



DIRECTORATE-GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT **A**
ECONOMIC AND SCIENTIFIC POLICY



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Non-Standard Monetary Policy Measures and the Balance Sheet of Major Central Banks

Monetary Dialogue
July 2014

COMPILATION OF NOTES



DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

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Monetary Dialogue 14 July 2014

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Abstract

The notes in this compilation - prepared by selected monetary policy experts - analyse similarities and differences in the crisis reaction of the ECB, the FED and the BoE as well as the reasons for the different reactions (institutional set up, economic reasons etc.). In this context, the notes also assess how successful these 'non-standard policy measures' have been and how they have affected central banks' balance sheets in terms of volume and composition. The notes have been requested by the Committee on Economic and Monetary Affairs (ECON) as an input for the July 2014 session of the Monetary Dialogue between the Members of ECON and the President of the ECB.

This document was requested by the European Parliament's Committee on Economic and Monetary Affairs.

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Manuscript completed in July 2014

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This document is available on the internet at:

<http://www.europarl.europa.eu/committees/en/econ/monetary-dialogue.html>

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INTRODUCTION

In the course of the crisis, the European Central Bank (ECB) has adopted a number of non-standard measures to preserve the smooth functioning of the monetary policy transmission throughout the euro area. Other major central banks of developed economies, including the Federal Reserve (FED) and the Bank of England (BoE) have implemented non-standard monetary policy measures. These measures have affected the composition and volume of the balance sheet of the respective central banks.

The notes in this compilation - prepared by selected monetary policy experts - analyse similarities and differences in the crisis reaction of the ECB, the FED and the BoE as well as the reasons for the different reactions (institutional set up, economic reasons etc.). In this context, the notes also assess how successful these 'non-standard policy measures' have been and how they have influenced central banks' balance sheets in terms of volume and composition. The main conclusions and policy options are summarised below.

The notes have been requested by the Committee on Economic and Monetary Affairs (ECON) of the European Parliament as an input for the July 2014 session of the Monetary Dialogue between the Members of the ECON Committee and the President of the ECB.

Karl Whelan (University College Dublin). The ECB has been slower to cut interest rates and to consider asset purchase programmes than the other major central banks even though the euro area economy has performed worse than its comparators. This failure to act has not stemmed directly from the ECB's price stability mandate. Indeed, by not acting sufficiently strongly, the ECB is now failing to meet its own definition of price stability. The measures introduced at the ECB's June Governing Council meeting will have only a modest positive effect on the euro area economy as: i) the negative deposit rate will have a small effect in reducing money market rates and yields on low-risk sovereign bonds but will do little to boost bank lending. Indeed, it may have a slight negative effect as banks raise interest rates on loans to offset the negative effect of the ECB charging them for their deposits; ii) the Targeted Long-term Refinancing Operations (TLTRO) is not particularly well targeted and many banks will treat it as an unconditional two-year LTRO; iii) while some banks will consider using TLTRO funds to provide loans to the private sector, this programme will do little to counter strong pressures on banks to deleverage and to establish stable private funding sources. Large asset purchase programmes – of both sovereign bonds and private asset-backed securities – are overdue. The ECB should not wait until all of the regulatory issues with SME-loan-backed bonds are resolved and a large market for these instruments established. It should announce a programme of ABS purchases as soon as possible. A programme of sovereign bond purchases would also reduce long-term interest rates and send an important signal to the public that the ECB intends to meet its price stability target. Such a programme would not violate the Treaty's monetary financing clause.

Charles Wyplosz (Graduate Institute of International and Development Studies). As the financial crisis deepened, central banks have innovated in many ways. The ECB was the first to provide ample liquidity to commercial banks when the interbank market froze. In the next two phases, however, important differences have arisen between the ECB, on one hand, and the Federal Reserve and the Bank of England on the other hand. The difference is quantitative. While the balance sheets of the Federal Reserve and the Bank of England have increased fivefold since 2007, the ECB only allowed half that much. In addition, the biggest increase came late, starting at end-2011. The difference is also qualitative. The Federal Reserve and the Bank of England engaged in Quantitative Easing (QE), a series of measures that aimed at providing an expansionary boost at a time when their traditional instrument, the very short-term policy interest rate had been brought down to the zero

level bound. The ECB did not reach the lower bound until May 2014, so it had no need for non-standard instruments. In the period that lasted between August 2007 and September 2008, which is between BNP Paribas' decision to suspend a fund and the collapse of Lehman Brothers, the ECB was active in providing liquidity to banks. It sharply expanded this action in September 2008, but less so than the Federal Reserve and the Bank of England, and the same applies to the interest rate reduction. Under the separation principle, the ECB simultaneously conducted liquidity providing operation and a less expansionary standard monetary policy as it was concerned with inflation pressure. Again in contrast to the Federal Reserve and the Bank of England, the ECB also failed to act as lender in last resort to both banks and governments. This is most likely the reason why the Sovereign Debt Crisis has only affected the Euro Area. By not dealing with ailing Irish and Spanish banks, the ECB effectively forced otherwise fiscally disciplined governments to rapidly increase their debts. By not supporting government bonds on the secondary markets, it let investor fears of potential defaults simmer. It is only at the end of 2011 that the ECB expanded the scale and the scope of its liquidity providing operations through the LTROs. This is also when the SMP started to deal with the catastrophic situation of public bonds in the crisis countries. These efforts were too late to reverse the trend of rising market panic. The decisive move came later, in mid-2012, with the OMT programme. A significant step towards accepting its role as lender in last resort to governments, the programme has turned the tide. Yet, the economic recovery is now foreseen to remain very weak and inflation has fallen to the point where some observers fear deflation. This has led the ECB to finally reach the zero lower bound, even slightly below. The time for QE is coming, but the ECB is still "thinking" about it.

Gregory CLAEYS (Bruegel). The ECB's policy response to the crisis was mainly oriented towards ensuring the provision of liquidity and repairing the bank-lending channel. In order to do that, the ECB mainly modified its existing monetary policy tools. It increased the average maturity of its refinancing operations from months to years. It eased the collateral requirements to access those refinancing operations, and liquidity was allocated at a fixed rate and full-allotment basis. Retrospectively, those measures appear to have been a very appropriate and effective way to deal with the liquidity crisis of 2008-2012. The ECB also introduced more unconventional measures with the Securities Market Programme and the Covered Bonds Purchase Programme, which it used to buy particular assets – government bonds from troubled countries and covered bank bonds – in order to repair the monetary transmission channel in the euro area. However, the scope and impact of those measures was limited and short-lived. The ECB also announced the Outright Monetary Transactions programme, in order to purchase unlimited amounts of government bonds of member states subject to a European Stability Mechanism (ESM) programme. This measure has not been used, but its announcement had a significant impact on government bond yields of the EMU member states because it demonstrated the determination of the ECB to maintain the integrity of the euro area. The Federal Reserve (Fed) and the Bank of England chose a more radical and unconventional path in terms of monetary policy when they decided very quickly to implement large-scale asset-purchases programmes as their main response to the crisis. The sizes of these programmes were very significant (grossly equivalent to 20-25% of GDP) and, although it is very difficult to estimate their impact, there is a broad consensus in the literature that those measures had a positive impact on financial variables and also on GDP and inflation in the US and the UK. The liquidity crises that have plagued the euro area in the last few years seem to be behind us. The ECB's main problem now is the continuous decline of inflation in the euro area to a level well below its definition of price stability of close but below 2%. In order to counteract this fall and to bring inflation back to 2% in the medium term, the ECB announced a broad package of measures at its June 2014 Governing Council meeting. However, although we welcome the fact that the

ECB finally recognised that inflation will be too low for a too-long period and decided to act, we believe that the measures it proposes arrive too late, are too limited, and might be too “conventional” to solve the current problem. That is why we urge the ECB to implement a large-scale asset-purchase programme as soon as possible. To do that, we propose monthly purchases of €35bn of ESM/EFSF/EIB bonds, corporate bonds and asset-backed securities (ABS) in order to anchor inflation expectations and bring euro-area inflation back to 2% in the medium-term.

Anne SIBERT (Birkbeck, University of London and Centre for Economic Policy Research). The ECB and the Fed responded decisively to the liquidity crisis of August 2007 to June 2008, but at first as if it were a pure monetary policy problem. The Bank of England delayed its response. The size of the balance sheets of the Federal Reserve System, the Eurosystem and the Bank of England were little changed over the course of the liquidity crisis, but their composition changed. During the solvency crisis of July 2008 to April 2010, the ECB, the Fed and the Bank of England provided liquidity, sought to support dysfunctional markets and undertook quantitative easing. The Fed stands out for the size of its quantitative easing and its blatant quasi-fiscal measures. The balance sheets of the Federal Reserve System, the Eurosystem and the Bank of England grew over the course of the solvency crisis and their composition changed. In the course of the sovereign debt crisis, beginning in May 2010, the ECB has mainly focused on restoring calm to disorderly markets while the Fed and the Bank of England have engaged in aggressive quantitative easing. The balance sheets of the Federal Reserve System and the Bank of England have expanded markedly over the course of the sovereign debt crisis and the Federal Reserve System’s is still expanding. Notably, the expansion of the balance sheet of the Eurosystem was only temporary.



DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

The ECB and non-standard monetary policies: Too little, too late?

Karl WHELAN

IN-DEPTH ANALYSIS

Abstract

The ECB has been slower to cut interest rates and to consider asset purchase programmes than the other major central banks even though the euro area economy has performed worse than its comparators. This failure to act has not stemmed directly from the ECB's price stability mandate. Indeed, by not acting sufficiently strongly, the ECB is now failing to meet its own definition of price stability. The measures introduced at the ECB's June Governing Council meeting will have only a modest positive effect on the euro area economy. Large asset purchase programmes – of both sovereign bonds and private asset-backed securities – are overdue.

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EXECUTIVE SUMMARY

- The ECB has been slower to cut interest rates and to consider asset purchase programmes than the other major central banks even though the euro area economy has performed worse than its comparators.
- This failure to act has not stemmed directly from the ECB's price stability mandate. Indeed, by not acting sufficiently strongly, the ECB is now failing to meet its own definition of price stability.
- The measures introduced at the ECB's June Governing Council meeting will have only a modest positive effect on the euro area economy.
- The negative deposit rate will have a small effect in reducing money market rates and yields on low-risk sovereign bonds but will do little to boost bank lending. Indeed, it may have a slight negative effect as banks raise interest rates on loans to offset the negative effect of the ECB charging them for their deposits.
- The Targeted LTRO is not particularly well targeted and many banks will treat it as an unconditional two-year LTRO.
- While some banks will consider using TLTRO funds to provide loans to the private sector, this programme will do little to counter strong pressures on banks to deleverage and to establish stable private funding sources.
- Large asset purchase programmes – of both sovereign bonds and private asset-backed securities – are overdue.
- The ECB should not wait until all of the regulatory issues with SME-loan-backed bonds are resolved and a large market for these instruments established. It should announce a programme of ABS purchases as soon as possible.
- A programme of sovereign bond purchases would also reduce long-term interest rates and send an important signal to the public that the ECB intends to meet its price stability target. Such a programme would not violate the Treaty's monetary financing clause.

1. INTRODUCTION

The period since the beginning of the global financial crisis in 2008 has been an extraordinary one for central banks around the world. Short-term interest rates have been brought to historic lows and central banks have introduced a wide range of new operations that would have considered almost science fiction little more than a decade ago. Traditional methods for providing central bank liquidity have been overhauled and central banks such as the Federal Reserve and the Bank of England have undertaken significant large-scale asset purchases (LSAPs) and as well as a range of special programmes targeted at specific sub-sectors of the financial system.

The ECB has played some role in this global movement away from traditional central banking but its embrace of so-called “non-traditional” monetary policies has been slower and less enthusiastic. Like other central banks, the ECB responded to the crisis in 2008 by providing large amounts of liquidity to the banking system and simplifying its rules by moving towards full-allotment fixed rate operations. Indeed, the ECB’s existing comprehensive collateral framework meant that it was better positioned than some of the other large central banks to respond to the initial phases of the global crisis.

Since 2008, however, the ECB has been consistently slower to respond to the weakness in the economy and the financial system than either the Federal Reserve or the Bank of England. While these central banks quickly cut interest rates to near zero, it has taken the ECB almost six years to do this with this period including a mistaken tightening of policy in 2011. Unlike the Bank of England or Federal Reserve, the ECB has not undertaken significant LSAPs – its asset purchase programmes were limited to small purchases of covered bonds and the SMP programme of reluctant and temporary sovereign bond purchases. Where the Bank of England and the Fed have experimented with new approaches to “forward guidance”, the ECB has limited itself to bland (and probably impact-free) assurances that current monetary policies will be in place for some time to come.

With the ECB now acknowledging that it has effectively run out of room for further rate cuts, the debate about which “non-standard policies” it should adopt has intensified and the June Governing Council meeting saw some new measures introduced. This paper discusses the new measures introduced by the ECM. It also argues the case for asset purchase programmes and discusses a number of specific issues that complicate their application in the euro area.

This structure for this paper is as follows. Section 2 makes the case that the ECB has not reacted strongly enough to the economic weakness in the euro area and that, rather than just considering them now, it should have already introduced large-scale asset purchase programme. Section 3 then discusses the actions taken by the ECB Governing Council in June – most importantly, a new targeted long-term refinancing operations (TLTRO) and a negative deposit rate – and argues that these decisions TLRTO will have a limited impact. Finally, Section 4 focuses on two types of programmes that could be introduced: A programme of purchasing bonds backed by loans to small and medium-sized enterprises and a sovereign bond purchase programme.

2. THE CASE FOR LARGE-SCALE ASSET PURCHASES

This section outlines the rationale for Large Scale Asset Purchases (LSAPs) by a central bank, compares the actions since 2008 of the Federal Reserve with those of the ECB and then argues that the ECB is failing to meet its mandate by its failure to pursue effective LSAP programmes.

2.1. Why Employ LSAPs?

In normal recessions, central banks respond to economic weakness by cutting the short-term interest rates that they control. These cuts end up being passed through to the rates that private sector firms and households can borrow at. In a low inflation environment, however, nominal interest rates tend to be relatively low on average and a severe recession may lead the central bank to cut interest rates to zero.

Once interest rates have been cut to zero, the central bank's traditional transmission mechanism for monetary policy is exhausted. This is not because the central bank cannot set a negative interest rate: It is perfectly possible, for example, for the ECB to offer negative interest rate loans to banks i.e. to loan money and then allow the borrowing bank to return less than the amount borrowed. However, under normal circumstances, it will not be possible to get private sector financial institutions to provide loans with negative interest rates – they would be better off simply to keep the money as cash in the bank (or under a mattress) than making loans of this type.

In addition to cutting interest rates to zero, central banks can also communicate to the public their intention to keep these rates very low for a long time – this will tend to reduce longer-term interest rates which are heavily determined by the expected future path of short-term rates.

Beyond this kind of “forward guidance”, central banks can choose to influence private sector interest rates by intervening directly in financial markets. By purchasing large quantities of securities, central banks can raise their price, which reduces their yield. These reductions in yield may then be passed on to other key interest rates in the economy.

This latter point about LSAPs, or “quantitative easing” as it is sometimes known, is important. Most of the commentary about these programmes characterises them as “printing money” and it is often suggested that their purpose is to expand the broader money supply and thus increase the availability of credit in the economy. However, this is not how either the Federal Reserve or Bank of England have viewed these programmes. While the textbook “money multiplier” model describes how increases in the monetary base are automatically translated into increases in the broader money supply, this model does not provide an accurate description of money creation in a modern economy in which banks make decisions about credit creation based on a wide range of macroeconomic and regulatory factors.¹

Instead of focusing on the idea that these programmes boost the broader money supply, research from the Federal Reserve and the Bank of England such as D’Amico et al (2012) and Joyce et al (2010) has clearly highlighted the reduction of bond yields as the objective of LSAPs. In particular, these studies have emphasised that they view the main purpose of LSAPs as being the reduction of “term premia”, i.e. that part of long-term interest rates that is unrelated to expected future short-term rates. In other words, while LSAPs may play a role in providing forward guidance on future short-term rates, this is not seen as the principal channel through which they operate.

¹ The recent paper McLeay, Radia and Thomas (2014) is effectively an official explanation of this viewpoint by the Bank of England.

There is a growing empirical literature on the impact of LSAPs on bond yields. The message from these studies is somewhat mixed: LSAPs work to reduce bond yields but the effects are relatively limited and obtaining these limited effects requires a very large amount of money creation. For example, D'Amico et al (2012) state their results as follows

For longer-term Treasury securities, the first LSAP program (undertaken in 2009) consisted of \$300 billion of Federal Reserve purchases, while the second program (in late 2010 to mid-2011) consisted of \$600 billion of purchases. Our preferred estimates suggest that, taking scarcity and duration together, the first program of LSAPs reduced longer-term Treasury yields by about 35 basis points; the second program, larger in dollar amount but smaller in its impact on duration, reduced longer-term Treasury yields by about 45 basis points.

So while LSAPs do work, they are a poor substitute for the ability to cut short-term interest rates by another couple of percentage points. This illustrates one of the downsides of operating in a low inflation environment.

2.2. Comparison of the ECB and Federal Reserve

When compared with the actions taken by other central banks, the remarkable thing about the ECB's current situation is that it has taken so long (and things have had to get so bad) for it to cut its policy rates towards zero and to consider asset purchase programmes.

