LISER
LUXEMBOURG INSTITUTE OF SOCIO-ECONOMIC RESEARCH

Missing the wealthy in the HFCS
Micro problems with macro implications

Sofie R. Waltl[1] and Robin Chakraborty[2]

[1]LISER - Luxembourg Institute of Socio-Economic Research

[2]Deutsche Bundesbank

1st WID.world Conference
Paris School of Economics
December 15, 2017

This project has mainly been carried out during the authors' employment at the European Central Bank and within the work of the *ECB Expert Group on Linking Macro and Micro Data for the Household Sector*. The usual disclaimers apply.

Distributional National Accounts (DINA)

- Distributional information as addition to National Accounts (NA)
- Integrate distributional information into framework predominantly used by central banks for economic analyses, forecasting and policy design
- Enable a consistent and comprehensive discussion about inequality and distribution
- Information for the public, targeted policy design and analysis, research, etc.

Why linking micro and macro data?

- Macro data embedded in the System of National Accounts links all sectors of the economy
- NA data are quite harmonized globally (SNA). In Europe, the ESA 2010 standard is legally binding for EU member states.
- Break-downs (by income/wealth quintiles, socio-economic indicators) should add up to macro totals to avoid confusions.
- Linking micro and macro data means exploiting the strengths of each source:
  - NA are good for aggregates
  - HFCS is good for distributional structure
- Linked data leads to a better understanding of macro phenomena (e.g., where does growth come from? who is affected by certain macro policies?)

Current institutional initiatives

- OECD-Eurostat Expert Group (mainly: income and consumption)
- ECB Expert Group on Linking Macro and Micro Data for the Household Sector
  - launched in December 2015
  - exclusive focus on wealth
  - long-term goal: DINA for wealth
  - assessment of the use of the HFCS for distributional breakdowns

How to Measure Wealth Distributions?

Tax data

- **Income Capitalization Method**
- **Estate Multiplier Method**
- Direct Taxes on Wealth

Household Survey Data

- HFCS (Household Finance and Consumption Survey)
- US Survey of consumer finances, UK Wealth and Assets survey, etc.

Pros and Cons of using Survey Data I

- 👍 All asset classes and liabilities obtained from one data source
- 👍 Asset classes that do not generate income flows are included (owner occupied housing)
- 👍 Direct link to socio-economic characteristics potentially leading to detailed break-downs
- 👍 Harmonization of data source across countries
- 👍 Possibility to cross-check and correct answers based on register data

Pros and Cons of using Survey Data II

- 👎 Reporting errors (intentional and unintentional)
- 👎 Sampling errors
- 👎 Bad representation of top tail (Vermeulen, 2016, 2017) – oversampling increases precision but cannot remove non-participation bias
- 👎 Long time spans between survey waves

- 👉 Self-valuation (households have lots of information but they are no experts – questionable results for real estate and equity)
- 👉 Consistant definitions in survey and NA (challenging but possible)

The Household Finance and Consumption Survey (HFCS)

- Coordinated by the European Central Bank and carried out by National Central Banks and some National Statistical Institutes in Europe
- Harmonised methodology leaving room for country-specific implementation
- General purpose survey: focus on assets and liabilities plus
  - Demographic information and Employment status
  - Income
  - (some information about) Consumption
  - Inheritances and gifts
- 1st wave in 2010, covering 15 countries
  2nd wave in 2014, covering 20 countries
  3rd wave fieldwork partly finalised / in progress

DINA and the HFCS

(1) Bottom-up approach: from instrument to net worth

(2) Bridging instruments between NA and HFCS $\rightarrow$ identify conceptual discrepancies and work on improvements

DINA and the HFCS

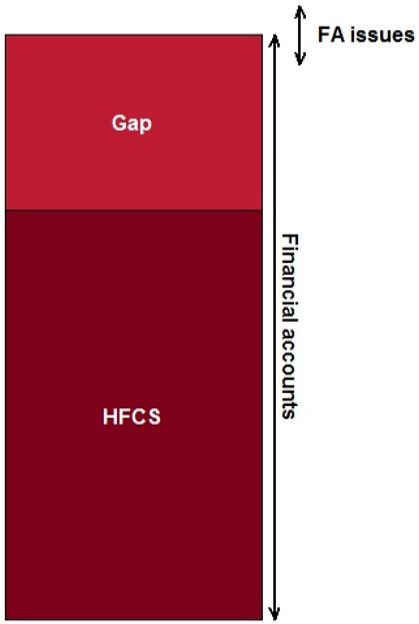
(1) Bottom-up approach: from instrument to net worth

(2) Bridging instruments between NA and HFCS $\rightarrow$ identify conceptual discrepancies and work on improvements

(3) micro-MACRO gap: the most common case for highly comparable instruments is under-coverage

