Household Heterogeneity in the Euro Area Since the Onset of the Great Recession

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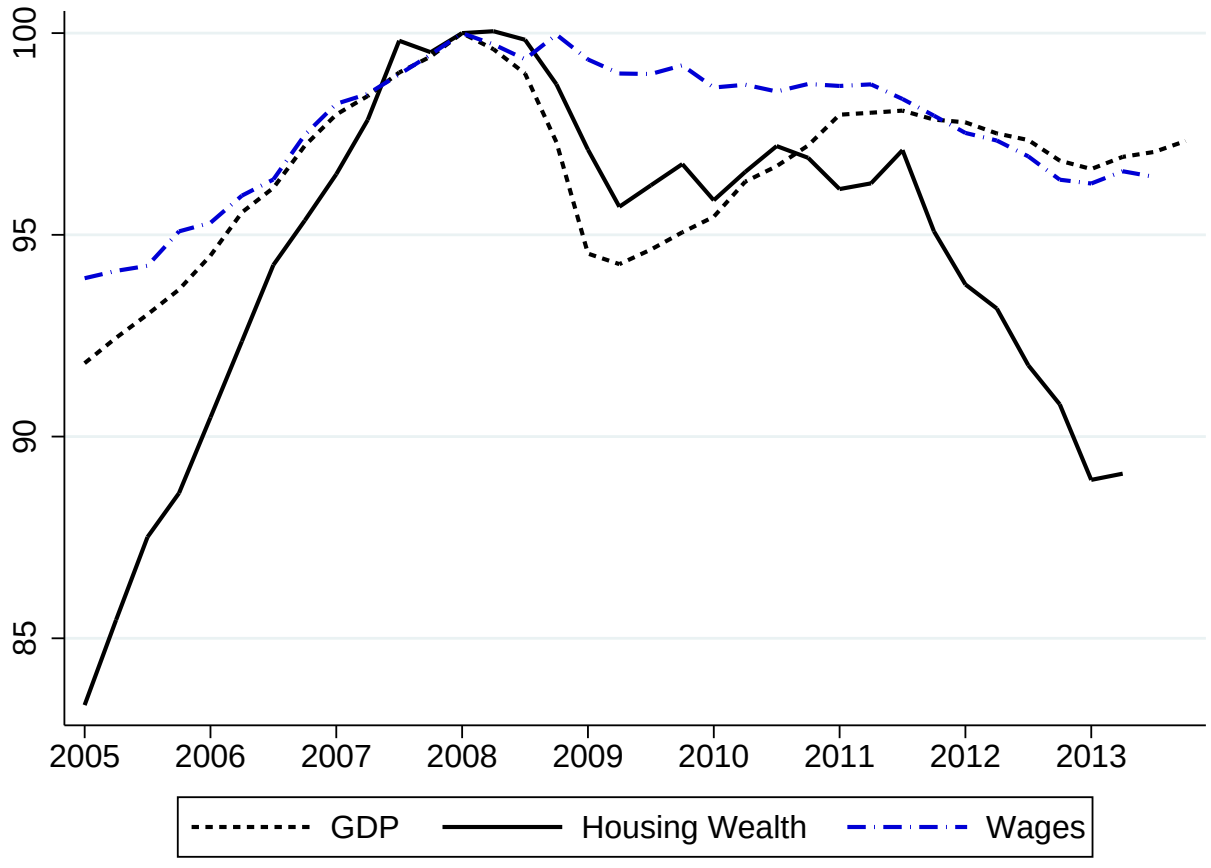
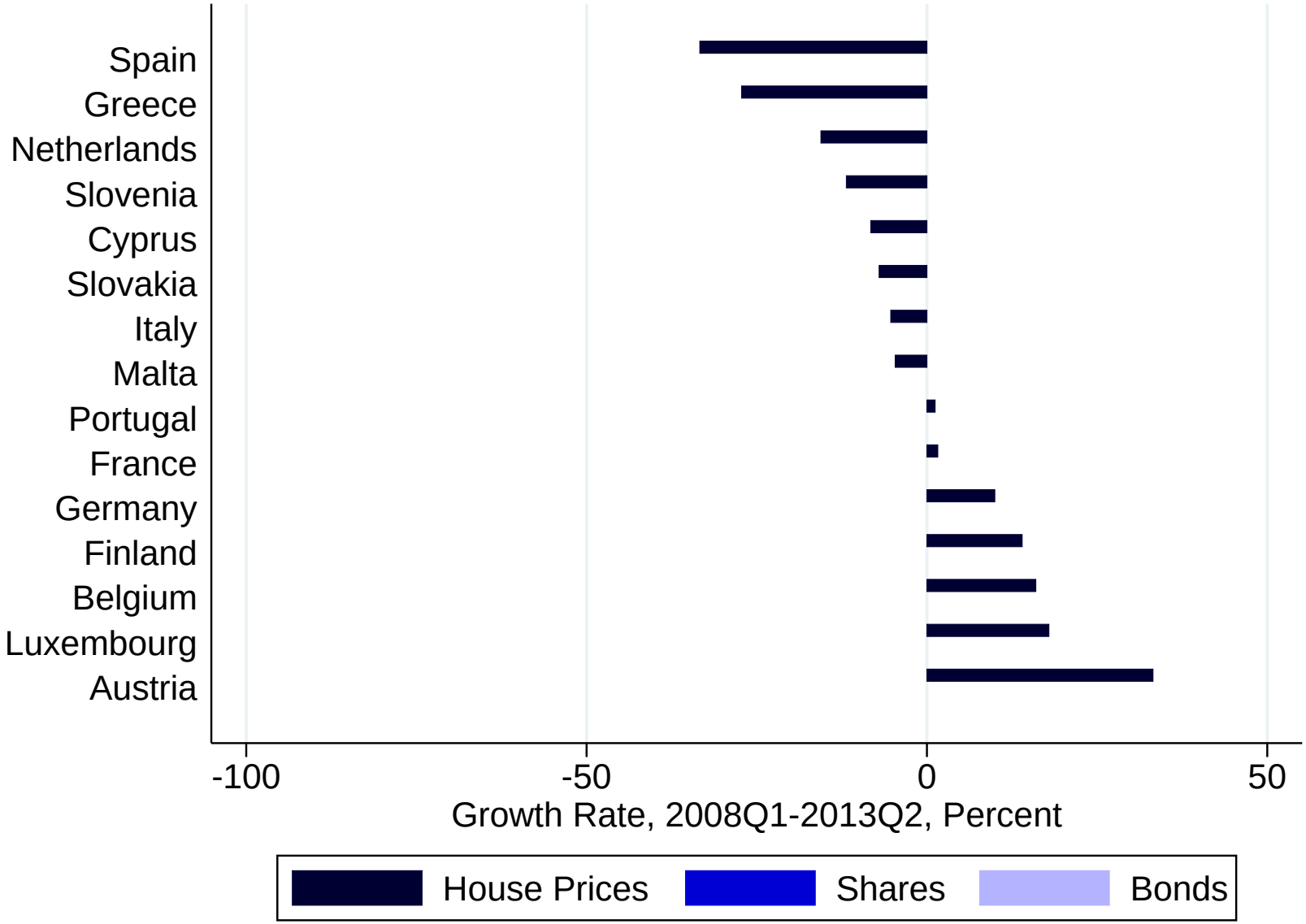
Adverse shocks in EA since Great Recession

Large & persistent adverse shocks:

- Real wages ↓ by 4 percent
- Household wealth ↓ by 10+ percent



Diverse dynamics of asset prices across countries



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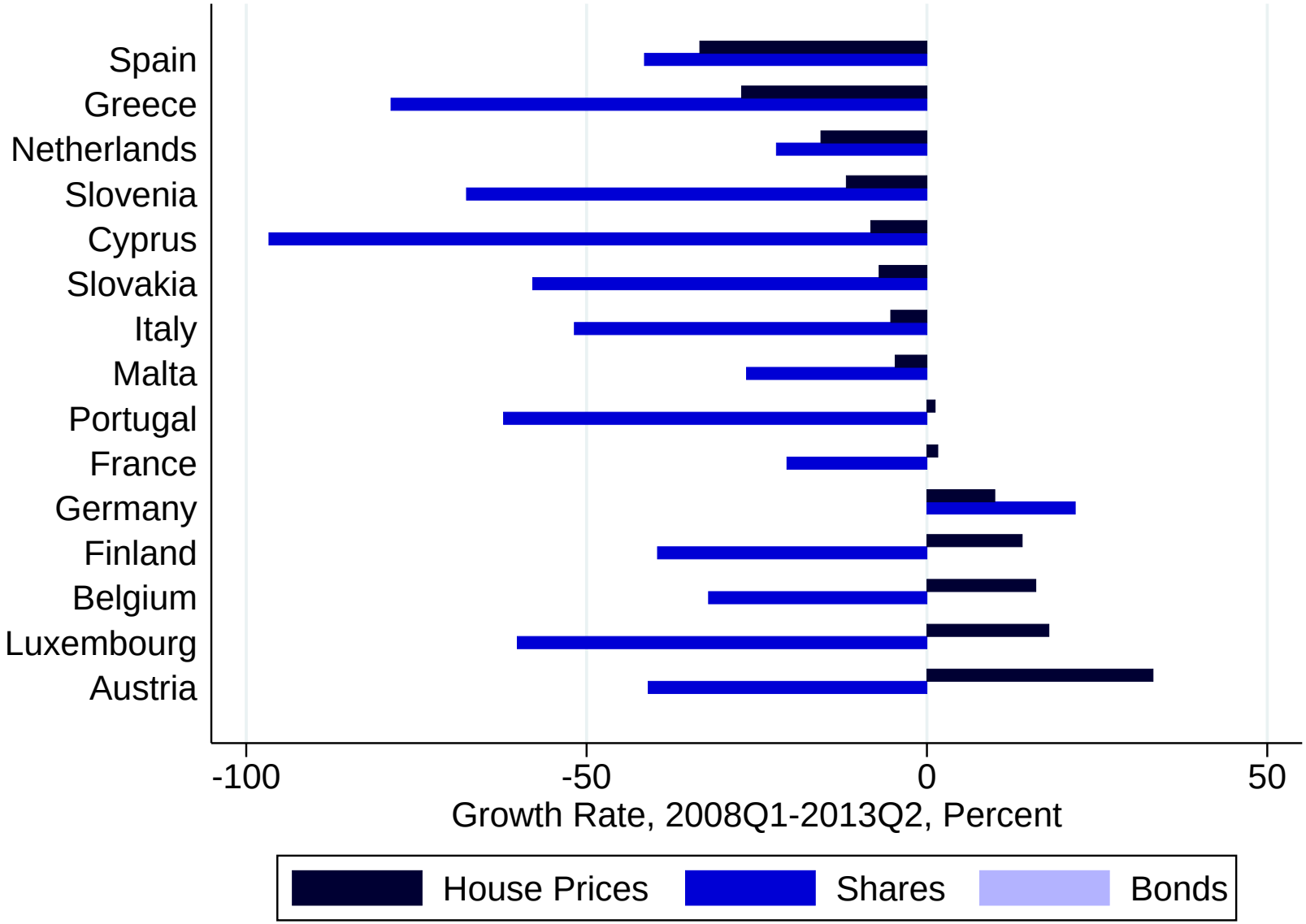
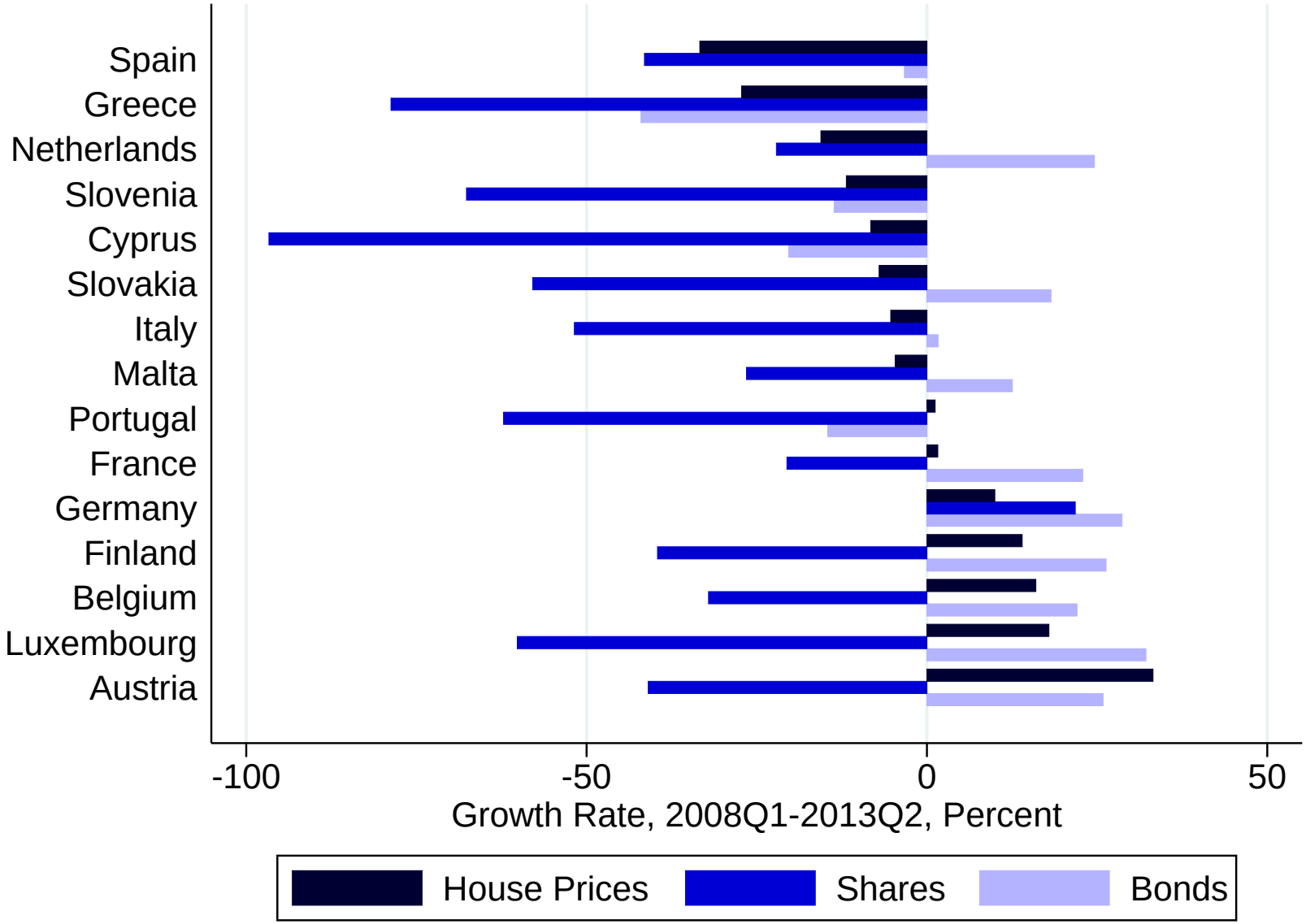
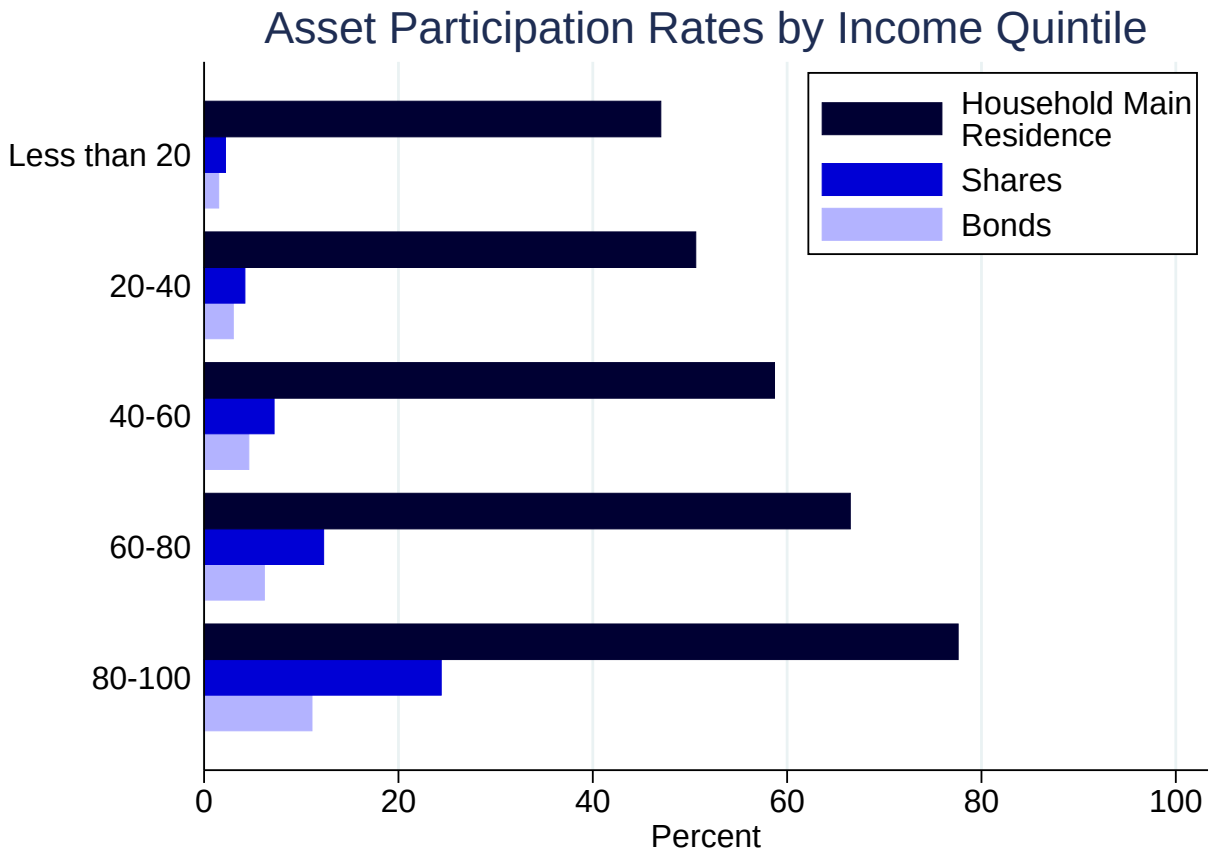


