The New Paradigm: Analysis of Eurosytem Monetary Operations

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Abstract

In 2015 and the first half of 2016, the actions of global central banks continued to be one of the main drivers of financial markets and a key focus for market participants. In this article, we review the Eurosystem experience over this period outlining the main changes to the Eurosystem's operational framework, in particular the expansion of the asset purchase programmes, and analyse the impact of these measures on Eurosystem liquidity provision and on liquidity conditions. In this context, the article also summarises developments in the euro-area money market over the review period and provides a brief summary of the debt capital market activity of both the Irish sovereign and main domestic banks.

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1. Introduction to monetary policy developments (2015 & H1 2016)

Over the course of 2015 and the first half of 2016, the ECB's Governing Council introduced a number of new non-standard measures in order to achieve its monetary policy mandate of maintaining the euro-area inflation rate of below, but close to, 2 per cent over the medium term. These measures, which occurred against a backdrop of subdued economic growth and low inflation, included an increase in the volume of purchases under the asset purchase programmes, the expansion of the purchasable asset classes to include sovereign and corporate debt, reductions to the policy rates and continued liquidity provision via the Targeted Longer Term Refinancing Operations (TLTROs).

The ECB was not alone in adopting further non-standard stimulus measures. Monetary accommodation was also added by other central banks and the adoption of negative interest rates became a feature of the period. The Bank of Japan (BoJ), having expanded its asset purchases to ¥80 trillion 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. In addition, the Swiss National Bank (SNB), which had removed its exchange rate cap to the euro in January 2015, lowered its deposit rate from 0.25 per cent to -0.75 per cent, as it aimed to reduce the pressure on the Swiss franc and "in turn, the risks to price and economic developments which may arise as a result of an appreciation."[2] In Sweden, the Riksbank cut its repo rate a number of times, moving it further into negative territory to -0.50 per cent in February 2016, while the Danmarks Nationalbank cut its certificate of deposit rate further to finish at -0.65 per cent by the end of H1 2016.[3]

In anticipation 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. Moreover, in light of the outcome of the UK vote on 23 June 2016, the BoE announced that, as a backstop and to support the functioning of markets, it stood ready to provide £250 billion of additional funds through its normal facilities. At the time of writing, market expectations have risen for a rate cut by the BoE to counter any deterioration in the outlook for the UK economy.

Outside of Europe the decisions of two key central banks were significant drivers of markets during the review period. Firstly, the Peoples' Bank of China (PBOC) engaged in monetary policy easing in August 2015, by conducting a series of currency devaluations which saw the currency depreciate by 2.7 per cent against the US dollar over the month. This was followed by a further policy change in January 2016, when the PBOC introduced a "referenced" rate (which represented a departure from a more closely managed exchange rate) for the renminbi against a basket of currencies, and made a number of reductions to banks' reserve requirement ratios during this period.

In contrast to more expansionary monetary policies adopted by other central banks, the US Federal Reserve made a decision to embark on its first interest rate hike since 2006, as a result of improved US economic performance and declining unemployment. At its meeting in December 2015, the Federal Open Markets Committee (FOMC) raised the funds rate to a range of 0.25-0.50 per cent. The highly anticipated decision by the Federal Reserve to increase the funds rate from a range where it had been since January 2009 was a key driver of financial markets and, in particular, a stronger US dollar towards the end of 2015.

While mindful of the global backdrop this article focuses on the euro area and the actions of the ECB. It is structured as follows: Section

2 Source: Swiss National Bank website (Speech 13/01/2016) - Fritz Zurbrügg, Vice Chairman of the Governing Board of the Swiss National Bank: http://www.snb.ch/en/mmr/speeches/id/ref_20160113_zur.

3 Source: Danmarks Nationalbank official interest rates.

2 gives an overview of the ECB's monetary policy decisions over 2015 and H1 2016. Section 3 looks at overall trends in Eurosystem open market operations, while Section 4 discusses developments in Ireland with regard to Eurosystem liquidity provision as well as the sovereign and domestic banks' debt market activity. Section 5 concludes the paper.

