

3 Impact of the ECB's non-standard measures on financing conditions: taking stock of recent evidence

Since June 2014 the ECB has adopted a series of non-standard monetary policy measures to bring inflation rates back to levels below, but close to, 2% over the medium term. These measures have included targeted longer-term refinancing operations (TLTROs); lowering the deposit facility rate into negative territory; and an expanded asset purchase programme (APP) targeting a variety of investment-grade private and public sector securities. This set of measures has been underpinned by forward guidance on the key ECB interest rates, which are expected to remain at present or lower levels for an extended period of time, and well past the horizon of the net asset purchases; and on asset purchases, which are intended to continue at their current pace “until the end of December 2017, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent with its inflation aim”. In the context of its forward guidance, the ECB has also reiterated its readiness to increase the asset purchases in terms of size and/or duration, if a less favourable outlook or an unwarranted tightening in financial conditions were to materialise.

This box takes stock of recent evidence on the effectiveness of these measures in supporting financing conditions and credit intermediation. The adoption of non-standard monetary policy measures by major central banks, as well as their effects and the mechanisms by which they operate, have been the subject of much academic research in the past few years.¹³ This box reviews some key lessons that can be distilled from this research on the euro area, focusing on adjustments in financial market prices and in bank lending behaviour, which constitute the essential early stages of the monetary policy transmission process.¹⁴ The box organises the empirical evidence according to three stylised transmission channels, namely the signalling channel, the direct pass-through channel and the portfolio rebalancing channel.

Via the signalling channel, the non-standard measures have underpinned the ECB's intention to keep short-term interest rates low for an extended period of time and have supported inflation expectations. The reduction in the deposit facility rate to levels below zero has been a powerful instrument signalling that short-term interest rates may stay low, or even be reduced to lower levels, for a longer period than would have been expected otherwise; this has reinforced the effect of the ECB's APP on the entire yield curve.

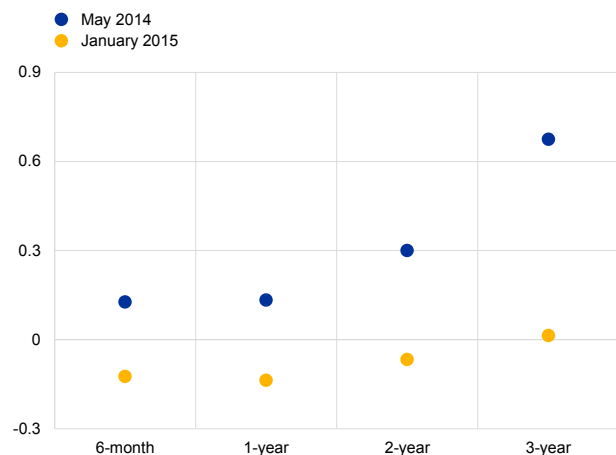
¹³ For the United States, see, for instance, Krishnamurthy, A. and Vissing-Jorgensen, A., “The Effects of Quantitative Easing on Long-term Interest Rates”, *Brookings Papers on Economic Activity*, autumn 2011, pp. 215-265, and Gagnon, J., Raskin, M., Remache, J. and Sack, B., “The Financial Market Effects of the Federal Reserve's Large-Scale Asset Purchases”, *International Journal of Central Banking*, Vol. 7(1), 2011, pp.3-43; for the United Kingdom, see Joyce, M.A.S., Lasaosa, A., Stevens, I. and Tong, M., “The Financial Market Impact of Quantitative Easing in the United Kingdom”, *International Journal of Central Banking*, Vol. 7(3), 2011, pp. 113-161.

¹⁴ For an earlier comprehensive assessment of the ECB's non-standard measures, see the article entitled “The transmission of the ECB's recent non-standard monetary policy measures”, *Economic Bulletin*, Issue 7, ECB, 2015.

Chart A

Three-month EONIA (OIS) forward rates

(percentages per annum; horizon)



Source: ECB.

