Do Homeowners Save More Than Renters? – Evidence from the German Wealth Survey

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Motivation

- **Homeowners** exhibit **higher wealth levels** than renters in Germany and many other countries

GERMANY	Net wealth in euro 2014		Financial assets in euro 2014	
	Mean	Median	Mean	Median
Renters	54,700	10,500	34,500	7,000
Owners with mort.	336,900	155,500	67,800	33,500
Outright owners	477,800	270,000	104,900	45,500

- **Why do these differences exist?**

  a. **House prices** may increase stronger than returns to other/financial assets: between 1970 and 2010 growth rate for real house prices in Germany: -0.001 (var: 0.01), increasing prices only since 2010

  b. Only **certain types** of households own main residence: **indeed, owners** differ in many aspects from renters (higher incomes, older, married, inheritances)

  c. **Homeowners save more** than renters

- Understanding **differential savings behavior** important for understanding **aggregate consumption and saving dynamics**

- Studying renters' and owners' consumption and savings decisions informs new models with **heterogeneous agents**

Structural differences – Renters versus Owners

Germany	Annual gross household income	Annual net household income	Household Size	Age of main income earner	Gift or inheritance	Married Couple
	Mean	Mean	Mean	Mean	Share	Share
Renters	36,250	23,050	1.84	49	21%	45%
Owners with mort.	76,030	45,780	2.72	49	35%	75%
Outright owners	56,050	32,950	1.98	63	41%	78%
Total	348,400	29,580	2.02	53	29%	59%

- **Owners** with and without mortgage have **higher incomes** than renters
- **Owners** are **on average older** than renters
- **Owner households** are **larger** than renter households
- **More owners than renters** have received substantial **gifts or inheritances**

=> Structural **differences need to be taken into account** when comparing wealth levels of renters and owners

Theory: Homeownership and Savings Behavior

- Homeowners (or the rich) have a **higher propensity to save** …
  (Sheiner, 1995; Grunert, 2003; Flavin and Yamashita, 2002; Charles and Hurst, 2002; Dynan et al. 2004, Alan et al. 2014, Gross, 2017)
  - ➢ Homeowners continue to save more after purchasing a home

- … **or not?**
  (Di et al., 2007; Krumm and Kelly, 1989; Skinner, 1989, 1994; Lersch 2014)
  - ➢ Homeowners reduce savings and substitute them with mortgage repayments

- Housing and mortgage repayments as a commitment device for saving
  (Schlafmann 2016; Kovacs & Moran 2017)
  - ➢ Household behavior consistent with “temptation preferences”
  - ➢ Mortgages and housing as self-control devices to discipline behavior

- House price appreciation as passive saving
  (Campbell and Cocco, 2007; Attanasio et al., 2011; Engelhardt, 1996)
  - ➢ Strong consumption/saving effect of house price changes

Research Questions

- Budget Constraint: $\text{Consumption}_t + \text{Savings}_t = \text{Income}_t + (1+r)\ \text{Savings}_{t-1}$

  - **Owners:**
    Consumption_t + $\text{Mortgage Repayments}_t$ + $\text{Unsecured (Consumer) Loan Repayments}_t$ + Savings_t
    = Income_t + (1+r) Savings_{t-1}

  - **Renters:**
    Consumption_t + $\text{Unsecured (Consumer) Loan Repayments}_t$ + Savings_t
    = Income_t + (1+r) Savings_{t-1}

- **Do homeowners in Germany save more than <u>comparable</u> renters?**

- **Do homeowners in Germany with a mortgage substitute loan repayments and other savings?**

The German Context

- Germany's **housing market** characterized by:
  - low homeownership rate 44.2% in 2010 and 2014 (EA 2010: 60%; 2014:61%) and a well-developed rental market
  - relatively stable house prices up until 2010 (HFCN 2013, Christelis et al 2013), increases between 2010 and 2014
  - high transaction costs: up to 10% of house price for brokerage fee, notarial act, tax authorities
- **Mortgage** markets:
  - taking a loan typically requires substantial equity (70-80% LTV at origination)
  - banks require monthly repayments on mortgages
  - mortgage payments in most cases annuity payments combining interest and repayment
  - mortgage interest rates on the HMR are not tax deductible
- **Savings**:
  - Germans save in (long-term) contracts
  - prematurely dissolving long-term contracts is costly

