The Role of Inflation Expectations

IBF / Deutsche Bundesbank Symposium
Inflation: Yesterday, today – and tomorrow?

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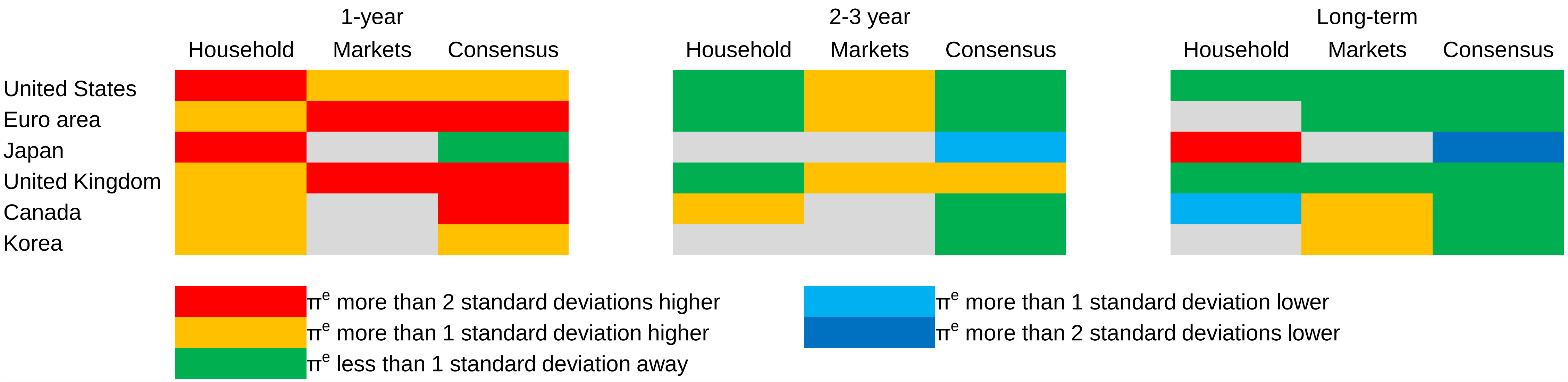
Mixed signals from inflation expectations?

Inflation expectations serve as important input for monetary policy decisions.

- But which expectations? Various groups form expectations, at several horizons.
- Should we take comfort from long-run anchoring?
- Or worry about short run expectations?



Source: IMF March 2023 GPM Global Inflation Monitor

Overview of Presentation

- A brief history of the role of inflation expectations
- Which expectations matter?
- The role of monetary policy
- Concluding remarks

A brief history of the role of inflation expectations

Inflation modeling before the Great Inflation

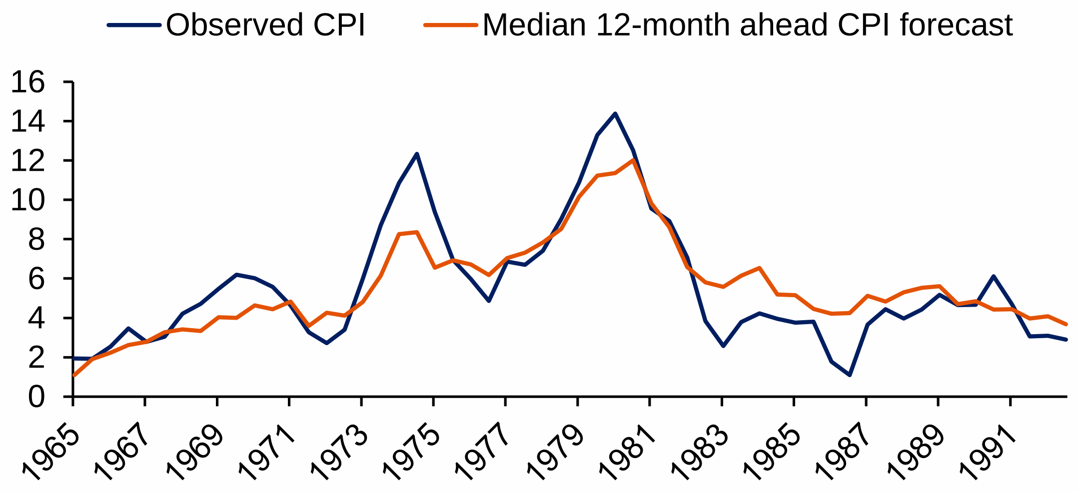
- Phillips' original curve (PC):
  - Wage inflation depends on unemployment.
- Samuelson and Solow:
  - Formulate a PC for price inflation but **no role for expectations**.
  - Interpreted as a "menu" of inflation/unemployment: possible to lower unemployment (permanently) if allow inflation to rise modestly.
- Empirical performance of Phillips Curve deteriorated as inflation rose progressively beginning in the mid-1960s.
  - Could not explain combination of high inflation and high resource slack seen in 1970s.

