Monetary Policy Tightening and Mortgage Refinancing

A Shield Against Rising Borrowing Costs

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Motivation and Literature

- Consumers face complex financial decisions, which require financial sophistication
- Often seek information (e.g. from friends, relatives, professional advisors) to improve their financial decisions
- Households rely heavily on advice from financial intermediaries: 80% of households in Germany, 91% in UK, 73% in US (Guiso et al., 2022)
- Limited sophistication and limited information create a space for steering and biased advice (Egan et al., 2019; Foa et al., 2019)
- Principal agent problem (LaCour-Little, 2009) ending up with loans having more risky parameters (Alexander et al., 2002; Allen et al., 2024) or even welfare losses (Guiso et al., 2022)

Motivation and Literature

- Monetary policy shapes the consumption and investment decisions of households, operating in large part through the financial system
- MP tightening and easing cycles shape borrowing behavior by altering cost of credit (Bernanke and Gertler, 1995; Kashyap and Stein, 2000):
  - Borrowing less (i.m.) or not borrowing at all (e.m.) (Mian et al., 2013)
  - Reassessment of preferred fixation options (Badarinza et al., 2018; De Stefani and Mano, 2025
  - Unresponsive behavior among very wealthy or very poor (Cloyne et al., 2020)

Financial advisors in Slovakia

- Financial advisors active on the mortgage market since its beggining in 2003–2004
- In 2015 around 50% of mortgages granted via financial advisor; this value increased to 65% in 2022
- Currently more than 400 companies, however the market is rather concentrated (69% of all financial agents are employed by 10 companies with the largest market share
- Their provisions are usually based on the volume of the loan advised
- Several risks related to activity of financial advisors raised by the NBS (NBS, 2019)
- Advisor-mediated loans tend to have higher amounts, LTVs, DTIs, and longer maturities (Cesnak et al., 2025)
- Advisor-mediated loans amplify macropru policy effects, e.g. front-loading and distribution shifts towards policy thresholds (Cesnak et al., 2025)

This paper

Main questions:

Does financial sophistication (either direct via education or indirect via professional mediation) help borrowers secure a better position for these loans in the face of the recent monetary policy tightening cycle?

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Yes...

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Yes...

... and no.

Data description

Slovak loan-level register data

- Unique microdata on the universe of mortgage and non-mortgage loans in Slovakia
- Detailed information on borrowers' socio-demographic and economic characteristics
- Major banks in Slovakia report data to the NBS on a quarterly basis since 2018 $\rightarrow$ sample 2018Q3 - 2025Q2
- Highly representative data: coverage of almost 100% of the portfolio
- Information on more than 730k new mortgages (flow) and 550k-700k of reported mortgages each quarter (stock)
- The data has been actively used at the NBS for fin. stability purposes

Variables selection

Outcome variables:

- Interest rate
- Granted amount (in log)
- Maturity (in years)
- Loan-to-value (LTV)
- Debt-to-income (DTI)
- Debt service-to-income (DSTI)
- Fixation of interest rate

Main independent variables:

- Multinomial variable determining different periods related to the MP tightening cycle
- Dummy variable if the loan was mediated through a financial advisor
- Dummy variable if at least one borrower on the contract has a university education

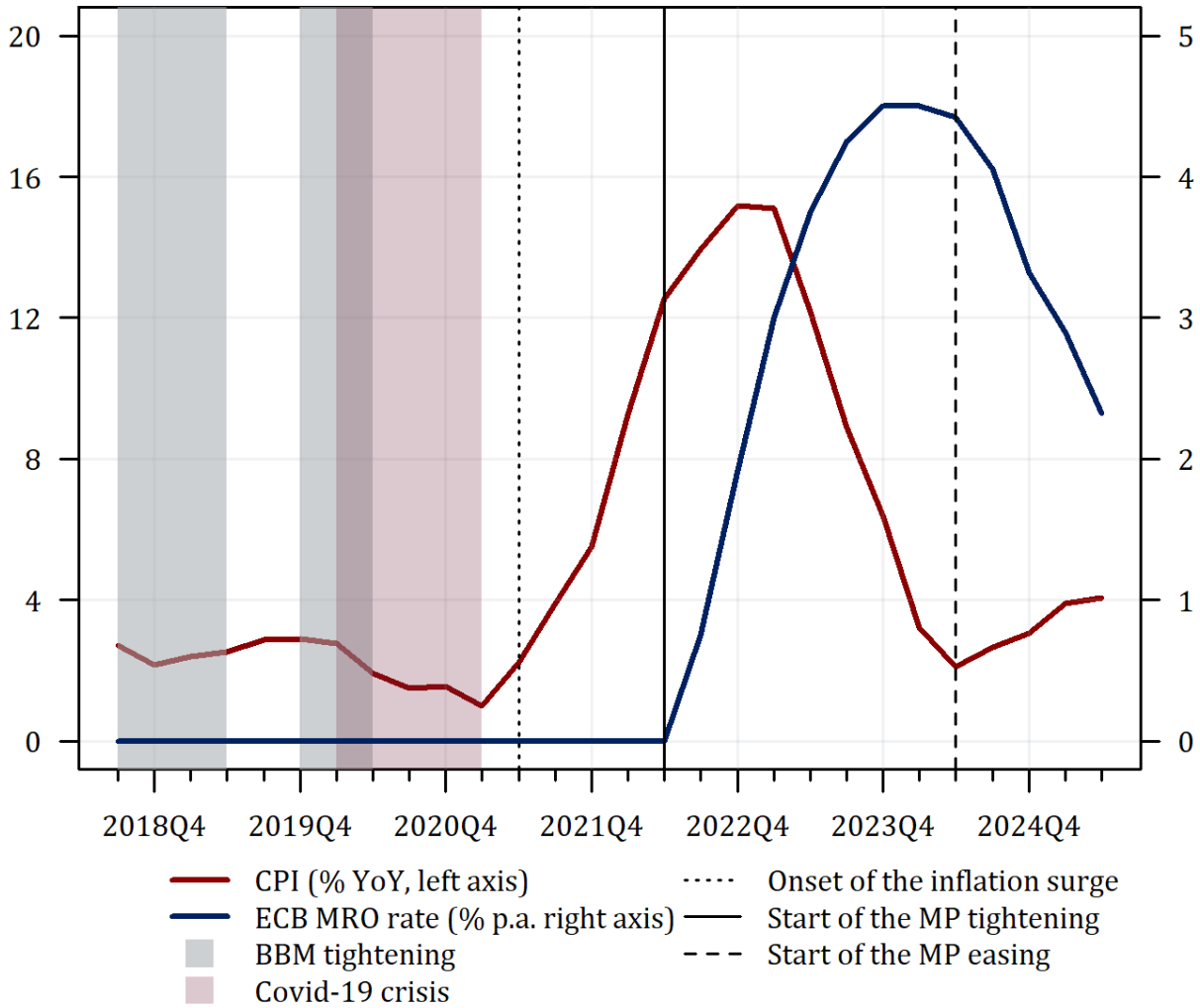
Variables selection

Control variables:

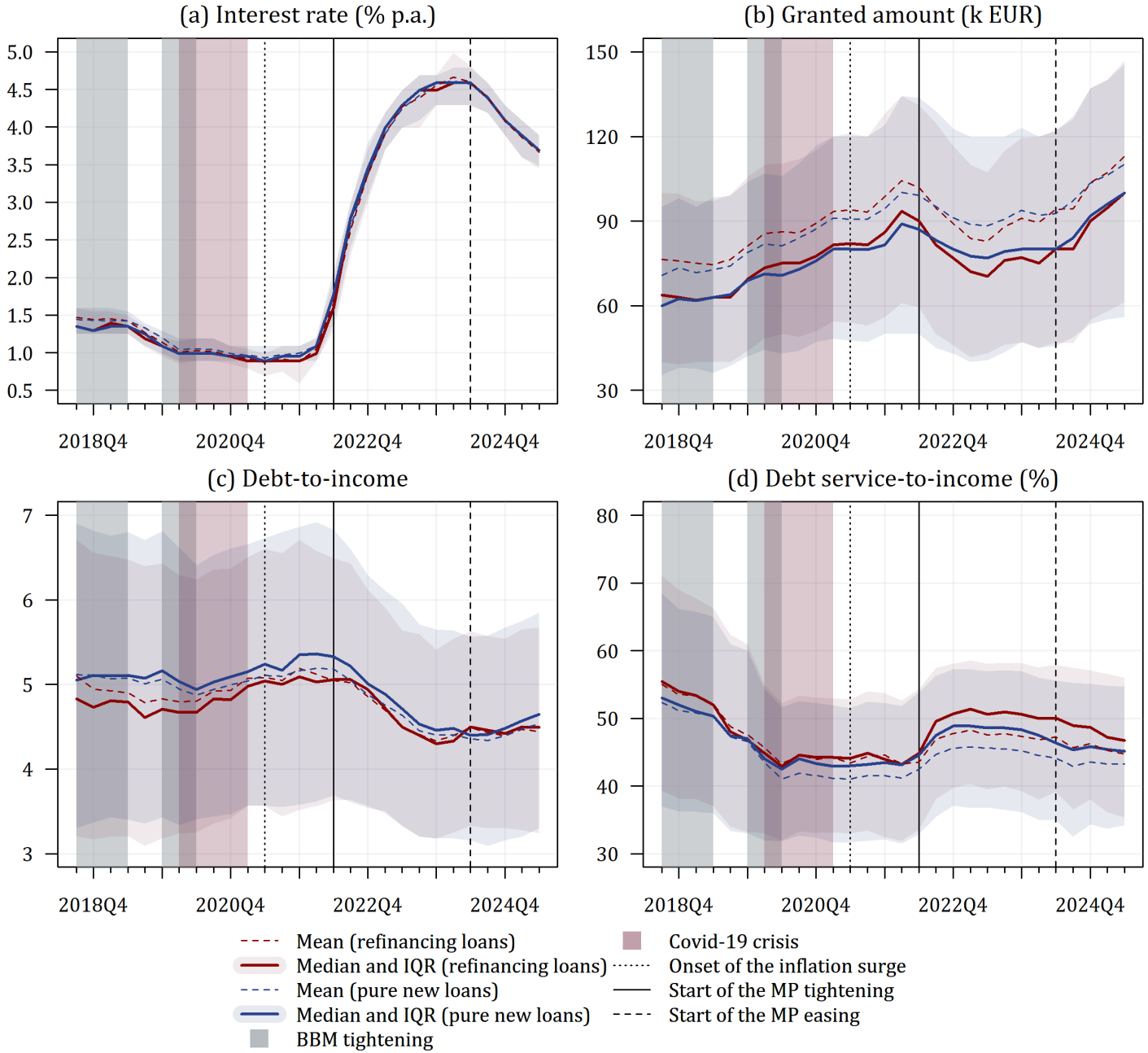
- Borrower's financial position: collateral value (in log), income (in log), value of financial assets (IHS), having another housing loan, having another consumer loan, outstanding amount of another debt
- Borrower's socio-demographic characteristics: source of income, gender, age, age sq., number of children, number of adults
- Fixed effects: Bank FE, Region FE, Quarter FE