=> The German context is particularly interesting for our analysis, as it provides several incentives to save for (prospective) homeowners and offers alternative illiquid savings vehicles for renters

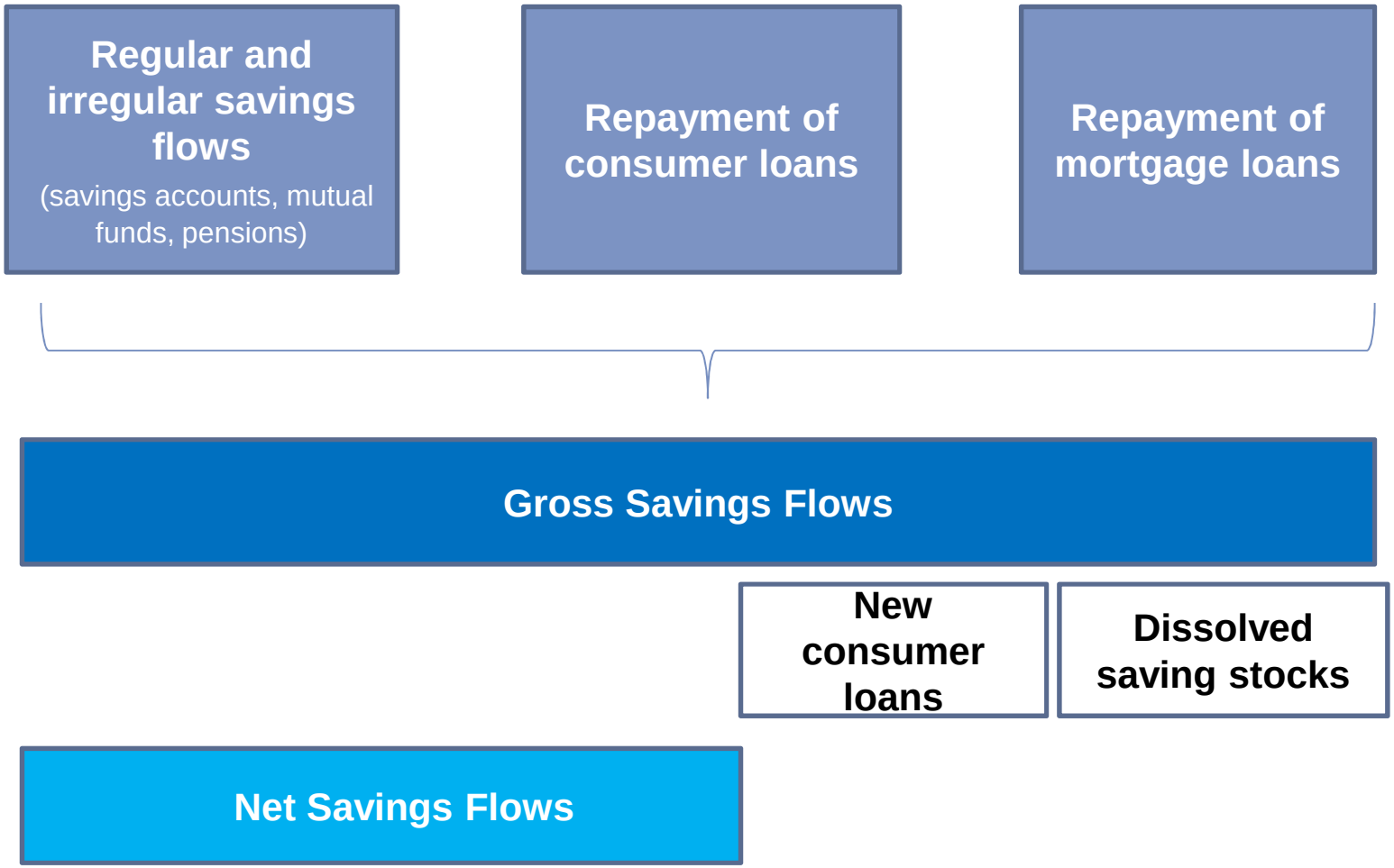
Contributions and Empirical Approach

- Use **unique micro-data** on wealth and **savings flows** from large scale panel of private households
- Separate **different types of savings flows**: financial assets, loan repayments, …
- Distinguish between **homeowners with** and **without mortgage and renters**
- **(Panel) Matching** estimator to control for **difference in characteristics** between owners and renters

