Analysis

Monetary policy measures have strengthened the anchoring of inflation expectations

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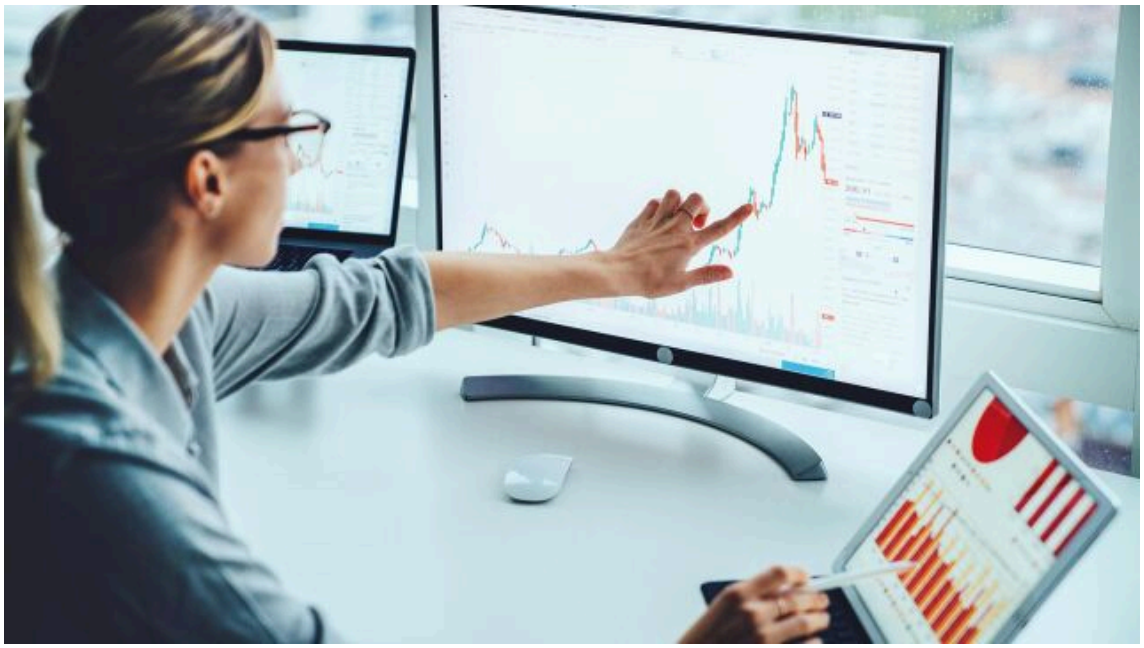


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The tightening of monetary policy has stabilised inflation expectations. Inflation expectations have an impact on companies' pricing decisions as well as on the results of wage negotiations. They therefore directly affect actual inflation rates. When inflation expectations stay in line with the European Central Bank's (ECB) inflation target – that is, when they are anchored to the target – this will help return inflation to the target level over the medium term.



Inflation expectations play a key role in the implementation of monetary policy. The New Keynesian Phillips curve indicates that inflation expectations have a direct impact on the pricing decisions of companies and the results of wage negotiations. This means that there is a direct link between inflation expectations and actual current inflation. Expectations that price growth will be stable in the future will also facilitate economic and financial planning and thus lower inflation risk premia. To keep inflation expectations stable, the ECB and other major central banks are committed to achieving the inflation target over the medium term. If the public believes that the ECB will deliver on its mandate, i.e. if the target is credible, long-term inflation expectations will remain close to the inflation target and be relatively stable despite fluctuations in inflationary pressures.

As argued by Corsello et al. (2021), keeping inflation expectations in line with the central bank's inflation target, or anchoring them, is necessary if that inflation target is to be achieved. In fact, well-anchored inflation expectations can prevent the triggering of an adverse wage-price spiral. The stability of inflation expectations has also been offered as an explanation for how the United States avoided a sharp decline in inflation expectations after the global financial crisis, despite the high unemployment rate (Ball and Mazumder, 2019).