Sample selection

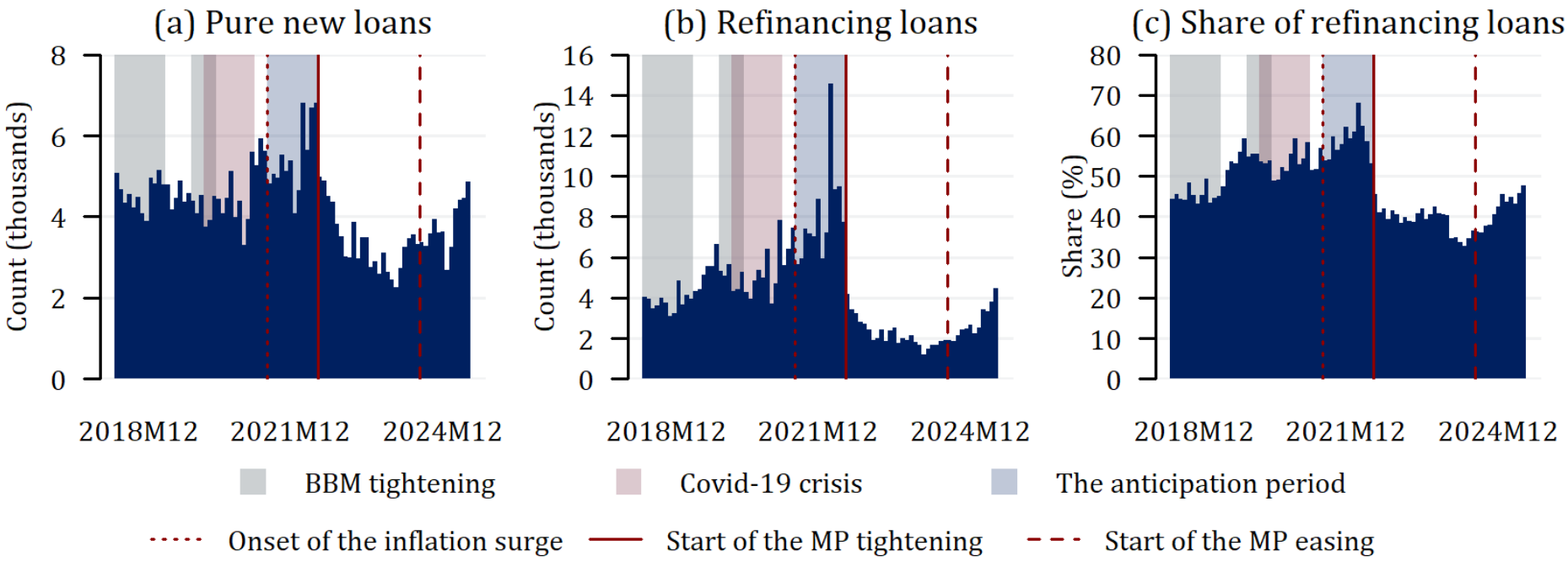
- Differentiating between the stages of the monetary policy cycle (pre-anticipation, anticipation, tightening, and easing)
- $\Rightarrow$ Estimation sample = 2020Q3–2025Q2



Initial observations - Impact of MP on loan outcomes

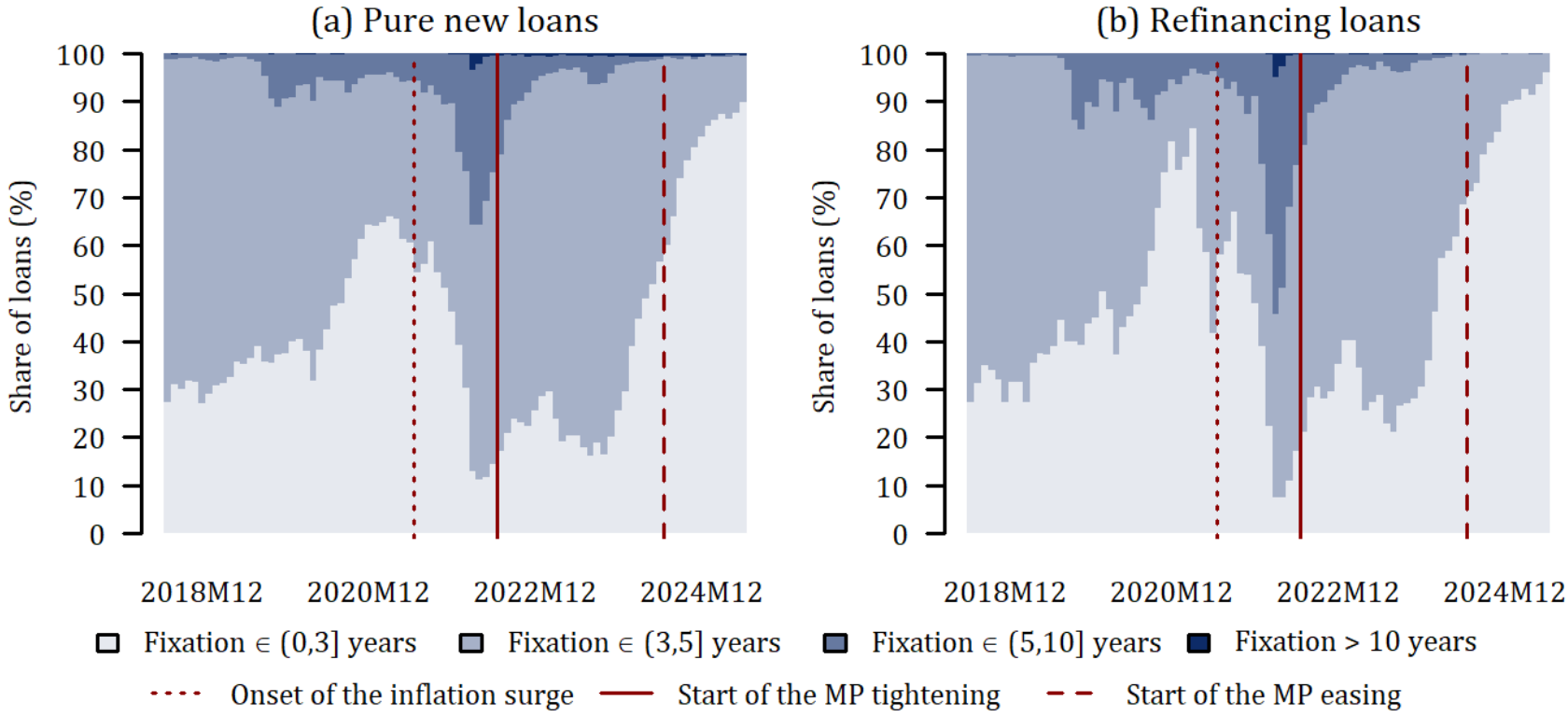


Initial observations - Impact of MP on loan originations



- Borrowers adjust the timing of their market entry, even more sensitively when considering improvements to existing contracts
- Notable among loans granted to university educated borrowers, less among advisor-mediated loans see here

Initial observations - Impact of MP on fixation choices



- Borrowers acted to stabilize their loan conditions ahead of tightening, anticipating future increases in borrowing costs
- Longer fixations began to diminish before and during easing, reflecting participants' expectation of falling rates
- Again, more notable among university educated borrowers and less among advisor-mediated loans see here

Estimation approach - OLS regression

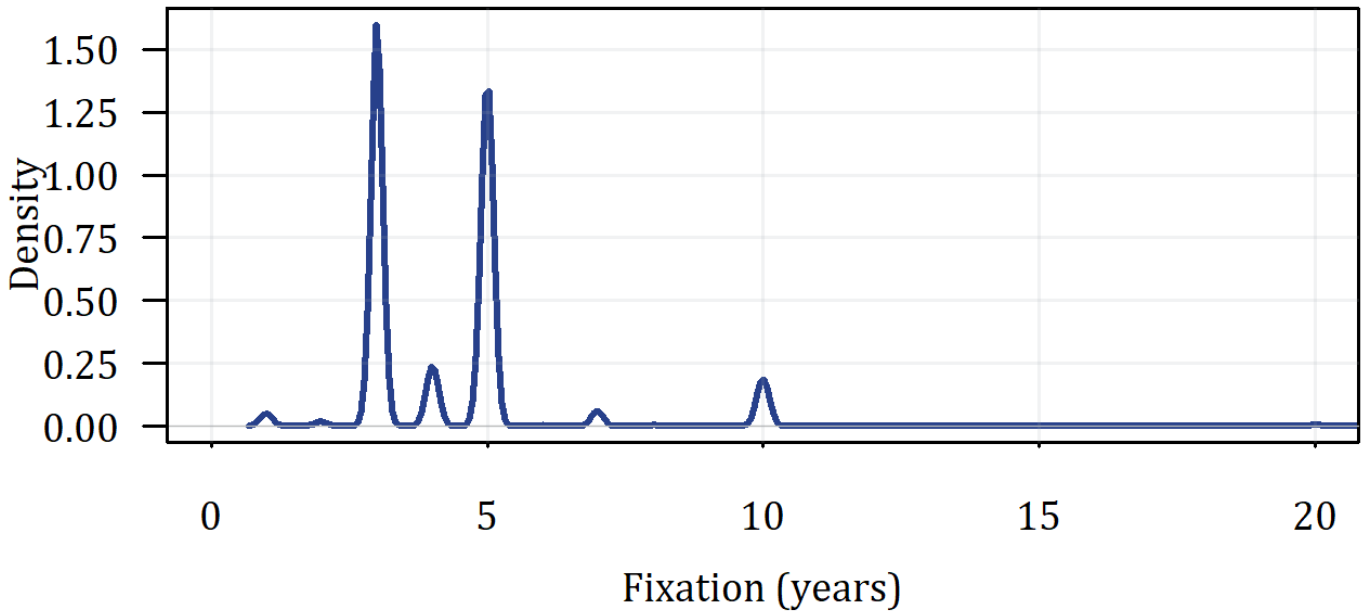
- Estimating the impact of financial knowledge, monetary policy and their interaction on mortgage outcomes by OLS:

$$Y_{ibrt} = \alpha + \beta' \mathbf{MP}_t + \eta' \mathbf{T}_{ibrt} + \theta' (\mathbf{MP}_t \cdot \mathbf{T}_{ibrt}) + \delta' \mathbf{X}_{ibrt} + \lambda_{b \times t} + \gamma_r + \varepsilon_{ibrt},$$

