Monetary Policy and the Homeownership Rate

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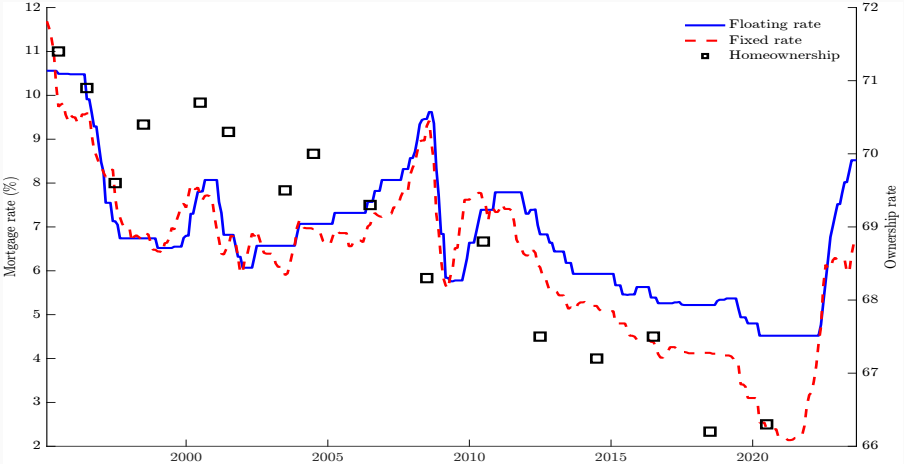
Motivation

- How does monetary policy affect the homeownership rate?
- Which monetary policy transmission channels matter most for homeownership decisions?
  - Interest rates
  - Incomes
  - House Prices
- What features of the macroeconomy, housing market, and mortgage market shape homeownership dynamics?

Motivation

- Difficult to investigate homeownership vs. monetary policy empirically!



Contribution

- **This paper**:
  - Build a rich heterogeneous household model with housing decisions
  - Calibrate to Australian data and housing/mortgage market features
  - Embed realistic macroeconomic dynamics in the model
  - Study effects of monetary policy and decompose transmission channels
  - Counterfactuals under different macro, housing, and mortgage structures

Related Literature

- Models of monetary policy and the housing market
  - Beraja et al. (2019), Wong (2021), and Eichenbaum et al. (2022), **Dias et al. (2022)**
  - **This paper:** homeownership decisions, household heterogeneity, high frequency shocks
- Heterogeneous household models + aggregate housing demand shocks:
  - 2000s boom and bust: Favilukis et al. (2017), Kaplan et al. (2020), and Garriga et al. (2020)
  - COVID-19 boom: Gamber et al. (2022), Diamond et al. (2024), and Favara et al. (2025)
  - **This paper:** Regular high-frequency monetary policy decisions
- Models of the Australian housing market:
  - Cho et al. (2024), Cho et al. (2023), Ong et al. (2023), and Graham (2025)
  - **This paper:** offset accounts, mortgage servicability buffer, dynamics

Model

Model Overview

- Discrete time, **quarterly frequency**, ages 20–65
- Income: deterministic life-cycle + idiosyncratic shocks + **differential exposures to GDP**
- Assets: liquid assets, housing, mortgage
- Discrete choice between: renting, buying house, repaying mortgage
- **Novel Australia housing/mortgage features:**
  - Borrowing constraints: max LTV ratio + max Net Income Surplus
  - Mortgage serviceability buffer at origination
  - Lenders Mortgage Insurance for high-LTV ratio loans
  - Mortgage redraw/offset accounts (Graham, 2025)
  - Progressive stamp duty on home purchases (Cho et al., 2024)
- **Effect of monetary policy shocks:**
  - VAR(1) in rates, income, prices with identified monetary policy shocks
  - Embedded in household expectations, internalise evolution of aggregate states

VAR for Aggregate State Variables

- Aggregate state vector maps to data via:

$$\begin{aligned} S &= \{r, Y, P_h\} \\ &= \{\text{Real 90-day rate},\ \text{Real GDP},\ \text{Real house prices}\} \end{aligned}$$

- De-trend data series with 4th-order time polynomial

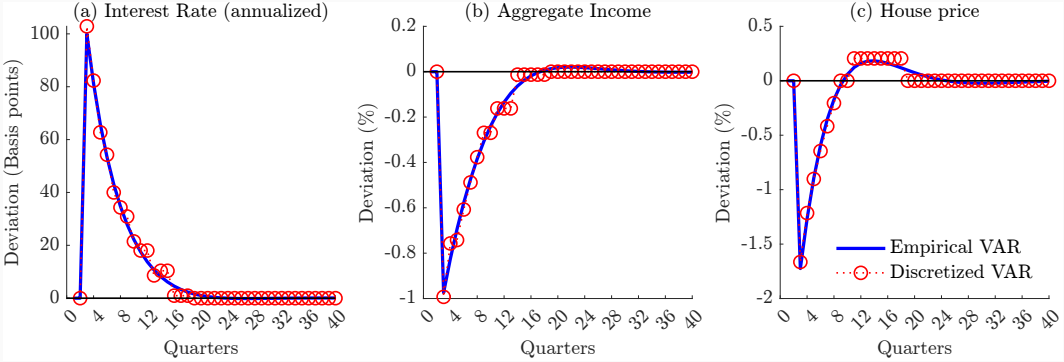
- Estimate VAR(1):

$$\begin{aligned} S_t &= AS_{t-1} + u_t \\ &= AS_{t-1} + B\varepsilon_t \end{aligned}$$

