The Response of Debtors to Rate Changes

Andreas Fuster[1] Virginia Gianinazzi[2] Andreas Hackethal[3]
Philip Schnorpfeil[3] Michael Weber[4]

[1]EPFL, Swiss Finance Institute, and CEPR

[2]Nova SBE

[3]Goethe University Frankfurt and SAFE

[4]Purdue University, CEPR, and NBER

ifo & BERD "Novel Financial Data for Research" 2025

Introduction

- Large increases in interest rates after post-pandemic inflation
- Key consequence: higher cost of household debt—mortgages are largest component
- Many countries have fixed-rate mortgages that require refinancing before loan repaid
  - Higher rates then only apply in staggered fashion, once HH need to refinance
- But actual transmission of monetary policy depends on household actions
  - E.g., forward-looking HH adjust before reset $\rightarrow$ speed up or mute rate effects

$\Rightarrow$ Debtor responses to future rate hikes shape monetary transmission and stability

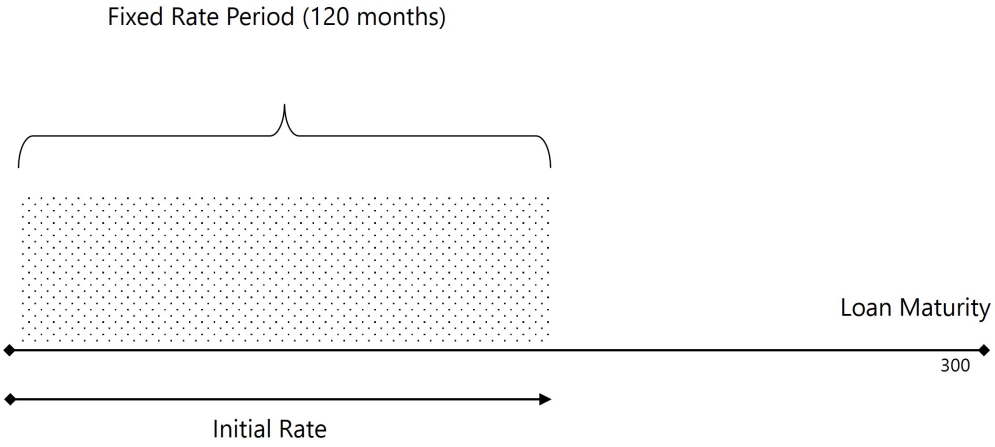
This paper

- Study how borrowers prepare for and react to (anticipated) rate changes
- How? Combination of data from large bank in Germany, where FRMs dominate
  - Mortgage and account data: study refinancing choices
  - Survey: actual beliefs, preparation, response to hypothetical scenarios
  - Letter RCT: information about rate evolution, payment consequences, options to manage
- Preview of findings:
  - Various borrower actions reduce impact of higher rates on monthly payments
  - Survey: overall strong propensity to prepare; sensitive to size and timing of reset
  - Letter: limited avg. effects; subgroup close to reset acts; selection in who reads it

Plan for the talk

1. German mortgage market
2. Patterns from bank data
3. Survey and vignette
4. Letter RCT

German mortgage market



German mortgage market—borrower options around refinancing

- For some: annual prepayment of $\leq 5\%$ of original amount *(Sondertilgung)*
- Lock in refinancing rate up to four years early (*forward mortgage*)
- Regular refinancing can be agreed on within six months from expiration
  - Existing lender sends refinancing offers six weeks before expiration—"just sign"
- Upon expiration, can always reduce balance via partial (or complete) payoff
- Speeding up amortization upon refinancing is possible; extending term more difficult

