Strategic Stimulus: Analysis of Eurosystem Monetary Operations

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Abstract

Throughout 2016 and during the first half of 2017, the Eurosystem continued to provide substantial monetary policy stimulus, against an environment of shifting political headwinds and gradually rising inflation both in the euro area and globally. In this article, we review the Eurosystem's experience over this period outlining the main changes to the Eurosystem's operational framework, in particular the expansion of the asset purchase programmes and introduction of TLTRO-II, and analyse the impact of these measures on Eurosystem liquidity provision and on liquidity conditions. In this context, the article discusses the measures introduced by other major central banks, while also providing a brief summary of the debt capital market activity of both the Irish government and the main domestic banks.[2]

1 The authors would like to acknowledge, with thanks, the input of Sean Furlong and Patrick Haran, and the helpful comments and suggestions of John Nash, Neil Lawton, Ken Egan and other colleagues in the Financial Markets Division of the Central Bank of Ireland.

2 A glossary of terms used throughout this article is available after section 6.

1. Introduction to monetary policy developments (2016 & H1 2017)

Over the course of 2016 and the first half of 2017, the ECB's Governing Council expanded and augmented a number of non-standard measures in order to achieve its monetary policy mandate of maintaining euro area inflation rates of below, but close to, two per cent over the medium term. These measures included an increase in the volume of purchases under the Asset Purchase Programme (APP), the expansion of the purchasable asset classes to include corporate debt, the acceptance of cash collateral under the securities lending facilities put in place for the Public Sector Purchase Programme (PSPP), reductions to the key policy rates and continued liquidity provision via the Targeted Longer Term Refinancing Operations (TLTROs).

This article briefly reviews the evolving monetary policies of the main central banks, but goes on to focus on the euro area and the actions of the ECB. It is structured as follows; Section 2 reviews developments at other major central banks, while Section 3 gives an overview of the ECB's monetary policy decisions over 2016 and H1 2017. Section 4 looks at overall trends in Eurosystem open market operations, while Section 5 discusses developments in Ireland with regard to Eurosystem liquidity provision, as well as the sovereign and domestic banks' debt market activity. Section 6 concludes the paper.

2. Global monetary policy developments in the review period

During the review period, a number of the main global central banks continued on a path of non-standard stimulus measures in an effort to address a low inflation environment, with some choosing to introduce more unconventional measures over further reductions in negative rates.

The Bank of Japan (BoJ), having expanded its asset purchases to ¥80 trillion (€713 billion)[3] per year, announced the introduction of a tiered reserves system in January 2016, in which a portion of financial institutions' reserves held with the central bank attract a negative interest rate of -0.1 per cent. Further to this, the BoJ announced a departure from more conventional measures in September 2016. Referred to as quantitative and qualitative monetary easing[4] with yield curve control, the BoJ adjusted the volume of long-term bond purchases in an effort to keep 10-year Japanese government bond yields close to 0 per cent. This measure was coupled with a commitment from the BoJ to overshoot its inflation target of 2 per cent.

Moreover, central banks with a traditionally strong alignment to the euro, maintained negative policy rates. In Sweden, the Riksbank cut its repo rate a number of times, eventually moving it to -0.50 per cent in February 2016[5], while Danmarks Nationalbank cut its certificate of deposit rate to -0.65 per cent by the end of H1 2016.[6]

Elsewhere in Europe, the main political focus of this period was that of the UK's referendum on European Union membership, as the UK electorate voted in favour of leaving the EU. In anticipation of uncertainty around the time of the UK's vote on EU membership, the Bank of England (BoE) announced in early March 2016 that additional Indexed Long-Term Repo operations would be offered in the weeks around the referendum. Following the outcome of the UK vote on 23 June 2016, the BoE announced that it stood ready to provide £250 billion of additional funds through its normal facilities, to act as a backstop and to support the functioning of markets. In an effort to manage a trade-off between the BoE's goal of meeting its inflation target and anticipated

3 Reference rate as of 21 September 2016.
4 Bank of Japan announcement 21 September 2016.
5 Riksbank repo rate decision 10 February 2016
6 Danmarks Nationalbank Official interest rates.

economic weakness, the BoE introduced a number of monetary stimulus measures in August of 2016[7]. The BoE reduced its official Bank Rate to 0.25 per cent from 0.50 per cent, a level at which it had stood since March 2009. It also introduced a term funding scheme to reinforce the pass-through of the rate cut, under which the BoE would lend £100 billion to banks at a rate close to the new Bank Rate. The BoE's Monetary Policy committee also voted unanimously in favour of introducing the purchase of up to £10 billion in UK corporate bonds and the expansion of its asset purchases in UK government bonds by £60 billion, taking the total stock of asset purchases to £435 billion, all of which were to be funded by the issuance of central bank reserves.

