

Home Ownership Inequality and Access to Credit Markets: Five Countries Comparison

Alena Bičáková and Eva Sierminska

*The Luxembourg Wealth Study:
Enhancing Comparative Research on Household Finance*

LWS Conference, July 5-7, 2007, Roma, Italia

Motivation I

There is substantial cross-country variation in home ownership rates. This variation is even greater when we focus on young households only.

To maximize their lifetime utility, young households typically want to borrow against their future earnings in order to buy their home.

However, in countries with imperfect financial markets, with limited mortgage availability, young hh are credit constrained.

Can it be explained by the different degree of financial market development across different countries?

Motivation II

Current household income \sim proxy for permanent income.

It is also one of the indicators of solvency in the evaluation of mortgage applications.

Less perfect financial markets are likely to require higher values of household income for mortgage applications.

→ distribution of home ownership and mortgage rates across income should reflect access to credit (mortgage availability) in country-specific financial markets

Previous Research

Chiuri and Jappelli (2003) estimate the effect of down payment ratio on distribution of home ownership across age, using a dataset of 14 OECD countries over time

- focus on distribution of home ownership across age
- down payment ratio as indicator for mortgage availability

Instead, we limit our analysis to five countries and focus on

- current household income - as one indicator used for mortgage application evaluations
- in addition, have and use info on mortgage take-up; document, compare and relate the two

This paper

Focus on young households (18-40 years) in five countries: Finland, Germany, Italy, the UK and the US, using Luxembourg Wealth Study data.

Explore the distribution of home ownership and mortgage rates across income among young households, and the relation of the two.

How strongly do the observed home ownership patterns among young hhs depend on mortgage availability?

Measure and compare countries in terms of their *home ownership inequality* across income.

Data - Luxembourg Wealth Study

Finland (HWS 1998), Germany (SOEP 2002), Italy (SHIW 2002), the UK (BHPS 2000) and the US (SCF 2001)

- head and spouse are between 18 and 40 years old
- students are excluded
- extremely rich individuals excluded
(> 95th percentile of financial assets)

Germany and the US - multiple imputations, five replicates

→ weights divided accordingly (summary stats)

→ standard errors in regressions still need adjustment

first approximation: blow up SE with $\sqrt{5}$

Kennickell (SCF Codebook 2001)

Home Ownership (HO) and Mortgage (MT) Rates

Young Households (both head and spouse between 18-40)

Country	HO	MT (of all)	MT/HO	N
Germany 2002	0.214	0.185	0.866	3,270
Finland 1998	0.433	0.386	0.891	1,102
US 2001	0.479	0.427	0.891	1,130
Italy 2002	0.509	0.157	0.308	1,178
UK 2000	0.639	0.621	0.971	1,335

Source: LWS, weighted with sample means

Ranking according to HO rates corresponds to the ranking by MT, with one exception:

Italy (the second highest HO, but the lowest MT)

→ credit constraints in Italy are not binding (other channels), private transfers substitute imperfect financial market

Plan - Three Parts

1. Compare cross-country differences in
 - HO and its distribution across income
 - MT and its distribution across income
2. Estimate the probability of HO (MT) as a function of household characteristics and income
3. Decompose the predicted cross-country variation in HO rates (MT rates) into the part due to variation in household characteristics (X s) and the part due to different country regimes (coefficients)

Part I

We first calculate home ownership and mortgage take-up rates by deciles of total household income and compare their distribution for the different countries, using decile ratios P90/P10, P90/P50, and P50/P10.

We then correlate logarithm of household income with the HO and MT rates in a simple probit model

$$Prob(HO = 1) = \Phi [constant + \alpha \ln(hincome)]$$

$$Prob(MT = 1) = \Phi [constant + \alpha \ln(hincome)]$$

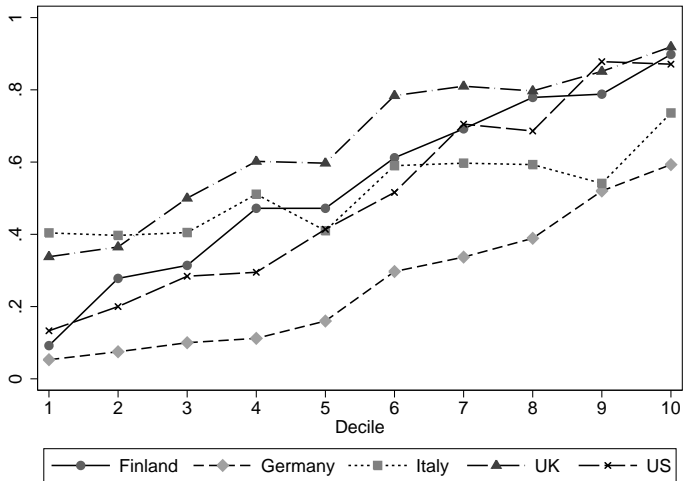
and compare the coefficient α , as a measure of dependence of HO and MT on household income, across countries.

