

# Houses and Families across Countries

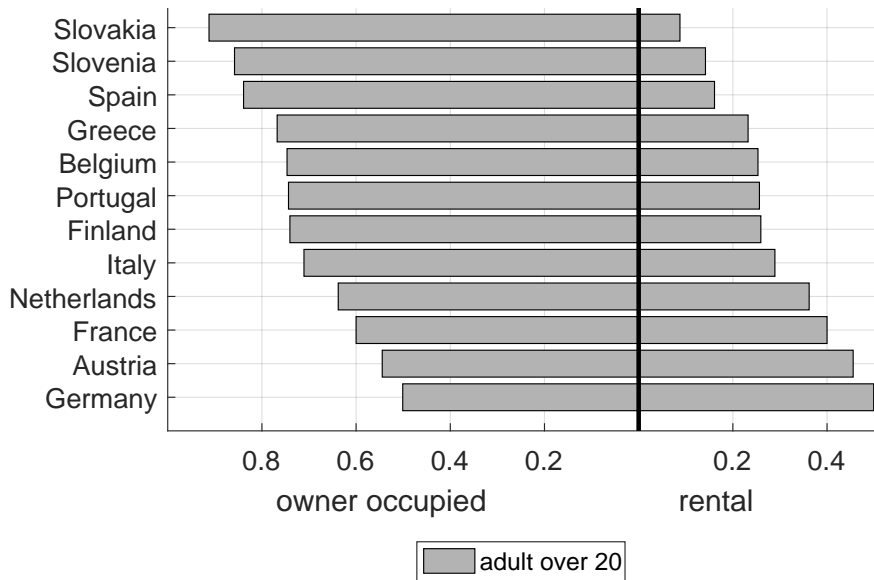
Alessandra Peter, Monika Piazzesi and Martin Schneider

SITE, August 2018

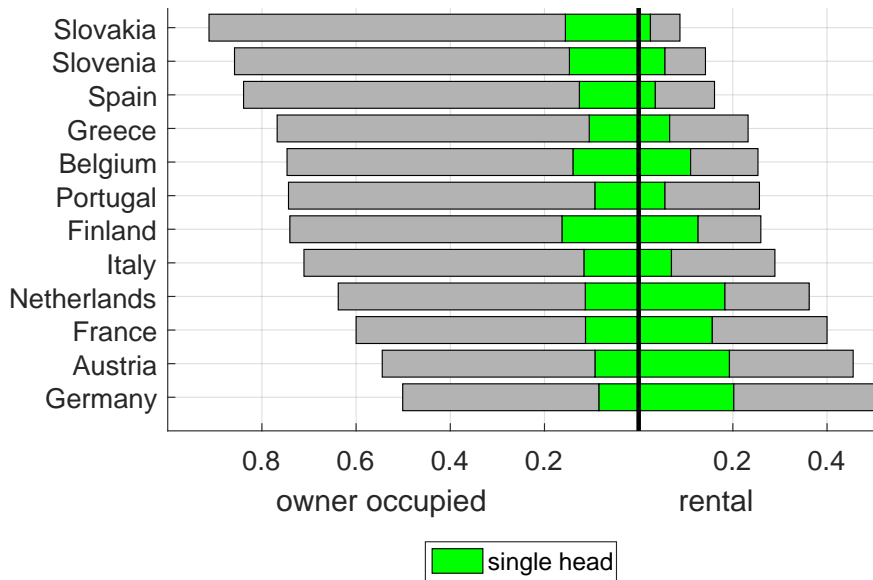
# Motivation

- How are housing services produced and sold?
- HFCS: new data on houses and families