- Y_{ibrt} captures the characteristics of the i-th individual loan in bank b, region r and quarter t
- MP_t determines different periods related to the monetary policy cycle
- T_{ibrt} indicates whether the i-th loan was mediated via financial advisor (0/1) and whether it was granted to university educated borrowers (0/1)
- X_{ibrt} captures a large set of borrower control variables and $\lambda_{b \times t}$, γ_r capture the bank-quarter and region FE respectively
- S.E. clustered at the bank level

Estimation approach - Ordered logit regression

- Fixation distribution clustered around the most preferred values:



- $\Rightarrow$ Alťernatively, we estimate fixations using ordered logit model for fixation categories $(0, 3]$, $(3, 5]$, $(5, 10]$, > 10 years:

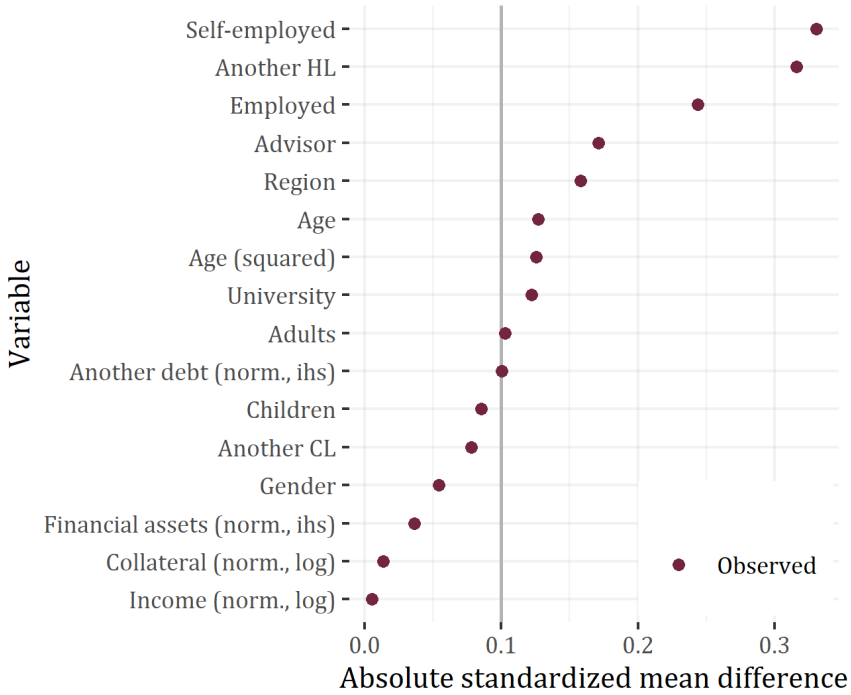
$$Pr(Y_{ibrt} = j|\mathbf{X_{ibrt}}) = \Lambda(\mu_j - \beta'\mathbf{X_{ibrt}}) - \Lambda(\mu_{j-1} - \beta'\mathbf{X_{ibrt}})$$

where Λ is the logistic CDF.

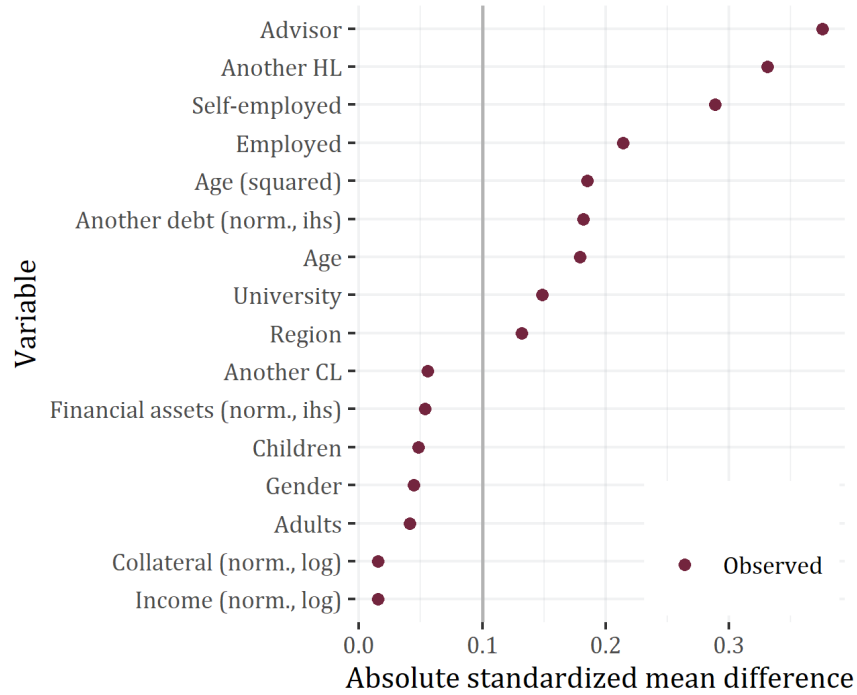
Estimation approach - Propensity score weighting

- Potential confounding due to changes in borrower composition over MP cycle

(a) Pure new loans



(b) Refinancing loans



- We approach this issue by inverse probability of treatment weighting (IPTW; Austin & Stuart, 2015) using propensity score estimated by generalized boosted models (GBM; McCaffrey et al., 2004 and McCaffrey et al., 2013)

Impact of MP on newly originated loans

Panel A: Pure new loans

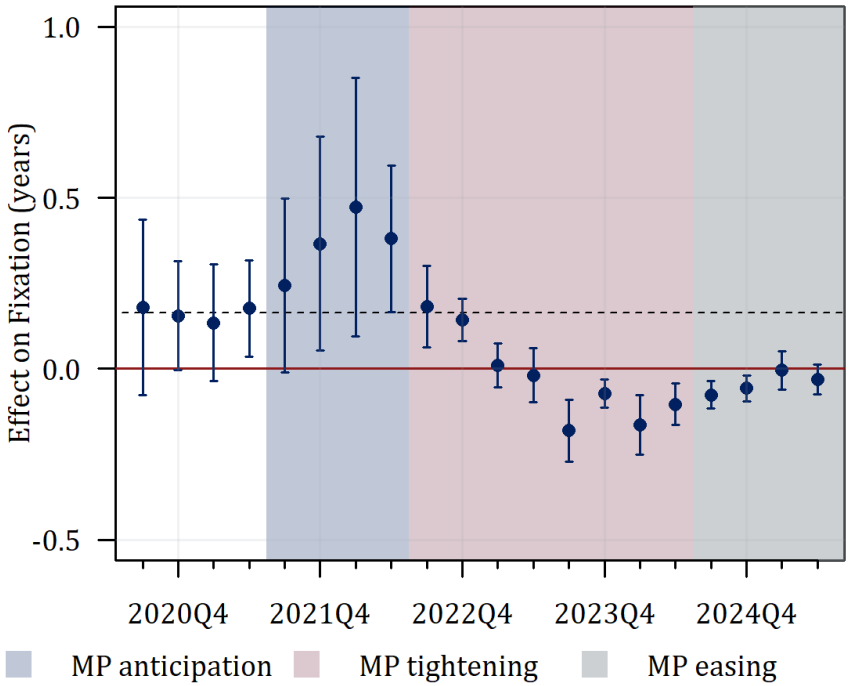
	(1) Amount (log)	(2) Maturity	(3) Int. rate	(4) Fixation	(5) DSTI	(6) DTI	(7) LTV
MP anticipation	0.016	0.329***	0.215***	1.387***	0.0005	0.063	0.002
	(0.025)	(0.104)	(0.028)	(0.408)	(0.005)	(0.041)	(0.004)
MP tightening	−0.106***	0.543***	2.894***	0.737***	0.046***	−0.400***	−0.033***
	(0.035)	(0.187)	(0.082)	(0.138)	(0.007)	(0.064)	(0.005)
MP easing	−0.070**	1.099***	2.968***	−0.582***	0.053***	−0.443***	−0.027***
	(0.030)	(0.238)	(0.062)	(0.128)	(0.005)	(0.067)	(0.009)
Observations	196,618	196,618	196,618	196,618	196,618	196,618	196,618
Adjusted R^2	0.569	0.584	0.856	0.211	0.394	0.469	0.282
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	B+R	B+R	B+R	B+R	B+R	B+R	B+R

Panel B: Refinancing loans

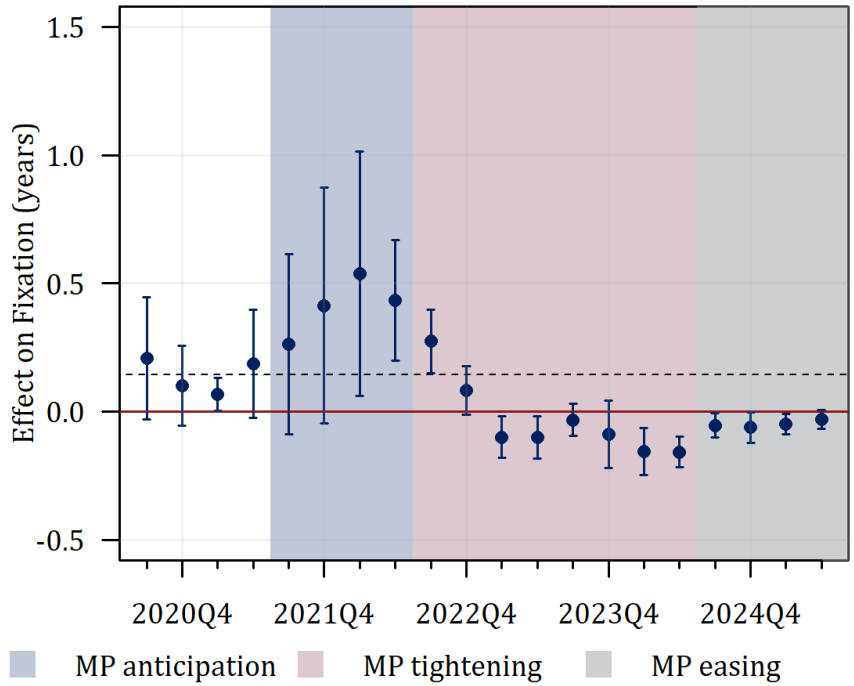
	(1) Amount (log)	(2) Maturity	(3) Int. rate	(4) Fixation	(5) DSTI	(6) DTI	(7) LTV
MP anticipation	−0.001	0.217	0.154***	1.877**	−0.002	−0.0003	−0.009
	(0.013)	(0.148)	(0.050)	(0.738)	(0.005)	(0.048)	(0.008)
MP tightening	−0.173***	0.672**	2.834***	0.852***	0.043***	−0.504***	−0.049***
	(0.020)	(0.265)	(0.087)	(0.224)	(0.004)	(0.079)	(0.014)
MP easing	−0.136***	1.168***	2.980***	−0.467	0.053***	−0.531***	−0.052***
	(0.021)	(0.260)	(0.039)	(0.310)	(0.010)	(0.092)	(0.013)
Observations	148,225	148,225	148,225	148,225	148,225	148,225	148,225
Adjusted R^2	0.628	0.613	0.872	0.289	0.395	0.488	0.275
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	B+R	B+R	B+R	B+R	B+R	B+R	B+R