Further afield, and under a contrasting economic cycle, the Peoples' Bank of China (PBoC) left its 1-year benchmark lending and deposit rates unchanged during 2016 and H1 2017, instead increasing its 7-day, 14-day and 28-day reverse repo rates in Q1 2017. Prior to this, the PBoC had been on a path of monetary policy easing during 2015. Having conducted a series of currency devaluations in 2015, the PBoC introduced a further policy change in January 2016, in the form of a "referenced" rate (which represented a departure from a more closely managed exchange rate) for the renminbi against a basket of currencies, as well as making a number of reductions to banks' reserve requirement ratios during this period. Further to this, the PBoC introduced a change in the way it calculates the renminbi's daily reference rate against the dollar in May 2017, by using a 'counter-cyclical adjustment factor' aimed at reducing the impact of big market movements. While China introduced measures to address capital outflows to reduce downward pressure on the renminbi, it further opened its bond markets[8] and foreign exchange market[9] to international investors, aiming to attract flows into the country.

In December 2015, the US Federal Reserve was the first major central bank to tighten its monetary policy, and following the US presidential election in November 2016, it continued on a path of tightening as a result of continued improvement in US economic performance, declining unemployment, and an expectation that inflation would rise towards its 2 per cent target over the medium term[10]. Having increased the Federal Funds rate from a range where it had been since January 2009, from 0–0.25 to 0.25-0.50 per cent at its meeting in December 2015, the Federal Open Markets Committee (FOMC) went on to make three further rate increase decisions during 2016 and H1 2017, raising rates to 0.50-0.75; 0.75-1.00 ; and 1.00-1.25 per cent, in December 2016, March 2017, and June 2017 respectively. In addition, the Fed has announced a reduction of its balance sheet[11] before the end of 2017.

3. ECB's key policy decisions in the review period

The Eurosystem provided substantial monetary stimulus in H1 2016 to counteract heightened risks to the ECB's price stability mandate, while further adjustments and additional measures were introduced to ensure normalised market activity over the remainder of the review period. These measures were against a backdrop of very low or even negative inflation in the euro area experienced prior to 2016, and had an objective of securing the return of inflation to levels below, but close to, 2 per cent over the medium term. The measures introduced included the expansion of the APP (with subsequent modifications during the period in terms of volumes and asset composition), the expansion of securities lending facilities under the PSPP to also accept cash as collateral, further key policy rate cuts and the announcement of a new series of TLTROs. Box 1 below summarises the main decisions of the ECB throughout the review period..

7 Bank of England monetary stimulus measures 04 August 2016

8 Announcement of Bond Connect settlement service by the Hong Kong Monetary Authority 19 May 2017

9 Announcement by State Administration of Foreign Exchange - 27 February 2017

10 FOMC Minutes of the Board's discount rate meetings 14 November 2016 to 14 December 2016

11 The Fed currently holds $4.24 trillion in outright purchases on its balance sheet, as of Q2 2017, and reinvests in new securities as holdings mature, see Quarterly balance sheet developments report 2017-05 (page 12)

Box 1: Summary of ECB Decisions

On 10 March 2016, the Governing Council decreased the Main Refinancing Operation (MRO) interest rate by five basis points to 0.00 per cent; the Marginal Lending Facility (MLF) rate by five basis points to 0.25 per cent and the rate on the Deposit Facility by 10 basis points to -0.40 per cent, starting from the operation settled on 16 March 2016.

The following measures were also announced on 10 March 2016:

- The launch of a Corporate Sector Purchase Programme (CSPP) as an additional component of the ECB's APP. This added investment-grade euro-denominated bonds issued by non-bank corporations established in the euro area to the list of assets that are eligible for regular purchases. This was to further strengthen the pass-through of asset purchases to the financing conditions of the real economy (commencement details announced on 2 June 2016);
- The increase of combined monthly purchases under the APP to €80 billion, starting in April 2016;
- A new series of four Targeted Longer-Term Refinancing Operations (TLTRO-II) starting in June 2016.

This package of monetary policy decisions aimed to provide substantial monetary stimulus to counteract the heightened risks to the ECB's price stability objective.

On 3 May 2016, the ECB published an amending decision introducing an additional early repayment option for TLTRO-I borrowings in June 2016.

On 2 June 2016, the Governing Council announced that on 8 June the Eurosystem would start making purchases under its already announced CSPP (see 10 March 2016 announcement).

Moreover, starting on 22 June, the Eurosystem would conduct the first operation in its new series of TLTRO-II.