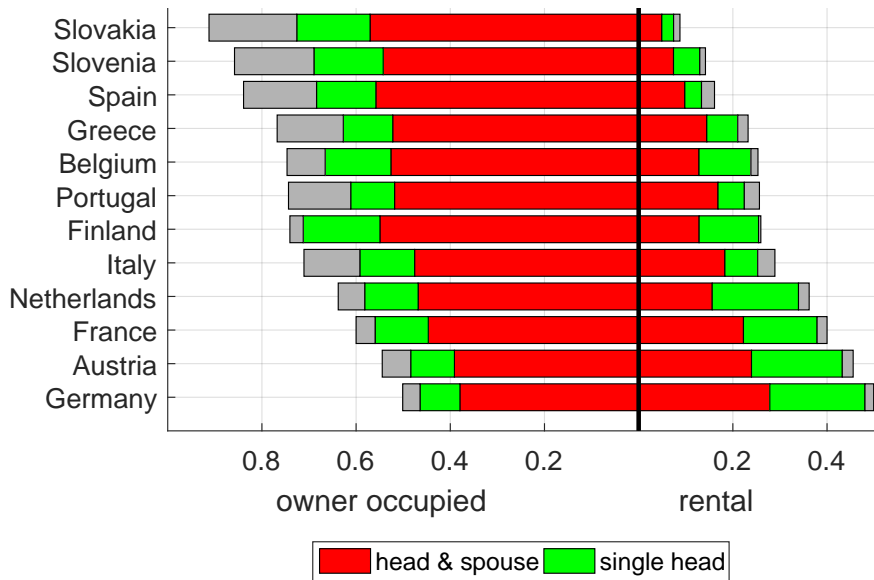
## Home ownership rates across European countries



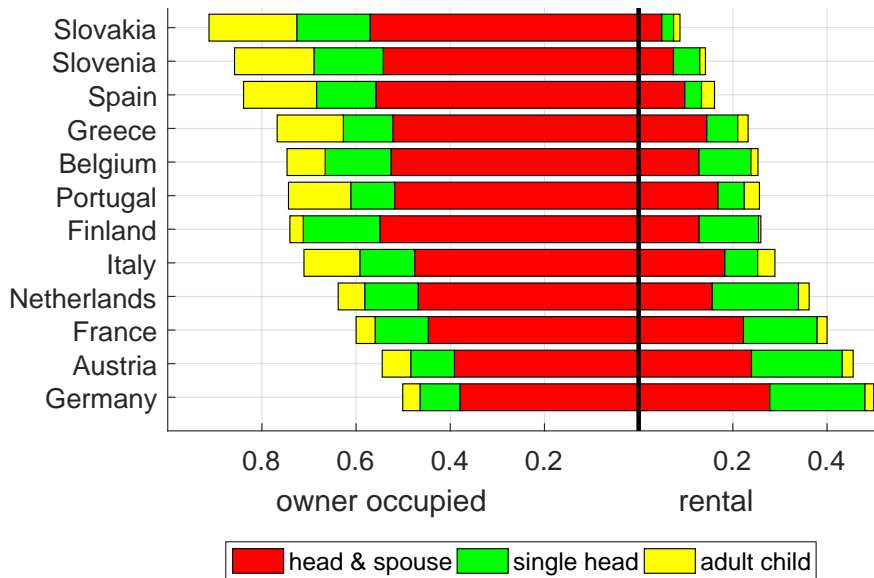
## Home ownership rates and family structure



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# Motivation

- How are housing services produced and sold?
- HFCS: new data on houses and families
- This paper: joint choice of houses and families.

# This paper

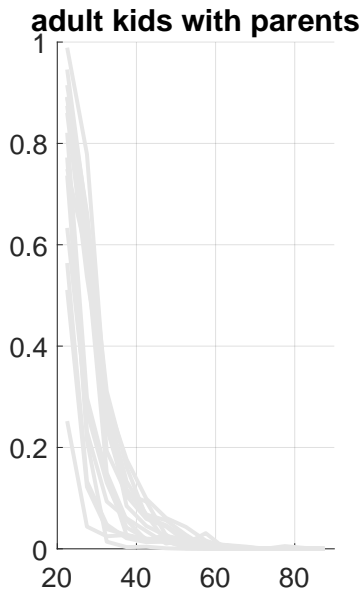
- model of household formation, savings and housing
  - ▶ builds on standard model of tenure choice  
low productivity of renting, collateral constraint
  - ▶ household technology depends on # household members
  - ▶ cohabitation = informal rental and credit market
- study model predictions with HFCS data
  - ▶ within countries: singles more housing intensive → rent more, cohabitation of owner parents & poor kids
  - ▶ across countries, two forces for higher ownership:
    1. weaker rental markets → more savings by owners & cohabitation
    2. stronger credit → less savings by owners & cohabitation⇒ both at work in different sets of countries



