

Household Borrowing and Monetary Policy Transmission: Post-Pandemic Insights from Nine European Credit Registers

Tamás Briglevics¹ et al.²

¹MNB

²NBB, BdE, MNB, CBol, Bdl, LT, LV, BdP, NBS

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Disclaimer: The views expressed in this project are those of the authors and do not necessarily reflect those of the participating institutions.

Et al.: Institutions and Co-authors

Central Bank	Co-authors
European Central Bank	Olivier De Jonghe , Elitsa Stefanova
National Bank of Belgium	Olivier De Jonghe , Marina Emiris
Banco de España	Dmitry Khametshin, Maria Rodriguez-Moreno
Central Bank of Hungary	Tamás Brilevics, Pálma Filep-Mosberger, Viola M. Grolmusz, Lajos Tamás Szabó
Central Bank of Ireland	Nicholas Kaiser, Laura Moretti
Banca d'Italia	Margherita Bottero , Angelo Nunnari
Bank of Lithuania	Karolis Bielskis, Mantas Dirma, Valentin Jouvanceau
Latvijas Banka	Konstantīns Benkovskis, Artūrs Jānis Nikitins, Kārlis Vilerts
Banco de Portugal	Diana Bonfim , Sujiao Emma Zhao
National Bank of Slovakia	Martin Cesnak, Tibor Lalinsky

Purpose of the Cross-Country Project

Objective

Investigate heterogeneity in household credit markets across nine European countries (8 euro area)

1. Stylized Facts

- Composition of HH Credit
- Post-pandemic credit dynamics
- ... steep monetary policy tightening cycle

2. Pass-through

- ... to *mortgages* and *consumer credit*
- ... **heterogeneity** across
 - Countries
 - Borrowers
 - Product features

Harmonizing Household Credit Registers

Challenge

- No euro area-wide register for household credit
- National datasets fragmented and unharmonized
 - ... complicates comparison across countries
- Confidentiality requirements (GDPR) prevent sharing available data
- Our solution: Semi-aggregation
 - ... can lead to a loss of information,
 - ... but enables cross-country analysis
 - ... still a lot more granularity than ever done before

Aggregation: Key Data Dimensions

Countries: nine EU countries (8 euro area)

Time Periods: six 6-month intervals
Jan 2022–Dec 2024

Credit types: Mortgages (purchase/construction)
Consumer credit (excl. leasing)

Borrowers: Natural persons only; six age bins

Creditor types: MFI vs. OFI

Contract details: 4 Maturity bins
4 Rate-fixation bins
Collateral flag

Binning and Statistics

Bin Construction

- Create indicator dimensions: country, half-year, Credit type, age, maturity, IRF, collateral, MFI
- Form all possible combinations →
 $BIN_{Country, Period, LoanType, Age, Maturity, IRF, Collateral, MFI}$

The binned statistics are shareable across the team!

Summary statistics: Mortgages and Consumer Credit

Number of bins and observations in a bin

	Panel A: Mortgages						
	count	mean	p5	p25	p50	p75	p95
Number of new contracts	3000	1158	7	25	117	629	5971
Average Amount on new contract							
St.Dev. Amount on new contract							
Coefficient of variation - amount							
Average interest rate on new contract							
St.Dev. interest rate on new contract							
Coefficient of variation - interest rate							
	Panel B: Consumer Credit						
	count	mean	p5	p25	p50	p75	p95
Number of new contracts	5728	7194	9	58	509	3385	38143
Average Amount on new contract							
St.Dev. Amount on new contract							
Coefficient of variation - amount							
Average interest rate on new contract							
St.Dev. interest rate on new contract							
Coefficient of variation - interest rate							

Summary statistics: Mortgages and Consumer Credit

Amounts → Stylized facts

	Panel A: Mortgages						
	count	mean	p5	p25	p50	p75	p95
Number of new contracts	3000	1158	7	25	117	629	5971
Average Amount on new contract	3000	108960	23577	58995	104008	147256	227522
St.Dev. Amount on new contract	3000	71514	13018	42346	61992	94499	159865
Coefficient of variation - amount	3000	0.70	0.37	0.52	0.65	0.80	1.17

