



National Analytical Center

Survey-calibrated DSGE of the credit channel

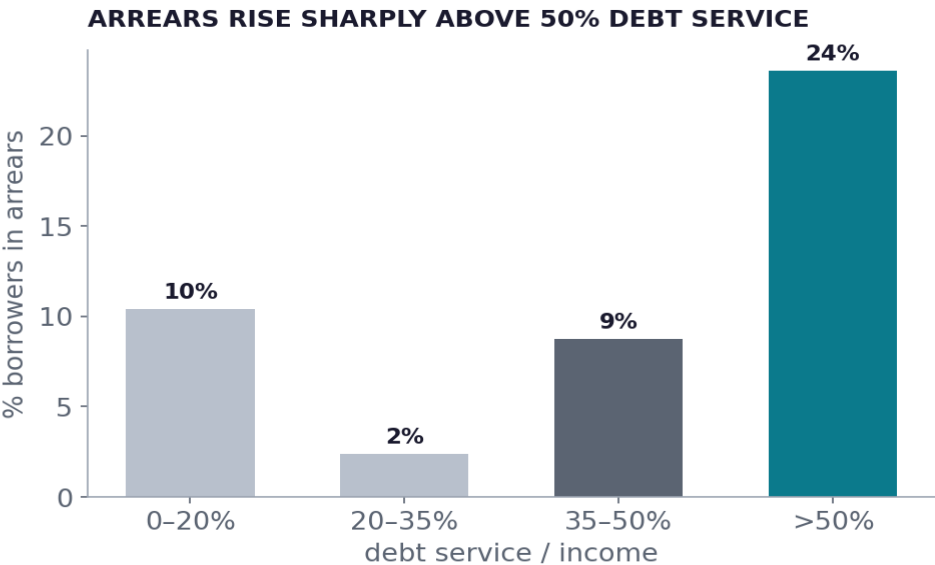
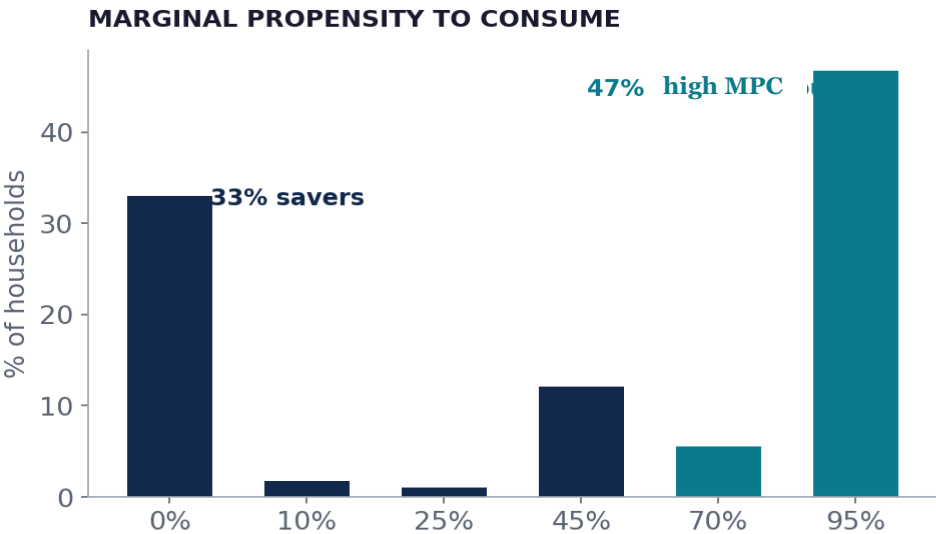
Household credit behaviour, monetary transmission, and non-performing loans in Kazakhstan

10th International Public AMCs Forum (IPAF) Summit · Astana · 13 August 2026

A survey of 1,000 households, before model estimation

The population is two households—high MPC (the ones who spend all their income) and savers

69.5%	0.54	41%	6.8%
carry debt	mean MPC	income to debt service	hold a mortgage



Two questions motivated by the survey and examined with the DSGE model

The survey shows who is financially constrained and how households behave. Our DSGE credit model tests how these differences affect credit and monetary-policy transmission.