# Outline

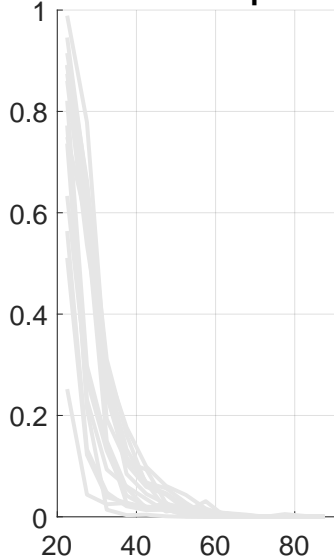
- evidence on household technology
  - ▶ cohabitation & age
  - ▶ renters' expenditure shares
- model
- within country predictions
- cross country predictions

How old are adult children who live with their parents?

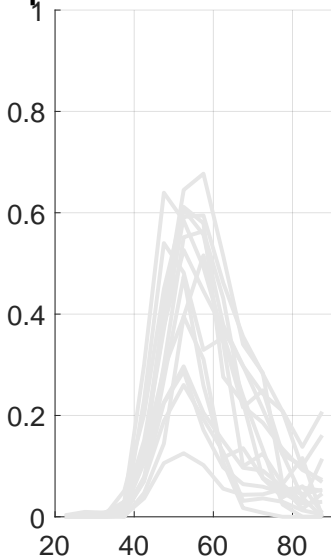


# How old are parents who live with adult children?

**adult kids with parents**

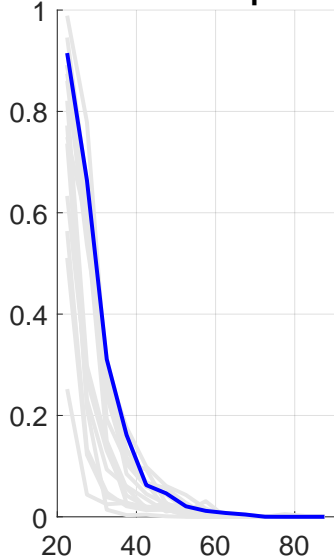


**parents with adult kids**

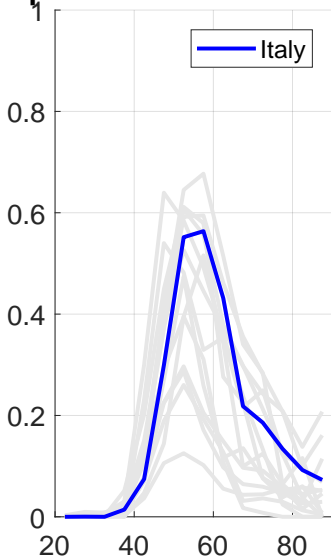


## Differences across countries in cohabitation

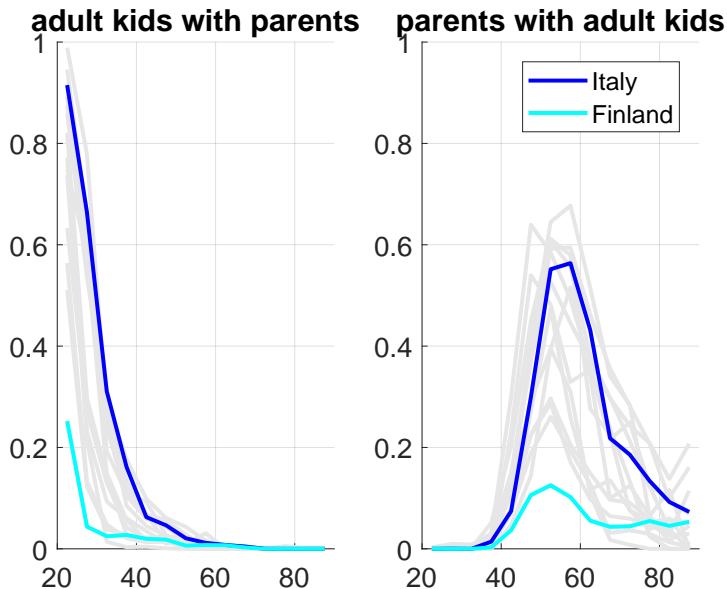
**adult kids with parents**



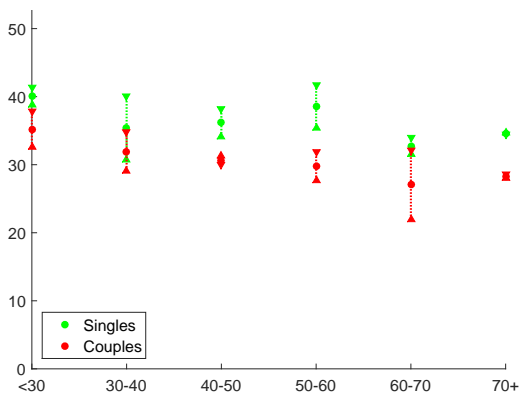
**parents with adult kids**



## Differences across countries in cohabitation



## Evidence on housing intensity



- mean expenditure share on rent across countries  $\pm$  one sd
- **single households** spend more than **couple households**
- regressions of expenditure share on household characteristics
  - ▶ single dummy has large & significant coefficient in all specs
  - ▶ zero coefficients for log savings or income

## Demographics & income

- 3 period lives: young, middle, old
  - ▶ young have middle-aged parents
- agent type  $\theta$  captures anticipated evolution of life
  - ▶ whether single or partner in couple at date  $t$ ; couples do not split
  - ▶ whether or not a parent at date  $t$
  - ▶ individual income  $y_t(\theta)$ 
