State Dependency of Monetary Policy: The Refinancing Channel

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Summary

▶ Question: how does dist. of existing mortgage rates influence monetary transmission?

▶ Approach:

    1. County-level refinancing regressions, instrumented by intraday MP shocks.

    2. Partial equilibrium model calibrated to match refi behavior.

▶ Main findings:

    1. Data: moving interest incentive $0 \rightarrow 25$bp increases coeff. on ΔR_t^M by 2.4x.

       - Shifts effect of subsequent 25bp fall in rates on refis from 2% to 5%.

    2. Model: state dependence explains $\approx 2/3$ of consumption response to mort. rates.

       - 25bp increase in incentive shifts impact of 25bp rate fall on cons. from 0.95% to 1.4%

    3. Theory: lower transaction costs $\implies$ MP more powerful but less state dependent.

Evaluation

▶ Highly plausible and intuitive mechanism.

▶ Main comment: **type of refinancing matters**.

▶ Key distinction: whether household extracts equity ("cash-out") or doesn't ("rate refi").

▶ Empirical approach may be picking up rate refis w/ limited effect on agg. consumption.

▶ Main suggestion: make sure model can match **credit growth** as well as refi rate.

Main Idea

▶ Typically, prepayment (refinancing) rate modeled as S-curve in gap between existing and new interest rate.

▶ Relevant part of the state space: convex (left) side of curve.
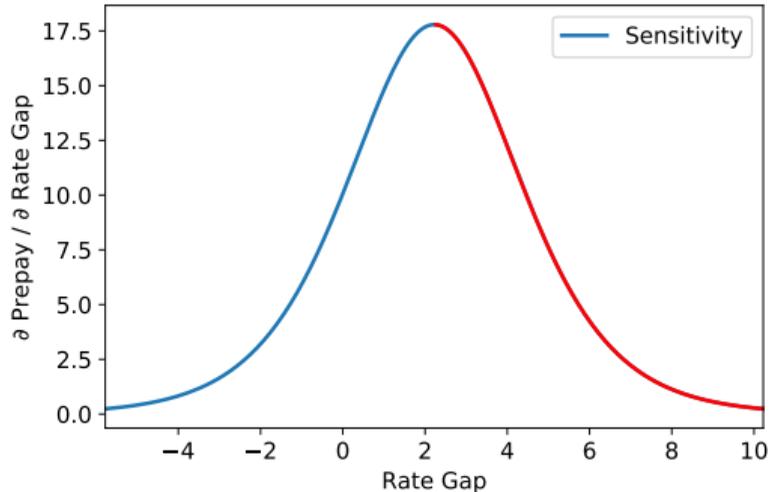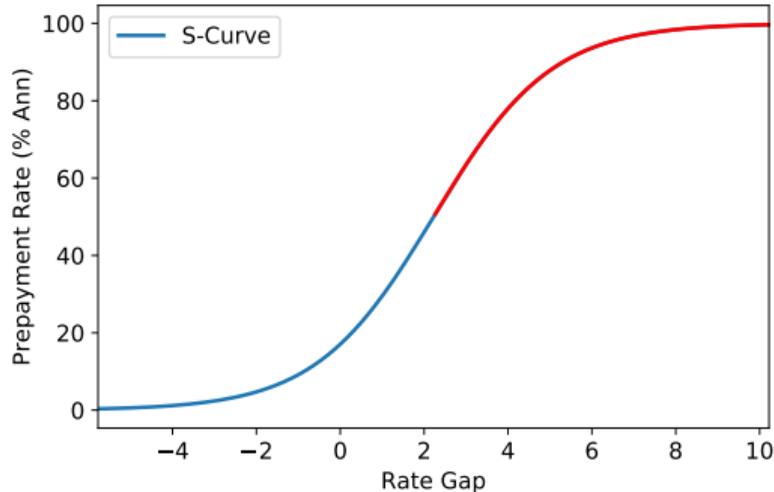
Main Idea