Examining inflation expectations requires a broad-based approach

Inflation expectations are typically gauged using the expectations derived from surveys and financial market prices. Survey-based expectations include various surveys of consumers, businesses and professional forecasters, examining their views on inflation for different time

horizons. The inflation expectations of markets can be derived from the prices of inflation swaps traded in the financial markets. The dilemma in having a diversity of indicators for inflation expectations is that it raises the question of whose expectations the monitoring should focus on in inflation analysis and the implementation of monetary policy. All expectation indicators have their weaknesses, which must be remembered when interpreting and drawing conclusions from inflation expectations and movements in these (see information box below).

Among the different surveys, the expectations of consumers and businesses are, on average, higher and display greater volatility (bigger differences between respondents and from one survey to another). Furthermore, the expectations of businesses and especially consumers are strongly based on actual price and inflation developments (Malmendier and Nagel, 2016). It has been suggested that the reasons for these results include the 'stickiness' of the information associated with consumers' and businesses' expectations and the formation of these, and the fact that they tend to update their views more slowly than professional forecasters (Carroll 2003). It has also been suggested that consumers are poorly informed, i.e. that their survey responses emphasize the prices of goods and services that they themselves find important (e.g. Coibion and Gorodnichenko, 2015 and Coibion et al., 2018). The advantage of consumer and business surveys is that their sample group can be very broad and heterogeneous. Interestingly, slow reactions to new information have also been observed in the survey responses of professional forecasters (Coibion and Gorodnichenko, 2012).

Compared with surveys, the advantage of using market expectations is that the data is high frequency, it can be mapped flexibly across different time horizons and it is 'real' in the sense that it is unaffected by the means of collecting data or the type of survey. On the other hand, the downside of using market expectations is that besides describing inflation expectations, they also incorporate a risk premium, which may become significant, particularly in a turbulent market environment.

For the analysis of inflation anchoring, the most important market expectations are the longer term expectations, the most commonly monitored being perhaps the 5y/5y expectations (5-year, 5-year forward inflation expectations derived from inflation swaps[1]). Other longer term market expectations (e.g. 3y/3y) are also widely used, and there is a strong correlation between all of them. Over shorter time horizons, expectations are influenced by individual shocks, such as energy prices, which makes them less useful in the analysis of inflation anchoring.

The most important indicators for monitoring and analysing inflation expectations in the euro area are the inflation expectations derived from financial market swap data and the ECB Survey of Professional Forecasters (SPF)[2]. Data on both of these is available covering long time series and

for expectations relevant to different time horizons. Bańbura et al. (2023) found that using information from inflation expectation surveys of professional forecasters also improves the accuracy of inflation forecasts, whereas long-term market-derived expectations and expectations based on business and consumer surveys do not.

Among the consumer and business surveys, the most important indicators of inflation expectations are the surveys conducted by the ECB and the European Commission. Since 2020, the ECB has conducted a Consumer Expectations Survey (CES)[3] to measure consumers' views on the economy, including inflation. By contrast, in the Commission's consumer survey, households are asked whether they believe that inflation will increase or slow from the current level (they are not asked directly about the inflation rate itself). This phrasing makes it more difficult to use the results of the Commission's survey to directly assess whether inflation expectations are in line with the ECB's inflation target.

Information on businesses' inflation expectations is collected in the ECB's quarterly survey of businesses, known as the ECB's contacts with non-financial corporations (CTS). In the CTS, the ECB does not directly inquire about inflation expectations of companies; instead, it asks about sector-specific price and cost outlooks, which helps assess the trends in euro area producer prices and wages and, consequently, the direction of consumer price inflation. It also provides valuable additional information about the causes of current price developments.

In addition to the CTS, the ECB has since 2009 gathered quarterly data on euro area companies' financing conditions through the Survey on the Access to Finance of Enterprises (SAFE). This survey, too, does not regularly ask companies about their inflation expectations, but recent surveys have included one-off additional questions concerning companies' recent and expected price developments. The Commission's business survey provides information on the price outlook of companies for a short three-month time horizon. At a general level, the results of the CTS, SAFE and Commission business surveys provide useful additional information when assessing short-term inflation trends and outlooks, but as it stands they do not provide information on the longer term inflation expectations for use in monetary policy decision-making.