Inflation expectations and the Phillips Curve

- Poor performance of static Phillips Curve generated interest in other explanations.
- Phelps (1967) and Friedman (1968): **inflation expectations matter for inflation.**
  - ▸ People will come to expect higher inflation, which raises current inflation (holding resource slack constant).
  - ▸ Acceleration in inflation as long as U<U*

US: Inflation and inflation expectations 1965-1992

(yoy percentage changes)



Sources: Livingston Survey - Philadelphia Fed, Haver, IMF staff calculations

- ▸ In a long sample, granger causality runs in both directions: inflation expectations cause observed inflation, and vice versa.

- Two key implications:
  - ▸ For monetary policy: no permanent tradeoff between inflation and U.
  - ▸ Galvanized interest in how inflation expectations matter for both AS and AD.

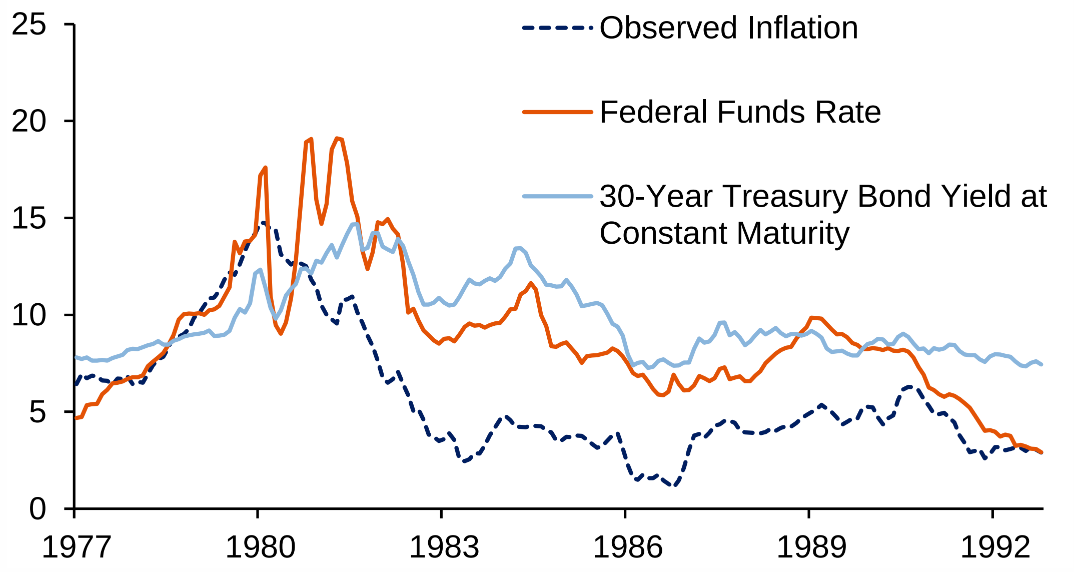
Heightened focus on inflation expectations

- Central banks devoted increasing attention to long-run expectations by Volcker period.
  - Imperfectly proxied by long-term bond yields.
  - Long-term yields had moved from roughly 4 percent in the early 1960s to nearly 20 percent by the late 1970s.
- Viewed as critical to **re-anchor the system by reducing long-term inflation expectations** through tight monetary policy.
  - High long-term inflation expectations a symptom of low CB credibility in delivering price stability.
  - Weak anchoring recognized as hurting policy effectiveness and ability to conduct countercyclical policy.

Building credibility and fighting "inflation scares"

- In Volcker disinflation, inflation fell much more quickly than long-run inflation expectations.
  - Suggested that monetary credibility took long time to be regained (Erceg and Levin, 2003; Goodfriend and King, 2005).
  - Fed reluctant to ease policy until long-run inflation expectations had come down significantly.

US: Inflation and Interest Rates



Sources: Haver, IMF staff calculations

  - Responded to subsequent "inflation scares" – rapid jumps in long-term nominal yields – by aggressive tightening (Goodfriend, 1992).
  - Takeaway was that **monetary policy could influence LT inflation expectations – and hence inflation – through persistent policy actions**.

Long-run inflation expectations in today's policymaking

- Central banks remain very attentive to ensuring that measures of long-run inflation expectations (market and survey-based) remain near their targets.
  - Key signal of central bank policy credibility.
  - Critical for monetary transmission through financial market channels.
  - Typically viewed as important in affecting current inflation dynamics.
- Even now, central bank models focus on long-run inflation expectations (FRB model for US economy; Hooper, Mishkin, Sufi, 2020; Cecchetti, Feroli, Hooper, Kashyap, Schoenholtz, 2017).
- In post-GFC, CBs concerned that fall in long run inflation expectations would reduce current inflation and compress policy space… at least until recent inflation surge.

Which inflation expectations matter?

LR inflation expectations important, but..

- While long-run inflation expectations are clearly critical for policy, some key open questions:
    - In current period, should CBs feel comfortable that inflation will return to target because market-based long-term inflation expectations are well-anchored?
    - Or are there other dimensions of inflation expectations that matter for inflation determination and monetary policy transmission?

..what else matters?