Distribution of HO across Income Deciles

Income Deciles	Finland	Germany	Italy	UK	US
1	0.092	0.053	0.404	0.338	0.133
2	0.278	0.075	0.397	0.365	0.200
3	0.314	0.100	0.405	0.500	0.284
4	0.472	0.112	0.511	0.602	0.295
5	0.472	0.160	0.410	0.597	0.414
6	0.612	0.297	0.590	0.784	0.516
7	0.692	0.337	0.597	0.810	0.705
8	0.779	0.389	0.593	0.797	0.686
9	0.788	0.520	0.541	0.851	0.878
10	0.898	0.593	0.736	0.919	0.871
Overall	0.433	0.214	0.509	0.639	0.479

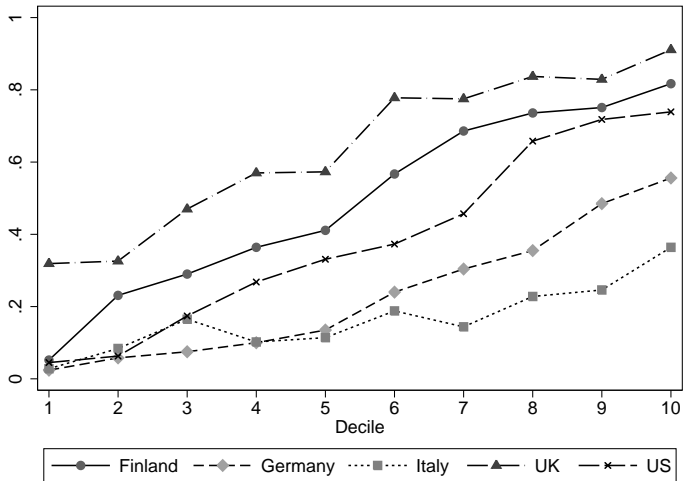
Home Ownership Distribution

Home Ownership Distribution Across Hh Income Deciles



Mortgage Take-Up Distribution

Mortgage Distribution Across Hh Income Deciles



Distribution Across Income - Summary Measures

Home Ownership Rates

Income Deciles	Finland	Germany	Italy	UK	US
p90/p10	8.57	9.81	1.34	2.52	6.60
p90/p50	1.67	3.25	1.32	1.43	2.12
p50/p10	5.13	3.02	1.01	1.77	3.11
α (probit)	1.110	0.960	0.382	0.404	0.964

α is coefficient of HO on log hh income (probit, unweighted)

Mortgage rates

Income Deciles	Finland	Germany	Italy	UK	US
p90/p10	14.44	20.21	8.79	2.60	13.76
p90/p50	1.83	3.59	2.16	1.45	2.51
p50/p10	7.90	5.63	4.07	1.80	5.48
α (probit)	1.170	1.025	0.511	0.490	1.108

α is coefficient of MT on log hh income (probit, unweighted)

Part II

Next we add other household characteristics and estimate a full probit with binary indicators for hh income deciles

$$Prob(HO = 1) = \Phi \left[constant + X\beta + \alpha_2 D_2^{(hinc)} + \dots + \alpha_{10} D_{10}^{(hinc)} \right]$$

$$Prob(MT = 1) = \Phi \left[constant + X\beta + \alpha_2 D_2^{(hinc)} + \dots + \alpha_{10} D_{10}^{(hinc)} \right]$$

where X s are functions of age, education, marital status, household size, presence of children, self-employed in the hh, have unsecured debt, have fin. assets $> 3000EUR$

$D_n^{(hinc)}$ binary indicator for the hh to belong into decile n

Descriptive Statistics

Variable	Finland	Germany	Italy	UK	US
age of hh head	31.02	31.97	34.04	32.07	31.19
low educ	0.17	0.13	0.48	0.35	0.13
medium educ	0.49	0.59	0.41	0.44	0.58
high educ	0.34	0.28	0.11	0.20	0.29
couple	0.57	0.52	0.66	0.59	0.59
kids < 15	0.41	0.40	0.52	0.53	0.55
self-empl	0.11	0.08	0.30	0.12	0.05
hh size	2.45	2.25	2.74	2.71	2.83
has other debt	0.58	0.22	0.19	0.69	0.78
income mean	25,905	25,950	26,011	35,618	36,513
income SD	13,974	16,418	17,031	20,938	30,210
fin. assets*	0.40	0.33	0.67	0.39	0.45

Estimation samples, weighted. * Has financial assets > 3000 USD

Home-Owners vs. Non-Owners Comparison

Home Owners typically

- older by around 3 years
- almost twice as likely to be couple and have children below 15 years old
- almost twice as likely to be self-employed
- have substantially higher households income and more financial assets (also reflects hh size)

This holds across all countries, although in Italy the differences between the two groups are much smaller.