Average interest rate on new contract

St.Dev. interest rate on new contract

Coefficient of variation - interest rate

	Panel B: Consumer Credit						
	count	mean	p5	p25	p50	p75	p95
Number of new contracts	5728	7194	9	58	509	3385	38143
Average Amount on new contract	5728	13862	637	2758	9484	19721	40508
St.Dev. Amount on new contract	5728	9883	495	2588	6517	12041	32892
Coefficient of variation - amount	5728	0.89	0.35	0.55	0.76	1.04	1.81

Average interest rate on new contract

St.Dev. interest rate on new contract

Coefficient of variation - interest rate

Summary statistics: Mortgages and Consumer Credit

Interest Rates → Pass-Through

Panel A: Mortgages							
	count	mean	p5	p25	p50	p75	p95
Number of new contracts	3000	1158	7	25	117	629	5971
Average Amount on new contract	3000	108960	23577	58995	104008	147256	227522
St.Dev. Amount on new contract	3000	71514	13018	42346	61992	94499	159865
Coefficient of variation - amount	3000	0.70	0.37	0.52	0.65	0.80	1.17
Average interest rate on new contract	2972	4.22	1.62	3.05	4.01	4.93	7.87
St.Dev. interest rate on new contract	2971	0.95	0.31	0.58	0.84	1.17	1.98
Coefficient of variation - interest rate	2971	0.26	0.07	0.14	0.23	0.34	0.55
Panel B: Consumer Credit							
	count	mean	p5	p25	p50	p75	p95
Number of new contracts	5728	7194	9	58	509	3385	38143
Average Amount on new contract	5728	13862	637	2758	9484	19721	40508
St.Dev. Amount on new contract	5728	9883	495	2588	6517	12041	32892
Coefficient of variation - amount	5728	0.89	0.35	0.55	0.76	1.04	1.81
Average interest rate on new contract	4763	11.52	2.89	6.62	8.73	14.47	27.58
St.Dev. interest rate on new contract	4752	4.16	0.58	1.73	2.85	4.60	13.45
Coefficient of variation - interest rate	4751	0.42	0.08	0.20	0.31	0.48	0.99

Stylized Facts: Composition of New Loan Contracts

Objective

Document key patterns in newly originated loans

Composition of flows: volume and value

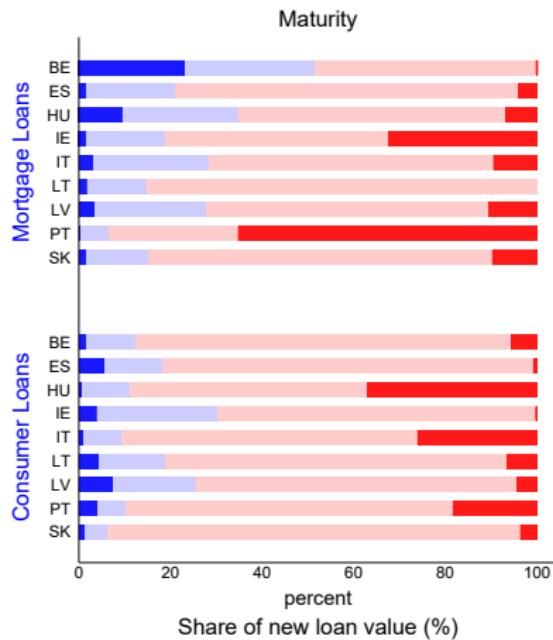
- *across age, maturity and IRF buckets*
- *for mortgages and consumer credit*
- *by country*

