



# The role of housing in wealth inequality in Eurozone countries

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# A 1 Motivation

## Relevancy

### Media coverage in Germany

The New York Times

*“...**large structural imbalances** may remain hidden...”*

9 April 2013

Handelsblatt

*“...**warns** against reading too much into the ECB wealth statistics...”*

10 April 2013

Frankfurter Rundschau

*“...**not wealth** that is in short supply but cash...”*

13 April 2013

FINANCIAL TIMES

*“...Germany and Spain **essentially having a different Euro.**”*

15 April 2013

DER SPIEGEL

*“...**debate** over a redistribution of the burdens **is long overdue**...”*

15 April 2013

### Contributions of the study

- ▶ Quantifies **wealth inequality** in 15 Euro-zone countries
- ▶ Maps the **contribution of specific assets and groups** to total wealth inequality
- ▶ Identifies **factors that are associated with higher wealth levels**
- ▶ Reveals the role of environment in the **international differences** in wealth levels

**B** **1** **Data**

## Wealth distribution extremes

Net wealth distribution																
Top 1%	8%	9%	9%	9%	12%	13%	14%	15%	18%	18%	19%	21%	21%	22%	23%	25%
Top 5%	22%	26%	26%	25%	31%	32%	32%	31%	37%	37%	43%	36%	41%	40%	48%	46%
Top 10%	33%	39%	40%	37%	45%	44%	45%	44%	50%	50%	57%	47%	53%	51%	61%	59%
Bottom 90%	67%	61%	60%	63%	55%	56%	55%	56%	50%	50%	43%	53%	47%	49%	39%	41%
Mean (TEUR)	79.7	147.8	170.2	148.7	161.5	338.6	275.2	291.4	233.4	230.8	670.9	366.0	152.9	710.1	265.0	195.2

Households with negative net wealth																
Households	1.2%	2.6%	11.7%	2.0%	10.6%	2.7%	1.4%	3.5%	3.9%	4.8%	2.8%	0.8%	2.6%	3.8%	5.3%	7.4%

- ### Highlights
- ▶ At the EZ 15 top 10% of wealthiest households hold 50% of total wealth
  - ▶ High concentration of wealth among top 10% of wealthiest households in DE and AT
  - ▶ High share of households with negative wealth in the Netherlands and Finland
  - ▶ Slovakia has relatively high share of wealth belonging to the bottom 90% of population in terms of wealth as well as low share of households with negative wealth