Controlling for Household Characteristics

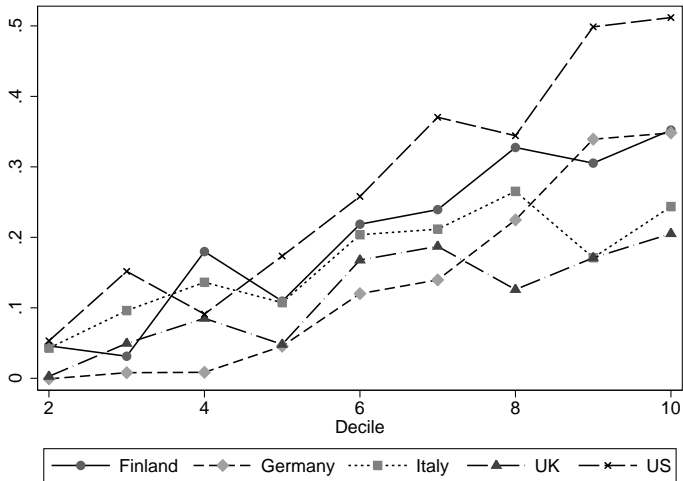
We estimate probit models of HO and MT as a function of nine binary indicators (dec2-dec10) of household income decile in which the household belongs. The base category is the first decile.

Coefficients of the income decile indicators provide us with a measure of HO (MT) income inequality, similar to the intra-decile rates, now but controlling for hh characteristics.

We explore the marginal effects of belonging to a particular decile relative to the first decile and plot them in the following figure. Both their differences from zero and from each other (their steepness) capture the inequality of HO (MT) across hh income.

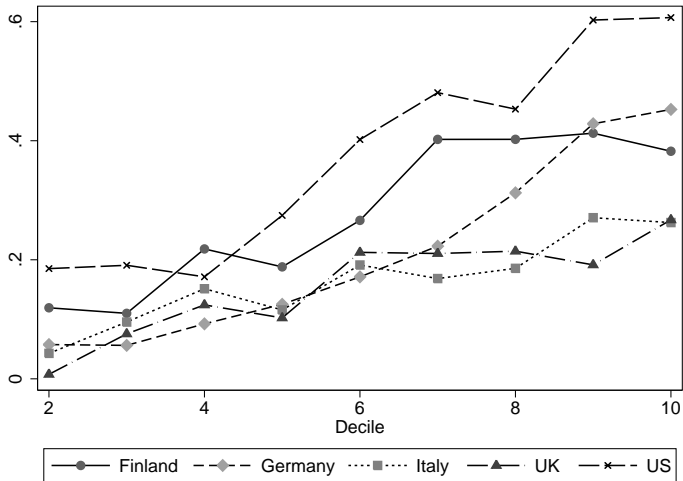
HO across Income Deciles - Controlling for Xs

Marginal effects of other 9 deciles relative to 1st decile



MT across Income Deciles - Controlling for Xs

Marginal effects of other 9 deciles relative to 1st decile



Effect of other Xs

Most of them similar across countries and consistent with our prior expectations.

- couples, with children, and bigger households are more likely to own homes
- age and education also increases the probability of owning
- self-employed are more likely to be HO
- having financial assets > 3000 *EUR* increases HO
- people with unsecured debt are less likely to own homes except for the US

Part III

Having estimated the full probit model,

we generate counterfactual prediction of HO and MT rates, interacting household characteristics (Xs) from one country with coefficients (β) from another country.

While variation in

Xs represent cross-country differences in the characteristics of young households across across the five countries, variation in

βs reflect the cross-country differences in regimes (effects of hh characteristics on HO and MT), i.e. institutions, mortgage market development, housing market, and also country-specific preferences.