Practical use

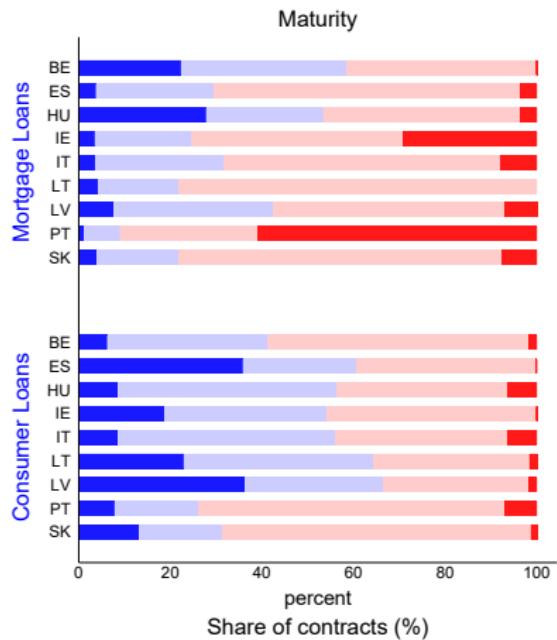
- Assess variation
- Interpret pass-through results
- Benchmark other (out-of-sample) countries (or meta-studies)

Breakdown of New Loan Contracts: Maturity

By Value



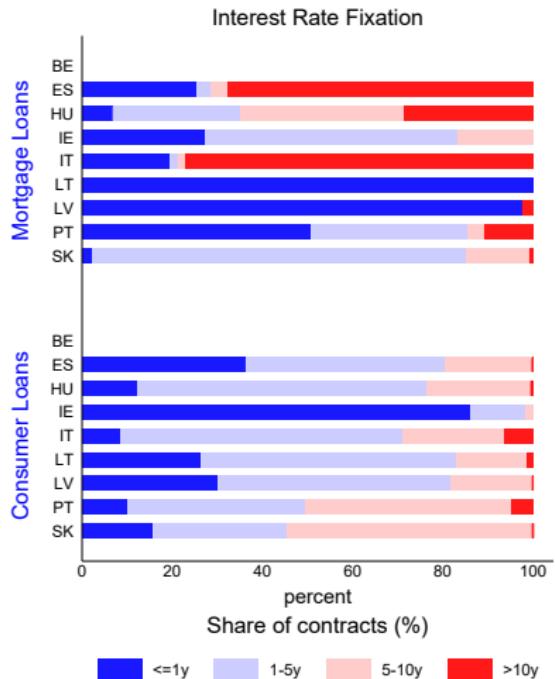
By Number



Bucket	Mortgages	Consumer
Short	≤ 10 y	≤ 1 y
Medium	10–20 y	1–3 y
Long	20–30 y	3–10 y
Very Long	> 30 y	> 10 y

Breakdown of New Loan Contracts: Fixation period (IRF)

By Number



Main Insights

- ① Spain, Hungary & Italy: fixed-rate mortgages dominate
- ② Portugal, Latvia, Lithuania: short IRF mortgages
- ③ Ireland and Slovakia: mortgages with moderate reset frequency
- ④ Ireland consumer credit: short IRF dominance
- ⑤ Consumer credit in other countries: mostly fixed (set to maturity)

▶ Back to Results

Interest Rate Pass-Through

Regression Framework

$$\begin{aligned} \text{IR}_{\text{bin}} = & \beta_1 \text{ Reference Rate}_{c, \text{bin}, t} \\ & + \sum_d \beta_d (\text{Reference Rate}_{c, \text{bin}, t} \times D_d) \\ & + \sum_d \gamma_d D_d + \nu_{c \times \text{mat}} + \varepsilon \end{aligned}$$

Key Points

- D_d are dummies for each dimension
 $d \in \{\text{Country, Age, Maturity, IRF}\}.$
- Interaction terms β_d capture **heterogeneity in pass-through**.
- Controls γ_d soak up fixed effects for each characteristic.
- Estimated separately for **mortgages** and **consumer credit**.
- OFIs are excluded from the regressions