# C 1 Results

## Gini index



### Results

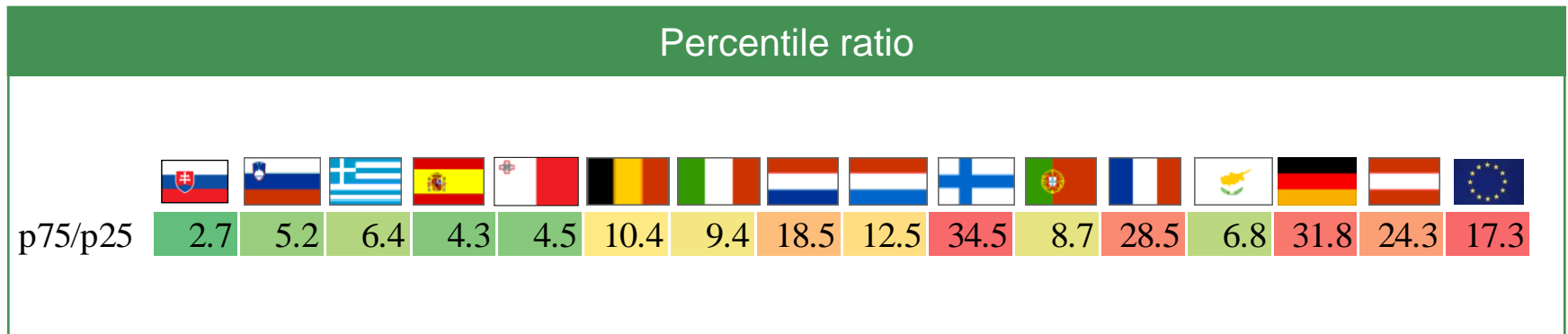
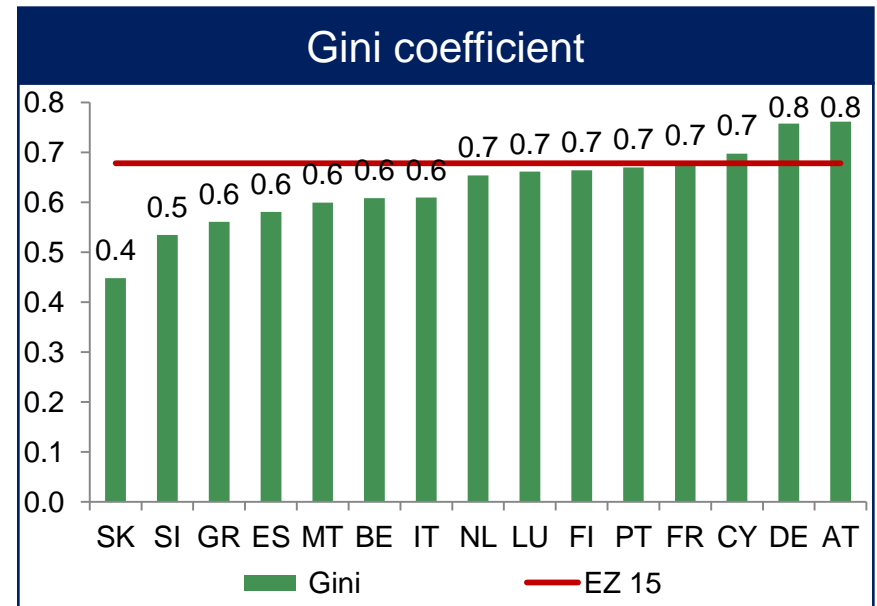
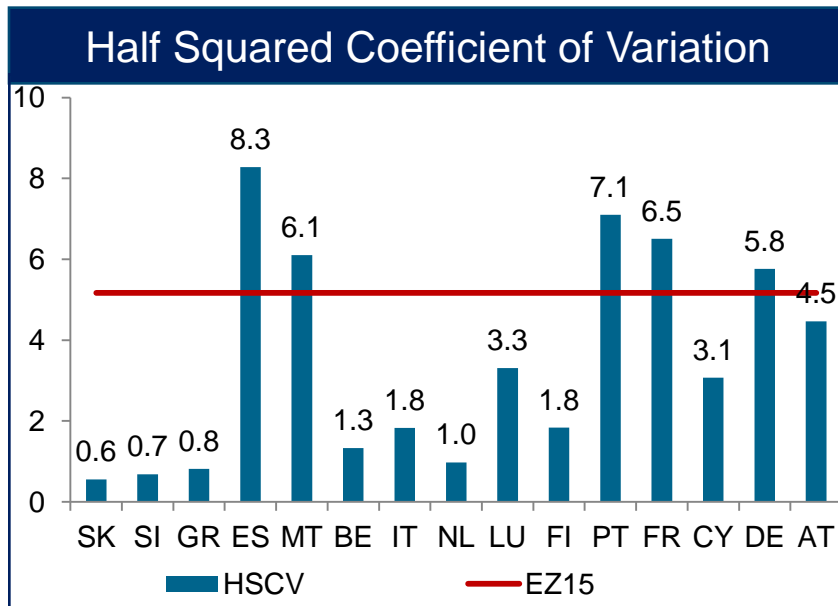
- ▶ Highest wealth inequality in AT and DE
- ▶ Lowest wealth inequality in SK and SI
- ▶ Average Gini coefficient 0.68

### Discussion

- ▶ Developed social system does not guarantee low wealth inequality
- ▶ Large population in DE, FR results in high overall inequality in Europe
- ▶ Country ranking depends on the definition of inequality measure