Heterogenous effect of MP on fixation by education

(a) Pure new loans



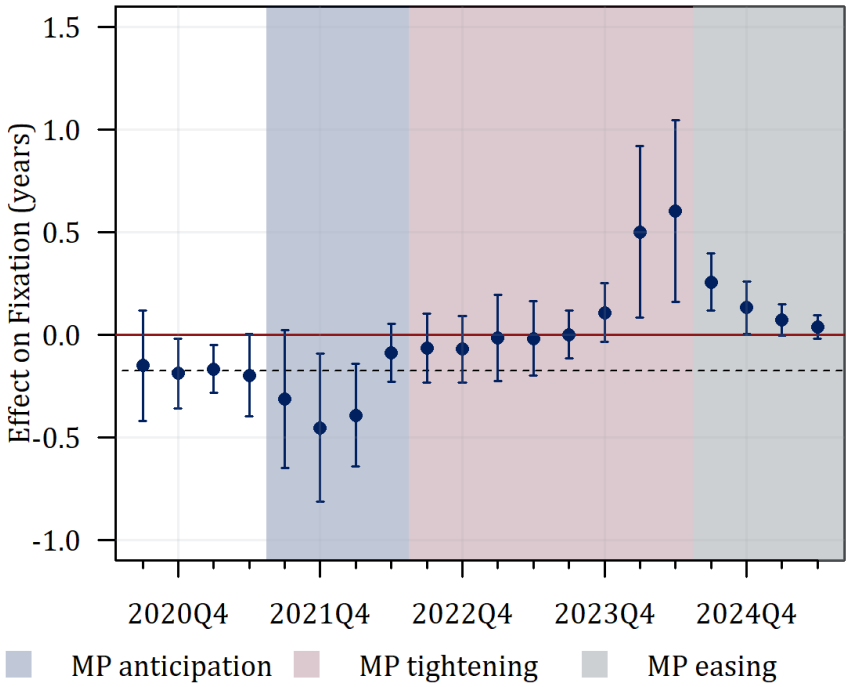
(b) Refinancing loans



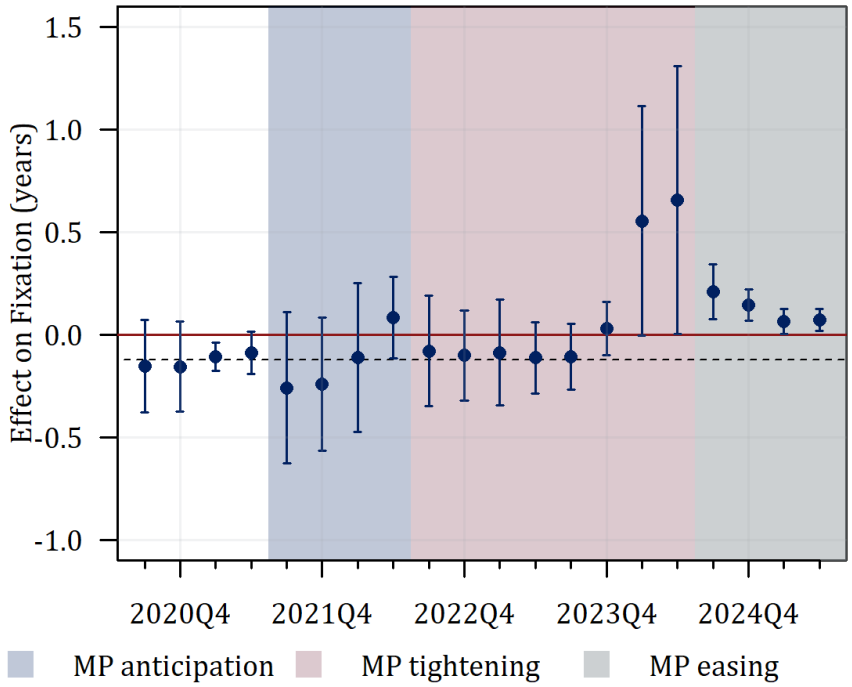
- Loans granted to university-educated borrowers reflect strategic management of interest rate risk:
  - In normal times, they prefer longer fixations to lock in predictable rates
  - When anticipating a future rise in interest rates, they extend fixations even further to avoid higher costs
  - When expecting rates to fall, they shift to shorter fixations to benefit from lower future rates

Heterogenous effect of MP on fixation by loan mediation

(a) Pure new loans



(b) Refinancing loans

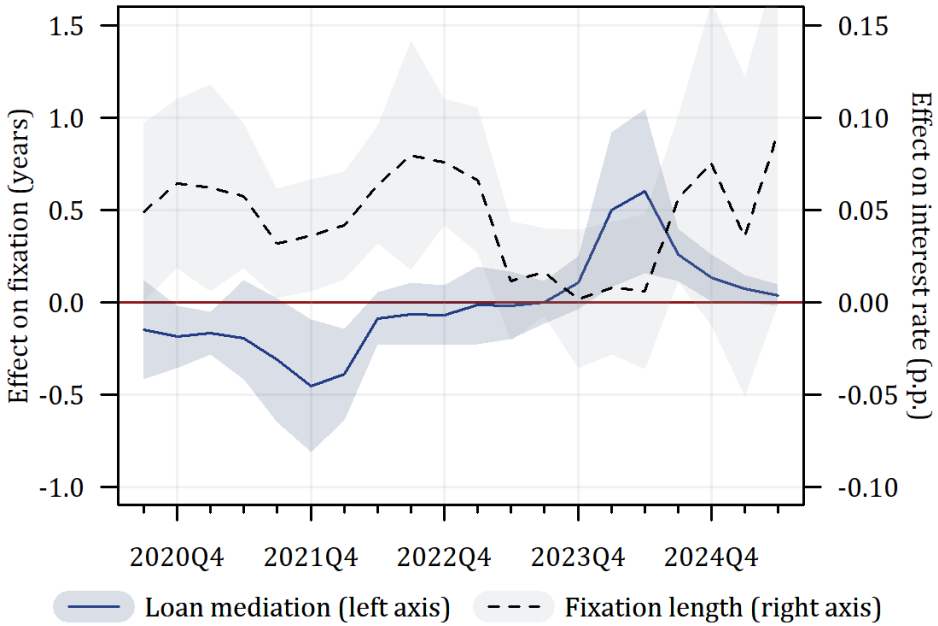


- Advisor-mediated loans follow the exact opposite pattern
- Ordered logit regression confirms these findings see here
- Effects hold also after accounting for selection bias see here

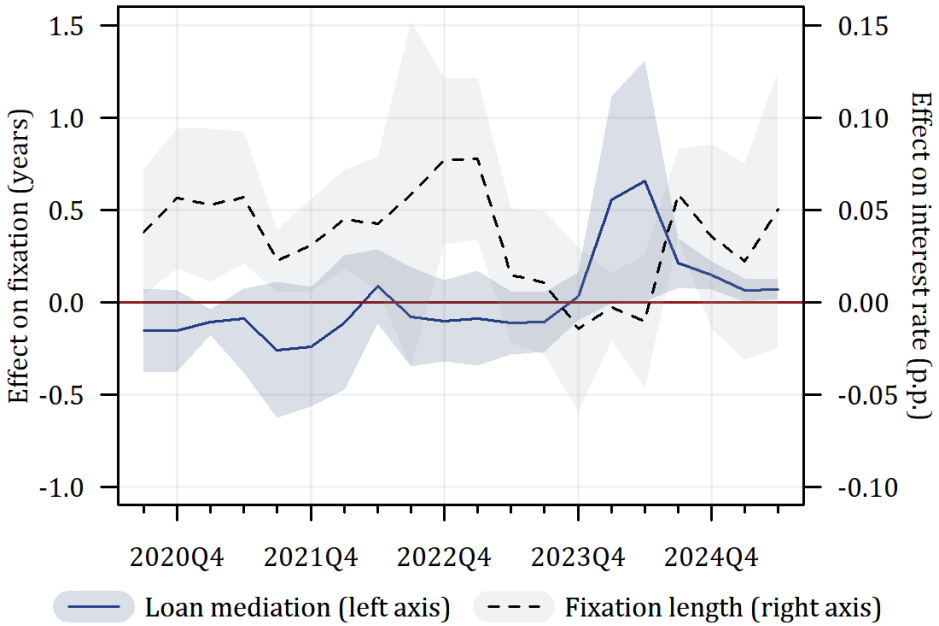
Link to the fixation-interest rate curves

$$IR_{ibrt} = \alpha + \beta FIX_{ibrt} + \tau_t + \boldsymbol{\theta}'(\tau_t \cdot FIX_{ibrt}) + \boldsymbol{\delta}'\mathbf{X}_{ibrt} + \lambda_{b\times t} + \gamma_r + \varepsilon_{ibrt},$$

