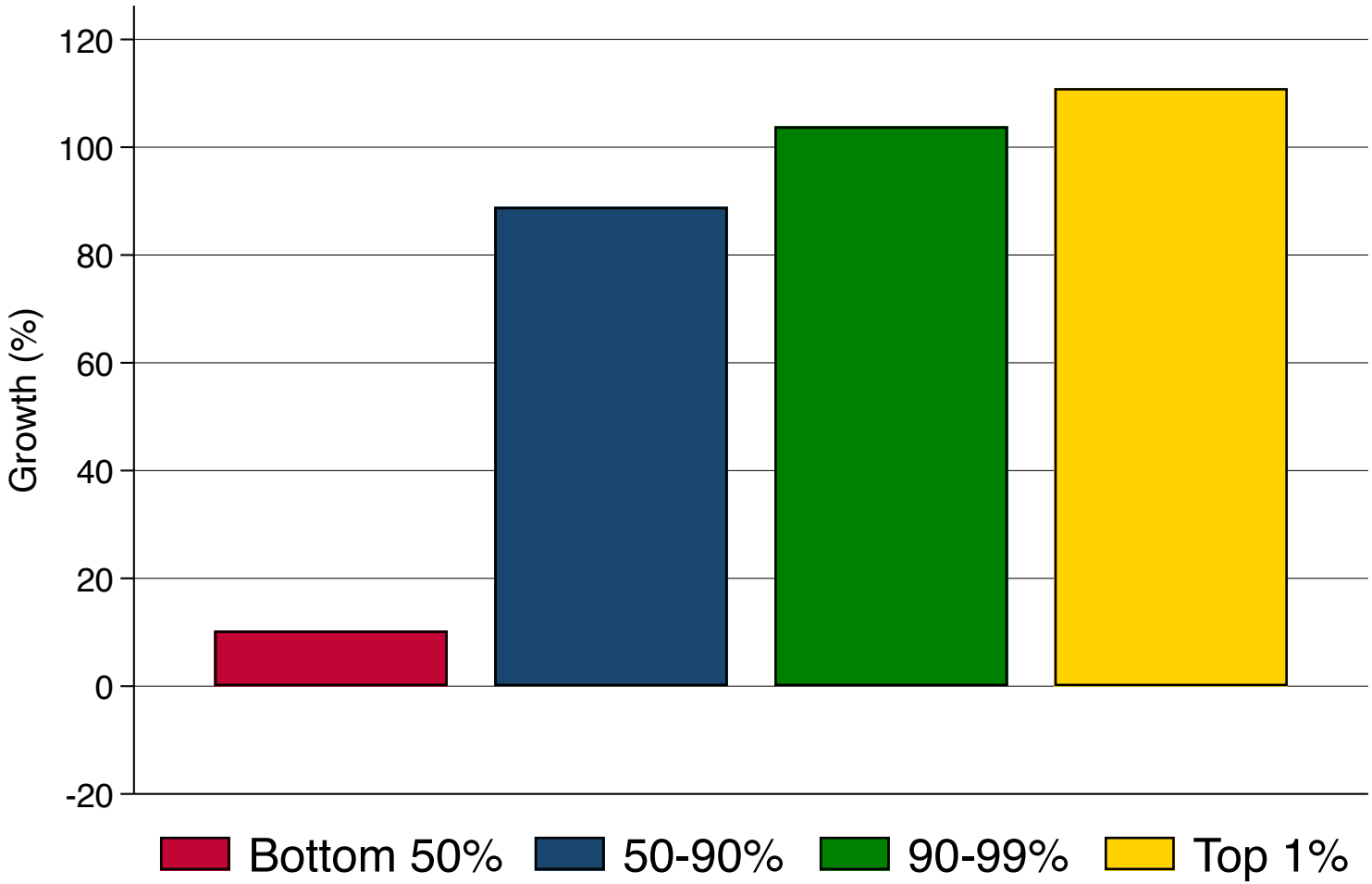
1949-1989

1992-2014



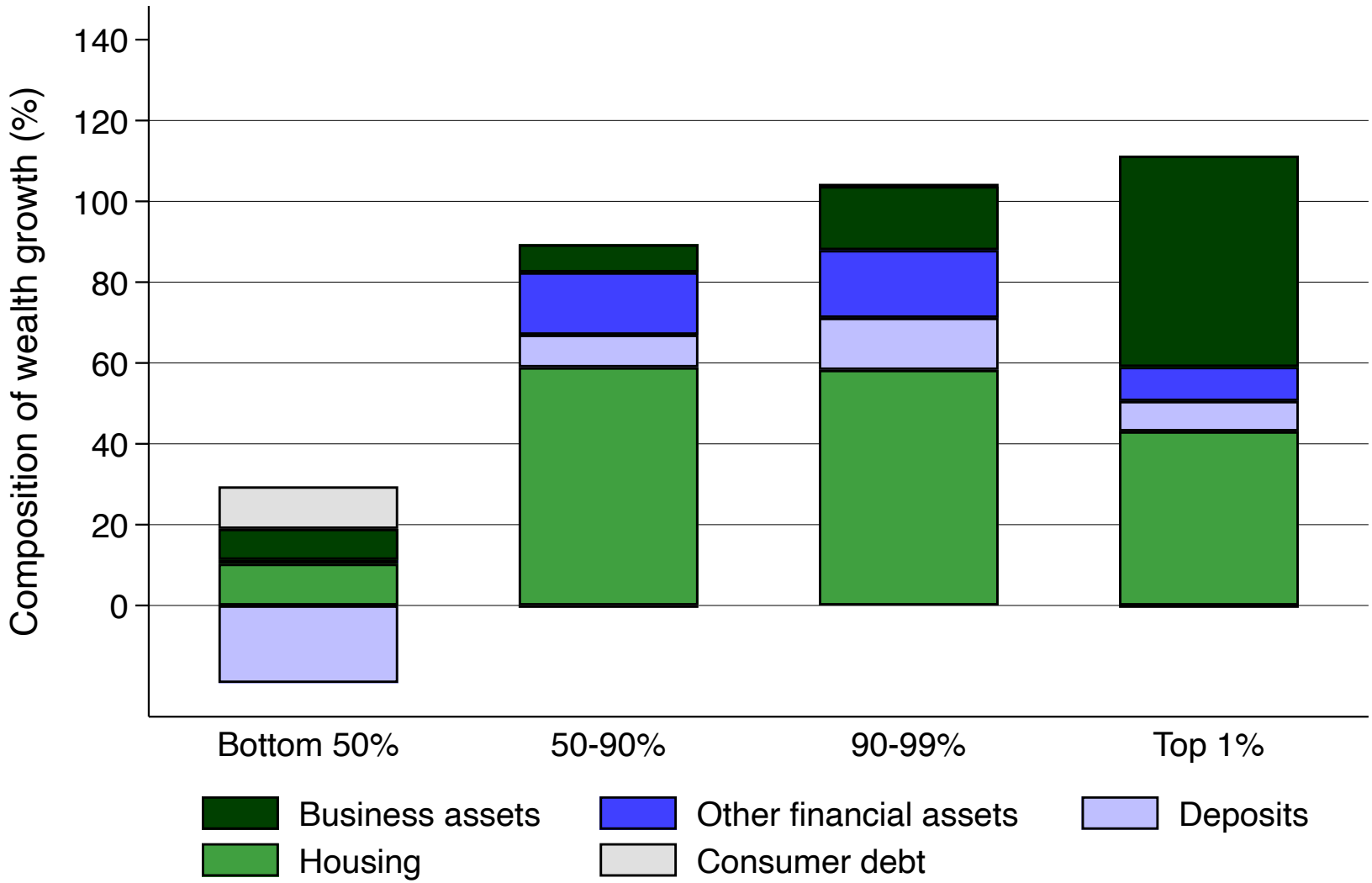
▸ back to top1 shifts ▸ back to total shifts