Mortgage rates on expiring vs. new loans—"regime shift" in 2022

Plan for the talk

1. German mortgage market
2. Patterns from bank data
3. Survey and vignette
4. Letter RCT

Bank data

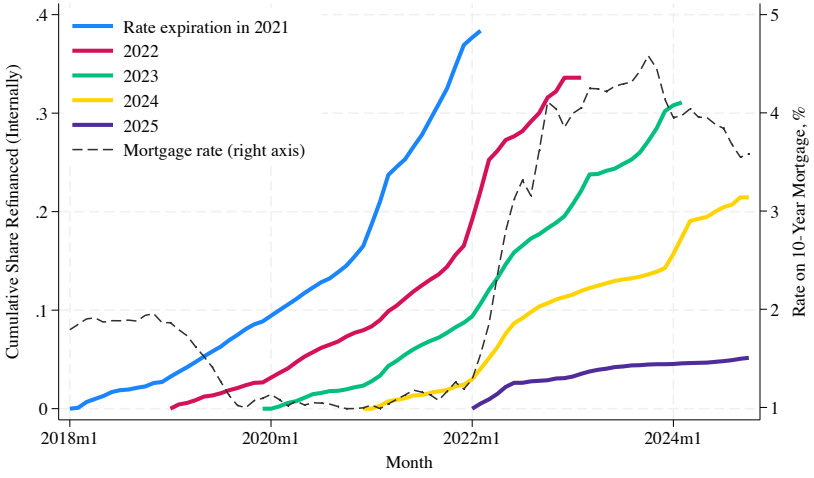
- ∼240k customers with outstanding mortgage between 2017 and 2024
- Observe loan characteristics annually (e.g., balance, rate, monthly payment, fixation)
- ∼50% refinance or pay off in sample; can link loans if internal refinancing
  - Data limitation: if loan pays off, don't know whether truly paid off or refinanced externally
- Observe borrower characteristics, other bank products, advisor meetings
- Broadly representative of outstanding German mortgages (Bundesbank survey)

Study response to higher mortgage rates in three steps

1. Propensity to refinance internally (as opposed to external refi or payoff)
2. Conditional on internal refinancing, combined effect of actions on payment changes
3. Decomposition of combined effect—which actions matter

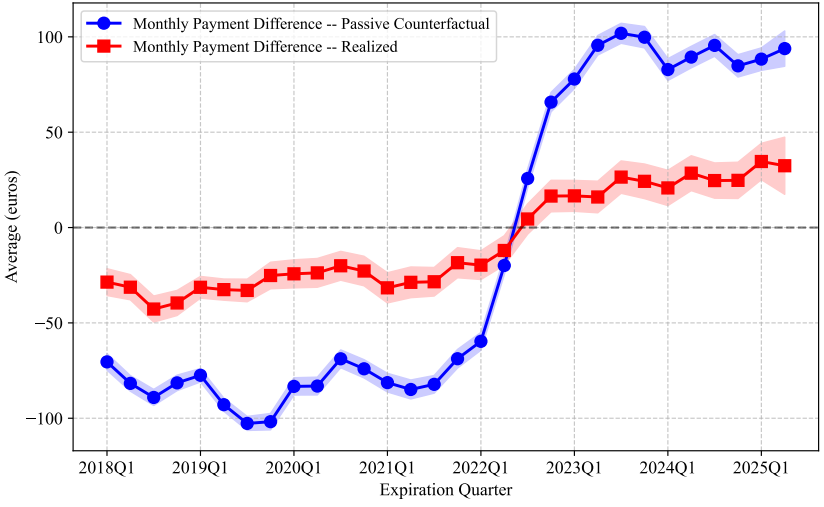
Cumulative internal refinancing propensity by loan vintage

Internal refinancing ↑ during rate rise and ↓ since rates are high



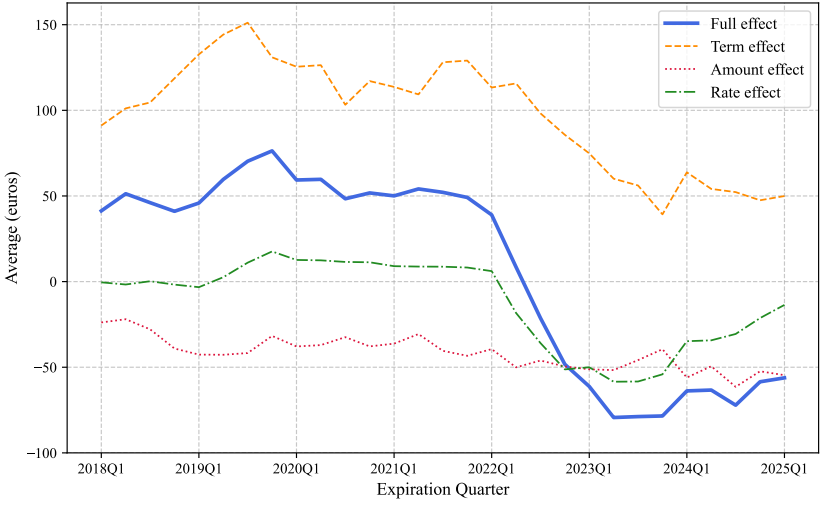
Average payment changes: realized vs. "passive counterfactual"

Borrower actions mitigate payment impact of rate changes



Mitigation of rate impact: contribution of rate, amount, and term changes

Balance reductions and rate lock-in key. Term changes always increase payments, less so since mid-2022