Since 2019, the ECB has also collected information on inflation expectations in its Survey of Monetary Analysts (SMA). The SMA includes 29 respondents from the counterparties of the ECB's money market operations (banks and other institutions) and provides information on the expectations of the financial sector regarding, among other things, inflation.

When are inflation expectations considered to be well anchored?

There are different ways to determine whether inflation expectations are anchored, one being that they are in line with the central bank's inflation target (level-anchored). Another, slightly less used but nonetheless important definition of inflation anchoring, according to Corsello et al. (2021), is called shock-anchoring, meaning that anchored long-term inflation expectations do not respond to short-term economic shocks. In line with this definition, Beechey et al. (2011)[4] argue that long-term inflation expectations are sensitive to economic news when these expectations are not firmly anchored. For it to be credible, a central bank's inflation target should define the long-term, average inflation rate, making the perceived long-term rate mostly insensitive to short-term news.

A credible central bank inflation target will also reduce uncertainty concerning future inflation. Thus, along with the average and median inflation expectations, the uncertainty about future inflation also serves as an indicator of how firmly expectations are anchored (see e.g. Gürkaynak et al., 2010).[5] For example, the distribution of long-term inflation forecasts made by professional forecasters provides information on inflation-related uncertainty. Similarly, changes in the probability distribution derived from inflation options give a market pricing-based view of the uncertainty around future inflation (see e.g. Hilscher et al., 2022).[6]

The anchoring of expectations is not, however, an unambiguous phenomenon in which expectations are either clearly well-anchored or unanchored, but rather a question of how firmly or poorly the expectations are anchored to the inflation target. For example, before 2012, inflation expectations in the United States were more sensitive to economic news than in the euro area, which has been interpreted as an indication that at the time, expectations were less firmly anchored in the United States than in the euro area (Beechey et al., 2011). According to Bundick and Smith (2018 and 2023)[7], the adoption of a numerical inflation target by the US Federal Reserve System in early 2012 then helped to improve the anchoring of expectations.

Expectations this year have been more sensitive to inflation surprises

Before the COVID-19 pandemic and Russia's war in Ukraine, the euro area experienced a prolonged period of low inflation, which began in 2013. Inflation even temporarily dropped into negative territory at the end of 2014 and into 2015. At the same time, there was a sharp fall in inflation expectations, especially short-term – but also long-term – expectations. Market-based

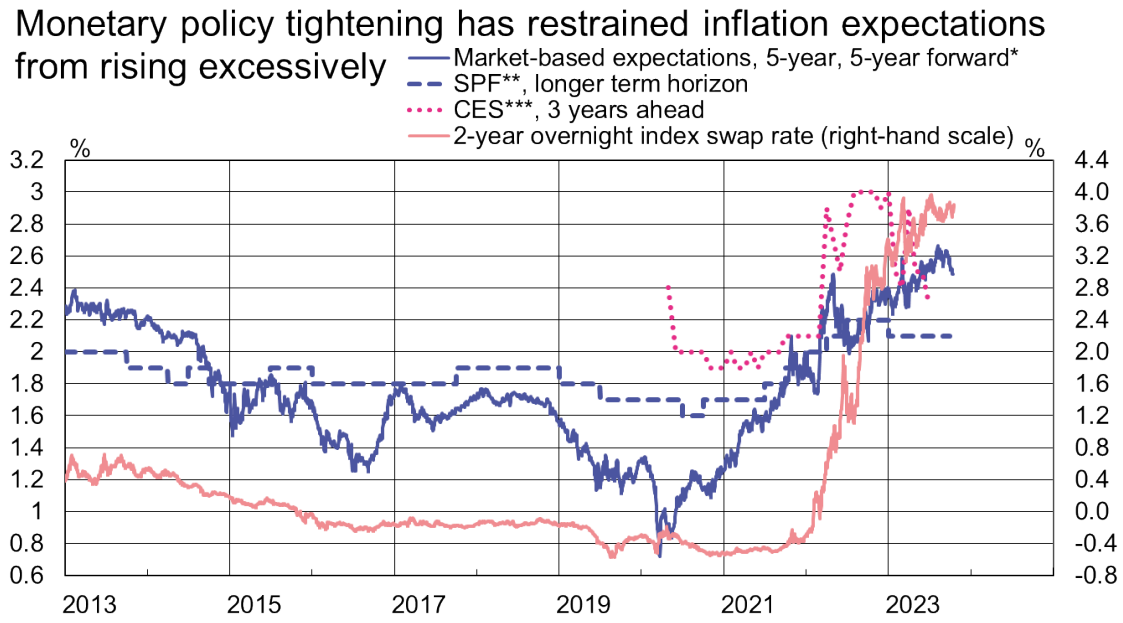
expectations decreased the most, but a decline was also evident in the results of the ECB Survey of Professional Forecasters (Chart 1). This raised concerns that the level of expectations was no longer firmly anchored to the ECB's inflation target, and consequently that there was an increased risk of drifting into deflation. In early 2015, the ECB adopted substantial monetary policy stimulus measures to return inflation expectations and inflation to their target level.