2. ECB's Key Policy Decisions in the review period

The Eurosystem provided substantial monetary stimulus over the period to counteract heightened risks to the ECB's price stability mandate. This was in response to very low or even negative inflation in the euro area, and had an objective of securing the return of inflation to levels below, but close to, 2 per cent. The measures introduced included the expansion of the purchase programmes (with subsequent modifications during the period in terms of volumes and asset composition), further 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.

Box 1: Summary of ECB Decisions

On 22 January 2015, the ECB's Governing Council announced details of its expanded asset purchase programme (APP), with combined monthly purchases of €60 billion, which added the public sector purchase programme (PSPP) (comprising sovereign bonds) to its existing private sector asset purchase programmes. The purchases were intended to be carried out at least until September 2016, and encompassed the Asset-Backed Securities Purchase Programme (ABSPP) and the third Covered Bond Purchase Programme (CBPP3) which were both launched in 2014.

The Governing Council also decided that the interest rate for the remaining six TLTROs would be equal to the rate on the Eurosystem's Main Refinancing Operations (MROs) prevailing at the time of the TLTRO tender announcement, thereby eliminating the 10 basis point spread that previously applied to these operations.

On 5 March 2015, the Governing Council adopted a decision on the public sector purchase programme (PSPP), defining the scope and details of the key operational arrangements of the PSPP announced on 22 January 2015, applied from 9 March 2015. The Governing Council also approved the list of international and supranational institutions in addition to agencies whose securities are eligible for purchase under the PSPP.

On 3 December 2015, the Governing Council decided to reduce the rate on the Deposit Facility by 10 basis points to -0.30 per cent, with effect from 9 December 2015, while leaving the interest rates on the MRO and the Marginal Lending Facility unchanged at 0.05 per cent and 0.30 per cent respectively.

The following measures were also announced on 3 December 2015:

- the extension of the APP and carrying out monthly purchases of €60 billion until the end of March 2017, or beyond, if necessary;
- the reinvestment of the principal payments on the securities purchased under the APP as they mature, for as long as necessary;
- the extension of MROs and three-month LTROs as fixed rate tender procedures with full allotment for as long as necessary, and at least until the end of the last reserve maintenance period of 2017 (which represented an extension of this procedure by one year).

Box 1: Summary of ECB Decisions

On 10 March 2016, the Governing Council decreased the interest rate on the MROs of the Eurosystem by 5 basis points to 0.00 per cent; the marginal lending facility by 5 basis points to 0.25 per cent; 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 APP, to include investment-grade euro-denominated bonds issued by non-bank corporations established in the euro area in the list of assets that are eligible for regular purchases. This is to further strengthen the pass-through of asset purchases to the financing conditions of the real economy;
- 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 was announced.

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

3. Developments in Eurosystem Liquidity Provision

Excess liquidity[4] across the euro area increased from €262.1 billion as at 1 January 2015 to €859.9 billion as at 30 June 2016, driven primarily by purchases under the APP, while continued participation in TLTROs, combined with the application of fixed rate full allotments in refinancing operations generally, also contributed. Box 2 below provides further details of the first TLTRO series (TLTRO-I), in addition to the second series of TLTROs (TLTRO-II) announced by the Governing Council on 10 March 2016.