▶ Key idea: curve is **more sensitive** to interest rates when rate gap (incentive) is high.
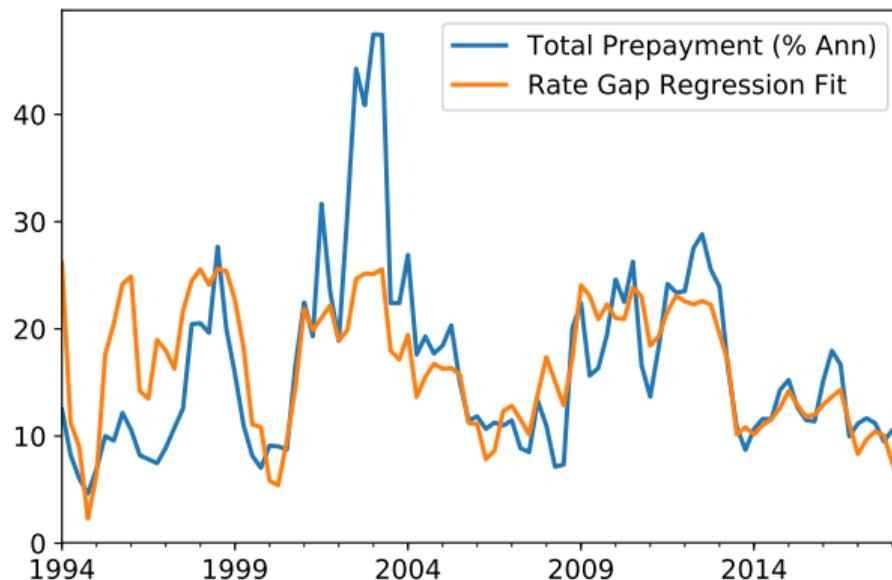
▶ **State dependence** of monetary policy.
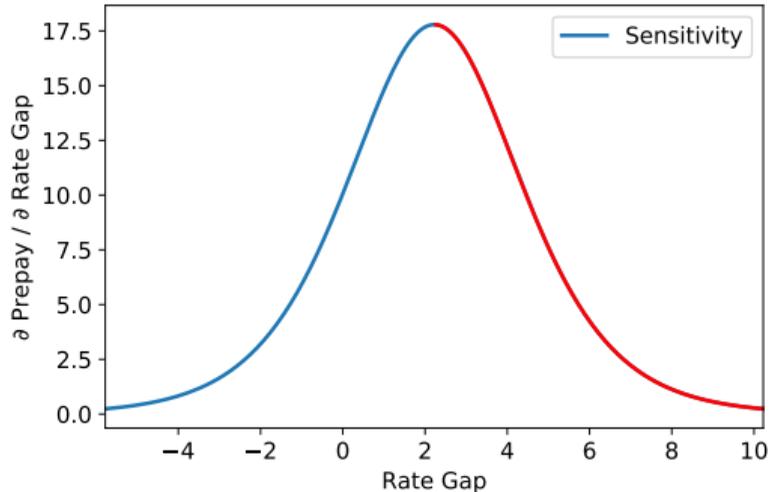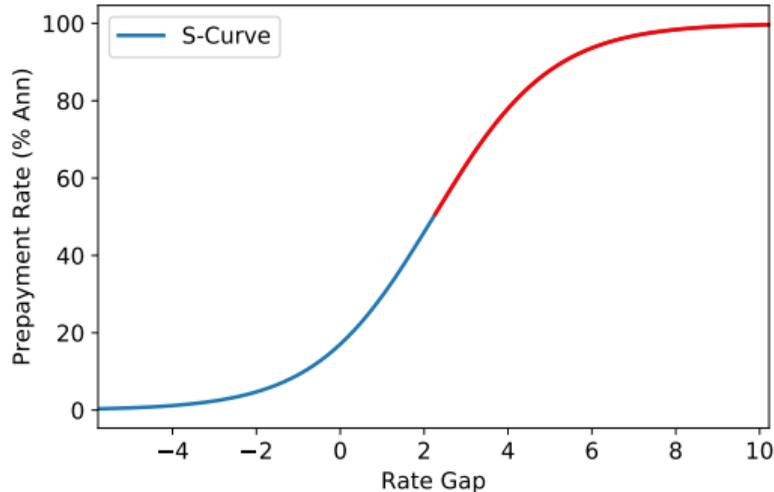
Prepayment vs. Rate Gap

▶ Get prepayment rate and existing coupon rate data from Fannie Mae MBS (source: eMBS).