Wealth growth by group, 1993-2018



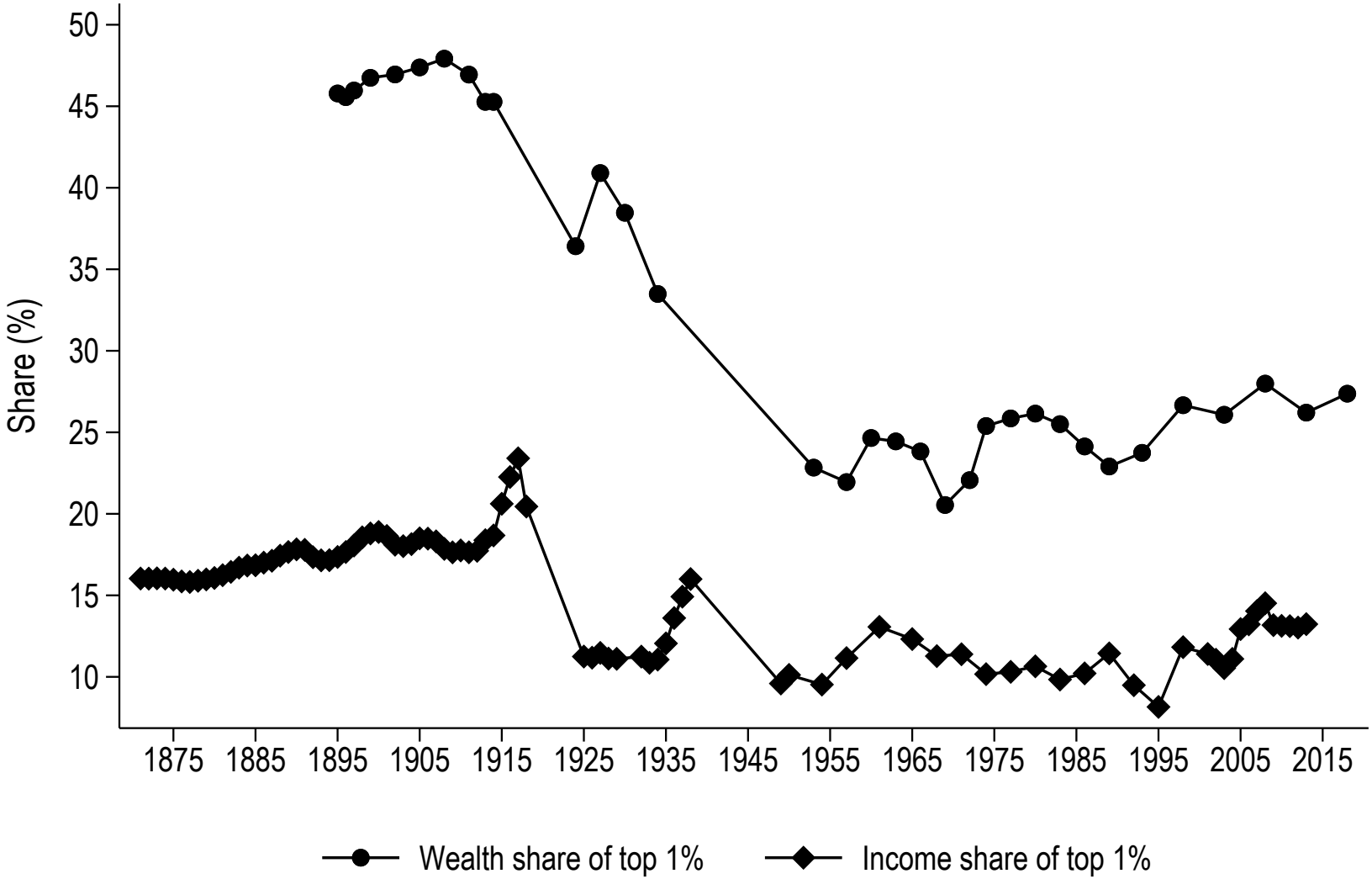
Source: Top-corrected and uprated EVS.

