Monetary policy transmission mechanisms

Carlo Altavilla
European Central Bank

13th ECB Central Banking Seminar: Monetary policy in the euro area
Frankfurt am Main, 1 to 5 July 2019

The opinions in this presentation are those of the authors and do not necessarily reflect the views of the European Central Bank and the Eurosystem
Interest rate corridor and excess liquidity

**Interest rate corridor**

- **Eonia**
- **MRO**
- **Deposit rate**
- **Marginal Lending Rate**

**Excess Liquidity**

(Current Account + Deposit Facilities - Reserve requirements)

Source: ECB.
Term structure of OIS yields at different dates (percentages per annum)

Channels of Transmission

Standards Measures (interest rate)
- Interest rate
- Confidence
- Exchange Rate
- Expectations

Non-Standards Measures (QE, NIRP, TLTRO, FG)
- Signalling
- Direct pass-through
- Portfolio rebalance
- Risk-taking, Deposit channel

New Policy instruments and toolkit
Challenges to monetary policy normalisation

Source: Thomson Reuters, Bloomberg and ECB calculations.
Euro Area Monetary Policy Database (EA-MPD): High-frequency database that covers all official policy actions across different maturities (for several asset classes).


Altavilla, Brugnolini, Gürkaynak, Motto, Ragusa (2019) "Measuring euro area monetary policy," ECB WP 2281
The Footprint of monetary policy measures

Altavilla, Brugnolini, Gürkaynak, Motto, Ragusa (2019) "Measuring euro area monetary policy," ECB WP 2281
The transmission of standard measures

The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

Impact on GDP and Inflation

Conclusions
The transmission of standard measures

The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

Impact on GDP and Inflation

Conclusions
Transmission mechanism – How interest rates affect prices

Official interest rates

- Expectations
- Money market rates
- Money, credit
- Asset prices
- Bank rates
- Exchange rates
- Wage and price-setting
- Supply and demand in goods and labour markets
- Domestic prices
- Import prices

Price developments
The transmission of standard measures

The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

Impact on GDP and Inflation

Conclusions
Monetary policy announcement – high frequency effect on banks

Sovereign Holdings by banks

Developments in main bank credit components in the euro area
(12-month flows in EUR bn, nsa)

Composition of euro area credit institutions’ sovereign bond portfolios
(share of each group of issuer, percentage points)

Source: ECB.
Notes: Loans to private sector exclude interbank and CCP loans. Latest observation: April 2019.

Source: ECB.
Notes: Holdings of bonds issued by general governments resident in the euro area. Latest observation: 2018Q4.
Evidence from the Bank Lending Survey

Impact of the APP on euro area banks’ assets and market financing conditions (net percentages of banks)

- **equity issued**
- **unsecured bank bonds**
- **covered bonds**
- **financing via ABSs**
- **euro area sovereign bond holdings**

Source: ECB. Bank lending survey (BLS)

Notes: The net percentages are defined as the difference between the sum of the percentages for “increased/improved considerably” and “increased/improved somewhat” and the sum of the percentages for “decreased/deteriorated somewhat” and “decreased/deteriorated considerably”. The periods in the legend refer to the respective BLS survey rounds. “Expected” denotes expectations indicated by banks in the current round.

Impact of the APP on bank lending volumes (net percentages of banks)

Source: ECB. Bank lending survey (BLS).

Notes: The net percentages are defined as the difference between the sum of the percentages for “increased considerably” and “increased somewhat” and the sum of the percentages for “decreased somewhat” and “decreased considerably”. The periods in the legend refer to the respective BLS survey rounds. “Expected” denotes expectations indicated by banks in the current round.
The transmission of standard measures

The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

Impact on GDP and Inflation

Conclusions
Transmission Channels of NIRP

1. Removal of non-negativity restriction
NIRP not only shifts down short rates to negative territory, but also keeps open expectations of possible further rate cuts. As a result, the forward curve becomes flatter and monetary accommodation propagates over the entire term structure.

2. Demand of long-term assets
The incentive for investors to move to longer dated assets increases the demand for these securities relative to their supply. This ultimately exerts an extra downward pressure on the term premium, which compensates investors for the risk of holding bonds with longer duration.