▶ Plotted: Prepay_t vs. $\widehat{\text{Prepay}}_t$ from regression $\text{Prepay}_t = \text{const} + \beta \text{RateGap}_{t-1} + \varepsilon_t$.
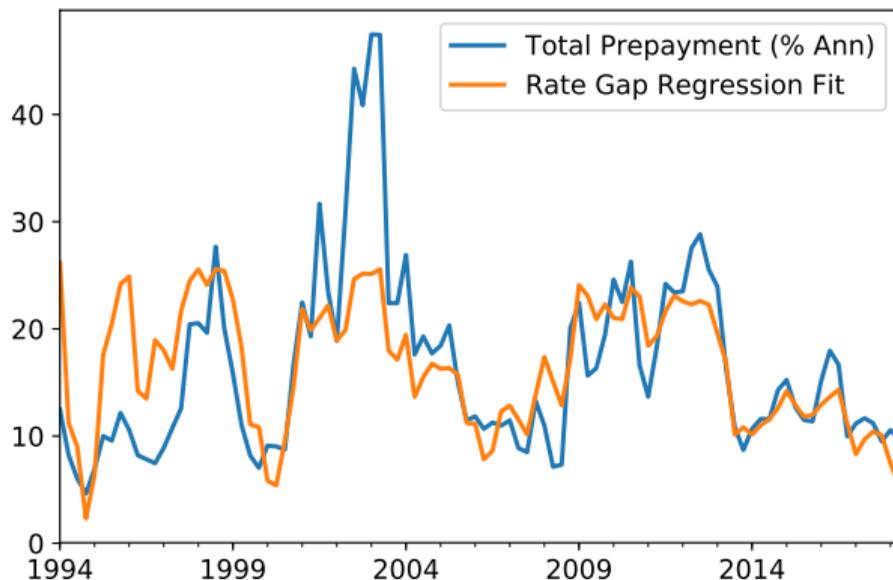
Prepayment vs. Rate Gap

▶ Lots of explanatory power ($R^2 = 0.464$), tracks closely for most of sample.

▶ Enough variation to generate substantial curvature (state dependence).

Credit vs. Payment Effects

▶ Refinancing a mortgage has two possible effects:

    1. The interest rate is changed (payment effect).

    2. The balance on the loan is changed (credit effect).

▶ Claim: credit effect more important for aggregate consumption response.

▶ Payment effect weakened by:

    - Lender response (esp. if financial intermediaries are constrained).

    - Delayed spending $\implies$ weaker effects in NK models.

▶ Compare to credit effect:

    - No obvious lender/intermediary response if issued at market rates.

    - Immediate spending $\implies$ strong effects in NK models.

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Explaining Credit Growth

▶ Compare interest rate gap to real agg. mortgage debt growth (source: FoF).

▶ Zero variation in debt growth explained by interest rate gap ($R^2 = 0.000$).
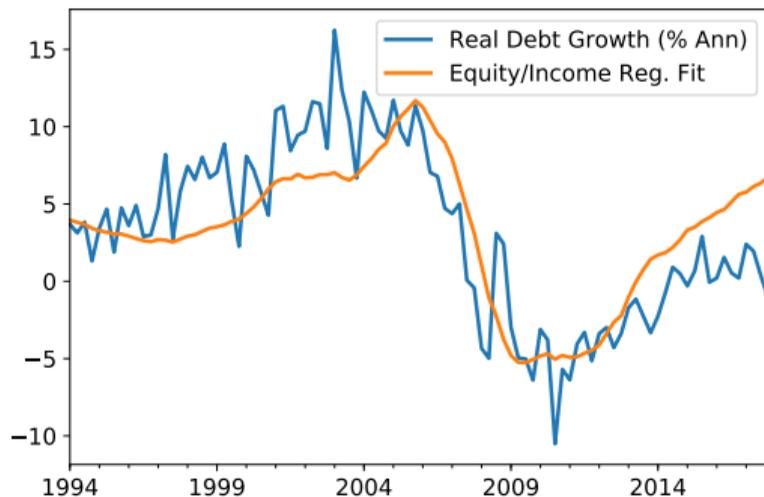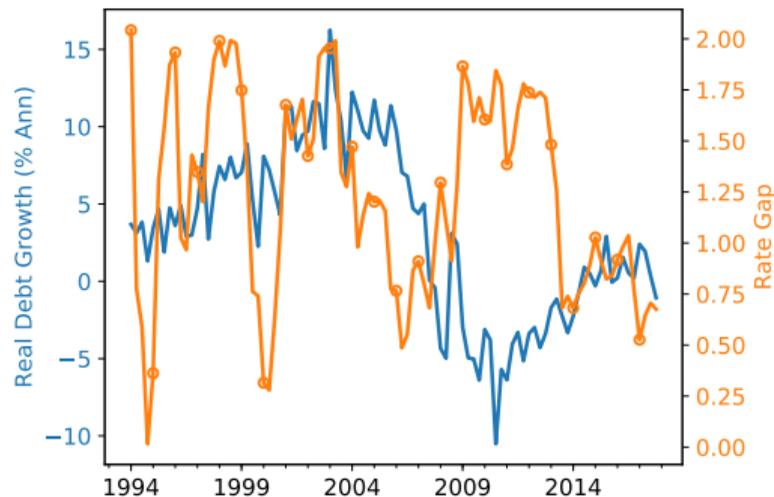
Explaining Credit Growth