Composition of wealth growth, 1993-2018



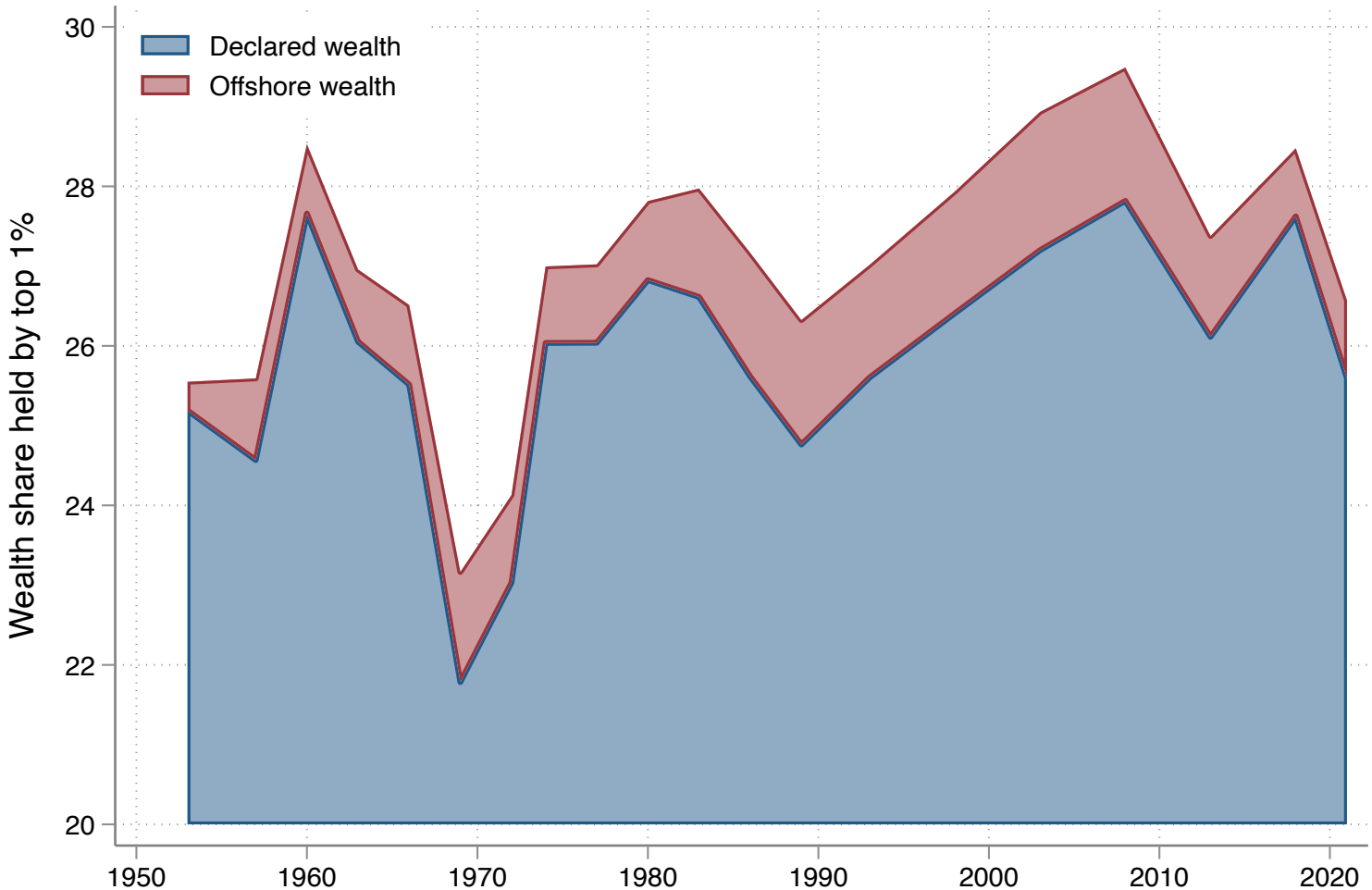
Source: Uprated and top-corrected EVS.

Top 1% income and wealth share in Germany