3. Portfolio rebalancing channel
The attempt by individual banks to escape the charge results in balance sheet adjustments, whereby banks react to the mechanical absorption of their excess liquidity by creating new (riskier) loans or by purchasing securities.

Source: Thomson Reuters, Bloomberg and ECB calculations. Note: x-axis reports months.
An identification strategy

Expectations of future short-term rates observed and counterfactual (percentages per annum)

Sources: Rostagno, Altavilla, Carboni, Lemke, Motto, Saint-Guilhem, Yiangou (2019).
Notes: Evolution of the OIS forward curve from pre-policy package (black-dotted line) to post-policy package (red line), together with risk neutral option-implied distributions (Euribor 3m – spread adjusted), as well as a shifted counterfactual forward curve (blue-dotted line) and its risk-neutral option-implied distribution. The counterfactual distribution and forward curve is constructed by anchoring the current distribution at zero and subsequently assuming that w/o FG and w/o NIRP, all probability mass that is observed below zero after shifting would proportionally re-distribute to and above zero.

Four instruments

- **TLTRO (Targeted longer-term refinancing operations):** To influence banks' lending rates by compressing the cost components of loan creation
- **Negative rate policy:** To pin down the level of the term structure of interest rates
- **Purchases of securities issued by public and private institutions:** To control the slope of the term structure of interest rates
- **Forward guidance:** To orient expectations of the purchase and rate policies
Large impact of combined rate policies (NIRP and forward guidance)

Expectations of future short-term rates observed and counterfactual
(percentages per annum)

Sources: Rostagno, Altavilla, Carboni, Lemke, Motto, Saint-Guilhem, Yiangou (2019).
Notes: Evolution of the OIS forward curve from pre-policy package (black-dotted line) to post-policy package (red line), together with risk neutral option-implied distributions (Euribor 3m – spread adjusted), as well as a shifted counterfactual forward curve (blue-dotted line) and its risk-neutral option-implied distribution. The counterfactual distribution and forward curve is constructed by anchoring the current distribution at zero and subsequently assuming that w/o FG and w/o NIRP, all probability mass that is observed below zero after shifting would proportionally re-distribute to and above zero.

Lending rates to NFCs, actual and counterfactual under no NIRP
(percentages per annum)

Notes: The counterfactual path for lending rates to NFCs under no-NIRP is given by the forecast of a BVAR model conditional on the no-NIRP path for forward rates depicted on the LHS chart. Latest observation: April 2019.
The lending channel

Stock of Deposits

(percentage points)


Notes: Deposit rates on outstanding amounts are reported by individual banks for each of the available product categories, weighted by outstanding amounts in March 2019. Household deposits include deposits from private households (S.14 ESA 2010) and deposits from non-profit institutions serving households (S.15). Non-vulnerable countries exclude IT, ES, PT, GR, IE, SI, CY. Latest observation: March 2019.
The lending channel

Lending volumes
(level; 1=May 2014)


Notes: Total lending (left) and total deposits (right) of banks that never charge negative deposit rates as opposed to banks that do offer negative deposit rates. Total volumes for the two categories are normalized to the level in May 2014. The blue vertical lines indicate the four episodes of DFR cuts below zero.
The corporate channel of monetary policy

NIRP and the credit channel
(annual percentage changes; percentage points)


Notes: LHS: Bank health is proxied by the level of NPL. Healthy banks belong to the percentiles between the 20th and the 50th of the NPL ratio distribution (average NPL ratio: 4%). Unhealthy banks belong to the percentiles between the 50th and the 80th of the NPL ratio distribution (average NPL ratio: 9%). The counterfactual is computed assuming that both groups of banks do not have any outstanding NPL. RHS: Exposure to NIRP is measured by the ratio of current assets to total assets (a proxy for bank deposits) of firms that are connected to banks charging negative rates.
The transmission of standard measures

The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

Impact on GDP and Inflation

Conclusions
Transmission channels of TLTRO

Transmission Channels

1. Direct pass-through channel (for bidders)

The substitution of more expensive financing with TLTROs will decrease the average funding costs of banks borrowing from the TLTROs.