The graphs over the next few pages compare aspects of the euro area and United States economies over the past few years. They illustrate categorically that the ECB's weaker and slower response over the past few years has occurred despite the euro area economy performing far worse than the U.S. economy.

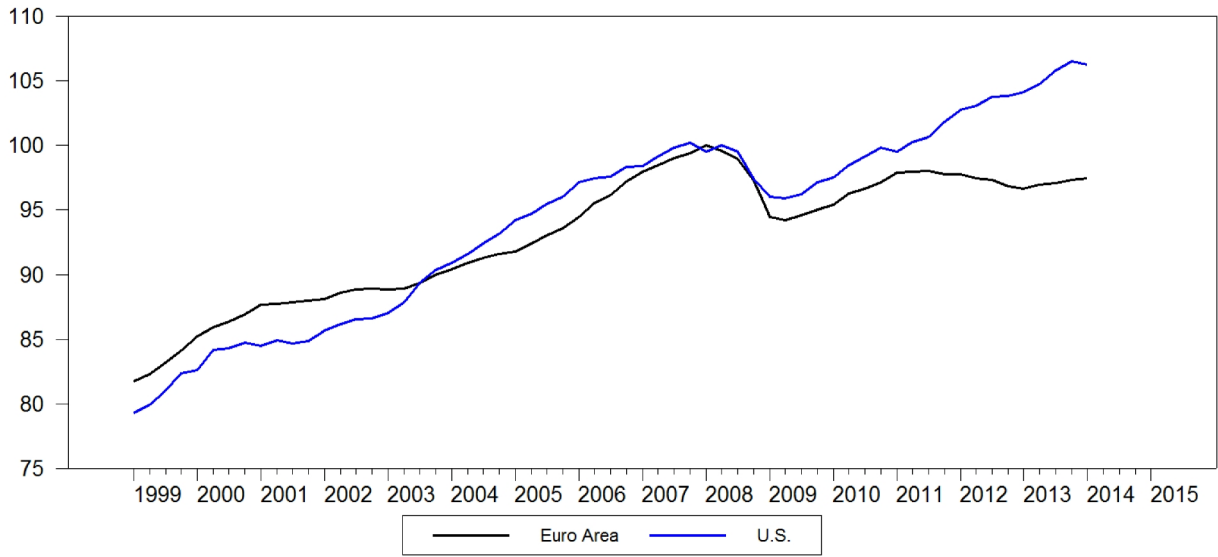
Figure 1 compares real GDP in the euro area and the United States, indexing both series to 100 at their 2008 peak values. Despite a widespread perception that the 2008 recession was driven by the events in the United States, the decline in GDP was larger in the euro area with GDP falling about 6 percent, compared with a decline of about 4 percent in the United States.

The euro area has continued to underperform the United States in the years following the severe global contraction. Despite widespread dissatisfaction in the U.S. with a relatively slow pace of growth, the U.S. economy has grown steadily since the middle of 2009 and real GDP in the first quarter of this year was 6 percent above its previous peak in 2008. In contrast, the euro area economy began a sluggish recovery in 2009 which petered out in 2011 as the economy entered back into recession (see Figure 1). While four quarters of very slow growth have now been recorded, euro area real GDP in the first quarter of this year remained 2.5 percent below its pre-crisis peak.

The euro area's experience with unemployment has also been more negative than that of the United States. The initial increase in unemployment in 2008/9 was larger in the U.S., with its unemployment rate rising from well below the European level to matching the euro area rate in late 2009. However, from that point onwards the U.S. unemployment rate gradually eased to reach 6.3 percent in May 2014. In contrast, unemployment in the euro area rose in 2008 and 2009, plateaued in 2010, and then began increasing again during the second recessionary dip. At 11.7 percent, the current unemployment rate in the euro area is still two-thirds higher than it was prior the global economic crisis (see Figure 2).

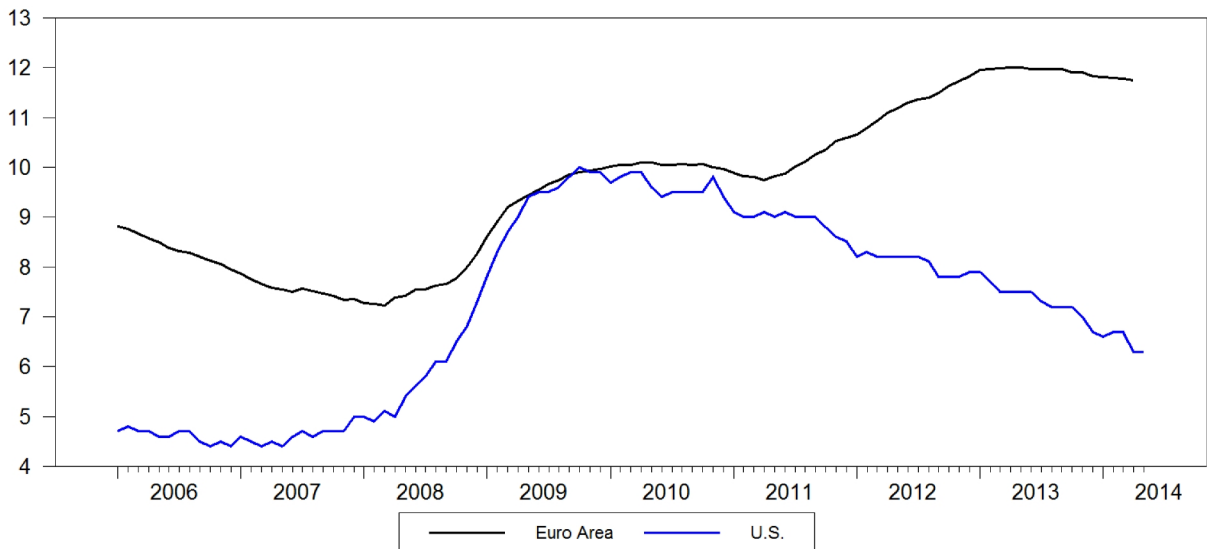
Figure 1: Real GDP in Euro Area and the United States

Indexed to 100 at 2008 Peak



Source: ECB SDW and Federal Reserve FRED Database

Figure 2: Unemployment Rates in Euro Area and the United States



Source: ECB SDW and Federal Reserve FRED Database

Despite this significantly inferior economic performance, the ECB has been consistently more reticent to use its powers to promote economic activity. The ECB raised interest rates in July 2008 at a time when (we now know) the euro area economy was in recession. The ECB was then slower to cut interest rates than the Fed. While the Fed had cut its policy rate to effectively zero by the end of 2008, the ECB only gradually cut rates to one percent in May 2009. The ECB then raised rates in Spring and Summer of 2011, just as the euro crisis was intensifying and leading the euro area back into recession. Only at its most recent meeting has the ECB finally reached the point where its key policy rate is close to zero.

The ECB's approach to expanding its balance sheet has also been far more conservative. There have been two types of bond-purchasing programmes but both were relatively small and are now over: A limited set of covered bond purchases and the mysterious and opaque stop-start bond purchases associated with the now-defunct Securities Market Programme. The ECB did provide additional liquidity to the European banking system after 2008 and its balance sheet had more than doubled after the second large LTRO in early 2012. However, from then until the most recent Governing Council meeting, there were no new initiatives to actively use the ECB's balance sheet and it has now shrunk in size by about €1 trillion due to banks repaying their LTRO borrowings. Figure 4 illustrates the ECB's lack of use of its balance sheet relative to the Federal Reserve, which has expanded its assets by a factor of almost five.

2.3. The ECB: Meeting or Failing to Meets Mandate

One argument for the less active approach is that the ECB differs from the Federal Reserve in having a primary mandate for price stability and this mandate has forced it to act in a more conservative manner. I disagree with this position for a number of reasons.

First, it should be noted that the Federal Reserve has performed well in meeting its inflation mandate despite pursuing policies such as LSAPs. Indeed, in the period since August 2008, average consumer price inflation has been almost identical in the euro area and the United States.² Nor has there been any sign that years of the stimulative "non-standard" monetary policies are producing any delayed impact on U.S. price inflation, which has remained close to target over the past few years. The idea that the ECB could not afford to risk programmes such as LSAPs because of their inflationary impact simply does not match the evidence.

Second, in the absence of more vigorous monetary policies, the ECB is actually failing to meet its own definition of price stability. The ECB's current staff projections envisage HICP inflation of 0.7 percent this year, 1.1 percent in 2015 and 1.4 percent in 2016. Following on from last year's HICP inflation rate of 1.4 percent, this projection represents a significant cumulative shortfall from the price level path consistent with the ECB's interpretation of its own mandate.

This shortfall is particularly dangerous given the current economic conditions in the euro area. Many European governments, firms and households are struggling with high debt burdens and below-target inflation slows the process of adjusting these burdens downwards via nominal wage increases. An important part of this process is the recovery of competitiveness in peripheral economies but a low average inflation rate for the euro area as a whole makes it difficult for these countries to improve their competitiveness without experiencing a deflationary cycle that exacerbates existing debt burdens.