Box 2: Targeted-Longer-Term Refinancing Operations - present and future

TLTRO-I

In June 2014, in order to support bank lending to the euro-area non-financial sector, the ECB introduced a series of eight TLTROs, to be conducted on a quarterly basis, each with a maturity of four years. The operations initially enabled counterparties to borrow up to 7 per cent of the total amount of eligible loans to the euro area non-financial private sector (excluding loans to households for house purchase) outstanding as at 30 April 2014, in two operations in September and December 2014. Subsequently, additional amounts could be borrowed through the operation based on the evolution of a counterparty's eligible lending activities in excess of bank-specific benchmarks. Banks that borrowed in TLTRO-I and fail to achieve their benchmarks as at 30 April 2016 will be required to pay back their borrowings in full in September 2016. The interest rate on the operations was initially set at a 10 basis point spread above the prevailing MRO rate at the time of the operation. However, in January 2015, the Governing Council waived the 10 basis points spread; therefore the rate on the remaining six TLTROs, allotted between March 2015 and June 2016, was fixed over the life of the operation at the MRO rate prevailing at the time of the tender announcement. All TLTROs mature in September 2018.

4 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: Targeted-Longer-Term Refinancing Operations - present and future

A total of €212.4 billion was allotted across the euro area in the initial two TLTROs in September and December 2014. In the review period, a total amount of €219.6 billion (€205.5 billion in 2015, with a further €14.1 billion in 2016) was allotted through these operations.

The declining trend in TLTRO participation throughout 2015 and into 2016 was largely driven by the abundant liquidity conditions arising from previous TLTRO take-up and the APP, which placed downward pressure on money market rates and allowed banks to fund more cheaply in the money market. In addition, a total of €367.9 billion was voluntarily early repaid in TLTRO-I in June 2016, as many counterparties anticipated rolling borrowings into TLTRO-II.

TLTRO-II

In March 2016, with inflation rates remaining below the ECB's inflation target, the Governing Council announced the introduction of four new TLTROs (TLTRO-II) as part of a wider package of measures, commencing in June 2016, each with a maturity of four years. The operations, which will be conducted at a quarterly frequency, and will allow for an early repayment after two years, are intended to further ease private-sector credit conditions, by offering attractive long-term funding. The new operations have different features compared to the first series of TLTROs as there is no mandatory repayment operation and the borrowing rate may be negative if certain lending thresholds are met.

A total amount of up to 30 per cent of eligible loans (loans to the non-financial corporations and households excluding loans for house purchases, which is in line with the definition of eligible lending for the first series of TLTROs) can be borrowed through TLTRO-II, less any funds borrowed in the first two TLTROs conducted in 2014. The interest payable on the loans is determined by the evolution of a counterparty's eligible lending relative to a bank-specific benchmark between 1 February 2015 and 31 January 2016. If a counterparty's eligible net lending exceeds 2.5 per cent of its benchmark, outstanding TLTRO II borrowings will be charged at the rate of the Deposit Facility (currently -0.40 per cent). As the rate of the Deposit Facility is currently in negative territory, this results in the counterparty receiving remuneration on any outstanding borrowings, therefore providing an incentive to participate. If a counterparty's eligible net lending exceeds its benchmark, but is below 2.5 per cent of its benchmark, an interest rate between the rate on the Deposit Facility and the MRO rate (currently zero per cent) will be applied.

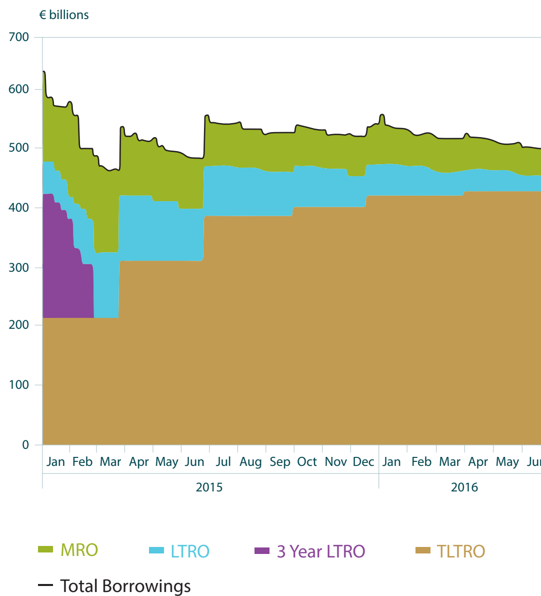
Following the Governing Council meeting in March 2016, the ECB introduced an additional voluntary repayment possibility in June 2016 for all outstanding funds borrowed through the first series of TLTROs. This allows counterparties to roll over any funds borrowed under the first series of TLTROs into TLTRO II. A total of €399.3 billion was provided in the first take-up of TLTRO-II by euro area counterparties, which settled on 29 June 2016.

