Bank of England

The neutral rate of interest – and its relevance for monetary policy

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Dr. Catherine L. Mann
External member of the Monetary Policy Committee

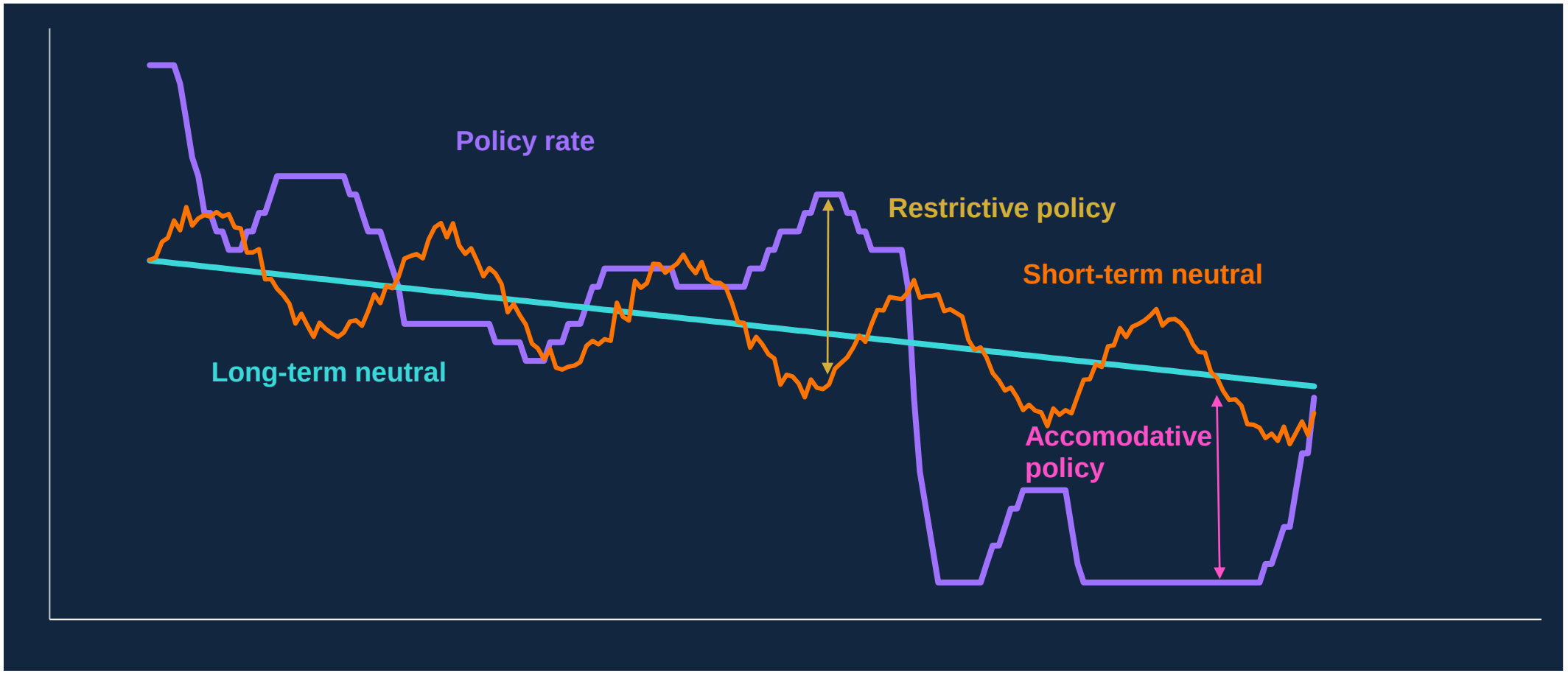
What is the neutral rate of interest?

What is the neutral rate of interest?

- Definition: Varies across institutions, papers and studies
  - My preferred definition: the interest rate that neither stimulates nor depresses inflation
  - But, the time horizon of ‘neither stimulate nor depress’ is key, as time horizon incorporates the presence and dynamics of shocks, transmission, lags, and spillovers
- Synonyms? Neutral, natural, terminal, equilibrium rate… R-star, r-star…
  - In practice these are not all synonymous, they are different concepts, and differ by interlocutor
  - For my decision-making, the ‘neutral rate’ is the short-term rate at which the economy is neither stimulated nor contracted within the monetary policy horizon, and inflation is sustainably at target
- Measurement challenges:
  - Few of the elements underpinning the neutral rate are observable

Bringing the concepts together…

Illustrative example of the interaction between notions of nominal neutral and the nominal policy rate



Sources: Bank calculations.
Notes: Because the illustration asserts that (policy rate – short-term neutral) = degree of restrictiveness or accommodation, it follows that short-term and long-term neutral in this illustration is in nominal terms.

Restrictiveness at time *t*:

Determined by the term structure of expected interest rates, including the transmission through financial markets relative to the neutral rate, and the policy rate

Illustrative example of the term structure of neutral and the policy rate

Sources: Bank calculations.
Notes: Because the illustration asserts that (policy rate – short-term neutral) = degree of restrictiveness or accommodation, it follows that short-term and long-term neutral in this illustration is in nominal terms.