$$\text{Coverage Ratio} = \frac{\text{HFCS total}}{\text{NA total}} < 1$$

(4) Understanding the sources of the gap and develop solutions



The missing wealthy

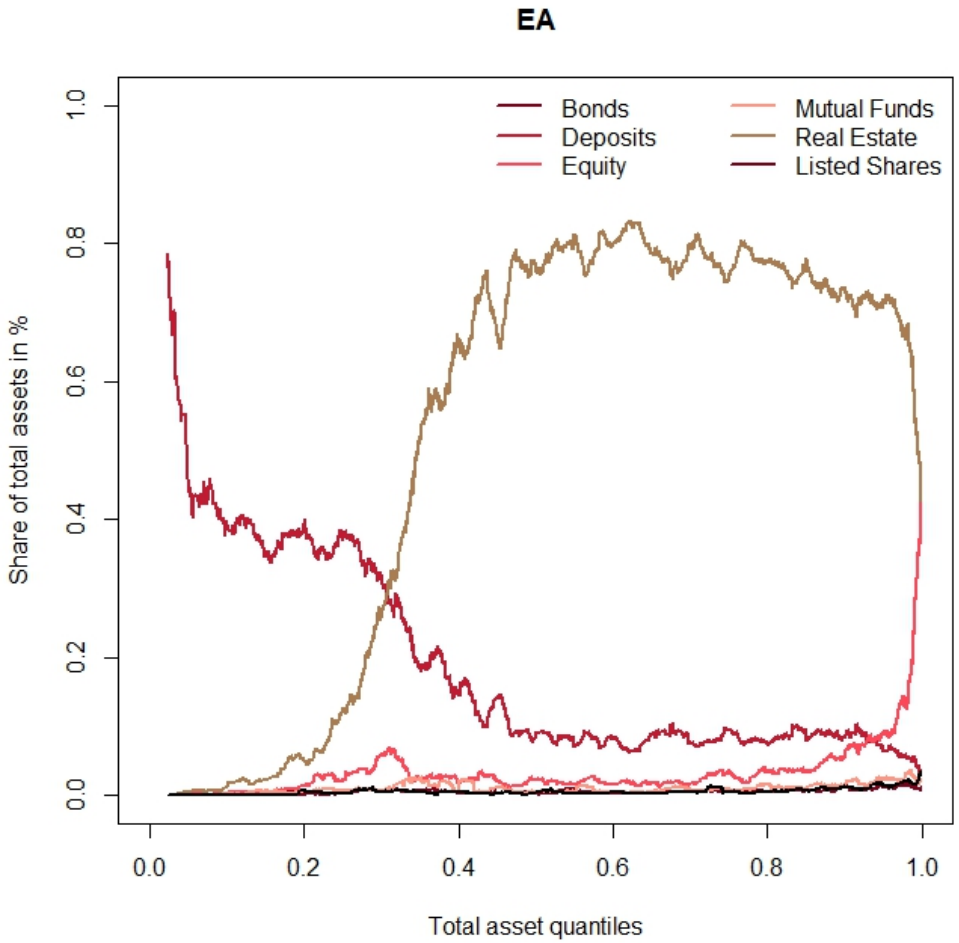
- The top of the wealth distribution is not well reflected in any household survey.
- Replace top tail by parametric model (here: Pareto distribution)

The missing wealthy

- The top of the wealth distribution is not well reflected in any household survey.
- Replace top tail by parametric model (here: Pareto distribution)
- Estimate Pareto model by combining top HFCS observations and rich list data (accepting all its flaws)
- Rich list data: Forbes list (billionaires only), national lists (100-500 obs., national currency)
- Break down adjusted wealth distribution by instruments (relying on HFCS portfolio structure – heavy assumption!)

Portfolio break-down

- Portfolio structures change over the wealth distribution



Portfolio break-down

- Portfolio structures change over the wealth distribution
- Variation also large within the tail (here: ≥ 1 mEUR)
- Split tail Y into 4 quartiles Q_i and apply average portfolio structure per quartile to total wealth per quartile

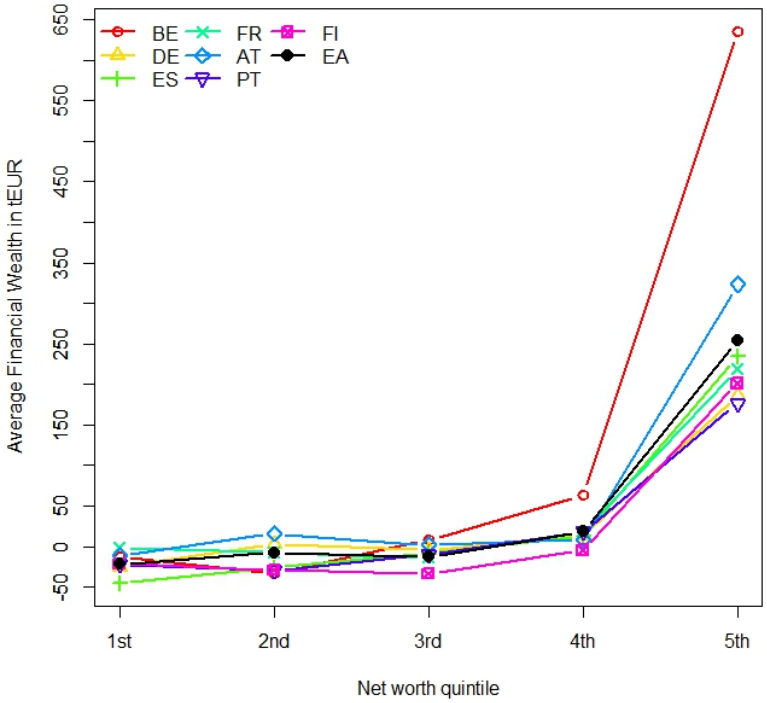
$$0.25 \cdot N_{tail} \cdot \mathbb{E}_{Pareto(\hat{\vartheta})}[Y|Y \in Q_i] \cdot \text{share}_i^{\text{instrument}}$$

- Analytical and numerical (Monte Carlo + bootstrap) approach (tail totals plus insecurity measure)