3.1 Eurosystem Refinancing Operations

Participation in Eurosystem refinancing operations decreased by €70.9 billion over 2015, from €629.4 billion on 31 December 2014 to €558.5 billion on 31 December 2015. As at 30 June 2016, total Eurosystem lending stood at circa €541.2 billion. This lower level of recourse to Eurosystem lending was largely due to the abundant liquidity arising from the APP.

As can be seen from Chart 1, TLTROs became the dominant refinancing tool for counterparties, accounting for approximately 86 per cent of liquidity provided by the Eurosystem as at 30 June 2016. Chart 1

Chart 1: Total Eurosystem Lending (2015 - end H1 2016)



Source: CBI calculations.

illustrates the trend in Eurosystem refinancing operations.

Finally, refinancing via MROs declined by €103 billion during the period, from €156.1 billion on 31 December 2014 to €53.1 billion on 30 June 2016, as counterparties had reduced recourse to the Eurosystem's standard refinancing operations.

3.2 Eurosystem's Purchase Programmes

As previously mentioned, purchases of euro area debt securities under the APP have been a significant contributor to excess liquidity with cumulative purchases on 1 July 2016 of €1,088.8 billion. Box 3 below provides a summary of developments in relation to the asset purchase programme over the course of 2015 and H1 2016.

Box 3: The evolution of the euro area expanded asset purchase programme

The European Central Bank (ECB) announced an expanded asset purchase programme (APP) on 22 January 2015 in response to a prolonged period of persistently low inflation in the euro area and in order to achieve the ECB's price stability mandate. The aim of this box is to highlight some of the details around the APP and outline some of the changes to the programme that have been implemented since its inception.[5]

The APP incorporated a new Public Sector Purchase Programme (PSPP) which supplemented the existing private sector asset purchase programmes, encompassing the Asset-Backed Securities Purchase Programme (ABSPP) and the Covered Bond Purchase Programme (CBPP3), both of which were launched in late 2014. The APP was augmented this year with the Corporate Sector Purchase Programme (CSPP), which extends the programme to include purchases of investment-grade euro-denominated bonds issued by non-bank corporations. PSPP purchases began on 9 March 2015 comprising marketable debt instruments issued by euro area governments, certain agencies and certain international or supranational institutions located in the euro area. Eurosystem purchases under the APP were initially conducted at an average pace of €60 billion each month from 9 March 2015 and were intended to be carried out until at least September 2016 and in any case until the Governing Council saw "a sustained adjustment in the path of inflation that is consistent with its aim of achieving inflation rates below, but close to, 2 per cent over the medium term." On 1 July 2016, the total cumulative purchases of euro area debt securities under the APP amounted to €1,088.8 billion. Of this, €878.5 billion related to the PSPP, €183.6 billion to the CBPP3, €19.9 billion to the ABSPP and €6.8bn to the CSPP.[6]

5 For a more detailed analysis on why the programme was introduced and the various channels through which it works please see Dunne, Everett and Stuart ' The expanded asset purchase programme – What, Why and How of Euro Area QE' Quarterly Bulletin No. 3 2015

6 As outlined in the consolidated financial statement of the Eurosystem as at 1 July 2016.

Box 3: The evolution of the euro area expanded asset purchase programme

A number of criteria were announced around the purchases of securities under the PSPP. Securities are only allowed to be purchased in the secondary market in order to comply with Article 123 of the Treaty on the Functioning of the European Union (TFEU), which prohibits the purchase of sovereign debt securities in the primary market by the Eurosystem. In addition, securities must be denominated in euros, be eligible as collateral for Eurosystem monetary policy operations and have a minimum remaining maturity of 2 years and a maximum remaining maturity of 30 years and 364 days at the time of purchase. It was also decided in March 2015 that bonds yielding less than the rate on the ECB's Deposit Facility are not eligible for purchase.