² CPI inflation in the U.S. has averaged 1.65 percent while HICP inflation in the euro area has averaged 1.66 percent.

Overall, I believe that the ECB is failing to meet its own mandate by acting too cautiously and that it bears an important element of responsibility for both the failure to meet its own inflation target and the poor state of the euro area economy.

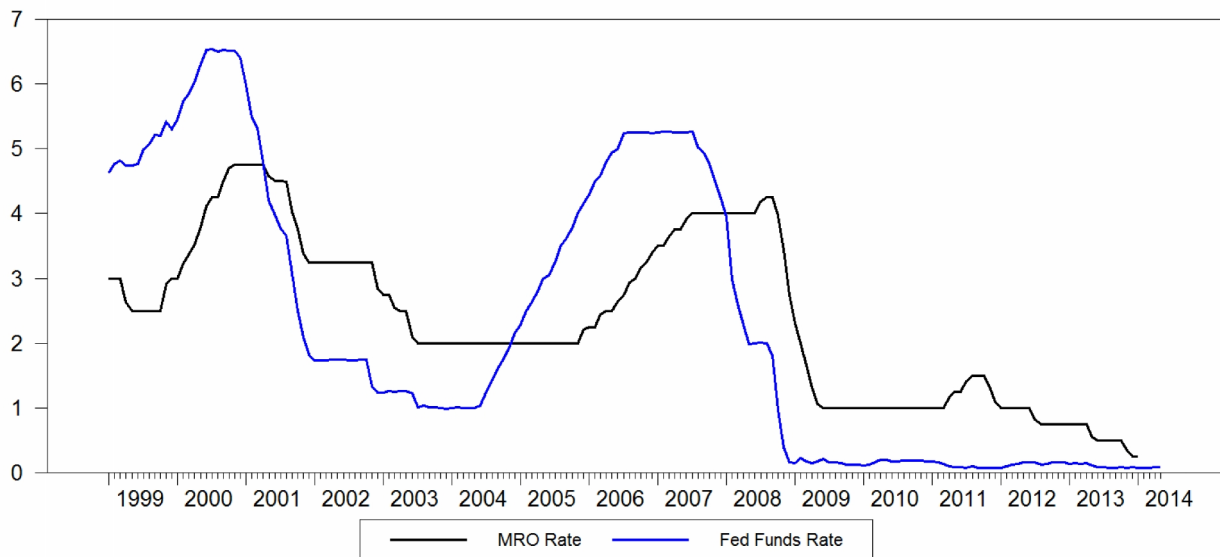
In my opinion, these arguments suggest that a more radical approach to monetary policy, such as new LSAP programmes, is long overdue. The ECB, however, does not agree. In an important speech in April, Mario Draghi mentioned the conditions under which he believed the ECB should adopt various new approaches.³ He noted that a “targeted LTRO or an ABS purchase programme” would be the appropriate if there was “a further impairment in the transmission of our stance, in particular via the bank lending channel” and stated that “a worsening of the medium-term outlook for inflation ... would warrant a more broad-based asset purchase programme.”

I am a bit puzzled by this approach to asset purchase programmes.

First, given that the euro area economy is already in very poor shape and inflation is falling well short of target, it is unclear why it is that the ECB needs to wait for a further worsening medium-term outlook for inflation before introducing LSAPs.

Second, it is unclear why the ECB believes that this condition had not already been met. The ECB itself admits that it anticipates undershooting its own price stability target for at least four successive years. This constitutes an unsatisfactory medium-term inflation outcome and I hope the ECB will accept this over the coming months. For this reason, I would anticipate that some form of large asset purchase programme is likely to be implemented before the end of this year.

Figure 3: Policy Rates in Euro Area and the U.S.



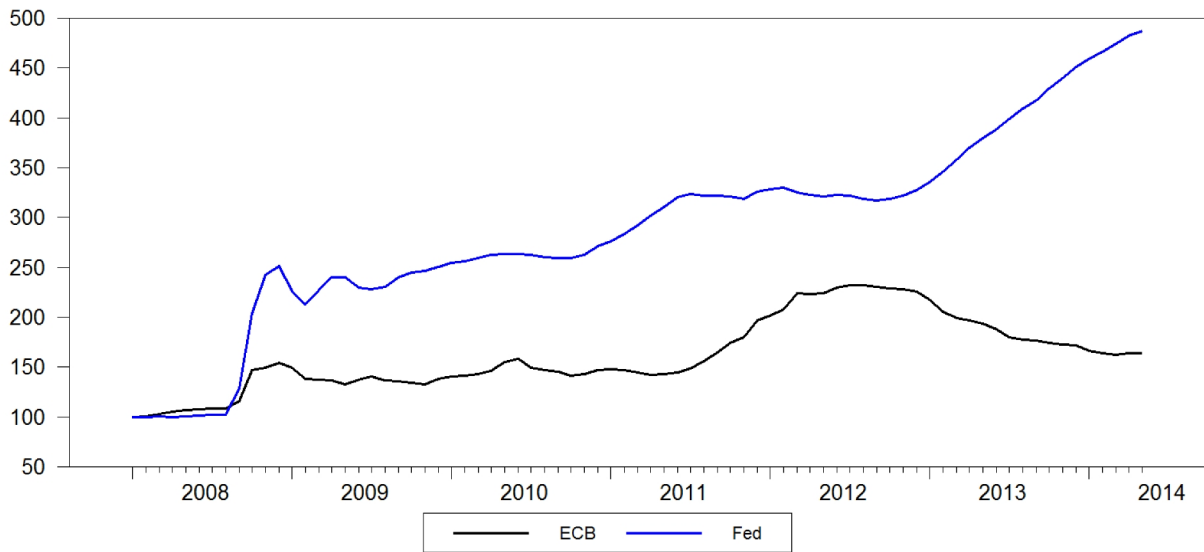
Note: Black Line is Main Refinancing Operation Rate and Blue Line is Fed Funds Rate

Source: ECB SDW and Federal Reserve FRED Database

³ This speech “Monetary policy communication in turbulent times” can be found at <http://www.ecb.europa.eu/press/key/date/2014/html/sp140424.en.html>

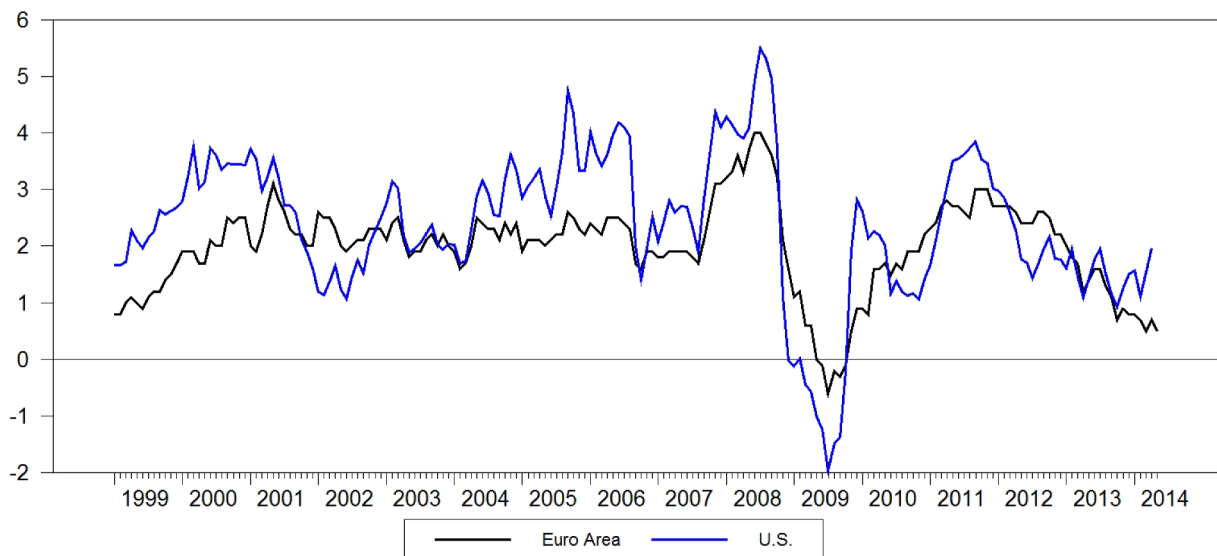
Figure 4: Balance Sheet Expansions of ECB and Federal Reserve

Index: January 2008=100



Source: ECB SDW and Federal Reserve FRED Database

Figure 5: Consumer Price Inflation in Euro Area and the U.S.