Interest Rate Pass-Through: homogeneous

	MORTGAGES			CONSUMER CREDIT		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Average interest rate on new contract						
Reference Rate	0.903*** (0.028)	0.904*** (0.029)	0.908*** (0.025)	0.358*** (0.038)	0.356*** (0.059)	0.522*** (0.056)
Observations	2863	2863	2863	2641	2641	2641
Adjusted R-squared	0.77	0.86	0.86	0.81	0.87	0.82
FE	CxM	CxM	CxM	CxM	CxM	CxM
SE-cluster	Cntry-Age	Cntry-Age	Cntry-Age	Cntry-Age	Cntry-Age	Cntry-Age
WLS	-	number	value	-	number	value

Main insights

- 1 Mortgage pass-through: 90%
- 2 Consumer credit pass-through: more muted, 41% (unweighted)
- 3 Weighted: Consumer pass-through \uparrow to 56% \rightarrow maturity (stay tuned)
- 4 Weights: determined by perspective (micro, cross-country, macro)

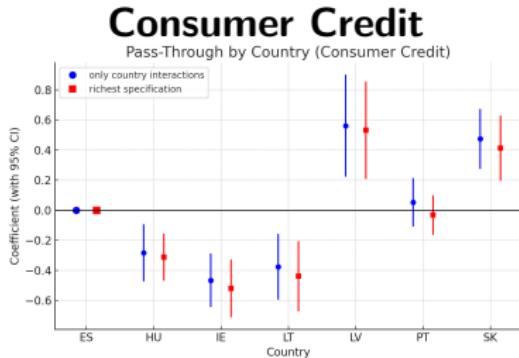
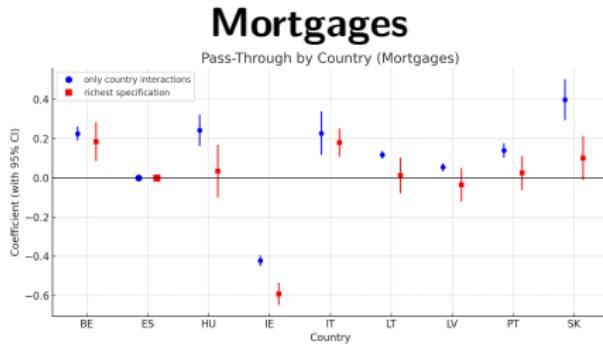
Interest Rate Pass-Through: heterogeneity - mortgages

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Average interest rate on new contract						
Reference Rate	0.904*** (0.029)	0.796*** (0.009)	0.799*** (0.013)	0.816*** (0.012)	0.865*** (0.039)	0.895*** (0.050)
BE \times Reference Rate		0.225*** (0.018)	0.213*** (0.028)	0.277*** (0.040)	0.155*** (0.042)	0.185*** (0.051)
ES \times Reference Rate	-	-	-	-	-	-
HU \times Reference Rate		0.242*** (0.041)	0.234*** (0.033)	0.316*** (0.033)	-0.044 (0.045)	0.033 (0.069)
IE \times Reference Rate		-0.422*** (0.014)	-0.431*** (0.012)	-0.416*** (0.017)	-0.585*** (0.025)	-0.592*** (0.030)
IT \times Reference Rate		0.223*** (0.056)	0.213*** (0.055)	0.233*** (0.059)	0.173*** (0.037)	0.176*** (0.037)
LT \times Reference Rate		0.116*** (0.010)	0.093*** (0.015)	0.112*** (0.011)	0.047 (0.039)	0.012 (0.048)
LV \times Reference Rate		0.085*** (0.011)	0.066*** (0.014)	0.096*** (0.015)	0.014 (0.039)	-0.005 (0.044)
PT \times Reference Rate		0.137*** (0.019)	0.127*** (0.021)	0.140*** (0.029)	0.034 (0.037)	0.022 (0.045)
SK \times Reference Rate		0.397*** (0.053)	0.382*** (0.056)	0.394*** (0.055)	0.109* (0.055)	0.097* (0.056)
Age: < 25 \times Reference Rate			0.073*** (0.018)			0.065*** (0.020)
Age: 25-34 \times Reference Rate			0.032*** (0.009)			0.027*** (0.009)
Age: 35-44 \times Reference Rate			-			-
Age: 45-54 \times Reference Rate			-0.006 (0.009)			-0.002 (0.008)
Age: 55-64 \times Reference Rate			-0.051** (0.021)			-0.018 (0.029)
Age: >=65 \times Reference Rate			-0.187*** (0.045)			-0.152*** (0.048)
Short \times Reference Rate				-0.316*** (0.110)		-0.324** (0.128)
Medium \times Reference Rate				-0.008 (0.017)		0.005 (0.012)
Long \times Reference Rate				-		-
Very Long \times Reference Rate				-0.028 (0.029)		-0.034 (0.022)
IRF: <= 1 year \times Reference Rate					-	-
IRF: 1-5 yrs \times Reference Rate					0.453*** (0.075)	0.435*** (0.079)
IRF: 5-10 years \times Reference Rate					-0.119 (0.077)	-0.133 (0.081)
IRF: > 10 years \times Reference Rate					-0.159* (0.081)	-0.191** (0.091)
Observations	2863	2863	2863	2863	2863	2863
Adjusted R-squared	0.86	0.87	0.87	0.87	0.90	0.91