H1

Behavioural transmission - the effect of credit support depends on who receives it.

High-MPC households are likely to spend a larger share of additional resources, while low-MPC households are more likely to save them. The model tests whether the same policy produces different effects on consumption depending on the household group.

H2

Household lending may affect the amount of credit available to firms.

Does subsidised household credit displace business credit through the bank balance sheet?

A two-type New-Keynesian DSGE with a bank balance sheet

22

equations / variables

6

structural shocks

8

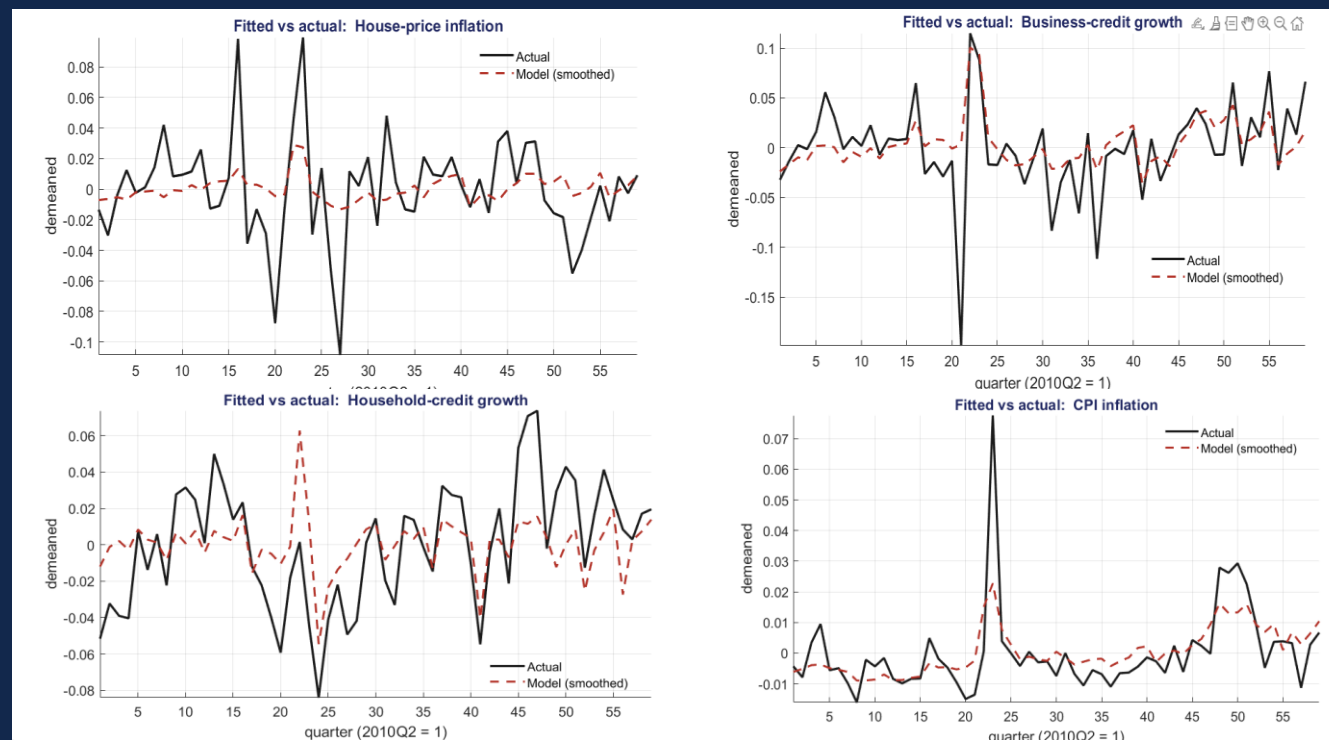
observables · 2010–24

100,000

Metropolis draws

KEY STRUCTURAL FEATURES

- Two households — high MPC (spend) and savers (smooth); the split is calibrated from the survey MPC.
- A bank balance sheet in which household and business credit compete for a limited pool of funds — the crowding-out test.
- Business credit finances investment and enters output, so displacing it is costly.
- Estimated by Bayesian methods (Kalman filter + random-walk Metropolis-Hastings): household block calibrated, credit block estimated.