Despite the accommodative monetary policy stance, inflation expectations remained below the ECB's price stability target for a long time. Corsello et al. (2021) found that in 2013–2019, the long-term inflation expectations derived from the SPF became more sensitive to negative inflation surprises (and to short-term inflation expectations). In their analysis, Garcia and Werner (2021) concluded that the anchoring of euro area inflation expectations has weakened since 2013: the inflation expectations derived from 5-year, 5-year forward swap prices are increasingly sensitive to surprises in inflation forecasts.

During the period of post-pandemic economic recovery, inflation expectations rose gradually, after having been historically low in spring 2020. At the beginning of 2022, both inflation expectations of the markets and those from the SPF had returned close to the ECB's inflation target of 2%. Russia's invasion of Ukraine and the subsequent energy crisis triggered high turbulence and uncertainty in the markets, and inflation expectations rose significantly in spring 2022. Short-term inflation expectations, in particular – and specifically those of consumers[8] – rose sharply, but there was also a steep and strong upward shift in longer term expectations. Since mid-2022, both the market-based and SPF-based inflation expectations have been slightly above the ECB's 2% inflation target.

Market-based inflation expectations increased in February and March 2023, and long-term market expectations have risen to slightly above 2.5% since April. Overall, inflation expectations have fluctuated a lot in 2022 and 2023 – especially in the case of market-based expectations because of the high frequency of updates to this data – which demonstrates well the uncertainty seen in the markets in recent times. Sharp movements particularly in the early phase of the Ukraine war and again this year, and specifically in short-term inflation expectations, may indicate that, in the current environment of market uncertainty, economic and financial news and shocks may be exerting a stronger and more persistent influence on inflation expectations than before. This may point to an increased risk that inflation expectations have become less well anchored.

Chart 1.



A more extensive analysis of the expectation indicators, however, shows no clear evidence that inflation expectations have become de-anchored. In 2023, only market expectations have suggested a movement towards higher inflation expectations, though this could also be explained by the increase in risk premia and not necessarily by a rise in inflation expectations. Long-term expectations are still fairly close to their long-term average level, so they are in no way exceptionally high. The surveys of professional forecasters, businesses and consumers all demonstrate that inflation expectations have moderated in the course of this year. In both the SPF and the CES, long-term expectations have returned close to the inflation target. The 5-year forward inflation expectations from the SPF are close to the average of the pre-pandemic data series (1999–2019). Similarly, the 3-year forward inflation expectations from the CES have returned closer to the levels that prevailed in the initial years of the survey (2020–2021).

In the latest Survey of Monetary Analysts (SMA) from July 2023, inflation is expected to moderate noticeably towards the end of this year and in 2024 and to return to around 2%. Businesses' inflation expectations have moderated, too. Therefore it seems that, despite the recent sharp movements and the clear upward trend in short-term inflation expectations, in particular, inflation is not going to get out of control, and long-term inflation expectations are reverting back to their previous levels.