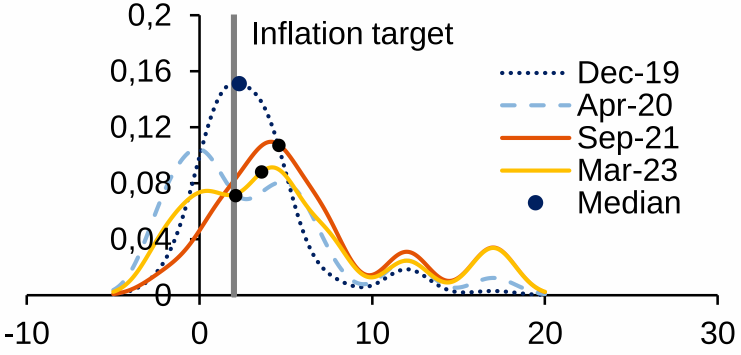
- Other measures of inflation expectations can be important in understanding inflation and wage dynamics, and transmission through aggregate demand. Along various dimensions:
  - **Shorter horizons** (Werning, 2022; Reis, 2021).
  - **Different economic agents** (households, firms).
    - Firm inflation expectations relevant for investment, hiring, and price-setting decisions (Gorodnichenko & Coibion, 2018).
    - Household inflation expectations relevant for consumption, saving, home-ownership and financing decisions, and feed into wage negotiations and labor supply (D'Acunto et al., 2022; Andrade et al., 2020; Duca-Radu et al., 2021).
  - **Distribution** of expectations.

Household expectations—a closer look

- Household inflation expectations traditionally not regarded useful input to (monetary) policy decisions, due to their volatile and dispersed nature.
- But use of survey expectations (particularly households) improves the empirical performance of NKPC (Coibion et al., 2018).
- …and dispersion of household expectations is actually *informative*.

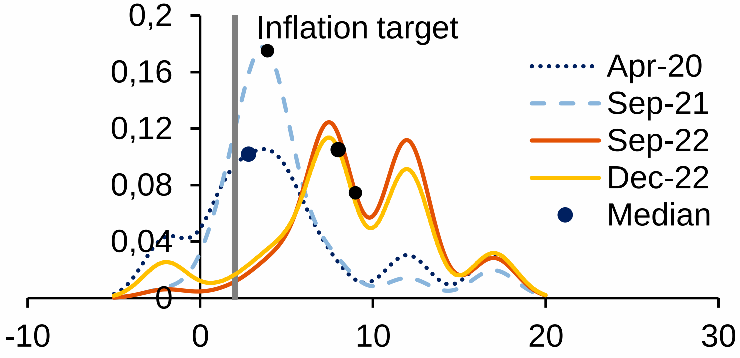
Distribution of household expectations can send signals

US: 1-year inflation expectations



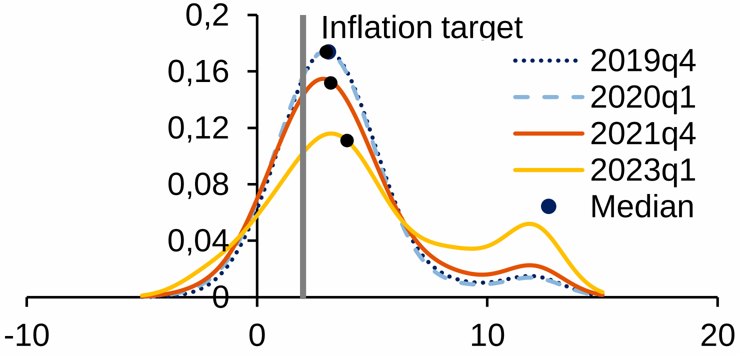
Sources: Survey of Consumers - University of Michigan, IMF staff calculations

Germany: 1-year inflation expectations



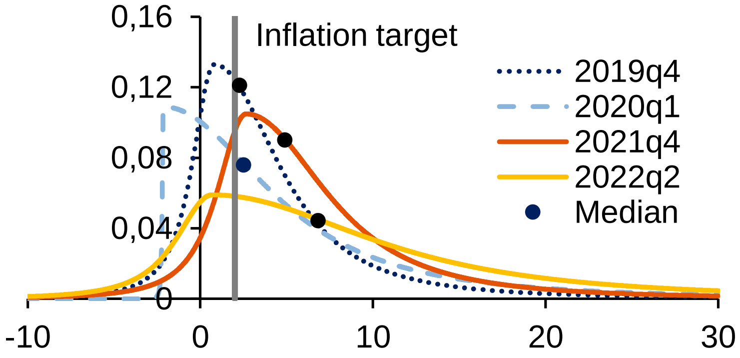
Source: Bundesbank Online Panel - Households (BOP-HH), IMF staff calculations

UK: 1-year inflation expectations



Source: Bank of England, IMF staff calculations

Canada: 1-year inflation expectations



Sources: Bank of Canada, IMF staff calculations.
Note: This chart was constructed by fitting a skewed t distribution to percentiles of point forecasts, unlike the other charts which fit a kernel density.