Diverse dynamics of asset prices across countries



BUT also pervasive heterogeneity across Hhs

- Across variables (income, wealth, debt, fin pressure, . . .)
- In various measures (participation rates/holdings/Gini, . . .)



- **Hh heterogrnty can be important for macro outcomes**

Information on household balance sheets

Hh-level data: Hh Finance & Consumption Survey

- Detailed ex ante harmonized Hh-level data (62,000 Hhs)

BUT

- Only one point in time available so far (mostly 2010)
  - 2nd wave under way
- Some heterogeneity in reference periods across countries
- Not too timely

Aggregate data: National accounts

- Fresher information

What we do

Generate "updated" HFCS

- Combine household-level (HFCS) and aggregate data
- Use micro-simulations to allow for unempl & debt dynamics

Hh heterognty in EA & its implications since Great Rec

- Describe shocks to wealth, income, fin pressure at Hh level
- Back out implications for consumption and deleveraging

Why we are doing this

- Allows for evolution of distributions over time
- Captures some Hh heterogeneity
- Synchronizes reference periods
- Available virtually in real time
- Useful for
  - Simulations
    - Financial fragility of Hhs
    - Wealth effects on C
    - Lending to Hhs/credit constraints
  - Evaluation of 2nd wave of HFCS
- **No substitute for 2nd wave! (Of course)**

Combining household-level and aggregate data

- Use country-level aggregate counterparts
- Extend backward to 2008Q1 and forward to present (2013Q2)
- Compare 08Q1 and 13Q2 to investigate Great Recession
- Compare real variables, deflated with country HICP

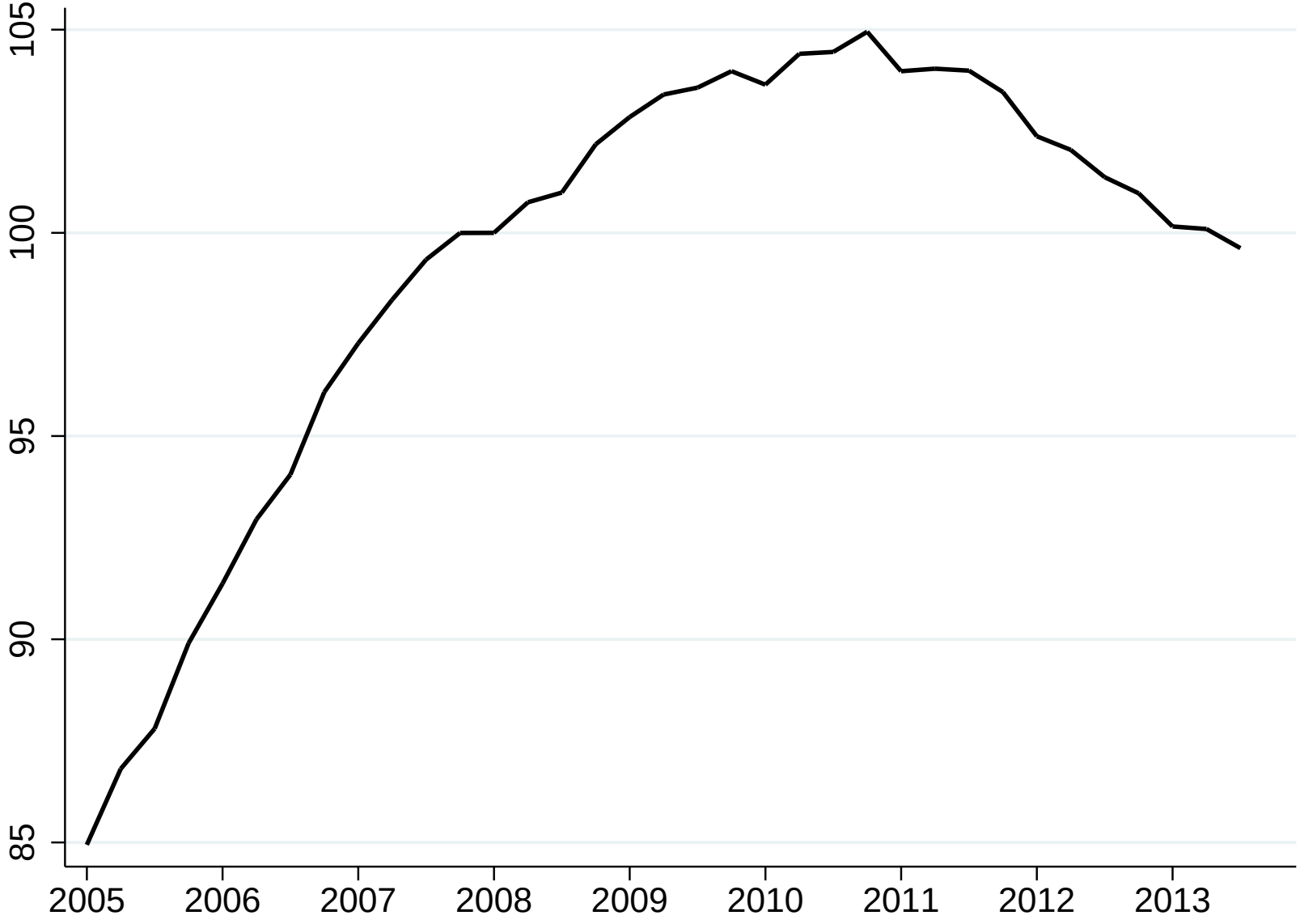
Hh-level series and their aggregate counterparts