Note: Black Line is Euro Area HICP, Blue Line is US CPI

Source: ECB SDW and Federal Reserve FRED Database

3. THE ECB'S JUNE GOVERNING COUNCIL DECISIONS

Though it stopped short of adopting an asset purchase programme, the ECB announced a range of new monetary policy measures at its June meeting. In addition to cutting its Main Refinancing Operation rate by 10 basis points to 15 basis points, the ECB announced other measures including

- Lowering the "remuneration rate" on excess reserves and deposits held with the Eurosystem to a negative ten basis points, so that banks need to pay a charge to the ECB for such deposits.
- Ending the "fine-tuning operations" for sterilisation of SMP bond purchases.
- Announcing that three-month long-term refinancing operations (LTROs) would continue on a fixed-rate full-allotment basis until December 2016.

The ECB also announced a new Targeted Long-Term Financing Operation (TLTRO). This is a relatively complex operation with the following features.

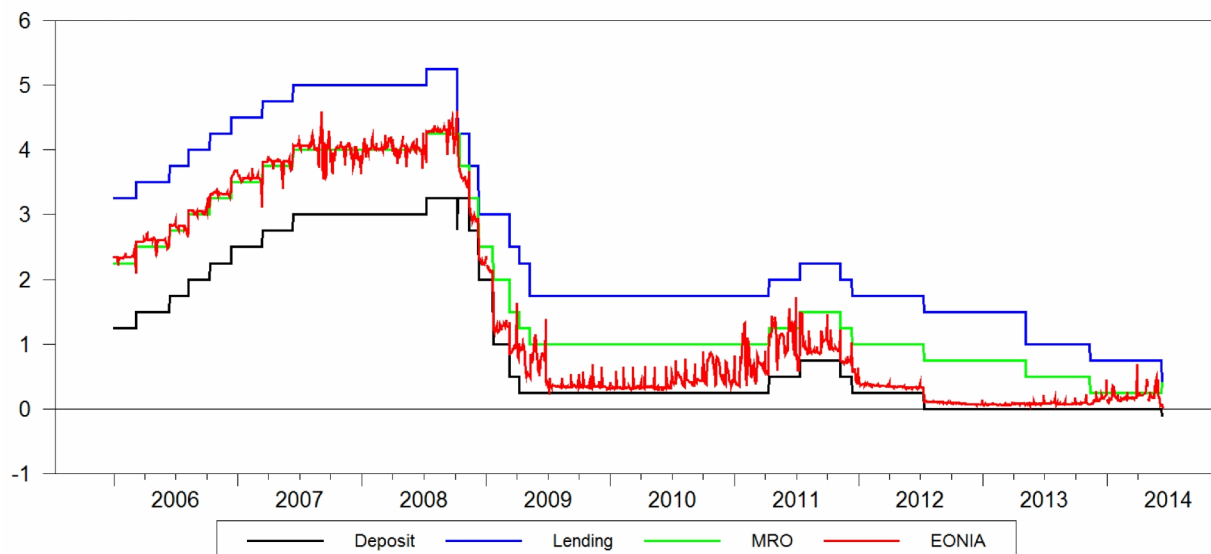
- It allows banks to borrow for four years at a fixed rate. In this year's two operations that rate will be 25 basis points.
- The amount that a bank can initially borrow from this operation is 7 percent of their loans to the euro area non-financial private sector, excluding loans to households for house purchase.
- Subsequently, from March 2015 to June 2016, banks will be able to borrow additional amounts that can reach up to three times their net lending to the non-financial private sector (excluding loans for house purchase) from April 2014 onwards in excess of a specified benchmark. The benchmark will be an institution-specific calculation based on each bank's net lending in the year prior to April 2014.

While I would have preferred to have seen the announcement of large-scale asset purchase programmes, these measures will have a small positive impact on the euro area economy by lowering interest rates somewhat. I am less optimistic that they will generate a significant increase in bank lending to the real economy.

3.1. The Negative Deposit Rate

In relation to interest rates, the move to negative rates on the deposit facility will have some effects on money market rates and on higher-quality government bonds. The interaction between monetary policy and money market rates has changed in recent years. Figure 6 illustrates the "corridor" system by which the ECB traditionally controlled euro area money market rates. Prior to 2008, EONIA, the average overnight money market rate, generally stayed very close to the ECB's MRO rate and fluctuations in this rate were bounded above by the marginal lending facility rate and below by the deposit rate.

In recent years, however, many banks that are perceived as higher-risk have been excluded from short-term unsecured money markets. While these banks can borrow at the MRO rate, the traditional arbitrage relationship between this rate and the money market rate has effectively broken down. Instead, money market borrowing has been limited to lower-risk banks and the low rate earned on these loans is seen as an alternative for lending banks to leaving the money at the ECB and earning the deposit facility rate.

Figure 6: EOINA and the ECB's Interest Rates

Source: ECB SDW

For these reasons, EONIA has tracked the deposit facility rate rather than the MRO rate over the past few years. The move to a negative deposit facility rate will thus move money market rates downwards, a pattern that can already be seen in the week since the negative rate was introduced on June 11.

The reduction in the deposit facility rate will also have a small impact in reducing the yield on low-risk sovereign bonds. With money market rates falling towards zero and banks paying a fee for having deposits with the Eurosystem, the demand for holding these short-duration low-risk sovereign bonds as an alternative investment will increase, thus driving down yields.

The “hot potato” effect on asset yields – driven by a desire by banks to have liquid assets instead of deposits with the Eurosystem – will intensify somewhat because of the additional liquidity entered into the system by the Governing Council’s decision to stop sterilising its SMP purchases and also by the TLTROs in September and December of this year.

This liquidity-boosting effect may be temporary, however, because the ECB’s current operational policies mean that the supply of central bank liquidity is effectively demand-driven: With full-allotment policies in place and banks allowed to repay LTRO borrowings, the total amount of liquidity in the system will be determined by the actions of private banks rather than the ECB. Indeed, once the two original large LTROs are repaid next year, it is not clear that TLTRO will actually boost liquidity to much above current levels.

One potential goal of the negative deposit rate is to increase the supply of bank credit. One theory is that the charge on Eurosystem deposits will encourage banks to make loans instead of having deposits at the central bank. It is very unlikely, however, that this mechanism will do much to add to credit growth. European banks are focused on building up regulatory capital ratios and are still very cautious in their assessment of private sector credit risk. While the negative deposit rate may boost demand for liquid securities, it is unlikely to do much for the supply of loans to the private sector.

Indeed, with banks focusing on raising profit margins, it is possible that the negative effects on banking system income of the charge on deposits may end up being passed through in the form of slightly higher interest rates on loans. In this sense, the negative deposit rate could actually prove harmful to credit conditions for firms and households in the euro area.

3.2. The TLTRO

Unlike the negative deposit rate, the TLTRO is intended to act directly to raise the supply of bank credit to the private sector.

The scheme offers a number of incentives to banks to borrow from the ECB and use the funds to lend to the private sector. The cost of this credit is very cheap: This year's TLTROs will have a fixed interest rate of 25 basis points and subsequent LTROs will have an interest rate that is only 10 basis points above the prevailing MRO rate. In addition, the four-year maturity for these loans is helpful to banks that are concerned about satisfying regulations on net stable funding ratios: It is hard to make four-year loans to customers on the basis of short-term funding from the central bank.

Despite these positive elements, I have a number of doubts about whether TLTROs will have much impact on bank lending to the private sector.

First, despite the name, the "targeted" nature of the TLTROs is weak. There is no fine or punishment for banks that take TLTRO funds and then don't satisfy the lending benchmark. Instead these banks just have to pay back the funds after two years. In this sense, the TLTRO also operates like a regular LTRO with a two-year maturity. For this reason, it is likely that some banks will use the TLTRO to run two-year carry trades in which cheap ECB funding is used to purchase sovereign bonds and other securities. That said, even this element of the TLTRO is not particularly important because of the announcement that three-month LTROs will be continued unto December 2016. The interest rate on these three-month LTROs is currently 10 basis points below the TLTRO and rolling over these loans may prove cheaper than the TLTRO over the next two years.

Second, the availability of cheap funding of this sort does not change the strong longer-term incentives that European banks have to deleverage. A bank that is concerned about the current ECB-led stress tests (and likely follow-up exercises over the next few years) is unlikely to aggressively expand its balance sheet simply because it can borrow cheaply for a few years from the ECB. Compliance with Basle 3 and market-driven demands for higher capital ratios are also playing an important role in restraining credit growth as is the perception that risk in areas like SME lending remains very high.

Third, while a four-year TLTRO may look like a good deal and may qualify as stable funding for regulatory purposes, it does not change the fact that many banks wish to minimise the amount of funding they get from the ECB. This is partly due to a "stigma" effect in which a bank is viewed as being in weak condition if it borrows a lot of money from the ECB. It is also due to the negative "encumbrance" effect that comes from having to pledge collateral to the ECB to obtain funding.