- Densities of the point forecasts of 1-year ahead inflation by households.
- Meaningful shifts in distribution of expectations not captured by changes in median expectations.

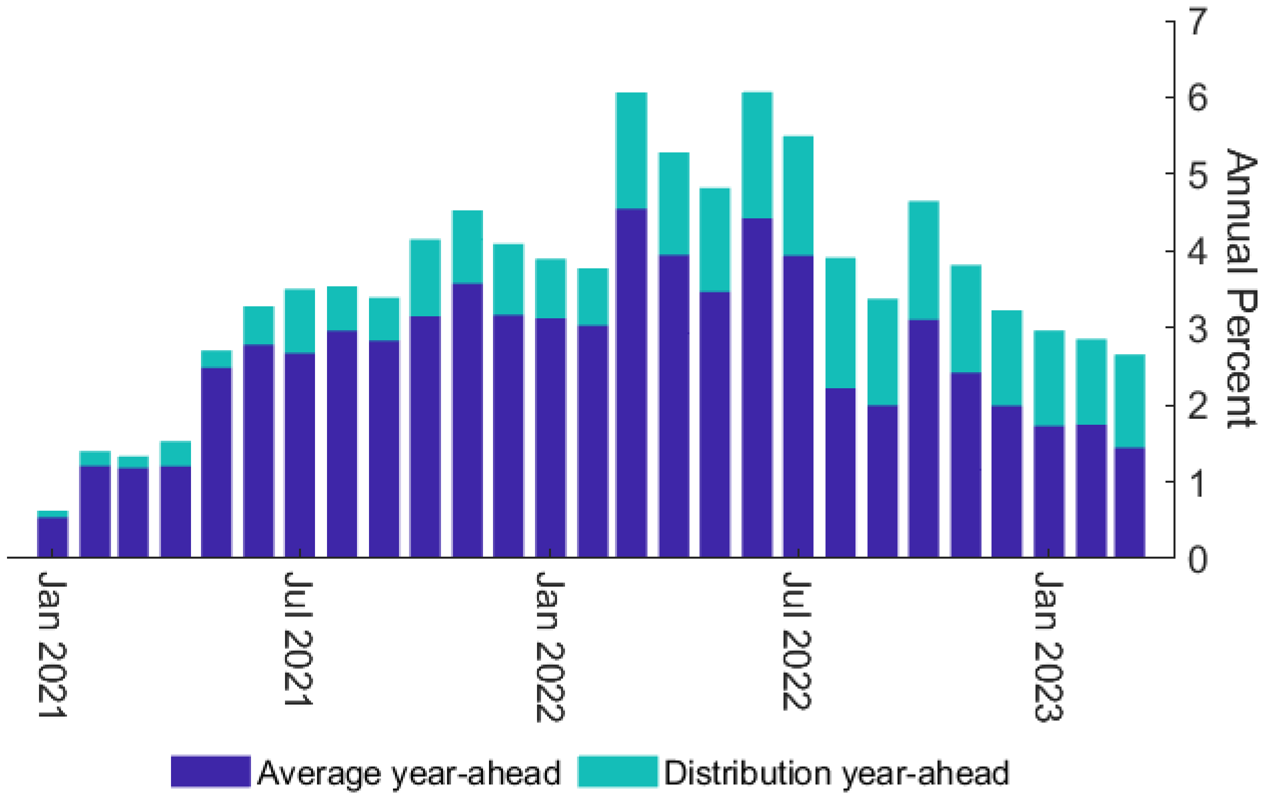
Changes in the distribution of household expectations contain information about future inflation

- Work at the IMF by Brandao Marques et al. (forthcoming) shows that changes in the distribution of one-year-ahead household expectations help predict one-year-ahead inflation.
  - Brandao Marques et al. (forthcoming) extract factors from the distribution of one-year inflation expectations.
  - They show that these factors, capturing higher moments of the distribution, help predict year-ahead inflation, over and above market / professional forecasts.
- The importance of higher moments versus mean or median expectations may be time-varying.

And household expectations can help explain inflation

- Phillips curves estimated using household survey expectations improve standard rational expectations models (Coibion et al., 2018).
- Heterogeneous household expectations modify the Phillips curve (Mavroeidis et al., 2014) with extra belief factors.
- Factors from distributions of household expectations enter the Phillips curve, found to explain inflation (Meeks and Monti, 2023).

Year-ahead household inflation expectations explain sizeable share of the rise in US inflation since late 2020



Notes: Contributions to fitted month-on-month CPI inflation due to (a) the average Michigan survey expectation, and (b) the distribution of survey expectations around the average in the heterogeneous beliefs Phillips curve (Meeks and Monti, 2023). Contributions are normalized to zero in December 2020.

Household expectations may affect demand

Household inflation expectations may matter for:

- Consumption decisions
  - Higher inflation expectations increases consumption (Duca-Radu et al., 2021; D'Acunto et al., 2022).
  - Positive inflation expectations increases MPC on durables (Andrade et al., 2023).