The Governing Council also announced limits around the volume of purchases. It was decided to have a 25 per cent issue share limit (the proportion of any one bond issue that can be held by the Eurosystem, aggregated across all portfolios) and a 33 per cent issuer limit (the proportion of bonds issued by a particular sovereign or supranational institution held by the Eurosystem). These limits were designed to prevent the Eurosystem from having a blocking minority in a debt restructuring involving collective action clauses (CACs)[7], while preserving market functioning and safeguarding price formation. Finally, regarding implementation, the ECB coordinates the purchases, with the vast majority of purchases undertaken on a decentralised basis by the national central banks (NCBs) in line with the capital key[8].

Since its launch, a number of changes to the programme have been implemented in terms of the size, duration, composition and in relation to certain modalities of the APP. All of the announced changes are designed to improve the smooth implementation and effectiveness of the programme, with the ultimate goal of helping the Eurosystem to achieve its price stability mandate. The main changes were:

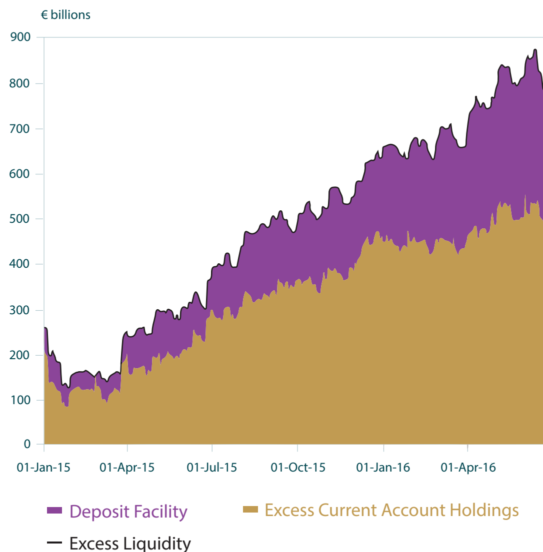
- The list of agencies whose debt is eligible for purchase under the PSPP has been updated on two occasions, **April and July 2015**.
- **In September 2015**, the issue limit was increased from 25 per cent to 33 per cent subject to a case-by-case verification that it would not create a situation whereby the Eurosystem would have a blocking minority for the purposes of CACs, in which case the issue share limit would remain at 25 per cent.
- **In December 2015**, the Governing Council decided to extend purchases from September 2016 to March 2017[9] and to make certain marketable debt instruments issued by regional and local governments located in the euro area eligible for regular PSPP purchases. The Governing Council also decided that the principal of each bond would be reinvested as the bond matures, for as long as necessary.
- **In March 2016**, it was decided to increase the pace of purchases of the APP to an average of €80 billion per month. The CSPP was also announced in March 2016. Finally, it was also decided to increase the issue share limit for EU supranational bonds from 33 per cent to 50 per cent and to decrease the share of EU supranational bonds from 12 per cent to 10 per cent of PSPP purchases.

7 A collective action clause (CAC) allows a large majority of bondholders to agree to a debt restructuring that is legally binding on all holders of the bond, including those who vote against the restructuring.

8 The capital key is the percentage that each National Central Bank contributes to the ECB capital. It is calculated as each respective country's share in the total population and gross domestic product of the EU, equally weighted.