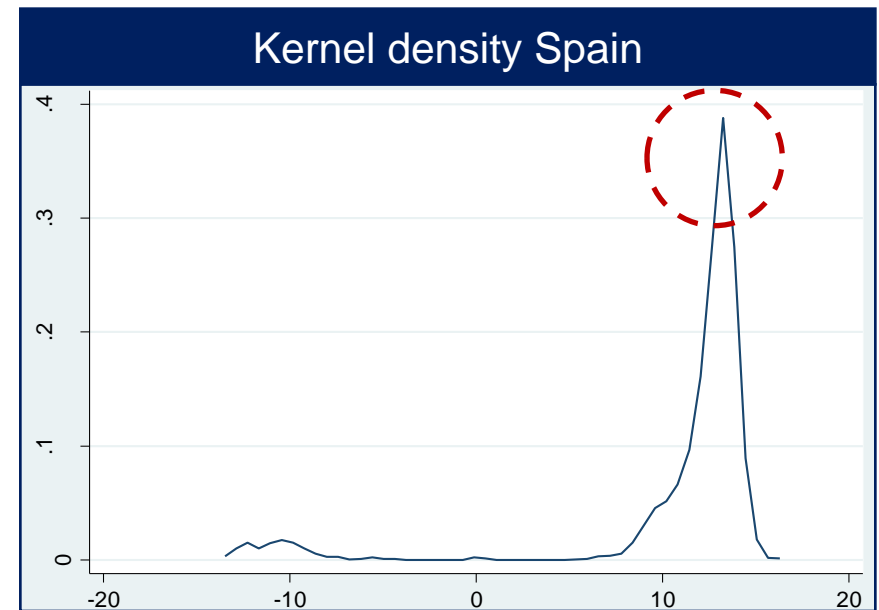
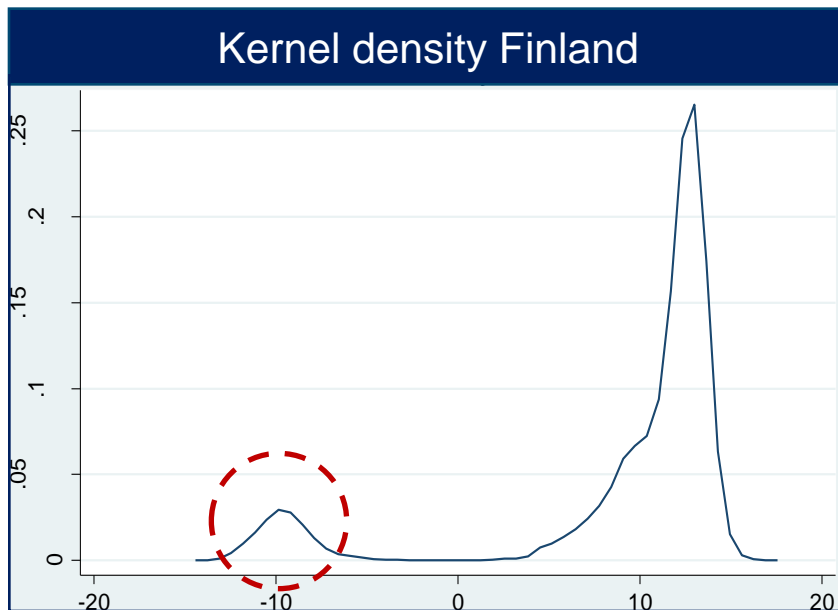
# C 1 Results

## Inequality measures



# C 1 Results

## Probability Density Functions of net wealth

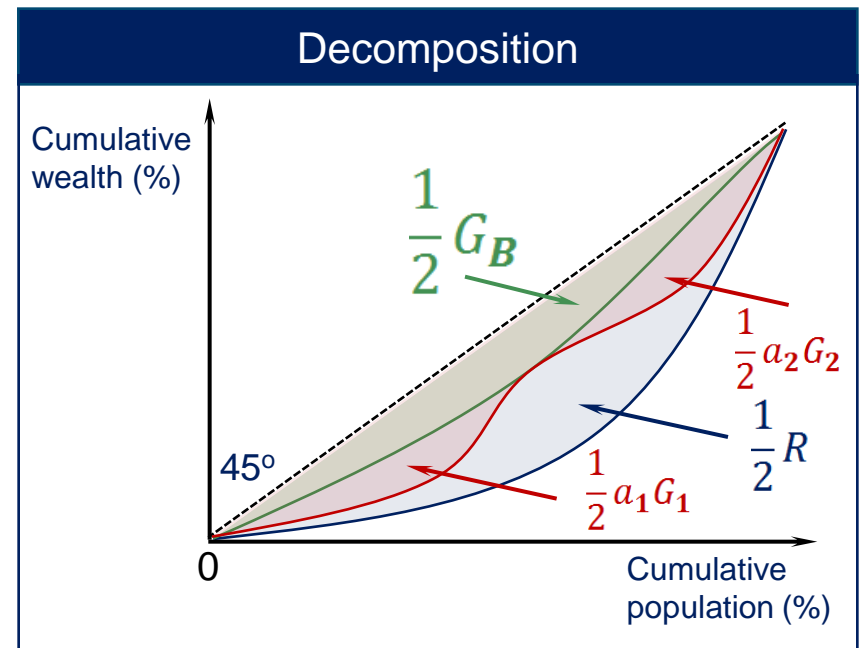
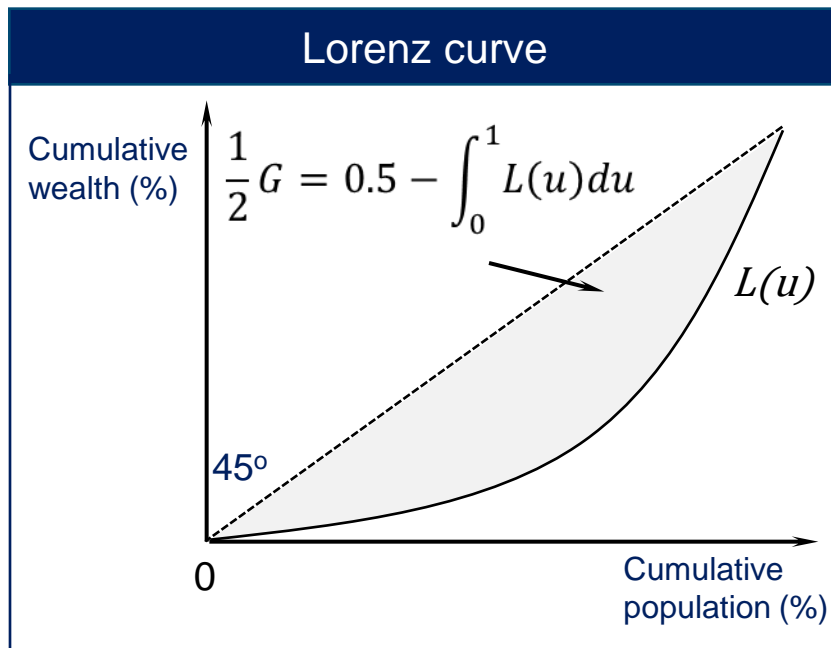