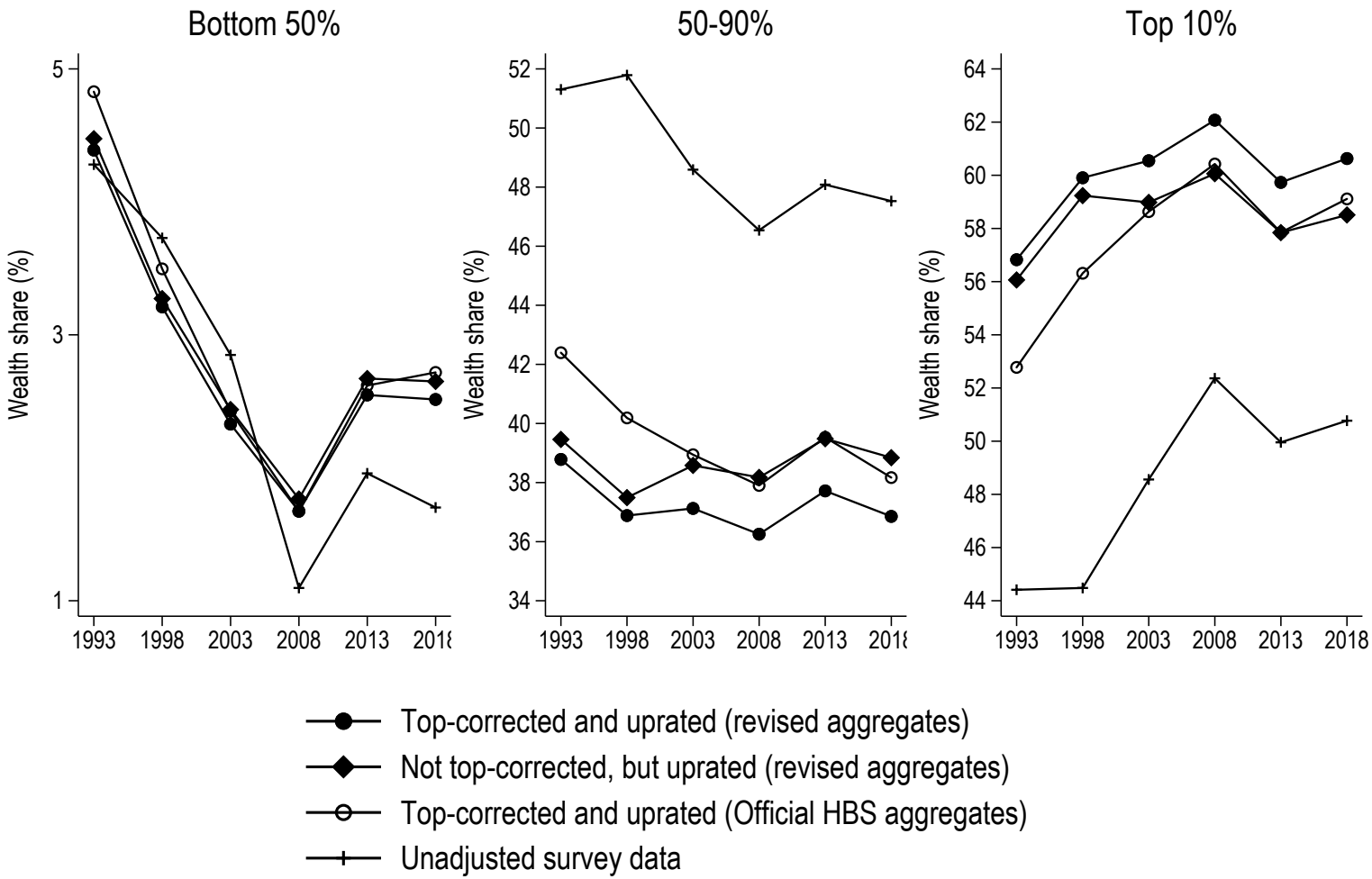
Source: Top 1% wealth share based on wealth tax until 1974, top-corrected HIES 1978-2013. Top 1% income share based on income tax data from Bartels (2019).