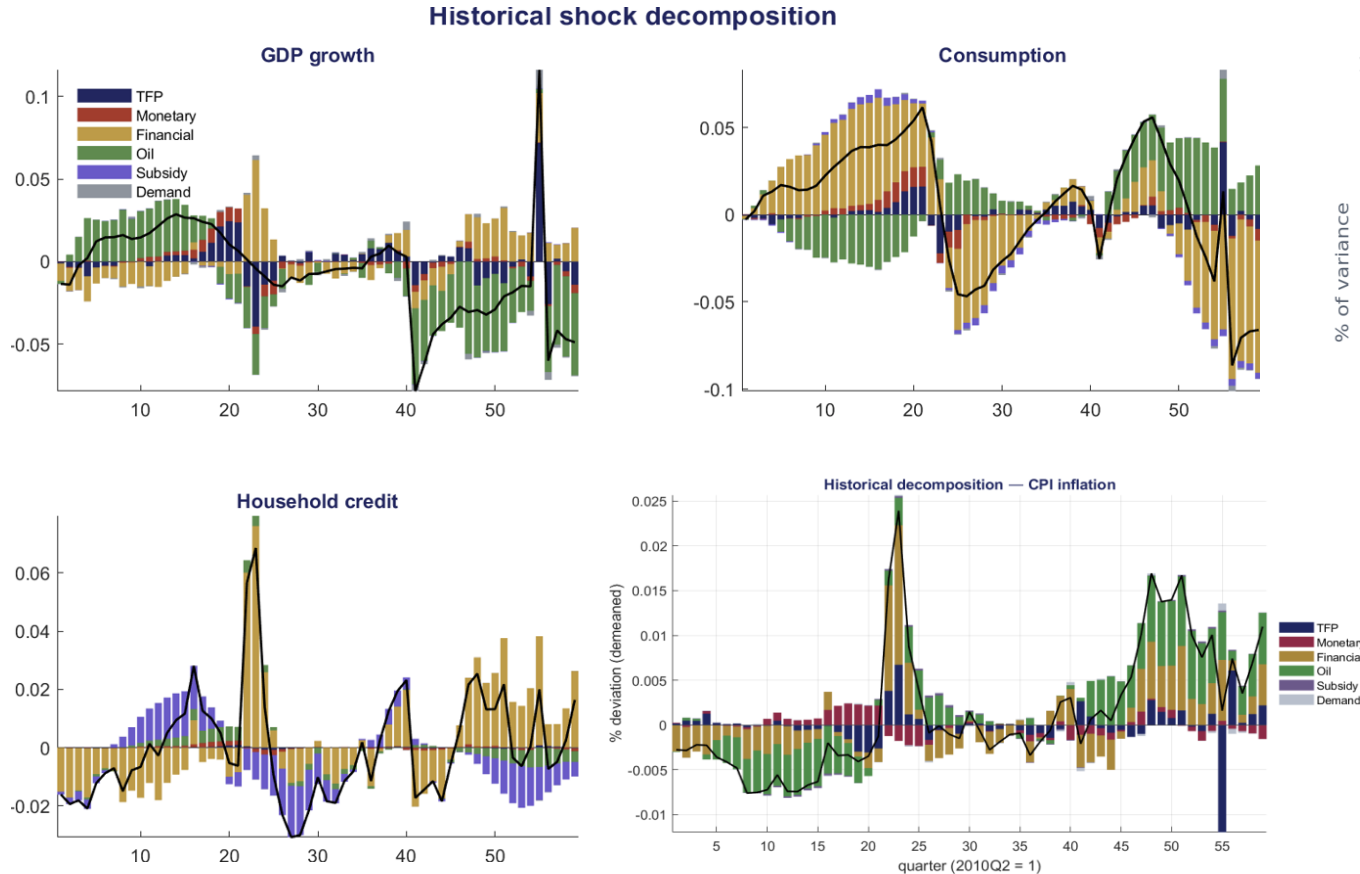
Key estimated parameters, and what they mean