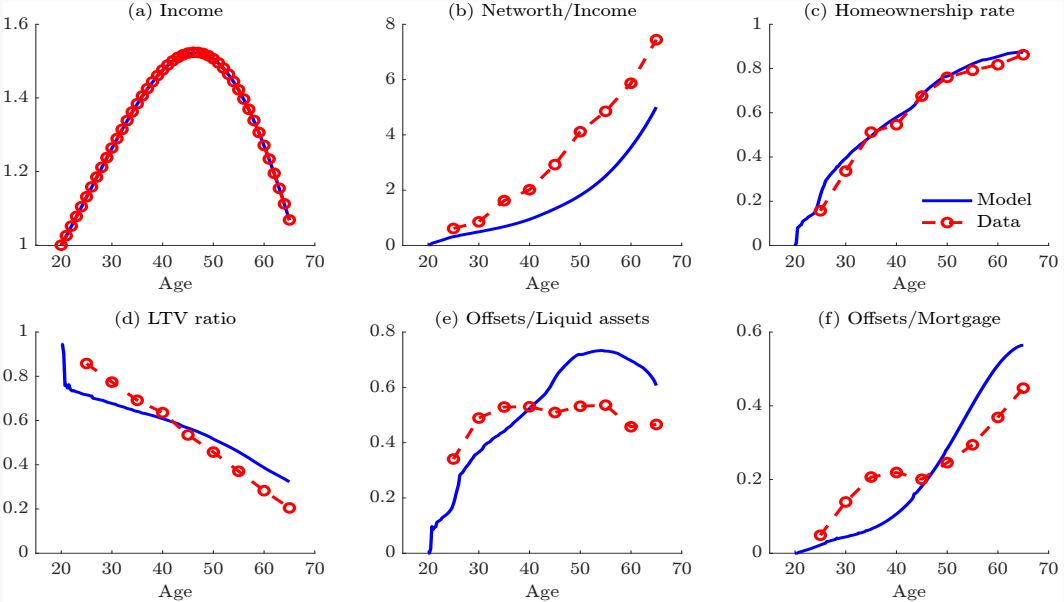
- Sign-restrictions on B identify monetary policy shocks
- For contractionary shock: r (+ve), Y (-ve), P_h (-ve)

VAR for Aggregate State Variables

- Curse of dimensionality! Need efficient approximation to VAR dynamics
- Discretization: $\{N_r, N_Y, N_{P_h}\} = \{7, 7, 15\}$



