



How ChatGPT helps to forecast ECB decisions

We employ ChatGPT to interpret several thousand speeches by ECB Governing Council members and categorise them as dovish or hawkish. The new derived "ChatECB Indicator" supports our forecast that the ECB will continue to cut interest rates in the coming quarters, albeit to a moderate extent.

| Dr. Marco Wagner

Our new "ChatECB Indicator" ...

An important component of our ECB interest rate forecast – alongside macro data and models – is the sentiment in the Governing Council. We try to derive this from the speeches and interviews of Governing Council members by interpreting their comments as "dovish" or "hawkish", which is based on our experience. In the future, we will also use ChatGPT to analyse ECB comments, which has two merits:

1. Firstly, it enables us to tackle the enormous number of speeches and interviews. With this new tool, we are able to analyse several thousand speeches by current and former members of the Governing Council since 1999.
2. Secondly, this AI application offers a certain degree of objectivity. The speeches and interviews are interpreted on the basis of a constant evaluation scheme.

This makes it possible to graphically depict changes in sentiment in the Governing Council and possible correlations with interest rate changes over a longer period of time. A detailed description of our approach can be found in the [appendix](#).

... is leading ECB decisions for several months ...

The resulting aggregated 'ChatECB indicator' ranges from -1 (dovish) to +1 (hawkish) and in many cases signals a change in monetary policy several months before the actual interest rate turnaround (title chart):

- After the dotcom bubble had burst in March 2000, the statements of the ECB Governing Council members became more dovish, and around nine months later they lowered interest rates. With the subsequent interest rate cuts, the ECB attempted to shield the European economy and financial markets from the possible consequences of the terrorist attacks of 11 September 2001.
- After the aftermath of the Lehman bankruptcy and the financial market crash had largely been overcome, the members of the ECB Governing Council became more confident again from mid-2009. As a result, their communication gradually became more hawkish, which resulted in an interest rate hike in April.
- Just a few months later, the debt crisis spread and the eurozone economy slipped into recession. The central bankers' statements became more dovish again, whereupon they lowered interest rates barely six months later, in November 2011.
- In mid-2013, the comments of the ECB Governing Council members once again became more dovish after a seemingly never-ending recession – the eurozone economy contracted by an average of 0.3% quarter-on-quarter for six consecutive quarters. At the same time, a disinflationary process had set in: inflation fell below 2% at the beginning of 2013, continued to fall significantly in the following months and even briefly turned into deflation at the end of 2014. The central bankers finally cut interest rates to -0.10% in June 2014 – the first time they went into negative territory.
- After almost a decade of low – and for long stretches negative – interest rates, central bankers became much more hawkish in 2021 in an environment of rising inflation rates. However, it took around a year for the ECB to take up the fight against inflation and push through its first interest rate hike.

However, there were also phases in which the ECB decision-makers changed their communication and interest rates more or less simultaneously. This applies to the interest rate hike around the turn of the millennium and in the years before the financial crisis. This is mainly due to the fact that the members of the ECB Governing Council, such as Presidents Willem Duisenberg (1998-2003), his successor Jean-Claude Trichet (2003-2011) or the then Chief Economist Otmar Issing (1998-2006), rarely commented on current developments, but rather gave speeches on more general issues such as the single monetary policy, the euro or European integration. In doing so, the ECB followed the strategy of "constructive ambiguity" at the time, with which it retained a certain element of surprise for market participants.



The parallel communication and interest rate cuts after the Lehman collapse can be explained by the fact that the ECB decision-makers were surprised by the outbreak of the crisis and were forced to react quickly.

Finally, the high volatility of the indicator between 2015 and 2020 is striking. This can be explained by the fluctuations in inflation and economic activity. However, because inflation rarely reached 2% in these years, most speeches had a dovish tone on average.