Top 1% wealth share including offshore wealth



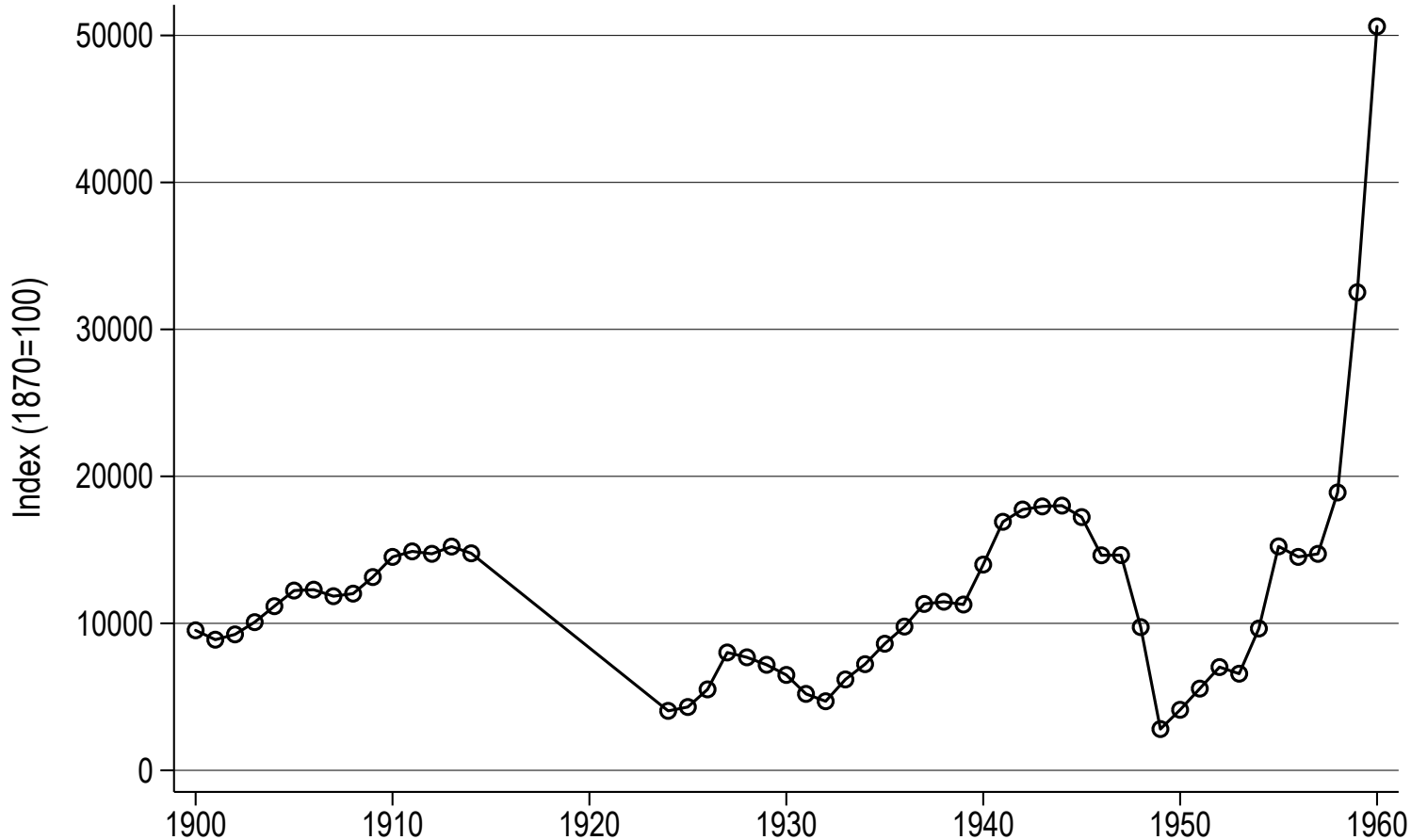
Quelle: Albers/Bartels/Schularick (2022).