▶ Instead, debt growth mostly explained by ratio of home equity to income ($R^2 = 0.645$).

▶ Bartscher et al (2018): home equity/income has explanatory power in cross section.
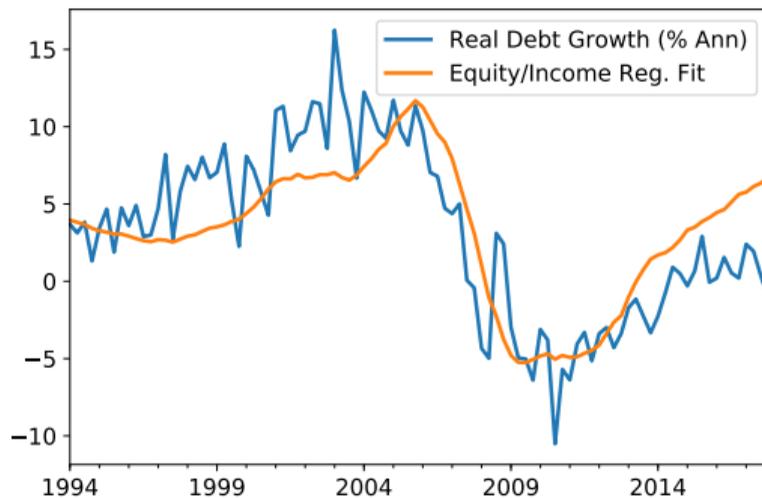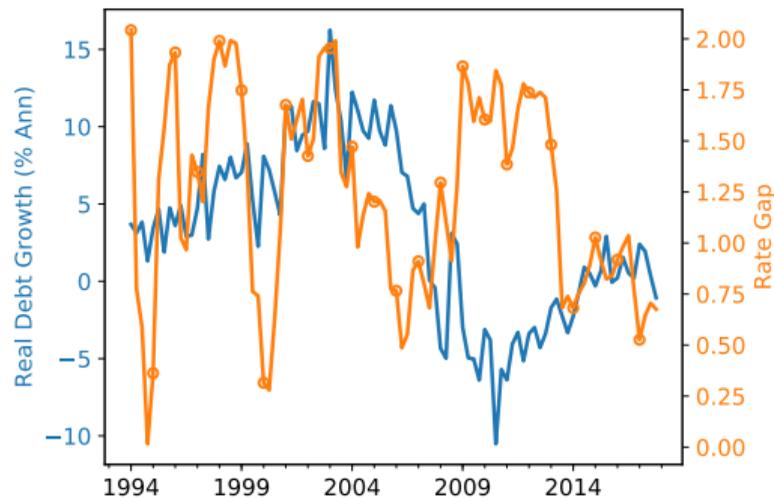
Rate vs. Cash-Out Refinancing

▶ What's going on? My take: artifact of aggregating two types of refinances.

  1. **Rate refinance:** change the interest rate, but not the balance on a loan.
  2. **Cash-out refinance:** change the interest rate and extract equity.

▶ My view: cash-out refis are more important for agg. consumption than rate refis.