The term structure of the neutral rate: short-run versus long-run

- The distinction between short and long-run neutral rate has been previously made in the literature (Platzer et al., 2022; Obstfeld, 2023) and in policy-making (Seim, 2024; Baker et al., 2023)
- Short-run neutral can be moved around by economic shocks, changes in first stage financial market transmission, volatility, and spillovers of varying sources (e.g. risk, fiscal, demand shocks)
- Long-run neutral is determined by the equilibrium level of savings and investment in the economy. It is the risk-less return that equates the demand and supply for savings. It is linked to slow-moving structural changes in the economy, such as demographics and productivity growth
- For me, short-run neutral has greater monetary policy relevance. Long-run neutral is far off-stage, but it is helpful to the extent that this is the trend around which short-run fluctuates

Assessing the degree of restrictiveness

1) interest rate gaps

Monetary policy strategy: measuring restrictiveness

Let restrictiveness be defined as:

$$\text{real interest rate} - \text{neutral rate} = r - r^{*} \quad (1)$$

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$$r = i - E(\pi) \quad (2)$$

and

$$r^* = i^* - E(\pi^*) \quad (3)$$

i = nominal interest rate set by the MPC (i.e. Bank Rate), $E(\pi)$ is expected inflation, i^* = nominal neutral interest rate and $E(\pi^*)$ is expected long-run inflation (2% is the BoE inflation target).

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Rearranging (4):

$$r - r^* = [i - i^*] - [E(\pi) - E(\pi^*)] \quad (5)$$

Monetary policy and measuring restrictiveness: what do we know?

$$r - r^* = [i - i^*] - [E(\pi) - E(\pi^*)] \quad (5)$$

- The elements of the real rate gap $r - r^*$ are not observable
- The policy rate i is known (it's my job), but i^* has to be measured
- The inflation target $E(\pi^*)$ is pre-determined, but inflation expectations $E(\pi)$ need to be measured (and managed)

a) The nominal rate gap

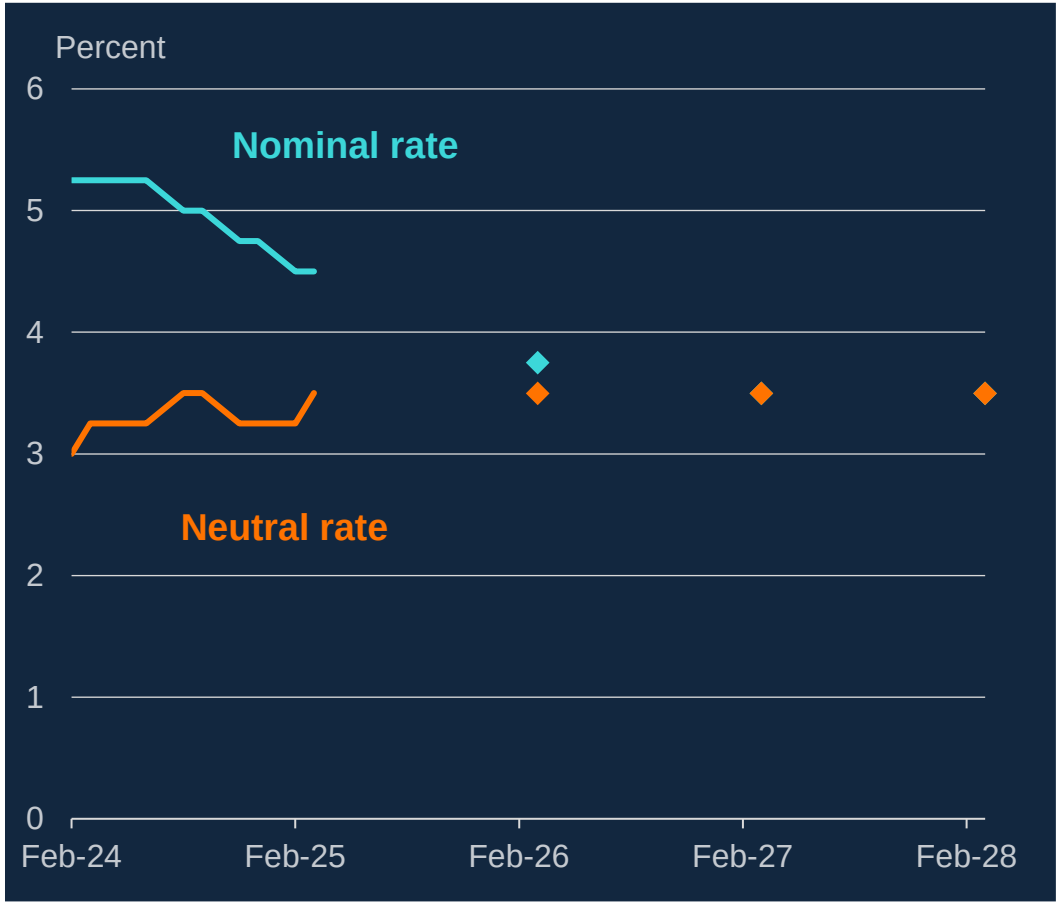
$$r - r^* = \underbrace{[i - i^*]}_{\text{Nominal rate gap}} - [E(\pi) - E(\pi^*)] \quad (5)$$