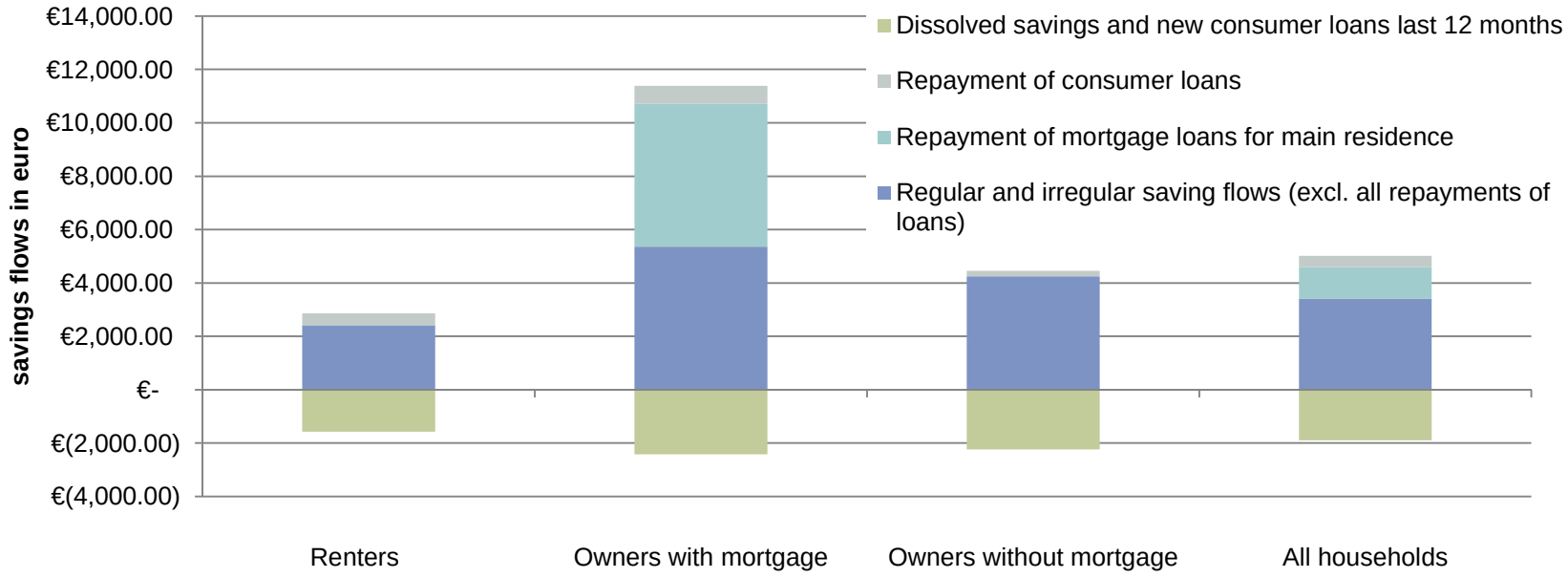
Database

- German wealth survey **“Panel of Household Finances” (PHF)** - Wave 1 and 2:
  - Voluntary CAPI face-to-face interviews with private households in Germany in 2010 and 2014:
    - Wave 1 (9/2010 - 6/2011): 3,565 households
    - Wave 2 (4/2014 - 10/2014): 4,461 households of which 2,139 panel households
  - Collects information on private households’ asset and debt holdings, income and several socio-demographic characteristics
  - Details on financial assets and debt contracts
- Questions on living arrangements: owner of main residence vs. renter
- Special **module on active savings**:
  - qualitative and quantitative data on regular savings attached to financial assets
  - information on all private and occupational pension savings for individuals 16+
  - summary question on discretionary savings
  - details on debt repayments

Composition and Key Variables on Savings Flows



Descriptive Statistics – Average Annual Gross and Net Savings Flows



	Renters	Owners with mortgage	Owners without mortgage	All households
Net Savings Rate	*6.3%*	*20.9 %*	*8.8 %*	*11.3 %*

- **Homeowners** have **higher average annual savings flows** than renters regardless of indicator
- **Owners save more**, even without considering mortgage repayments
- However, **fundamental structural differences between renters and owners**
- Owner households are on average larger, richer, more likely to live in rural areas

Empirical Approach - Matching Estimator I

- Compare **owners with mortgage to renters with similar/same characteristics** to answer question:

  How would the savings flows of a homeowner look, if she were a renter?