Wealth inequality, 1993-2021: uprating and top-correction



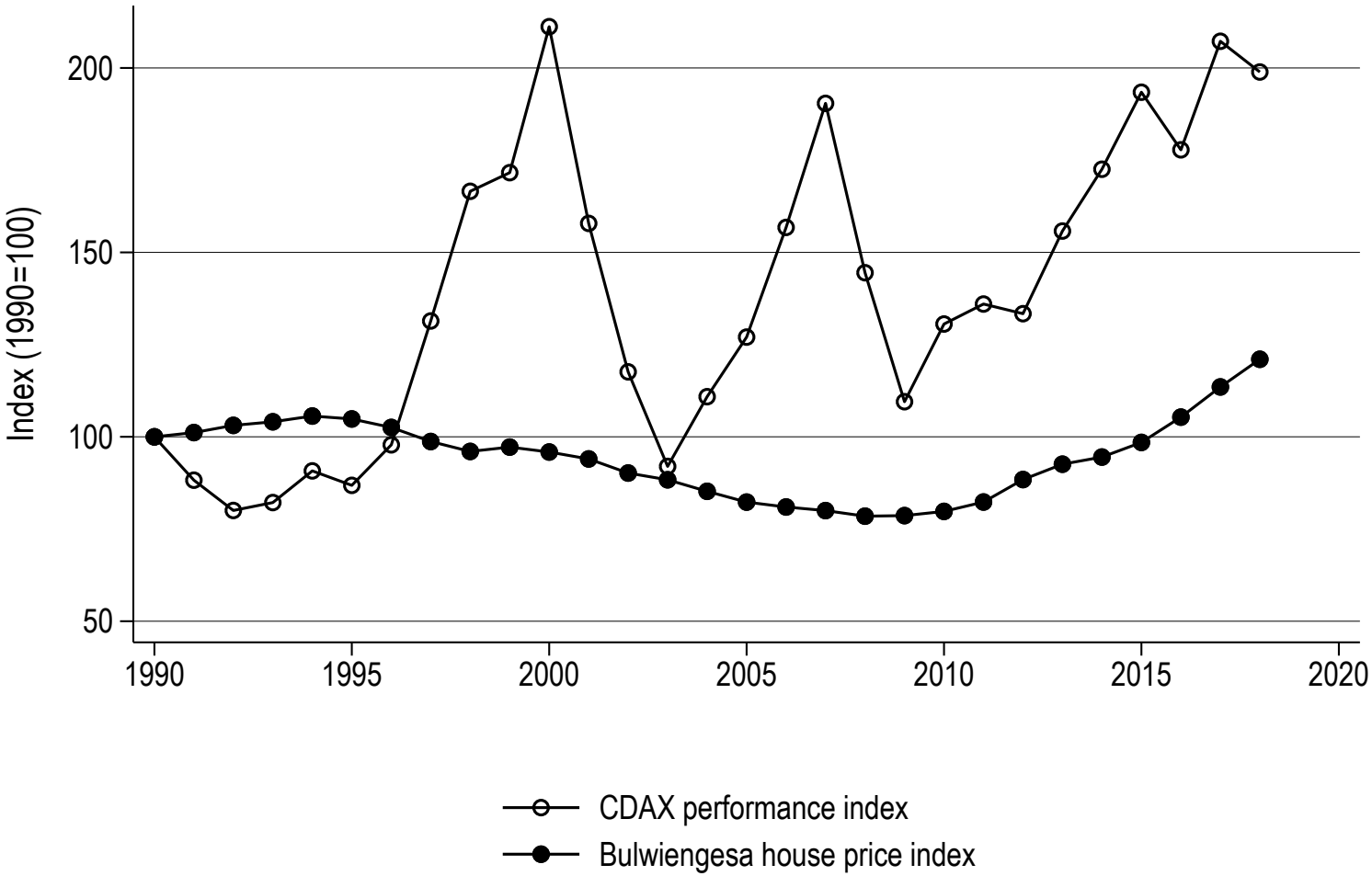
Source: Top-corrected and uprated survey data.