    - low when young, high in middle aged, zero in old age
    - for couples,  $y_t$  includes 1/2 household income
    - new partner at  $t \rightarrow y_t$  also includes wealth of partner
  - ▶ for young: parents' income, wealth & whether single or couple

## Preferences & technology

- utility over housing services & other consumption

$$\log f_0(c_0, h_0, \tau_0, \theta) + \beta(\theta) \log f_1(c_1, h_1, \tau_1, \theta) + \beta(\theta)^2 \log c_2$$

- household felicity

$$f_t(c, h, \tau, \theta) = c^{1-\alpha_t(\tau, \theta)} (\eta(\tau, \theta) h)^{\alpha_t(\tau, \theta)}$$

- tenure choice  $\tau$ : own/rent + cohabiting yes/no
  - ▶ cohabitation only possible for single young
- housing intensity  $\alpha_t(\tau, \theta)$ 
  - ▶ higher for singles than others
- productivity of making housing services  $\eta(\tau, \theta)$ 
  - ▶ lower for renters than owners; stand-in for moral hazard, regulation...
  - ▶ additional knockoff for cohabiting child
  - ▶ parents' felicity not affected by cohabitation



# Markets

- competitive credit, housing and rental markets
  - ▶ constant interest rate  $R$
  - ▶ constant house price  $p$ ; rent = user cost:  $p_r = p(1 - (1 - \delta) / R)$
- borrowing constraints
  - ▶ collateral constraint for owners:  $-b \leq \lambda p h$
  - ▶ liquidity constraint for renters:  $b \geq 0$
- cohabitation
  - ▶ single young make take-it-or-leave-it offer to parents for joint choices of consumption, housing, tenure & savings