- Too few observations that change ownership status to use Diff-in-Diff on panel samples

	W2: Renters	W2: Owners	W2: Total
W1: Renters	749	84	833
W1: Owners	59	1,247	1,306
W1: Total	808	1,331	2,139

⇒ **Matching approach**: Match owners with mortgage to renters with same characteristics within and across waves to **account for selection on observables and unobservables**

- „Conditional difference-in-difference“ (Heckman et al. 1998)
- „Matching with difference-in-difference“ (Blundell and Costa Dias 2000)

Empirical Approach - Matching With Diff-in-Diff I

Three separate matchings required:

A) <u>treated with untreated within wave 2</u>

- standard matching accounts for selection on observables
- identify control group for match C

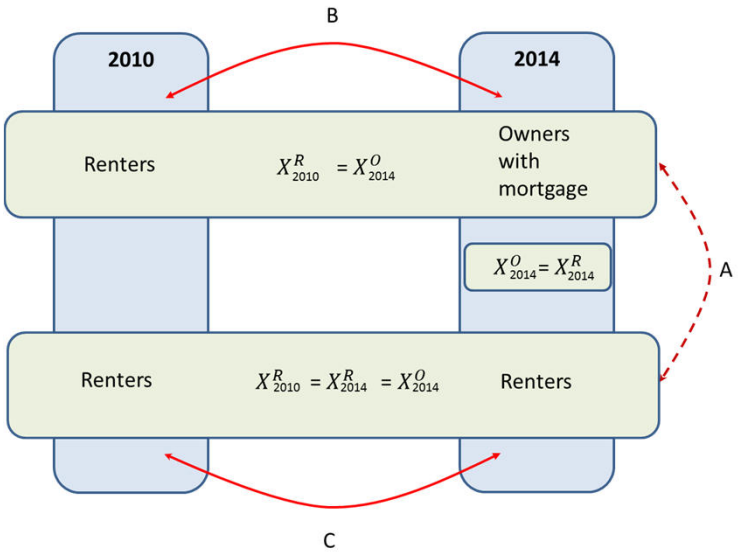
B) <u>treated from wave 2 with untreated from wave 1</u>

- mimics classic “Diff-in-Diff” in panel setting
- controls for individual specific effects

C) <u>Matched untreated in wave 2 (from matching A)</u> with untreated in wave 1

- controls for common macro-trends
- “How would the treated household have behaved if it would have remained in the untreated state?”

=> **Combine** all three matchings **for the average treatment effect of the treated**



$$\alpha_{\mathrm{TT}}^{\mathrm{CDiDRCS}} = (E(Y_{i,t_1}^{\mathrm{T}} | X_{i,t_1} = x, S_{i,t_1} = 1) - E(Y_{k,t_0}^{\mathrm{C}} | X_{k,t_0} = x, S_{k,t_0} = 0)) - (E(Y_{h,t_1}^{\mathrm{C}} | X_{h,t_1} = x, S_{h,t_1} = 0) - E(Y_{j,t_0}^{\mathrm{C}} | X_{j,t_0} = x, S_{j,t_0} = 0))$$

Source: Aerts and Schmidt (2008), adapted

Empirical Approach - Matching With Diff-in-Diff II

- Matching technique: **propensity score** matching with one **nearest neighbour**

- Match **different groups** of households:
  1. Owners with mortgage and renters
  2. Owners with mortgage and owners without mortgage
  3. Owners without mortgage (from matching 2) and renters

- **Propensity score** estimated with the **same covariates for all matchings**:

  - Household net income
  - Household size: number of household members
  - Main income earners' age, marital status, level of education and employment status
  - Household's willingness to take risk and a score for its patience
  - Indicator for substantial inheritance/gift in the past
  - Indicator for households that moved within last three years prior to the survey
  - Indicators for whether the household lives in East Germany and in the city center

Results: Do Homeowners Save More?