Taking these points together, I expect the TLTRO to have a relatively modest effect on bank lending.

4. POTENTIAL EURO-AREA LSAP PROGRAMMES

The ECB is not currently undertaking any asset purchase programmes. Here I discuss two different possible types of asset purchase programme, one that the ECB is openly considering (purchasing asset-backed securities) and one that it is not yet considering (a programme of sovereign bond purchases).

4.1. Asset-Backed Securities

The idea that the ECB could use asset purchases to boost bank lending via purchasing asset-backed securities (ABS) has featured in European policy discussions for at least a few years now. Indeed, the impact of the ECB purchases of ABS was discussed in a series of Monetary Dialogue papers written in June 2013.

The economic case for such a programme is strong. Unlike programmes that focus on providing cheap funding, a sufficiently-large ABS purchase programme by the ECB could play a significant role in promoting lending. Banks could make money (via fees) for originating loans to SMEs without triggering the funding or capitalisation concerns associated with expanding their balance sheets.

During 2013, the ECB admitted it was considering a programme of ABS purchases, with the securities backed by loans to SMEs. It set up a task force with the European Investment Bank (EIB) to examine how such a scheme would work. At the June 2013 Governing Council press conference, Mario Draghi said⁴

there is a task force working on this together with the European Investment Bank, and if they produce something, it will be collateralised, it will be guaranteed by other institutions.

In other words, any ABS purchases by the ECB would have to be guaranteed by the EIB.

When I considered this issue in my June 2013 Monetary Dialogue paper, I was pretty downbeat about the prospects of a successful programme emerging and wrote "I suspect the proposal for the ECB to purchase ABS will turn out to be a damp squib given the ECB's lack of enthusiasm for asset purchases and a reluctance to use up much shared European public money to provide the required guarantees."

Unfortunately, this prediction turned out to be correct. The ECB-EIB task force appears to have ended in failure. European Investment Bank President Werner Hoyer stated in April⁵

It is the EIB's job to provide financing for growth and jobs. Offering large-scale guarantees to revitalize the ABS market would not be in accordance with this

The ECB is again talking about ABS purchases but it is still in "preparation" mode. The recent announcement stated

The Governing Council has decided to intensify preparatory work related to outright purchases in the ABS market to enhance the functioning of the monetary policy transmission mechanism, given the role of this market in facilitating new credit flows to the economy. Under this initiative, the Eurosystem will consider purchasing simple and transparent ABS with underlying assets consisting of claims against the euro area non-financial private sector, taking into account the desirable changes in the regulatory environment, and will work with other relevant institutions to that effect.

The "intensification of preparatory work" may seem like a positive development but I am still not optimistic that an ABS programme will emerge any time soon.

⁴ See <http://www.ecb.europa.eu/press/pressconf/2013/html/is130606.en.html>.

⁵ See <https://mninews.marketnews.com/content/eib-hoyer-not-ready-large-scale-guarantees-abs-press>

While it appears that the ECB has perhaps given up looking for some other European public body to insure its ABS purchases (an unnecessary and time-wasting exercise) it seems to me that its new approach is to signal a willingness to purchase ABS backed by SME loans only when these instruments are designed and regulated in a way that produces a large and well-functioning market.

This will not be a matter of amending a few small regulations. Even when issuance of ABS was at its peak prior to the financial crisis, SME-backed bonds accounted for only a very small percentage of these assets. SME loans have a number of features that make them less compatible with securitisation than, for example, household mortgages. SME loans contain a large amount of idiosyncratic risk; a much larger fraction of the risk associated with mortgage loans can be summarised through a few observable household characteristics. SME loans are also less homogenous in their terms and conditions, including collateral requirements and underlying interest rates. With small firms more vulnerable to economic conditions than large ones, the income flows underlying these securities will generally feature more correlated risk than mortgage-backed securities.

A sense of the complexity of this issue can be seen from the range of issues covered in the ECB's new joint paper on this topic with the Bank of England. The paper covers a very wide range of issues, including the need for a simple and transparent design for ABS, the need for credit register data and the role of the European Union in certifying and regulating these securities.

My sense is that two separate issues are being conflated here. The first issue is a longer-term one of how to create a large and successful market for ABS in the European Union. This is a good policy objective but it is a complex and long-term project. The second is whether the ECB can do something soon to boost bank lending to SMEs in the euro area. I believe the ECB should act on the second issue before the first issue is resolved.

The ECB has now done a large amount of preparatory work on the kind of ABS that it wishes to see as a popular investment – ABS that are “simple, real, transparent” to quote Mario Draghi from the June Governing Council meeting. It would certainly be possible for the ECB to announce in the next few months that it is willing to purchase a set amount of ABS designed in specified fashion.

An announcement of this sort would probably help to develop the market for these instruments and the ECB may well be able to sell them on a later date once this market is more fully developed. However, for now, this should be seen as a secondary development. Again, I'm afraid I am not optimistic. With its earnest talk of the need for various regulatory changes, the ECB has given itself a very large fig-leaf to justify continued inaction.

4.2. Sovereign Bonds

Finally, the ECB could consider a much broader programme of asset purchases. In theory, such a programme could involve corporate bonds and equities. However, I will restrict myself here to discussing a potential programme of sovereign bond purchases.

We know a lot about how programmes of large-scale sovereign bond purchases work from the experiences of the Federal Reserve and Bank of England. This provides a range of empirical evidence to draw on to illustrate how such a programme would reduce long-term interest rates. Inevitably, though, things are more complicated in the euro area and an LSAP programme of sovereign bond purchases would face a series of issues relating to operational design as well as legal questions.

In terms of design, the most obvious type of programme would be one that purchases the same fraction of the public debt of each euro area member. However, such a design could

lead to objections that it somehow incentives countries to have large amounts of debt. An alternative design would see the allocation of bonds purchased set according to some other indicator such as the country's ECB capital key.

Based on evidence from the UK and US, a programme of this sort, focused on long-term bonds, could be expected to reduce long-term interest rates in all euro area countries. One complexity when comparing the euro area with the UK and US, however, is that the public debt of those countries is effectively priced free of default risk. In contrast, a number of euro area countries still have significant amounts of default risk priced into their public debt. These risk spreads may well be more sensitive to demand factors than the "term premia" through which LSAPs have worked in the UK and US. If so, the impact of a sovereign bond LSAP in the euro area could be larger in countries such as Italy, Spain, Greece and Portugal.

In my opinion, an LSAP programme of this type is overdue and will have a modest positive effect on the European economy. Perhaps even more important than its impact via lowering long-term interest rates would be its signal to the public that the ECB is serious about meeting its inflation target. This would help to raise inflation expectations and thus act to bring about the desired outcome.

One predictable aspect of an LSAP programme of sovereign bond purchases is that it will trigger various claims that it is illegal under the European Treaty's monetary financing clause. In truth, these arguments have long since been settled. If the SMP programme of secondary market purchases was legal, then a broader programme aimed at purchasing the bonds of all euro area member states should also be seen as legal. Indeed, since this programme would apply to all states rather than simply a small number deemed to be in trouble, it is not to be subject to a critique of providing "special treatment" to certain member states, a critique that lies at the heart of the recent German Constitutional Court objection to the OMT programme.

One issue raised in the German court judgment which is worth a few final words is the issue of *pari passu* or equal treatment of bond purchases. I believe this is an area where the ECB's statements have added unnecessary confusion. When a central bank purchases a bond in an open market operation, the terms and conditions of this bond give the central bank the exact same rights as any other purchaser of this bond. No special legal act needs to be passed to place the ECB on the same footing as other investors – this is simply how things are. If, for example, a government passes a law changing the terms and conditions of its public debt, then this applies also to the debt owned by the ECB.

In practice, the ECB used its considerable power and influence to avoid taking any losses on its portfolio of Greek bonds (bought on the market at a low price due to the substantial default risk that was priced in). My reading of the so-called *pari passu* "feature" of the OMT is not that this is a special legal feature of OMT purchases but that it was an implicit promise from the ECB to avoid behaving as a "holdout" investor and using threatening behaviour to avoid taking losses. If so, this is to be welcomed – private investors deserve to know they stand on an equal footing with all other purchasers of a particular security. This implicit promise should also apply to any potential future sovereign bond purchase programme.

Time will tell if the ECB is actually willing to undertake such a programme.

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NOTES



DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Non-standard monetary policies in the euro area, the US and the UK

Charles WYPLOSZ

IN-DEPTH ANALYSIS

Abstract

Non-standard policies are one among the many innovations adopted by central banks as they fought the Great Financial Crisis and its equally dramatic aftermath. Although the ECB was at the forefront of the early efforts to keep banking systems afloat, it has lagged behind the Federal Reserve and the Bank of England as far as reviving the economy is concerned. Non-standard policies are designed to extend an expansionary stance when the interest rate reaches the lower zero bound. It is only in May 2014 that the ECB has reached – in fact passed – the zero lower bound. It has yet to engage into non-standard monetary policy. Nor has the ECB acted as lender of last resort until mid-2012, thus being slow in adopting a practice that used to be considered as non-standard as well.