Interest Rate Pass-Through: heterog. - consumer loans

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Average interest rate on new contract					
Reference Rate	0.356*** (0.059)	0.485*** (0.083)	0.450*** (0.076)	0.608*** (0.103)	0.438*** (0.086)	0.634*** (0.132)
ES × Reference Rate	-	-	-	-	-	-
HU × Reference Rate	-0.242** (0.090)	-0.241*** (0.084)	-0.285*** (0.083)	-0.262*** (0.090)	-0.281*** (0.076)	
IE × Reference Rate	-0.429*** (0.084)	-0.428*** (0.077)	-0.456*** (0.084)	-0.384*** (0.086)	-0.500*** (0.094)	
LT × Reference Rate	-0.339*** (0.107)	-0.329*** (0.103)	-0.405*** (0.108)	-0.333*** (0.113)	-0.390*** (0.110)	
LV × Reference Rate	0.566*** (0.185)	0.574*** (0.186)	0.531*** (0.191)	0.551*** (0.181)	0.539*** (0.195)	
PT × Reference Rate	0.051 (0.081)	0.054 (0.073)	-0.025 (0.079)	0.039 (0.080)	-0.028 (0.067)	
SK × Reference Rate	0.513*** (0.095)	0.522*** (0.090)	0.465*** (0.101)	0.484*** (0.104)	0.473*** (0.098)	
Age: < 25 × Reference Rate		0.040 (0.061)			0.040 (0.064)	
Age: 25-34 × Reference Rate		0.035* (0.018)			0.028 (0.018)	
Age: 35-44 × Reference Rate		-			-	
Age: 45-54 × Reference Rate		0.005 (0.020)			0.012 (0.020)	
Age: 55-64 × Reference Rate		0.050* (0.026)			0.060** (0.027)	
Age: >=65 × Reference Rate		0.153*** (0.033)			0.174*** (0.034)	
Short × Reference Rate			-0.208** (0.086)		-0.271** (0.126)	
Medium × Reference Rate			-0.137* (0.079)		-0.146* (0.084)	
Long × Reference Rate			-		-	
Very Long × Reference Rate			0.371** (0.170)		0.469** (0.194)	
IRF: <= 1 year × Reference Rate				-	-	
IRF: 1-5 yrs × Reference Rate				0.104 (0.080)	-0.074 (0.118)	
IRF: 5-10 years × Reference Rate				0.118 (0.085)	-0.062 (0.115)	
IRF: >10 years × Reference Rate				-0.196** (0.077)	-0.511*** (0.100)	
Observations	2641	2641	2641	2641	2641	2641
Adjusted R-squared	0.87	0.87	0.87	0.88	0.87	0.88