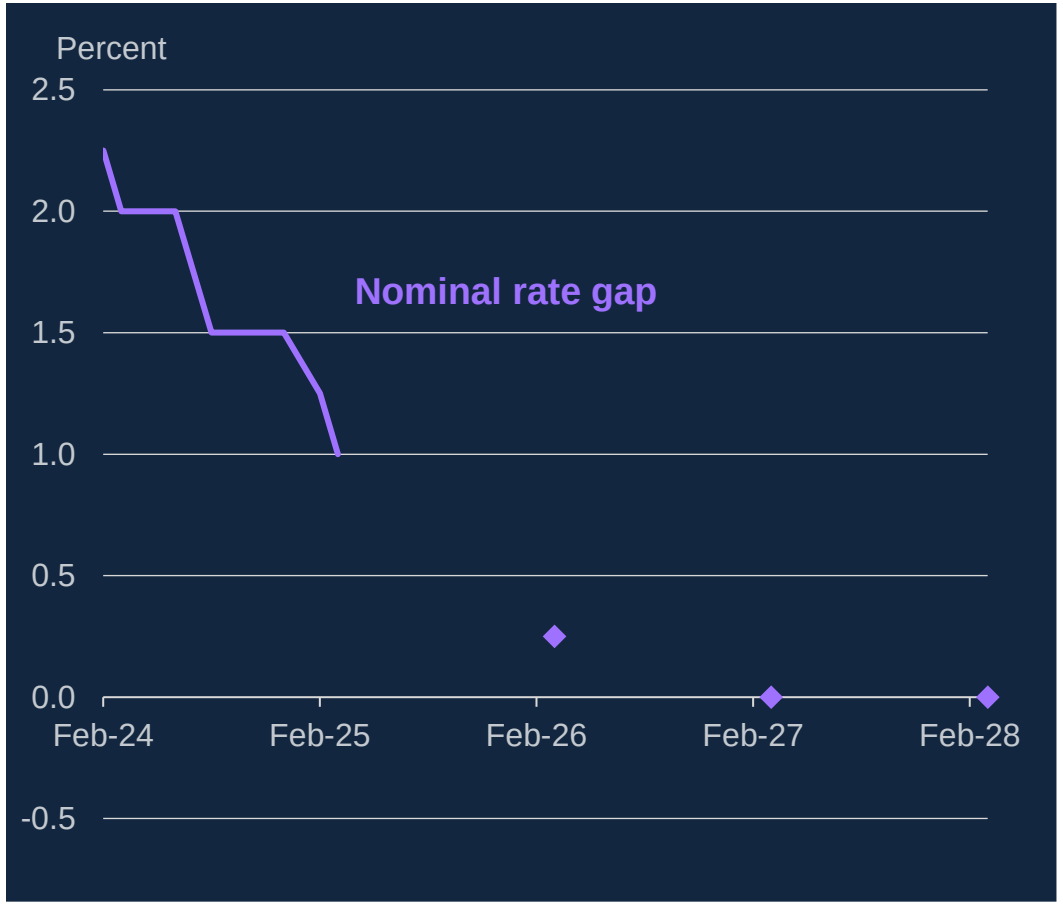
- Some channels of the monetary transmission mechanism (mainly the cash flow channel, through mortgage rates for instance) are nominal in nature

- Monetary policymakers affect monetary conditions, and therefore financial conditions, by changing i and/or by affecting inflation expectations $E(\pi)$ while keeping long-term inflation expectations anchored at the inflation target $E(\pi^*) = 2\%$

Measuring $[i - i^*]$: A majority of MaPS respondents expect policy to turn neutral within 2 years

MaPS-implied nominal rate gap





Sources: Market Participant Survey and Bank calculations.
Notes: Diamonds show the MaPS median response of interest rate expectations 1-, 2- and 3-years ahead (aqua). The nominal rate gap (purple) is calculated at the nominal rate (aqua) minus the neutral rate (orange), in realised (solid lines) and expectations (diamonds) terms. Latest data: March 2025 survey.