## → collection of choice problems

- ▶ single adults optimize given expectations of future income & partner
  - ▶ couples plan based on joint income and wealth
  - ▶ cohabitation between single kid and parents?
    - kids maximize utility s.t. participation constraint for parents
    - parent utility independent of cohabitation because of TIOLI offer
- to predict house size & household wealth, aggregate individual members

## Dynamic programs

- singles (couples) who remain singles (couples)

$$v_t(a, \theta) = \max_{c, h, b, a', \tau} \log f_t(c, h, \theta, \tau) + \beta(\theta) v_{t+1}(a' + y_{t+1}(\theta))$$

rent

$$c + b + p_r h = a$$

$$a' = Rb$$

$$b \geq 0$$

own

$$c + b + ph = a$$

$$a' = Rb + p(1 - \delta)h$$

$$-b \leq \lambda ph$$

- substitute out  $b$  and house price:

$$c + p_r h + a' / R = a$$

$$a' \geq 0$$

$$a' \geq \frac{1 - \delta - \lambda R}{1 - (1 - \delta) / R} p_r h$$

- single who meets new partner keeps only  $a' / 2$ ,  
but  $y_{t+1}(\theta)$  includes 1/2 income & wealth of new partner

# Tradeoffs

- Standard elements of tenure choice

1. high productivity  $\eta$  for housing services favors ownership
2. collateral constraint: low desire to save favors renting  
→ discount factor, slope of income profile matter

- New elements with endogenous family choice

1. household technology  $(\eta, \alpha)$  depends on tenure  $\tau$  & type  $\theta$
2. desire to save depends on type  $\theta$   
→ slope of income profile now reflects also matching with partner
3. cohabitation with parents allows for informal credit, rental

## Middle age

- all agents save (no income when old!)
  - ▶ homothetic utility & linear constraints: tenure doesn't depend on  $a$
  - ▶ owning more productive than renting (higher  $\eta$ )
  - ▶ desire to save depends on discount factor  $\beta(\theta)$ , single / couple
  - ▶ cohabitation irrelevant, but compare singles, couples
- proposition: threshold  $\beta^*$  s.t.  $\beta(\theta) \geq \beta^*$  own, otherwise rent.  
threshold  $\beta^*$  is increasing in housing intensity  $\alpha$ .
- intuition:
  - ▶ trade-off: productivity  $\eta$  vs desire to save  
owning is more productive for all agents  
owning requires savings for downpayment  
low  $\beta(\theta)$  agent would like to save less  
own only if high enough desire to save
  - ▶ household production is more housing intensive  $\rightarrow$  want more housing  
higher downpayment  $\rightarrow$  renting more attractive  
own only if desire to save is really high

## Middle age: observable implications

- couples own more than singles
  - ▶ household production is less housing intensive
  - ▶ choose lower house value relative to income
  - ▶ but: couples may own larger house (higher household income)
- owners save more than renters
  - ▶ agents with higher desire to save select themselves into ownership
  - ▶ in proposition above, exogenous variation in discount factor
  - ▶ alternatively: differences in  $\eta(\theta)$  by type  $\theta$ ;  
agents who are more efficient at owning save more

## Young age: savings & ownership

- agents save or borrow (income in both periods!)
  - ▶ fix expected income next period
  - ▶ cash today matters: high slope of income profile  $\rightarrow$  low desire to save
- proposition: threshold  $a^*$  s.t.  $a \geq a^*$  own, otherwise rent.  
threshold  $a^*$  is increasing in housing intensity  $\alpha$ .
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## Young age: cohabitation

- agents save or borrow (income in both periods)
  - ▶ fix expected income next period
  - ▶ cash today matters: slope of income profile  $\rightarrow$  desire to save
  - ▶ **shut down rental market**: productivity of renting  $\eta = 0$
  - ▶ owning more productive than living with parents
- proposition: threshold  $a^*$  s.t.  $a \geq a^*$  own, otherwise live with parents. threshold  $a^*$  is increasing in wealth of parents.
- intuition:
  - ▶ parents require no downpayment  
living with parents works like renting
  - ▶ parents also give unsecured loans
  - ▶ live with poorer parents only if really poor
- what if both rental market and living with parents are available?
  - ▶ depends on productivity of renting and owning, living parents