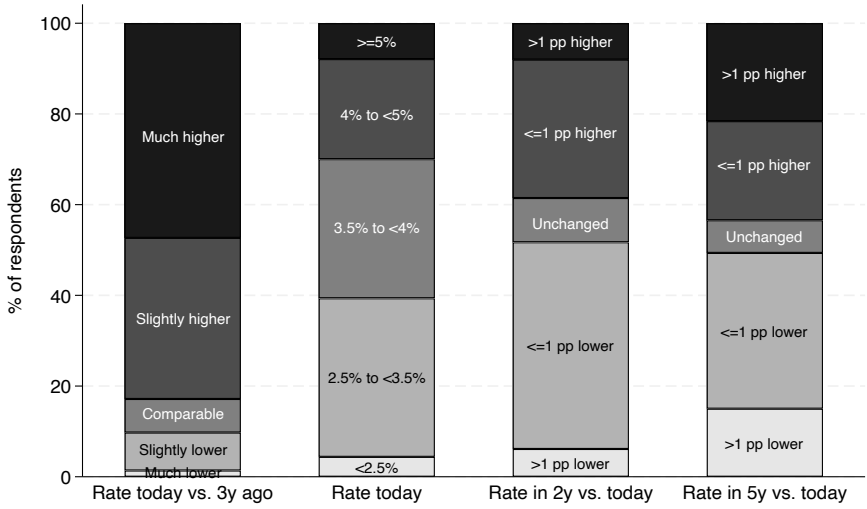


Plan for the talk

1. German mortgage market
2. Patterns from bank data
3. Survey and vignette
4. Letter RCT

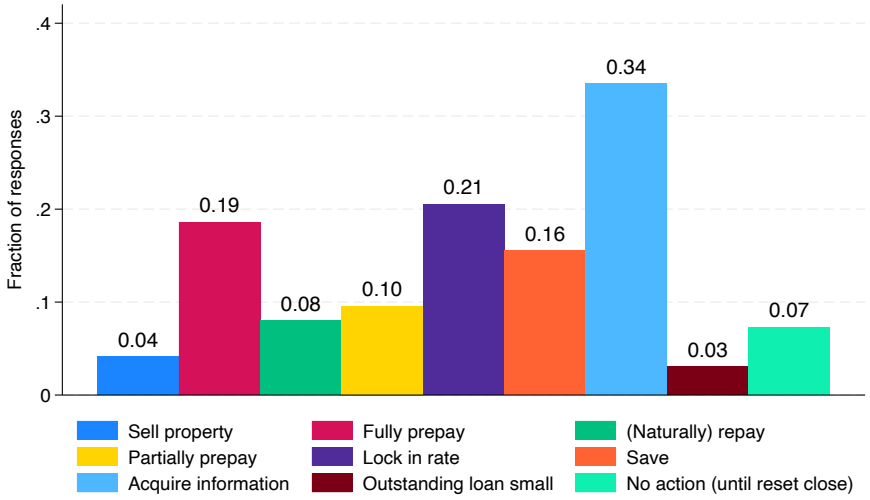
Beliefs about mortgage rates

Accurate perceptions of past rate changes and current rates, expect current rates to persist



Preparation for future rates according to open-text responses

Most borrowers actively prepare, often mitigating impact of higher rates



Vignette

Hypothetical scenario ("role-play")

Imagine that the remaining balance on your mortgage is €100,000 and the fixed interest rate period ends in one year. Your current interest rate is 1.5%. Due to changing market conditions, you expect your interest rate to rise by two percentage points to 3.5%, although there is uncertainty about the exact evolution of rates.

- Text above is baseline: € 100k mortgage resets from 1.5% to 3.5% in 1y
- Variant 2: more distant reset: happening in 3y instead of 1y
- Variant 3: smaller rate increase: from 3% to 3.5% (i.e., only 0.5 pp)

- Randomize into one scenario, then ask about preparation over coming 12 months
  - Create dummy = 1 if a given action marked as "rather likely" or "very likely"

Effects of changes in hypothetical refinancing scenario

Dependent variable (0/1):	Prepay	Forward	Costs ↓	Income ↑	Advisor	Search	Fix ≥10y
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
V2: 1.5% to 3.5% in 3y	−0.009	−0.042	−0.057**	−0.071***	−0.153***	−0.057***	−0.011
	(0.024)	(0.027)	(0.028)	(0.027)	(0.025)	(0.019)	(0.027)
V3: 3% to 3.5% in 1y	−0.041	0.100***	−0.008	−0.056**	−0.047*	−0.015	0.059**
	(0.025)	(0.027)	(0.028)	(0.027)	(0.024)	(0.019)	(0.027)
Controls	Y	Y	Y	Y	Y	Y	Y
Avg. Y V1	0.78	0.88	0.71	0.47	0.46	0.48	0.56
Observations	1,913	1,913	1,913	1,913	1,913	1,913	1,913
R-squared	0.05	0.06	0.10	0.08	0.06	0.12	0.07