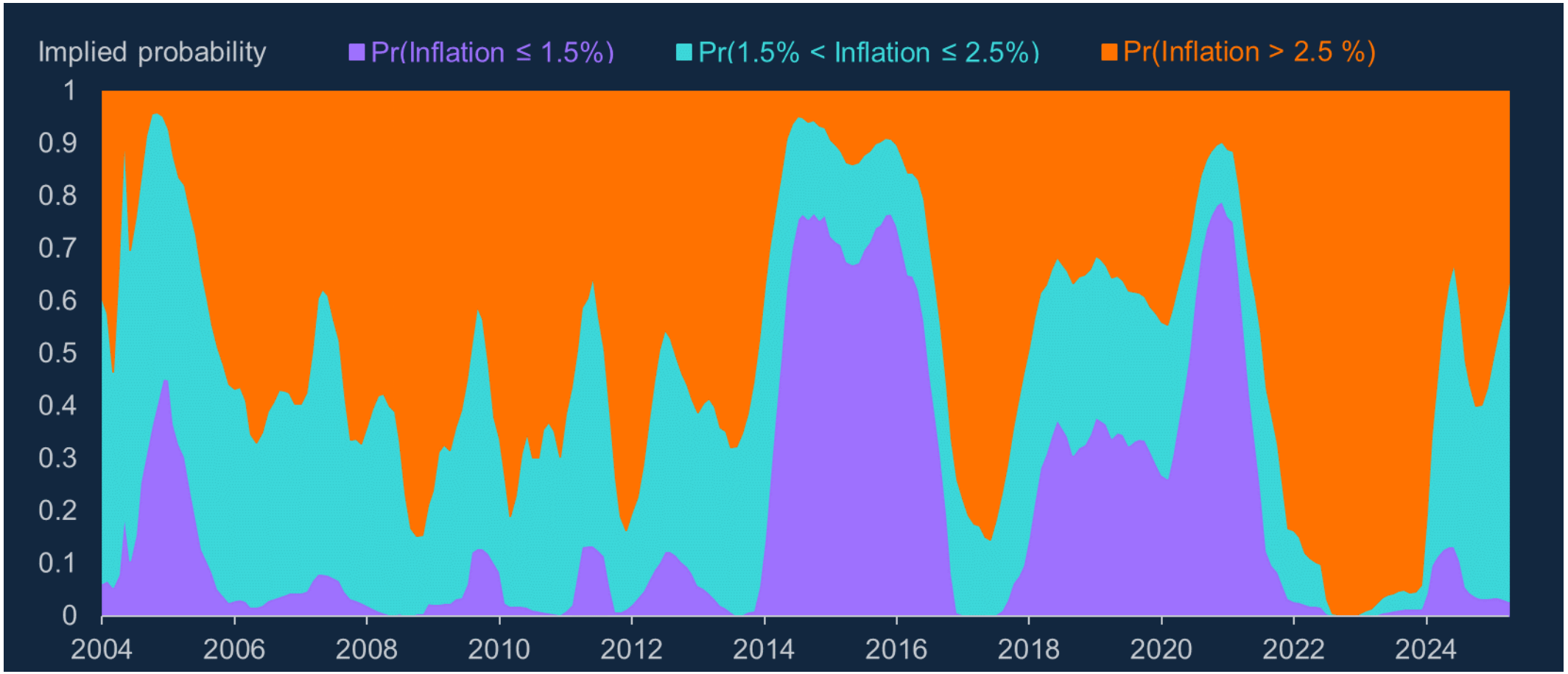
b) Inflation expectations 'drift'

$$r - r^* = [i - i^*] - \underbrace{[E(\pi) - E(\pi^*)]}_{\text{Inflation expectations drift}} \quad (5)$$

- Monetary policymakers affect monetary conditions, and therefore financial conditions, by changing i and/or by affecting inflation expectations $E(\pi)$ while keeping long-term inflation expectations anchored at the inflation target $E(\pi^*) = 2\%$
- Many factors that affect $E(\pi)$ are not directly under the control of the monetary policymaker, but to which it needs to respond (supply shocks, degree of forward-vs-backward-lookingness in expectation formation, frequency of price changes)

Measuring $E(\pi) - E(\pi^*)$: Implied probabilities of expected CPI inflation outcomes

Asset-price-implied probabilities of lower, around target and higher 12-months-ahead UK CPI outcomes



Sources: Bloomberg Finance L.P., Consensus Economics, LSEG Datastream, Office for National Statistics, Tradeweb, ICE BofAML and Bank calculations.
Notes: 6-month moving average of asset-price-implied probabilities of 12-months-ahead UK CPI inflation outcomes. Asset-price-implied probabilities are based on a monthly quantile regression of 12-months-ahead CPI inflation on asset prices from which probability density functions are obtained, adopting the methodology of Adams et al. (2021) and the New York Fed. Asset prices include UK 3-year OIS rate, UK 10-year govt. bond yield, FTSE All-Share, UK IG corporate bond spread, sterling ERI.

