Housing Markets and the Heterogeneous Effects of Monetary Policy Across the Euro Area

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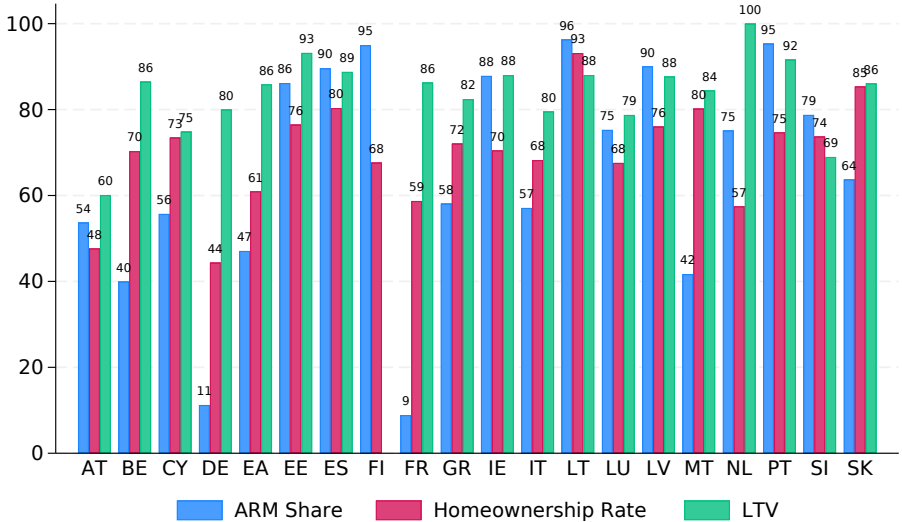
  - Quantify potential of LTV as macroprudential tool

Local housing and mtg market features differ widely



Preview of findings

- Countries with stronger empirical responses to MP shocks in consumption and mtg rates are those with higher ARM shares, higher HoR, and higher LTV
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  - But housing and mtg market features are correlated across countries
- To quantify relative importance of each feature, turn to New Keynesian model with household heterogeneity and two countries: Foreign and Home
- I calibrate the model to key housing and mtg features: Foreign economy to the euro area as a whole (EA) and Home economy to each euro area country
- Model reproduces cross-country pattern of empirical heterogeneity: following a 25bp cut in interest rate, consumption response peaks range from 0.6% to 1.8%, and mtg rate troughs from -0.03 to -0.25pp

Preview of findings cnt'd

- Using Portugal (PT) as case study, I show that elevated level of ARM, HoR, and LTV generate substantial amplification in aggregate consumption:
  - Higher ARM share strengthens the pass-through to mortgage rates
  - Higher HoR means more mortgaged homeowners benefiting from lower rates
  - Higher LTV allows households to borrow more during expansions

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  - Higher LTV allows households to borrow more during expansions
- Use the model to evaluate macroprudential policy
  - Reducing PT's LTV ratio could close part of the gap in responses to monetary policy between PT and EA
  - Eliminating the gap entirely would require cutting PT's LTV to roughly one-third of its current value

Literature review

- Housing and the Macroeconomy: Mian, Rao, Sufi (2013), Mian, Sufi (2008, 2014), Berger, Guerrieri, Lorenzoni, Vavra (2018), Greenwald (2018), Greenwald, Guren (2025)
  - Here: Study cross-country effect of ARM & HoR in the MP transmission
- Housing & Monetary Policy: Iacoviello (2005), Iacoviello, Neri (2010), Rubio (2011), Calza, Monacelli, Stracca (2013), Greenwald (2018), Slacalek, Tristani, Violante (2020), Corsetti, Duarte, Mann (2021), Almgren, Gallegos, Kramer, Lima (2021), Koeniger, Lennartz, Ramelet (2021)
  - Here: Empirical evidence on mortgages; NK model to quantify role of housing and mtg market institutions
- Monetary Policy in Open Economy: Galí, Monacelli (2005, 2008), Faia, Monacelli (2008), De Paoli (2009), Corsetti, Dedola, Leduc (2010)
  - Here: Currency union with rich within-country households balance-sheets

Outline

Data

- Monthly data spanning $2000M1$–$2012M12$, 19 euro area countries
- ECB: short rate (EURIBOR) as policy rate, mortgage rate on new loans, Overnight Interest Rate Swaps around policy announcements Altavilla, Brugnolini, Gürkaynak, Motto (2019)
  - MP shock: Sum intra-day 1-Year OIS changes over each month
- EUROSTAT: Harmonized CPI (HICP)
- Almgren et al 2022: Monthly aggregate consumption and output
- Household Finance and Consumption Survey: 2014 ARM, HoR, and LTV