- Saving/investment decisions
  - Homeownership decisions: higher inflation expectations increases preference for buying versus renting house (Malmendier and Wellsjo, 2020).
  - Financing decisions: e.g., fixed vs. floating rate mortgage (Malmendier and Nagel, 2016; Botsch and Malmendier, 2021).

Household expectations may affect supply

Household inflation expectations may matter for:

- Labor supply decisions and wage setting
  - Short term household inflation expectations relevant for wage Phillips Curve (Glick et al., 2022)

- Both are potentially regime-dependent (Rudd, 2021):
  - Low and stable inflation: little effect of expectations on labor supply and wage negotiations.
  - Persistently high inflation: cost of living becomes important for wage negotiations (Douty, 1975).
  - Borio, et al.(2023) show similar two-regime effects for price-setting by firms.

How do households form their expectations?

- Inflation expectations not very responsive to central bank communication (Binder, 2017; Coibion et al., 2020; D’Acunto et al., 2021)
  - If anything, they respond once, to information of target (Coibion et al., 2022)
- Recent literature documents that (personal) experiences matter:
  - Experience of high inflation has a long-lasting effect (Malmendier and Nagel, 2016).
  - Exposure to price changes matters—greater for frequently-purchased grocery items, and for prices increases. This is a source of cross-sectional dispersion (D’Acunto, et al., 2021; D’Acunto, Malmendier, and Weber, 2021).
  - Such experiences *also* affect professionals, such as firm managers.

Implications for monetary policy

Need to anchor inflation expectations even at shorter horizons

- Central banks should (still) worry about long-run expectations: they provide signals about policy credibility (Binder, Janson, Verbrugge, 2022).

- Currently, long-run inflation expectations seem fairly well anchored.

- But central banks also need to consider the impact of shorter-term expectations on inflation, and on aggregate demand and supply

- Even a de-anchoring of shorter-term inflation expectations would make reducing inflation more painful.

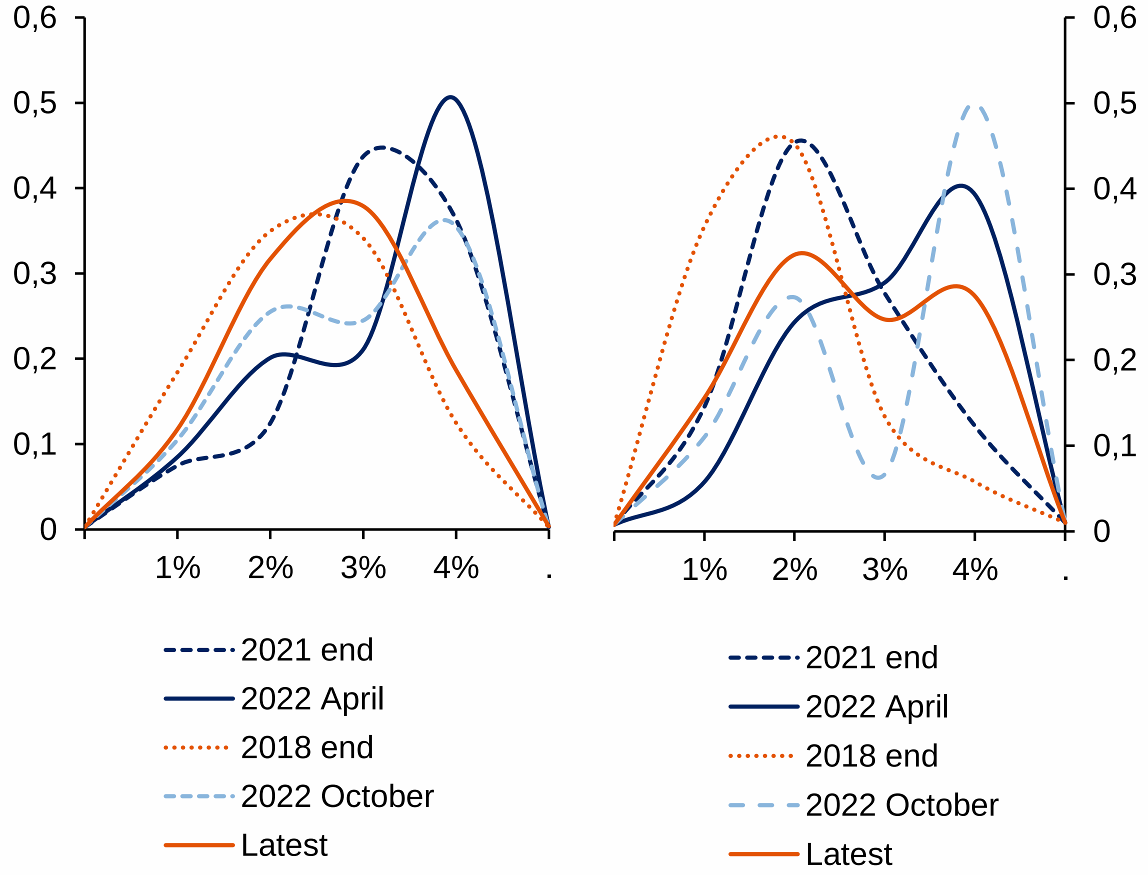
Market-based inflation expectations still elevated, but distributions normalizing