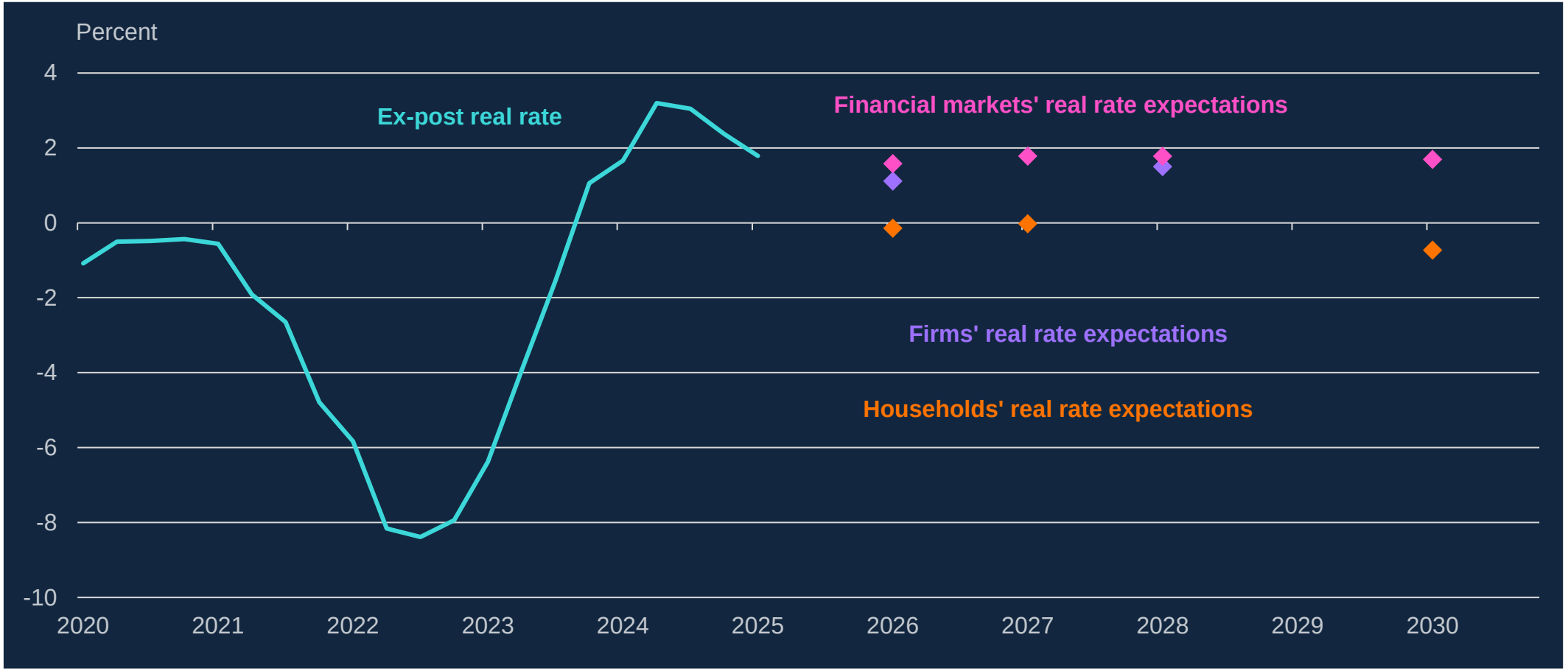
c) The real rate gap

$$\underbrace{r - r^*}_{\text{Real rate gap}} = [i - i^*] - [E(\pi) - E(\pi^*)] \quad (5)$$

- Real rates are not directly observable
- Monetary policymakers affect real rates indirectly through their effect on i and $E(\pi)$
- So the real rate gap is endogenous to policy and shocks

Measuring r using survey-based $E(\pi)$: Real interest rates differ across economic agents

Measures of ex-ante real interest rates by economic agent



Sources: Bank of England, Bank of England/Ipsos, Bloomberg Finance L.P., Decision Maker Panel, Market Participants Survey, ONS, Tradeweb and Bank calculations.
Notes: Ex-ante real interest rates are calculated as the 1, 2, 3 and 5-year ahead OIS rate respectively, minus the (maturity-matched) survey-implied inflation expectation. Quarterly data. For households, the Bank of England/Ipsos Inflation Attitudes Survey is used, the Decision Maker Panel for firms' and the Market Participants survey for financial markets. The ex-post real interest rate is calculated as Bank Rate minus realised headline CPI inflation.