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EXECUTIVE SUMMARY

As the financial crisis deepened, central banks have innovated in many ways. The ECB was the first to provide ample liquidity to commercial banks when the interbank market froze. In the next two phases, however, important differences have arisen between the ECB, on one hand, and the Federal Reserve and the Bank of England on the other hand.

The difference is quantitative. While the balance sheets of the Federal Reserve and the Bank of England have increased fivefold since 2007, the ECB only allowed half that much. In addition, the biggest increase came late, starting at end-2011.

The difference is also qualitative. The Federal Reserve and the Bank of England engaged in Quantitative Easing (QE), a series of measures that aimed at providing an expansionary boost at a time when their traditional instrument, the very short-term policy interest rate had been brought down to the zero level bound. The ECB did not reach the lower bound until May 2014, so it had no need for non-standard instruments.

In the period that lasted between August 2007 and September 2008, which is between BNP Paribas' decision to suspend a fund and the collapse of Lehman Brothers, the ECB was active in providing liquidity to banks. It sharply expanded this action in September 2008, but less so than the Federal Reserve and the Bank of England, and the same applies to the interest rate reduction. Under the separation principle, the ECB simultaneously conducted liquidity providing operation and a less expansionary standard monetary policy as it was concerned with inflation pressure.

Again in contrast to the Federal Reserve and the Bank of England, the ECB also failed to act as lender in last resort to both banks and governments. This is most likely the reason why the Sovereign Debt Crisis has only affected the Euro Area. By not dealing with ailing Irish and Spanish banks, the ECB effectively forced otherwise fiscally disciplined governments to rapidly increase their debts. By not supporting government bonds on the secondary markets, it let investor fears of potential defaults simmer.

It is only at the end of 2011 that the ECB expanded the scale and the scope of its liquidity providing operations through the LTROs. This is also when the SMP started to deal with the catastrophic situation of public bonds in the crisis countries. These efforts were too late to reverse the trend of rising market panic. The decisive move came later, in mid-2012, with the OMT programme. A significant step towards accepting its role as lender in last resort to governments, the programme has turned the tide.

Yet, the economic recovery is now foreseen to remain very weak and inflation has fallen to the point where some observers fear deflation. This has led the ECB to finally reach the zero lower bound, even slightly below. The time for QE is coming, but the ECB is still "thinking" about it.

1. INTRODUCTION: DIFFERENT WORLDS

In August 2007, BNP-Paribas suspended one of its investment funds. Within hours, interbank markets across a large number of developed countries ceased to function. Commercial banks were too well aware of their own vulnerabilities not to be concerned about the others' vulnerabilities. Rationally, they stopped lending to one another. Since commercial banks cannot function unless they have continuous access to liquidity on the interbank market, this was a massive threat to banking systems worldwide.

The ECB reacted promptly, immediately followed by the Federal Reserve. The Bank of England tried to wait, but it soon realized that this was not an option. They stepped in to replace the interbank markets. They adopted different procedures, but the key was to ensure that commercial banks had immediate and continuous access to liquidity. Instead of feeding the interbank markets with the amount of liquidity that they see fit to their monetary policy objectives, and let the market distribute the liquidity, the central banks took it upon themselves to provide each eligible bank with the liquidity that it needed. This extraordinary intervention failed to revive the interbank markets, but it succeeded in keeping banking systems afloat.

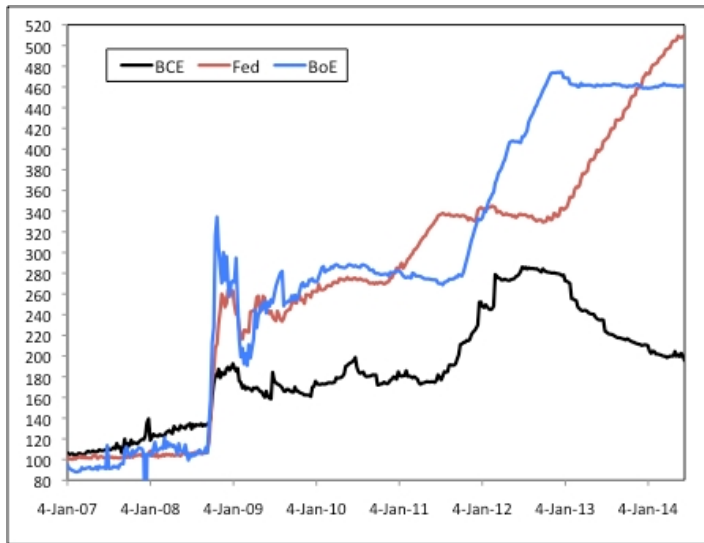
It was hoped that things would eventually return to normal. As we know, this did not happen. Because of the deep linkages among large commercial banks, a small amount of "toxic assets" triggered chain reactions. Poorly capitalized banks – thanks to the now infamous Basel 2 rules – could not withstand relative small losses. The crisis went on simmering for a whole year and exploded in September 2008 with the collapse of Lehman Brothers. The rest is history. It included the most dangerous ever banking crisis, which led to a quick, sharp recession and, next, to the Sovereign Debt crisis in the Euro Area.

These events did not just lead to massive economic hardship on a global scale, they changed the world of finance. Central banks had to rethink their roles, bank regulators had to admit their errors and bank supervisor had to explain why they allowed this to happen.

Of particular interest are the differences in the way central banks reacted. Figure 1 displays the size of the balance sheets of the ECB, the Federal Reserve and the Bank of England. For ease of comparison, they are computed as indices set to 100 at the beginning of 2007. It shows that throughout the simmering period, neither the Federal Reserve nor the Bank of England expanded much their balance sheets, while the ECB did, a little. September 2008 changed all that. All three central banks sharply increased their balance sheets, but the ECB move, although huge by historical standards, pales in comparison with what the two other central banks did. Then by 2012, the Bank of England stopped adding liquidity, while the Federal Reserve embarked into a new wave of quantitative easing (QE) while a reflux started in the Euro Area. Thus we have three different worlds.

As the figure shows, there were three different periods. The first one lasts from August 2007 to September 2008. The second one extends to mid-2012 and the third one is the current one, which is coming to an end now. These periods are reviewed in the next three sections. Section 5 then argues that the ECB has not yet pursued non-standard macroeconomic policies. Section takes up the role of central banks as lender of last resort, a new form of non-standard policies. The last section briefly concludes. This Note omits many details – including the instruments used – presented in an earlier Note (Wyplosz, 2013) to which readers are referred.

Figure 1: Assets of central banks: Euro Area, UK and US
(Index: 100= January 2007)



Source: ECB, Federal Reserve, Bank of England

2. BETWEEN BNP PARIBAS AND LEHMAN BROTHERS

During this period, it was generally believed that the crisis could be contained. The urgent attention of central banks was directed at providing banks with liquidity. To do so, central banks were making loans directly to individual commercial banks. Because they do not take risks, central banks require that these loans be guaranteed by pledging some assets as collateral. A technical issue is which assets are eligible as collateral.

The normal practice is for central banks to only accept safe assets as collateral. They typically establish a limited list of eligible assets. When the ECB was created, it had to establish this list. It was natural to somehow inherit the lists of the constituent central banks, but practices had differed and these lists were differently constituted. In order to avoid endless discussions, the ECB essentially accepted all the previously eligible assets, many of which would not have been accepted if it had started with a clean sheet. The result was a much wider list than those of the Fed or the Bank of England. This turned out to be a blessing.

Indeed, the extraordinary quench of commercial banks for liquidity implied that the US and British commercial banks soon exhausted their stocks of eligible assets, while the ECB could soldier on without any hindrance. Over time, the Fed and the Bank of England vastly expanded the list of eligible assets, but they reluctantly did so as they were unwilling to take risks. This partly explains the difference visible in Figure 1. The other explanation is that banks represent the bulk of financial activity on the continent while financial markets assume a far greater role in the US and the UK; this is the so-called Anglo-Saxon model.

As a result, there was no major bank failure in the Euro Area during this period. In contrast, a few institutions had to be somehow rescued in the US (Bear Stearns, Countrywide) and in the UK (Northern Rock).