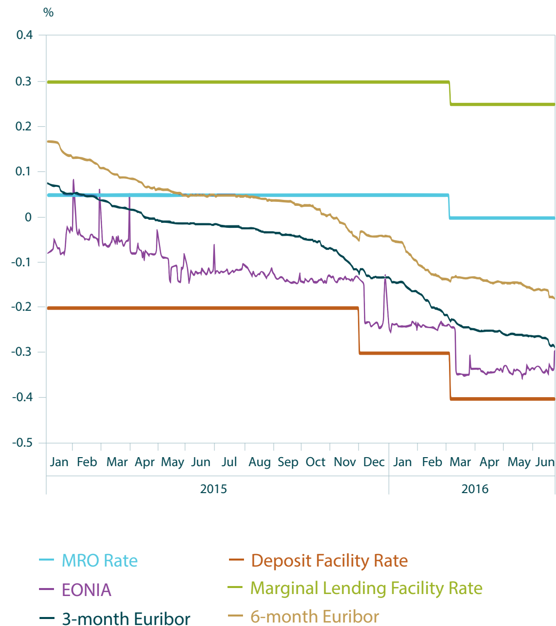
9 Purchases under the APP are now intended to run until the end of March 2017, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent with its aim of achieving inflation rates below, but close to, 2 per cent over the medium term.

Chart 2: Composition of Excess Liquidity (2015 - end H1 2016)



Source: CBI calculations.

Chart 3: The Eurosystem's Interest Rate Corridor & Selected Money Market Rates (2015 - end H1 2016)



Source: Bloomberg.

3.3 Overview of Liquidity Conditions in the euro-area and impact on money market rates

Eurosystem counterparties deposit liquidity either on the overnight Deposit Facility or on their current account as excess reserves (thereby over-fulfilling minimum reserve requirements). The growth in excess liquidity increased upon commencement of the Eurosystem's PSPP in March 2015 (combined with increased lending via TLTRO-I during the same month). Chart 2 illustrates this rising trend in excess liquidity over the review period.

As a consequence of the monetary policy decisions taken by the ECB, in particular the APP, money market rates continued a decline to historic lows. The EONIA rate reached its lowest average monthly fixing over 2015 in December (-0.199 per cent) following the Governing Council's decision to lower the rate on the Deposit Facility by 10 basis points to -30 basis points. This rate declined further to an average fixing of -0.333 per cent for the remainder of the review period following the Governing Council decision on 10 March 2016 to decrease the rate on the Deposit Facility to -40 basis points. Chart 3 illustrates that in an environment of high excess liquidity, money market rates move closer to the rate on the Deposit Facility.

This close link between the EONIA and the rate on the Deposit Facility reflects the fact that in an environment of high excess liquidity, this rate acts as the main policy anchor of money market rates. The increase in excess liquidity also drove EURIBOR fixings lower into negative territory during this period following further Governing Council announcements on the expansion of the purchase programmes.

4. Summary of Irish Developments

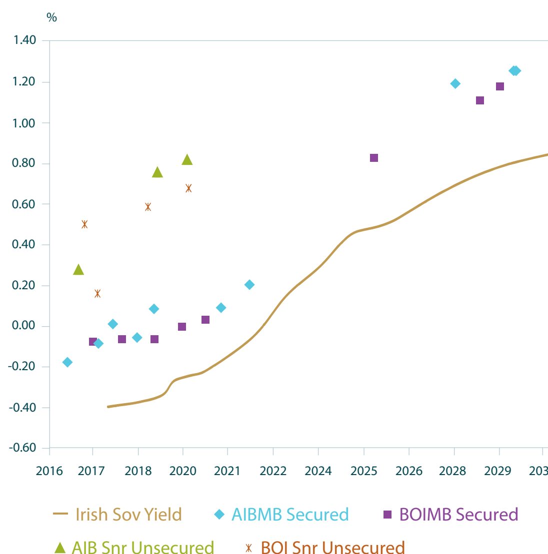
4.1 Irish Eurosystem Borrowings & TARGET2 Balance

Against the backdrop of the Eurosystem's APP and high levels of excess liquidity, Eurosystem lending to Irish domiciled counterparties decreased from €20.7 billion at 2014 year-end, to €10.7 billion at the end of 2015. There was a decline in Eurosystem lending to domestic

banks (from €12.6 billion to €9 billion) and for subsidiaries and branches of foreign banks (from €8.1 billion to €1.7 billion)[10]. During 2015, and as seen in the preceding year, Irish domestic banks continued to reduce their level of central bank funding mainly due to deleveraging, increased deposit inflows and improved access to the international debt markets.