A substantial part of the decline in the expected path of short-term interest rates can be ascribed to the non-standard monetary policy measures. Chart A compares two constellations of three-month overnight index swap (OIS) forward rates (which are a proxy for market expectations regarding the evolution of nominal short-term interest rates).¹⁵ The first constellation is observed in May 2014, i.e. just prior to the launch of the non-standard measures; the second constellation is observed immediately after the Governing Council meeting on 22 January 2015 when the APP was announced. Over the period from May 2014 to January 2015 market expectations regarding interest rates were revised downwards markedly, as reflected, for instance, in the decline of OIS rates three years ahead, which fell by around 70 basis points. In addition to the monetary policy measures, a variety of factors may possibly have contributed to these changes in market expectations.

Within the literature, one method used to identify the contribution of the ECB's measures is to examine changes in asset prices around policy announcement dates (an approach often referred to as "event-study evidence").¹⁶ This approach confirms that a relevant part of the decline in the expected path of short-term rates can be ascribed to the non-standard monetary policy measures.¹⁷ Moreover, this approach shows that the measures have exerted signalling effects on inflation expectations, which have increased markedly, in particular around the various APP announcement dates.¹⁸ This re-anchoring of inflation expectations is instrumental in achieving a sustained adjustment in the path of inflation.¹⁹

¹⁵ In principle, OIS forward rates may not fully reflect expected future short-term rates because they may embody a term premium component. In view of the focus on short and medium-term maturities, this consideration is somewhat less relevant, given that for such maturities the compensation for term risk tends to be more contained.

¹⁶ As financial markets are forward looking, asset prices will respond to policy measures when expectations of those measures are formed and revised, notably around the time of policy announcements. Similar event-study approaches have been used to assess the policy measures adopted in the United States and the United Kingdom. For the United States, see, for instance, Krishnamurthy, A. and Vissing-Jorgensen, A., *op. cit.*; and, for the United Kingdom, see Joyce, M.A.S., Lasaosa, A., Stevens, I. and Tong, M., *op. cit.*

¹⁷ The signalling channel has also contributed to reducing uncertainty surrounding future interest rates. As lower interest rate volatility decreases the likelihood of large swings in the interest rate, it also makes bonds with long maturities less risky, and hence induces a compression in term premia.

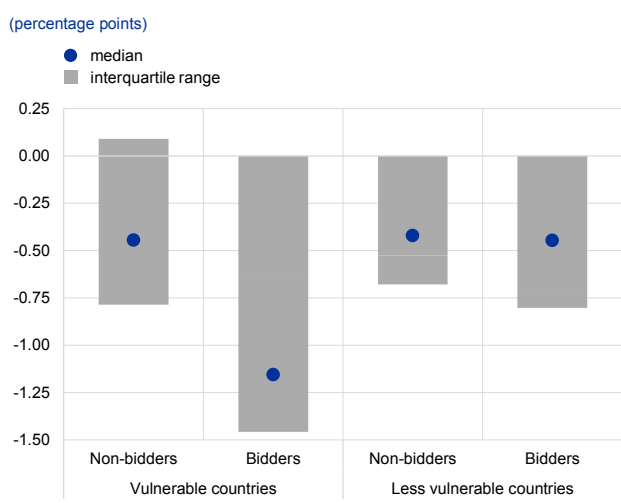
¹⁸ For instance, it has been found that the APP announcement in January 2015 raised inflation expectations across all maturities, with an impact ranging between 10 and 30 basis points for a maturity of five years on inflation expectations derived from inflation-linked swap contracts. See Altavilla, C., Carboni, G. and Motto, R., "Asset purchase programmes and financial markets: lessons from the euro area", *ECB Working Paper Series*, No 1864, ECB, 2015; and Ambler, S. and Rumler, F., "The Effectiveness of Unconventional Monetary Policy Announcements in the Euro Area: An Event and Econometric Study", *Oesterreichische Nationalbank Working Papers*, No 212, Oesterreichische Nationalbank, 2017.

¹⁹ Specifically, a model-based assessment suggests that this re-anchoring channel may account for a third of the APP's impact on inflation. See Andrade, P., Breckenfelder, J., De Fiore, F. and Karadi, P., "The ECB's asset purchase programme: an early assessment", *ECB Working Paper Series*, No 1956, ECB, 2016.