Empirical specification

All IRFs cons | All IRFs mtg rate

- Panel local projections pooling all euro area countries:

$$y^c_{t+h} - y^c_{t-1} = \alpha^c + \beta_h \epsilon^{MP}_t + \gamma_h 1^c_G \epsilon^{MP}_t + \text{Controls} + u^{h,c}_t$$

$\forall h = 0, \ldots, H$ months and characteristic G (ARM, HoR, LTV)

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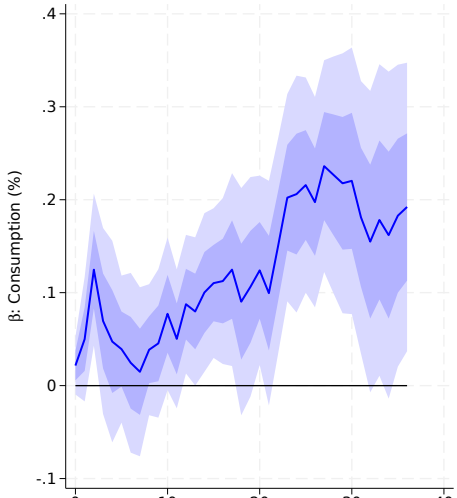
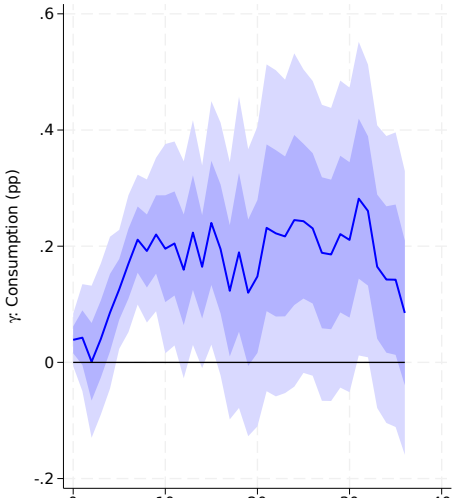
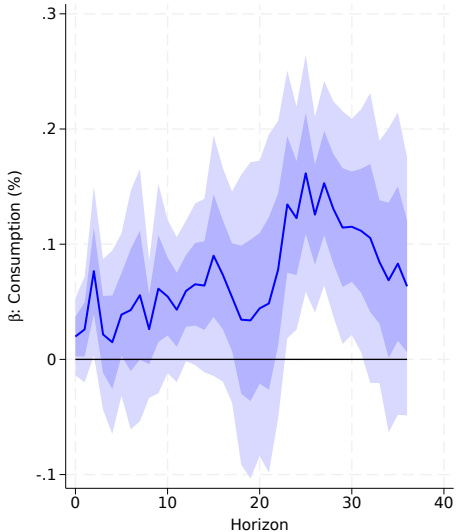
- γ_h: differential MP responses for countries with above median characteristic relative to those with lower values

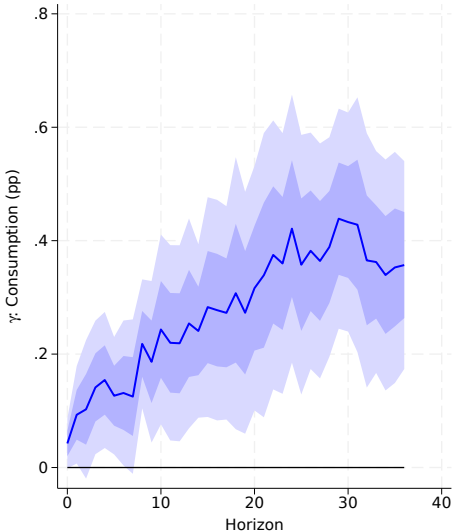
Consumption in high ARM regions responds more strongly