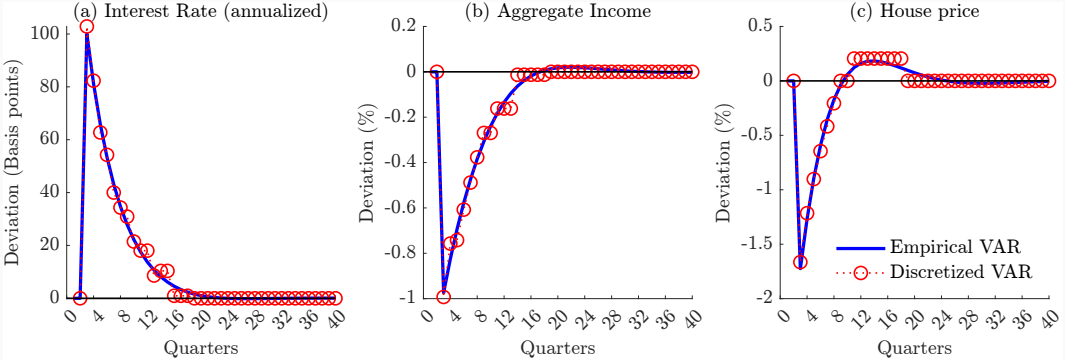
Calibration: Life-Cycle Profile



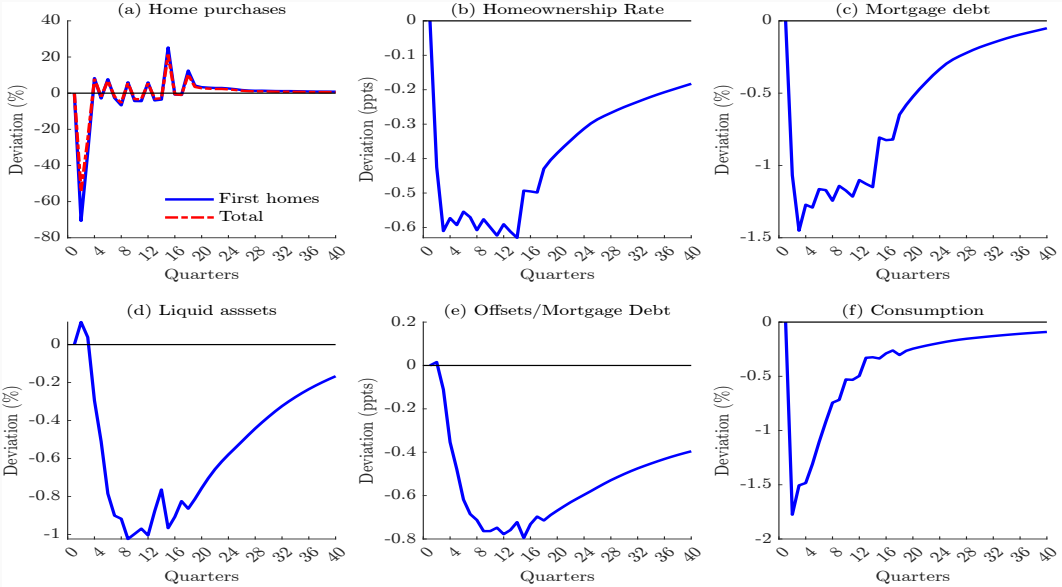
Monetary Policy Shocks

Monetary Policy Shocks

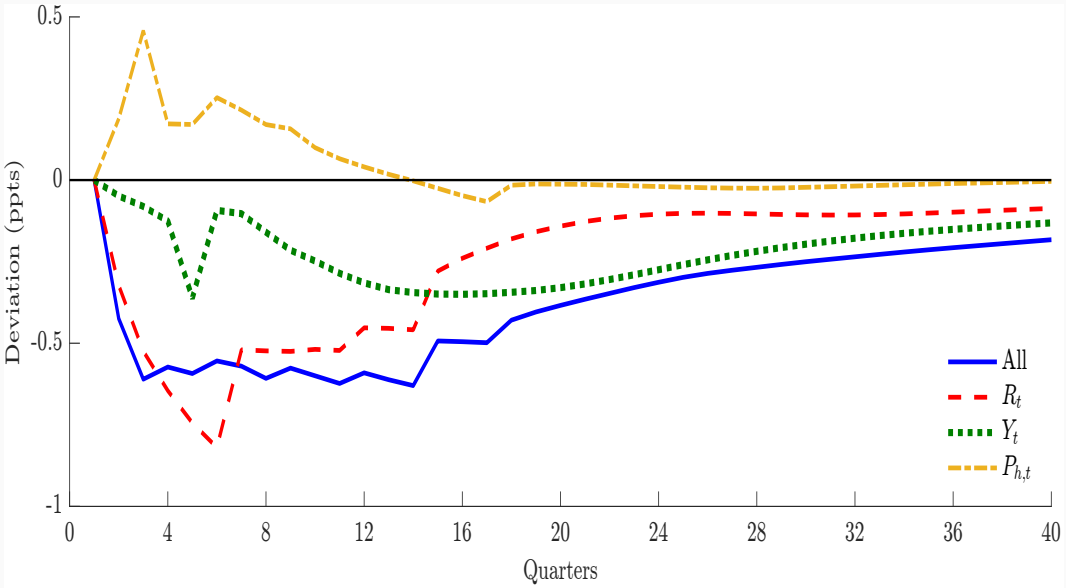
- Now study effects of monetary policy shocks on housing choices



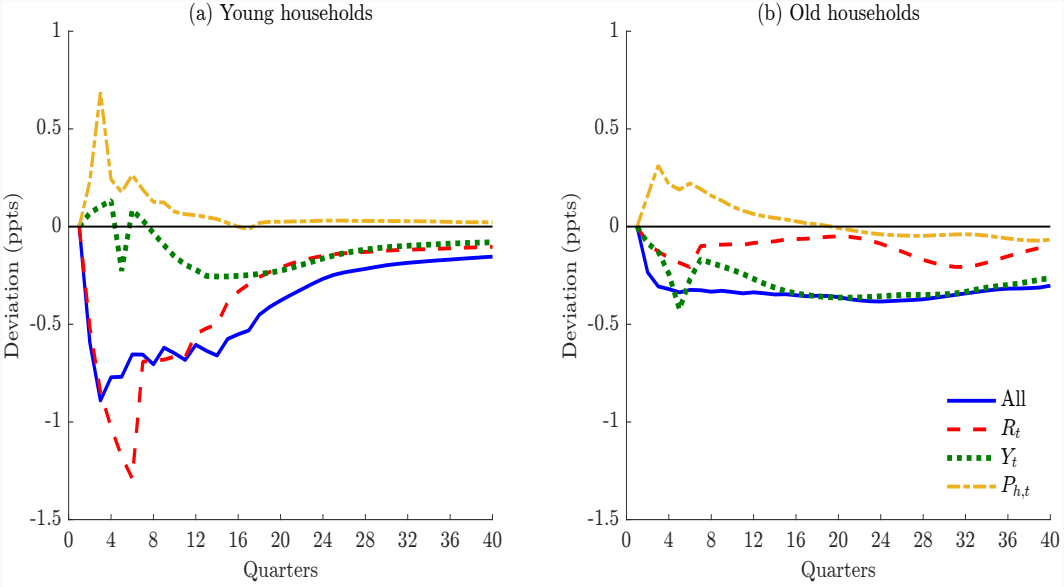
Aggregate Effects



Homeownership Decomposition

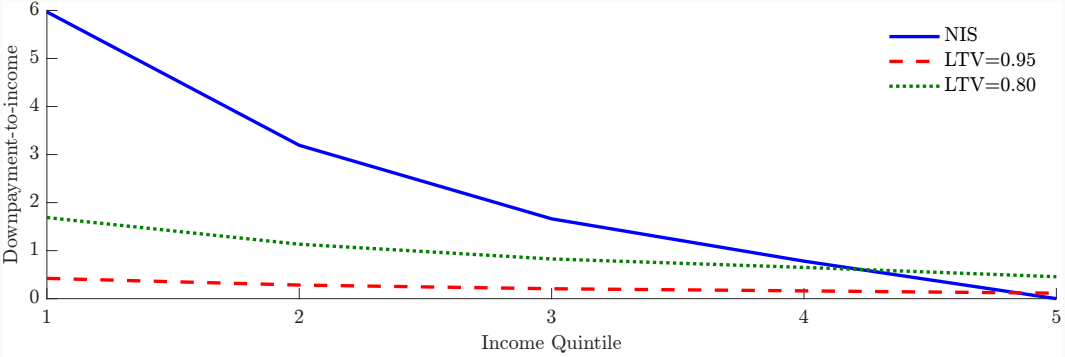


Homeownership Decomposition by Age



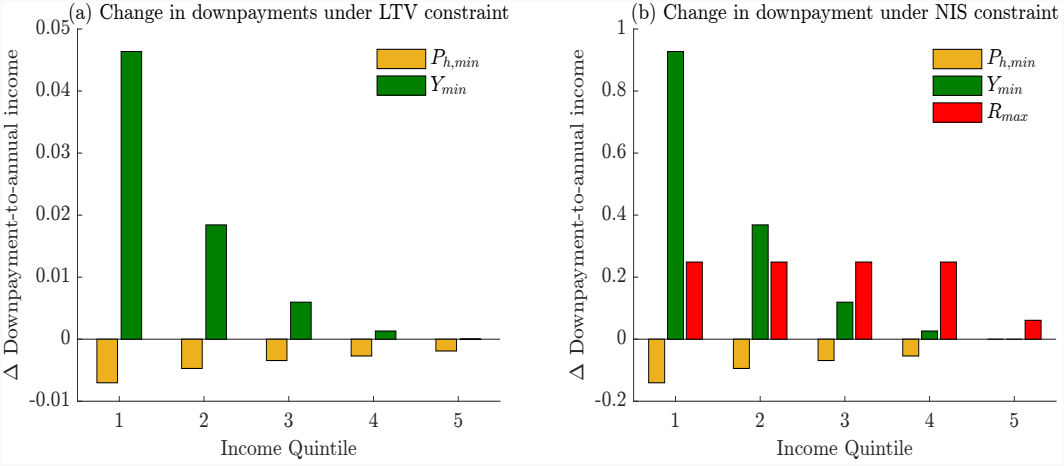
Mortgage Borrowing Constraints

- Households up against mortgage borrowing constraints when buying a home
- Most households constrained by NIS constraint, rather than LTV constraint