Heterogeneity: insight 1

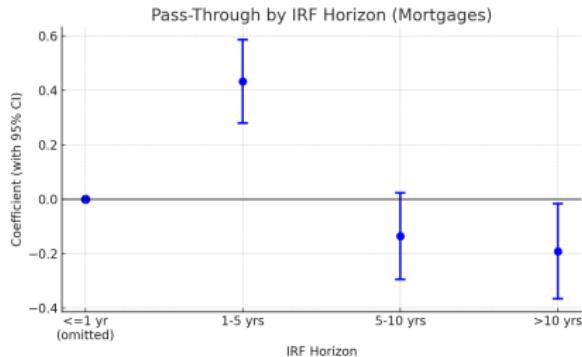


Country heterogeneity (relative to Spain)

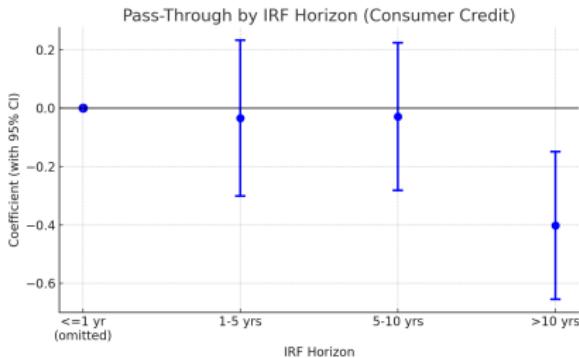
- 1 Mortgages: Adding contract characteristics decreases heterogeneity
- 2 Consumer credit: Larger heterogeneity between countries
- 3 Consumer credit: heterogeneity remains in richest specification
→ structural features (market structure, non-bank competition,...?)

Heterogeneity: insight 2

Mortgages



Consumer Credit



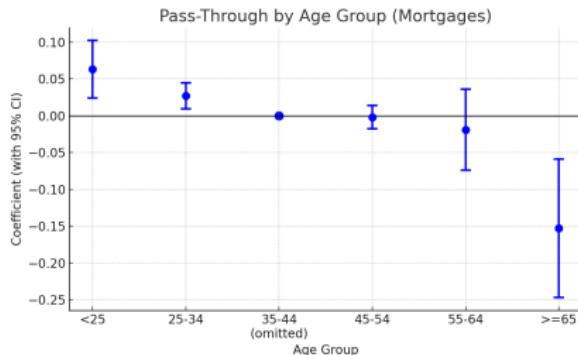
Interest Rate Fixation

- ① Mortgages: variable > fixed
→ high IRF 1-5 years?
- ② Consumer: variable > fixed
→ even clearer in robustness

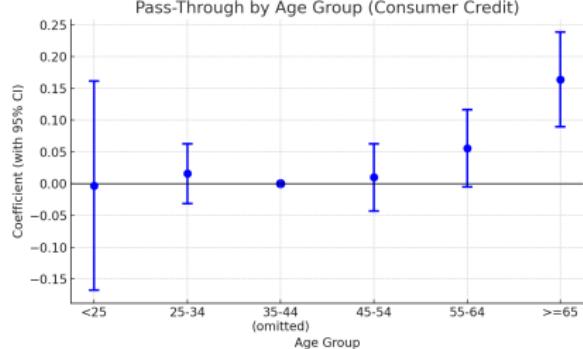
▶ Back to IRF distributions

Heterogeneity: insight 3

Mortgages



Consumer Credit



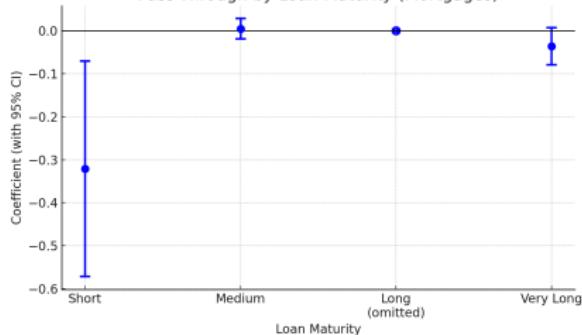
Age

- ① Mortgage Pass-through decreases with borrower age:
... distributional implications
- ② Drivers of age pattern:
 - Young borrowers: lower income, first-time, weaker bargaining
 - Older borrowers: greater wealth, stronger credit history, second home
- ③ Consumers: modest upward slope → 55-64 and ≥ 65 higher pass-through