		Owners with mortgage vs. renters		Owners with vs. owners without mortg.		Owners without mortgage vs. renters	
	Variable	ATT	Sign.	ATT	Sign.	ATT	Sign.
Gross Savings	Savings flows without any repayments	1163		-575		2454	***
	Only consumer loan repayments included	1224		-439		2090	***
	Only mortgage repayments included	7314	***	5757	***	2485	***
	All repayments included	7370	***	5888	***	2121	***
Net Savings	Savings flows without any repayments	-15		-2135	***	2112	***
	Only consumer loan repayments included	45		-2001	***	1759	***
	Only mortgage repayments included	6118	***	4179	***	2143	***
	All repayments included	6177	***	4313	***	1789	***

- Owners **with mortgage save more** than owners without a mortgage **once mortgage repayments are accounted for …**
- … but **savings in financial** assets **higher for owners without** a mortgage
- **Owners without** a mortgage save more than renters

Conclusions

- Households **owning** their main residence **save more than** comparable renters
  - True for gross and net indicators
  - Stronger for mortgaged households than outright owners

- Owner households **do not substitute** (other) savings with mortgage repayments, but save on top.
  - Owners restrict their (potential) consumption, because they substitute rent with annuity payments (interest + repayment)
    => part of rent becomes saving and is no longer “housing consumption”
    + no substitution of real and financial assets saving
    => save more in net and gross terms
  - Outright owners save more in financial assets than mortgaged households (“learned” to save)
  - Mortgage payments as disciplinary/commitment device

- **Differential savings behavior** can have implications for aggregate consumption and saving
  - Implications for macro savings rate
  - Implications for response to shocks and policy changes
  - Informative for models of household savings and consumption in presence of housing

Future Research

- Analyze **savings behavior at transitions** between ownership states
  - Renters planning to buy
  - Second time buyers
  - Other property purchases
- Extend analysis to **2017** data
  - include house price changes
  - study monetary policy effects
- Investigate mechanisms for different countries and institutional settings

Thank you for your attention !

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Appendix

Net Wealth and Financial Assets by Ownership Status

GERMANY	Net wealth in euro 2010		Financial assets in euro 2010	
	Mean	Median	Mean	Median
Renters	53,500	11,300	31,600	8,300
Owners with mort.	283,200	167,200	64,500	36,500
Outright owners	464,200	257,100	90,000	44,000
	Net wealth in euro 2014		**Financial assets in euro 2014**	
	Mean	Median	Mean	Median
Renters	54,700	10,500	34,500	7,000
Owners with mort.	336,900	155,500	67,800	33,500
Outright owners	477,800	270,000	104,900	45,500

Source: PHF 2010, 2014 all implicates, weighted

Results: Owners with Mortage versus Renters

For renters and owners with a mortgage: Estimate propensity (score) to be **owner with a mortgage** using a probit model

As **expected**:

- larger households
- high income households
- married
- Households which own other property

are more likely to be owners with a mortgage than renters.

Variable	Estimated Coefficients
Household net income	0.000 ***
Household Size 2	0.369 ***
Household Size 3	0.690
Household Size 4	0.860
Married Couple	0.338 ***
Main Income Earner: Age	0.001
Main Income Earner: Medium Education (ISCED 3+4)	0.549 ***
Main Income Earner: High Education (ISCED 5+6)	0.688 ***
Main Income Earner: Unemployed	-0.882 ***
Willingness to take risk (score 0-10)	0.004
Patience (score 0-10)	0.013
Household received gift/inheritance in the past	0.346 ***
Household moved within last three years	-0.632 ***
Household owns other property	0.233 ***
Households lives in East Germany	-0.061
Household lives in city centre	-0.563 ***
Constant	-2.056 ***
Observations	2791
Log-Likelihood	-1333.3521
Pseudo – R2	0.267

Matching: Estimation of the Propensity Scores

Variable	Owners with mortgage vs. renters	Owners with mortgage vs. owners without	Owners without mortgage vs. renters
Household net income	0.000 ***	0.000 ***	0.000 ***
Household Size 2	0.369 ***	0.081	0.483 ***
Household Size 3	0.690	0.287	0.652
Household Size 4	0.860	0.358	0.714
Married Cupple	0.338 ***	0.013	0.349 ***
Main Income Earner: Age	0.001	-0.044 ***	0.006 **
Main Income Earner: Medium Education (ISCED 3+4)	0.549 ***	-0.114	0.600 ***
Main Income Earner: High Education (ISCED 5+6)	0.688 ***	-0.112	0.67 ***
Main Income Earner: Unemployed	-0.882 ***	-0.574	-0.942 ***
Willingness to take risk (score 0-10)	0.004	0.058 ***	0.006
Patience (score 0-10)	0.013	-0.010	0.011
Household received gift/inheritance in the past	0.346 ***	-0.080	0.388 ***
Household moved within last three years	-0.632 ***	0.640 ***	-0.971 ***
Household owns other property	0.233 ***	-0.263 ***	0.394 ***
Households lives in East Germany	-0.061	0.038	-0.136
Household lives in city centre	-0.563 ***	-0.012	-0.473 ***
Constant	-2.056 ***	2.027 ***	-2.548 ***
Observations	2,791	2,505	2,283
Log-Likelihood	-1333.3521	-1344.0032	-921.776
Pseudo – R2	0.267	0.202	0.222