### Highlights

- ▶ PDF of inverse hyperbolic sine transformation of net wealth –  $\ln(w+(w^2+1)^{1/2})$
- ▶ HSCV is very sensitive to inequality at high wealth levels
- ▶ Finland – low mean, low variance → high percentile ratio, low HSCV
- ▶ Spain – high mean, high variance → low percentile ratio, high HSCV

# C 2 Methodology

## Gini group decomposition



**Formal decomposition**

$$G = G_B + \sum a_k G_k + R$$

















Gini coefficient
Between groups
Within groups
Residual



















# C 2 Results

## Homeowners vs non-homeowners Gini decomposition

Net wealth (excl. <0) inequality by subgroup decomposition

																
Between	0.09	0.16	0.21	0.31	0.13	0.24	0.17	0.26	0.29	0.27	0.31	0.22	0.35	0.18	0.42	0.40
Overlap	0.35	0.36	0.31	0.24	0.41	0.33	0.39	0.33	0.33	0.36	0.32	0.40	0.29	0.47	0.28	0.30
Within	-0.00	-0.00	0.01	0.00	0.02	0.03	0.02	0.01	-0.02	0.02	0.02	0.04	0.03	0.03	0.02	0.04
<b>Gini (excl. &lt;0)</b>	<b>0.44</b>	<b>0.51</b>	<b>0.53</b>	<b>0.55</b>	<b>0.56</b>	<b>0.59</b>	<b>0.59</b>	<b>0.60</b>	<b>0.60</b>	<b>0.64</b>	<b>0.65</b>	<b>0.65</b>	<b>0.66</b>	<b>0.68</b>	<b>0.72</b>	<b>0.73</b>

Net wealth Gini within groups

																
Non-homeowners	0.76	0.79	0.76	0.62	0.84	0.84	0.77	0.75	0.77	0.79	0.78	0.82	0.81	0.82	0.76	0.81
Homeowners	0.40	0.45	0.44	0.41	0.50	0.48	0.52	0.48	0.49	0.55	0.53	0.58	0.50	0.63	0.57	0.58

### Highlights

- ▶ Largest part of inequality comes from between group inequality
- ▶ Within group inequality is negligible
- ▶ Inequality among homeowners is distinctly lower than among non-homeowners
- ▶ Inequality among non-home owners can be high in countries with low overall Gini

## C 3 Methodology

### Gini source decomposition

#### Idea

- ▶ Importance of assets depends on
  - 1) Fraction of households having asset
  - 2) Distribution of the asset
  - 3) Correlation with overall distribution
- ▶ Sensitivity of inequality to changes in specific wealth items can be identified