On 22 June 2016, the Governing Council reinstated a waiver of minimum credit rating requirements for marketable instruments issued or guaranteed by the Greek government, subject to special haircuts and eligible for use in Eurosystem operations, starting on 29 June 2016. The Governing Council acknowledged the commitment of the Greek government in implementing the ESM programme and expected continued compliance with its conditionality, and said that it will examine possible purchases of Greek government bonds under the PSPP at a later stage.

On 27 September 2016, the ECB and People's Bank of China (PBoC) extended for a further three years the bilateral currency swap arrangement established in 2013. The swap arrangement has a maximum size of CNY 350 billion and €45 billion.

On 8 December 2016, the Governing Council decided to continue its purchases under the APP at the monthly pace of €80 billion until the end of March 2017. However, from April 2017, the net asset purchases were to continue at a lower monthly pace of €60 billion, but with purchases extended 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 target. If, in the meantime, the outlook becomes less favourable or if financial conditions become inconsistent with further progress towards a sustained adjustment of the path of inflation, the Governing Council intends to increase the programme in terms of size and/ or duration.

Box 1: Summary of ECB Decisions

In addition to the extension of the programme, the following parameters were announced, for implementation on 2 January 2017:

- the maturity range of the PSPP was broadened by decreasing the minimum remaining maturity for eligible securities from two years to one year.
- purchases of securities under the APP with a yield to maturity below the interest rate on the ECB's deposit facility were permitted to the extent necessary.

Moreover, the Governing Council decided that Eurosystem national central banks would have the possibility to also accept cash as collateral in their PSPP securities lending facilities (discussed further in Box 3).

On 19 January 2017, the Governing Council provided further details on the purchase of assets with yields below the Deposit Facility Rate (DFR):

- No purchases below the DFR would be conducted under the third covered bond purchase programme (CBPP3), the asset-backed securities purchase programme (ABSPP), or the CSPP
- With regard to the PSPP, for each jurisdiction, priority would be given to purchases of assets with yields above the DFR. This meant that the amount of purchases that have to be made at yields below the DFR would vary among jurisdictions. This amount could also change over time, reflecting changes in market interest rates relative to the DFR.

On 19 June 2017, in pursuit of further transparency, the ECB published the 'Emergency Liquidity Assistance (ELA) agreement'. ELA aims to provide central bank money to solvent financial institutions that are facing temporary liquidity problems, outside of normal Eurosystem monetary policy operations.

4. Developments in Eurosystem Liquidity Provision

Throughout 2016 and into the first half of 2017, excess liquidity[12] continued to rise across the euro area, primarily driven by purchases under the APP and continued participation in the final rounds of TLTROs.

In addition, the Eurosystem maintained its provision of liquidity via fixed rate, full allotment refinancing operations including the MROs, the three-month Long Term Refinancing Operations (LTROs) and 7-day US dollar operations. However, as pre-announced, the final round of the TLTRO programme took place in March 2017. Box 2 below provides further details of the history of the TLTROs.

12 Excess liquidity exists in the Eurosystem when the liquidity supply provided through the ECB's monetary policy instruments exceeds the liquidity needs (autonomous factors plus reserve requirements) of the banking system.

Box 2: History of Targeted-Longer-Term Refinancing Operations

The first series of eight operations (TLTRO-I) was announced in June 2014. TLTROs aimed to provide financing at attractive conditions to euro area credit institutions with a maturity of up to four years.

This was followed by a second series of four quarterly operations (TLTRO-II), announced in March 2016. Under TLTRO-II, banks could borrow up to 30 per cent of the amount of their existing stock of loans to non-financial corporations and households (excluding loans to households for house purchases). Moreover, banks were given the opportunity to repay funds borrowed under TLTRO-I early and switch to TLTRO-II funding.

Such a shift of funding was deemed attractive for two reasons:

- First, it lengthened the term of bank funding and removed the requirement for mandatory repayment where lending thresholds were not met.
- Second, it lowered the average cost of TLTRO-I funding which stood at 0.10 per cent over the MRO rate at the time of the operation for the first two operations, while this cost was reduced to the MRO rate for the remaining six operations[13]. The maximum rate banks would have to pay for TLTRO-II funding was 0.00 per cent, as this was the MRO rate at the time of the operations and the higher bound in respect of TLTRO-II lending.

The TLTROs provide incentives for bank lending to the real economy. In the case of TLTRO-I, the incentives for lending were two-fold:

- First, banks whose net lending over a reference period exceeded a bank-specific benchmark could borrow more in the final six TLTRO-I operations and the maximum additional amount was set at three times the amount by which their net lending had exceeded their benchmark.
- Second, banks that did not meet their lending benchmarks were required to repay their TLTRO-I borrowings early.

