Mortgage Prepayment and Path Dependent Effects of Monetary Policy

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Summary

- Question: how does path dependence of mortgage refi influence monetary transmission?
- Approach:
  1. Loan-level prepayment regressions on fraction of borrowers with positive refi incentive.
  2. Quantitative model to map prepayment response into consumption.
- Empirical results: fraction with positive rate incentive is a good summary stat. for refi (esp. rate refi).
- Theoretical results: more transmission from new mortgage rates to rates borrowers pay when rates have been falling.
  - Effect of 100bp fall on refi ~4x stronger if rates were 100bp above current.
  - Effect of 100bp fall on consumption ~1.6x stronger in 2017 environment.

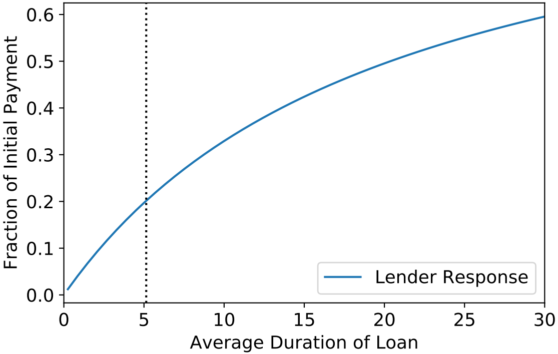
Evaluation

- Extremely elegant, well-crafted theoretical model.
  - Typical challenge: microfounding realistic prepayment (e.g., heterogeneous transactions costs).
  - This paper's assumption: people refinance if and only if they save money.
  - Empirical section validates that this describes the data well.
- Consumption results depend crucially on open economy assumption.
  - Lender consumption response probably not a big factor (historical conditions, without financial frictions).
  - But price-setting reaction kills consumption effects in closed-economy GE.
  - Key exception: at the zero lower bound.

Lender Response

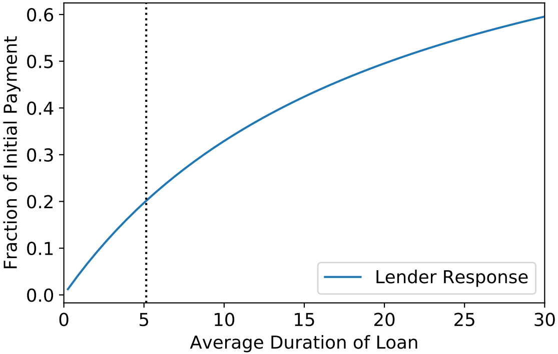
- Model assumes foreign lenders. In closed economy, domestic lenders would have consumption response.

- MPC out of current income is low, but transfers from refinancing can be persistent, affect permanent income.



Lender Response

- Typical loan lasts for $\sim$5 years before being prepaid, so permanent-income lender would offset only $\sim$20%.
  - Unless future durations are longer.
- Bigger concern: do financial intermediaries (hold > $6T of mortgages and MBS) act like permanent income agents?



Price-Setter Response

- Key attribute of rate-refi-induced spending: occurs gradually.
    1. Takes time for borrowers to refi into lower rates (max of 22% per year).
    2. Mortgage savings distributed over life of loan, mostly arrive relatively far in the future (2+ years).
- In a closed economy, this timing dampens agg. consumption response.
- Typical macro models: demand impacts output, consumption due to nominal rigidities.
    - Prices cannot adjust to equalize supply and demand, so quantities do.
- If forward-looking prices adjust before spending occurs, no effect.
    - Estimates: prices reset every $\sim$4Q (Nakamura & Steinsson, 2008).