  - Rate refis only have payment effect, cash-out refis have payment + credit effects.
  - Choice to rate refi is a tag that borrower is unconstrained (low MPC).
 - Choice to cash-out refi is a tag that borrower is constrained (high MPC).

Rate vs. Cash-Out Refinancing

▶ Definitions of loans from Fannie Mae Single Family Dataset (purchase, cash out, rate refi).

▶ Limited sample, but data quality much better in GSE vs. HMDA or servicer data.
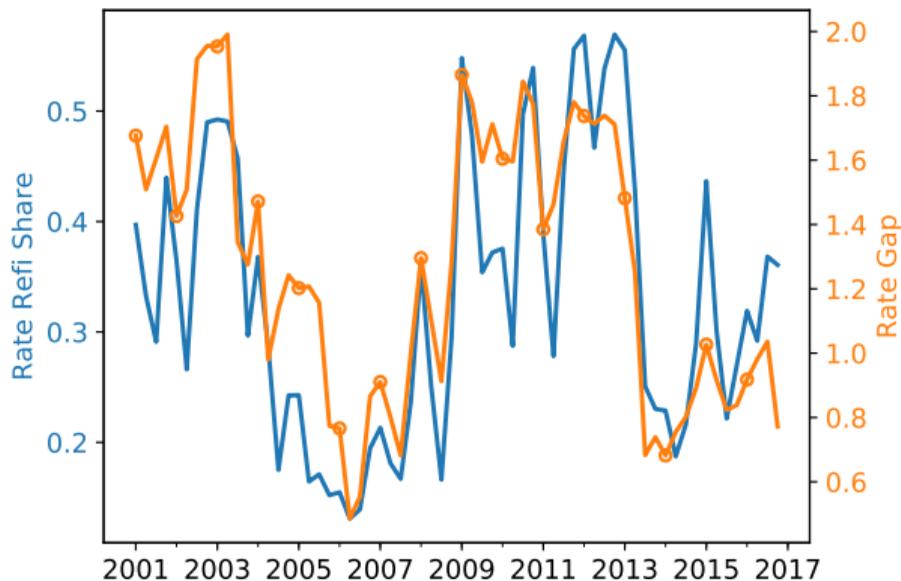
Rate vs. Cash-Out Refinancing

- Share of loans that are rate refis is strongly correlated with rate gap ($R^2 = 0.647$).

- My answer to puzzle: rate refi dominates high-frequency response to interest rates.
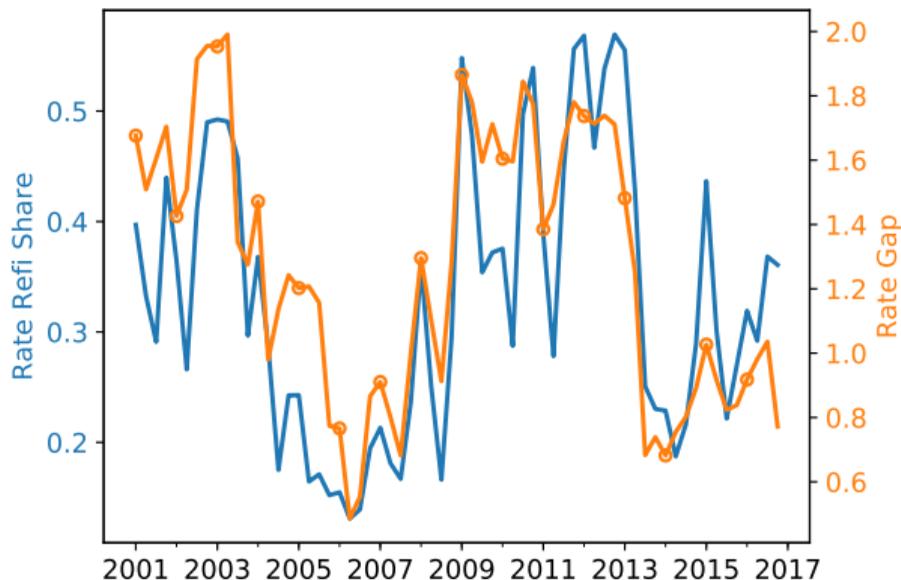
Rate vs. Cash-Out Refinancing

▶ Authors argue < 30% of refinances are rate refis (Fannie data: 52% of refis, 33% of loans).