- Real assets: House prices
- Financial assets: Deposits, stocks, bond prices, HICP
- Debt: HICP
- Income: Mostly wages per employee (+ capital income)
- Debt service variables:
  Calculate change in interest payments from outstanding amounts O

$$DS_{t+1} = DS_t + O_t \times \Delta IR_{t+1}$$

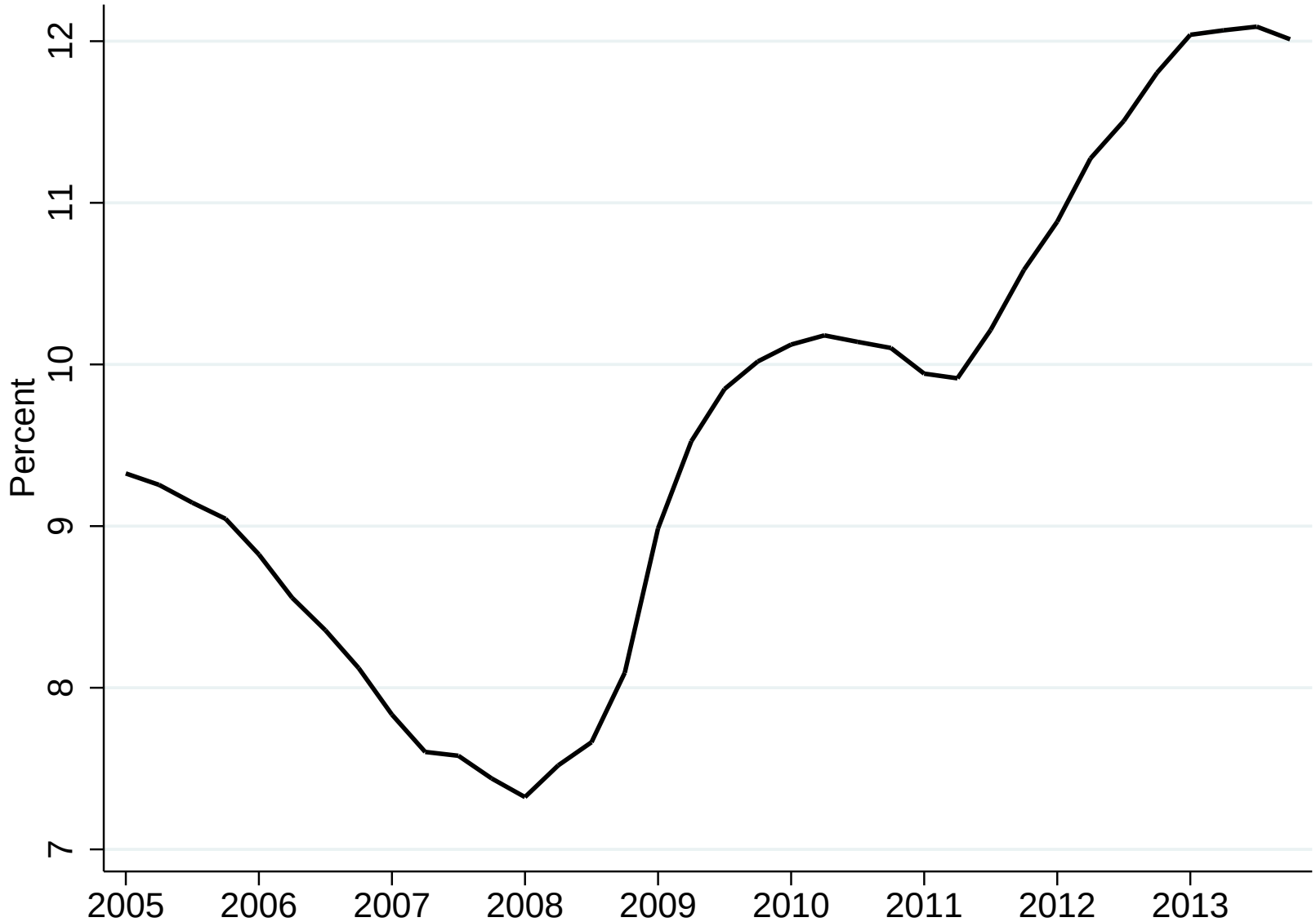
- Mortgages and non-collateralised debt:
  Debt service updates only for loans with variable rates
- For IR use home purchase/consumption interest rates