Heterogeneity: insight 4

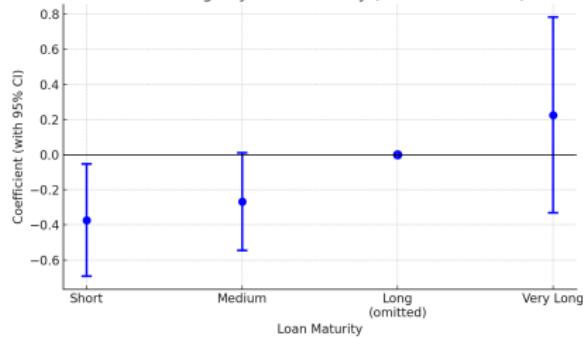
Mortgages

Pass-Through by Loan Maturity (Mortgages)



Consumer Credit

Pass-Through by Loan Maturity (Consumer Credit)



Maturity

- 1 Short-term mortgages behave like consumer credit:
... lower duration risk, sizable down-payments, second property
- 2 Consumer-credit maturity: monotonically increasing
... linked to underlying purpose and value

Concluding Remarks

Exploiting nine European credit registers

- **Mortgages:** high integration, complete rate pass-through
- **Consumer credit:** greater dispersion, muted pass-through, country effects

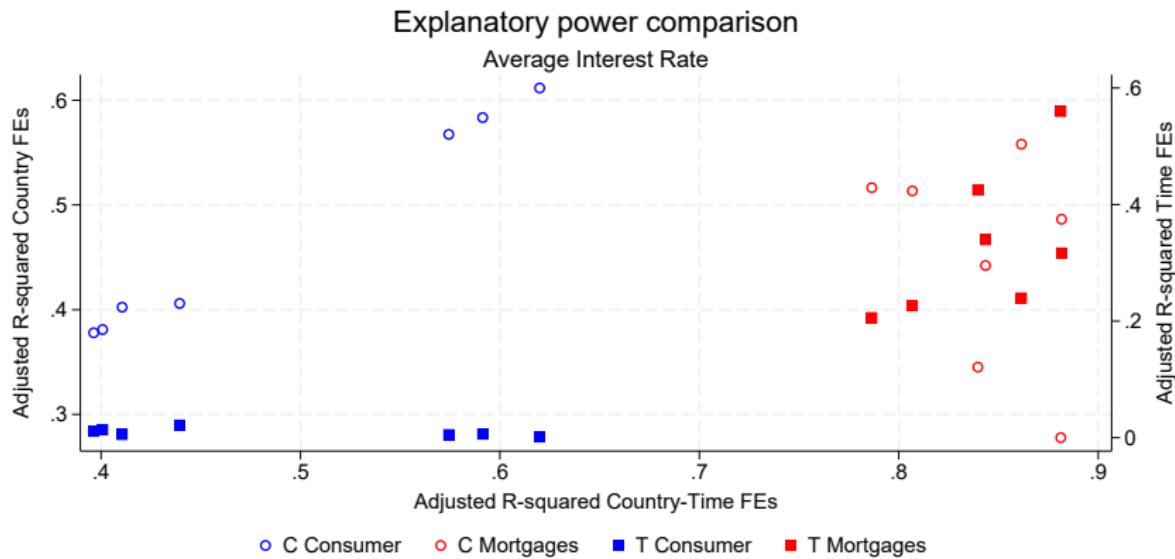
Policy Implications

- Monitor age-related heterogeneity in mortgage pricing
- Segment consumer-credit by product
- Flow-based analysis: long-lasting impact