Uncertainty over future inflation has increased

In assessing the evolution of inflation expectations, their distributions should also be analysed. Distributions of inflation expectations can be examined on the basis of the prices of inflation options or on the basis of survey results. As the panel of respondents is usually very heterogeneous in surveys, any average values calculated from the responses may conceal very different expectations about inflation. In this context, Reis (2021) finds that the risk of a post-pandemic rise in inflation expectations and in inflation was detected too late. He states that the risk of inflation accelerating was already visible in inflation distributions at an earlier phase: in 2021 in the United States, the distribution of consumers' inflation expectations began to show greater dispersion and to be skewed towards high inflation, as a larger proportion of consumers started seeing high inflation as a more persistent phenomenon. At the same time, however, the average expectation of consumers initially only changed marginally. By 2022, the situation had finally shifted to such an extent that the average expectation was also indicating a rise in consumers' inflation expectations.

Inflation expectation distributions for the euro area can be analysed using market information or the results of the SPF, for example. Market-based inflation expectation distributions can be derived from inflation options, whereas in the SPF, respondents are asked to give not only a point estimate but also to assign probabilities to different ranges of inflation outcomes. The probability distribution of five-year inflation expectations implied by market information shows that the probability of high inflation increased significantly after Russia's invasion of Ukraine. Already before this, during the post-pandemic recovery, there had been anxiety in the markets over the probability of higher inflation. Market information suggests that the risk of very high inflation has subsequently decreased slightly, but the markets still consider this risk as being clearly more probable compared with inflation expectations before the Ukraine war.

The general and growing uncertainty in the markets was visible in the probability distribution for inflation expectations derived from market information, as a clear widening of the distribution and as a skew to the right – towards the probability of higher inflation – in spring 2022 (Chart 2). This demonstrates, on the one hand, how the markets increasingly disagreed about the direction of inflation (widening of the distribution) and, on the other, how a greater proportion of respondents considered that inflation would accelerate rather than slow down (skewness of the distribution). In the case of the SPF inflation expectations, the probability distribution also widened, the probability of high inflation increased and the distribution became skewed towards high inflation (Chart 3).

Although the average values of the expectation indicators remained close to the inflation target in

2022 and 2023, the distributions' skewness towards high inflation was a clear sign that there was an obvious risk of a potential de-anchoring of inflation expectations.[9]

Chart 2.