EA real Hh debt 08Q1–13Q2—roughly constant

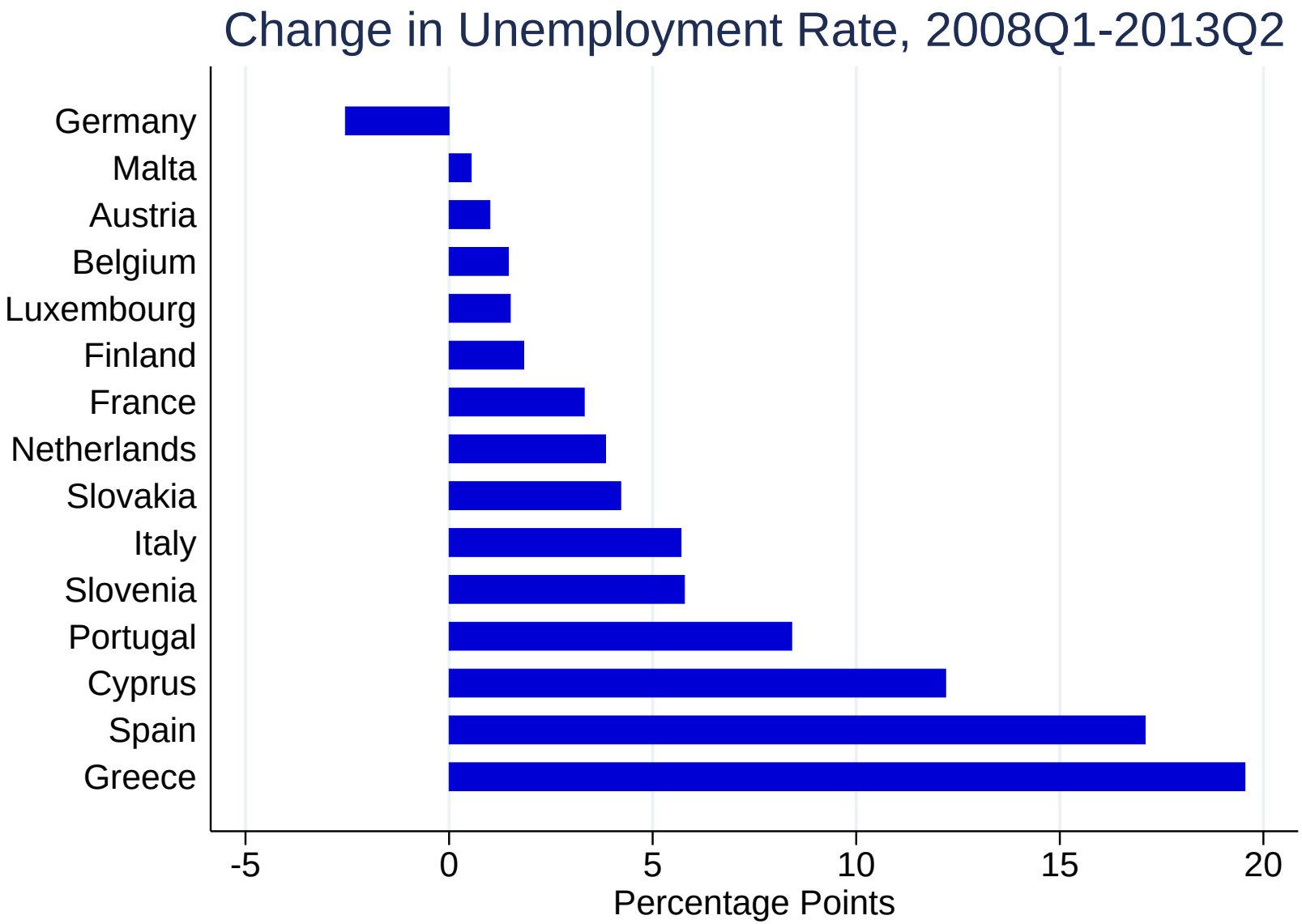


HFCS variable name	HFCS variable	Aggregate series used to extrapolate
Real Assets		
DA1110	Value of household's main residence	House price index
DA1120	Value of other real estate property	House price index
DA1130	Value of household's vehicles	HICP
DA1131	Valuables	HICP
DA1140	Value of self-employment businesses	Unquoted shares and other equity
Financial Assets		
DA2101	Deposits	Deposits
DA2102	Mutual funds	Stock price index
DA2103	Bonds	Zero-coupon-bond price index (derived from the convergence interest rate)
DA2104	Value of non-self-employment private business	Unquoted shares and other equity
DA2105	Shares, publicly traded	Stock price index
DA2106	Managed accounts	HICP
DA2107	Money owed to households	HICP
DA2108	Other assets	HICP
DA2109	Voluntary pension/whole life insurance	Insurance technical reserves
Income		
DI1100	Employee income	Wages per employee
DI1200	Self-employment income	Gross operating surplus and mixed income
DI1300	Rental income from real estate property	Gross operating surplus and mixed income
DI1400	Income from financial investments	Interests
DI1500	Income from pensions	HICP
DI1600	Regular social transfers (except pensions)	HICP
DI1700	Income from private transfers	Miscellaneous current transfers
DI1800	Other income	HICP
Debt and Financial Pressure		
DL1000	Total liabilities	HICP
DL2100	Payments for mortgages (flow)	House purchase interest rate
DL2200	Payments for non-collaterised debt (flow)	Consumption interest rate

EA unemployment rate: ↑ 4 pp



Δunempl—large XC heterogntny: $\uparrow$ up to 20 pp



Accounting for changes in unemployment

Goal

1. Δunemployment important for Δincome
2. Want to better allocate changes in work status

Method

- Target changes in aggregate unemployment rates $U_{c,t}/U_{c,r}$:

$$u^*_{c,t} = \frac{U_{c,t}}{U_{c,r}} \times u_{c,r}$$

$u_{c,t}$ unempl rate in survey
t target period, r reference period

- Two-step approach: Changes in employment & labor income

Accounting for changes in unemployment

- Changes in work status
  - Country-specific probits $\rightarrow \hat{Y}_{c,i}$—probablty having job
  - Sector-specific shocks $\eta_{c,i}$
  - Individual-specific uniform shock $\epsilon_{c,i}$
  - Probability of being employed:

$$\Delta_{c,i} = \epsilon_{c,i} + \eta_{c,i} - \hat{Y}_{c,i}$$

- Changes in labor income
  - Employment $\rightarrow$ unemployment: Replacement rates
  - Unemployment $\rightarrow$ employment: Heckman selection model

Shocks to wealth

- (Substantial) decline in net wealth, 2008Q1–2013Q2
  - Median wealth $\downarrow$ 13.7 %, mean $\downarrow$ 10.5
  - Decline primarily driven by $\downarrow$ in house prices
    - Real assets $\approx$ 85% of total assets
  - Increase in financial wealth
- Percentage declines even across income;
  EUR declines concentrated among rich Hhs
- Heterogeneity across countries
  - Net wealth $\uparrow$ in AT, BE, DE, LU
  - Declined by 20%+ in ES, GR, SI

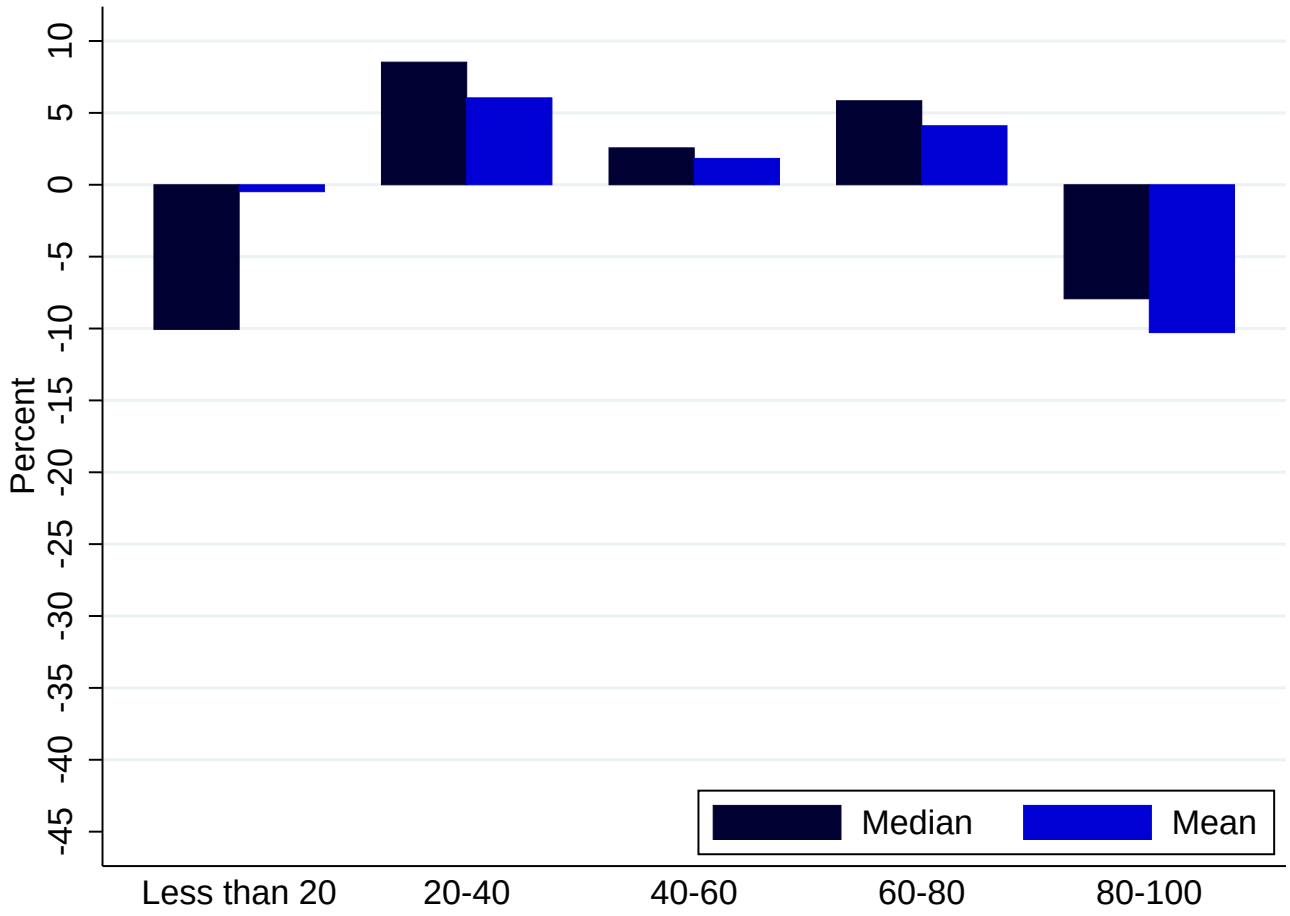
Shocks to wealth by income

Growth of net wealth, 2008Q1–2013Q2, real terms

	Median	Mean
All Households	−13.7	−10.5
Percentile of Income		
Less than 20	−1.1	−13.8
20-39	−7.7	−11.0
40-59	−10.2	−12.1
60-79	−13.2	−10.4
80-100	−11.4	−9.6