In line with lower levels of recourse to Eurosystem lending, Ireland's T2 liability declined to €3.0 billion by the end of 2015 from €22.7 billion at the end of 2014. The most significant factors for this movement included the increase in the Irish domestic banks' access to international debt markets, the on-going deleveraging process across some of the banks and also reportedly due to sales of NAMA assets to foreign investors.

Chart 4: Selected Irish Banks' Bond Yields



Source: Bloomberg.

4.2 Irish sovereign and bank debt market activity in 2015 and to end of June 2016

Reflecting the impact of the Eurosystem's APP, Irish sovereign bond yields reduced across the curve during 2015 and H1 2016. For example, the 10-year bond yield was 1.15 per cent at the end of 2015 compared to 1.25 per cent at the start of January 2015, while the spread over the equivalent German 10-year bund narrowed to 52 basis points by end-2015, from 71 basis points at the start of January 2015. Irish sovereign bond yields remained stable in H1 2016 despite the uncertain political climate at this time. The 10-year yield fell under the 1 per cent level and achieved record lows despite volatility observed in other asset classes, notably emerging markets. This performance was also achieved against a background of a continued improvement in the public finances which was reflected in rating upgrades by the main rating agencies over the period. Following the 'Leave' outcome of the UK's referendum on membership of the EU, and amid the subsequent general market volatility, this trend lower in Irish sovereign yields and spreads has continued.

During 2015 and into the first half of 2016, Irish domestic banks also demonstrated continued bond market access, through both secured and unsecured issuance to an international investor base. The bond issuances were well subscribed given the improved outlook for the banking sector. The improvement has been supported by better sovereign funding conditions, improving financial results of the banks and an accommodative monetary policy stance. Most Irish domestic banks' covered bonds trade c. 20-30 basis points above the equivalent Irish sovereign yield (see Chart 4). Chart 4 illustrates selected banks' secured and unsecured yield levels relative to the sovereign yield curve.

The decline in Irish banks' covered bond yields since early 2015 can in part be attributed to the on-going purchases under the CBPP3 programme and this trend continued into 2016. Unsecured Irish bank debt as at 30 June 2016 traded at an average spread over the sovereign of c. 90-100 basis points, at similar spreads seen in early 2015. It was against this backdrop that borrowing from Eurosystem operations by domestic banks declined over the period.

10 Based on the latest publicly available data.

5. Conclusion

Amid emerging market volatility and political uncertainty relating to certain euro area peripheral countries, central bank monetary policy decisions remained a key supportive driver of financial markets in 2015 and during H1 2016. The continued accommodative policy by the Eurosystem (and other major central banks) supported asset prices, while banks' recourse to Eurosystem lending declined further over the period. The euro area economy was also impacted by continued low inflation which led the ECB's Governing Council to announce further policy measures, notably successive reductions to the rate on the Deposit Facility to -0.40 per cent and an expansion of the APP in volume and asset classes. Purchases under the APP are now intended to run until the end of March 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 aim of achieving inflation rates below, but close to, 2 per cent over the medium term.

In this context, excess liquidity has continued to rise over the review period, reaching €859.9 billion by the end of H1 2016, and pushing both secured and unsecured money markets rates towards the rate on the Deposit Facility. Excess liquidity levels will continue to increase up to March 2017 as the Eurosystem's purchase programmes continue, which should in turn continue to anchor money market rates towards the rate on the Deposit Facility. The impact of policy decisions of the world's major central banks will continue to impact markets throughout 2016, along with other factors including developments following from the outcome of the UK's referendum on EU membership.

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 the current account balance.

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

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 (OMO's) 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 can also be 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 exceptional 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**).