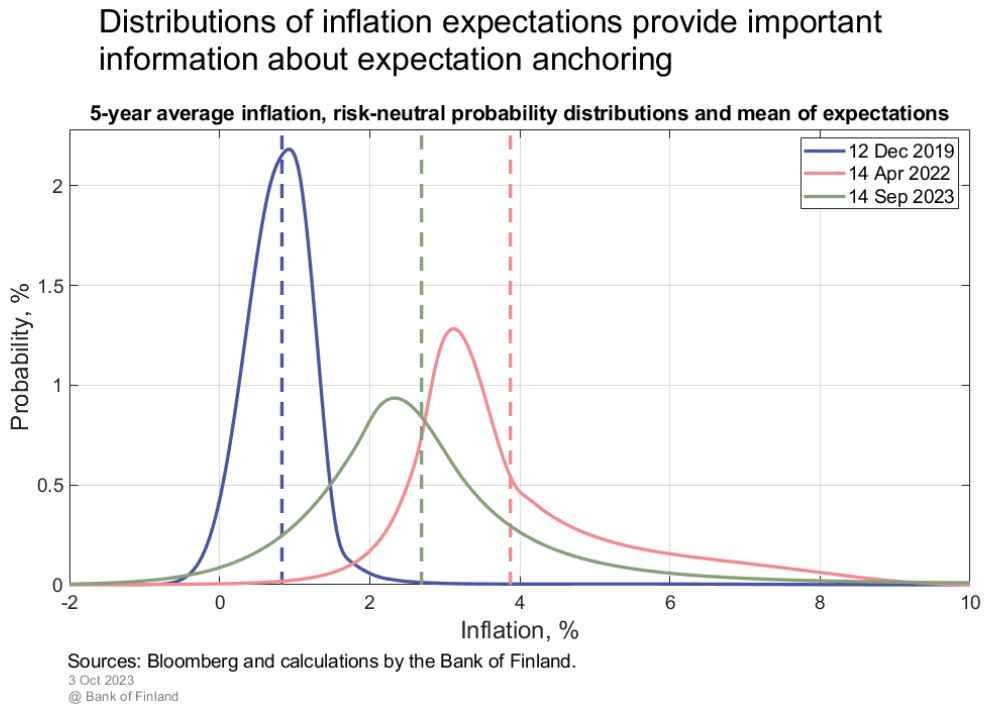
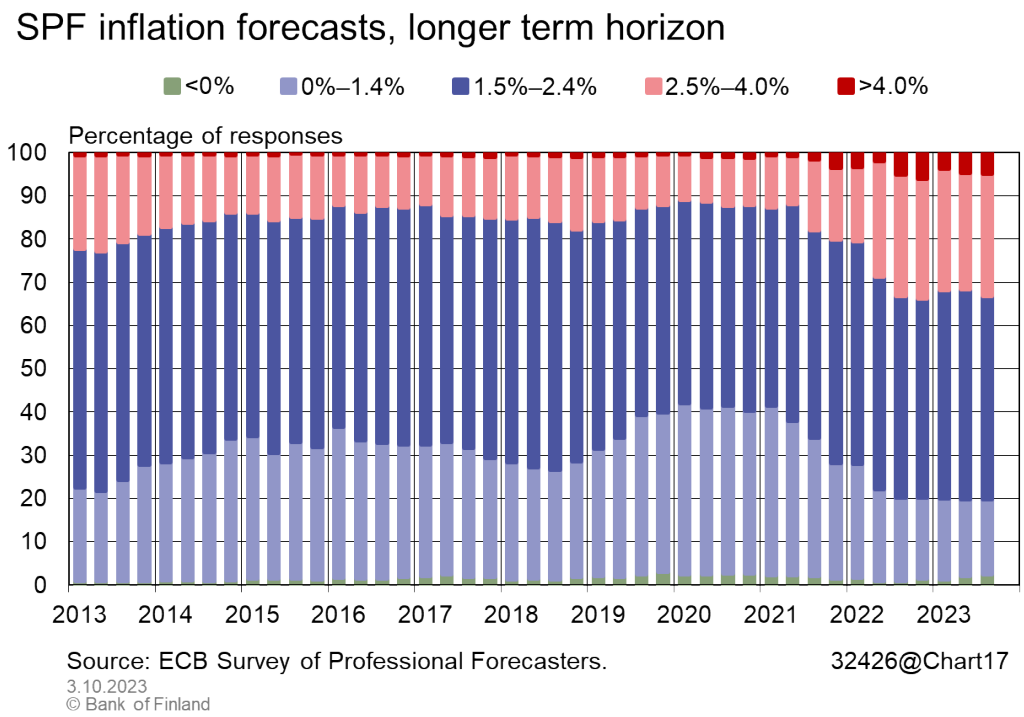


Chart 3.



Monetary policy measures have stabilised inflation expectations

Before 2022, inflation expectations were below 2% for a long time. Although they have since returned fairly close to the ECB's long-term target, they have become more sensitive to inflation surprises and to other changes in the inflation outlook. Consequently, the risk of inflation expectations becoming less well anchored has increased. The wider fluctuations in inflation expectations seen since 2022 may be attributable to the many inflation surprises that have pointed towards higher inflation. Inflation expectations also incorporate a risk of a more permanent shift towards greater price pressures because of the energy transition and deglobalisation, among other things. Financial and fiscal dominance risks, which have featured in discussions, may also have increased the uncertainty over the future path of inflation.

Strong monetary policy measures have, however, stabilised inflation expectations and made them more firmly anchored. Before 2022, central banks responded to low inflation expectations by decreasing their policy rates to exceptionally low levels – even below zero – and by introducing many unconventional monetary policy instruments. Now that the risk of above-target inflation is relevant, the unconventional monetary policy measures have gradually been discontinued and key policy rates have been raised substantially, which has been evident in the rising level of euro area

longer term risk-free rates (see Chart 1). Inflation expectations mirror the ECB's commitment to its price stability target. Strong monetary policy tightening has helped to anchor inflation expectations near the ECB's target.