Also heterogeneity within countries: Income-rich vs. poor in Finland

Growth of net wealth by income quintile, 2008Q1–2013Q2



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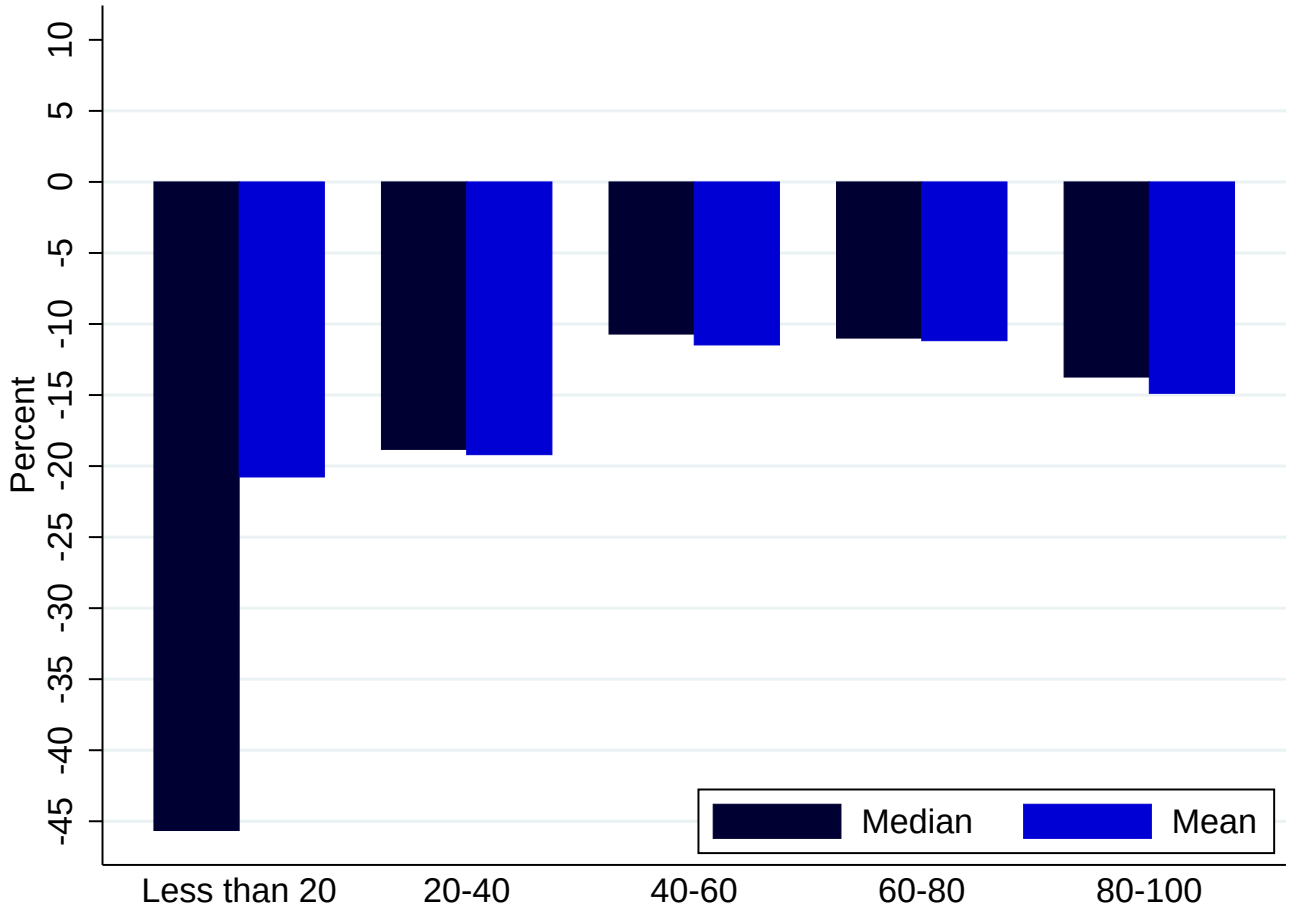


Shocks to income by income quintile

Growth of income, 2008Q1–2013Q2, real terms

	Mechanical Update		Unemployment Simulation	
	Median	Mean	Median	Mean
All Households	−2.0	−2.7	−5.7	−5.0
Percentile of Income				
Less than 20	−0.8	−1.3	−7.2	−6.9
20-39	−1.6	−1.8	−6.8	−6.1
40-59	−2.0	−1.9	−5.7	−5.4
60-79	−1.8	−1.9	−4.6	−4.5
80-100	−2.2	−3.7	−3.3	−4.7