## Young age: observable implications

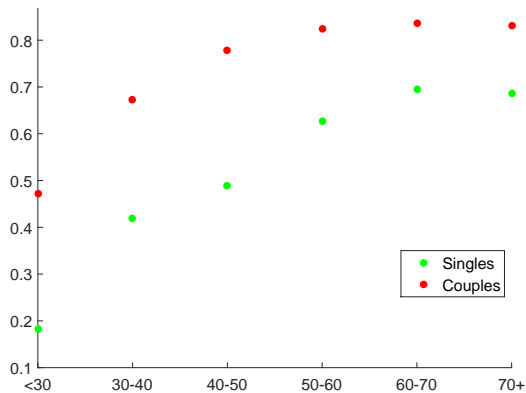
- young and temporarily poor rent or live with parents
  - ▶ low desire to save
- young couples own more than singles
  - ▶ more housing intensive
- cohabitation households more likely to own
  - ▶ gains from trade higher if parents have high desire to save & own
- cohabitation households save less than old couples w/o kids
  - ▶ combine borrower and lender under one roof
- young who do not match assortatively own
  - ▶ higher desire to save with small slope in income profile



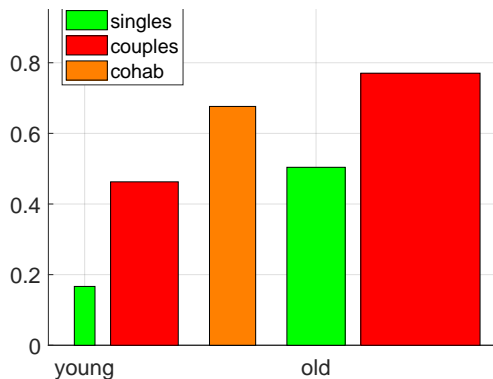
# Evidence on housing over the life cycle

- Ownership rates by age & family status
- Predicting ownership
  - ▶ probit regressions with household characteristics
  - ▶ large positive coefficient on household savings  
prob of owning increases by .25 if savings higher by one sd
- Predicting cohabitation
  - ▶ probit regressions with household characteristics
  - ▶ large negative coefficient on income of adult children
  - ▶ large positive coefficient on household savings
- Ownership rates & savings / income by age & tenure
  - pictures for France...

## Evidence on ownership rates

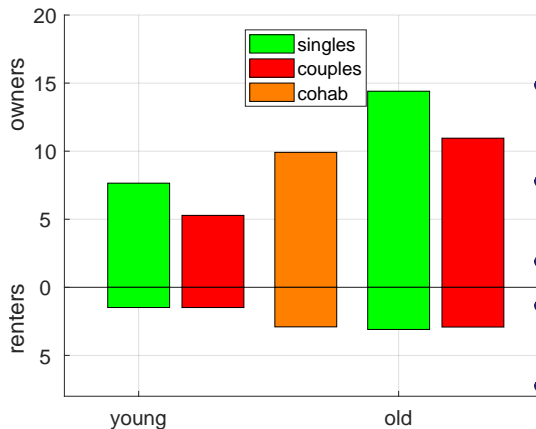


## Ownership rates in France



- ownership rate by group; old now  $\geq 40$ , width = fraction of adults
- old own more than young
- couples own more than singles at all ages
- cohabitation households mostly own

## Savings/income in France



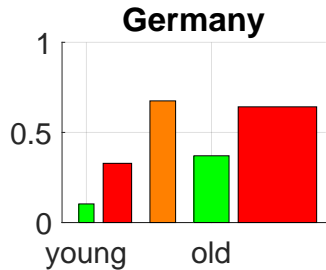
- savings / income by group; owners up, renters down
- owners save more than renters
- old save more than young
- single owners save more than couples
- cohabiters save in between