ⓘ Inflation expectations are obtained from many sources – the interpretation of each involves challenges

Consumers' inflation expectations are highly heterogeneous and reflect their own consumption habits and perceptions of the current level of inflation

The inflation expectations of consumers have recently attracted wide attention and been studied closely. Generally speaking, consumers' inflation expectations are strongly related to individual factors and to perceptions of current inflation rather than to views on the future path of inflation. In low inflation countries, in particular, where sharp swings in inflation are rarely witnessed and where consumers perceive little benefit in becoming more informed about inflation, consumers' knowledge of the central bank's monetary policy and its inflation target may be limited. Consumers' inflation expectations may indeed diverge significantly from the central bank's inflation target, even in conditions where inflation is low and stable, at the target level (Coibion et al., 2020). Consumers' perceptions of the prevailing level of inflation may also differ noticeably from actual inflation. Consumers' expectations are based more on complex, subjective and imperfect information than is the case with the expectation indicators from surveys of businesses and professional forecasters. Kmetz et al. (2022) found that a significant proportion of the increased gap between the inflation expectations of US consumers and of professional forecasters during the period 2021–2022 could be attributed to heightened (negative) media coverage of inflation.

When forming their expectations of future inflation, consumers rely on their own consumption habits and spending behaviour; prices that have changed substantially and received wide attention, such as those of fuels, food or energy, may strongly influence their inflation expectations (D'Acunto et al., 2021 and Trehan, 2011). For these reasons, the distribution of consumers' inflation expectations is clearly wider than that for other

inflation expectation indicators. Kim and Binder (2023) observed that repeat survey participation also influences consumers' responses: the inflation expectations of repeat survey participants are, on average, lower and so too is the level of uncertainty. This means that these repeat participants 'learn' to respond to the survey as they become more informed about inflation, whereas the inflation expectations of new survey participants are more influenced by their own subjective experience based on, for example, fuel price changes. The forecasting accuracy and variation seen in the inflation expectations also reflect the heterogeneity of consumers in terms of age, education, income, and so on. Moreover, consumers' inflation expectations are skewed upwards and higher on average than is the case with the other inflation expectation indicators. In a survey based on data from the United States, Europe and Japan, Gorodnichenko and Sergejev (2021) demonstrated that consumers do not expect deflation even in times of very low or negative inflation.

While businesses are the price setters in the economy, subjective experience is nevertheless a major determinant of their inflation expectations

As price setters, businesses play a key role in the economy. It might then follow that they attach great value to their inflation expectations. However, Coibion et al. (2018) showed that inflation is generally of relatively low importance in the business and pricing decisions of companies, and so few resources are devoted to assessing future inflation.

In fact, businesses' inflation expectations and the interpretation and analysis of these are surrounded by many of the same issues seen with consumers' expectations: businesses form a heterogeneous group with subjective views that are often based only on their own industry's input prices, costs and future prospects, and therefore do not necessarily reflect the price outlook and inflation expectations for the economy as a whole (e.g. Albaglia et al., 2022 and Candia et al., 2023a and 2023b). Although firms play a key role in inflation dynamics, Reis (2023) nevertheless argues that their rather short-term inflation expectations may very well be the least important for the re-anchoring of inflation expectations, given the prevailing conditions in which inflation has climbed rapidly. He bases his argument on the fact that firms are setting their prices not only in response to inflation expectations but also to the actual costs they face. These costs depend on the inflation expectations of consumers (wages) and of the financial markets (interests rates).

Surveys of professional forecasters show a broad correlation between these forecasters' inflation expectations and the central bank's inflation forecasts and inflation target

These surveys are perhaps the most commonly used expectation indicator in inflation analysis. This is due at least to the fact that surveys of professional forecasters have been conducted for a fairly long time, but also because the data obtained from them generally covers several different time horizons, stretching as far as ten years ahead. This information on professional forecasters' inflation expectations can be called into question though, as it very much reflects the central banks' inflation forecasts (e.g. Reis, 2020). One explanation for this is that professional forecasters base their views largely on the same academic structural and forecasting models of the economy as central banks. Respondents to the ECB's Survey of Professional Forecasters (SPF) also report that they use a high degree of judgement in their long-term forecasts (ECB, 2019), and this judgement, in turn, mainly relies on the inflation target of the ECB, actual inflation and market expectations (De Vincent-Humphreys et al., 2019). Professional forecasters may also lack the incentive to disclose their actual inflation expectations in a survey.