▶ Bigger problem for results is not level but **correlation** with rate gap.
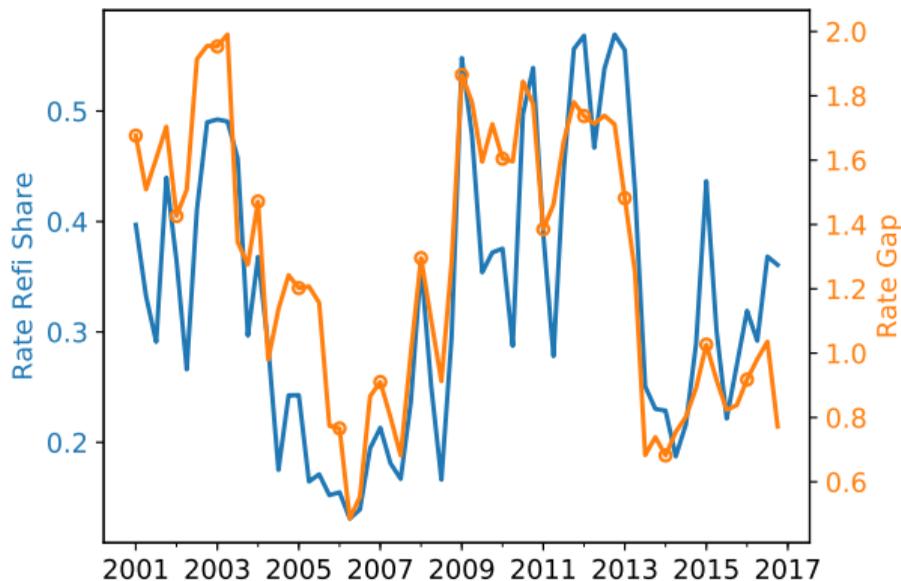
Rate vs. Cash-Out Refinancing

▶ Implied rate of equity extraction transactions (purchase + cash-out) from Greenwald (2018).

▶ Functional form $\rho_t = \Gamma\Big(\Omega_{1,t}\text{EquityShare}_t + \Omega_{2,t}\text{RateGap}_t\Big)$, for c.d.f. Γ.
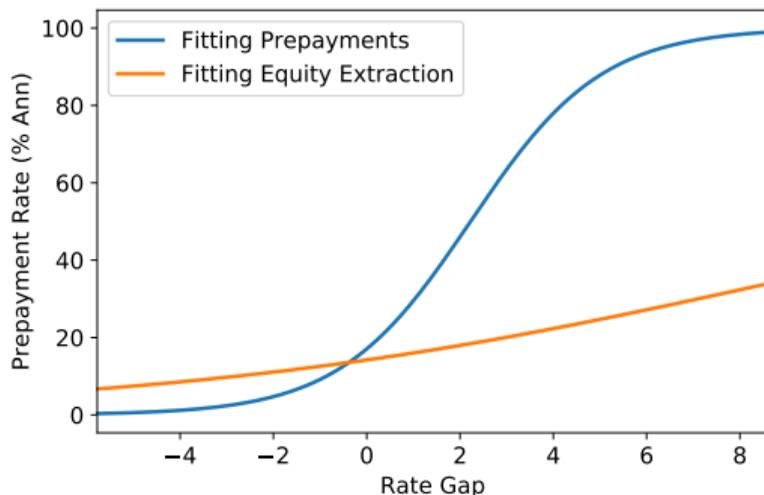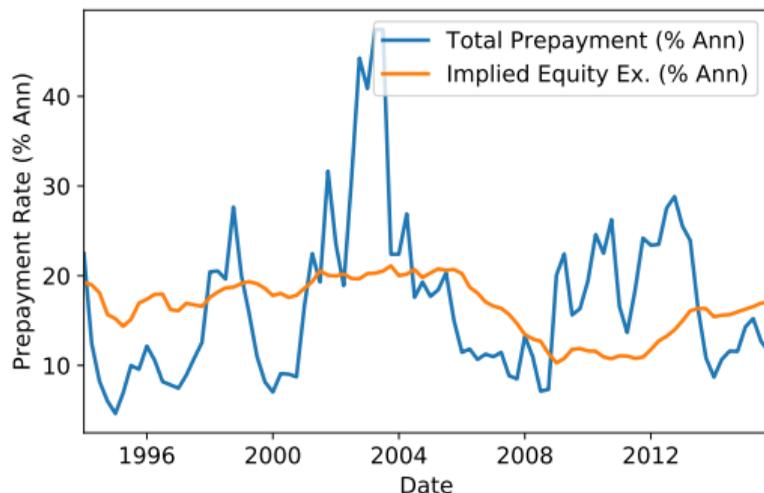
Rate vs. Cash-Out Refinancing