(a) Pure new loans



(b) Refinancing loans



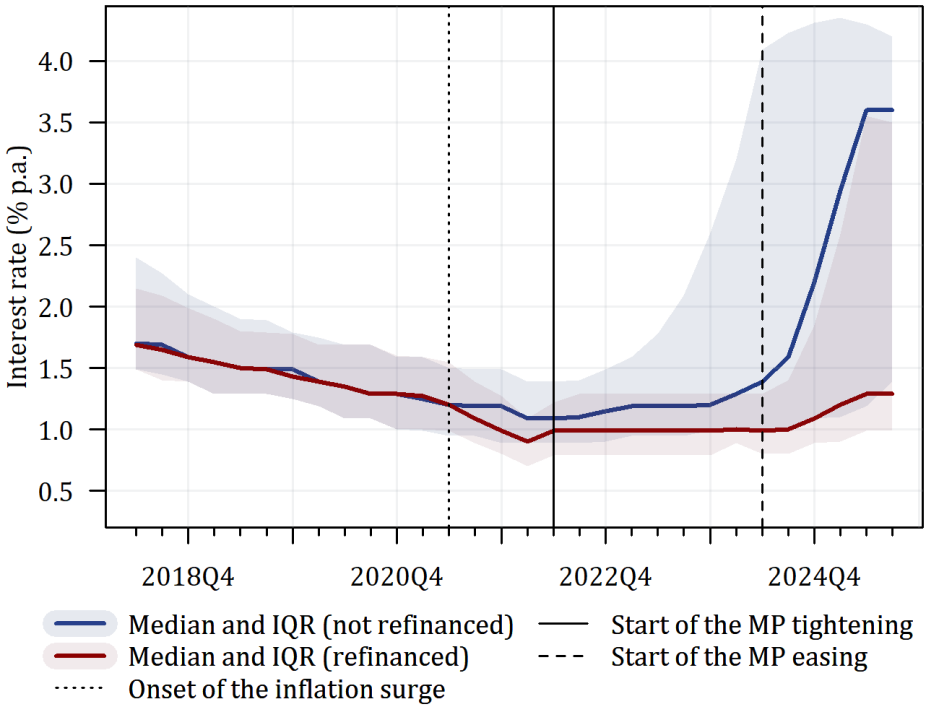
- In normal periods with a standard fixation-interest rate curve, advisor-mediated loans favor shorter fixations relative to the market
- Once the fixation-interest rate curve flattens or inverts, they switch to longer fixations
- Indicates a short term cost optimization
- ▸ Estimated curves

Welfare effect - empirical consequences

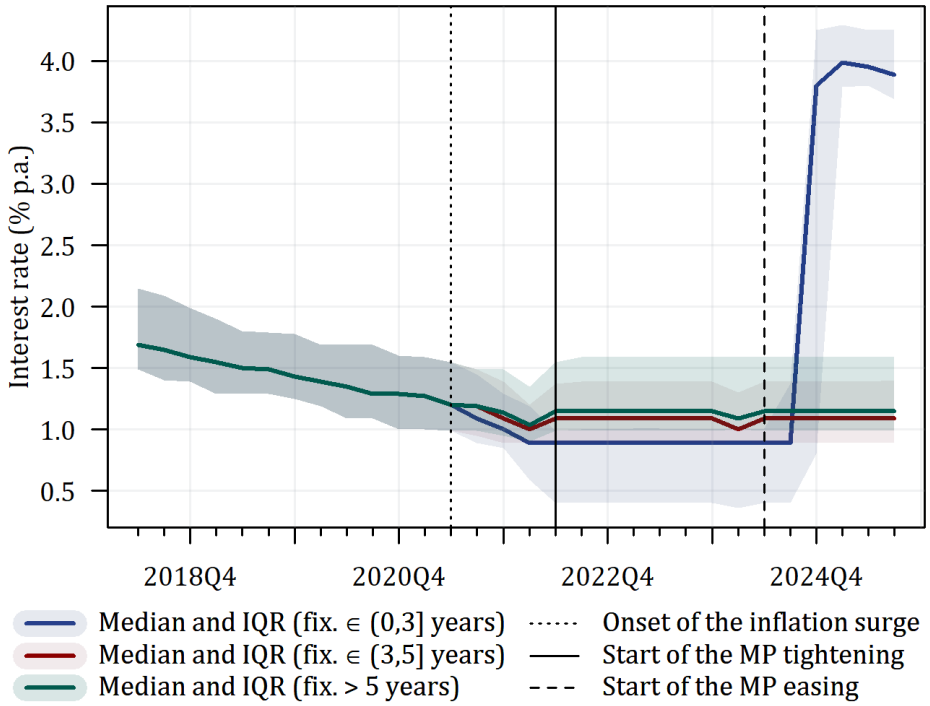
Effect of timely refixation on cost of credit

- Focusing only on loans granted before 2021Q2
- Comparing those refinanced within anticipation period to those never refinanced

(a) Extensive margin



(b) Intensive margin



- Keeping track of developments in the loan market pays off
- Longer fixations are associated with short-term cost premia but yield long-term benefits

Conclusions

- Recent MP tightening cycle significantly affected parameters of new loan production on the mortgage market
- Market participants reacted in terms of market entry as well as fixation choices
- These reactions were even amplified/muted by the presence of "financial knowledge":
  - Loans granted to university-educated borrowers favor long-term cost optimization, likely reflecting greater financial sophistication
  - Advisor-mediated loans aim for short-term cost optimization, likely in order to enhance loan attainability
- Such choices have material impact on households' short-term as well as long-term welfare

Next steps

- Develop theoretical welfare analysis
  - Incorporating the role of financial knowledge and loan mediation
- Shift-share IV-2SLS on interaction effect (Bartik, 1991); Borusyak, et al., 2023)
  - Addressing endogeneity
  - Further decompose the effect as in (Allen et al., 2024)
- Other stuff
  - Different reference period (before covid, only 2Q before MP tightening anticipation)
  - Distinguishing MP tightening anticipation and MP easing anticipation
- Study extensive margin also econometrically
  - Propensity to refinance (during different periods)
  - Need for data merging from different sources (loan registry, social registry, ...) – at this point still not feasible

Beyond the project

Exploring longitudinal effects of MP tightening

- Loan defaults
  - Role of refinancing, fixations, education and advisors

Questions

Thank you for your attention!

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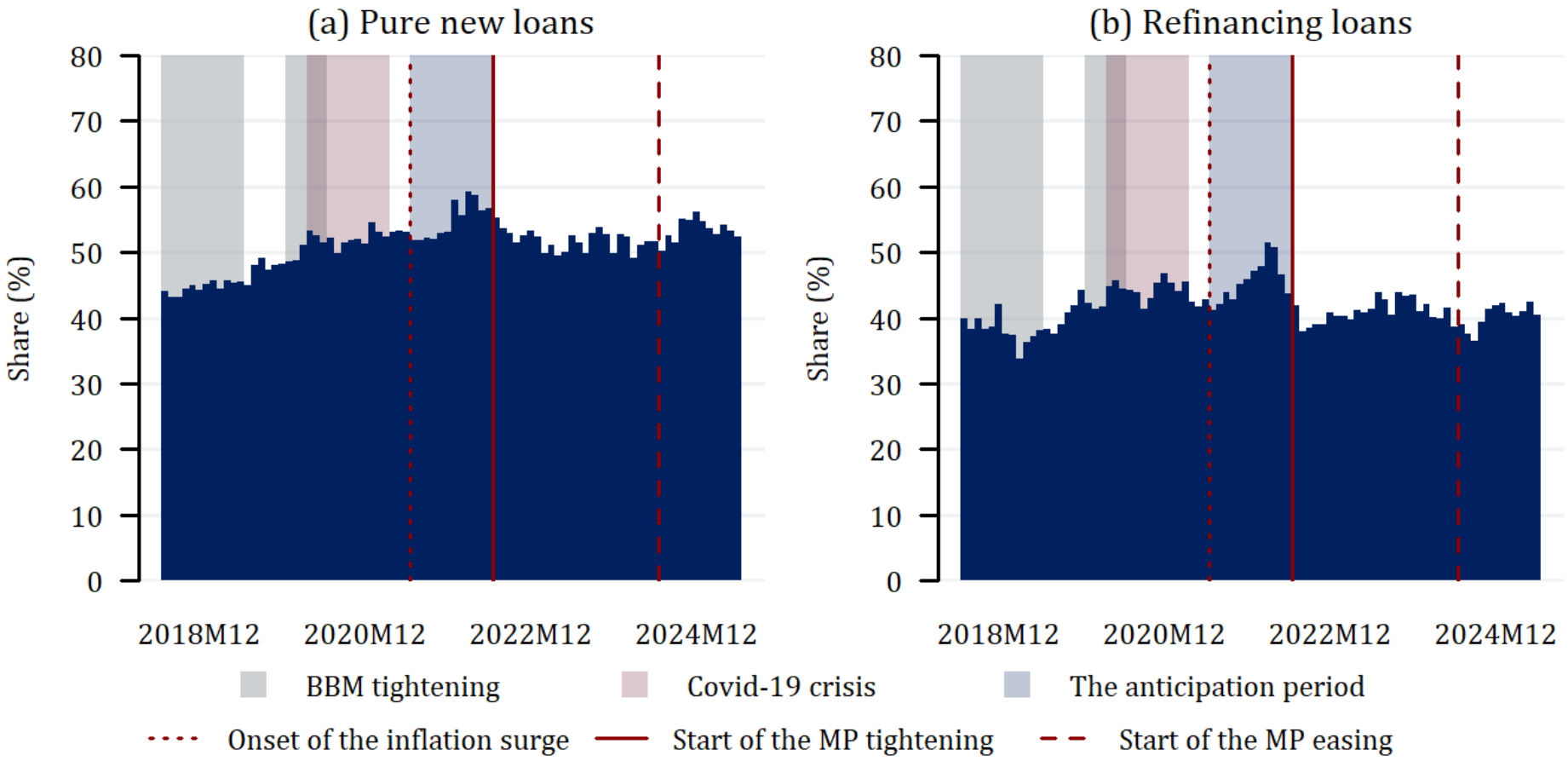
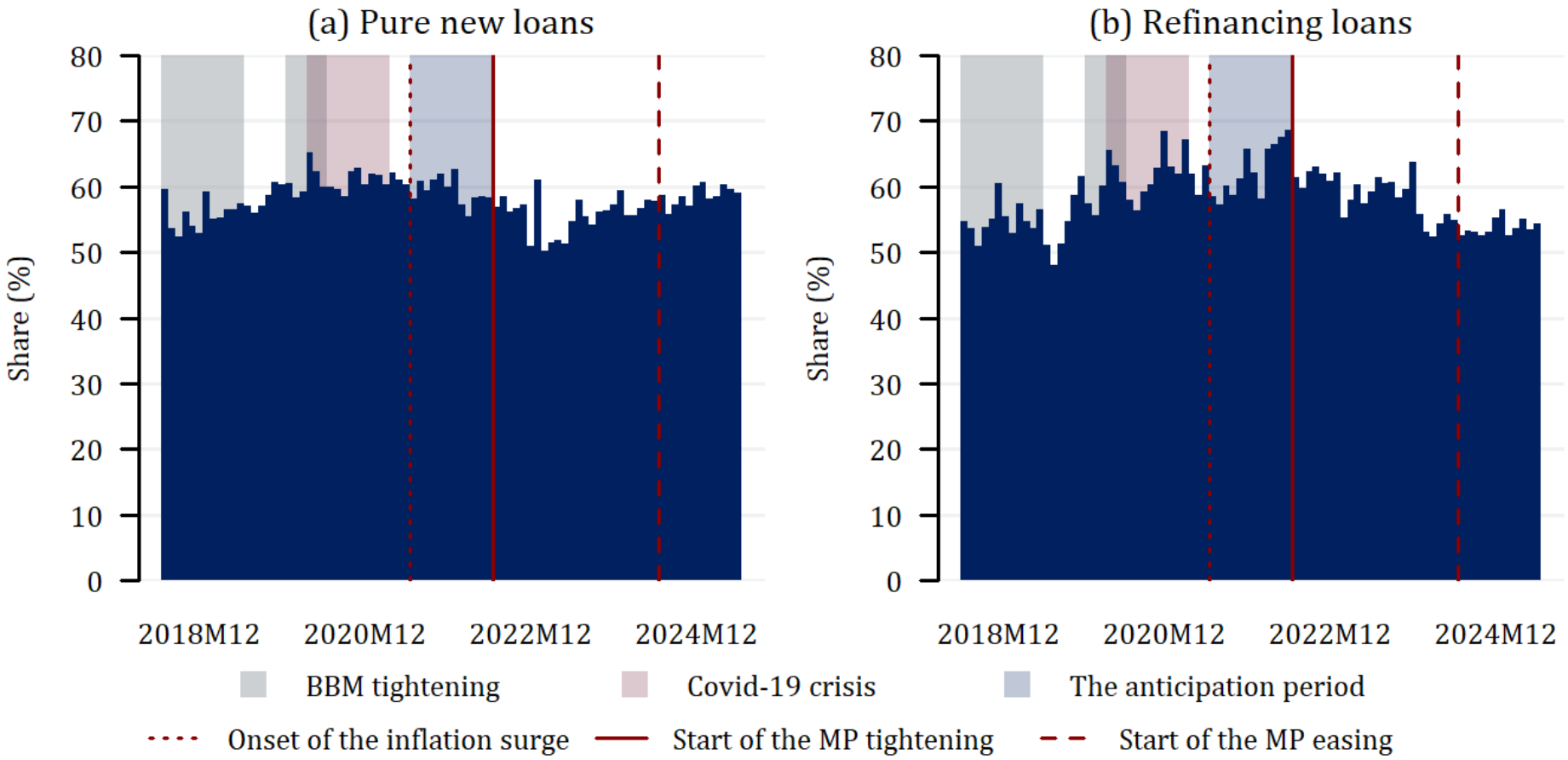
Additional slides