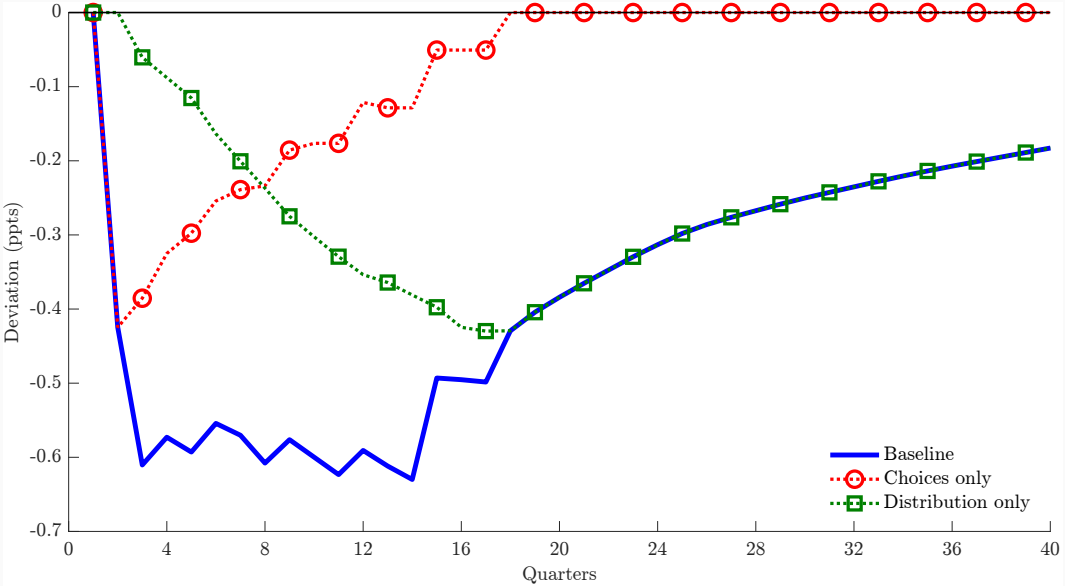
Effect of Monetary Policy on Borrowing Constraints

- NIS constraint moves the most in response to shocks
- Low income households most affected by income shocks
- Mid- to high-income households most affected by interest rate shocks