One-year inflation swap rates

(yoy percentage changes)

Option-implied probability of inflation outcomes

(probability density)

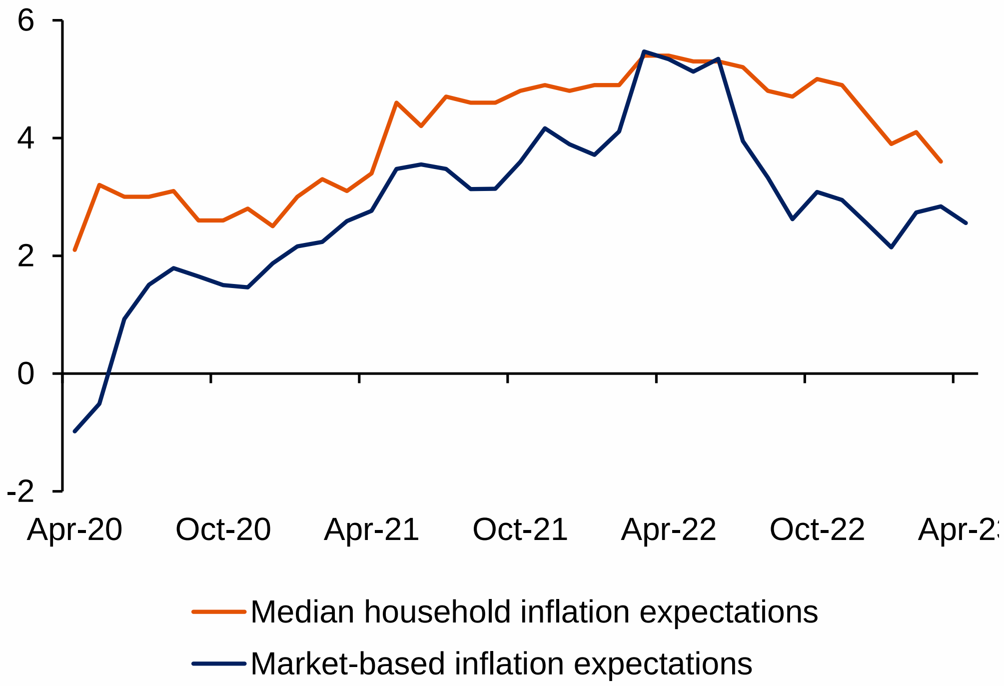


Source: Bloomberg Finance LP and IMF staff calculations

Short-term household expectations haven't fallen as much as market-based measures, and remain high

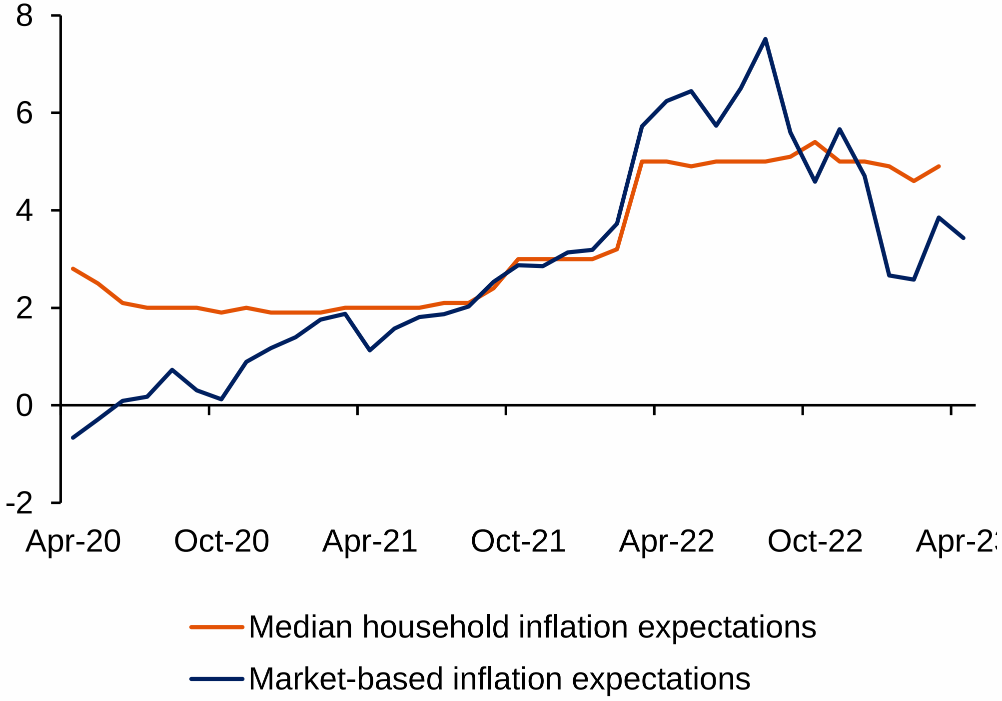
US: 1-year ahead inflation expectations

(yoy percentage changes)



Euro Area: 1-year ahead inflation expectations

(yoy percentage changes)



Source: Bloomberg, Michigan survey, EA CES, and IMF staff calculations

Monetary policy implications: real rates facing households don’t appear very high

- Shorter-term measures of household expectations still remain high.