Via the direct pass-through channel, monetary policy has induced a further pronounced easing in the market segments targeted by the non-standard measures. As well as inducing a broad-based easing in financial conditions, the ECB's policy measures have been designed to directly improve the way in which the resultant stimulus is passed through to the borrowing conditions of households and firms. The effectiveness of this channel is most evident in the case of the TLTROs, which have built-in incentive mechanisms to ensure that the favourable funding costs they offer to banks are passed on to the ultimate borrowers.²⁰

Chart B

Changes in lending rates for non-financial corporations: TLTRO-I operations



Source: ECB.

Notes: This chart covers the period from June 2014 to July 2015. In "vulnerable" countries, the "non-bidders" group comprises 10 banks and the "bidders" group comprises 49 banks. In "less vulnerable" countries, the "non-bidders" group comprises 71 banks and the "bidders" group comprises 43 banks.

Chart C

Changes in lending rates for non-financial corporations: TLTRO-II operations



Source: ECB.

Notes: This chart covers the period from March to December 2016. In "vulnerable" countries, the "non-bidders" group comprises 24 banks and the "bidders" group comprises 47 banks. In "less vulnerable" countries, the "non-bidders" group comprises 73 banks and the "bidders" group comprises 51 banks.

Charts B and C provide evidence of this channel using information on banks' lending rates and their bidding behaviour in the two series of TLTROs. The evidence suggests that banks located in vulnerable countries that have participated in TLTROs have lowered their lending rates by more than non-participating banks.²¹ This has helped steer the monetary stimulus to private sector borrowers in the euro area who have been most in need of accommodation.

Finally, via the portfolio-rebalancing channel, the ECB's non-standard measures have compressed risk premia across a wide range of asset classes.

Central bank asset purchases typically entail the absorption of medium to longer-

²⁰ The TLTROs are targeted operations, as the amount that banks can borrow is linked to their loans to non-financial corporations and households. The incentive mechanism works through price effects under TLTRO II: if participating banks outperform their specific quantitative benchmark for credit creation, the interest rate on their TLTRO II borrowings decreases relative to the standard borrowing cost – equal to the rate on the main refinancing operation applicable at the time of settlement – and can fall as low as the interest rate on the deposit facility applicable at the same time.

²¹ Throughout this box, the term "vulnerable countries" refers to Ireland, Greece, Spain, Italy, Cyprus, Portugal and Slovenia, while the term "less vulnerable countries" refers to the remaining euro area countries.

term bonds in return for “zero-duration” central bank reserves. As a result, investors have an incentive to rebalance their portfolios towards other, riskier market segments, while accepting lower compensation for holding this risk. This is because central bank purchases free up risk-taking capacity in the private sector and drive down risk-adjusted returns on the assets targeted by the purchase programmes, hence inducing investors to consider alternative investments. In order to shed light on this channel, Charts D and E show changes in the yields on securities for selected euro area sovereigns during the press conference on 22 January 2015 when the APP was announced.²² As the theory predicts, the longer the term to maturity, the sharper the decline in yields was. Broader asset price reactions are also consistent with the view that the ECB’s measures have brought about an easing in financial conditions, which was evident from the improvement in stock markets and the decline in corporate bond yields around this announcement. Arguably, confining the assessment to the market reaction on 22 January 2015 when the official announcement was made does not capture the evidence that ECB communications hinting at the imminent launch of a purchase programme began to affect market expectations as early as September 2014. When these anticipation effects are accounted for, the response of asset prices is qualitatively similar to the response seen following the APP announcement on 22 January 2015; quantitatively, the APP explains the bulk of the decline observed in euro area long-term bond yields since September 2014.²³ Moreover, risk premia have been compressed across a wide range of asset classes, suggesting spillovers to non-targeted assets. In the case of later recalibrations of the APP, it has become increasingly challenging to identify their effects via event studies, because market participants have, over time, gradually revised their expectations regarding policy packages on the basis of the continuous stream of economic data releases.²⁴ At the same time, available studies that seek to address this challenge by using time series and cross-sectional variation in asset prices and asset purchase volumes also confirm that the ECB’s measures explain the bulk of the decline observed in euro area long-term risk premia since September 2014.²⁵

²² Charts D and E report changes in yields between 14:30 and 16:00 CET on 22 January 2015 – i.e. between the start of the press conference and immediately after it ended.