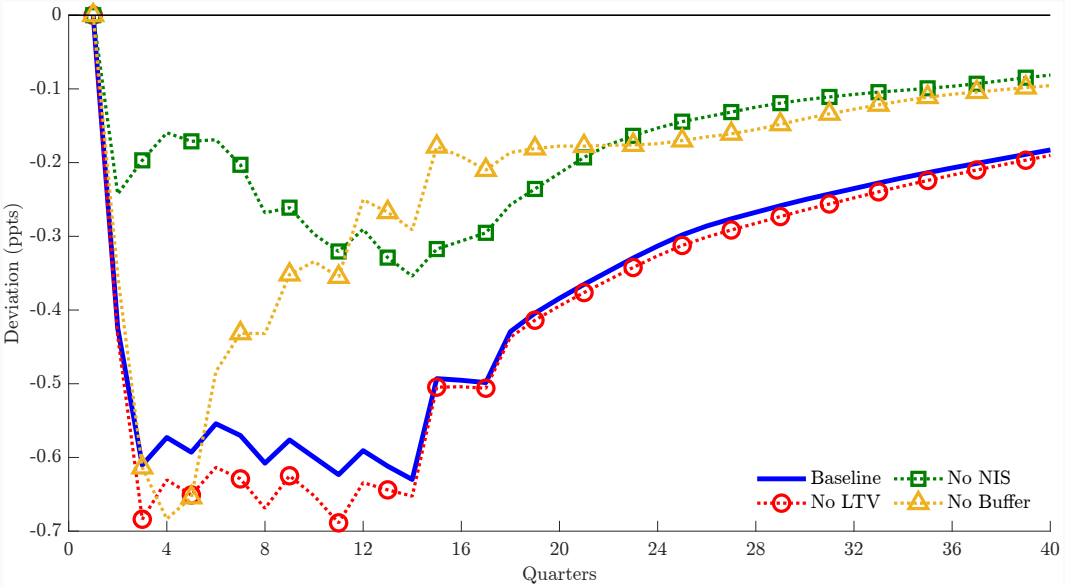
Impact of Decisions vs. Distributions

Homeownership Decisions vs. Distributions

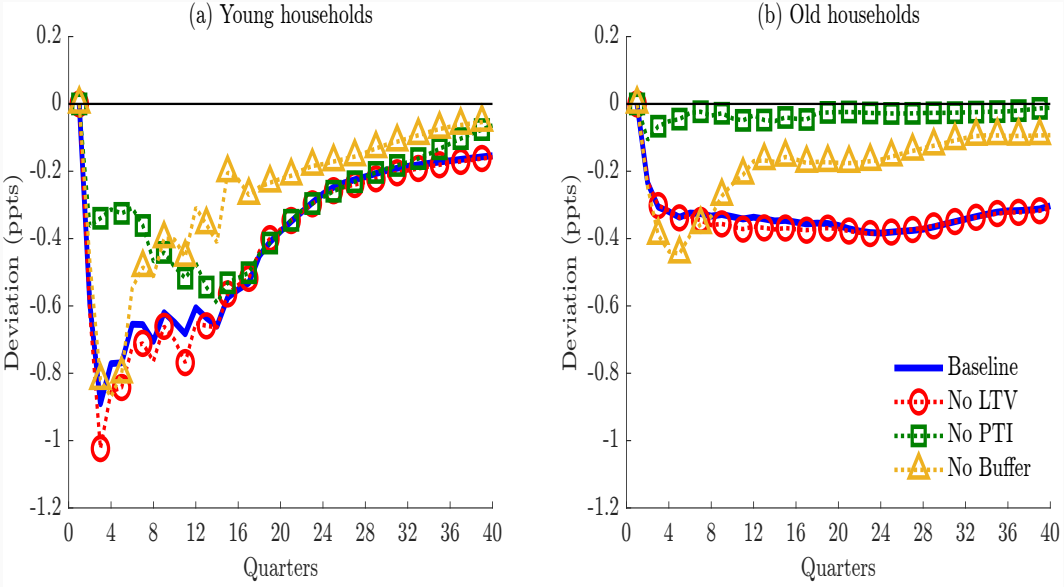


Impact of Mortgage Borrowing Constraints

Homeownership and Mortgage Borrowing Constraints

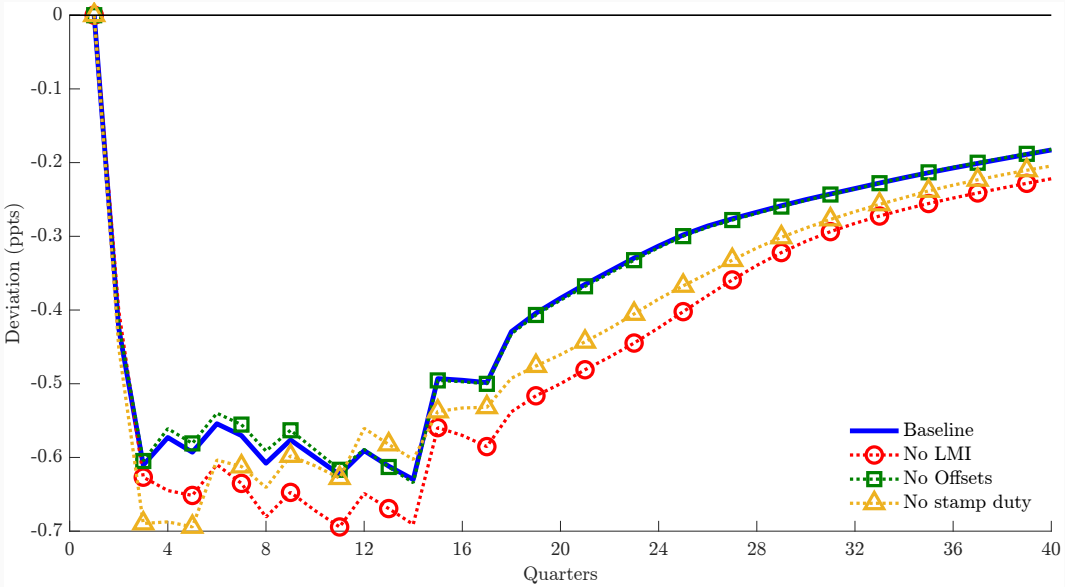