Incentives for lending are provided in a different form under TLTRO-II. Rather than penalising banks that fail to meet their benchmarks, TLTRO-II provides incentives, in the form of lower interest rates, for banks which outperform their benchmarks. Banks whose eligible net lending in the period between 1 February 2016 and 31 January 2018 exceeds their lending benchmarks will benefit from a rate reduction. The TLTRO-II rate can be as low as –0.40 per cent.

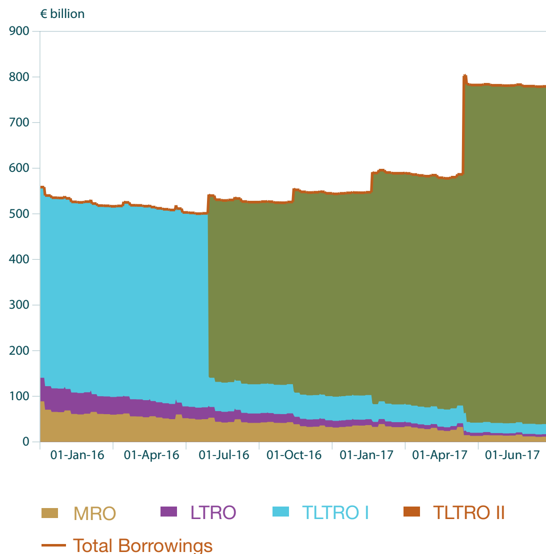
Euro area banks' total TLTRO-II borrowings currently stand at €740.2 billion. The first TLTRO-II operation (TLTRO-II.1, settled in June 2016) attracted bids amounting to €399.3 billion, which largely reflected a shift out of TLTRO-I funding and into TLTRO-II funding. The second and third TLTRO-II operations (TLTRO-II.2 and TLTRO-II.3) allotted €45.3 billion and €62.2 billion respectively.

Take-up in the final operation in March 2017 (TLTRO-II.4) was substantially higher at €233.5 billion, of which a significant share (€216.7 billion) constituted a net increase in TLTRO borrowings. The significant take-up in the final operation reflects the overall attractive pricing of TLTRO-II compared with banks' alternative market-based funding, and, to some degree, additional incentives for take-up in the final operation.

Overall, outstanding TLTRO credit (including outstanding TLTRO-I credit) stood at €760.6 billion as at end-March 2017 and was concentrated in the first and final TLTRO-II operations.

13 TLTRO-I first two operations incurred a rate of 0.15 per cent, operations three through six a rate of 0.05 per cent and the remaining operations seven and eight carry a 0.00 per cent rate.

Chart 1: Eurosystem Borrowings



Source: CBI calculations.

4.1 Eurosystem Refinancing Operations

Participation in Eurosystem refinancing operations across the euro area increased by €40.8 billion over 2016, from €559.4 billion on 30 December 2015 to €600.2 billion on 28 December 2016. As at 30 June 2017, total Eurosystem lending stood at circa €782.1 billion.

Chart 1 above illustrates this evolution with the increase in lending driven by the take up in TLTRO-II.

Eurosystem lending increased over the period largely due to the take up in the TLTRO-II operations. Conversely, the total amount borrowed through the MRO declined by €77.4 billion, from €89.0 billion on 31 December 2015 to €11.6 billion on 30 June 2017.

As can be seen in chart 1, throughout 2016, the composition of the total amount of liquidity provided through Eurosystem refinancing operations has continued to be in favour of TLTRO lending. TLTRO lending accounted for 75 per cent of total Eurosystem lending as at 31 December 2015, increasing to 91 per cent as at 31 December 2016 and rose to 97 per cent at 30 June 2017 as counterparties availed of the longer term funding.

The volume of participation in the Eurosystem's weekly 7-day US dollar operation increased during 2016, with total allotments throughout the year averaging $734.4 million, compared to an average allotment amount of $115.8 million in 2015. However, the increase during 2016 is generally reflective of higher market demand for dollar funding over end quarter periods, reflected in the median participation for 2016, which stood at $111.0 million. From 1 January to 30 June 2017 this trend has continued, as participation in the US dollar operation averaged $615.4 million, while the median was $185.5 million.

4.2 Overview of the ECB's Purchase Programmes

Liquidity injections by means of non-standard monetary policy measures were the main drivers of rising excess liquidity over 2016 and the first quarter of 2017. The APP has remained a key instrument in providing further monetary policy stimulus with policy rates at a historically low level. Box 3 below provides a summary of developments in relation to the APP over the course of 2016 and H1 2017.

Box 3: December 2016 Governing Council Meeting; decisions relating to the Asset Purchase Programme.

A number of changes to the APP have been made since inception, in terms of size, duration, composition, and the programme parameters, reflecting the evolving outlook for inflation and the need to ensure a smooth implementation of the programme. A number of adjustments were made over the review period, with the most important decisions being made at the Governing Council meeting on 8 December 2016. This box discusses those decisions.