Crowding-out is small ($\psi_L \approx 0.10$)		
PARAMETER	MEAN	INTERPRETATION
λ_h	0.35	policy rate $\rightarrow$ household credit <i>moderate pass-through</i>
ψ_L	0.10	household $\rightarrow$ business credit <i>crowding-out is small</i>
ι_L	0.56	business credit $\rightarrow$ output <i>business credit matters for output</i>
a_s	0.48	subsidy $\rightarrow$ household credit <i>subsidy does move credit</i>
ρ_{oil}	0.98	oil-shock persistence <i>oil shocks are long-lived</i>

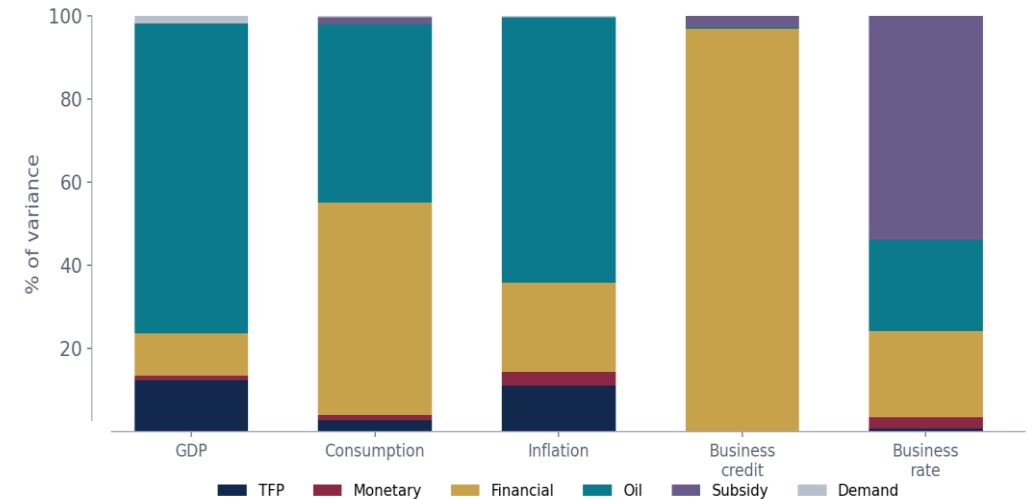
Insights from the survey:

	HIGH-MPC	SAVERS
Impatient — take cash now	56%	45%
In arrears	20%	9%
Considering bankruptcy	6%	3%
Median income (000 KZT)	300	425
Risk averse	82%	84%

Historical & variance decomposition



Historical decomposition — GDP, consumption, household & business credit.



GDP downturns are mainly associated with oil and financial shocks, especially around major stress periods