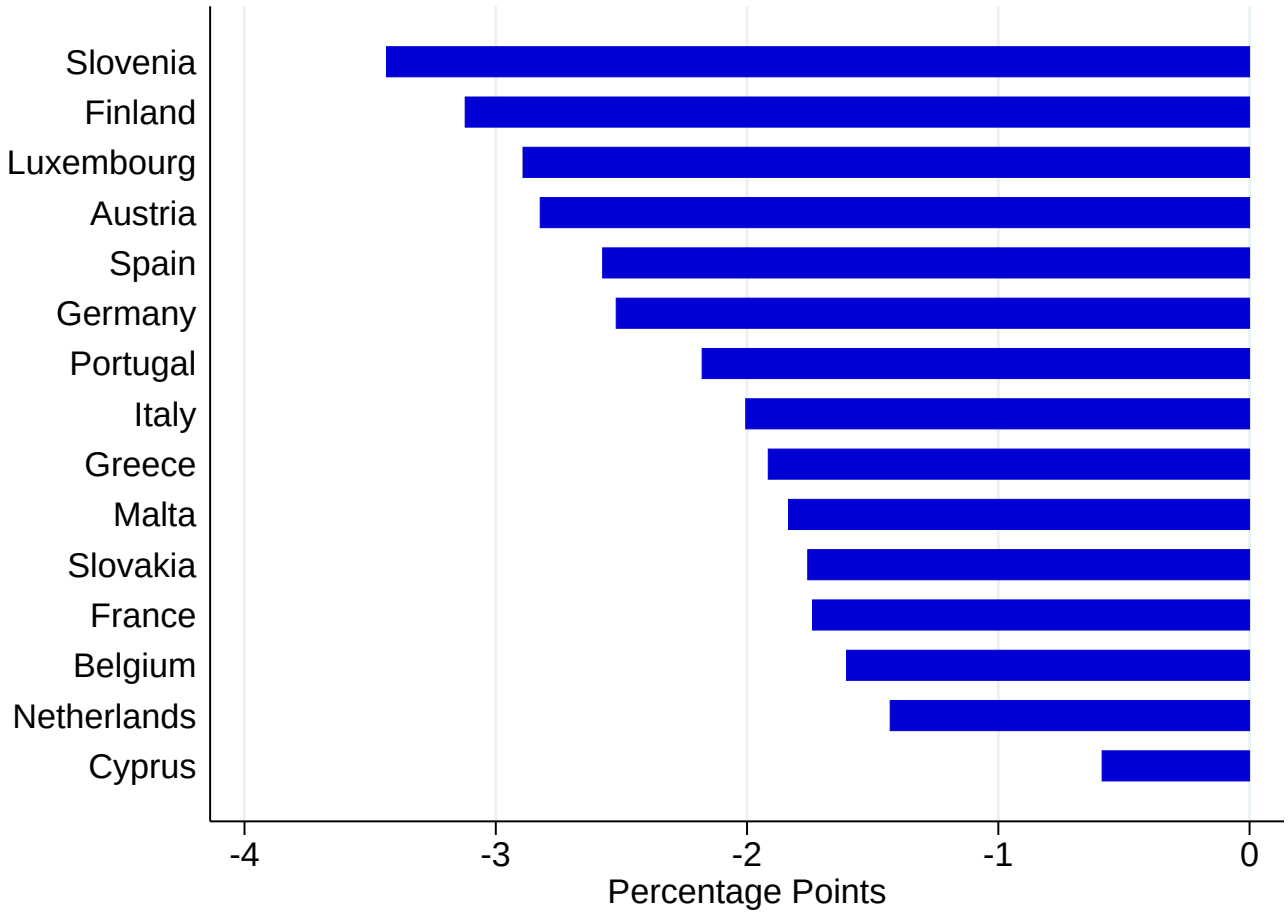
Shocks to income by country

Growth of income, 2008Q1–2013Q2, real terms

	Mechanical Update		Unemployment Simulation	
	Median	Mean	Median	Mean
All Households	−2.0	−2.7	−5.7	−5.0
Belgium	0.9	0.6	−2.1	−1.4
Germany	0.9	1.1	4.1	2.8
Greece	−9.4	−9.4	−19.8	−20.4
Spain	−2.9	−2.9	−15.8	−12.0
France	−2.7	−5.3	−4.8	−7.1
Italy	−4.5	−6.4	−10.5	−11.6
Cyprus	−5.6	−4.5	−14.5	−12.3
Luxembourg	0.0	0.1	−1.6	−0.5
Malta	0.3	0.5	−0.2	0.2
Netherlands	−3.5	−4.9	−5.7	−6.4
Austria	−1.2	−1.3	−2.0	−2.0
Portugal	−1.4	−1.3	−9.5	−6.7
Slovenia	0.2	−5.5	−18.1	−14.4
Slovakia	3.0	2.3	0.5	0.2
Finland	−1.2	−4.2	−3.5	−5.6

Shocks to financial pressure

Change in nominal interest rates on loans for house purchase, 2008Q1–2013Q2



- Decline in house purchase and consumption interest rates

Shocks to financial pressure by income quintile

Change in median, 2008Q1–2013Q2, real terms

	Total Debt Serv–Income	Mortgage Debt Serv–Income
All Households	−1.5	−2.2
Percentile of Income		
Less than 20	1.8	−6.0
20-39	−1.0	−3.0
40-59	−2.0	−3.4
60-79	−1.7	−1.7
80-100	−1.5	−1.7

Shocks to financial pressure by country

Change in median, 2008Q1–2013Q2, real terms

	Total Debt Serv–Income	Mortgage Debt Serv–Income
All Households	−1.5	−2.2
Country		
Belgium	−2.1	−2.1
Germany	−1.7	−1.8
Greece	0.5	0.5
Spain	−2.2	−3.5
France	−1.1	−1.3
Italy	−0.7	−1.7
Cyprus	0.5	0.2
Luxembourg	−4.6	−6.2
Malta	−2.9	−3.8
Netherlands	−3.8	−4.0
Austria	−2.4	−2.5
Portugal	−2.2	−4.3
Slovenia	−1.7	−3.2
Slovakia	−1.1	−4.5
Finland	*M*	*M*

Are results reasonable?

- **Spain: Comparison with EFF 2008–2011**

  Growth rates 2007Q4–2010Q4 (real, in percent)

	Income		Net Wealth	
Scenario	Median	Mean	Median	Mean
EFF Data	−8.6	−3.1	−20.1	−12.5
Mechanical Extension	2.1	1.4	−21.0	−18.8
Long-Term Replacement Rate	−7.9	−5.6		
Initial Replacement Rate	−6.0	−4.5		

- **US: Substantial adverse shocks also in SCF 2007–2010**
  - Wealth: Median −38.8%, mean −14.7%
  - Income: Median −7.7%, mean −11.1%

Wealth effects—road map

- Large literature
  1. MPC = 0.02–0.07
  2. Substantial heterogeneity in MPC across households
     Low-inc/low-wealth/indebted/liq constr Hhs—higher MPCs
- Impose MPC on micro wealth data, 2008–present
- Calculate implications for aggregate C

Wealth effects on consumption—2 scenarios

Calibrate MPC using existing estimates

2 scenarios

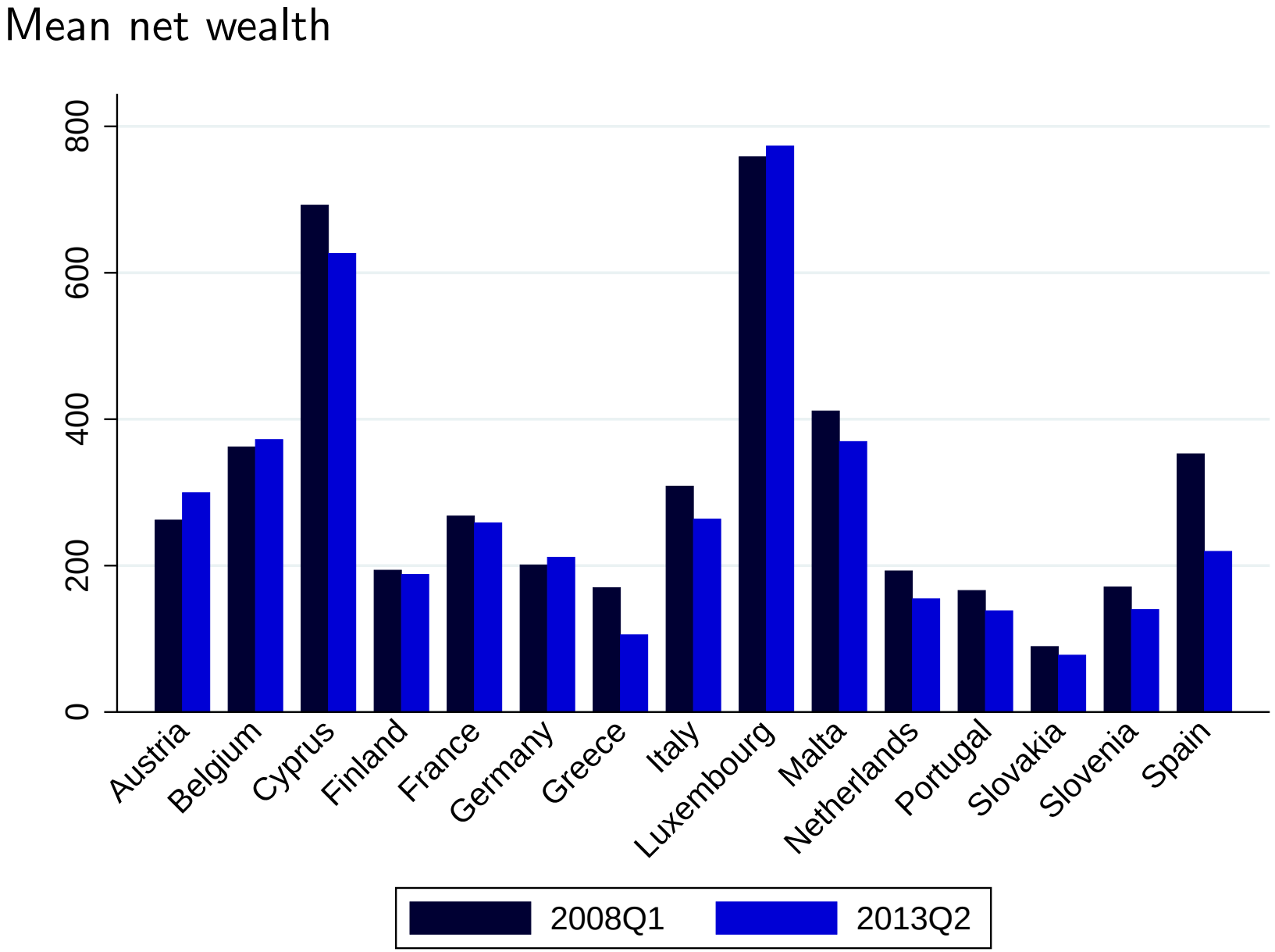
1. Homogeneous MPC
   MPC $= 0.025$ (Slacalek 2009)
2. Heterogeneous MPC
   MPC for Income Quintiles 1–5 $=$
   $\{0.04, 0.035, 0.025, 0.015, 0.01\}$ (Mian et al. 2013)