Stock price growth, 1900-1960



Source: Gielen (1994). back

Asset price growth, 1990-2018



Note: Excess price growth over consumer price growth.

Pareto interpolation for top shares and Gini

The **standard Pareto distribution** is characterized by a **single Pareto coefficient** $b = \frac{\overline{w}}{w}$:

$$F(w) = 1 - (w/k)^{-b/(b-1)}, \; w \geq k \tag{1}$$

We can assess the Pareto coefficient b from tabulated wealth tax distributions additionally drawing on total wealth and total population data. Rearranging (1) gives the income threshold of richest p%.

Then, the **wealth share of top p%** can be estimated as

$$b \cdot \text{income threshold of richest p\%} \cdot \frac{\text{p\% of total tax units}}{\text{total income}}$$

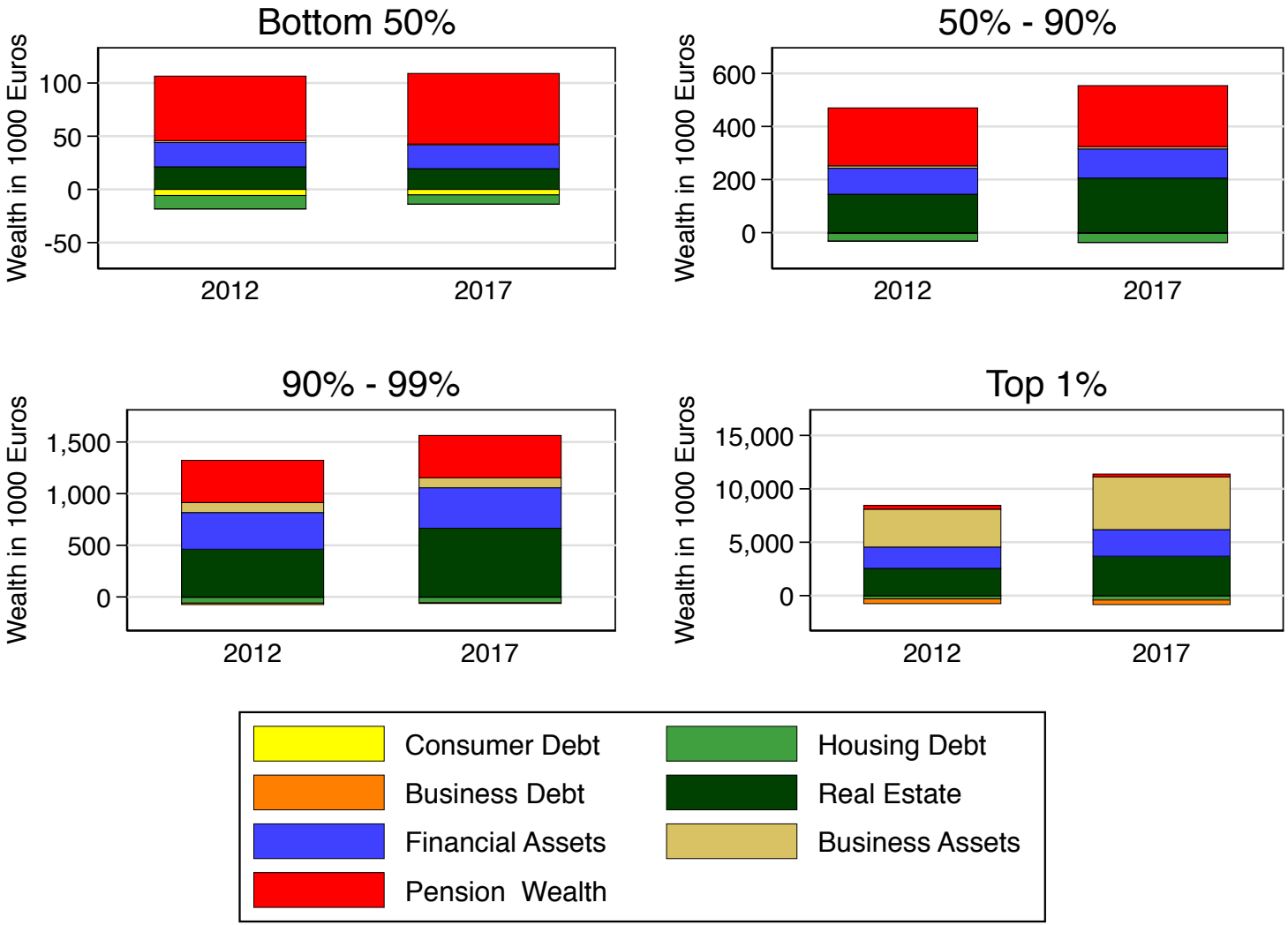
Empirically, b **varies** within the upper tail of observed income and wealth distributions. $\Rightarrow$ **Estimate Generalized Pareto curves** $b(p)$ across top quantiles p to reconstruct the full wealth distribution from tabulated data assuming an asymptotic power law (Blanchet et al., 2017). back