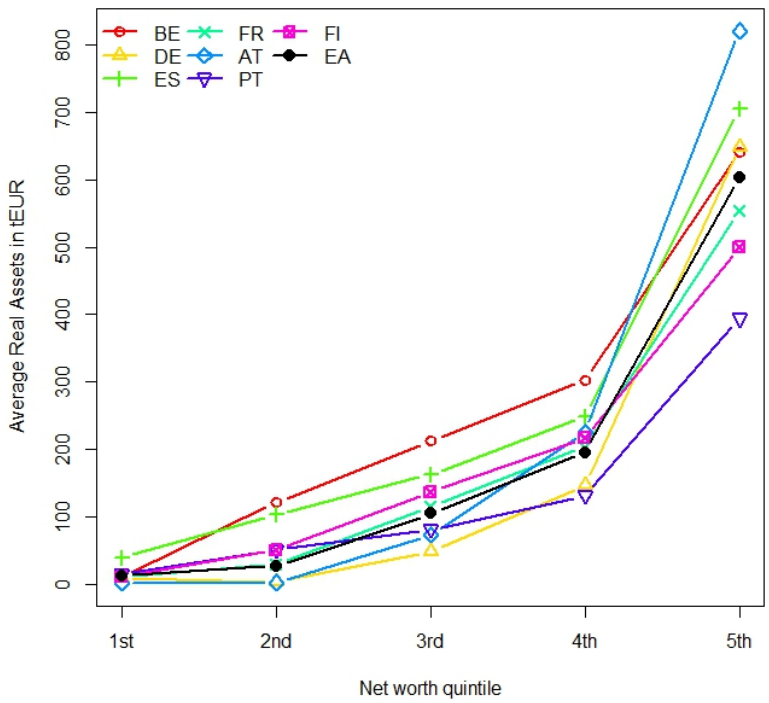
Empirical results

- Large increases for equity (unfortunately not (yet) well comparable to NA definition; HFCS totals exceed NA totals)
- Also increases for other instruments but less pronounced (usually up to 10 pp)
- Still substantial gap in coverage ratios
- Increases are larger for countries that do not oversample the wealthy
- Robustness checks: General results not very sensitive towards modelling choices