#### Marginal effect

$$\frac{dG/de_k}{G} = \frac{R_k G_k S_k}{G} - S_k$$

#### Formal decomposition

$$G = \sum_{k=1}^K R_k * G_k * S_k$$

**Gini coefficient**
**Rank correlation**
**Relative Gini**
**Share in total wealth**

**C 3 Results**

## Gini source decomposition

	Share in total wealth															
Main residence	36%	46%	47%	47%	53%	53%	56%	56%	58%	60%	60%	63%	67%	70%	77%	91%
Other real estate	39%	17%	23%	12%	22%	26%	13%	21%	34%	26%	30%	17%	27%	14%	7%	10%
Private business	24%	24%	15%	25%	10%	13%	5%	11%	3%	11%	5%	9%	4%	10%	5%	3%
Valuables and vehicles	2%	3%	5%	5%	5%	5%	3%	5%	4%	3%	5%	5%	6%	4%	6%	5%
Bonds and deposits	4%	9%	12%	13%	8%	10%	17%	9%	6%	6%	6%	7%	10%	4%	7%	15%
Shares, mutual funds	1%	2%	4%	3%	4%	2%	8%	3%	3%	2%	0%	2%	7%	1%	0%	4%
Voluntary pension	3%	2%	6%	2%	8%	1%	5%	5%	2%	2%	1%	1%	2%	1%	1%	19%
Other fin. assets	0%	0%	1%	1%	1%	1%	1%	1%	0%	1%	0%	0%	0%	0%	0%	-1%
Mortgage	-9%	-3%	-12%	-5%	-8%	-10%	-8%	-10%	-10%	-10%	-6%	-3%	-16%	-1%	-3%	-40%
Other debt	-2%	-1%	-2%	-1%	-3%	-1%	-1%	-2%	-1%	-2%	-2%	-1%	-6%	-2%	-1%	-8%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

### Highlights

- ▶ Low overall investments in RE in Austria, Malta, Belgium, Germany
- ▶ Low leveraged wealth in Malta, Italy, Slovenia and Slovakia
- ▶ Vacation homes in Cyprus, Greece, Luxembourg
- ▶ Real estate, MBS and ABS security crisis in the Netherlands
- ▶ Finland has highly leveraged investments in RE

**C 3 Results**

**Gini source decomposition**

Rank correlations with net wealth																
Main residence	0.70	0.82	0.92	0.87	0.84	0.81	0.90	0.86	0.79	0.86	0.89	0.79	0.81	0.88	0.85	0.90
Other real estate	0.79	0.86	0.87	0.90	0.83	0.84	0.75	0.88	0.86	0.86	0.82	0.90	0.91	0.88	0.86	0.86
Private business	0.53	0.73	0.87	0.89	0.89	0.90	0.90	0.91	0.92	0.92	0.93	0.94	0.95	0.96	0.97	0.97
Valuables and vehicles	0.50	0.49	0.58	0.66	0.57	0.50	0.58	0.70	0.56	0.62	0.54	0.55	0.60	0.67	0.59	0.67
Bonds and deposits	0.65	0.68	0.70	0.68	0.85	0.69	0.53	0.67	0.66	0.71	0.60	0.63	0.73	0.77	0.55	0.77
Shares, mutual funds	0.78	0.76	0.82	0.82	0.87	0.82	0.68	0.85	0.85	0.80	0.63	0.77	0.83	0.77	0.71	0.80
Voluntary pension	0.53	0.68	0.50	0.50	0.55	0.68	0.42	0.82	0.66	0.64	0.58	0.59	0.68	0.69	0.57	0.60
Other fin. assets	0.71	0.42	0.53	0.64	0.74	0.69	0.49	0.67	.	0.63	0.48	0.45	0.58	0.64	0.64	0.59
Mortgage	-0.08	-0.12	-0.21	-0.12	-0.11	-0.01	0.05	-0.33	0.02	-0.23	-0.07	-0.33	-0.19	-0.42	-0.30	-0.25
Other debt	0.43	-0.12	-0.25	0.08	0.21	-0.06	0.02	-0.22	-0.11	-0.01	-0.03	-0.08	-0.05	0.10	-0.17	0.35

**Highlights**

- ▶ In the majority of countries private business wealth has highest corr with net wealth
- ▶ High Gini coefficient is associated with high correlation of private business wealth
- ▶ Mortgage debt is mildly negatively correlated with total wealth
- ▶ Other debt can be slightly positively correlated with wealth as in Austria, Netherlands

