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The ECB's announcements of non-standard measures and longer-term inflation expectations

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Stable and well-anchored longer-term inflation expectations bolster the ability of the European Central Bank (ECB) to achieve its medium-term inflation objective. This article assesses the effectiveness of non-standard monetary policy measures in guiding longer-term inflation expectations in an environment where standard interest rate policy approaches the lower bound. This causal channel is identified by looking at the change in five-year-ahead inflation expectations following announcements of non-standard measures in the period since 2013. The results suggest that non-standard measures, and in particular the asset purchase programme (APP), were conducive to preventing a potential unanchoring of longer-term inflation expectations.

Under normal circumstances, the ECB uses its key interest rates to maintain price stability in the euro area, i.e. an annual rate of increase in the Harmonised Index of Consumer Prices that is below, but close to, 2% over the medium term. The unrestricted room to manoeuvre and consistent inflation performance help keep longer-term inflation expectations well anchored. However, as the interest rate approaches its effective lower bound, there is the risk that longer-term inflation expectations may become unanchored. In order to mitigate this risk and stabilise inflation, the ECB deployed non-standard monetary policy measures. This article assesses whether those measures were effective in driving longer-term inflation expectations.^[2]

Identifying the causal effect of monetary policy

To identify the causal impact of non-standard measures on longer-term inflation expectations, it is important to control for reverse causality. Monetary policy actions not only cause changes in expectations, but can also endogenously respond to such changes or other factors influencing inflation expectations. In order to control for such an endogenous response, the analysis is performed in two steps. The first identifies the component of non-standard monetary policy measures which, from the perspective of the private sector, is unrelated to movements in longer-term inflation expectations. This component is captured by the surprise change in a monetary policy indicator within a narrow intraday window around the time of relevant policy announcements. These high-frequency surprises are free from any reverse impact, because it is highly unlikely that news unrelated to monetary policy will reach the market systematically within the same narrow window. In the second step, all policy surprises are cumulated over three months to obtain a quarterly measure. The causal impact of monetary policy on longer-term inflation expectations is then assessed by analysing the relationship between the quarterly change in longer-term inflation expectations and the cumulated policy surprises.

It is necessary to clarify beforehand that the analysis described here is useful for identifying the *causal impact*, but it is not well suited to assessing the *overall impact* of non-standard monetary policy measures on financial markets and longer-term inflation expectations. The surprises do not capture a substantial part of the impact of those policy measures, namely the component that was incorporated in private sector expectations between Governing Council announcements. For example, ten-year German Bund yields declined by 1.2 percentage points between June 2014, when the ECB announced to launch a series of targeted longer-term refinancing operations (TLTROs) and preparatory work for outright purchases of asset-backed securities, and March 2015, when the implementation of APP was initiated. A substantial part of that decline is likely to be attributable to the policy intervention. However, only around 0.1 percentage point of the decline occurred around the time of the ECB's press conferences.

The rest of this article describes in more detail the data employed in the analysis and the construction of the surprise component of non-standard measures, before presenting the results of the regression analysis.

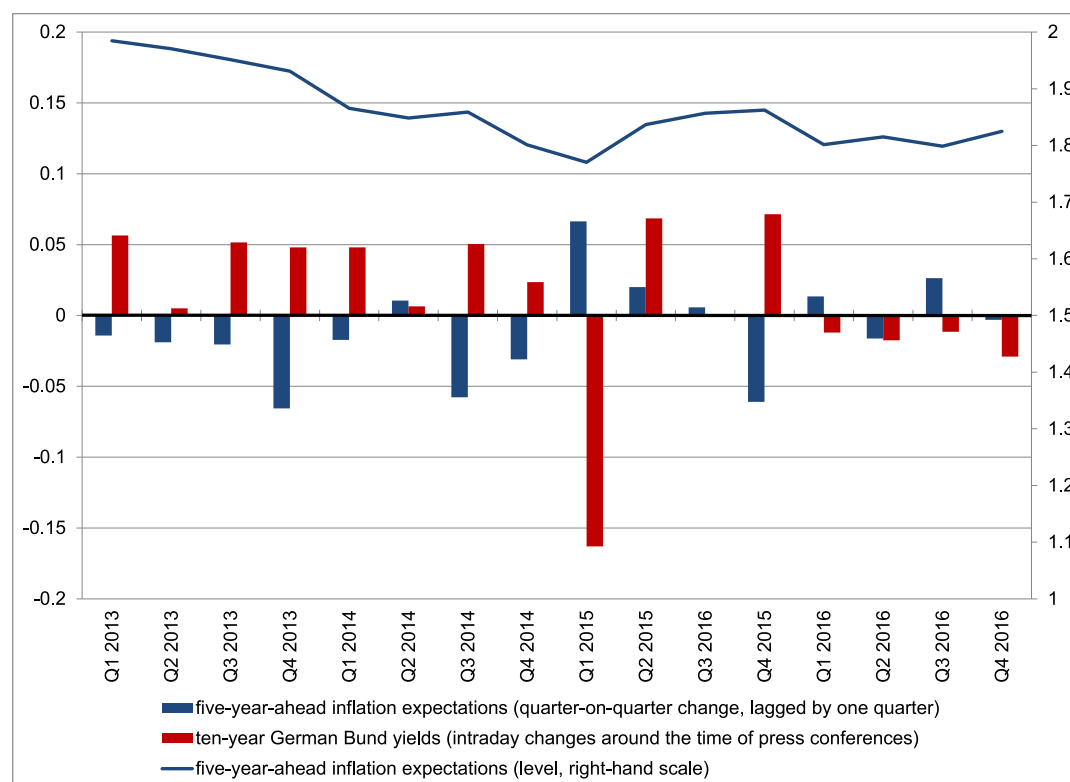
Measuring monetary policy surprises and inflation expectations