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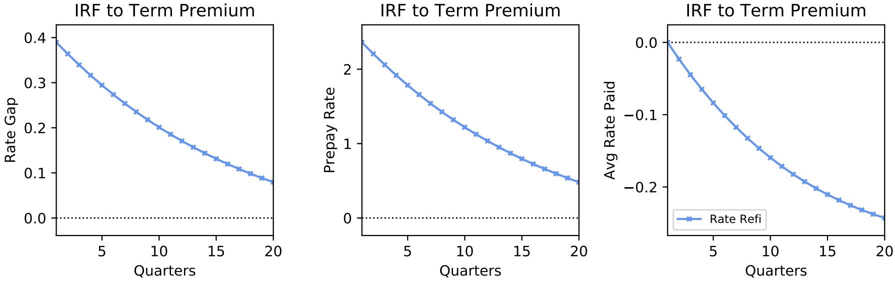
Closed-Economy Model

- To see effect of closed economy, run authors' experiments in model from Greenwald (2018).
- **Benchmark Model**:
  - Cash-out refinancing (vs. rate refi).
  - Loan size determined by LTV, PTI constraints (vs. fixed loan size).
  - Closed production economy with sticky prices (vs. open, endowment).
  - Agg. model with approx. rate dist. (vs. exact heterogeneous dist.).
- **Rate Refi Model**: version of my model closer to authors' specification.
  - Only rate refi (no equity extraction), fixed loan size.
  - Use mechanical refi rule $\approx$ step function, calibrate to match BMTV.

Rate Refi in a Closed Economy

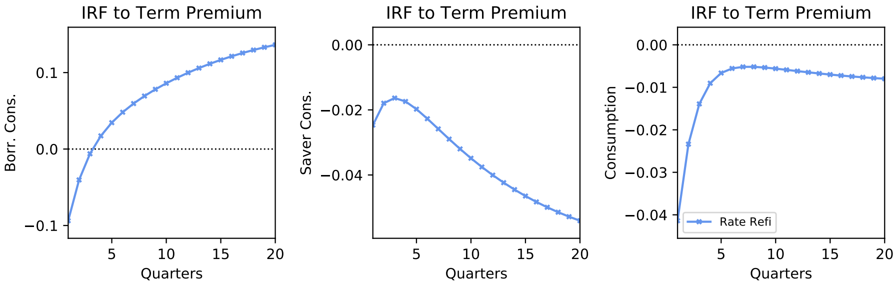
- Experiment: IRF to decline in term premium (100bp) starting from steady state.
- **Rate Refi Model** able to reproduce strong prepayment response.



Rate Refi in a Closed Economy

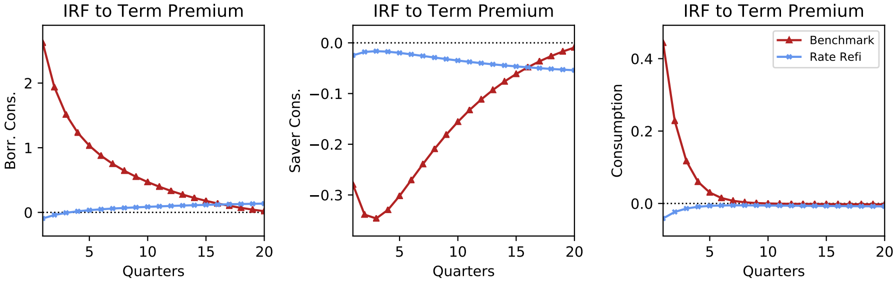
- Borrower, saver consumption move persistently in opposite directions (transfer of wealth).

- But no increase in aggregate consumption.
  - Lenders/price setter reaction $\Longrightarrow$ **fall** in agg. consumption on impact.



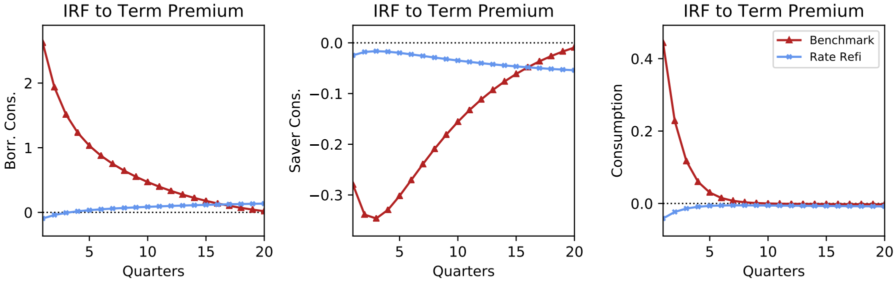
Rate Refi in a Closed Economy

- Compare to **Benchmark Model** which allows equity extraction.
  - Low rates loosen payment-to-income (PTI) limits directly, loan-to-value (LTV) limits through house prices.
- Delivers much larger aggregate consumption response.