- This may help account for why aggregate demand hasn’t slowed much, as **real short-term rates using household expectations don’t seem particularly high.**

  - For US : 1 year real rate using household inflation expectations estimated to be about 0.5 percent to a little over 1 percent (1 yr UST of 4.9 percent minus expected inflation of 4.4 percent using the NY Fed survey for April; or 3.6 using Michigan for March).
  - For euro area: 1 year real rate significantly negative.

- Important for central banks to consider alternative measures of real rates that include household expectations to gauge the tightness of the policy stance.

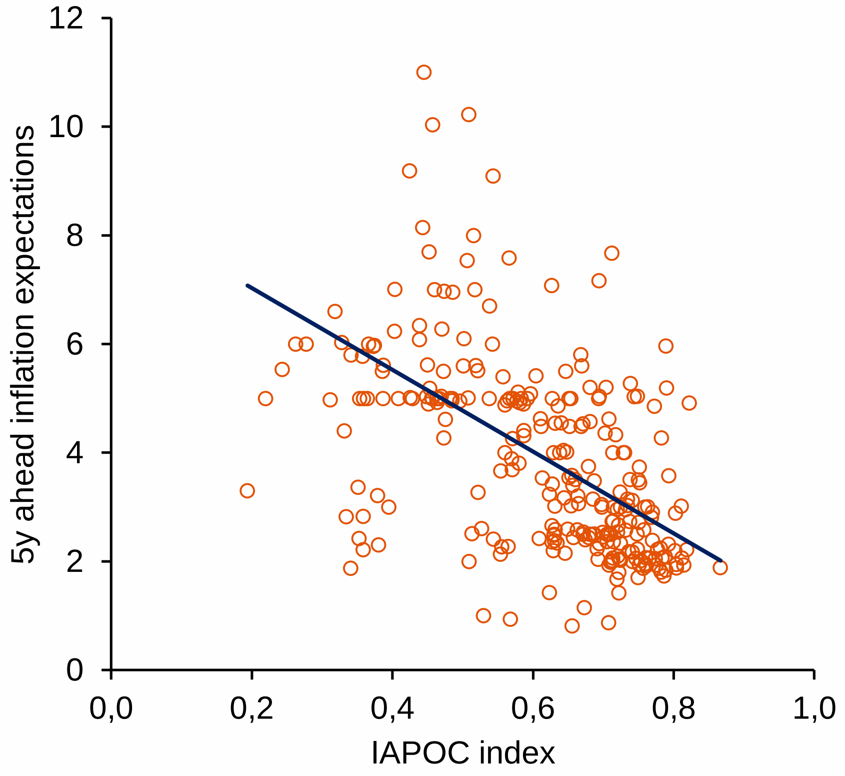
Evidence suggests still some risks of de-anchoring

- When inflation stays persistently high, risk of de-anchoring.
  - The experience of persistently high inflation has long-lasting effect on expectations: so can be risky to let inflation run high for long.
  - Household inflation expectations are more responsive to price increases than cuts: so may take more time to bring inflation expectations down than up.
  - Elevated short-term inflation expectations may get “baked” into wages

- Hence risk management considerations favor a tight policy stance and reacting aggressively to upside inflation shocks

Monetary policy frameworks are important, too!

5-year inflation expectations vs IAPOC index *(50 countries, combined)*



Source: IMF calculations; Unsal, Papageorgiou, and Garbers (2022), “Monetary Policy Frameworks: An Index and New Evidence”, IMF Working Paper No. 2022/022

- Central banks need to build and maintain strong policy frameworks.
- Inflation expectations are lower in countries with strong monetary policy frameworks.
- Chart: MP frameworks measured across three pillars: Independence and Accountability, Policy and Operational Strategy, and Communications (IAPOC).

Concluding remarks

Concluding remarks

- Central banks should care about shorter-term (as well as long-term) inflation expectations of markets, firms, *and* households.

- Short-term real interest rates using household inflation measures don’t appear high, and may help account for why activity hasn’t slowed that much.

- Risk management considerations call for continued tight policy stance:

  - Experience of high inflation can have lasting effects on expectations, so important not to let inflation run high for too long

  - Once in high-inflation regime, expectations more responsive to price changes.