²³ Most of the impact attributed to the APP is related to “stock effects” – i.e. the persistent changes in yields that are associated with the absorption of securities by central banks. See, for instance, Altavilla, C., Carboni, G. and Motto, R., *op. cit.*; Blattner, S.T. and Joyce, M.A.S., “Net debt supply shocks in the euro area and the implications for QE”, *ECB Working Paper Series*, No 1957, ECB, 2016; De Santis, R., “Impact of the asset purchase programme on euro area government bond yields using market news”, *ECB Working Paper Series*, No 1939, ECB, 2016; and Koijen, R.S.J., Koulischer, F., Nguyen, B. and Yogo, M., “Quantitative easing in the euro area: The dynamics of risk exposure and the impact on asset prices”, *Banque de France Working Papers*, No 601, Banque de France, 2016. The impact of the actual implementation of the purchases (“flow effects”) is also found to be significant, albeit more limited than the stock effects. See Holm-Hadulla, F. and De Santis, R., “Flow effects of ECB sovereign bond purchases: evidence from a natural experiment”, *ECB Working Paper Series*, ECB, forthcoming.

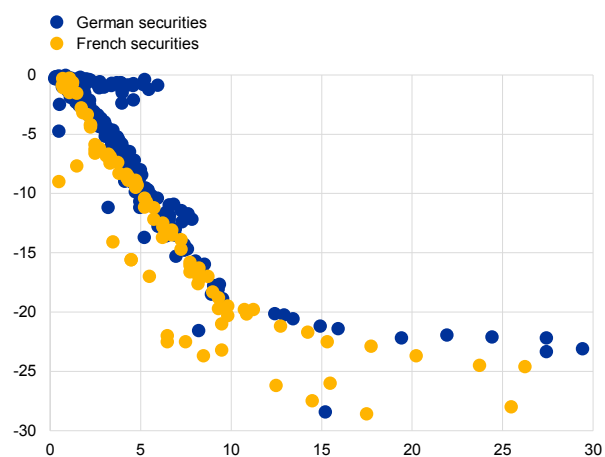
²⁴ This was evident, for instance, in the context of the most recent recalibration of the ECB’s monetary policy stance at the Governing Council meeting on 8 December 2016, which was largely anticipated by the market, as confirmed by survey-based information.

²⁵ See, for instance, Blattner, S.T. and Joyce, M.A.S., *op. cit.*

Chart D

Changes in yields of German and French securities following the announcement of the APP on 22 January 2015

(basis points; years to maturity)

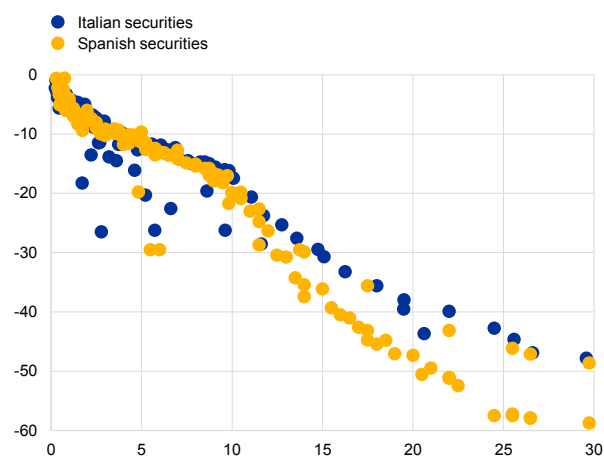


Source: ECB calculations.

Chart E

Changes in yields of Italian and Spanish securities following the announcement of the APP on 22 January 2015

(basis points; years to maturity)



Source: ECB calculations.

