Macroprudential Policy Interactions in a Sectoral DSGE Model with Staggered Interest Rates
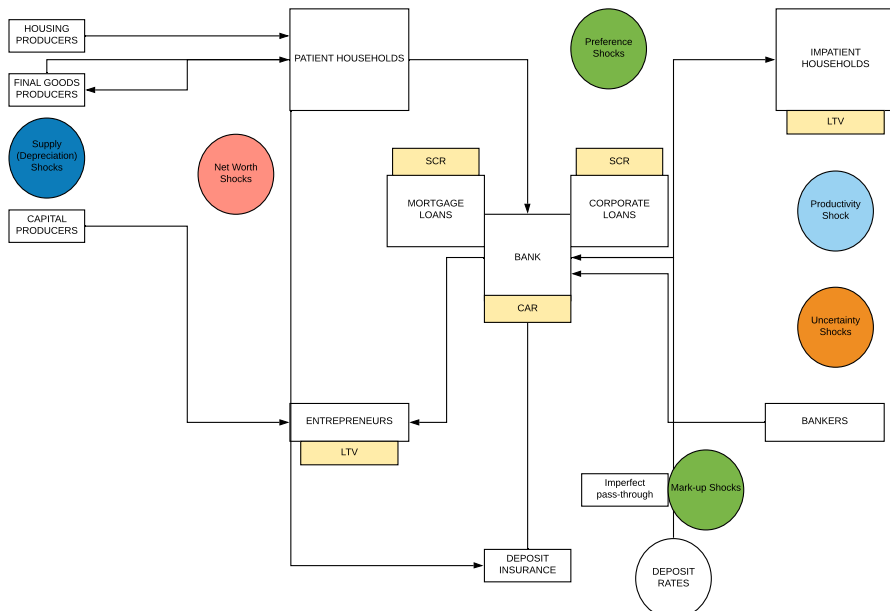
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December 4, 2019

Overview

- Model summary

- Estimation highlights

- Macroprudential Policy (CAR, SCR, LTV & CCyB)

- Interest rate pass-through & Macroprudential policy

Model Overview

Estimation-I

- Quarterly data for the U.K. economy over 1998Q1-2016Q4.

- 10 observables in:

    - Interest rates (Official bank rate, mortgage & corporate rates)

    - Real growth rates (output, investment, consumption and wages)

    - Credit growth rates (mortgage & corporate sectors)

    - House price growth

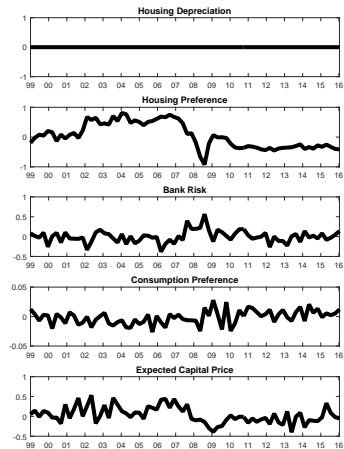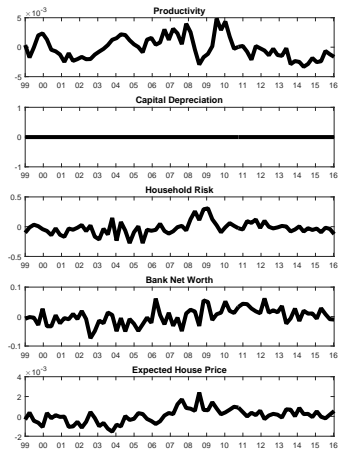- Model (partially) estimated using Bayesian likelihood methods.