Assessing the degree of restrictiveness

2) the role of volatility, uncertainty, risk premia

The role of uncertainty, volatility, and risk premia

$$r - r^* = [i - i^*] - [E(\pi) - E(\pi^*)] \quad (5)$$

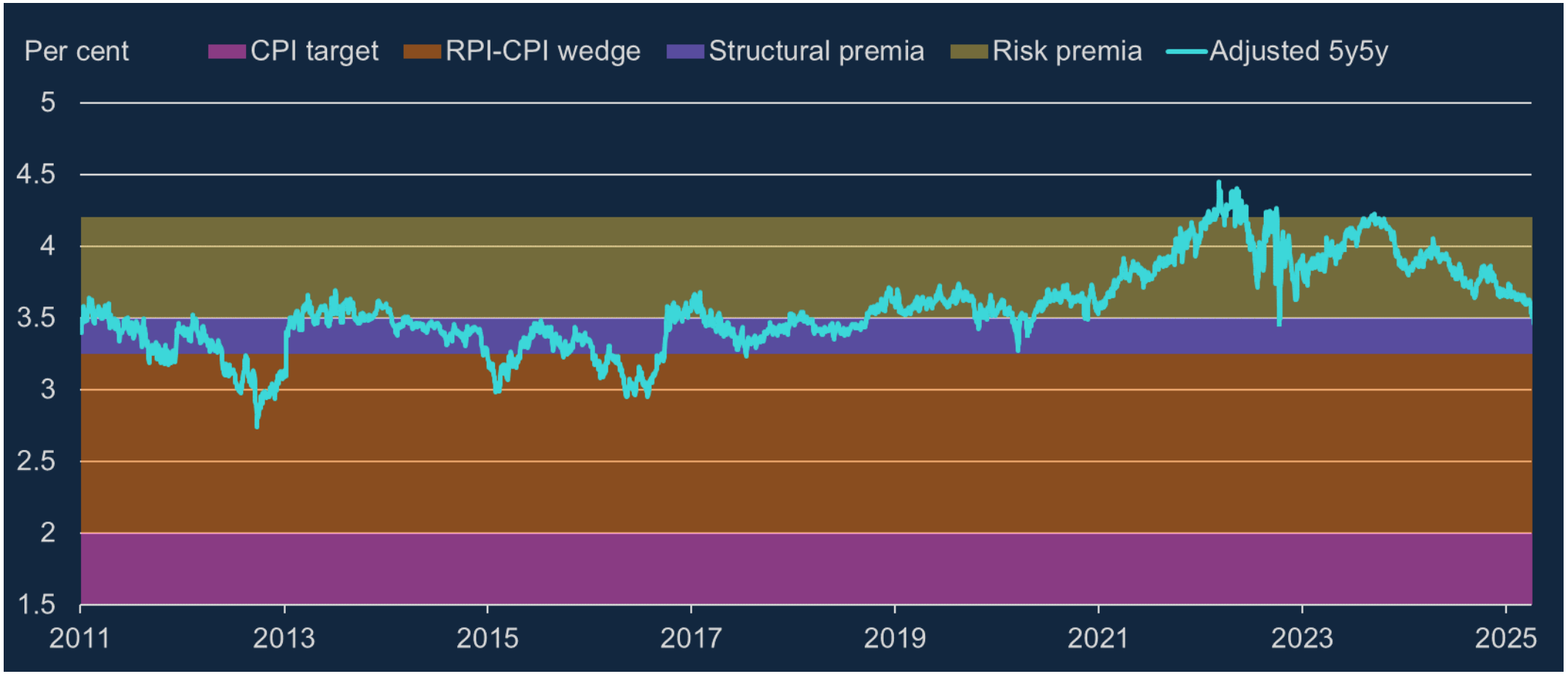
Uncertainty affects the real rate gap

Volatility affects the nominal rate gap and the inflation expectations drift

- Uncertainty reduces consumption and investment, lowering r^*
- Volatility in (π) is positive and asymmetrically related to (π), raising i^*
- Higher risk premia in financial markets yield higher r^* and i^*

Risk premia are significant, but often assumed away when looking at inflation expectations

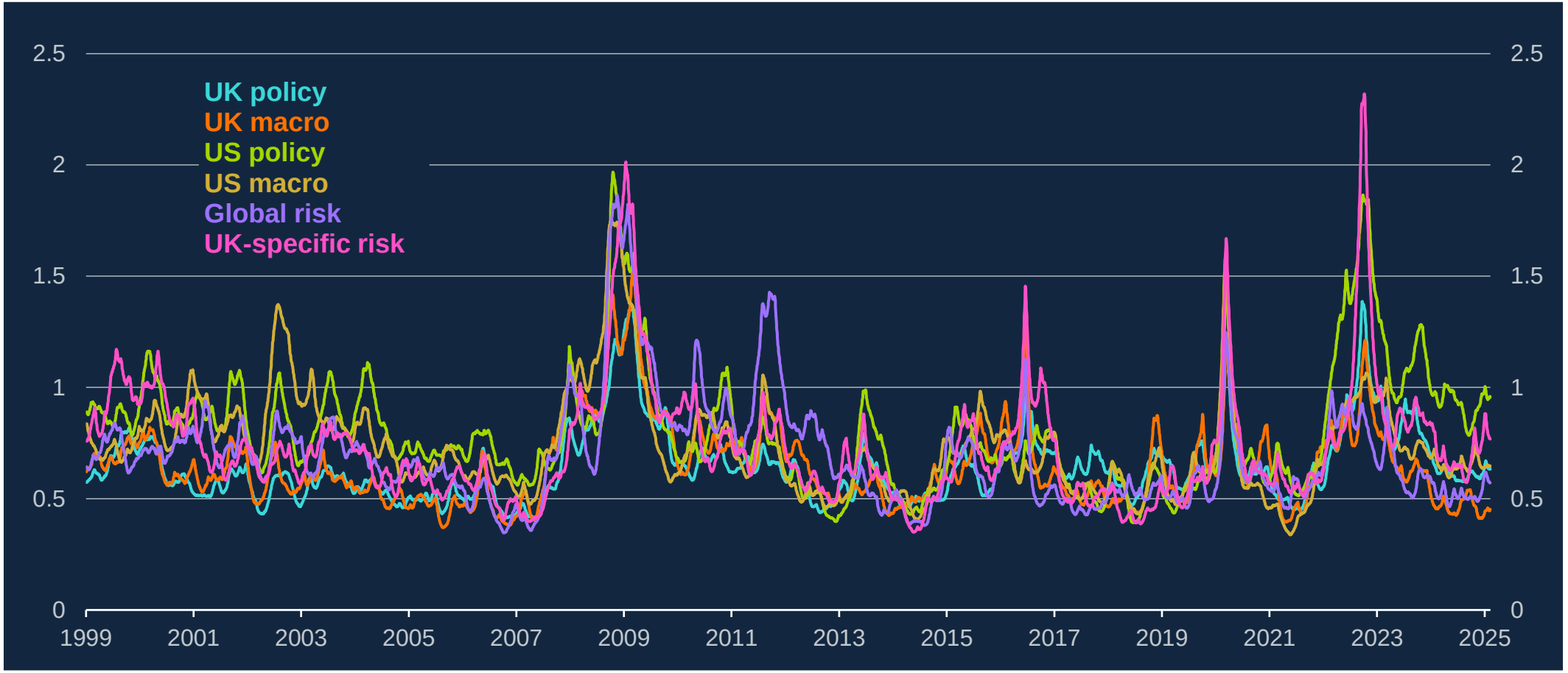
RPI-reform adjusted UK 5-year, 5-years ahead measure of inflation compensation