# What explains cross-country differences?

## Two forces

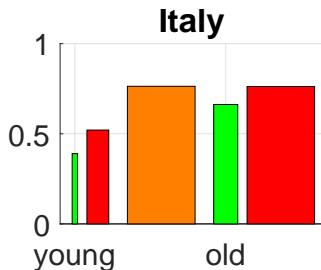
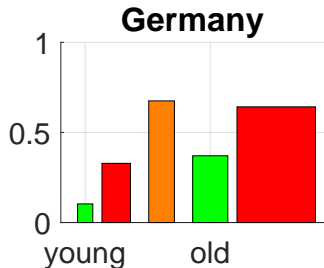
- worse rental markets: lower  $\eta$  from rentals
  - ▶ standard effect: higher ownership, higher savings by owners
  - ▶ with families: fewer young and single households, more cohabitation
  - ▶ extreme case: rental  $\eta = 0$ , everyone lives in owner-occupied housing, some rich young own their own home, others cohabit
- better credit markets: higher  $\lambda$ 
  - ▶ standard effect: higher ownership, savings unclear & possibly lower
  - ▶ with families: more young and single households, less cohabitation
  - ▶ extreme case:  $\lambda = 1$ , everyone lives in owner-occupied housing, including young households, only poorest young live at home
- GE effects? With CD felicity, results hold also with endogenous price
- in data, both forces are relevant...

# Ownership rates across countries



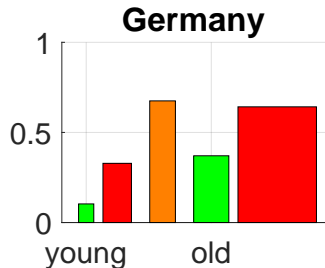
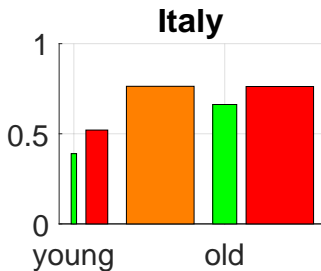
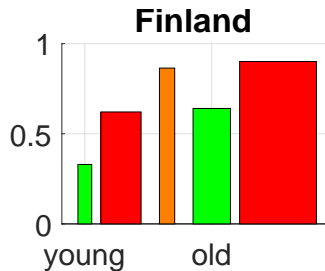
• country with lowest ownership

## Ownership rates across countries



- Italy: high cohabitation
- high ownership for young and old, including singles
- consistent with bad rental market
- fewer young households formed, but contribution to overall ownership similar to Germany

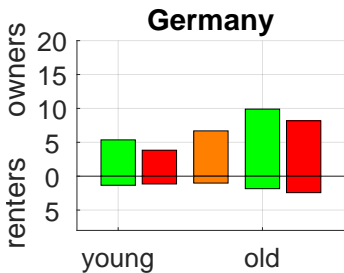
## Ownership rates across countries



- Finland: lowest cohabitation
- high ownership, also for young/single
- consistent with good credit market
- many young households formed, as in Germany, but more owners

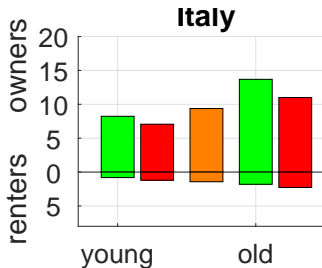
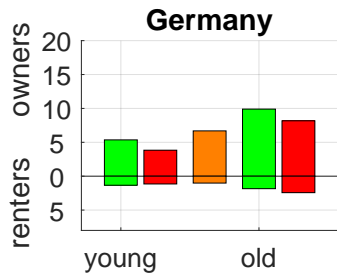