First, the Governing Council decided to extend APP purchases beyond the previously signalled end date of March 2017. ECB President Draghi announced that purchases would continue until at least December 2017, at an average monthly pace of €60 billion from April 2017, reduced from €80 billion. The extension of the programme was deemed necessary amid an absence of a sustained adjustment in inflation towards the ECB's inflation target, of below but close to 2 per cent. At the same time, the reduction in the pace was deemed appropriate as deflationary risks had dissipated since the decision to increase the pace of purchases from €60 billion to €80 billion in March 2016. In order to ensure the continued smooth implementation of the programme, it was also decided that the minimum eligible maturity for bonds purchasable under the PSPP be reduced from two years to one year, and that purchases below the DFR be allowed to the extent necessary. Significantly, the decision to reduce the pace of purchases was accompanied by a commitment to increase the pace again if necessary.

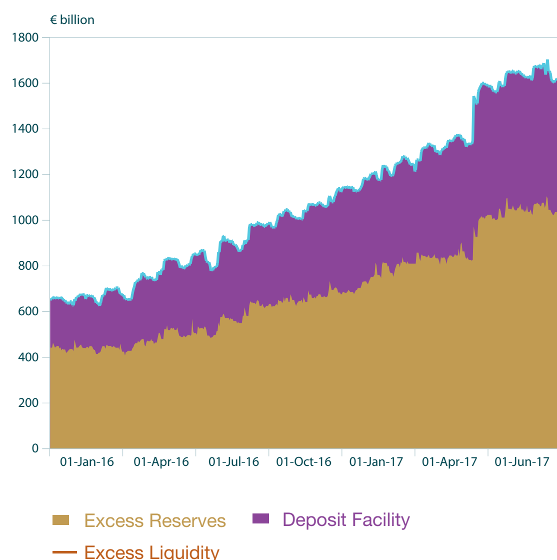
Second, the Governing Council also reconfirmed the previous announcement that the net purchase pace would be supplemented by the reinvestment of maturing APP holdings. While redemptions have been a feature of the Covered Bond Purchase Programme 3 (CBPP3) and the Asset Backed Securities Purchase Programme (ABSPP) since their inception, as there is no lower bound on the residual maturity for eligible purchases in these programmes, redemptions were a new feature in the PSPP. When the PSPP became operational in March 2015, the minimum eligible maturity for purchases was two years. Therefore, the first redemptions from the PSPP portfolio were due to begin in March 2017.

The monthly purchase pace set by the Governing Council represents the net monthly target for the APP. The gross purchase target equals the monthly target plus the volume of nominal redemptions in a given month, while the net figure excludes redemptions. The reinvestment of redemptions ensures that the Eurosystem balance sheet continues to grow at the pace set by the Governing Council. While the Eurosystem endeavours to fulfil the required reinvestments in the month they fall due, in certain cases this will not be possible, and reinvestments will be fulfilled in subsequent months. This will potentially cause some variation in the monthly purchase volumes published by the ECB.

Also in December 2016, the Governing Council decided to enhance the effectiveness of the PSPP Securities Lending facilities by allowing NCBs, on a voluntary basis, to lend bonds held under the PSPP against cash collateral. While the PSPP securities lending facilities had been in existence since the inception of PSPP, holdings could only be lent against collateral in the form of bonds, i.e. on a "cash neutral" basis. The decision to accept cash collateral was intended to support repo market liquidity and functioning by making the facility more accessible to market counterparties, and by facilitating the lending of PSPP holdings in greater volumes. Eight NCBs, plus the ECB, currently accept cash as collateral in their PSPP securities lending facilities, including the Central Bank of Ireland. A total limit of €50 billion has been set for the Eurosystem for lending against cash-only collateral. To avoid unduly curtailing normal repo market activity, securities are lent against cash collateral at a rate equal to the lower of the DFR minus 30 basis points (i.e. currently equal to minus 70 basis points), and the prevailing market repo rate.

The changes above contributed to the smooth implementation of the APP throughout 2017 to date. As of end June 2017, total Eurosystem holdings under the four constituent programmes amounted to €1.95 trillion. The PSPP accounted for over €1.6 trillion of this. As for the PSPP securities lending facilities, the average daily on-loan amount for June was €50.5 billion (against both securities and cash).

Chart 2: Composition of Excess Liquidity (2016 - end June 2017)



Source: CBI calculations.