Sources: Bloomberg Finance L.P. and Bank calculations.
Notes: Latest data: 1st April 2025. UK RPI adjusted 5y5y is derived by adjusting the five-year, five-year rate to account for UK RPI reform. From 2030, UK RPI will be aligned with the CPIH measure of consumer prices.

Volatility and spillovers affect UK financial conditions:
US monetary policy factor remains elevated, but UK specific risk is present too.

Stochastic volatility of asset price factors



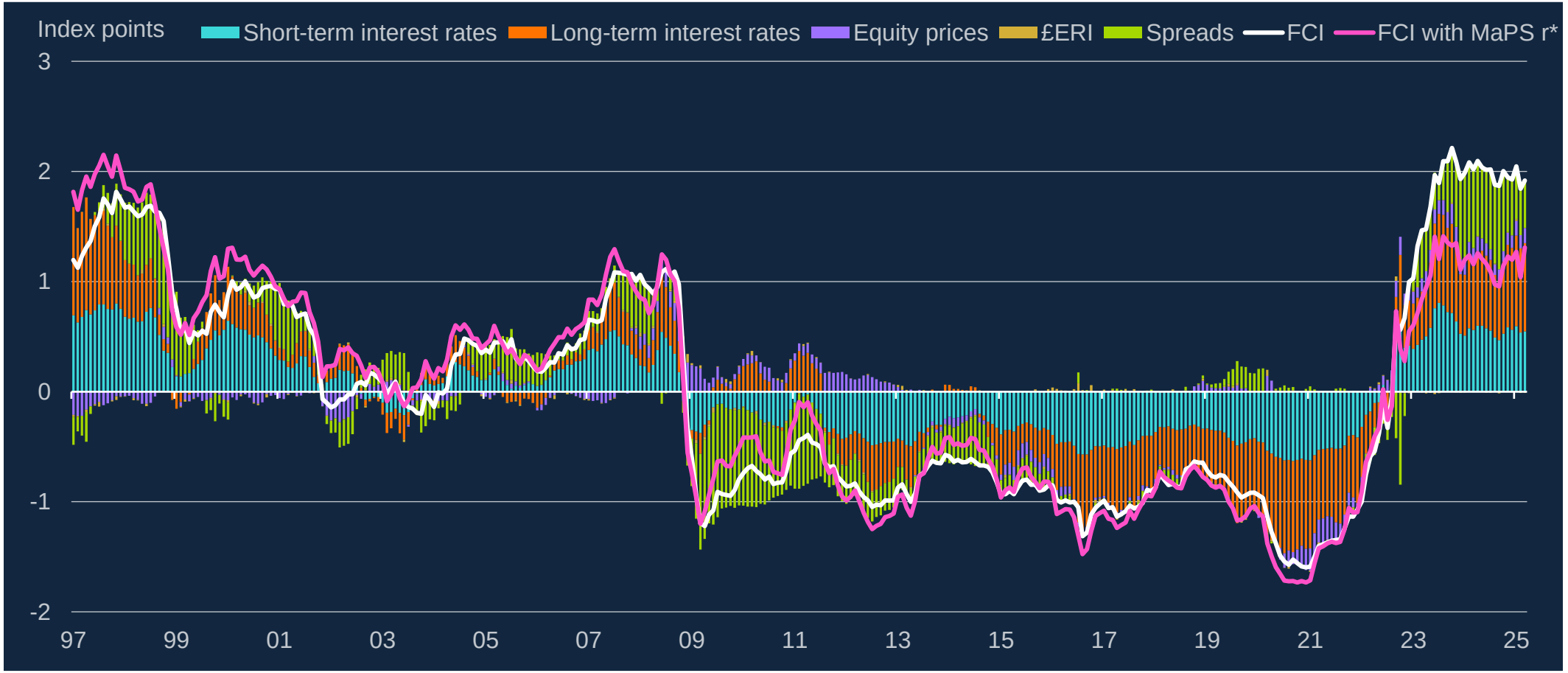
Source: Bloomberg Finance L.P. and Bank calculations
Notes: See Mann (2025) for more detail. The calculations are based on a structural VAR identified using sign and magnitude restrictions following Brandt et al. (2021). The model is extended to analyze monetary policy spillovers between the UK and its two most important trading partners and dominant currency blocks, the US and EA.