Wealth effects on aggr consumption, 08Q1–13Q2

Homogeneous MPC: All Households = 0.025
Heterogeneous MPC: Income Quintiles 1–5 = $\{0.04, 0.035, 0.025, 0.015, 0.01\}$

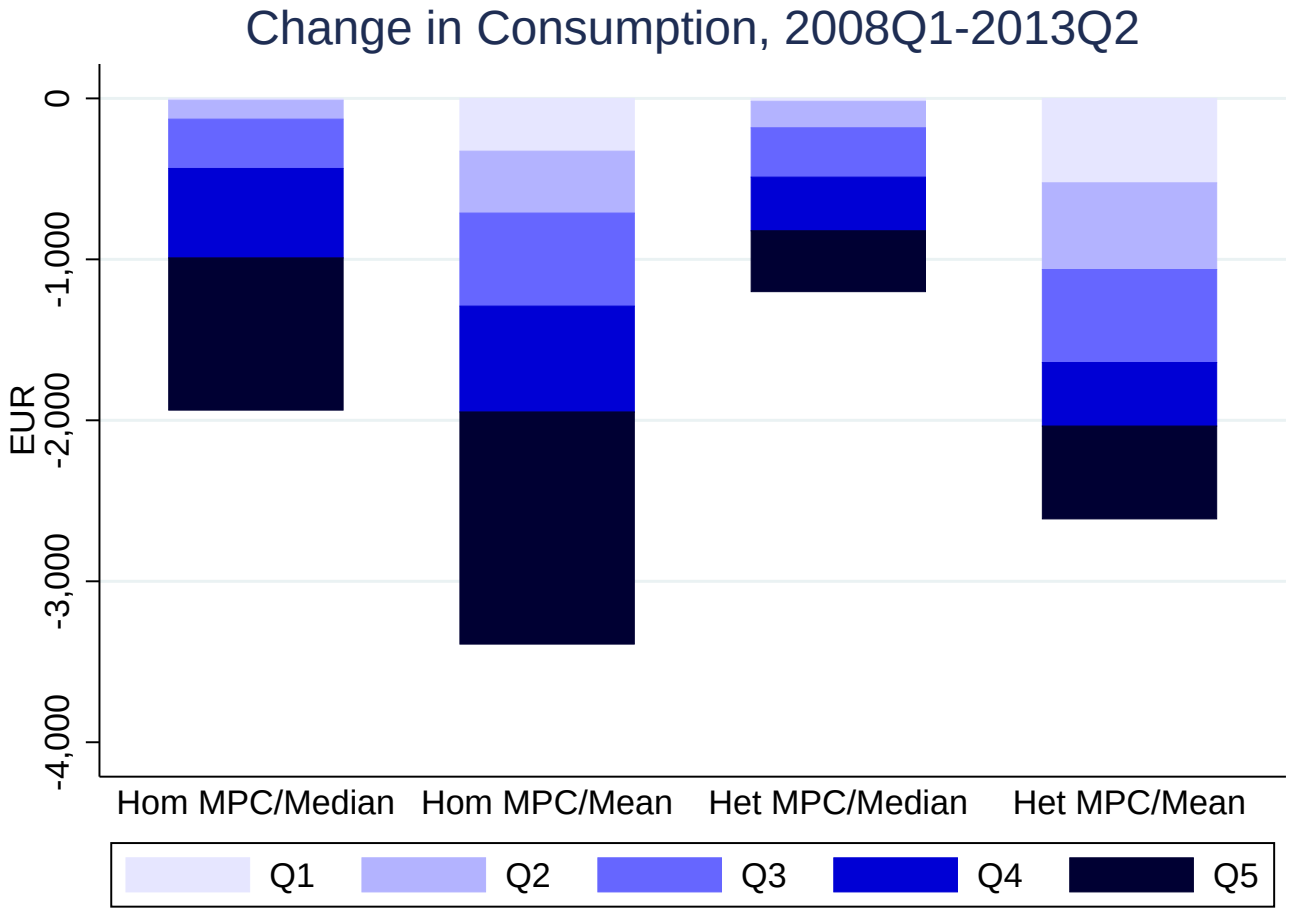
	Homogeneous MPC		Heterogeneous MPC		Consumption Growth
Country	Median	Mean	Median	Mean	2008–2013
Austria	0.8	2.1	0.4	1.5	4.2
Belgium	0.6	0.6	0.3	0.4	3.3
Cyprus	−3.5	−3.7	−2.6	−2.8	−8.5
Finland	−0.1	−0.3	0.0	−0.0	2.8
France	−0.6	−0.5	−0.2	−0.2	2.2
Germany	0.2	0.6	0.2	0.5	4.8
Greece	−2.7	−3.8	−2.3	−3.1	−8.4
Italy	−1.9	−2.8	−1.7	−2.2	−6.0
Luxembourg	0.4	0.5	0.3	0.4	5.7
Malta	−2.8	−3.5	−2.4	−3.1	3.8
Netherlands	−1.6	−2.5	−1.0	−1.9	−5.5
Portugal	−0.5	−2.1	−0.5	−1.3	−9.0
Slovakia	−1.2	−1.3	−1.1	−1.3	−1.4
Slovenia	−2.4	−2.9	−1.9	−2.6	−4.3
Spain	−6.1	−9.2	−5.3	−7.3	−9.2
All Countries	−1.0	−1.7	−0.6	−1.3	−0.9

ES, GR, CY lost most (in EUR terms) $\Rightarrow$ strong effect on C



Rich have lost more wealth; poor have higher MPCs

Het-MPC: drop in C evenly distributed across income



Summary & next steps

- Framework for "timely" update of Hhs' financial situation
- Simple approximation delivers reasonable results
  - Significant heterogeneity across and within countries
  - Heterogeneity important $\Rightarrow$ cannot be captured by aggregates
- Update useful for
  - Policy scenarios & simulations
  - Cross-check for macro projections (and 2nd wave of HFCS)
  - Input into more elaborate heterogeneous agents models
- Next steps
  - Further improve procedure
    - Unemployment simulation
    - Model defaults and link debt to rest
    - Include behavioral responses
  - Moving towards more structural approach