4.3 Overview of liquidity conditions in the euro area and impact on money market rates

During the period, excess liquidity continued to rise across the euro area, driven mainly by purchases under the APP and TLTRO-II. Excess liquidity is comprised of counterparty deposits on the overnight Deposit Facility and/or left on current accounts as excess reserves. A counterparty's current account holdings are comprised of its minimum reserve requirement in addition to 'excess reserves' held above this requirement. A counterparty's average minimum reserve requirements are remunerated at the MRO rate, while excess reserves bear the rate on the Deposit Facility (-0.40 per cent as at end-June 2017). Therefore, both excess reserves and funds placed on the Deposit Facility bear a rate of interest below that of the MRO.

Chart 2 illustrates the evolution and composition of excess liquidity (as at 1 January 2016) to end June 2017, the overall level of which has risen substantially over the period as stimulus measures such as the APP and TLTRO-II have continued to drive overall excess liquidity levels higher, from €654.5 billion in January 2016 to €1,633.1 billion at the end of June 2017.

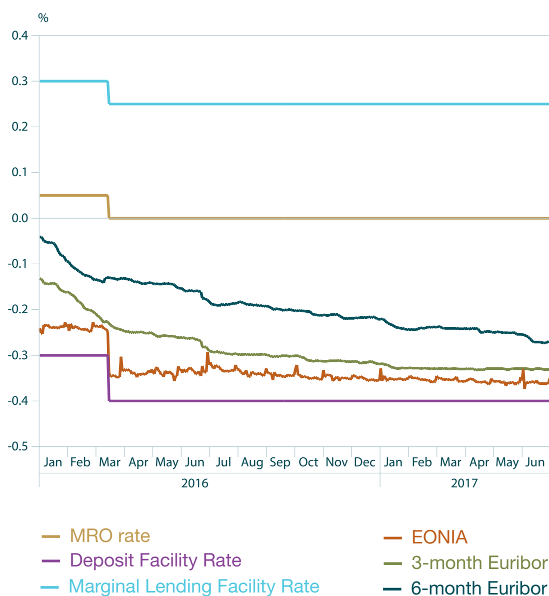
Current account holdings in excess of minimum reserve requirements averaged €567.3 billion for 2016, more than twice the level in 2015, which was €259.1 billion. The path of rising excess reserves has continued into 2017, with the average level of current account holdings held in excess of minimum reserve requirements standing at €937.1 billion for the year to 30 June 2017. Reserve requirements across the Eurosystem increased only slightly over the year, from €113.3 billion at end 2015 to €118.8 billion at end 2016, and by 30 June 2017 stood at €122.6 billion.

Excess liquidity across the euro area throughout 2016 was also reflected in an increased recourse to the Deposit Facility. Usage of the Deposit Facility averaged €326.1 billion per day in 2016, compared to a daily average of just €114.2 billion in 2015. So far in 2017, usage of the facility has remained elevated, averaging €530.7 billion per day during H1 2017, thus representing an important component of overall excess liquidity.

Against a backdrop of high levels of excess liquidity in the euro area, daily recourse to the MLF remained low throughout 2016, averaging just €0.1 billion, down from €0.3 billion in 2015. However, the average during H1 2017 has increased to €0.3 billion. Furthermore, the rate on the MLF was reduced by five basis points to 0.25 per cent in March 2016 and has remained at this level since.

Due to the increased liquidity, euro area money market rates remained at low levels in 2016 and in the first half of 2017. Moreover, following the Governing Council's decision to lower the rate on the Deposit Facility by 10 basis points to -40 basis points on 10 March 2016, the

Chart 3: The Eurosystem's Interest Rate Corridor & Selected Money Market Rates



Source: Bloomberg.

EONIA rate (a market measure of weighted average overnight unsecured lending) fell accordingly, and has remained at levels only a few basis points above the Deposit Facility. Chart 3 below illustrates that in an environment of high excess liquidity, money market rates closely track the rate on the Deposit Facility, rather than the rate of the MRO.

EONIA rates continue to be driven towards the rate on the Deposit Facility, reflecting an environment of high excess liquidity, as the DFR acts as the main policy anchor of money market rates. The increase in excess liquidity has also driven EURIBOR (Euro Interbank Offered Rate) fixings lower into negative territory during this period following further Governing Council announcements on the expansion of the purchase programmes and the introduction of TLTRO-II

5. Summary of Irish Developments

5.1 Eurosystem Borrowings & TARGET2[14] Balance

Eurosystem lending to Irish domiciled counterparties decreased from €10.7 billion at 2015 year-end to €7.4 billion at the end of 2016. However, it had moved up to €7.8 billion - consisting solely of long-term funding - by 30 June 2017[15].

During 2016 and the first half of 2017, and as seen in the preceding year, Irish domestic banks continued to reduce their level of central bank funding mainly due to increased access to debt capital markets in areas such as covered bond issuance and a balance sheet deleveraging process.