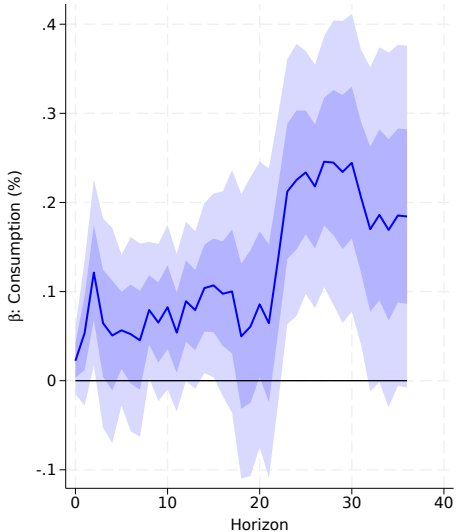


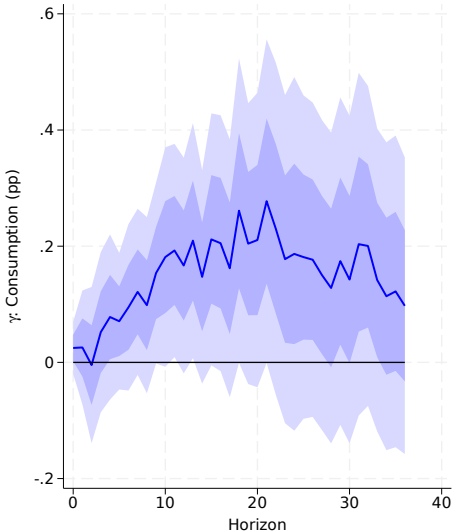
Consumption in high HoR regions responds more strongly



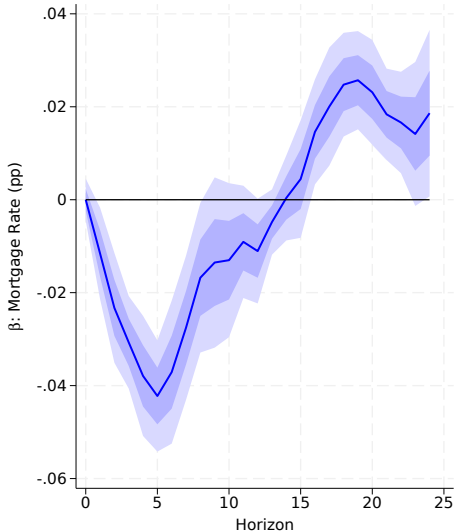


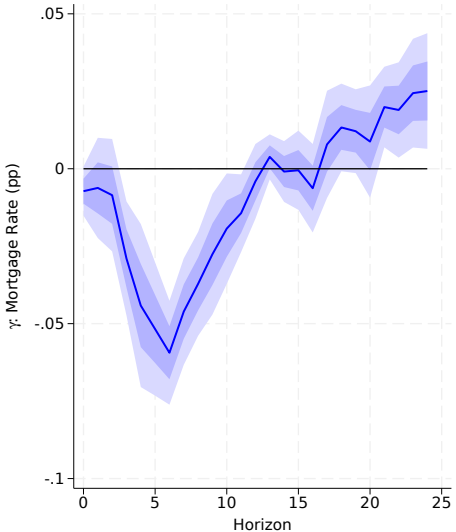
Consumption in high LTV regions responds more strongly



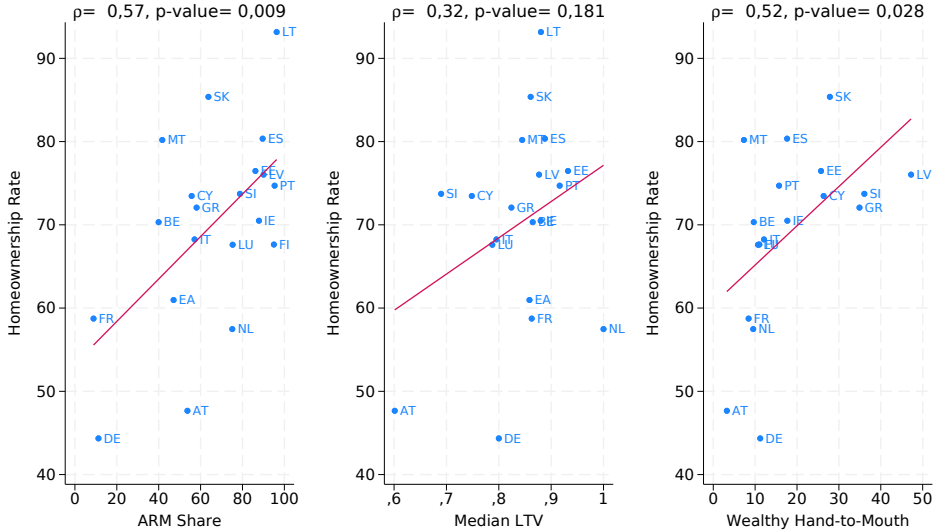


Mtg rates in high ARM regions responds more strongly





Housing and mortgage market features are correlated



Setup & key housing institutions

- Currency-union New Keynesian model with rich household balance sheets
  - Home and Foreign (EA). Home small wrt Foreign Faia-Monacelli (2008)
  - Tractably embed rich housing and mtg market characteristics Greenwald (2018)
  - Novelty: compare effect in change of characteristics across countries