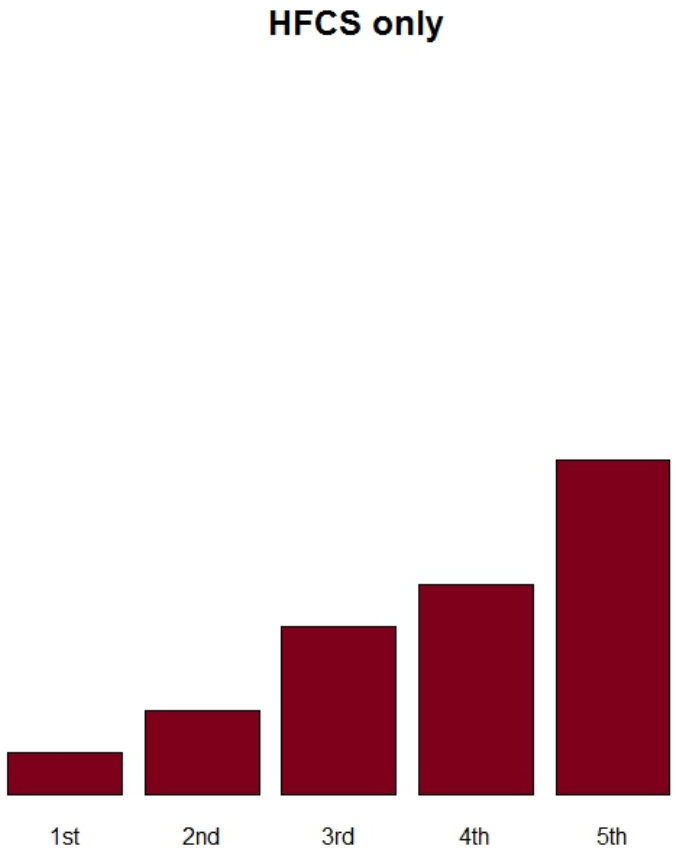
Financial Wealth

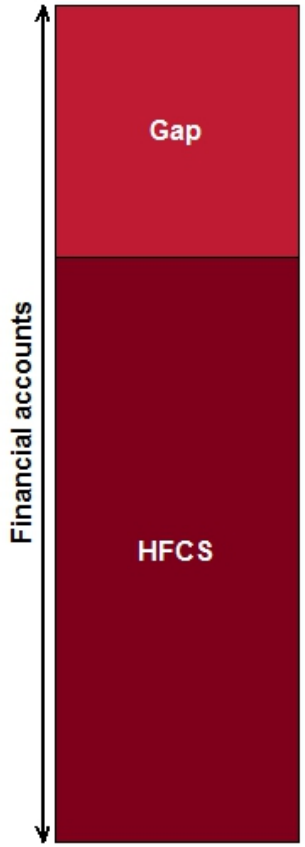


Housing Wealth

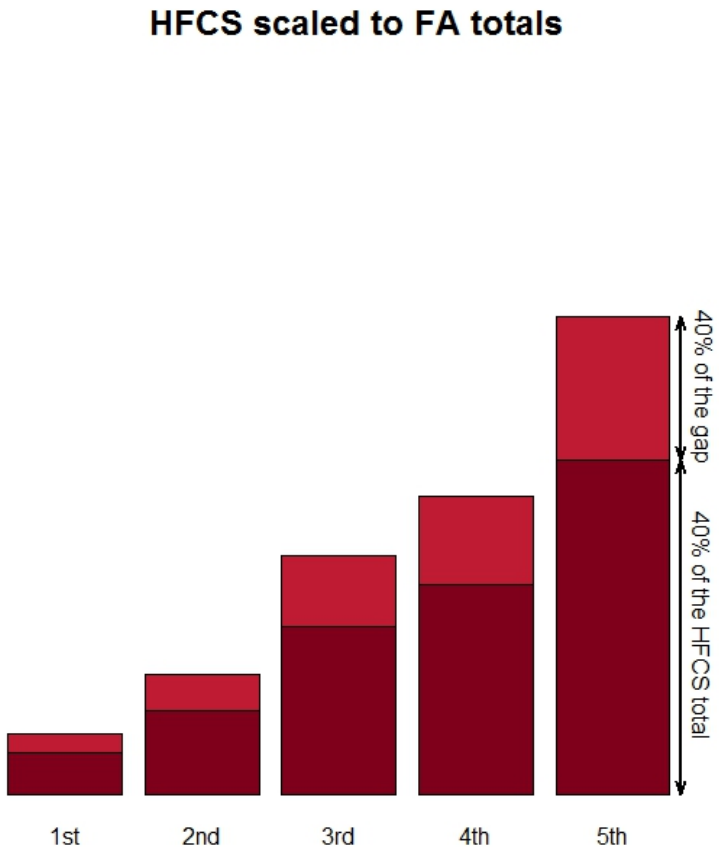


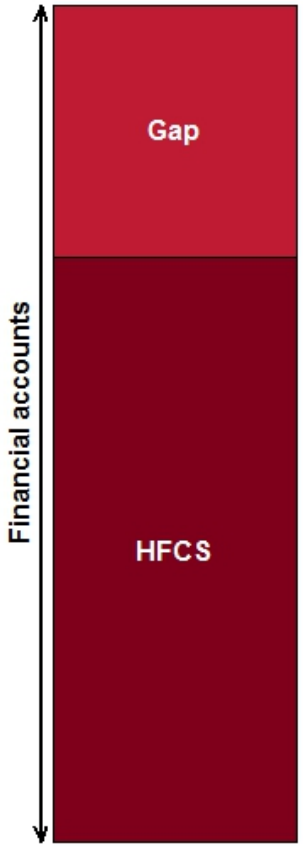
How to use results for DINA



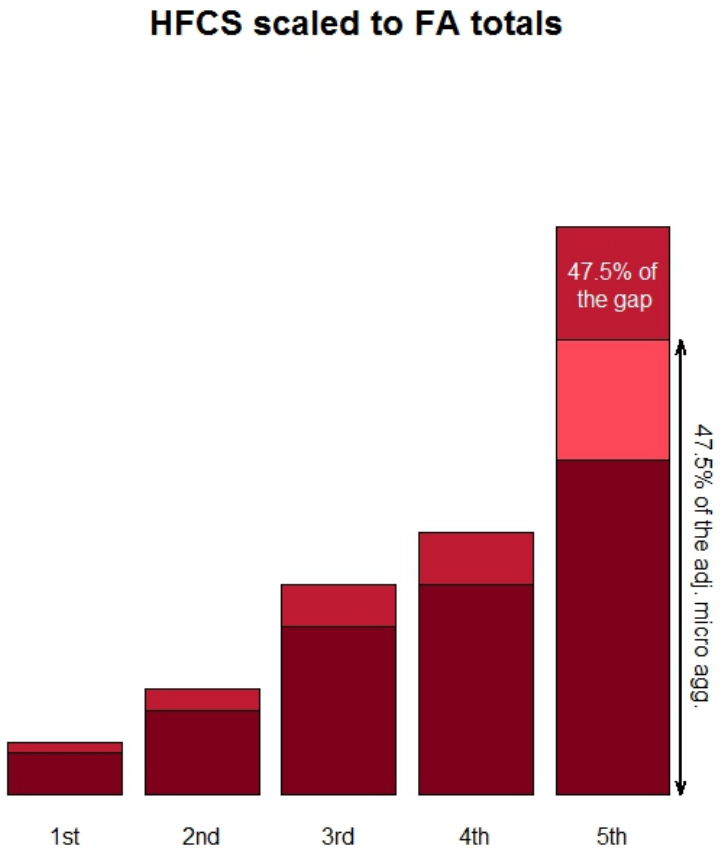


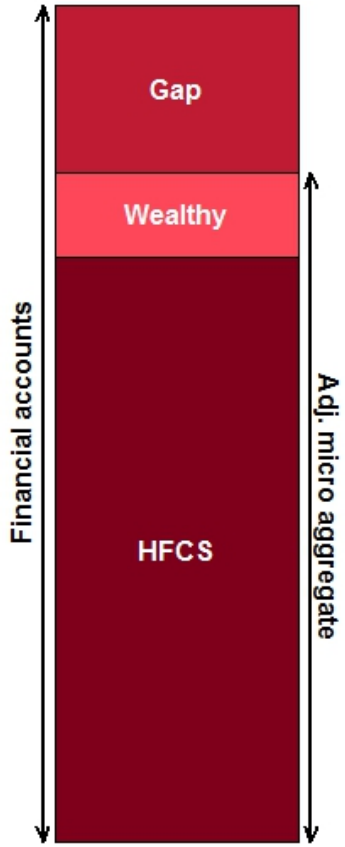
How to use results for DINA

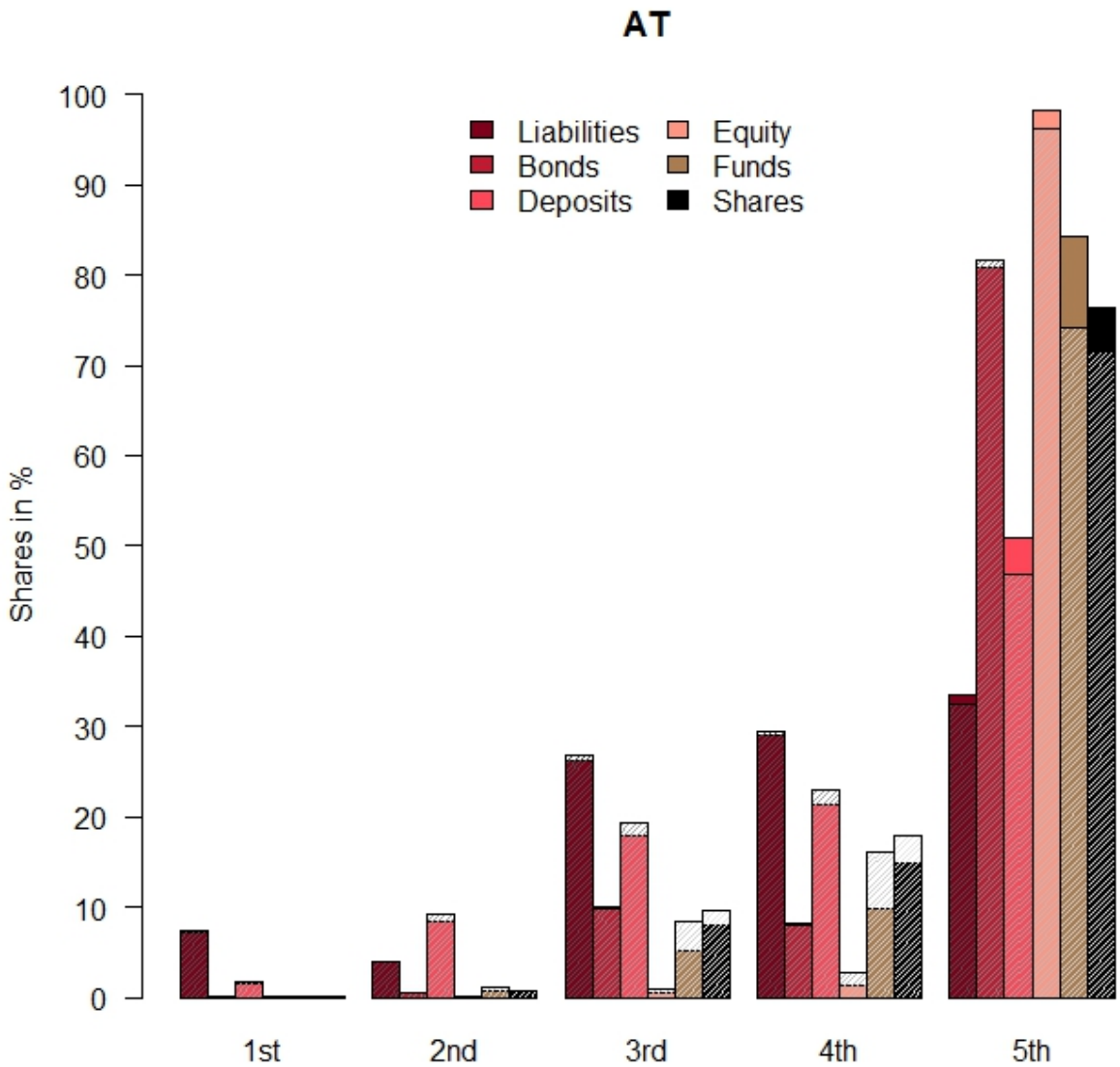




How to use results for DINA






AT
Liabilities
Bonds
Deposits
Equity
Funds
Shares
Shares in %
0
10
20
30
40
50
60
70
80
90
100
1st
2nd
3rd
4th
5th

Robustness Check: France

- Wealth shares computed via a (mixed) income capitalisation method: `WID.world` (i.e., we "know" how much of total wealth the top x% possess)
- Assumptions:
  - HFCS is correct for the entire distribution except the top 3% (millionaires)

$$\text{true wealth} = \text{observed wealth} + \varepsilon$$

  - Tail follows Generalized Pareto Distribution (Blanchet et al., 2017)
  - True wealth share held by the top 3% is correctly measured in WID
  - Portfolio shares observed in the HFCS are representative for the top (again: quartile-specific approach)

	Before adjustment	Adjusted coverage ratios: Top 3% share	Forbes list	CAPITAL list
Liabilities	84.13	87.46	87.96	87.74
Deposits	47.13	49.25	49.95	49.83
Bonds	21.46	27.41	29.91	29.32
Mutual Funds	24.42	27.66	29.61	29.34
Equity	137.96	158.30	172.55	169.40
Shares	90.44	111.36	125.20	123.06

Conclusions I

- There truly seems to be something missing at the top
- . . . and it's mainly equity.
- Making equity more comparable between NA and HFCS is essential.
- Harmonization of over-sampling strategies would be beneficial.
- Adjustment to account for the missing wealthy works well, as long as there is *one* piece of external information (rich list, average wealth of the richest x households, etc.)
- More information about portfolio structures at the very top would be helpful – where to find?

Conclusions II

- *Once we've understood* the shortcomings in the HFCS / NA and found methods to adjust for it, the HFCS seems to be well suited for the compilation of DINA. Very high degree of harmonization possible.
- Wealth inequality in Europe is striking!


The missing wealthy?
Thanks!