Estimation-II

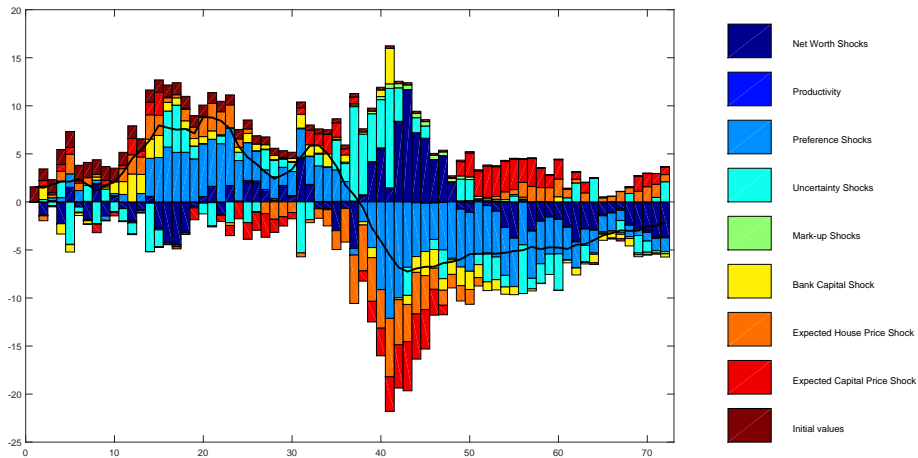Figure: Example: estimated interest-rate pass through
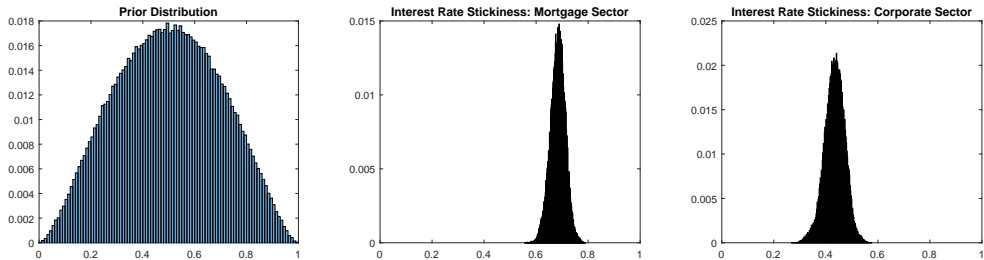
▶ Average Bank Rate pass-through is [4.73, 5.93] months on corporate rates and [8.21, 11.1] months on mortgage rates.
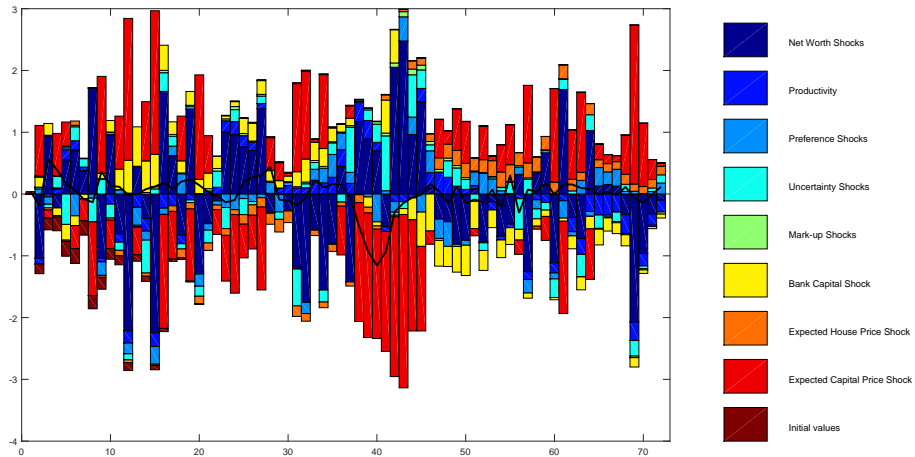
Estimated shocks over 1998Q1-2016Q4.

- ▶ Sequence of shocks over the estimation sample.

# Historical Variance Decomposition: Household Lending Growth

Legend:
- Net Worth Shocks
- Productivity
- Preference Shocks
- Uncertainty Shocks
- Mark-up Shocks
- Bank Capital Shock
- Expected House Price Shock
- Expected Capital Price Shock
- Initial values

Historical Variance Decompositions: Output Growth

■ (Net Worth Shocks)	Net Worth Shocks
■ (Productivity)	Productivity
■ (Preference Shocks)	Preference Shocks
■ (Uncertainty Shocks)	Uncertainty Shocks
■ (Mark-up Shocks)	Mark-up Shocks
■ (Bank Capital Shock)	Bank Capital Shock
■ (Expected House Price Shock)	Expected House Price Shock
■ (Expected Capital Price Shock)	Expected Capital Price Shock
■ (Initial values)	Initial values