New loan originations by education



New loan originations by loan mediation



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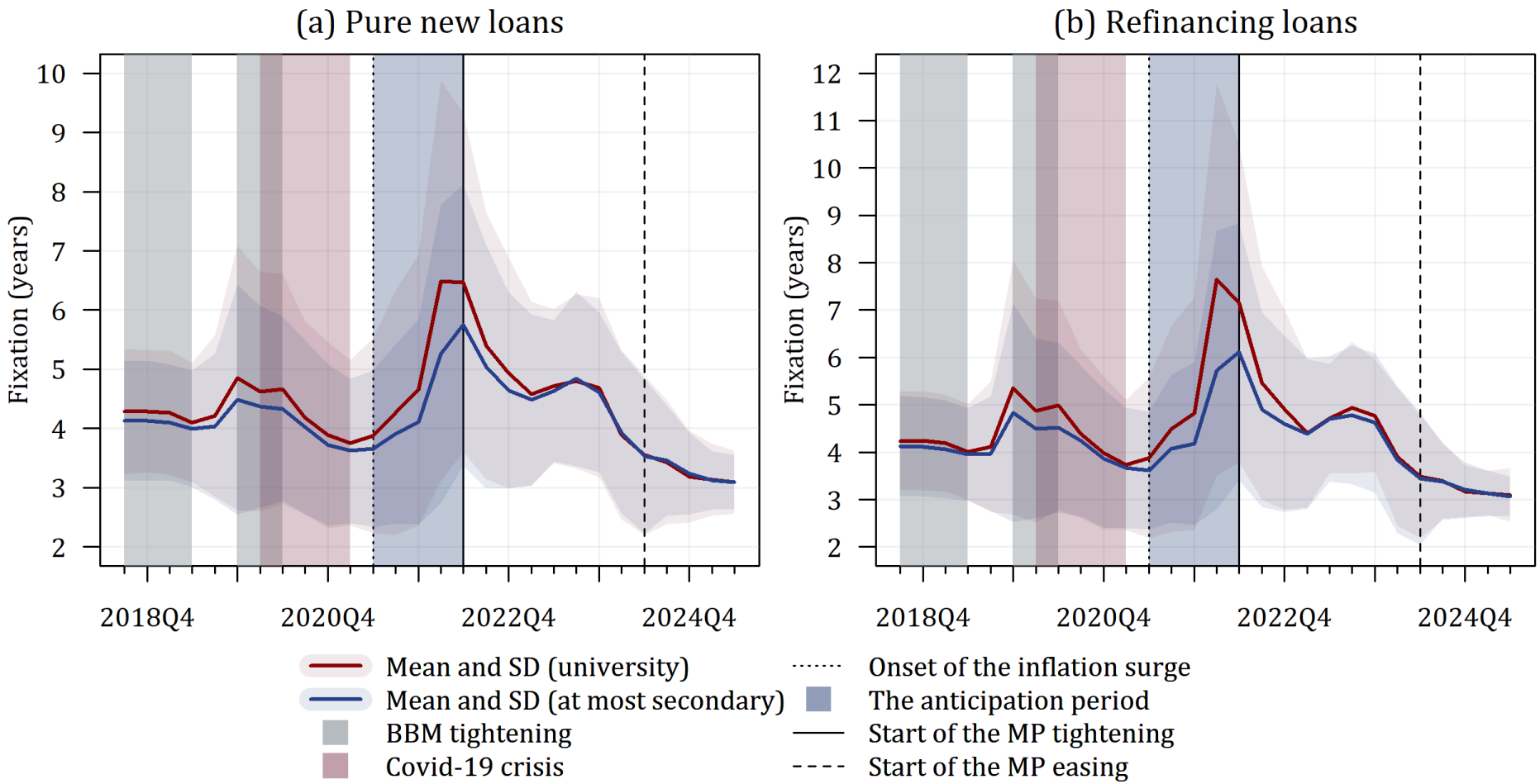
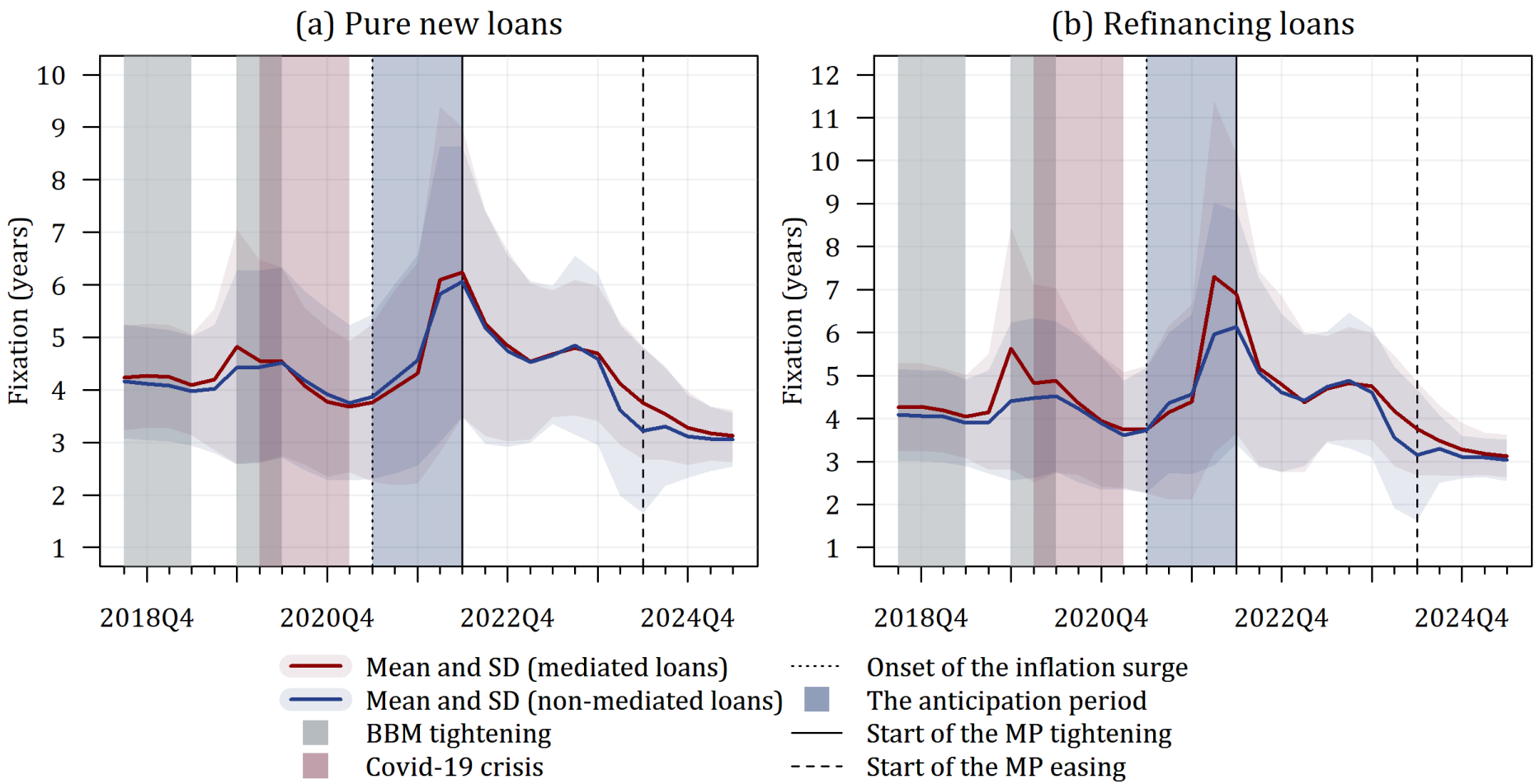
Average fixation over time by education