Market-based inflation expectations contain not just a perception of inflation but also an investment-related risk premium

Financial market data offer a valuable addition to the assessment of inflation expectations. Contrary to survey-based expectations, which are usually published rather infrequently and therefore represent a lagged response to changes in inflation and the economy, market-based inflation expectations can be produced on a daily basis. Another advantage of market-based expectations is that they can be formed across various time horizons, whereas surveys generally cover only a few specific time horizons (typically short- and medium-term horizons). Information from market data can also influence the views of other economic agents, and may therefore also be indirectly reflected in the inflation expectations of businesses, consumers and professional forecasters.

Market data is considered to be a reliable source in the sense that market participants often have a direct financial interest when determining their views and therefore a strong incentive to assess the future path of inflation. Typically, market-based inflation expectations are derived from inflation swaps, which are derivative contracts used to hedge against the uncertainty surrounding inflation. However, the prices of swaps do not

merely reflect derivatives traders' perception of inflation but also contain the compensation to investors for bearing the inflation risk. Consequently, changes in inflation expectations derived from inflation swaps do not necessarily merely reflect market-based expectations of inflation but also changes in investors' risk premiums (see e.g. Burban et al., 2022). Bahaj et al. (2023) observed that the liquidity premium amplifies movements in inflation swaps beyond actual changes in inflation expectations.

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Notes

1. Data on the market prices of euro area inflation swaps go back as far as the end of 2004, so the time series from which inflation expectations can be derived extends to almost 20 years. The advantage of expectations derived from inflation swaps is their high frequency: market swap data is available for each and every trading day. Euro area inflation swaps are available with a number of different maturities, up to as much as 30 years. Swaps with maturities from 1 to 10 years are generally seen as having the most relevance. ↑
2. The ECB has conducted and published the SPF since 1999. The survey is conducted quarterly with a panel that is composed of around 75 professional forecasters, of which about two thirds represent the financial sector and the rest represent non-financial institutions and research institutes. The average number of participants ranges between 40 and 50. In the SPF questionnaire, forecasters are asked to provide their inflation expectations for the current calendar year as well as the next one and the one after that, as well as an estimate for the longer term (4–5 years). Participants are also asked to provide their 'rolling horizon' forecast for 12 and 24 months ahead from the release of the latest available data (at the time of the survey). ↑
3. The survey is conducted separately for each country, and initially it covers the six largest economies in the euro area (Germany, France, Italy, Spain, the Netherlands and Belgium). ↑

The CES is a monthly online survey of some 14,000 adult consumers. The survey is currently being expanded to five new countries (Ireland, Greece, Austria, Portugal and Finland). In the CES, consumers are asked to assess inflation for three time horizons: their inflation perceptions over the past 12 months, inflation expectations over the next 12 months and inflation expectations over the next three years.

4. Beechey et al. (2011). ↑
5. Gürkaynak et al. (2010). ↑
6. Hilscher et al. (2022). ↑
7. Bundick and Smith (2018) and Bundick and Smith (2023). ↑
8. When interpreting the high level of consumers' inflation expectations, it should be borne in mind that, according to the Consumer Expectations Survey (CES), consumers also perceive actual inflation (inflation over the previous 12 months) as being significantly higher than it really is. ↑
9. Hilscher et al. (2022) examine changes in distributions of inflation expectations and the risk of 'inflation disasters' on the basis of the prices of 5y/5y inflation swaps. The authors argue that the low probability of inflation disasters may also be regarded as an alternative indicator of expectation anchoring. One of their findings is that the risk of high and persistent inflation has increased steadily in the United States since 2021, and in the euro area since 2022. ↑

Keywords

anchoring, euro area, inflation expectations, inflation targeting