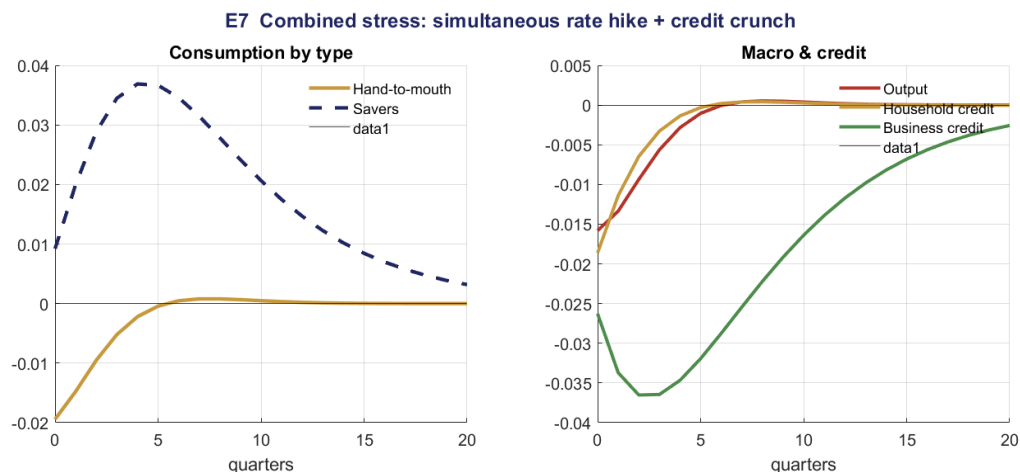
Consumption is also strongly affected by financial conditions

The subsidy shock accounts for ~54% of the business-rate variance.

Oil dominates GDP and inflation — the oil-exporter signature.

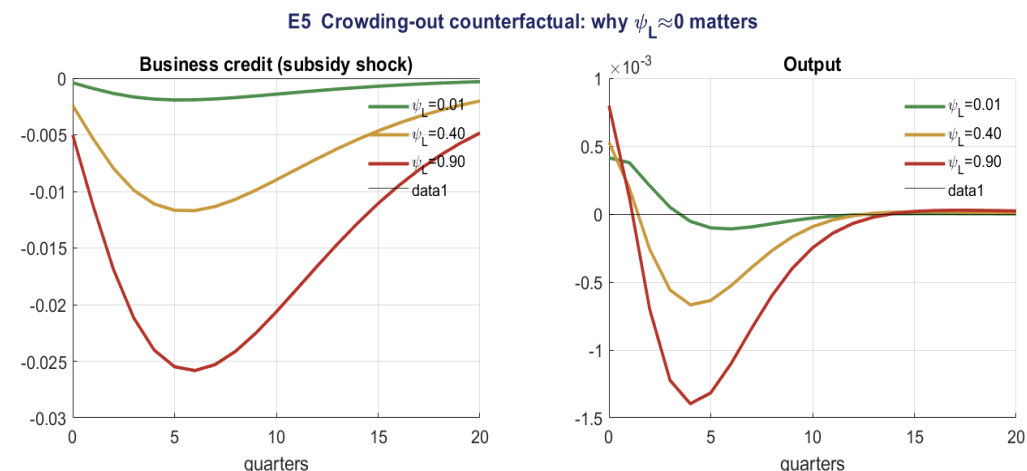
Who bears financial tightening?

Household effects depend on financial position, while the macroeconomic cost of household lending support depends on whether it displaces business lending.



The increase in policy rate affects household groups differently. High-MPC households **cut** consumption immediately by about 2%, but the effect is relatively short-lived. Savers initially **rises**, peaks at about 3.5–4% after four quarters, and then gradually returns to baseline.