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  - Novelty: compare effect in change of characteristics across countries
- Exogenous share in each country of ARM & FRM due to institutions
- Borrowers face a country-specific loan-to-value ratio
- Borrowers and landlords face within-period heterogeneous shocks in utility from owning $\Longrightarrow$ endogenous HoR Greenwald, Guren (2025)
  - Countries with higher HoR feature households happier to own on average
  - Differences in ownership utility reflective of rental market quality, subsidies

Bird's eye view: agents

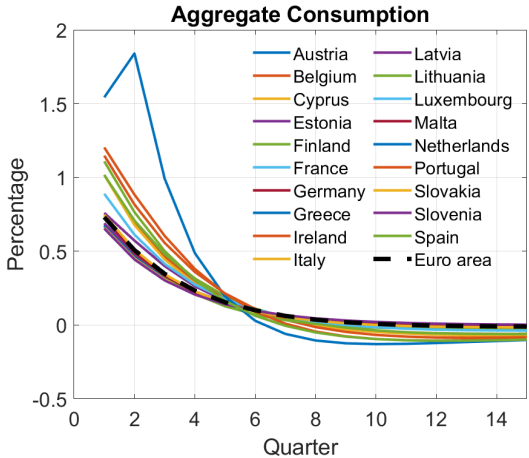
- Borrowers: representative family with measure χ_b of impatient households
  - Each borrower i can buy housing or rent. If decide to own, she receives idiosyncratic utility benefit from owning
  - Fraction ρ of borrowers demand mortgages, face a loan-to-value constraint
  - Fraction α of mortgages are FRMs, reminder $(1-\alpha)$ are ARMs

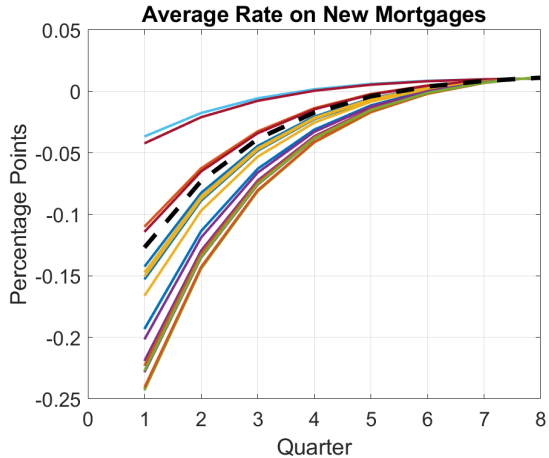
- Savers: representative family with measure $\chi_s = 1 - \chi_b$ of patient households. They are outright homeowners
  - Unconstrained, provide liquidity to borrowers in form of mortgages
  - Trade bonds both nationally and internationally

Closing the model

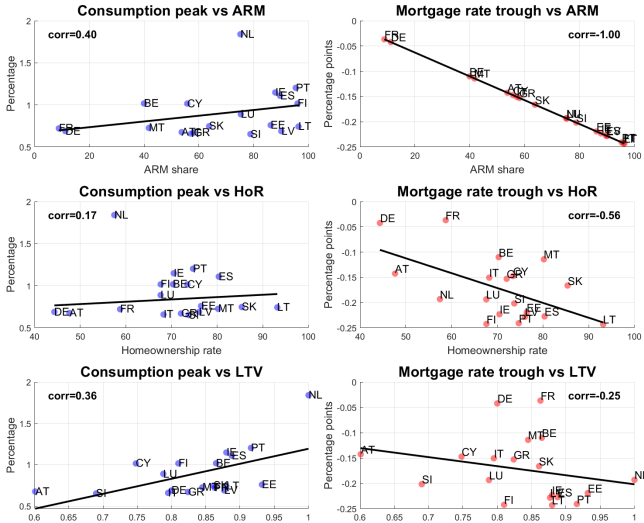
- Landlord: representative firm; transform housing into rental units
  - Owned by the savers
- Labor unions: standard, determine wage Phillips curve
- Monetary authority: Taylor rule at the euro area level and common nominal interest rate across countries (monetary union)
- Markets clear: bonds, mortgage, goods, rental, owner-occupied housing (which is in fixed supply)
- Calibration: Foreign economy matched to EA moments from the housing, mortgage, and labor markets. Home economy then calibrated to each ember state matching country-specific ARM, HoR, and LTV