Homeownership By Age and Mortgage Borrowing Constraints



Impact of Housing and Mortgage Market Features

Homeownership By Age and Housing and Mortgage Market Features



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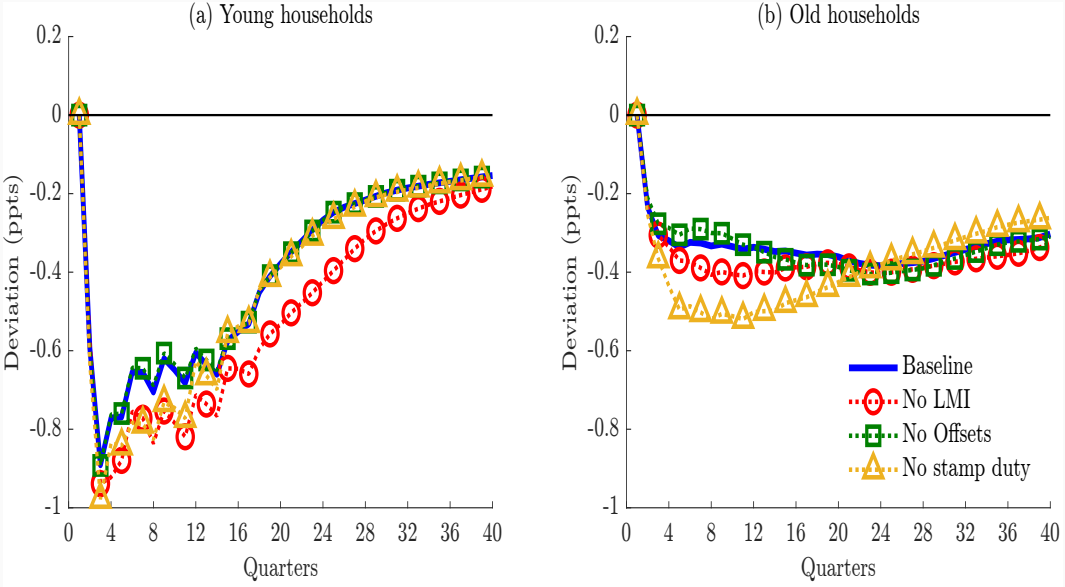
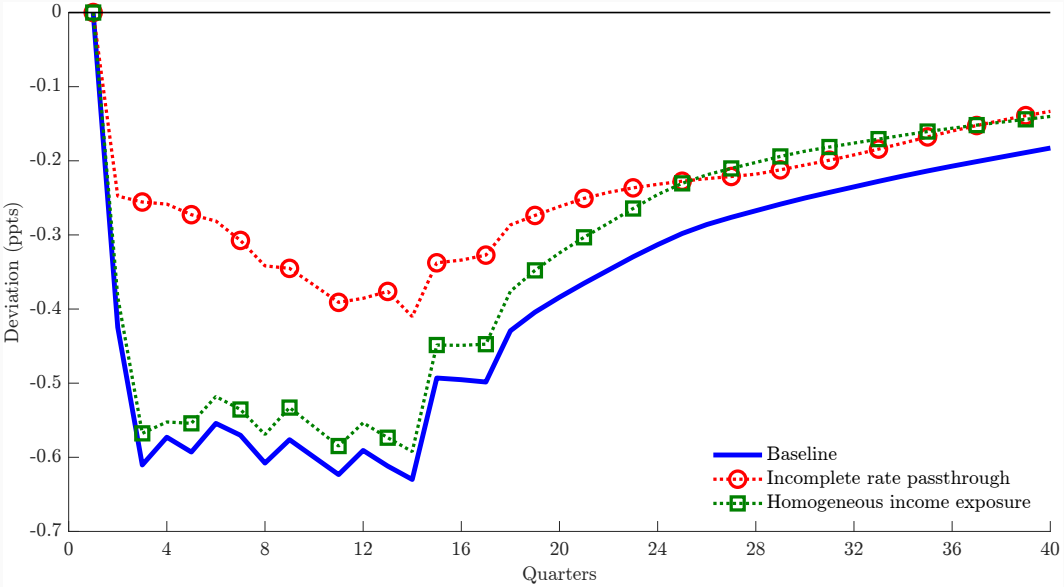
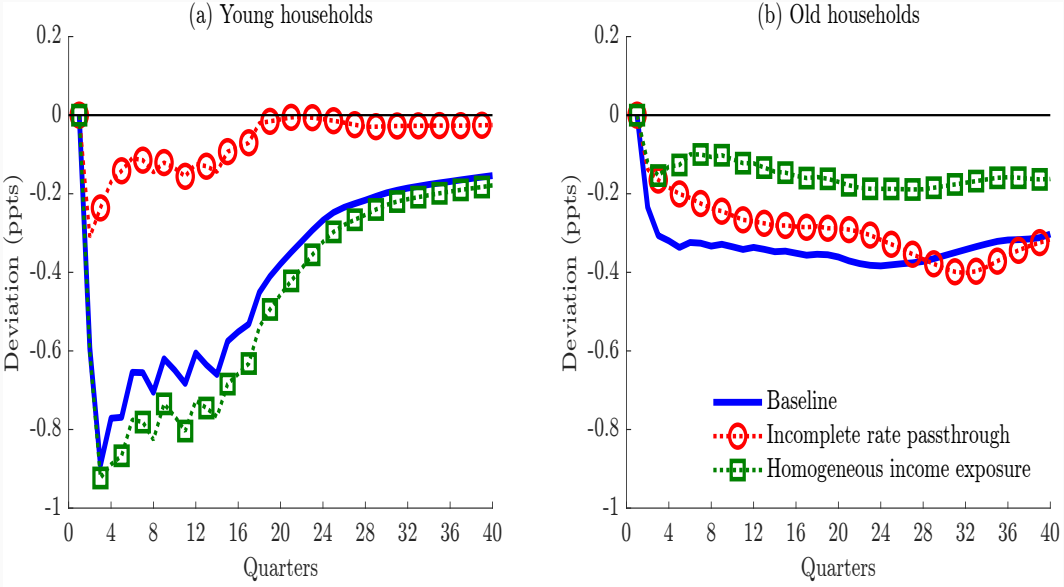