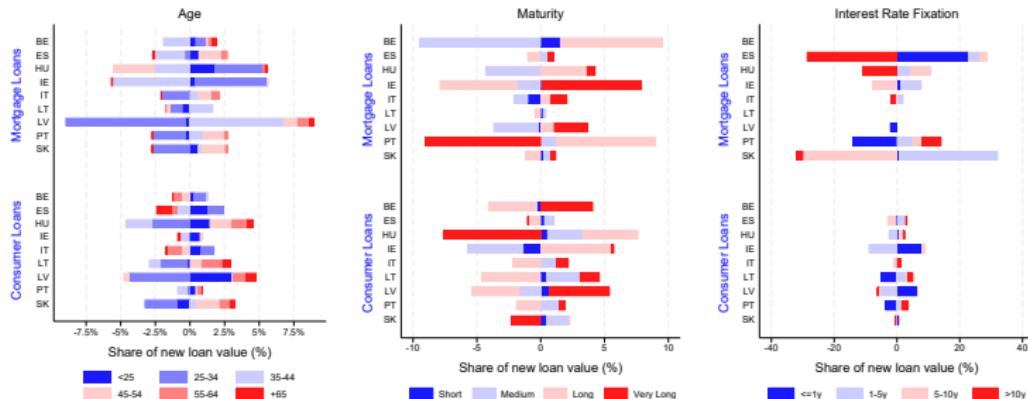
Foundations for many future analyses

- Drivers of rate dispersion
- MFI vs Other financial institutions
- Product-level spill-overs
- Asymmetries in tightening vs. easing

Extra - 1. Sources of variation: interest rates



Extra - 2. Share changes over a tightening episode



Compositional changes

[Back to overview](#)

- Change in share from peak (2023H2) to trough (2022H1)
- Indications of extensive margin effects
- Heterogeneous across products, countries and dimensions

Extra - 3. Robustness

- ① Only tightening (Excl. 2024): qualitatively similar (but larger standard errors)
- ② Excluding Ireland:
 - Mortgages results are identical
 - Consumers: IRF results improve
 - ... Variable faster than any other fixation period
- ③ Collateralized consumer loans:
pass-through is smaller (-0.233)

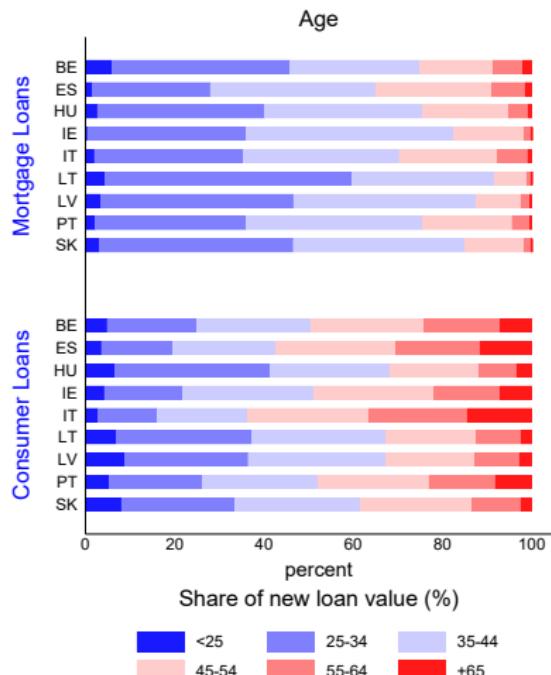
▶ Back to overview

Further insights from the data

- ① Robustness of the pass-through
 - Exclude 2024, exclude Ireland, add controls
- ② Changes over a tightening cycle in credit composition
 - across age, maturity and IRF buckets
 - for mortgages and consumer credit
 - by country
- ③ Dispersion: Beyond the pass-through to averages
 - Within-bin standard deviation, IQR and coefficient of variation
- ④ Identify dimensions to explore/exploit
 - **Explanatory power** of different sets of fixed effects
 - Guidance for analysis/specification

Breakdown of New Loan Contracts: Age of Borrower

By Value



Main Insights

- ① Mortgages dominated by 25–44 year old
- ② Mortgages above 45: second homes vs. constrained youth
- ③ Consumer credit: diversified participation
- ④ Cons. Credit: demographics ≥ 55 in IT, ES, BE, IE, PT
 ≤ 34 in HU, LT, LV, SK