The rebalancing channel has not only affected financial assets, it has also given banks incentives to improve credit conditions for households and non-financial corporations alike. A host of empirical analyses highlight that the different measures have had a mutually reinforcing impact on bank lending conditions.²⁶ For instance, on the liability side, the TLTROs have brought funding relief for banks participating in the operations; at the same time, the APP and the interest rate cuts have led to a compression of funding costs for the banking system as a whole. On the asset side, the negative interest rates on excess liquidity have reinforced portfolio rebalancing effects. This is because the implicit charge applied on excess reserves has increased the velocity of circulation of excess reserves in the money market, and thus has improved the relative attractiveness for banks of granting loans or holding securities with a higher return. At the same time, the precise patterns of the resultant improvements in credit conditions have varied across different types of bank and/or across countries.

In the case of banks with greater recourse to TLTROs and tighter balance sheet constraints, the measures have tended to be transmitted as a reduction in lending rates. For instance, banks located in vulnerable countries with high levels of participation in TLTROs have responded to policy measures primarily by lowering

²⁶ See, for instance, Albertazzi, U., Becker, B. and Boucinha, M., "Portfolio Rebalancing and the Transmission of Large-Scale Asset Programs: Evidence from the Euro Area", available as a conference paper in *Monetary policy pass-through and credit markets – ECB conference 27-28 October 2016*, ECB, Frankfurt am Main, 2016; Altavilla, C., Canova, F. and Ciccarelli, M., "Mending the broken link: heterogeneous bank lending and monetary policy pass-through", *ECB Working Paper Series*, No 1978, ECB, 2016; and Boeckx, J., De Sola Perea, M. and Peersman, G., "The Transmission Mechanism of Credit Support Policies in the Euro Area", *Working Paper Research*, No 302, Nationale Bank van België/Banque Nationale de Belgique, 2016.

interest rates on lending to non-financial corporations.²⁷ In such cases, the flow of credit has recovered only gradually amid, inter alia, a structural need for deleveraging and weak cyclical demand on the back of a slow economic recovery in vulnerable countries. The strong pass-through to lending rates in the countries that were hit hardest by the financial crisis largely reflects a normalisation from earlier impairments. This has also resulted in a reduction in the dispersion of bank lending rates and receding fragmentation in terms of financing conditions across euro area countries.²⁸

In the case of banks holding excess liquidity and facing significant demand for credit, the stimulus has tended to result in an improvement in credit volumes.

As a result of the ECB's measures, banks located in countries where the economic recovery has been firming more rapidly have rebalanced their portfolios by extending the provision of credit. In these countries, the impact on the cost of borrowing is less significant than in more vulnerable economies, possibly because spreads and premia were already compressed. Moreover, the relatively solid balance sheet positions of banks in less vulnerable economies have provided scope for asset expansion. Finally, complementary evidence suggests that negative policy rates have amplified portfolio rebalancing incentives, as increases in credit volumes have been found to be particularly significant in the case of banks with high levels of excess liquidity.²⁹

Taken together, the evidence supports the “bank lending view” of monetary policy transmission, according to which banks’ balance sheet conditions affect the terms and conditions of bank credit. The evidence also shows that the transmission of asset purchases in a bank-based system such as the euro area is not weaker than in systems in which capital markets take centre stage. Coupled with negative interest rates and targeted lending operations, the ECB stimulus has led to tangible improvements in borrowing conditions for the real economy.

²⁷ For instance, by the end of December 2015 non-standard measures had contributed 40 basis points to keeping interest rates on new loans to firms low. See Altavilla, C., Canova, F. and Ciccarelli, M., op. cit. See also Albertazzi, U., Nobili, A. and Signoretti, F., “The Bank Lending Channel of Conventional and Unconventional Monetary Policy”, *Banca d'Italia Working Papers*, No 1094, Banca d'Italia, 2016.

²⁸ See the article entitled “MFI lending rates: pass-through in the time of non-standard monetary policy”, *Economic Bulletin*, ECB, Issue 1, 2017.

²⁹ Demiralp, S., Eisenschmidt, J. and Vlassopoulos, T., “Negative interest rates, excess liquidity and bank business models: banks’ reaction to unconventional monetary policy in the euro area”, *ECB Working Paper Series*, ECB, forthcoming.