Moreover, in an environment of excess liquidity, lower levels of recourse to Eurosystem lending was, *inter alia*, a contributing factor in Ireland's TARGET2 balance switching from a liability of €3.0 billion at the end of 2015 to an asset of €8.2 billion by 30 June 2017. The change in balances reflects a net inflow of €11.2 billion of funds into Ireland across the TARGET2 system over the period.

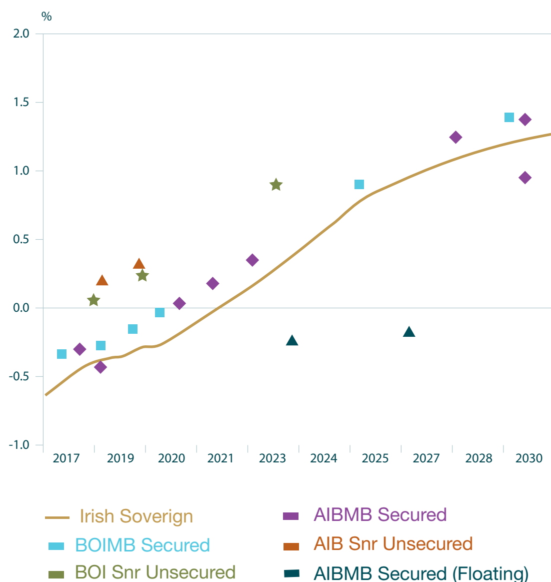
5.2 Irish sovereign and bank debt market activity in 2016 and to end of June 2017

Against a backdrop of record low interest rates and the continued support of the ECB's accommodative policies, Irish government bonds performed strongly, with spreads narrowing against German and French benchmark bonds in 2016. In 2017, the 10-year bond traded at a spread below 0.50 per cent for most of June against its German 10-year equivalent, and at one stage trading below seven basis points to the French 10-year equivalent bond, prior to the first round of the French presidential elections in April. For the period 1 Jan 2016 to 30 Jun 2017, the 10-year benchmark Irish government bond traded at a high of 1.215 per cent in Feb 2017 and

14 Trans-European Automated Real-Time Gross Settlement Express Transfer System

15 Latest publicly available data.

Chart 4: Irish Banks' Bond Yields as at 30/06/2017



Source: Bloomberg.

a low of 0.318 per cent in September 2016, with an average yield of 0.79 per cent. Notable moves for Irish yields took place alongside movements in other securities and bonds yields, reacting to political events, from the UK referendum to French and US presidential elections.

While the National Treasury Management Agency's (NTMA) 2016 planned market issuance was relatively low in the range of €6 billion to €10 billion, their first auction of the year was for €3 billion. A 10-year benchmark 2026 bond was issued via syndication in January, yielding 1.156 per cent, with international investors accounting for 88 per cent of the allocation. This bond was also tapped for a further €2.75 billion during 2016 at yields below 1.00 per cent. Also of note in 2016 was the State's first issuance of €100 million of a 100-year note, by private placement at a yield of 2.35 per cent.

Meanwhile, the NTMA funding plan announced for 2017 was for issuance of between €9 billion and €13 billion in long-term bonds, €9.36 billion of which had been issued by the end of June. Notable issuances included a new 20-year benchmark bond of €4.0 billion in January yielding 1.734 per cent, and the NTMA's first inflation-linked bond issuance of €609.5 million in April for a 23-year tenor, with a floating coupon of 0.25 per cent plus Irish HICP (excluding tobacco).

As a result of large retail inflows, all three Irish banks have much improved loan-to-deposit ratios and liquidity ratios during the review period, resulting in a low level of debt issuance over this term. AIB Mortgage Bank issued €1 billion in a 7-year covered bond in January 2016 and €750 million in both 7-year and 10-year floating rate covered bonds in February 2017. Meanwhile, Bank of Ireland's only issuance during this period was a €10 million unsecured 3-year bond in January of 2016. Chart 4 illustrates the banks secured fixed yield levels relative to the sovereign yield curve and AIB Mortgage Bank's two floating rate covered bonds mentioned previously.

6. Conclusion

Continued supportive central bank monetary policies remained necessary in light of below-target inflation during the period, as the ECB expanded its APP in March 2016 and offered incentivised funding to the banking sector through the TLTRO-II. The euro area economy saw an increase in inflation in Q4 2016 in line with rising global trends, and following the ECB Governing Council's announcement of further policy measures in early 2016, notably successive reductions in the rate on the Deposit Facility to -0.40 per cent and an expansion of the APP in terms of both volume and asset classes purchased. Purchases under the APP are intended to run until the end of December 2017, or beyond, if necessary.