Impact of Macroeconomic Features

Homeownership Macroeconomic Features

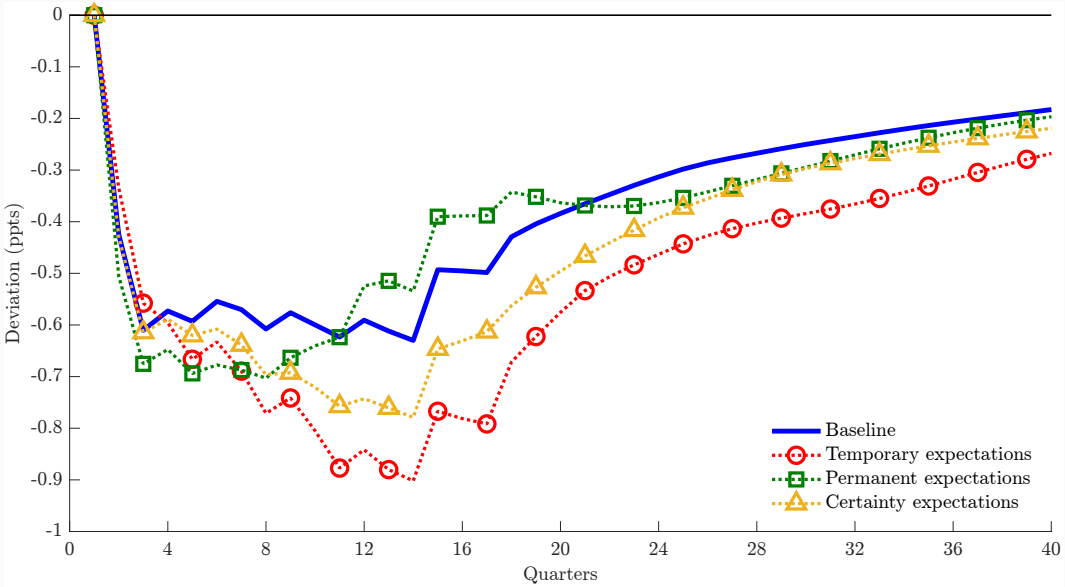


Homeownership By Age and Macroeconomic Features

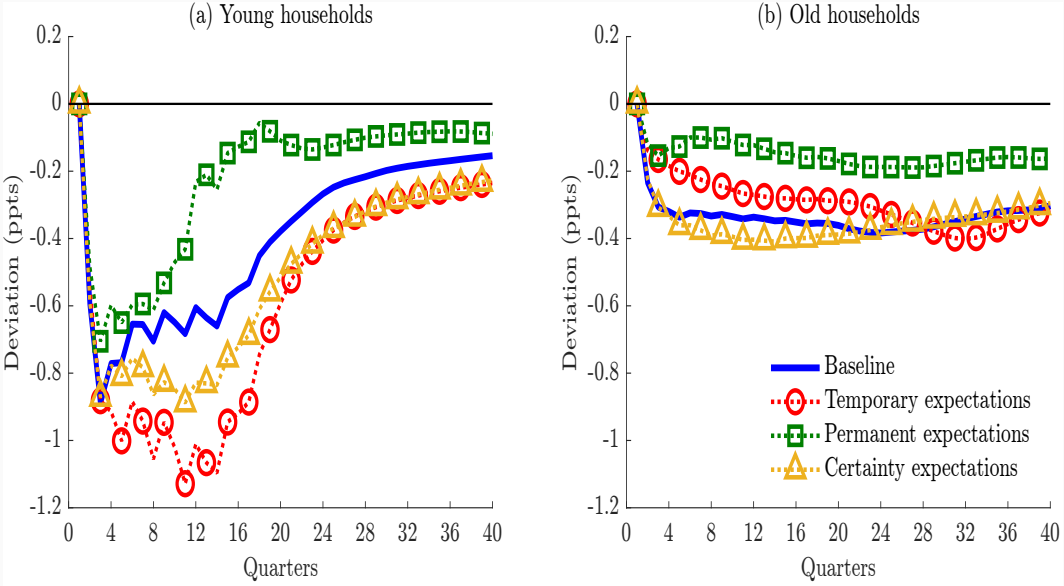


Impact of Household Expectations

Homeownership and Household Expectations



Homeownership By Age and Household Expectations



Conclusion

Conclusion

- Study effect of monetary policy on the homeownership rate
- Build life-cycle heterogeneous household model of housing and mortgage decisions
  - Novel features of the Australian housing and mortgage markets
  - Exogenous VAR to capture macro dynamics following a monetary policy shock

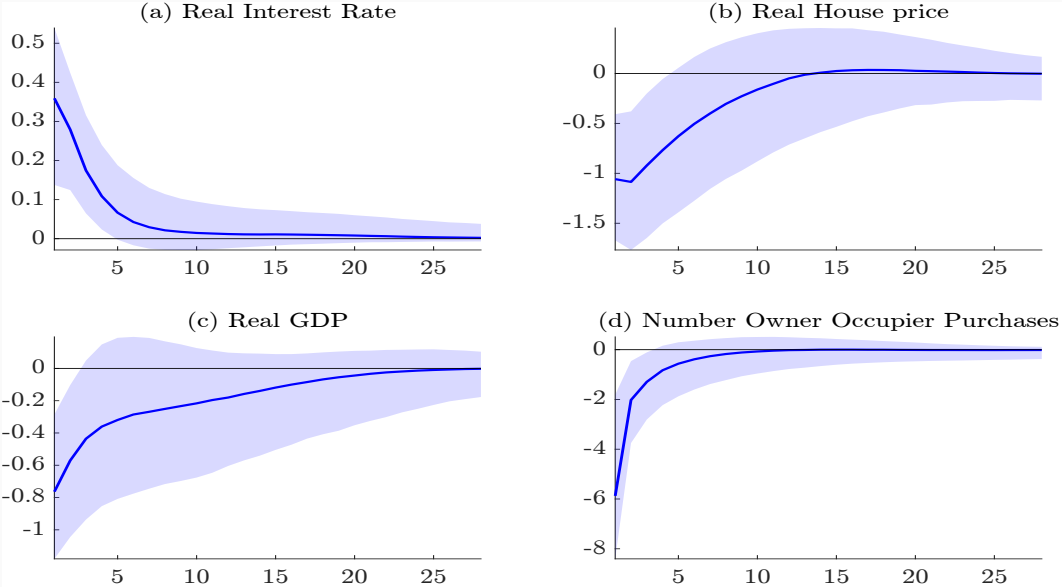
- Monetary policy shocks have a complex relationship with homeownership:
  - Short run: High interest rates discourage/delay home purchases
  - Medium run: Low incomes reduce savings used for home deposits
  - Lower house prices have small offsetting effects on ownership
  - Housing, mortgage, and macro features + expectations all matter for shape of homeownership dynamics

APPENDIX

Motivation: Evidence from Sign-Restricted VARs

- Sign-restricted VAR, quarterly data, 1990:2024
  - Real interest rates
  - Real house prices
  - Real GDP
  - Owner-occupier home purchases (Gillitzer et al., 2025)
- Identifying restrictions for monetary policy shock:
  - Interest rate rises on impact
  - House prices fall on impact
  - GDP falls on impact
  - Home purchases unrestricted

Motivation: Evidence from Sign-Restricted VARs



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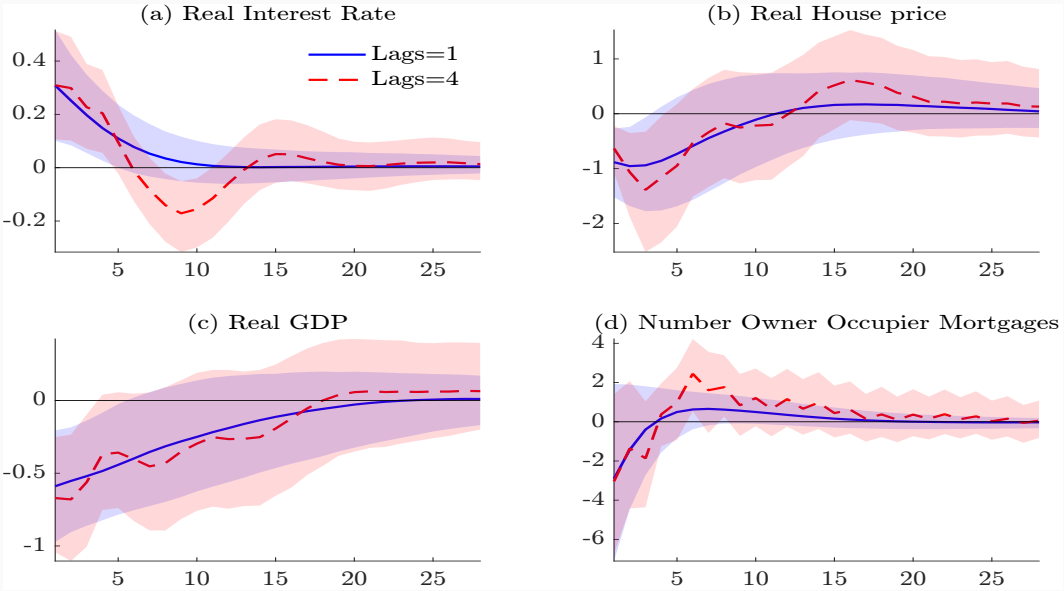