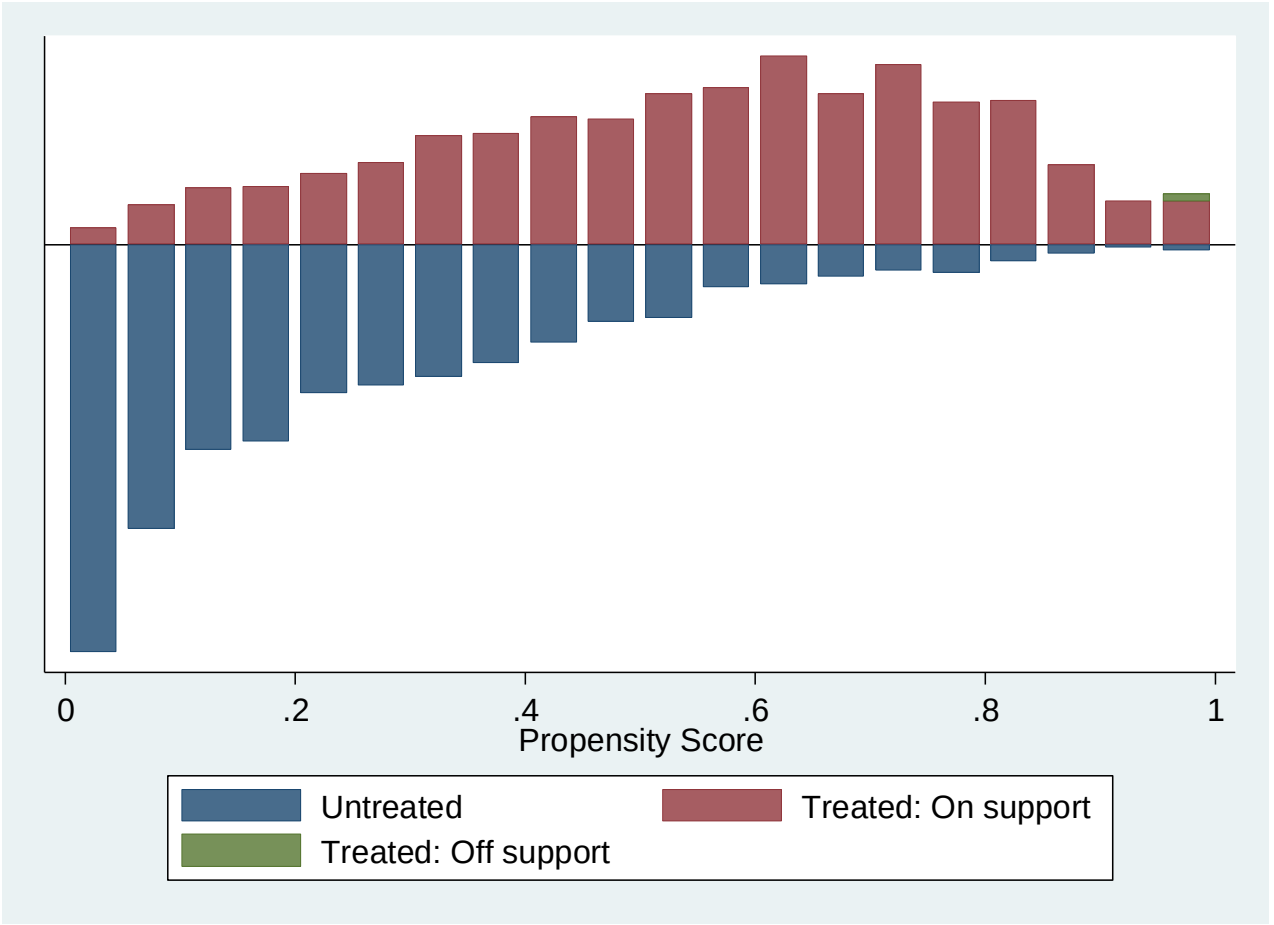
Results: Owners with Mortage vs. Renters