References

Blanchet, T., Fournier, J., and Piketty, T. (2017). Generalized pareto curves: Theory and applications. *WID.world WORKING PAPER SERIES*, 2017/3.

Vermeulen, P. (2016). Estimating the top tail of the wealth distribution. *American Economic Review*, 106(5):646–650.

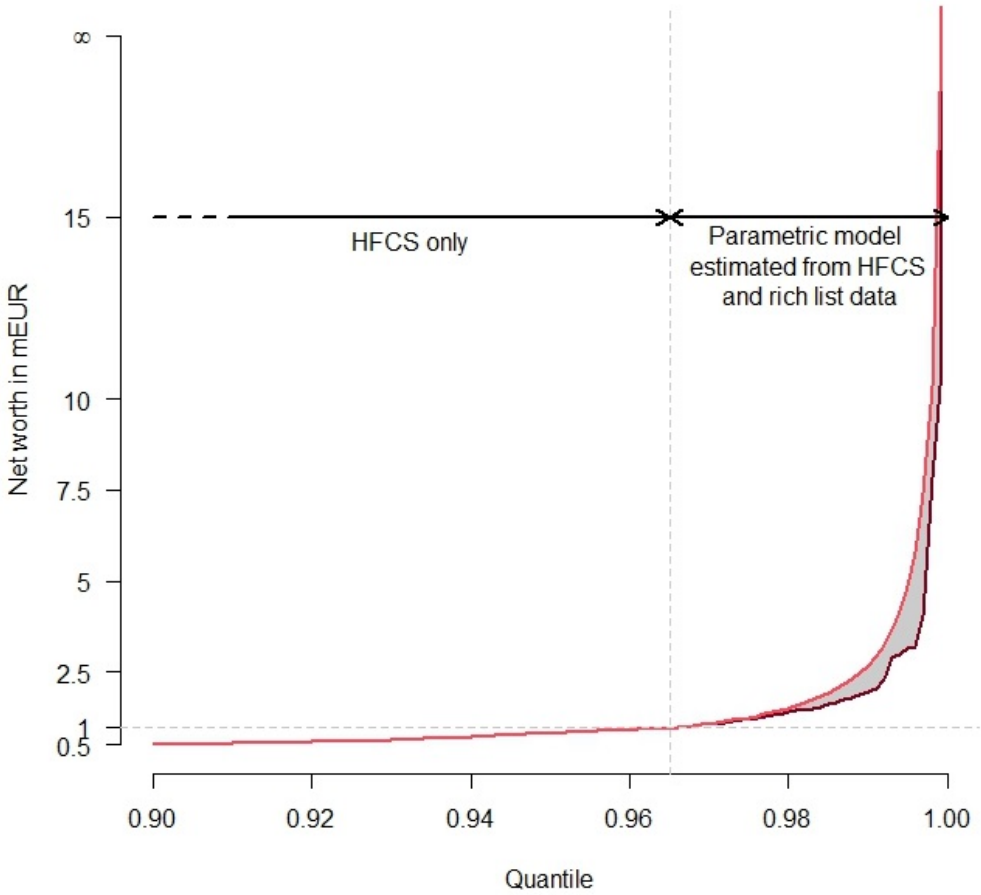
Vermeulen, P. (2017). How fat is the top tail of the wealth distribution? *Review of Income and Wealth*, forthcoming.