Heterogeneous effects of a common MP shock

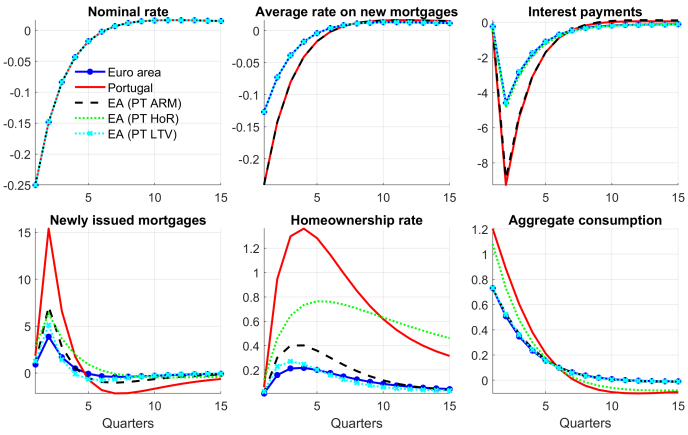




Correlations between responses and ARM, HoR, and LTV



Portugal responds more strongly than the euro area ...



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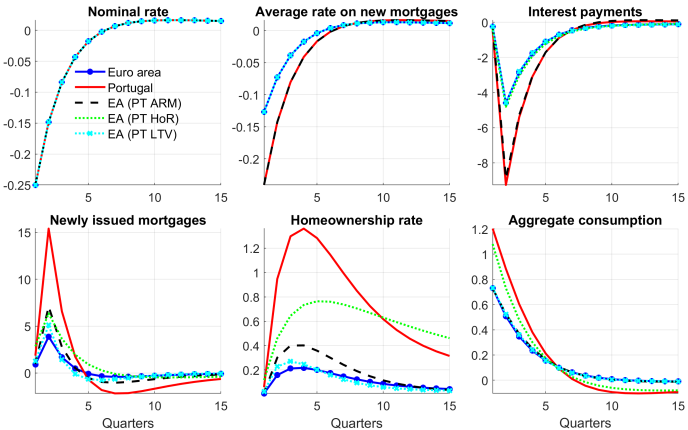

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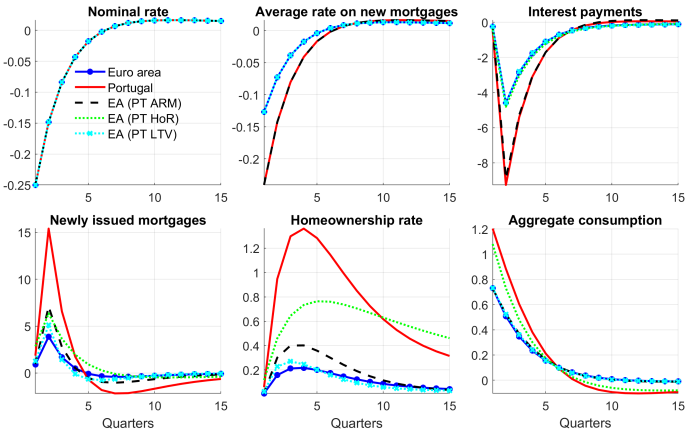