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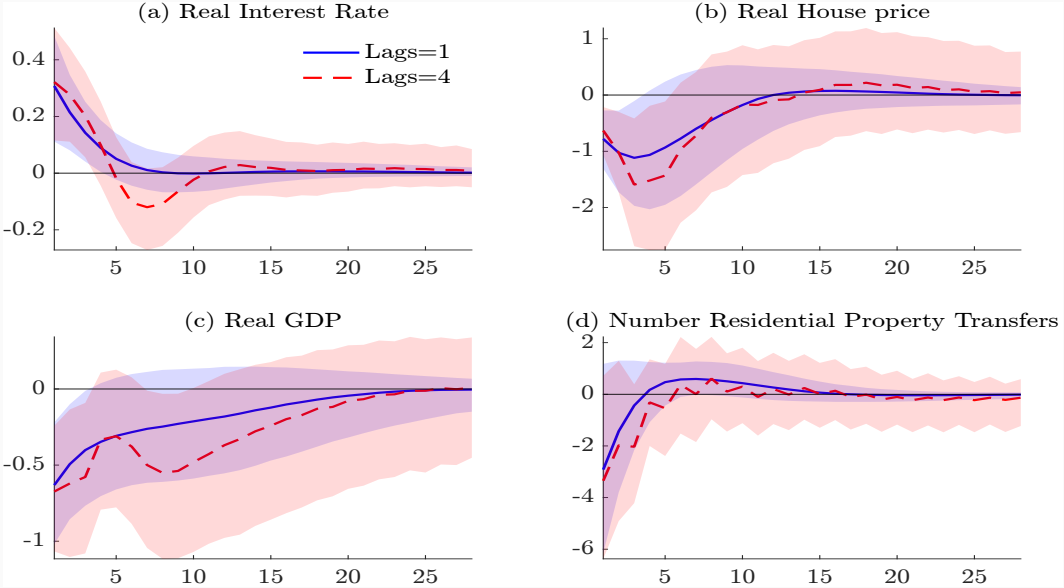

Model: Household Decisions

- Household state vector:

$$\mathbf{s} = [\ j,\ a,\ h,\ b,\ z,\ r,\ Y,\ P_h\ ]$$
$$[\textit{age},\ \textit{assets},\ \textit{house},\ \textit{mortgage},\ \textit{income},\ \textit{interest rate},\ \textit{aggregate income},\ \textit{house price}]$$

- Each period, households make discrete choice over:
  - Renting (R)
  - Buying a new house (B)
  - Making mortgage payments (M)
- Idiosyncratic taste shocks ε_i over choices, drawn from extreme value distribution
- Value function over discrete choice problems is:

$$V_j(\mathbf{s}) = \max_{i \in \{R,B,M\}} \left\{ V_j^i(\mathbf{s}) + \sigma_h \varepsilon_i \right\}$$

Model: Household Decisions: Renters

$$V_j^R(\mathbf{s}) = \max_{s,c,a'} u(c,s) + \beta \mathbb{E}[V_{j+1}(\mathbf{s}')] \tag{1}$$

$$\text{s.t.} \quad c + P_r s + a' + (1 + r_b) b = m_j(z, Y) + (1 + r) a + (1 - f_h) P_h h$$

$$a' \geq 0$$

$$h' = 0, b' = 0$$

- Monetary policy effects via: **interest rate**, **income**, and **house price** channels

Model: Household Decisions: Mortgage Repayment

- Fixed mortgage repayment $\pi_j(b, r_b)$ given interest rate r_b
- Assuming all households use redraw/offset account
- Monetary policy effects via: **interest rate**, **income**, and **house price** channels

$$V_j^M(\mathbf{s}) = \max_{c,a'} u(c,h) + \beta \mathbb{E}_{z',S'}[V_{j+1}(\mathbf{s}')] \tag{2}$$

$$\text{s.t.} \quad c + a' + \delta P_h h + \pi_j(b, r_b) = m_j(z, Y) + a + r\max\{a - b, 0\}$$

$$b' = b + r_b \times \max\{b - a, 0\} - \pi_j(b, r_b)$$

$$a' \geq 0$$

Model: Household Decisions: Home Buyer

- Must consider: mortgage constraints, LMI, transaction costs, stamp duty, future offset use
- Monetary policy effects via: **interest rate**, **income**, and **house price** channels

$$V_j^B(\mathbf{s}) = \max_{c,a',h',b^*} u(c,h') + \beta \mathbb{E}_{z',S'}[V_{j+1}(\mathbf{s}')] \tag{3}$$

$$\text{s.t.} \quad c + a' + (1 + f_b + \delta)P_h h' + SD(P_h h') + b + r_b \times \max\{b - a, 0\} + \pi_j(b^*, r_b) =$$
$$m_j(z, Y) + (1 - \mathbf{1}_{ltv \geq \theta_{lmi}} \tau_{lmi}) b' + a + r \max\{a - b, 0\} + (1 - f_s) P_h h$$
$$b^* = \min\{b^*_{LTV}(P_h), b^*_{NIS}(r_b, Y)\}$$
$$b' = b^*(1 + r_b) - \pi_j(b^*, r_b)$$
$$a' \geq 0$$