## Savings/income across countries



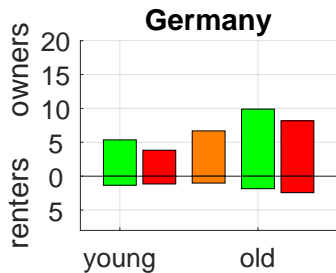
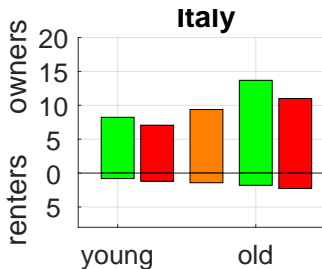
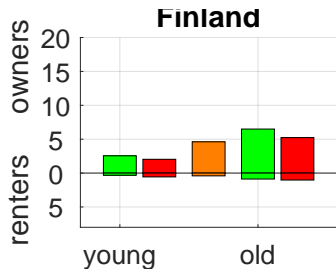
- patterns similar to France
- low savings across the board

## Savings/income across countries



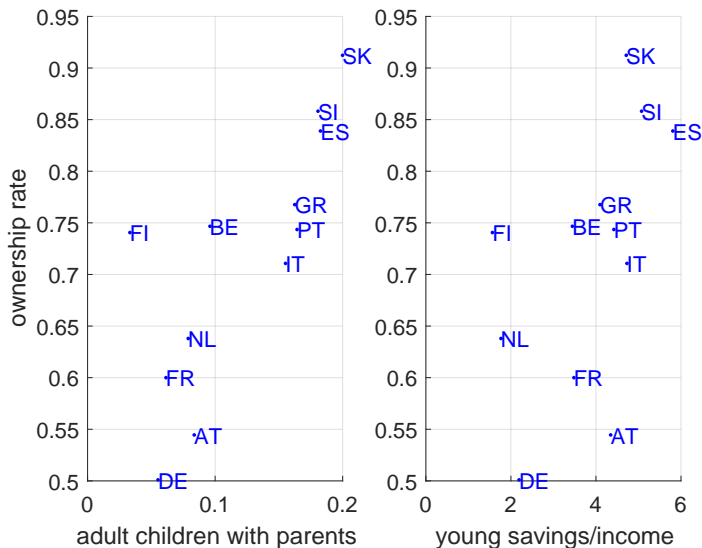
- higher savings in Italy, also for young owners and singles
- consistent with bad rental market

## Savings/income across countries

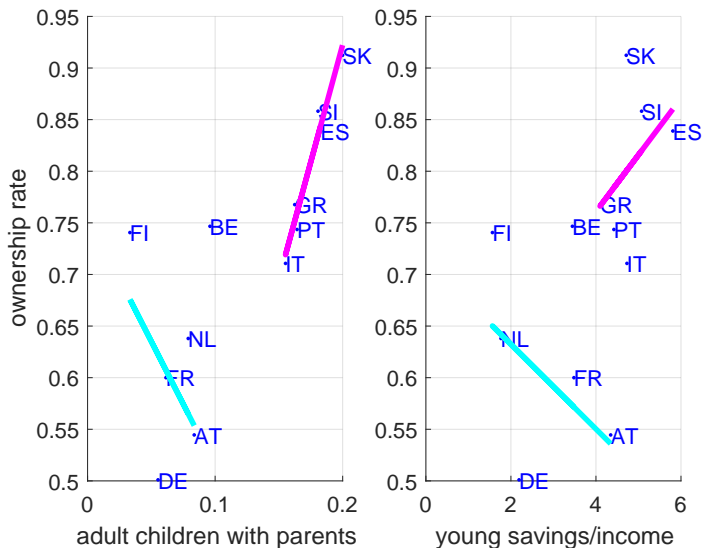


- lower savings in Finland, especially for young
- consistent with good credit market

## Cross country evidence



## Cross country evidence



# Summary

- model of household formation, savings and housing
  - ▶ builds on standard model of tenure choice  
low productivity of renting, collateral constraint
  - ▶ household technology depends on # household members
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- study model predictions with HFCS data
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