Consistency of DINA

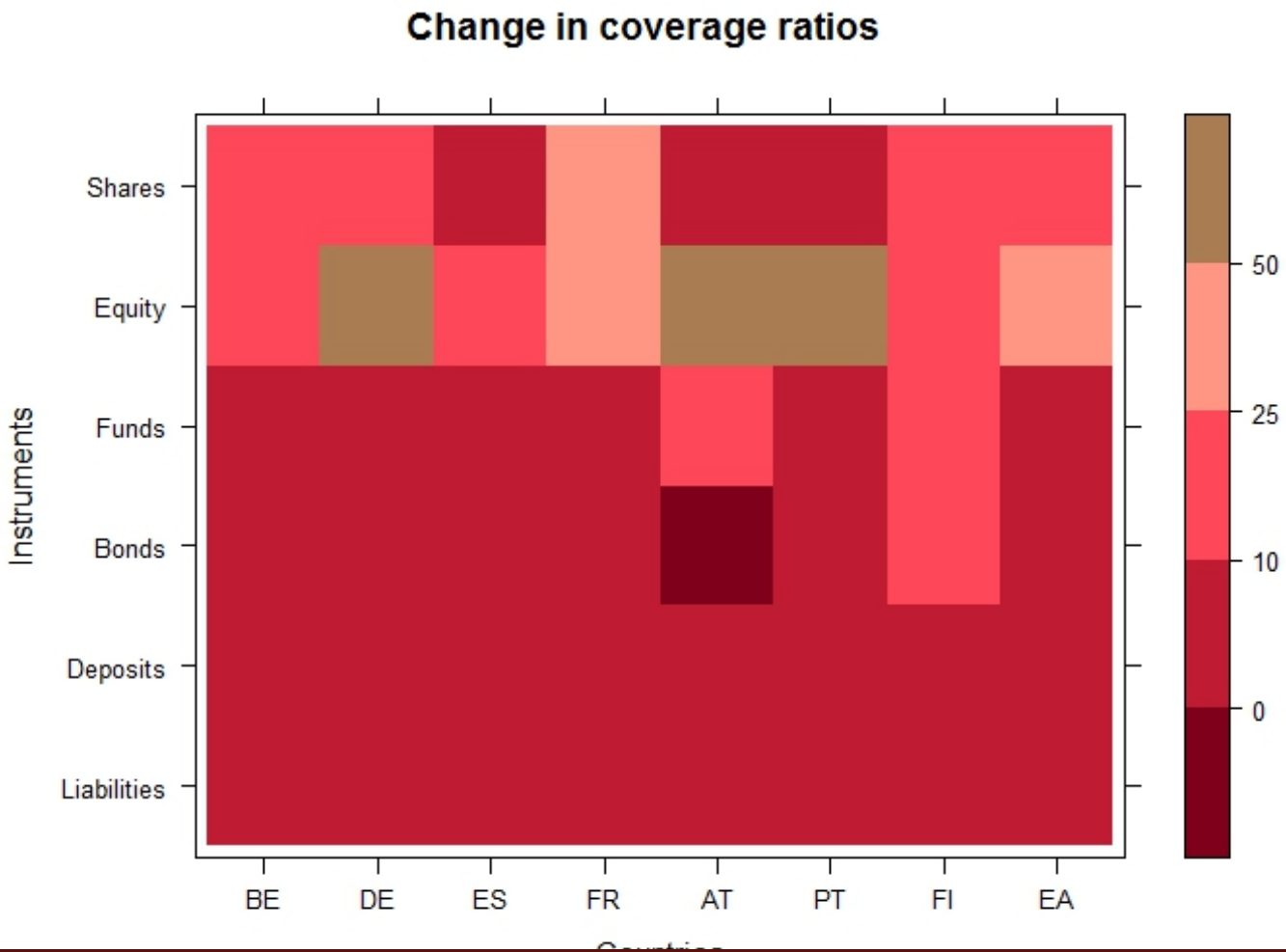
DE – Germany

	1st	2nd	3rd	4th	5th	Total
-Liabilities	-221,750	-50,051	-311,046	-356,566	-624,171	-1,563,584
Bonds	14	326	1,764	16,764	151,152	170,019
Deposits	20,326	75,095	238,026	389,579	1,116,170	1,839,197
Equity	342	886	4,741	8,706	487,563	502,237
Mutual Funds	1,256	1,561	29,472	49,102	348,842	430,233
Financial Wealth	-199,811	27,816	-37,044	107,584	1,479,556	1,378,102

Illustration: Semi-parametric approach



Change in Coverage Ratios after adjustment



Coverage Ratios in AT and DE

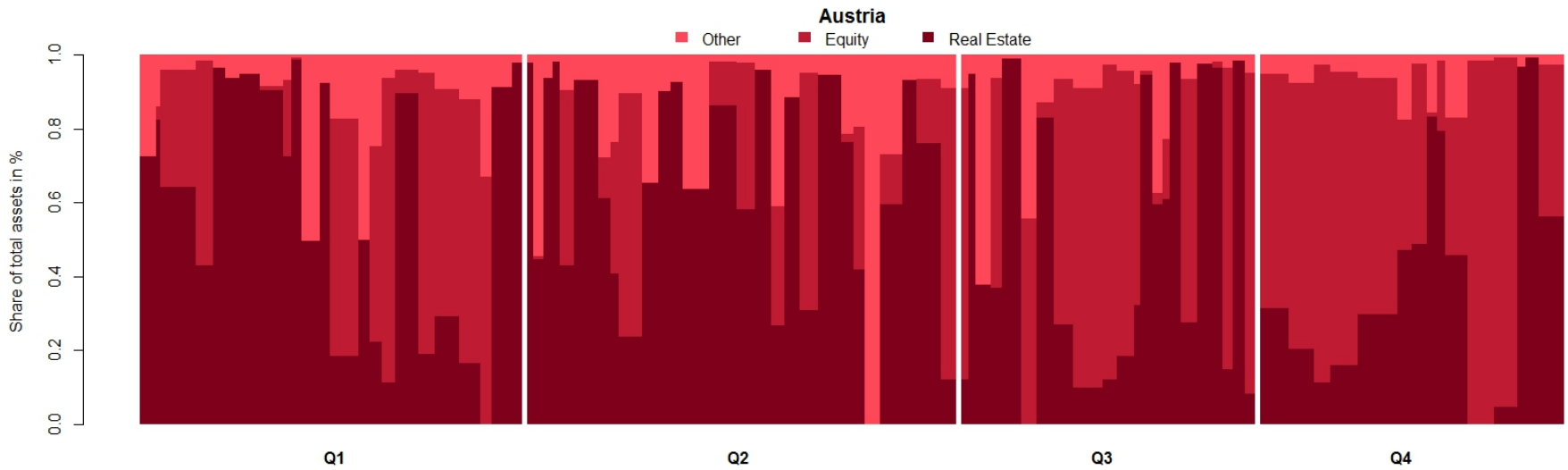
AT – Austria

	Observed CR	Adjusted CR	95% confidence interval for CR	Change in CR
Liabilities	39.58	40.24	(39.84; 41.24)	0.66
Bonds	12.90	12.42	(12.34; 12.50)	-0.48
Deposits	45.74	49.37	(47.96; 52.93)	3.63
Equity	155.71	320.41	(259.77; 449.02)	164.70
Mutual Funds	35.55	58.08	(49.27; 78.85)	22.53
Financial Wealth	95.28	180.67	(150.06; 245.33)	85.39