Check matching results/quality (selected list of variables shown)

		Mean		t-test	
Variable		Treated/Owner	Control/Renter	t-value	p>t
Propensity Score	Unmatched	0.556	0.244	36.46	0.00
	Matched	0.554	0.554	0.00	0.997
Annual net	Unmatched	4493.1	2370.6	14.34	0.00
household income	Matched	4246.8	4260.5	-0.11	0.913
Age of reference person	Unmatched	51.955	51.216	1.18	0.239
	Matched	51.918	52.274	-0.58	0.561
Reference person married	Unmatched	0.838	0.528	17.18	0.00
(dummy)	Matched	0.838	0.84	-0.12	0.903
substantial gift/inheritance	Unmatched	0.450	0.252	10.91	0.000
in the past	Matched	0.448	0.453	-0.230	0.822

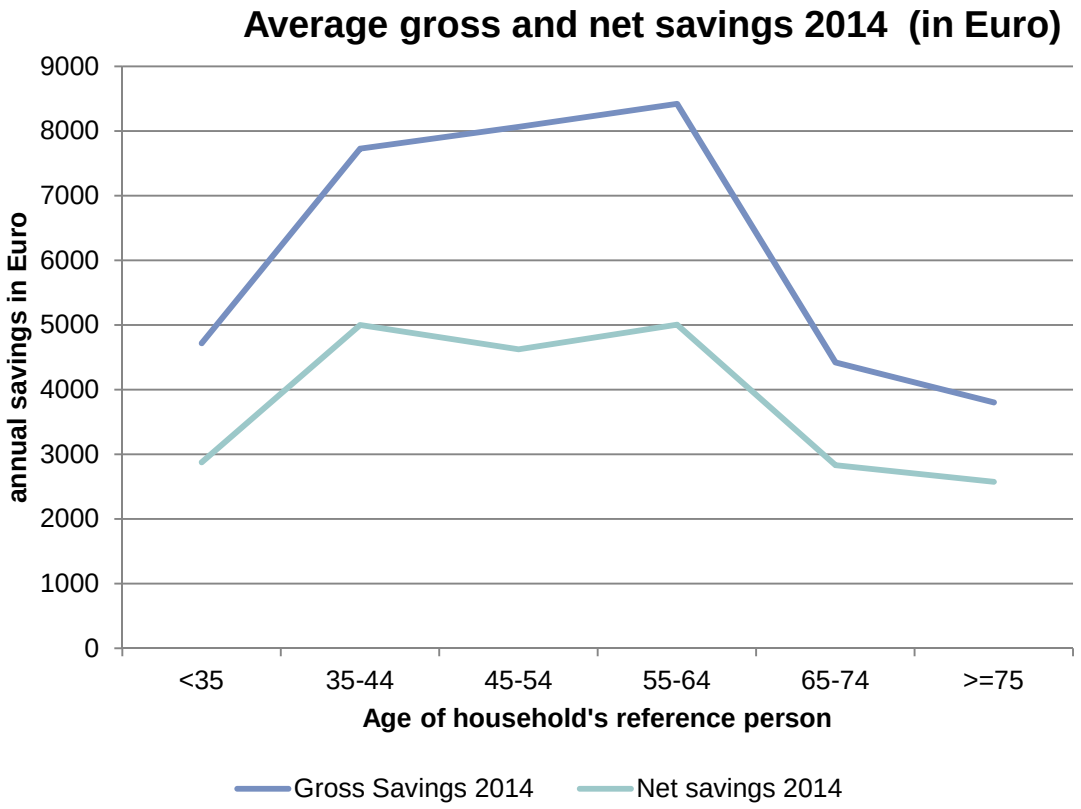
- **Before** matching: **significant differences** e.g. with respect to income or marital status.
- **After** matching: **no significant differences** between treated (“owners with mortgage”) and control (“renters”) remain => matching works