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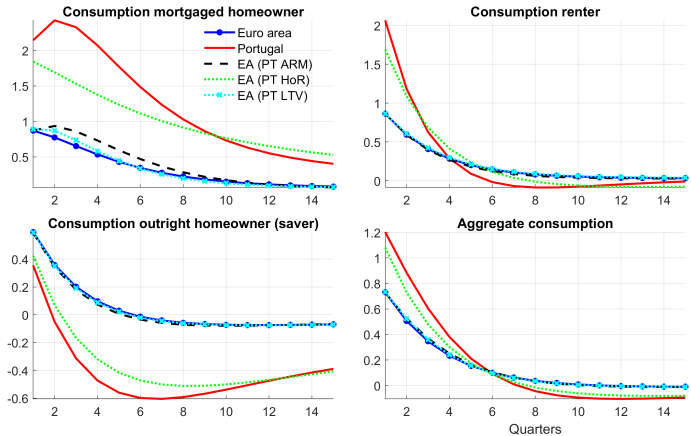
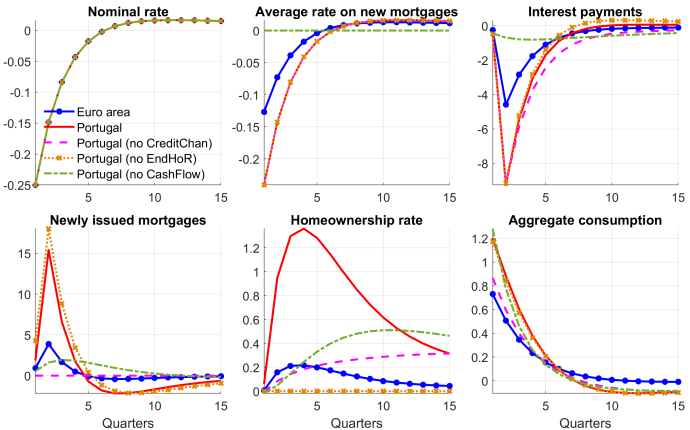
- The 3 features interact to ↑ consumption

. . . driven by consumption responses of borrowers



- Stronger responses in PT mostly driven by mortgaged homeowners
- Higher HoR means households can take on more debt
- Renters increase consumption only initially, then transition into homeownership
- Savers reduce consumption to provide credit to borrowers

The mortgage credit channel of MP dominates



- Three additional counterfactuals to assess relevance of economic channels
- Mortgage credit channel: fix newly issued mtgs at SS
- Cash flow channel: keep mortgage rates at SS
- Homeownership rate channel: keep HoR at SS

Reducing heterogeneity through macropru (LTV)

LTV in Portugal	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20
Consumption difference PT-EA	45	32	23	16	11	6	2	-2

- Most macroprudential levers in the hands of national authorities
- Regulation of LTV ratios offers a direct way to influence one of the key parameters identified for the heterogeneous transmission mechanism
- Closing the gap between PT and EA entirely would require reducing Portugal's LTV to roughly 0.3
- Such a large adjustment highlights both the potential and the limits of using a single macroprudential tool to address heterogeneity

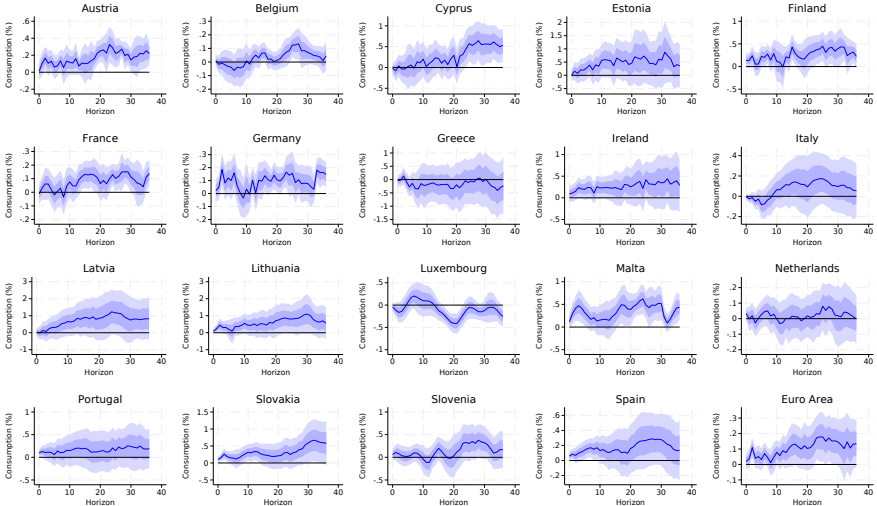
Conclusion

- Cross-country differences in the ARM share, HoR, and LTV ratio—three positively correlated housing and mortgage market institutions—are central to explaining the heterogeneous transmission of MP in the EA
- These features amplify one another through the cash-flow, homeownership rate, and mortgage credit channels, with the last one dominating.
- Policy experiments indicate that lowering high LTV ratios can mitigate heterogeneity

Appendix

Heterogenous consumption responses across the EA

Back



Heterogenous mtg rate responses across the EA

Back