- Distance to refinancing ↑ → likelihood raising income, advisor meetings, loan search ↓
- Size of rate hike ↓ → likelihood meetings, raising income ↓ & lock in rate, fixation ↑
- Borrowers more active with reset approaching and if rate increase larger

Plan for the talk

1. German mortgage market
2. Patterns from bank data
3. Survey and vignette
4. Letter RCT

Letter design

- Partnering bank sent letter to subset of mortgagors in Nov 2024
  - About three weeks prior to the survey
- 48k mortgagors: opt-in to being contacted; origination $<$2022-06; $>$€ 10k at reset
- Randomly divide sample into four groups, three of which receive letter
- RCT with two objectives:
  1. Gauge awareness of rates and how they translate into payments
  2. Assess how treat-induced awareness affects beliefs and choices

Letter content

1. Figure: market rates have increased substantially since early 2022
2. Current average rate is 4%, and future interest rates are uncertain
3. Sketch how higher rates can impact monthly installments
4. Options to cope: prepayments, locking in rates, increasing savings

Letter effects observed in survey data

DV:	Letter read	Rate change	Current rate	Pay change	Prepay know	Forward know	Prepay hypo	Forward hypo
Scale:	0/1	Std.	0/1	%	Std.	Std.	Std.	Std.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any letter	0.326***	−0.081	−0.012	0.008	0.158*	0.142*	0.134*	−0.078
	(0.027)	(0.075)	(0.034)	(0.024)	(0.085)	(0.080)	(0.078)	(0.078)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Avg. Y CG	0.08	0.00	0.77	0.05	0.00	0.00	0.00	0.00
N	882	882	882	660	882	882	882	882
R2	0.12	0.07	0.06	0.07	0.08	0.14	0.05	0.07

- Letter reception → reading mortgage letter past 2m ↑ by 33 pp
- Letter reception → no significant effects on rate and payment-change beliefs
- Letter reception → awareness of mortgage features ↑

Letter effects observed in bank data (work in progress)

DV (0/1):	Meet advisor	Refi	Early refi	Meet and open	Extra paym	Home sav / FW
	(1)	(2)	(3)	(4)	(5)	(6)
Any letter	0.031	0.155	0.111	0.176*	0.176	0.001
	(0.327)	(0.118)	(0.068)	(0.104)	(0.417)	(0.065)
Controls	Y	Y	Y	Y	Y	Y
Expiration year FE	Y	Y	Y	Y	Y	Y
Avg. Y CG	11.11	1.33	0.38	0.95	12.87	0.38
N	46845	46845	46845	46845	34195	46845
R2	0.06	0.20	0.03	0.10	0.02	0.01

- No significant letter effects on realized actions in full sample
- Not shown: if expiration soon, letter $\rightarrow$ internal refi and advisor meetings $\uparrow$

Heterogeneity in propensity to read letter

DV (0/1):	Having read bank letter in past two months on topic of mortgage-rate increases						
Trait:	Loan size	Loan reset	Loan repay	Literacy	Income	Rate change	Current rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Letter	0.336***	0.341***	0.301***	0.239***	0.252***	0.191***	0.233***
	(0.027)	(0.028)	(0.032)	(0.037)	(0.040)	(0.066)	(0.058)
Trait	−0.017	0.097*	−0.015	−0.001	−0.042	0.005	−0.036
	(0.017)	(0.056)	(0.039)	(0.037)	(0.037)	(0.053)	(0.048)
Letter x trait	0.070***	−0.021	0.105*	0.182***	0.152***	0.168**	0.133**
	(0.026)	(0.073)	(0.057)	(0.052)	(0.053)	(0.072)	(0.065)
Observations	881	881	877	884	884	884	884
R-squared	0.10	0.10	0.10	0.12	0.10	0.10	0.10

- Borrowers w/ larger loans and past prepayments more likely to read
- Financial literacy, income, and accurate rate beliefs predict reading too
- Ex-ante awareness of content reduces potential of intervention

Summary (work in progress)

- HH actions determine transmission of higher interest rates through FRM
- Mortgagors reduce higher-rate impact via forwards $\uparrow$, balance $\downarrow$, loan terms $\downarrow$ by less
- Survey reveals high ex-ante awareness of rates and strong inclination to prepare
  - Vignette shows that actions taken vary with timing and size of rate change
- Letter: no effects on beliefs, higher awareness of options, subgroup acts close to reset
  - Partly reflecting self-selection of who reads the letter