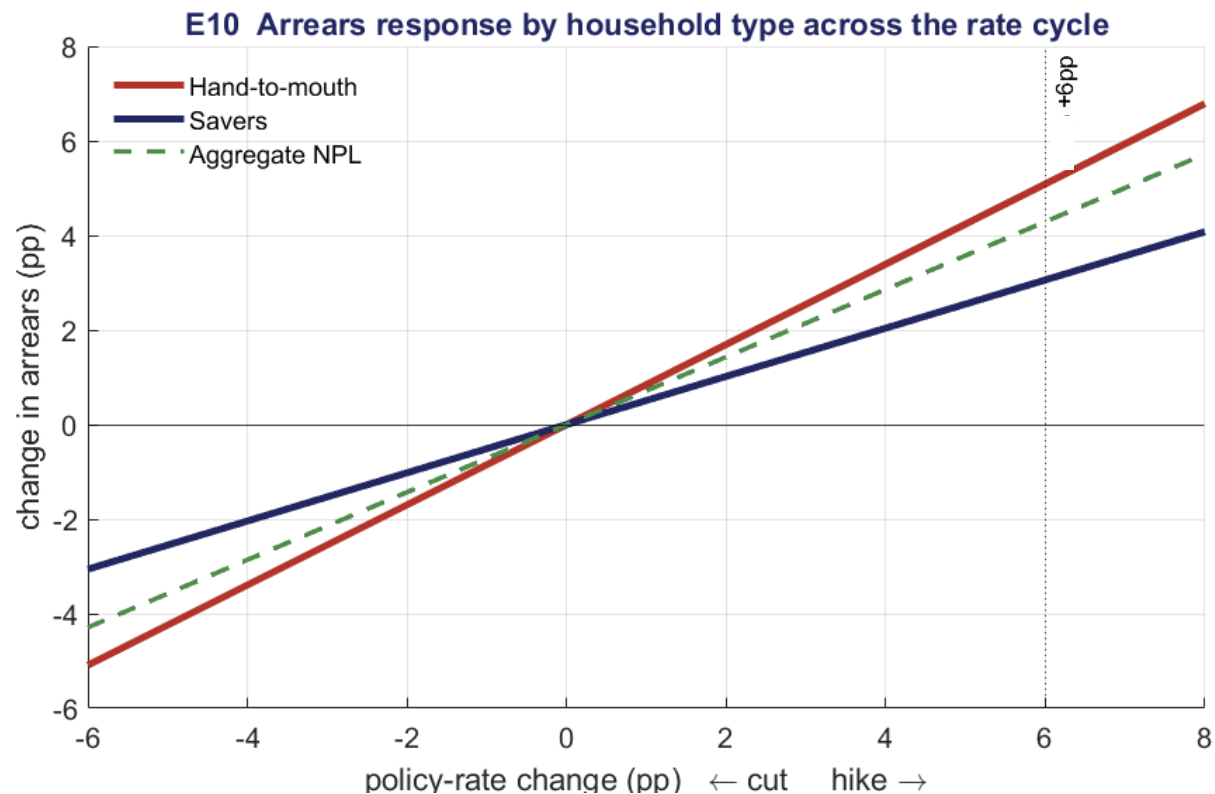
Output and household credit fall by roughly 1.5–2% initially and recover within about 6–8 quarters. Business credit reacts much more strongly: it falls by around 3.5–3.7% and remains slightly below baseline even after 20 quarters.



When the crowding-out parameter is close to zero (green line), expanding household lending has almost no effect on business credit and output. As the parameter increases, banks shift a larger share of their lending capacity towards household lending. Business credit contracts more sharply, reducing investment and temporarily lowering output.