**C 3 Results**

**Gini source decomposition**

Absolute contribution to Gini																
Main residence	0.16	0.19	0.22	0.24	0.24	0.26	0.28	0.28	0.29	0.30	0.30	0.30	0.30	0.31	0.34	0.36
Other real estate	0.29	0.13	0.19	0.21	0.10	0.22	0.28	0.17	0.05	0.11	0.20	0.19	0.17	0.10	0.13	0.07
Private business	0.22	0.22	0.09	0.12	0.05	0.04	0.03	0.09	0.05	0.09	0.04	0.14	0.10	0.24	0.08	0.02
Valuables and vehicles	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Bonds and deposits	0.02	0.03	0.03	0.06	0.12	0.03	0.03	0.04	0.02	0.02	0.05	0.07	0.05	0.07	0.04	0.07
Shares, mutual funds	0.01	0.01	0.02	0.01	0.06	0.00	0.03	0.03	0.00	0.00	0.06	0.03	0.03	0.02	0.02	0.03
Voluntary pension	0.01	0.01	0.01	0.01	0.02	0.00	0.01	0.06	0.00	0.01	0.01	0.04	0.03	0.01	0.00	0.08
Other fin. assets	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Mortgage	-0.02	-0.01	-0.00	-0.02	-0.01	-0.01	-0.01	-0.02	0.00	-0.00	0.00	-0.05	-0.02	-0.01	-0.01	-0.02
Other debt	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.01	0.00	-0.00	-0.01	0.00	-0.00	0.00	-0.00	0.03
Total	0.70	0.60	0.58	0.67	0.61	0.56	0.66	0.68	0.45	0.53	0.66	0.76	0.68	0.76	0.61	0.65

**Highlights**

- ▶ In Holland other debt contributes to wealth inequality
- ▶ In Germany mortgage debt has a significant negative contribution to inequality
- ▶ In Belgium savings are second to primary housing in contribution to inequality
- ▶ In Malta, Cyprus and Austria private business wealth are important contributors
- ▶ In Greece inequality comes primarily from real estate ownership

# C 3 Results

## Gini source decomposition

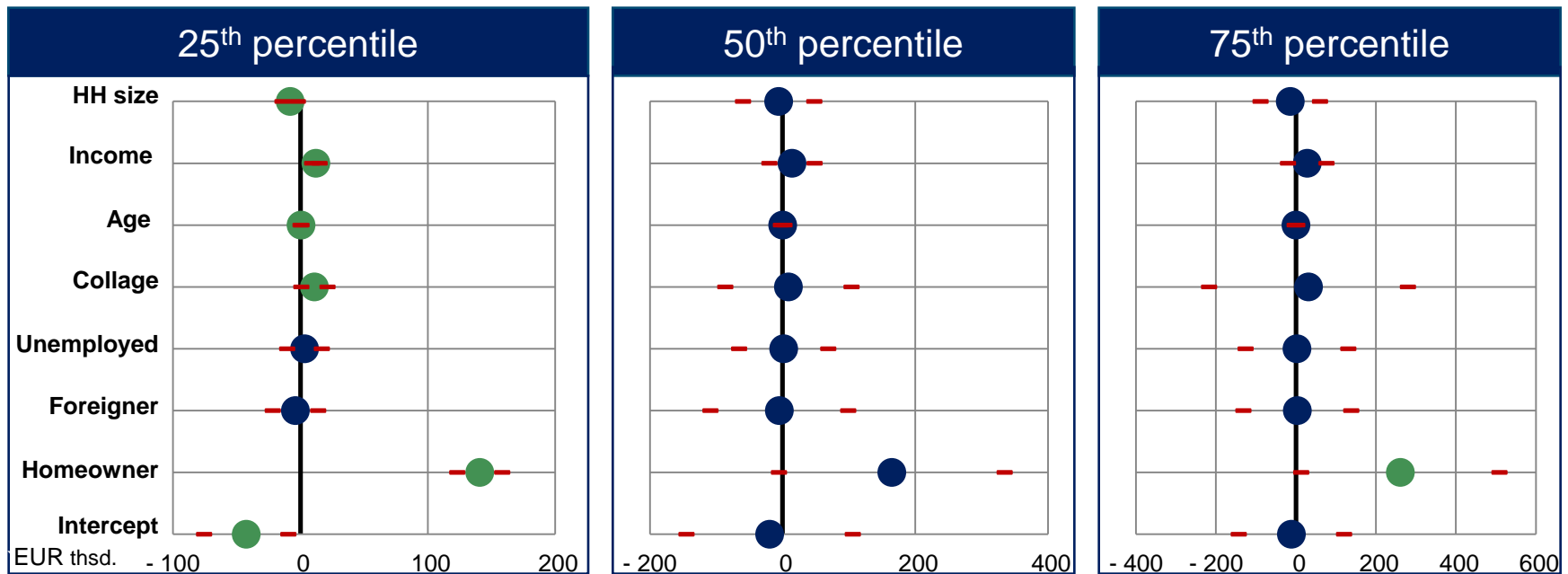
	Marginal effects															
Main residence	-0.36	-0.22	-0.21	-0.17	-0.17	-0.16	-0.14	-0.14	-0.14	-0.14	-0.12	-0.12	-0.11	-0.08	-0.07	-0.06
Other real estate	0.02	0.03	0.06	0.06	0.03	0.08	0.09	0.04	0.06	0.02	0.04	0.03	0.04	0.05	0.02	0.01
Private business	-0.01	0.01	0.05	0.05	0.02	0.01	0.01	0.13	0.07	0.07	0.04	0.04	0.03	0.03	0.04	0.06
Valuables and vehicles	-0.03	-0.03	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02	-0.02	-0.02
Bonds and deposits	-0.05	-0.03	-0.00	-0.01	0.02	-0.02	-0.00	-0.04	-0.00	-0.01	-0.01	-0.02	-0.02	-0.01	-0.03	-0.03
Shares, mutual funds	0.01	0.01	0.01	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	-0.00	0.00
Voluntary pension	-0.08	-0.00	0.00	-0.00	-0.01	-0.01	0.00	-0.00	0.00	-0.01	-0.00	-0.01	0.01	-0.00	-0.02	-0.00
Other fin. Assets	0.00	0.00	0.01	-0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.01	0.00	0.00	0.00	-0.00	-0.00
Mortgage	0.36	0.17	0.09	0.08	0.07	0.09	0.05	0.01	0.01	0.06	0.04	0.07	0.05	0.02	0.06	0.04
Other debt	0.13	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.01