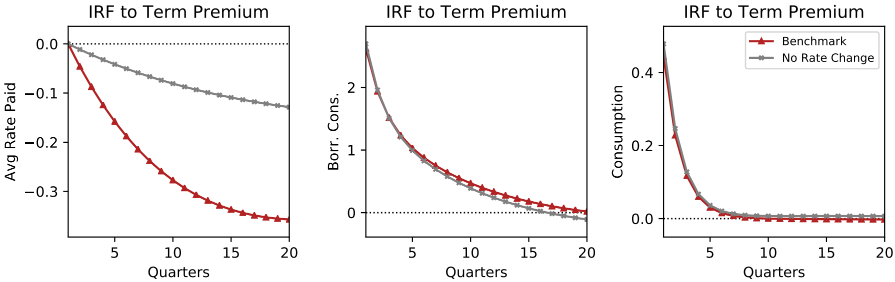
Rate Refi in a Closed Economy

- Key difference is timing.
  - Equity extraction provides resources for consumption **immediately**.
- Frontloaded spending increases output before prices adjust.
  - “Frontloading effect”



Rate Refi in a Closed Economy

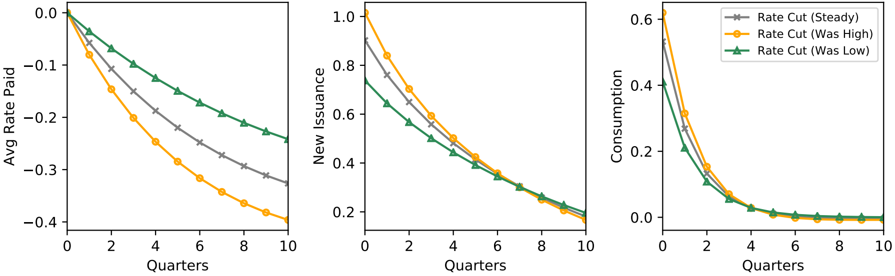
- Can even shut down rate change in **Benchmark Model** ("No Rate Change"), so that only balance updates with refi.
- Borrower consumption eventually affected by lack of rate savings, but nearly identical over horizon relevant for stimulus.
  - Aggregate consumption (driven by equity extraction) unaffected.



State Dependence in a Closed Economy

- Can you get state-dependent consumption responses in the Benchmark Model? Yes!

- Compare 100bp term premium cut:
  - (i) from steady state
  - (ii) after 100Q of high rates (**200bp above SS**)
  - (iii) after 100Q of low rates (**200bp below SS**).

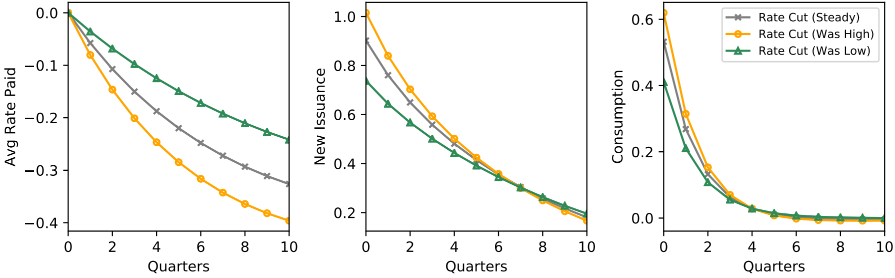


State Dependence in a Closed Economy

- Similar results to authors: consumption response ∼50% higher when rates were high relative to when rates were low.