Counterfactual Predictions HO

Home Ownership Rates

X	TRUE	$X\hat{\beta}^{FI}$	$X\hat{\beta}^{GE}$	$X\hat{\beta}^{IT}$	$X\hat{\beta}^{UK}$	$X\hat{\beta}^{US}$
FI	0.433	0.459	0.195	0.404	0.662	0.366
GE	0.214	0.394	0.228	0.386	0.605	0.258
IT	0.509	0.642	0.288	0.499	0.772	0.535
UK	0.639	0.489	0.221	0.393	0.644	0.423
US	0.481	0.521	0.223	0.428	0.670	0.438

Weighted with sample weights.

Italian hh characteristics are the most favorable, German the least (except in GE). The UK regime is the most favorable, German the least.

Counterfactual Predictions MT

Mortgage Take-Up Rates

X	TRUE	$X\hat{\beta}^{FI}$	$X\hat{\beta}^{GE}$	$X\hat{\beta}^{IT}$	$X\hat{\beta}^{UK}$	$X\hat{\beta}^{US}$
FI	0.386	0.397	0.159	0.129	0.624	0.318
GE	0.185	0.381	0.194	0.107	0.577	0.227
IT	0.157	0.479	0.229	0.164	0.719	0.463
UK	0.620	0.434	0.187	0.131	0.624	0.378
US	0.429	0.460	0.187	0.149	0.646	0.391

Weighted with sample weights.

Results are similar to the ones for HO.

Other factors

Home Ownership depends on

- personal preferences
- relative cost of renting and home-owning
- housing market (efficiency, [housing prices](#))
- mortgage availability

Housing Market - Prices and Affordability

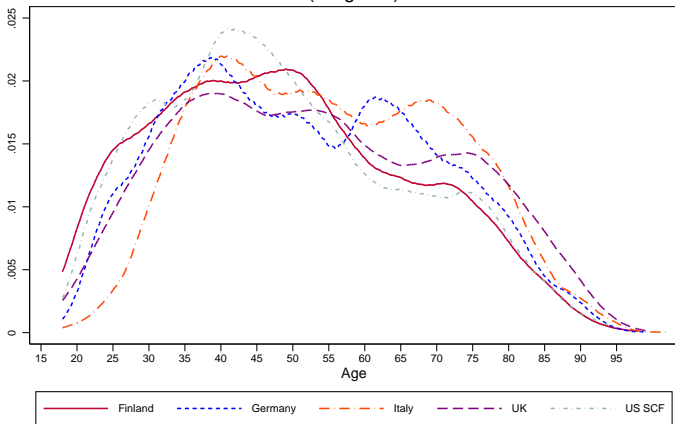
Home value/income ratios by five income quantiles for homeowners

Quantile		Finland	Germany	Italy	UK	US
1	Mean	4.06	15.26	15.44	12.15	8.11
	Median	3.54	12.46	13.11	7.87	6.00
	ranking	5	2	1	3	4
2	Mean	3.05	8.46	7.95	5.14	3.57
	Median	2.80	8.15	7.61	4.27	2.98
	ranking	5	1	2	3	4
3	Mean	2.61	6.91	7.25	3.92	3.07
	Median	2.39	6.44	5.64	3.44	2.89
	ranking	5	1	2	3	4
4	Mean	2.65	5.64	5.62	3.88	2.66
	Median	2.49	5.22	4.68	3.33	2.26
	ranking	4	1	2	3	5
5	Mean	2.43	4.73	3.89	3.33	2.65
	Median	2.42	4.45	3.98	2.99	2.35
	ranking	4	1	2	3	5

Endogenous Hh Formation I

Distribution of Households by Age of Household Head

Distribution of households across age
(weighted)



Endogenous Hh Formation II

Individuals do not become heads of households (i.e. leave their parents) until they start a family and have their own home

→ selection into household headship

especially in Italy (older, more couples, more children, have more assets, also more self-employed)

this selection is likely to depend on housing market and mortgage availability

Until now - taken as given - as part of the picture, and control for household characteristics

future: account for selection more formally.

Conclusions

- In cross-country comparison, HO rates among young households mirror their MT rates, with the exception of Italy: high HO and low MT → family transfers substitute financial market imperfections.
- Mortgage market in the UK is the most open and distribution of HO and MT is the most equal.
- In Germany, mortgage market is the least developed, resulting in the lowest HO rates and strong dependence of HO on income.
- Mortgage markets both in Finland and the US are fairly open but the one in the US is less equal (more dependent on income); also housing prices lower in Finland.

Future Research

Theoretical framework.

Model joint decision to buy one's home and take up mortgage to do that.

Address endogenous household formation (selection problem).

Focus more on institutions - which types of hhs are mostly affected in what way.