Top-correcting and uprating

1. **Compute each survey percentile's share** $s_{p,a}$ in each asset's aggregate as $s_{p,a} = w_{p,a} / \sum_{p=0}^{p=99} w_{p,a}$, where $w_{p,a}$ is total wealth of percentile p in asset category a.
2. **Adjust** $s_{p,a}$ **above the 99th percentile** upwards with the shares implied by the **MM-list** to obtain the top-corrected percentile shares $s_{p,a}^{tc}$.
3. **Distribute aggregate wealth** T_a of each asset type a across the distribution according $s_{p,a}^{tc}$.
4. Compute **each percentile's top-corrected and uprated total net wealth** tnw_p as $tnw_p = \sum^{a} s_{p,a}^{tc} \cdot T_a$.

▸ back

Distribution of pension wealth



Source: Bartels/Bönke/Glaubitz/Grabka/Schröder (2023)

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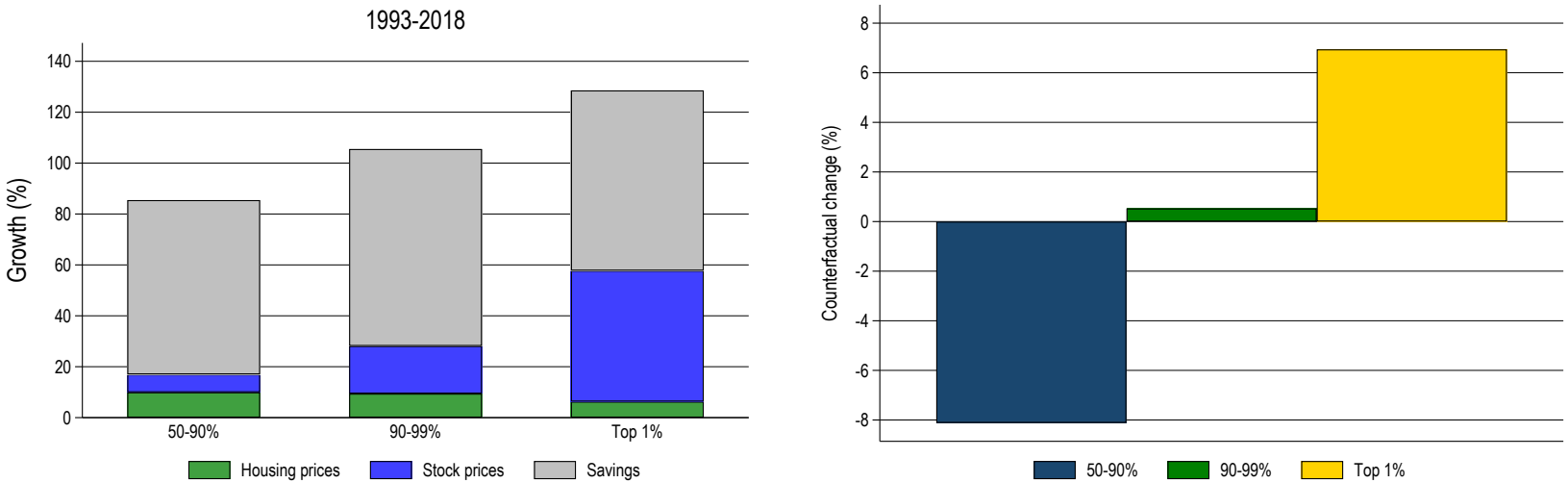
Counterfactual wealth growth: US savings rates



Source: Top-corrected and uprated EVS.
Note: Synthetic savings rates for top 1%: 35% in US and Germany; 90-99%: 15% in the US and 30% in Germany; 50-90% 0% in the US and 20% in Germany.