Average fixation over time by loan mediation



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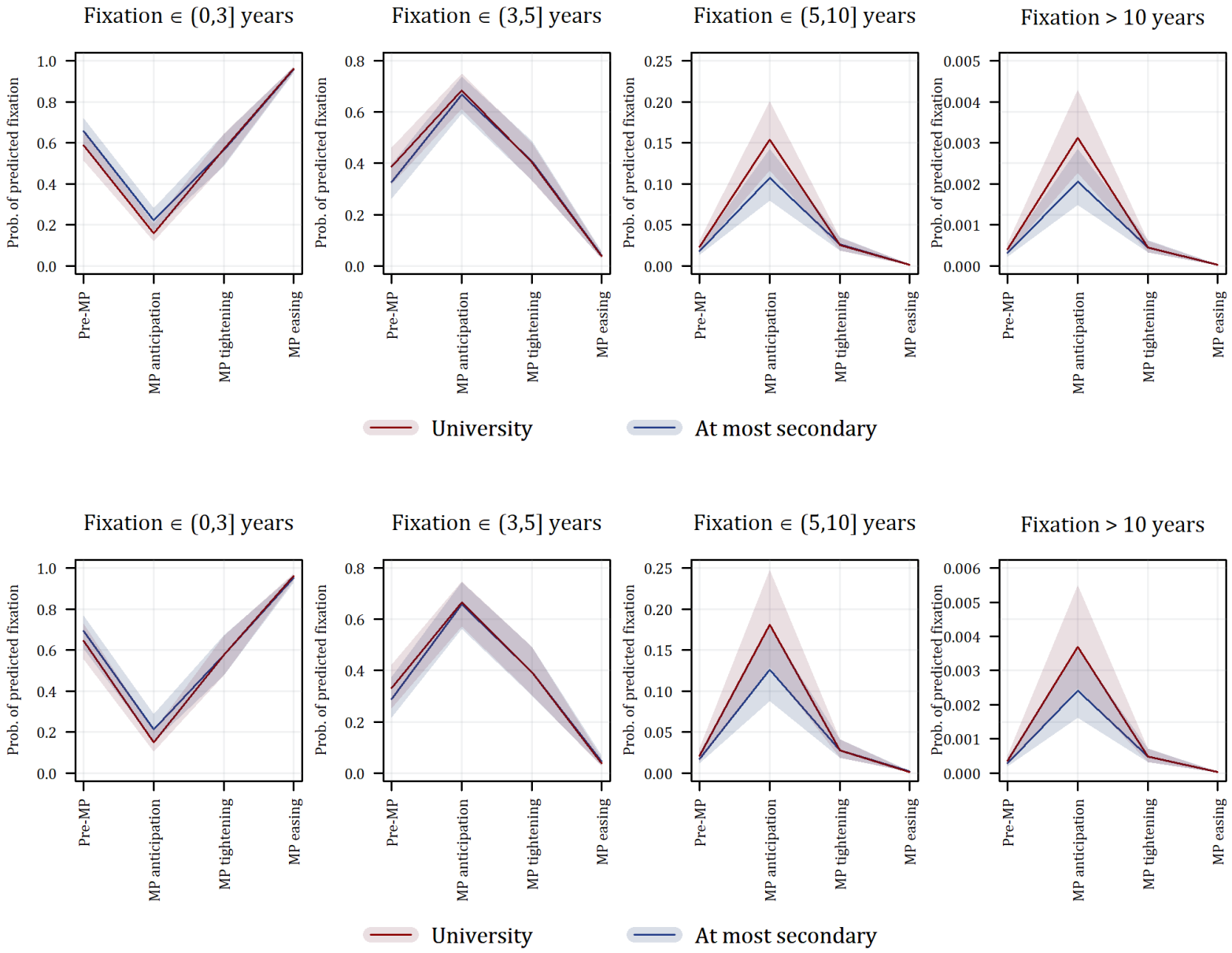
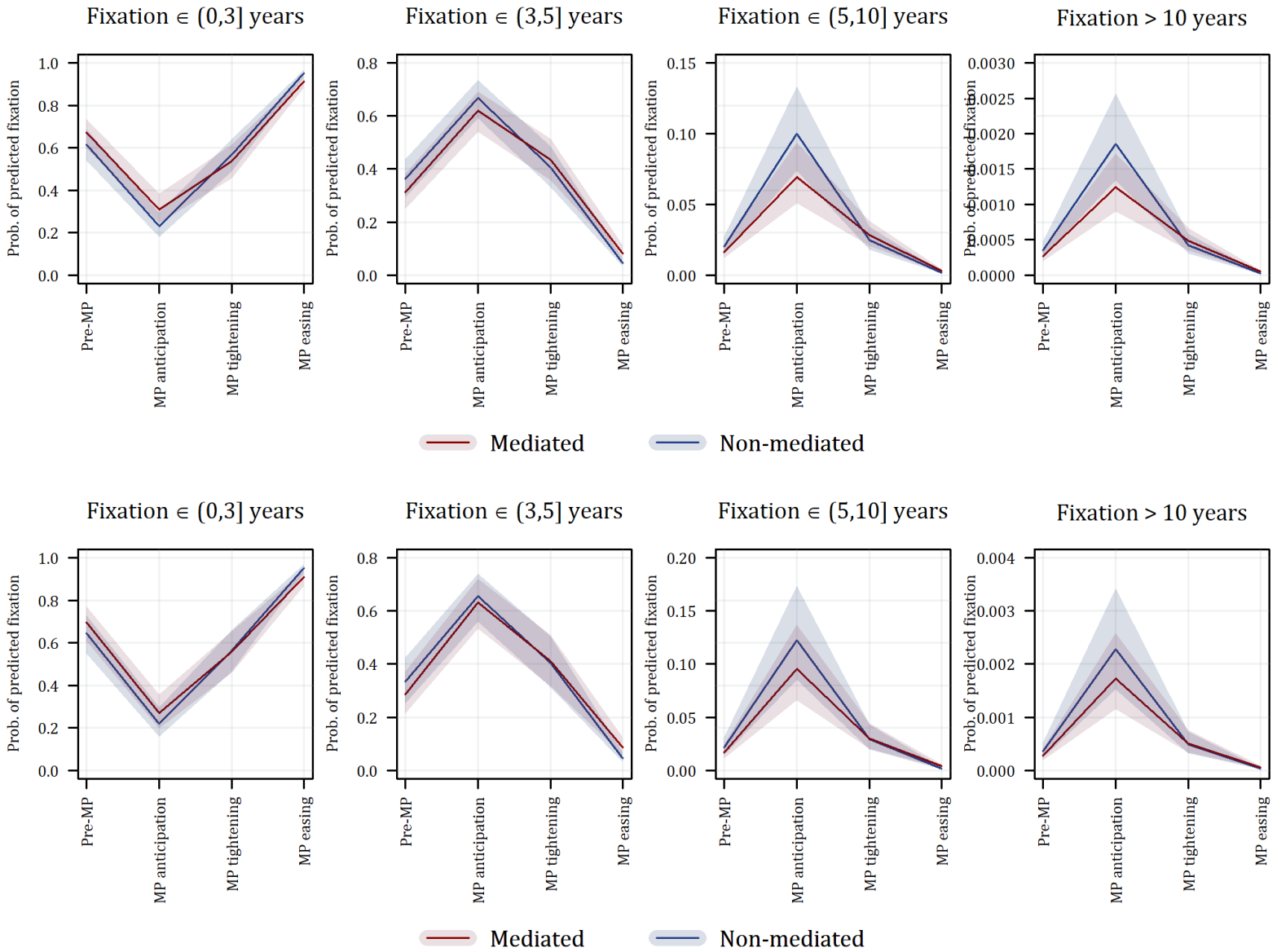
Predicted probability of fixation choice by education



Predicted probability of fixation choice by loan mediation



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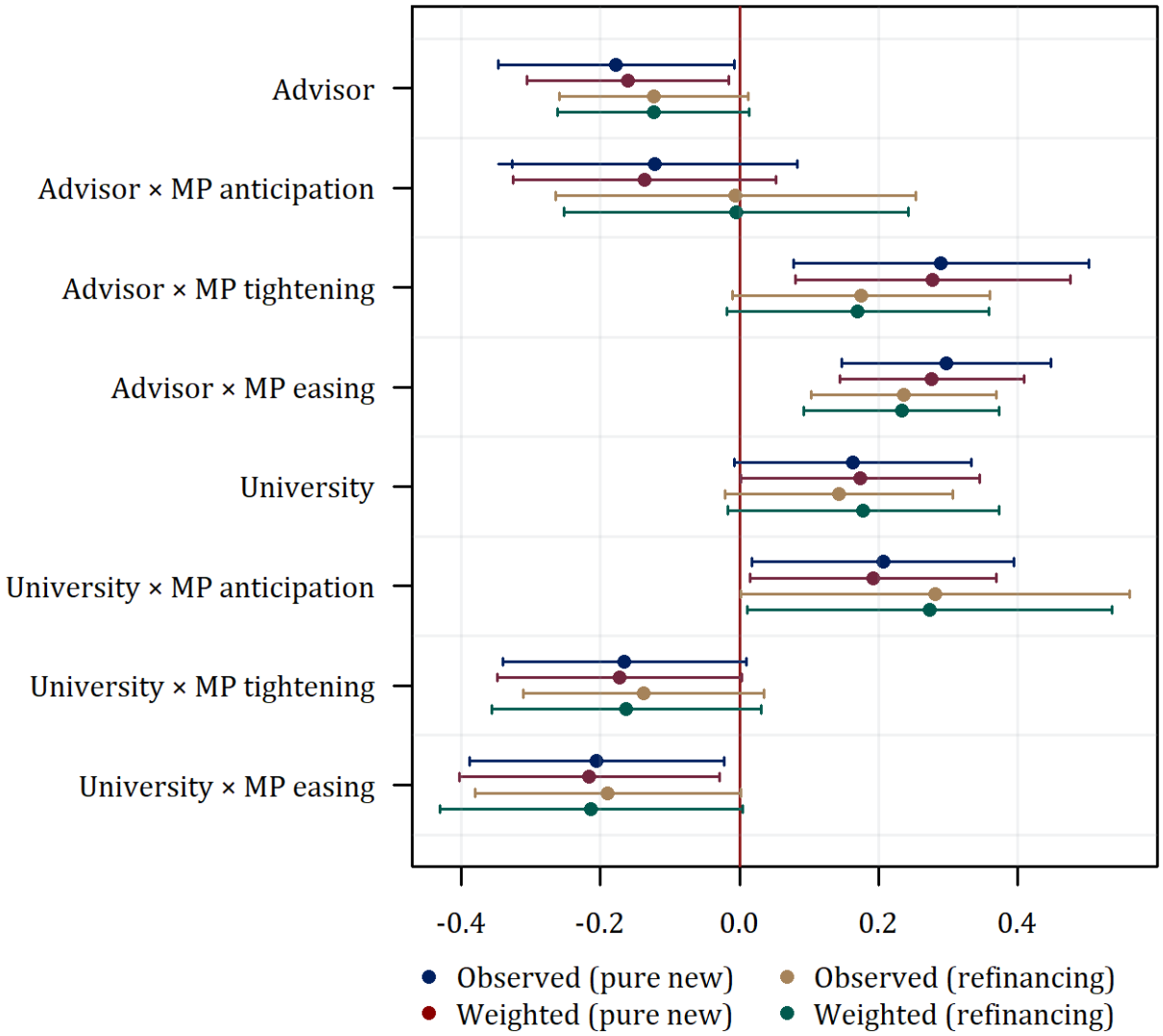
Results of doubly robust approach