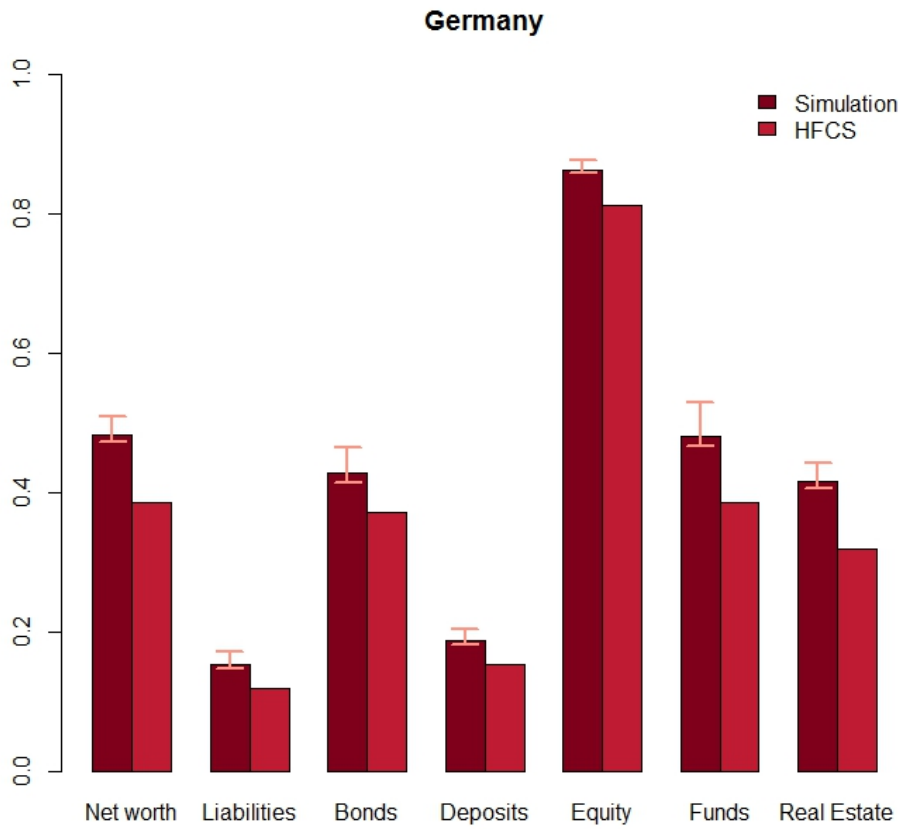
DE – Germany

	Observed CR	Adjusted CR	95% confidence interval for CR	Change in CR
Liabilities	65.29	67.99	(67.50; 69.34)	2.70
Bonds	42.30	46.67	(45.30; 49.71)	4.37
Deposits	54.80	57.23	(56.77; 58.24)	2.44
Equity	264.03	363.12	(347.28; 403.72)	99.09
Mutual Funds	48.08	57.33	(55.35; 62.91)	9.25
Financial Wealth	115.50	155.23	(148.87; 171.40)	39.72

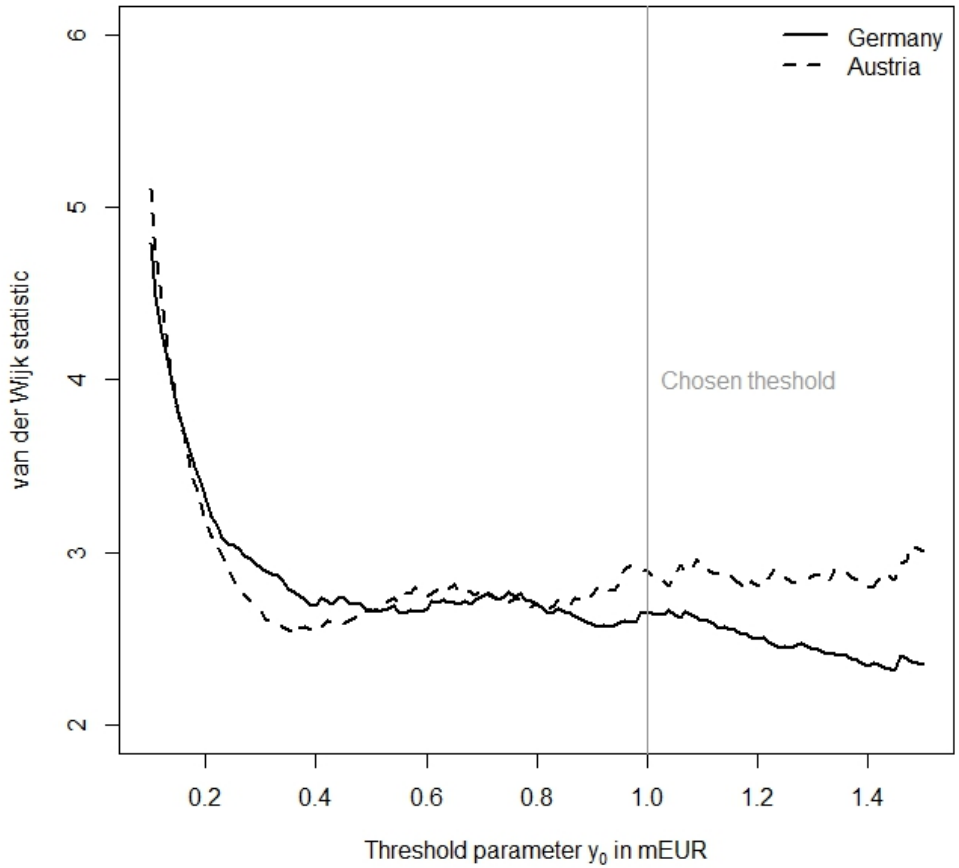
Observed tail portfolios in Austria



Shares held by millionaires in Austria



Robustness: Pareto threshold parameter



Alternative estimation of the Pareto shape parameter