Monetary policy surprises are measured in a narrow window around the time of the ECB's regular press conferences, which were conducted monthly until December 2014 and, since then, have taken place eight times a year. They are held by the President and the Vice President of the ECB – starting at 14:30 CET and lasting around one hour – and include an introductory statement together with a Q&A session. The press conferences detail the economic outlook and the policy decisions of the Governing Council, including key parameters of non-standard measures such as the APP. Decisions on the key policy interest rates are not included; these are instead announced separately in a press release 45 minutes before the start of each press conference.^[3] As the aim of the analysis is to measure the impact of announcements of non-standard monetary policy measures, the direct impact of contemporaneous interest rate surprises is excluded from the baseline intraday surprise measure. Three of the press conferences analysed (5 June 2014, 22 October 2015 and 10 March 2016) included modifications to the forward guidance about the likely future behaviour of policy interest rates. Since there is no reliable way to separate the impact of non-standard measures from such forward guidance announcements, this article will examine whether the results are robust to excluding those days from the analysis.

The article uses ten-year German Bund yields as the monetary policy indicator. They are a suitable benchmark because German sovereign debt is arguably one of the safest and most liquid assets in the euro area. Longer-term yields are sensitive to non-standard policy measures and are less responsive to contemporaneous interest rate surprises or forward guidance, which means they are a suitable unit of measurement for non-standard policy surprises.^[4] The intraday market prices are constructed using quotes from the Thomson Reuters Tick History database. The monetary policy surprise is measured as the change in this indicator around the time of the press conferences.^[5] In particular, the analysis uses a 90-minute window starting 10 minutes before and ending 20 minutes after the hour-long event. The window is long enough to incorporate market reactions to these high-profile events, but is narrow enough to minimise the chances that unrelated regular news announcements bias our measure. For example, the intraday window excludes monetary policy announcements by the Bank of England, which were regularly released at 13:00 CET on the same day until the end of 2014.^[6] The red bars in the figure below show the quarterly sum of the surprises. The data reveal a major easing surprise in the first quarter of 2015, when the expanded APP was introduced. There were major tightening surprises over the course of 2013 and in the fourth quarter of 2015, when the recalibration of the APP did not fully meet market expectations.

Figure: Five-year-ahead inflation expectations and monetary policy surprises

(percentages)



The figure shows the evolution of monetary policy surprises and subsequent changes in longer-term inflation expectations since 2013. The red bars show the intraday changes in ten-year German Bund yields around the time of press conferences cumulated over each quarter. The blue bars show the subsequent

changes in the five-year-ahead inflation expectations as reported in the ECB Survey of Professional Forecasters (SPF), and the solid line plots the level of the same inflation expectations.

Longer-term inflation expectations are measured by the five-year-ahead yearly inflation rate predicted by the SPF, which is conducted quarterly, usually in January, April, July and October, and aggregates forecasts by over 50 forecasters from financial and research institutions. An advantage of survey-based measures of inflation expectations relative to market-based measures (for example, the five-year inflation-linked swap rate five years ahead) is that they reflect expectations without any additional compensation for risk, which contaminates market-based measures.^[7] The figure above shows the development of longer-term inflation expectations since the first quarter of 2013, when they started to decline gradually from slightly below 2%. The blue bars show the changes in those expectations in the subsequent quarter. The figure shows that the gradual decline in expectations was reversed in the first quarter of 2015, when the APP was introduced. Expectations then increased persistently for two quarters, before their improvement halted in the fourth quarter of 2015 alongside market disappointment with the December 2015 recalibration of the APP.

How strong is the impact?