### Highlights

- ▶ Primary residence has wealth equalizing effect in all countries
- ▶ Other real estate does not have equalizing effect
- ▶ Bonds and deposits have marginally mitigating effect on wealth inequality
- ▶ Voluntary pensions have stronger equalizing effect in countries with high mortgage component such as Germany and Netherlands

C 4 Results

## Quantile regressions of net wealth for Germany



### Highlights

- ▶ Most of the considered covariates have a strong relationship with net wealth levels for Germany when looking at the bottom quintile
- ▶ At the middle and top quantiles net wealth levels are mostly decoupled from the explanatory variables
- ▶ Homeownership status is still strongly associated with higher wealth levels

# C 5 Methodology

## Blinder-Oaxaca counterfactual decomposition

**Implementation**

Set-up	Target	Counterfactual
$\overline{NW}_{IT} = \alpha_{IT} + \overline{X}_{IT}\beta_{IT}$ $\overline{NW}_{DE} = \alpha_{DE} + \overline{X}_{DE}\beta_{DE}$ <p><math>\beta_i</math> - coefficients  <math>X_i</math> - household characteristics  <math>\overline{NW}_i</math> - average net wealth</p>	$\underbrace{\overline{NW}_{DE} - \overline{NW}_{IT}}_{\text{Actual difference}}$	$\underbrace{\overline{NW}_{IT}^* = \alpha_{DE} + \overline{X}_{IT}\beta_{DE}}_{\text{DE base country}}$