Propensity Scores for Matching of Owners with Mortgage with Renters

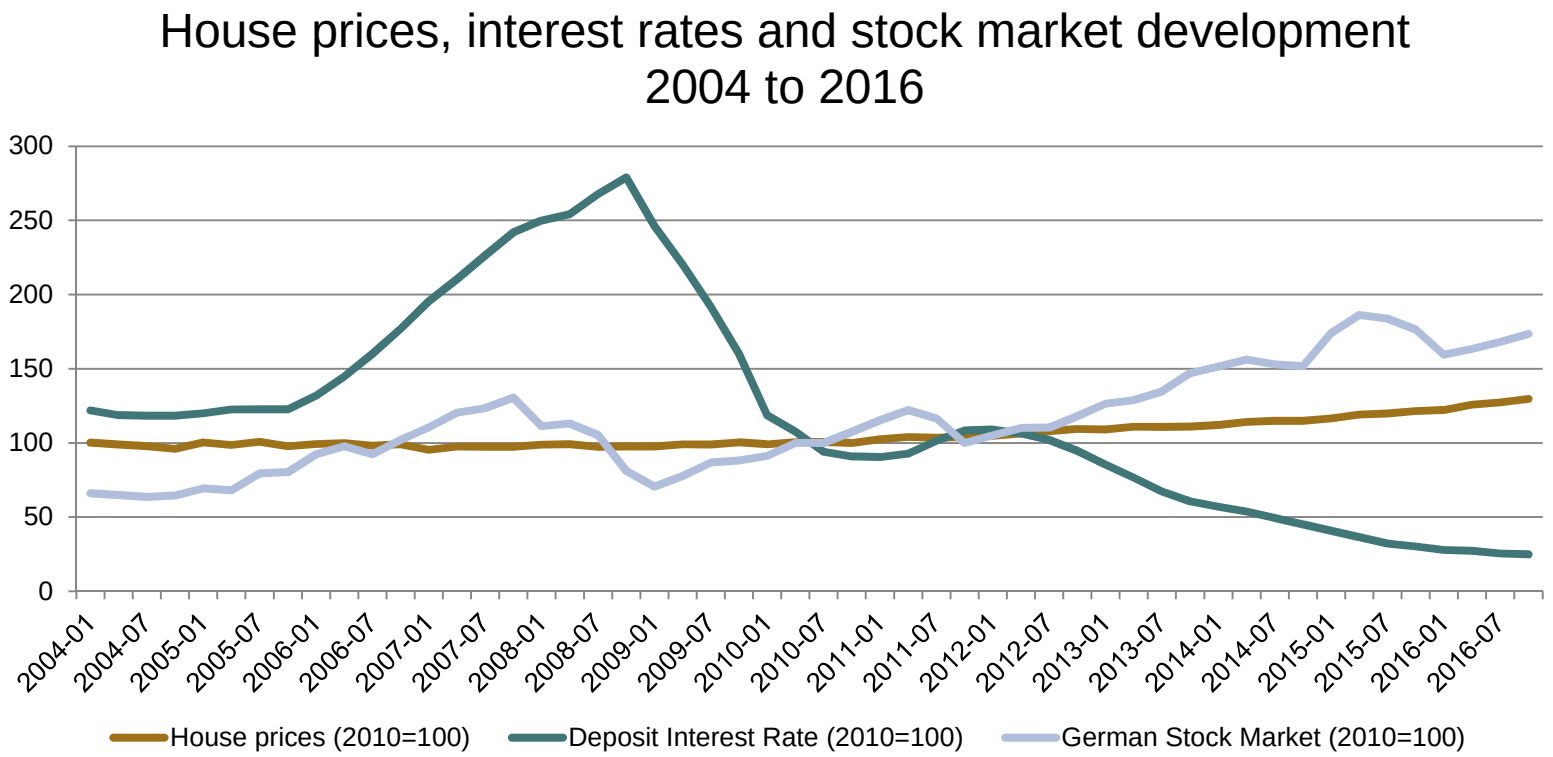


Descriptive Statistics – Gross and Net Savings Flows, by Age of Reference Person

- **Both gross and net savings** show **life-cycle** pattern



House Prices versus Other Investments



Sources: Interest Rates, Deutsche Bundesbank: Deposits of private households with a maturity of up to 2 years; House prices: Price index for „Wohnimmobilien“ calculated by Deutsche Bundesbank based on prices from bulwiengesa AG; Stock markets, boerse.de: end of month value of German stock market index.

- house prices relatively flat until 2010
- since 1970 growth rate for real house prices in Germany: -0.001 (var: 0.01)
- „action“ in prices since 2010