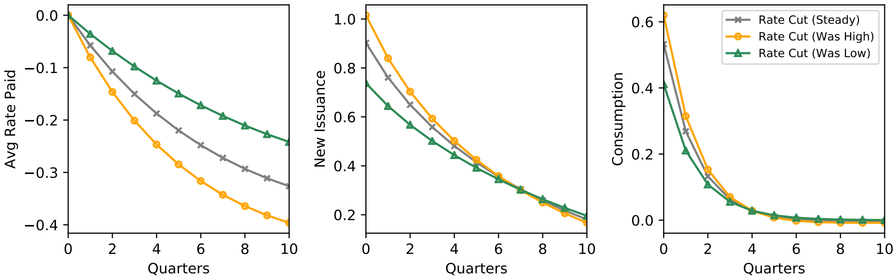
- But consumption response is driven mostly by state-dependent equity extraction opportunities.

  - Less caused by changes in rates paid (although also state dependent).



State Dependence in a Closed Economy

- Since effect is still there, does the source matter?
- Will quantitatively influence strength of channel.
- Important for policy guidance (e.g., HARP).

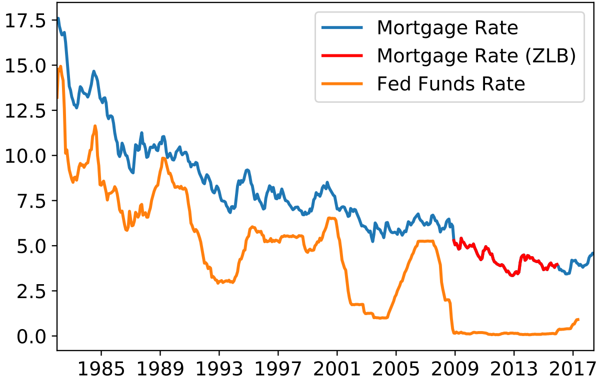


Suggestions

- Clearer mechanism when equity is extracted.
  - Immediate spending, no lender response, likely reveals high MPC.
- For rate refi to affect consumption in normal times, needs to go through **current account**.
  - Can we test this?
- If authors keep focus on rate refi, make sure that MPCs of rate refinancers match reality.
  - Concern is that choice to rate refi may be signal of low MPC.
  - If offered additional credit, would model refinancers take it?
  - If there is a mismatch, adjust calibration.

When Should Rate Refi Matter? At the ZLB!

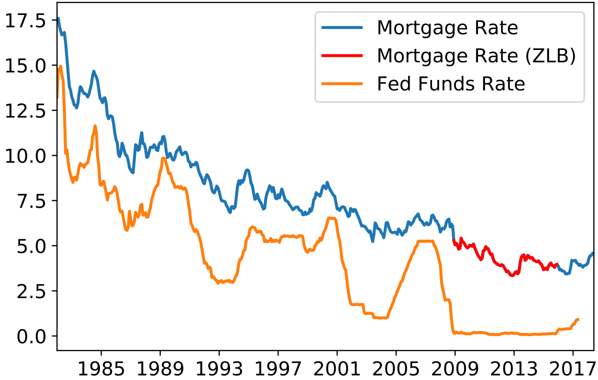
- Authors' rate refi channel should be very strong at the ZLB even in a closed economy.
- At ZLB, price adjustment to future spending should stimulate consumption.



When Should Rate Refi Matter? At the ZLB!

- How should monetary policy be conducted if rate refi "fuel" needed specifically at ZLB?

- Case for a higher inflation target?



Conclusion

- Elegant and tractable model of rate refinancing backed by micro data.
- Key question: how much of consumption response survives without open economy?
  - Modest lender response. Potentially large price setter response.
  - How much consumption response comes through current account?
  - Generalization to equity extraction would recover strength.
  - Note: results still distributionally/regionally important regardless.
- Suggestions:
  - Add support for open economy assumption.
  - Focus more directly on ZLB, when rate refi should be most important.