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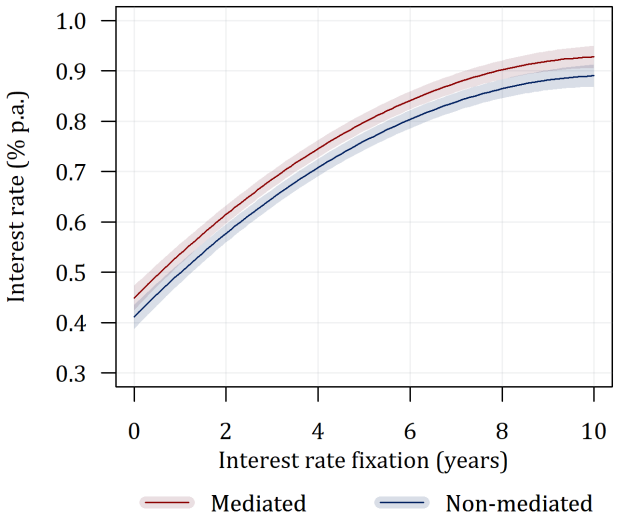
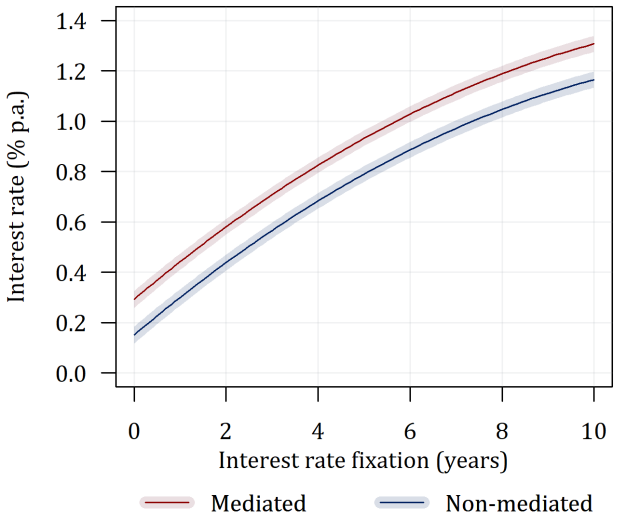
Fixation-interest rate curves across MP stages - continuous

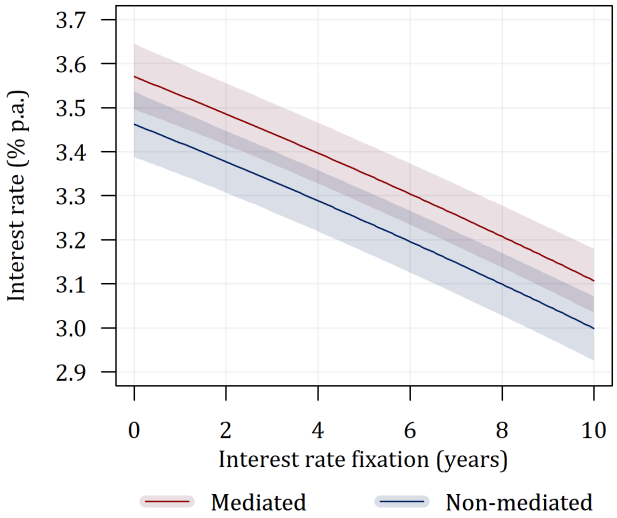
(a) Pre-anticipation



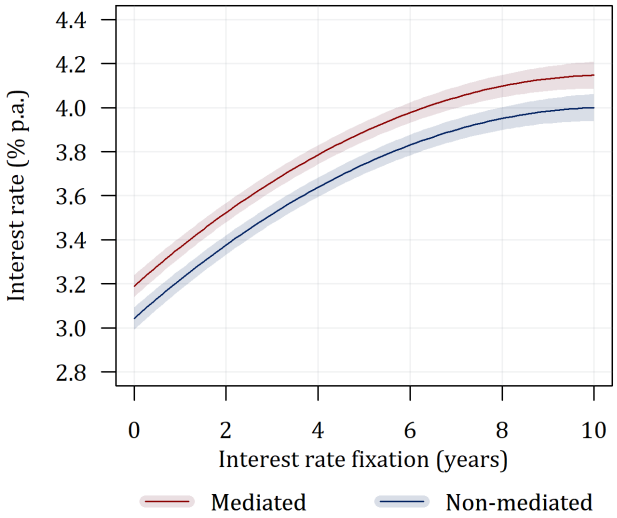
(b) MP anticipation



(c) MP tightening

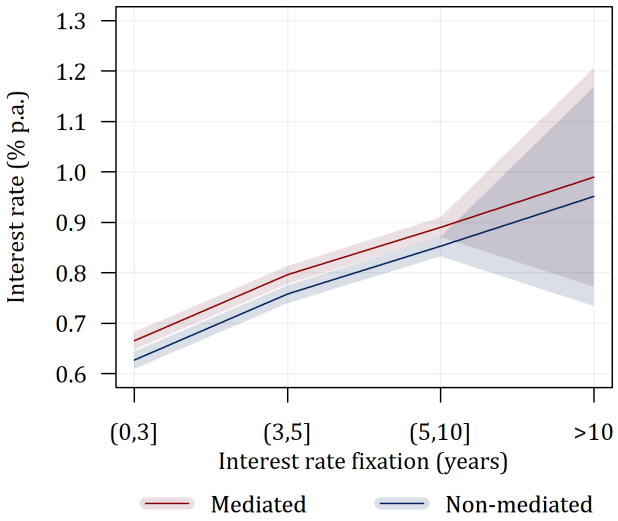


(d) MP easing

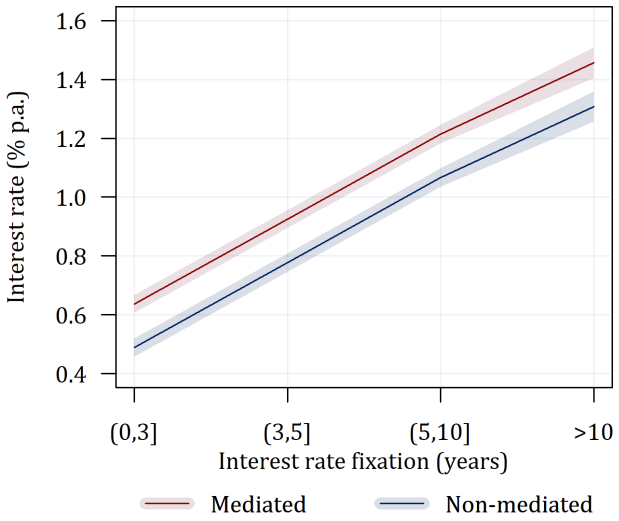


Fixation-interest rate curves across MP stages - categorical

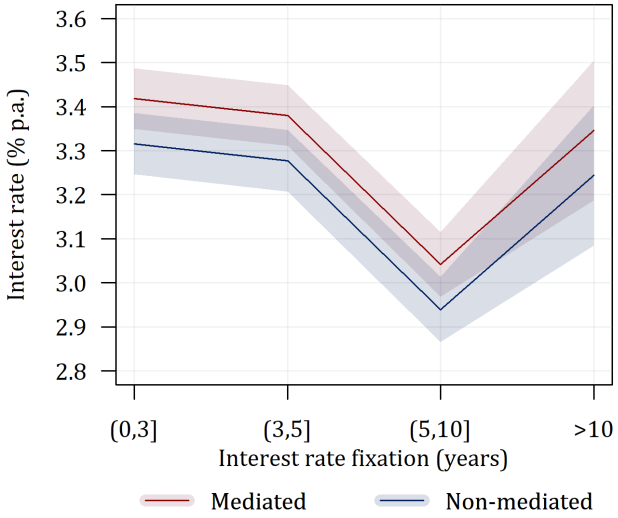
(a) Pre-anticipation



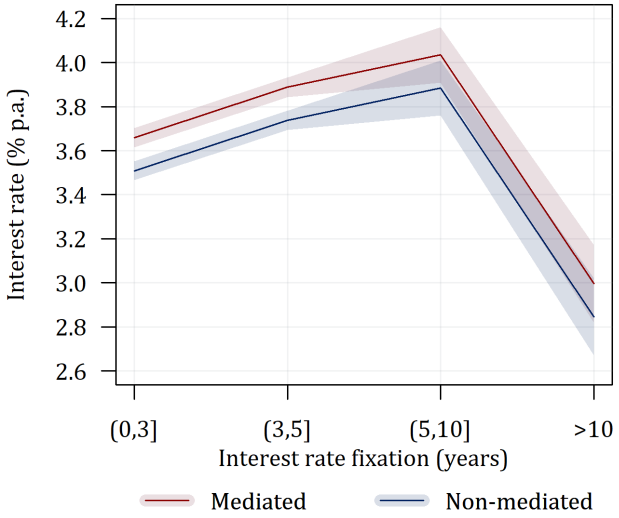
(b) MP anticipation



(c) MP tightening



(d) MP easing



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