▶ Equity extraction measure > prepayments ⟺ purchases > rate refis.

▶ Both sensitivity to rate gap and state dependence are lower for equity extraction measure.
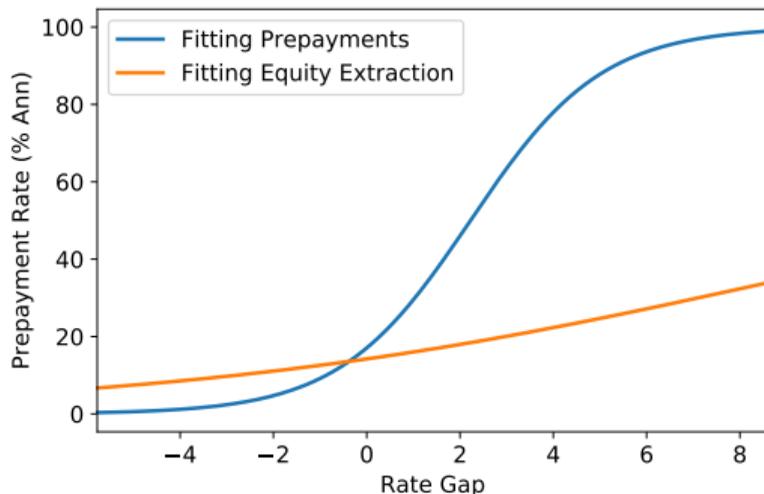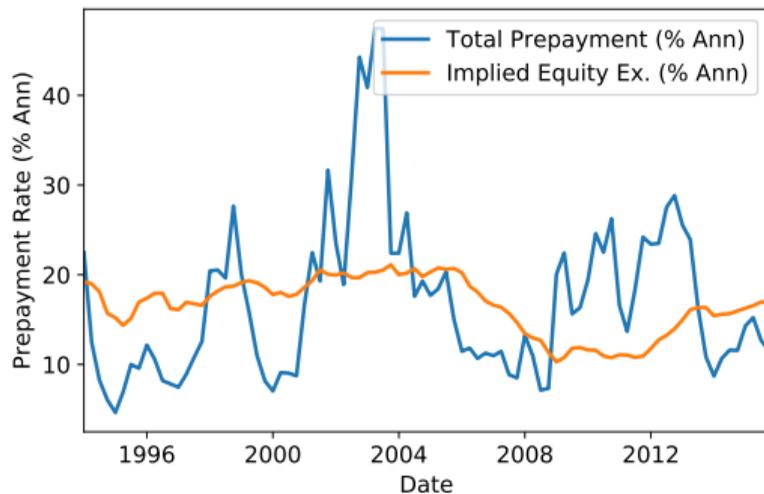
Suggestions

1. Decompose effect of MP into credit and payment effects.

   - Can the model match credit growth in addition to refi rate?

   - Compare to estimates in Bhutta and Keys (2016).

2. Include equity/income or similar ratio as a control (currently **change** in equity).

   - Since low rates $\rightarrow$ high house prices, equity extraction incentive may be correlated with A_{t-1}.

3. Compare sensitivity of rate refi share in model and data.

   - Correlation matters in addition to level.

   - Can this be matched with ex-ante identical agents?

Conclusion

▶ Nice paper with great mechanism.

- Good combination of empirics and quantitative modeling.

▶ Main suggestion: make sure model doesn't overstate sensitivity of credit to interest rate gap.

- Properties of rate refi vs. cash-out/purchase shares likely key.

▶ Rich model already has the relevant features.

- Just need to convince us that it is matching equity extraction dynamics.