Some key unobservables estimated by the model

- ▶ Household defaults are dominant during the crisis period.
- ▶ Welfare of both household types have an upward trend before the crisis, and downward afterwards.
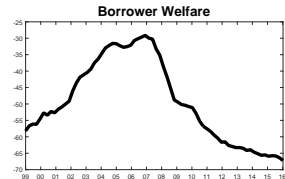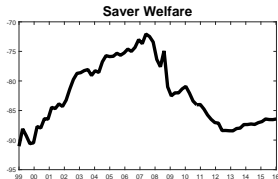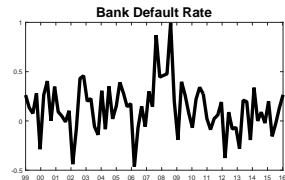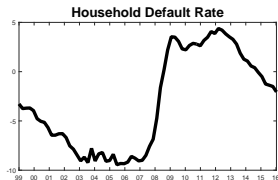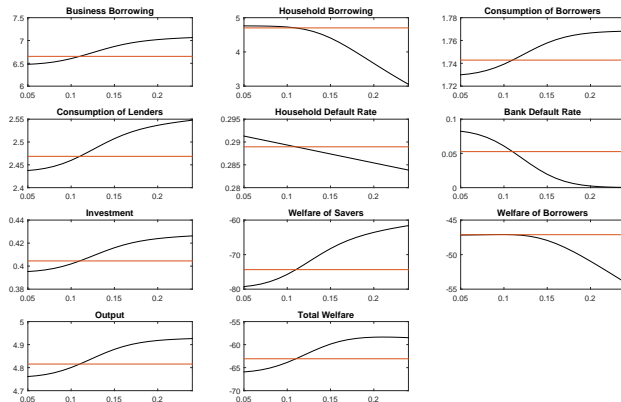
Macroprudential Policy

- Available tools in the model:

  - Minimum and sectoral capital requirements (Benchmark: 11 % CAR, no SCR)

  - LTV limit on businesses and households (Benchmark: 86 %)

  - CCyB (Benchmark: 0)

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- Steady-state welfare analysis

- Counterfactuals

- Interest rate stickiness & Macroprudential tools interaction

Example: Sectoral Capital Requirements on Mortgage Lending and Key Variables in Steady-state

Optimal Policies

- Ad-hoc mean-variance objective: $E[W_t] - \omega\sqrt{Var[W_t]}$

Optimal Policies

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Table: Optimal macroprudential parameters, one at a time. Results with $\omega = 0.1$. Benchmark values are: 11 % for CAR, 86 % for LTV limit, no SCR.

Parameter	Optimal Value	Welfare Improvement
LTV Limit	86.6 %	0.001 %
SCR-Mortgage	17.6 % (11 % CAR, 6.6 % add-on)	4.26 %
SCR-Corporate	16.7 % (11 % CAR, 5.7 % add-on)	3.22 %
CAR	14.5 %	3.82 %

Optimal Policies

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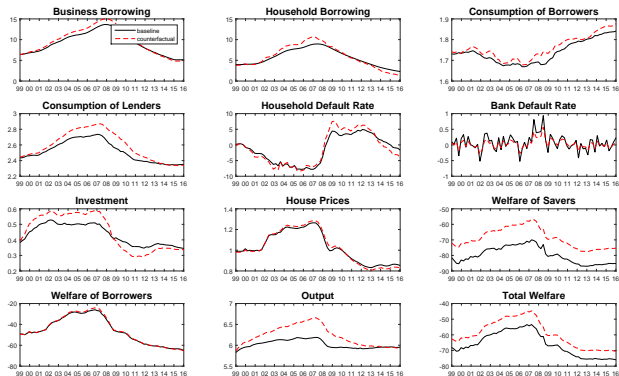| Parameter	Optimal Value	Welfare Improvement
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Table: Optimal joint SCRs and LTV

Parameter	
LTV	94.06 %
SCR-Mortgage	15.88 %
SCR-Corporate %	12.5 %
Welfare Improvement	4.8 %

- **Larger improvement with lower SCRs when macroprudential tools are coordinated.**
- LTV limit can be relaxed if SCRs are sufficiently high.
- CCyB is not as effective as CAR & SCRs.

Counterfactual with optimized policies

Figure: Counterfactual I with optimized values: $\phi_H = 15.8\%$, $\phi_F = 12.5\%$, $\epsilon_H = 94\%$.

Counterfactual with CCyB