The negative relationship between the policy surprises and the subsequent changes in longer-term inflation expectations is apparent in the figure above. To assess the magnitude of the relationship more formally, we can estimate the strength of the overall relationship using statistical techniques. The estimated relationship links the quarterly changes in the SPF five-year-ahead inflation expectations Δy_t to the lagged quarterly sum of the intraday surprises of ten-year German Bund yields (Δx_{t-1}):

$$\Delta y_t = \alpha + \beta \Delta x_{t-1} + \varepsilon_t$$

The parameter β measures the causal impact of monetary policy surprises on the inflation expectations. More specifically, it measures how an unexpected policy change can influence the subsequent development of the expectations. The table shows the estimates of β which measures the degree of the effects, for various samples and high-frequency surprise measures.

Table: Impact of high-frequency surprises in ten-year German Bund yields on five-year-ahead inflation expectations

	(1)	(2)	(3)	(4)	(5)
	Post-2013	Pre-2013	APP	APP, no FG	Daily
	Change (Δ) in five-year-ahead inflation expectations				$\Delta 5 \times 5$ ILS
Surprise in ten-year	-0.41***	0.16	-0.39**	-0.39***	-0.24***
German Bund yields	(0.08)	(0.11)	(0.10)	(0.08)	(0.10)
Sample	2013-16	2001-12	Q2 2014-2016	Q2 2014-2016	2013-2016
Observations	17	47	12	12	55
Goodness of fit	50%	5%	50%	60%	20%

Robust standard errors are in parentheses

*** significant at 1%, ** significant at 5%

The table shows the impact of surprises in ten-year German Bund yields around the time of press conferences on five-year-ahead inflation expectations.

The first regression runs over the sample of 2013-16. The results show a negative relationship that is significantly different from zero. The coefficient suggests that a 10 basis point decrease in ten-year German Bund yields caused by a policy easing is accompanied by a 4 basis point increase in five-year-ahead inflation expectations in the subsequent quarter. The overall explanatory power of the regression is high, though the sample is short. The second column tests the relationship over the 2001-12 sample. The coefficients are not statistically different from zero. This is in line with the view that, over this period, longer-term inflation expectations were well anchored and their response to policy surprises cannot be detected. Columns 3 and 4 show the robustness of the results over the sample between the second quarter of 2014 and 2016, when the asset purchase announcements were a dominant driving force of the policy surprises. Column 3 includes all surprises over the sample, and column 4 shows the impact if meetings announcing key modifications of the forward guidance on the interest rates are excluded. The results remain similar. Column 5 shows that the results remain robust if one uses the larger sample of daily changes in a market-based measure of inflation expectations instead of the quarterly survey-based measure. In particular, the regression shows the response of the daily change in the five-year inflation-linked swap rate five years ahead (5x5 ILS) to the intraday monetary policy surprise on 55 press conference days between 2013 and 2016.^[8]

Final remarks

The results suggest that in the period in which key ECB interest rates are restricted by the lower bound, announcements of non-standard monetary policy measures influenced longer-term inflation expectations. The caveat of the analysis is its small sample size. Nevertheless, the results indicate that non-standard monetary policy measures are important tools at the disposal of the ECB, which can be used to guide expectations and prevent a potential unanchoring of longer-term inflation expectations.

References

Andrade, P., Breckenfelder, J., De Fiore, F., Karadi, P. and Tristani, O. (2016), "The ECB's asset purchase programme: an early assessment", *Working Paper Series*, No 1956, ECB, Frankfurt am Main, September.

Coenen, G. and Schmidt, S. (2016), "The role of the ECB's asset purchases in preventing a potential de-anchoring of longer-term inflation expectations", *Research Bulletin*, No 25, ECB, Frankfurt am Main, July.

Gürkaynak, R.S., Sack, B. and Swanson, E. (2005), "Do actions speak louder than words? The response of asset prices to monetary policy actions and statements", *International Journal of Central Banking*, Vol. 1, No 1, May.

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[2] See also Andrade, P. et al. (2016) and Coenen, G. and Schmidt, S. (2016).

[3] Since 10 March 2016 key parameters of the APP have also been announced in the regular press release before the press conference. The results do not alter markedly if we include changes around the time of press releases in the surprise measure.

[4] The results are also robust to using five-year German Bund yields as a monetary policy indicator.

[5] See Gürkaynak, R.S., Sack, B. and Swanson, E.T. (2005).

[6] US weekly jobless claims are announced when the ECB press conferences start. Their effect can be disregarded because surprises in these announcements, measured as their difference from a Bloomberg survey, have only a marginal impact on the monetary policy indicator; they explain less than 1% of the variation in the monetary policy surprises.

[7] The results are robust if market-based inflation compensation measures are used (see column 5 in the table).

[8] The impact of the announcements on these market-based measures is somewhat smaller in absolute terms than the impact measured with survey-based inflation expectations. This is consistent with the view that the announcements reduced the required compensation for risk inherent in market-based measures, which offset part of the impact.

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