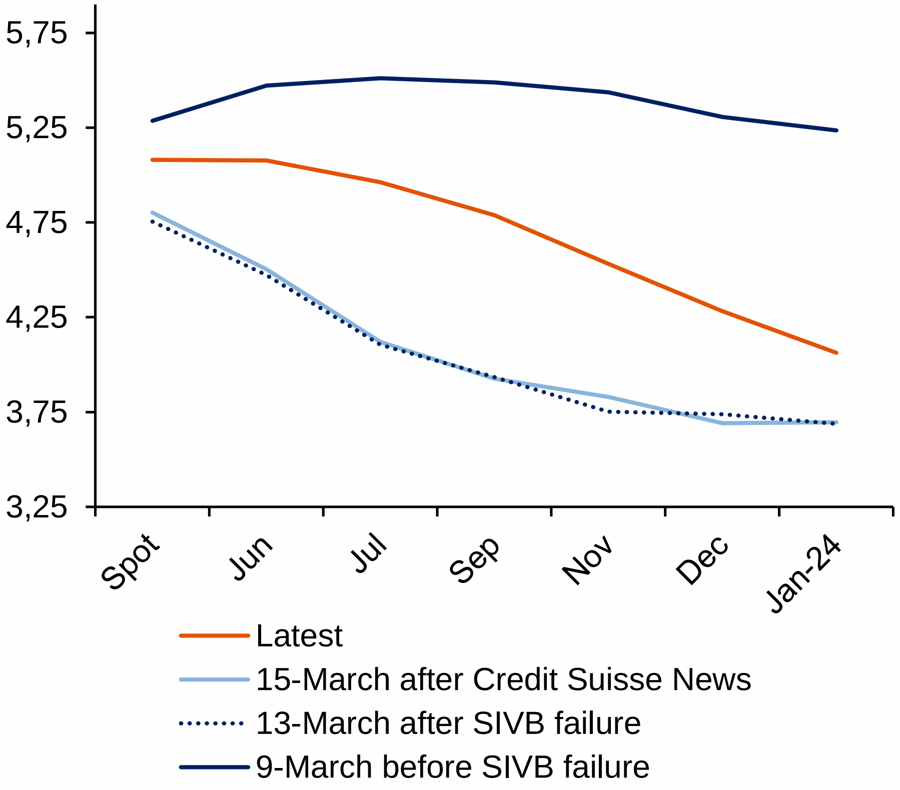
- Need to build and maintain strong monetary policy frameworks.

Thank you

Market expected policy rate path came down sharply after bank turmoil, but is now edging up again

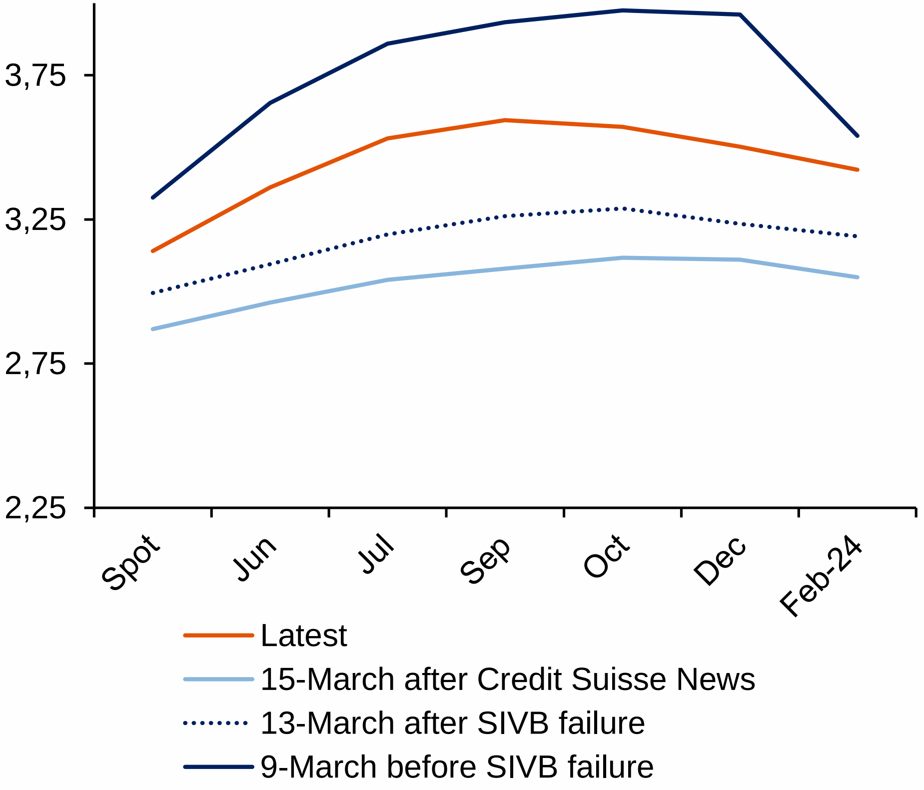
Policy path change in USD overnight swaps

(percent)



Policy path change in EUR overnight swaps

(percent)



Source: Bloomberg Finance LP and IMF staff calculations