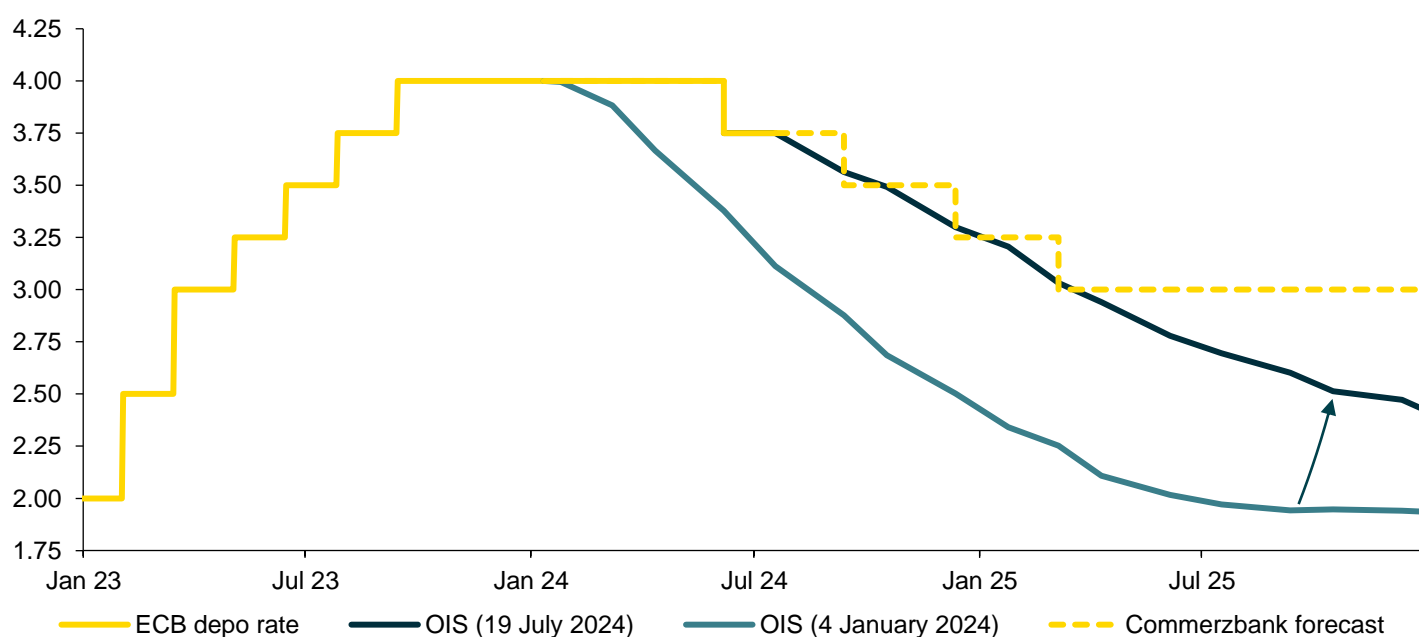
... and currently points to fewer interest rate cuts than previously expected

In view of the much more dovish tone of the ECB Governing Council members since the end of 2022, it can be assumed that they will tend to loosen monetary policy further after their first interest rate hike in June. However, in view of the somewhat more hawkish tone of late, the ECB's decision-makers are likely to cut interest rates rather cautiously. The recent stable core inflation rates of just under 3% – and therefore well above the ECB's target – have evidently also impressed the monetary policymakers.

These perceptions are reflected in the expectations of the markets, which have also become much more sceptical about the speed and scope of future interest rate cuts. The markets currently expect two further interest rate cuts by the end of the year and only a few beyond that, meaning that a deposit rate of around 2.75% could be reached by the end of 2025 (Chart 1).

Chart 1 - Markets expect fewer interest rate cuts than at the start of the year

ECB deposit rate and market expectations derived from overnight index swaps (OIS), in per cent; from July Commerzbank forecast



Source: Bloomberg, ECB, Commerzbank Research

The "ChatECB indicator" points to "cautious" cutting approach

In the past, our new "ChatECB indicator" has signalled changes in the direction of monetary policy at an early stage in some cases. Therefore, we reckon it reasonable complementing our toolkit for forecasting monetary policy. The indicator currently supports our view that the ECB should continue to loosen monetary policy in the future, but that interest rate cuts will be limited. The ECB's current stance is probably best described in the words of the Governor of the Banque de France, François Villeroy de Galhau, who advocates a "cautious" and "gradual approach".

Appendix - how the model works

For our new Commerzbank "ChatECB Indicator", the speeches of central bankers are scrutinized by ChatGPT. This allows us to analyse a large amount of comments from Governing Council members (in several languages) in a short time and to present the results graphically. In developing our new model, we draw on the work of our colleague Cesare Papa Malatesta, who analysed this topic as part of his master's thesis "[Quantifying the Effects of Central Bank Communication on Asset Prices](#)".



For our "ChatECB Indicator", we analysed several thousand speeches and interviews by Governing Council members since 1999 in three steps:

1. We use a web crawler to collect the speeches and interviews of former and current Governing Council members from the various websites (mainly of the ECB and the national central banks).
2. We prompt ChatGPT to pre-select whether a speech is relevant for understanding the monetary policy course or not. This step sorts out speeches about general topics such as the digital euro.
3. We use the relevant speeches and interviews and prompt ChatGPT to categorise them as "dovish", "moderately dovish", "neutral", "moderately hawkish" and "hawkish". These categories are then converted into numerical values from -1 to +1.

When interpreting the comments, ChatGPT draws on its acquired knowledge, whereby we use the latest version, GPT-4. The AI application is trained using an extensive text dataset from various sources on the internet. The training data includes diverse content such as books, (scientific) articles, websites and other forms of written text. This is how ChatGPT learns to interpret the speeches of ECB representatives as dovish or hawkish.

Overall, the aggregated "ChatECB indicator" shown in the title chart is a moving average of 40 speeches, which has proven to be an optimal compromise between too high and too low volatility. The final result is a measure of sentiment towards the ECB's monetary policy over time.

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We cannot guarantee the accuracy of the ChatGPT model and cannot completely rule out modelling biases or other shortcomings inherent in the underlying AI model. The conclusions of the model should be considered only as a guide and not as the sole basis for an investment decision.

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In accordance with ESMA MAR requirements this report was completed 26/7/2024 07:19 CEST and disseminated 26/7/2024 07:19 CEST.

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