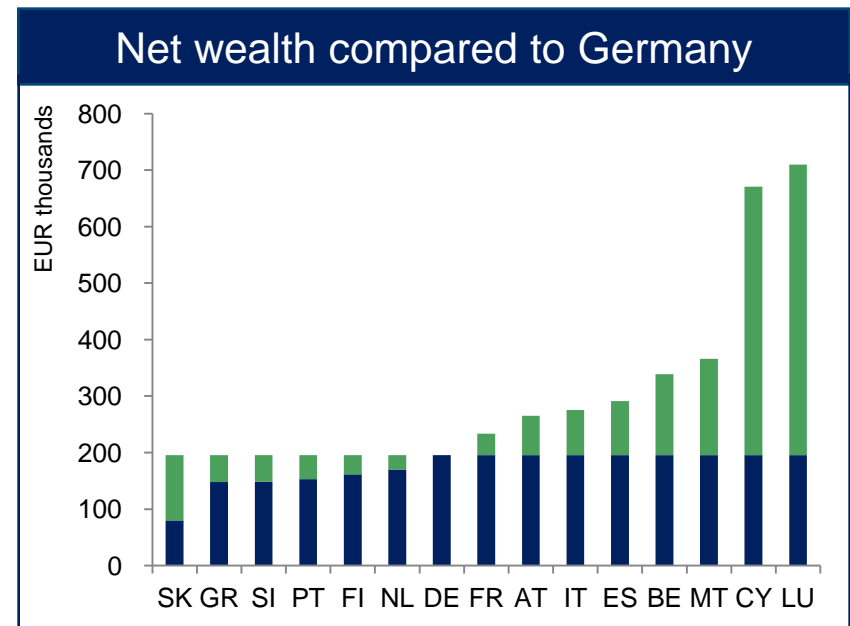
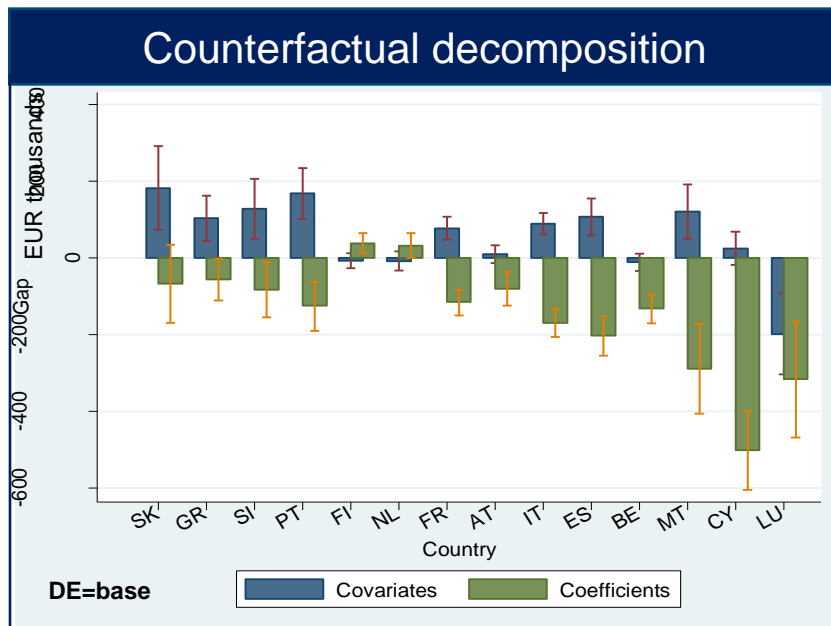
  

$$\underbrace{\overline{NW}_{DE} - \overline{NW}_{IT}}_{\text{Actual difference}} = \underbrace{(\overline{X}_{DE} - \overline{X}_{IT})\beta_{DE}}_{\text{Due to characteristics}} + \underbrace{(\alpha_{DE} - \alpha_{IT}) + (\beta_{DE} - \beta_{IT})\overline{X}_{IT}}_{\text{Due to environment}}$$



**C 5 Results**

## Counterfactual analysis



## Highlights

- ▶ Environment is the main driver of differences in wealth
- ▶ With the exception of LU covariates have the opposite effect than environment
- ▶ Explanatory variables include household size, age, dummies for higher education, gender, marital status, employment status, being a foreigner, divorced and pensioner

## Conclusions

### Main findings

- ▶ Wealth inequality among homeowners is much lower than among non-homeowners
- ▶ Wealth invested in the main residence has the strongest equalizing effect
- ▶ Education, homeownership and income are positively associated with net wealth levels
- ▶ Relationship between net wealth levels and covariates is stronger at bottom quantile
- ▶ Most of the international differences in wealth levels come from country environment



**Thank you for  
your attention!**

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## B 2 Background slide

### Household balance sheet

Assets		Debt	
<ul style="list-style-type: none"> <li>Real assets <b>83.2%</b> <ul style="list-style-type: none"> <li>Main residence 60.8%</li> <li>Other real estate property 22.7%</li> <li>Vehicles 2.9%</li> <li>Valuables (jewellery, art) 2.0%</li> <li>Self-employment businesses 11.5%</li> </ul> </li> <li>Financial assets <b>16.8%</b> <ul style="list-style-type: none"> <li>Deposits 42.9%</li> <li>Mutual funds 8.7%</li> <li>Bonds 6.6%</li> <li>Shares 7.9%</li> <li>Voluntary pension/insurance 26.3%</li> <li>Other financial assets 7.5%</li> </ul> </li> </ul> <p>Not including public pension entitlements</p>		<ul style="list-style-type: none"> <li>Liabilities <b>100%</b> <ul style="list-style-type: none"> <li>Mortgages on main residence 63.2%</li> <li>Mortgages on other real estate 19.7%</li> <li>Non-mortgage loans 15.5%</li> <li>Credit lines/bank overdrafts 1.4%</li> <li>Credit card debt 0.2%</li> </ul> </li> </ul>	
		<div style="border: 1px dashed blue; padding: 20px; width: fit-content; margin: 0 auto;"> <p><b>Net wealth</b></p> </div>	

# B 3 Background slide

## Survey timeline