Against the backdrop of these measures, excess liquidity in the Eurosystem has continued to rise over the review period, reaching €1.6 trillion by the end of H1 2017, keeping both secured and unsecured money

markets rates anchored to the DFR. Looking ahead, markets will continue to monitor the ECB's monetary policy stance, as other major central banks address possible tapering of their respective quantitative easing programs. Meanwhile, the ECB's Governing Council will continue to monitor progress towards achieving its objective, of maintaining euro area inflation rates of below, but close to, 2 per cent over the medium term.

Annex 1: Glossary of Terms

Autonomous Factors: Autonomous factors are normally outside the control of the Eurosystem and are defined as the items in the consolidated balance sheet of the Eurosystem, apart from monetary policy operations, that provide or withdraw liquidity from the system. The most notable autonomous factors are banknotes in circulation; government deposits with the Eurosystem; and net foreign assets.

EONIA (Euro Overnight Index Average) is a market index computed as the weighted average of overnight unsecured lending transactions undertaken by a representative panel of banks.

EURIBOR (Euro Interbank Offered Rate) is the rate at which interbank term deposits are offered by one prime bank to another prime bank. This is often the reference rate for maturities of one, two and three weeks, and for maturities of one to twelve months.

Excess liquidity arises when the supply of liquidity (as provided via the Eurosystem's monetary policy instruments), exceeds the demand for liquidity (as dictated by minimum reserve requirements and autonomous factors outside the direct control of individual NCBs), there is said to be **excess liquidity** in the banking system. In this situation, the excess will likely end up being deposited with the Eurosystem via Deposit Facility usage or banks' current account balances.

Excess Reserves: Current account holdings in excess of the average minimum reserve requirements.

General Collateral rates (GC) are the rates on a range of assets that are accepted, at any particular moment, as collateral in the repo market by the majority of market intermediaries and at a very similar repo rate.

Liquidity Provided: The net amount of liquidity provided by the Eurosystem through its monetary policy instruments.

Maintenance period (MP): The period over which compliance with reserve requirements is calculated. The MP begins on the settlement day of the first MRO following the policy meeting of the Governing Council.

Minimum reserves are determined on the basis of the institutions' average daily reserve holdings (calculated on the basis of certain balance sheet liabilities) over a maintenance period. Each bank in the Eurosystem is required to maintain a balance with their respective NCB. The required reserve holdings are remunerated at a level corresponding to the average interest rate over the maintenance period of the MROs of the Eurosystem.

Open Market Operations (OMOs) include Main Refinancing Operations, and Longer-Term Refinancing Operations, as defined below:

(i) Main Refinancing Operations (MRO) are regular liquidity-providing reverse transactions with a frequency and maturity of one week. The MRO rate is currently 0 per cent.

(ii) Longer-Term Refinancing Operations (LTRO) are liquidity-providing reverse transactions that are regularly conducted with a monthly frequency and a maturity of three months. Longer-Term Refinancing Operations are conducted at irregular intervals or with other maturities, such as with the length of one maintenance period, six months, twelve months or up to four years (as with the TLTROs).

Standing facilities aim to provide and absorb overnight liquidity, signal the general monetary policy stance and bound overnight market interest rates. Two standing facilities, which are administered in a decentralised manner by the NCBs, are available to eligible counterparties on their own initiative:

(i) Marginal Lending Facility (MLF): Counterparties can use the MLF to obtain overnight liquidity from the NCBs against eligible assets. The interest rate on the

MLF is currently 0.25 per cent and normally provides a ceiling for the overnight market interest rate.

(ii) Deposit Facility (DF): Counterparties can use the Deposit Facility to make overnight deposits with the NCBs. The interest rate on the Deposit Facility is currently -0.40 per cent and normally provides a floor for the overnight market interest rate.

TARGET2 is the payment system of the euro that is operated by the central banks of the Eurosystem. All payments are settled in central bank money (that is to say they are booked on the accounts that banks hold with their central bank) and are settled in real time. The payments are primarily between banks and ancillary systems (e.g. security settlement systems, central bank counterparties, retail payment systems) as well as payments forming part of Eurosystem operations such as Open Market Operations.

Variable rate allotment: In normal circumstances, the Eurosystem, when conducting its OMOs, assesses the total liquidity need of the banking sector and, in competitive tenders, allots this amount. Usually these tenders are conducted as variable rate tenders, meaning that banks pay the interest rate that they offer when they make their bids.

The Eurosystem may also execute its tenders in the form of fixed rate tenders, where the interest rate is specified in advance and banks bid the amount of money they wish to transact at the fixed interest rate.

In some circumstances, the ECB may decide in advance to allot the full amount of liquidity that banks request, i.e. to accommodate all bids, at a fixed interest rate (known as **fixed rate full allotment**). This is the method currently in use.