The Response of Debtors to Rate Changes

Authors:
Andreas Fuster, Virginia Gianinazzi, Andreas Hackethal, Philip Schnorpfeil, Michael Weber
Discussion:
Fabrice Tourre (Baruch College, City University of New York)

March 20, 2026

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- 25-35 year amortization
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SETTING

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Data

- administrative bank data ($\approx$ 240,000 borrowers)
- survey ($\approx$ 2,000 borrowers)
- letter-based RCT

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- Adjustments: term changes, prepayments, forward locking

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Letter RCT effects are targeted

- No effect on rate beliefs
- Increases awareness of options
- Raises refinancing among borrowers close to expiration

Multi-method identification

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Interesting findings (some of them not emphasized enough)

- refinancing decreases when current coupon $<$ market rate (feels like "standard" refi incentive, although never documented in non-prepayable contracts)
- refinancing spikes when rates rise rapidly (borrowers seem to respond to "momentum" of rates, this feels new)
- well informed borrowers (stark contrast with inertia in the US and lit. on financial literacy)

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Quantification: mortgage channel transmission seems weaker than mechanical calculations suggest.

Wearing my critical hat: institutional details needed!

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- mortgage principal amortizations (is this a choice during the life of the mortgage? Is the mortgage an annuity, like in the US?)
- What about home savings contract "Bausparen"? Very unclear how they work and what role they play in the analysis.

Wearing my critical hat: don't push interpretation too hard

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- That is technically true
- Does it necessarily "dampen" transmission channel of monetary policy through mortgages? Relative to what benchmark?
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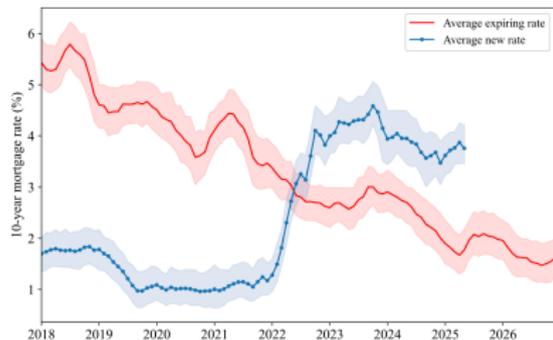
internal refinancing is not necessarily that interesting an outcome.

- Why do we care about this, for monetary policy purposes?
- We care about refinancing, whether it is by staying with the same bank or instead moving to a competitor

Mortgage rates and coupons

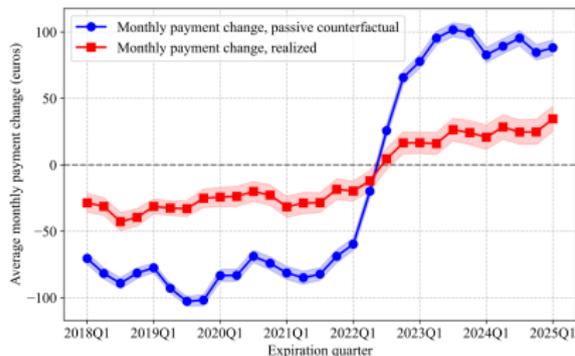Figure 1: Rates on new and expiring mortgages at our partner bank

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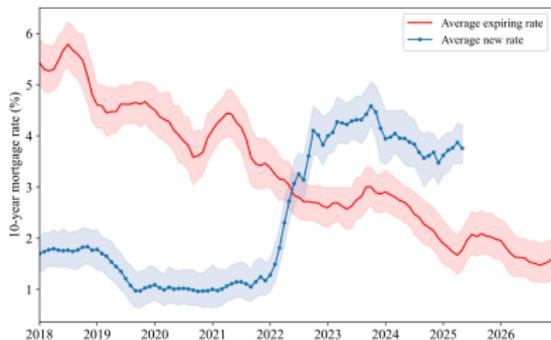
Payment shock

Panel B. Average actual vs. counterfactual monthly payment changes

WEARING MY CRITICAL HAT: WE NEED A MODEL!

In more recent expiration vintages, fewer borrowers refinance internally, consistent with the higher market rates leading borrowers to seek alternatives.

- Why does this make sense at all?
- Why wouldn't borrower always seek the most competitive rates?
- Why would they only do this when rates are elevated?
- Behavioral explanation?

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Unusual increase in refinancing activity around 3 years (2025), 2 years (2024) and 1 year (2023) prior to expiration, ascribed to borrowers refinancing via forward mortgages once market rates started increasing rapidly in early 2022.