Monetary policy and arrears across household types

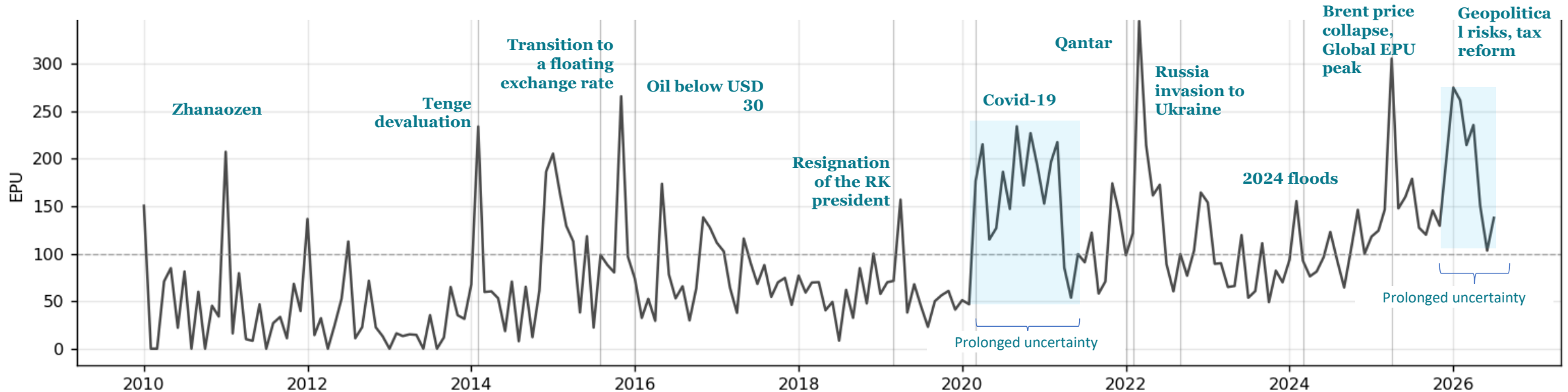
Changes in the policy rate have larger arrears effects for high-MPC households than for savers.



- At a 2022-style +6pp hike, hand-to-mouth arrears rise ~2× the savers' increase.
- The gap widens with the size of the move, in both directions
- Rate cuts reduce arrears for both groups, with a larger effect among high-MPC households.

Policy uncertainty (EPU)

When uncertainty remains high, households may become more cautious, delay spending, and struggle more with repayment decisions



How the index is constructed

Methodology: **Baker, Bloom & Davis (2016)**

The index measures the share of 1.5 million news articles in which terms from all three groups appear simultaneously:

① Economy ② Uncertainty / risk ③ Politics and public institutions (government, National Bank, taxes, budget, regulation)

The resulting shares are normalized, standardized, and aggregated into a single index..

Behavioral tools: mapping results into targeted nudges

The survey identifies the behavioural mechanism, the DSGE identifies when it becomes an arrears risk.

	WHAT THE SURVEY FOUND	WHAT THE MODEL SHOWS	THE BEHAVIORAL NUDGE
1	Two groups, not one. 47% would spend almost all extra income. 33% would save it. Mean MPC 0.54.	The model: The same policy affects two groups differently. They differ in patience, not in appetite for risk.	Design for impatience <i>Default a small automatic loan payment on payday. Make repayment happen before money is spent</i>
2	Debt stress becomes much worse above 50% of income. 24% of borrowers above the 50% debt-service threshold are in arrears.	The model: After a policy rate increase, consumption of high-MPC households falls considerably	Offer a lower-payment option before distress <i>When projected debt service approaches 50%, pre-offer a longer maturity that keeps the monthly payment manageable.</i>
3	Financial distress is concentrated in consumer credit. Only 6.8% of households have a mortgage, while financial stress is mainly associated with unsecured borrowing.	The model: Financially constrained households cannot smooth financial shocks. A rate hike combined with tighter credit causes an immediate fall in high-MPC consumption	Reduce the payment before reducing the debt. <i>Offer term extension first to lower the monthly instalment. Consider principal forgiveness only if affordability cannot be restored.</i>
4	Vulnerability is concentrated in one group. High-MPC households are in arrears much more often than savers: 20% vs 9%, and they have lower incomes and are more impatient.	The model: Once a shock arrives, this group deteriorates faster. A rate increase raises arrears for high-MPC households, so early repayment difficulty is more informative for this group.	Escalate at the first failed repayment commitment. <i>Reminder → failed promise → restructuring offer instead of reminder → reminder → reminder.</i>

Household balance sheets are the transmission mechanism

- The population is two households, not one — and they could respond to the same policy in opposite directions.
 - The subsidy doesn't crowd out business credit in quantity (firms still get their loans), but it does move the price firms pay.
 - Monetary policy reaches the fragile group almost directly — the case for targeted, behaviourally-informed tools.
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