Assessing the degree of restrictiveness

3) the effect of monetary policy on financial conditions and the economy

Financial market transmission matters:
It's not just the short-term interest rate that affects restrictiveness

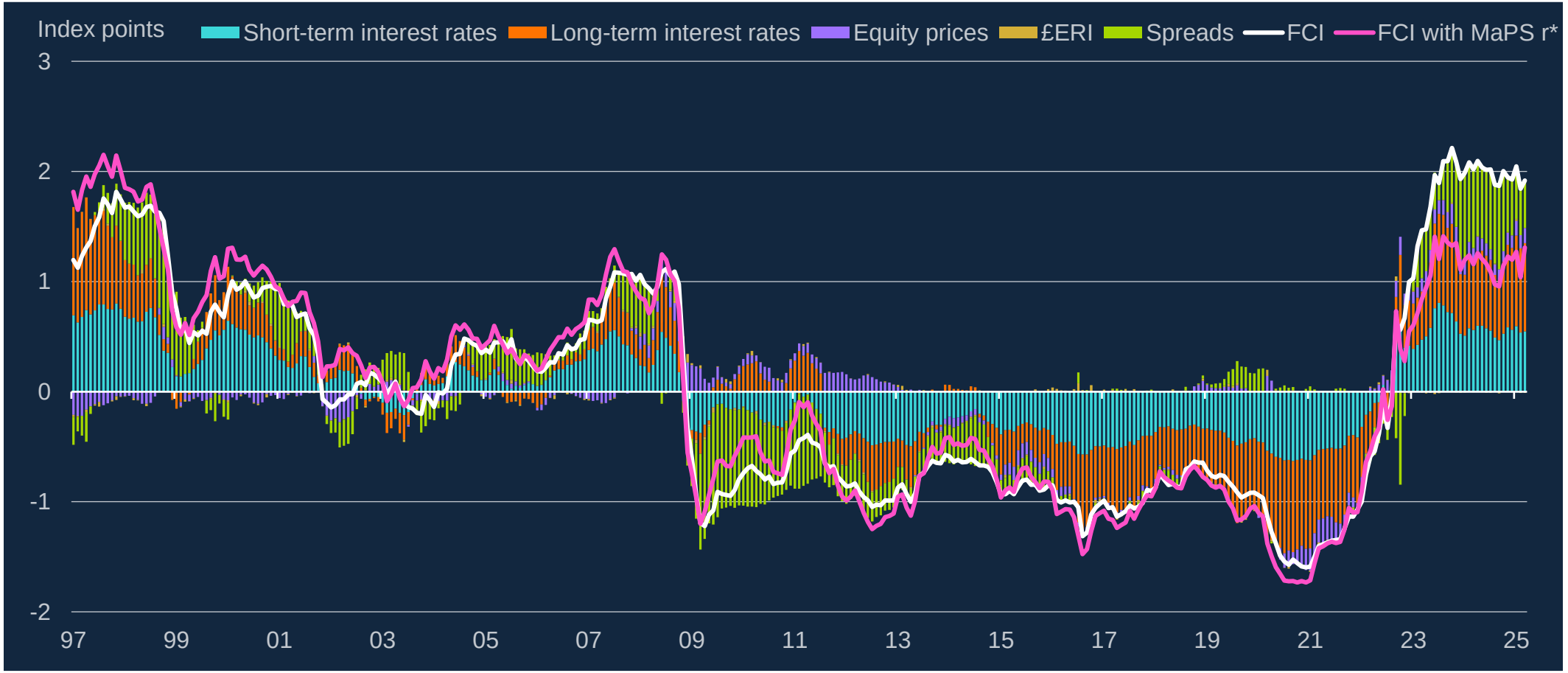
UK financial conditions index



Sources: Bloomberg Finance L.P., Moneyfacts, LSEG, Tradeweb and Bank calculations.
Notes: The pink line is an adaptation of Burr (2023), where interest rates are detrended using the MaPS median estimate of the neutral rate.

The choice of r^* matters: Underestimating r^* implies overestimating restrictiveness

UK financial conditions index



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Conclusions for monetary policy and research

- Evaluating restrictiveness of policy in real-time is challenging, with various methodologies which have strengths and weaknesses
  - Real rate gap:
    - Allows monitoring in real-time, but subject to strong assumptions
  - Nominal rate gap:
    - Allows monitoring of policy transmission to financial conditions, and is an early-indicator, but involves uncertainty about second-stage monetary policy transmission to output and inflation
  - Inflation expectations gap:
    - Allows a direct assessment of the effectiveness of policy, but is subject to measurement challenges and the channels of monetary policy transmission
- Biggest research gaps? Treatment of uncertainty, volatility, and risk