- Why does this make sense at all?
- Why would this be optimal?
- Borrowers' rate expectations different from those of the market?

Suggestive toy model (to begin with)

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Mortgage market

- competitive
- choose your favorite term-structure model of short rates r_t, with $Z(t, r)$ the price of corresponding t-maturity zero coupon bonds
- par-coupon for forward-starting mortgage θ periods from today:

$$c_\theta(r) := \frac{1 - Z(T + \theta, r)}{\int_0^T Z(\theta + u, r) du}$$

Assumptions

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Cost minimization problem

- When no action to be taken ($T \geq \tau \geq \bar{\tau}$)

$$V(r_0, \tau; c) = \int_{\bar{\tau}}^{\tau} c e^{-\rho(t-\bar{\tau})} dt + e^{-\rho(\tau-\bar{\tau})} \mathbb{E}_{r_0} \left[V(\tilde{r}_{\tau-\bar{\tau}}, \bar{\tau}; c) \right]$$

- When early refinancing (via forward contract) can be done ($0 \leq \tau \leq \bar{\tau}$)

$$V(r_0, \tau; c) = \min_{\theta \leq \tau} \int_{\theta}^{\tau} c e^{-\rho(t-\theta)} dt + e^{-\rho(\tau-\theta)} \mathbb{E}_{r_0} \left[V(\tilde{r}_{\tau-\theta}, T; c_\theta(\tilde{r}_{\tau-\theta})) \right]$$

Threshold strategy: Given (a) time-to-maturity τ and (b) current coupon c, threshold rate $r^*(\tau; c)$ so that $r < r^*(\tau; c)$ means it is optimal to refinance

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Economics: Since rates are mean-reverting:

- rates low $\rightarrow$ they are unlikely to go lower $\rightarrow$ optimal for the household to lock in (using forward contracts) such low rate
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Caveats:

- rates low $\rightarrow$ forward rate above spot rate $\rightarrow$ locking in with forward means locking in a rate that is higher than current spot rate;
- rates high $\rightarrow$ forward rate below spot rate $\rightarrow$ not locking in with forward means missing on a rate that is lower than current spot rate.

exercise boundary r*(tau,c)
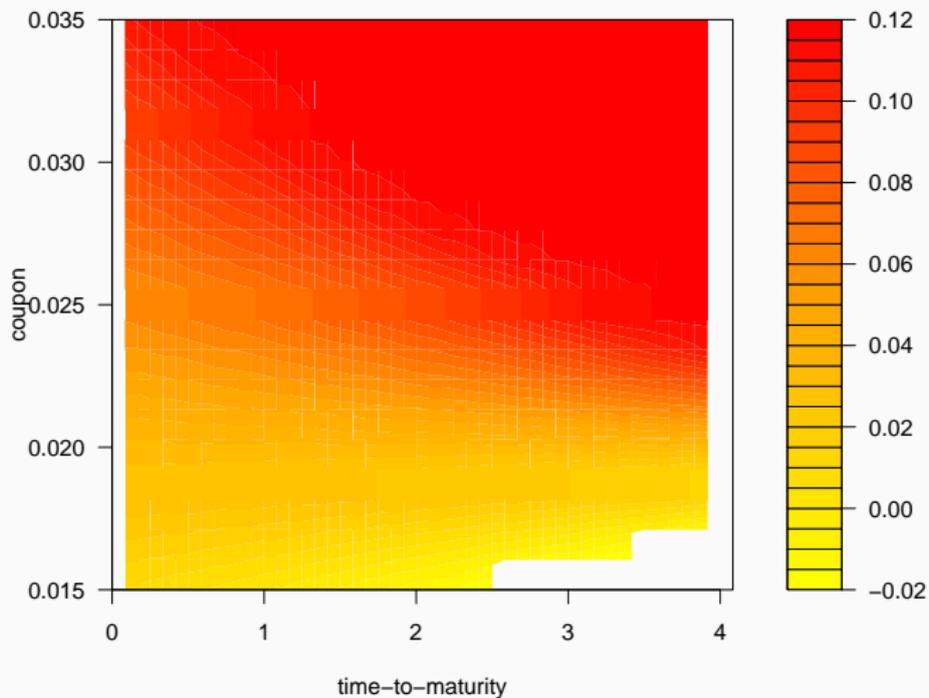
State- and time-dependent frictions

- what are the fixed costs (if any) incurred by households when refinancing (empirically)?
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Enriching the model

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