2. Portfolio rebalancing channel

Banks taking part in TLTRO would likely cancel or postpone plans to issue bonds into the market, bank bond scarcity would bring a funding cost relief even to the benefit of those banks that were to shun the operations.

3. Signalling channel

Large liquidity injection determined a shift of investor expectations concerning the future policy path.

Bank bond yields around past TLTROs announcement

(percentage points)

Notes: The chart shows the reaction of bank bond yields to the announcements of the TLTROs made in 5th June 2014 and 10th March 2016.
Past operations stimulated lending

**Lending volumes to NFCs of bidders and non bidders**

*(notional stock; September 2014=1)*

- **Vulnerable countries**
  - Non bidders
  - Bidders

- **Other countries**
  - Non bidders
  - Bidders

Source: ECB iBSI and ECB calculations.
Notes: The chart shows the notional stock of loans to NFCs across bidders and non bidders relative to September 2014. Vulnerable countries are Ireland, Greece, Spain, Italy, Cyprus, Portugal and Slovenia. Other countries are all the remaining euro area countries.

**Counterfactual estimation for euro area banks**

*(percent)*

- Model based counterfactual
- NFC loan growth
- NFC lending rate

Source: ECB calculations.
...and reduced lending rate level and dispersions

Lending rates to NFCs of bidders and non bidders
(percentage points; deviations from September 2014)

Source: ECB iMIR and ECB calculations.
Notes: NFC lending rates are on outstanding loans to non-financial corporations weighted by volume. Chart shows average rates across bidders and non bidders in deviation from rates in September 2014. Vulnerable countries are Ireland, Greece, Spain, Italy, Cyprus, Portugal and Slovenia. Other countries are all the remaining euro area countries.

Changes in lending rates to NFCs across individual banks in the euro area
(percentages per annum)

Source: ECB iMIR and ECB calculations.
Notes: The figure reports the distribution density approximation of individual banks’ new business lending rates in three different periods (September 2011, June 2014 and November 2018) for banks operating in two set of countries.
especially for banks that most needed

Decline in bank lending rates due to the ECB’s non-standard monetary policy measures by bank characteristics (percentages points)

Effect on lending to low-quality borrowers of monetary easing and centralized supervision

- MP easing leads to increase lending towards riskier firms
- But risk-taking tend to be canceled by centralized supervision

Open questions

- Do banks with ex-ante higher NPL supply more credit to riskier borrowers?
- Does centralised (ECB) vs. local banking supervision affect bank risk-taking?
- Does the interaction between bank supervision & MP affect risk-taking?

We address both issues by using multiple credit registers (our Big Data) about 300mln observations

Outline

- The transmission of standard measures

- The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

- Impact on GDP and Inflation

- Conclusions
Impact of ECB non-standard measures on the term structure of interest rates 2014-18
(percentage points per annum)

Contribution of ECB non-standard measures to real GDP growth 2014-2018 (year-on-year percentage changes)

Contribution of ECB non-standard measures to HICP inflation 2014-2018 (year-on-year percentage changes)

Notes: Shown is the impact of ECB non-standard measures on macro variables based on a macroeconomic model with financial variables conditioning on the yield curve impact shown on the previous slide.
Outline

- The transmission of standard measures

- The transmission of non-standard measures
  - APP
  - NIRP
  - TLTRO

- Impact on GDP and Inflation

- Conclusions
Conclusions

- The results presented suggest that the NSMs have significantly lowered yields in a broad set of financial market segments, with the effects generally increasing with maturity and riskiness.

- The various programmes have contributed to a reduction in banks’ funding costs, which has incentivised them to pass on the cost relief to final borrowers by granting more credit at better conditions.

- Overall, the improved credit conditions in the euro area have helped push the monetary policy accommodation through the intermediation chain to reach households and firms.

- The effects on real economic activity have been sizeable.


Rostagno, Massimo; Altavilla, Carlo; Carboni, Giacomo; Lemke, Wolfgang; Motto, Roberto; Saint-Guilhem, Arthur and Yiangou, Jonathan, 2019, “A Tale of two Decades: The ECB’s Monetary Policy at 20”, *ECB WP forthcoming*.