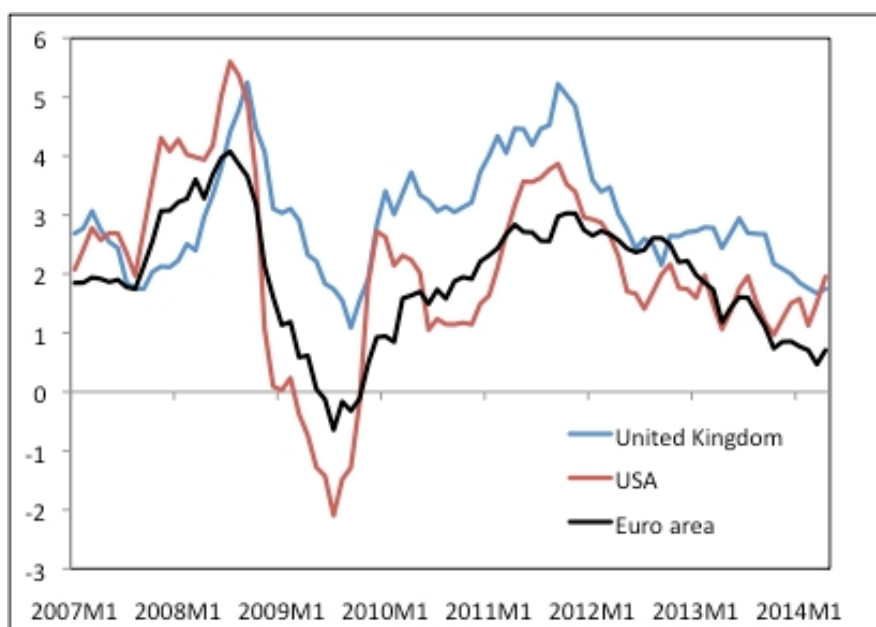
3. THE CRISIS AND THE RECESSION

After Lehman Brothers, the situation changed. The banking system was not just chasing liquidity anymore, but its financial losses became widespread. It was not only the subprime market that was in disarray, but also the whole mortgage market and, with it, the housing market. As financial markets suffered massive declines, deep losses reached the heart of the financial system. Central banks faced generalized banking collapses. Furthermore, such financial disarray was bound to create a severe recession, which would not only hurt hundreds of millions of people, but which would also deepen the banks' woes.

Figure 1 shows that the central banks reaction was swift, but much more moderate in the Euro Area. The reason is that the Federal Reserve and the Bank of England considered themselves as lenders in last resort to banks. The situation of the ECB was ambiguous. Because lending in last resort to banks is risky, the ECB feared that it could be seen as going beyond its price stability mandate. It also dreaded being in a situation of implicitly transferring resources to some particularly hard hit countries, a highly dangerous outcome from a political viewpoint. It considered that bank rescues was primarily the responsibility of governments. This led Ireland and Spain, where the bank crisis was most severe, to suddenly borrow massive amounts of cash to prevent a bank meltdown. The fact is that the Maastricht Treaty had not envisaged a generalized bank crisis while insisting on a restricted mandate for the ECB.

The first G20 Summit of November 2008 called upon governments and central banks to take measures that would limit the coming recession. Governments obliged to varying degrees. As for central banks, until then they had been battling rising inflation (see Figure 2). Shifting to an accommodating stance was not natural so long as they were not convinced that a serious recession was on its way.

Figure 2: Inflation rates: Euro Area, UK and US

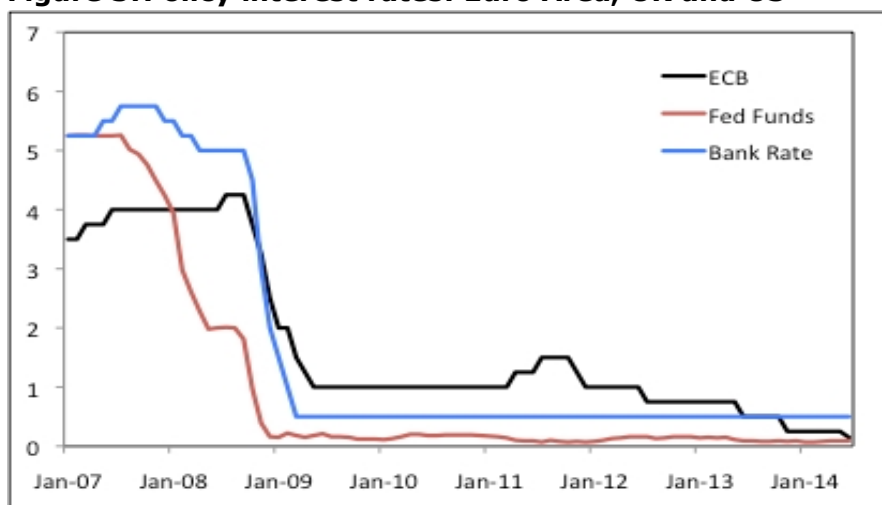


Source: IMF

Figure 3 shows that the Federal Reserve had started to slash its interest rate as soon as trouble started in mid-2007, while the Bank of England and the ECB kept battling inflation until September 2008. The Bank of England then immediately drove its interest rate to

what it considers its minimum level (0.5%), but the ECB moved more slowly and not completely, even raising its interest rate as late as July 2011. The depth of the recession drove inflation down to negative levels, except in the UK because of the impact of a deep depreciation of Sterling. Combined with Figure 1, this shows that the ECB did not just fail to act as lender of last resort to banks beyond providing immediate liquidity, but that it remained a step (or two) behind the deteriorating financial and economic situation. In fact, this was intentional. As explained in Bini-Smaghi (2009), the ECB followed the Separation Principle according to which it is desirable and possible to conduct independently classic monetary policy – setting the interest rate to achieve price stability – and liquidity provision to the banking system. This explains the disconnect between an active ECB on the liquidity front and a highly cautious ECB regarding inflation.

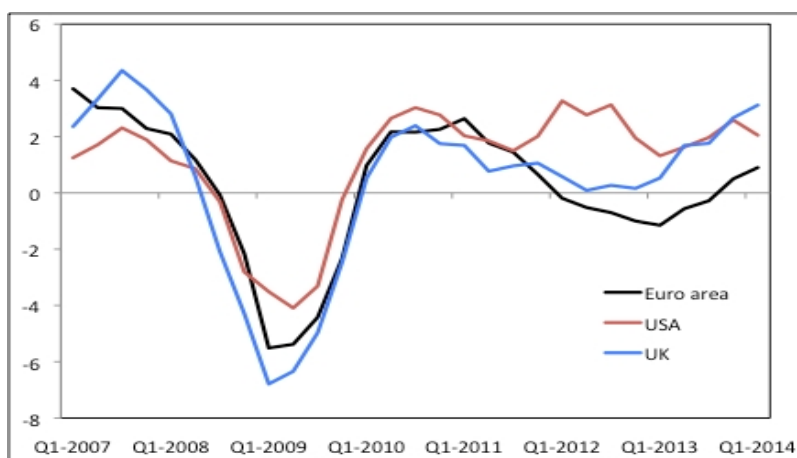
Figure 3: Policy interest rates: Euro Area, UK and US



Source: ECB, Federal Reserve, Bank of England

With fiscal policies increasingly focused on austerity, the half-hearted policy of the ECB proved to be insufficient to avoid a double-dip recession (Figure 4), which the UK barely escaped thanks to the weak Sterling and in spite of equally severe austerity measures. It bears emphasizing that the exchange rate is largely determined by monetary policy. This suggests that the ECB did not engage in the same kind of nonstandard policies as the Federal Reserve and the Bank of England, which is the subject of Section 5.

Figure 4: Growth rates: Euro Area, UK and US



Source: OECD

4. THE SOVEREIGN DEBT CRISIS

A stunning development is the transformation of the global financial crisis into a sovereign debt crisis, circumscribed to the Euro Area. Public debts also considerably increased in Japan, the US and the UK, yet these countries have not faced any serious market pressure. The explanation is now well known. De Grauwe (2012) makes the convincing point that the key difference is that the ECB has interpreted its mandate as preventing it from acting as lender in last resort to governments. Instead, the financial markets seem convinced that the Federal Reserve and the Bank of England will not allow default risk premia to be built into government bond rates. In that sense, the ECB's orthodoxy is a direct cause of the sovereign debt crisis.

Nor did the ECB take any major action, standard or non-standard, until late 2011, two years into the sovereign debt crisis as the crisis spread and caused a recession. Quite to the contrary, it raised its interest rate in the Summer 2011, in obvious reaction to a resurging inflation rate (Figure 2). This resurgence was driven by a rebound in commodity prices following the end of the global recession. It affected the US and the UK as well, without eliciting the same reaction from the Federal Reserve Bank and the Bank of England.

The situation changed rapidly at the end of 2011 when it became obvious that the recession was back and inflation was quickly declining. More ominously, the sovereign debt crisis was spreading and a breakup of the Euro Area became widely discussed. Standard monetary policy was (very) gradually relaxed.

This is when non-standard measures were enacted, as described in Wyplosz (2013). The Long Term Refinancing Operation (LTRO) extended the maturity of loans to banks to three years and was on a full allotment basis – no quantity ceiling. This was liquidity provision on a scale similar to those previously seen in the US. It started in December 2011 and its effects are visible from Figure 1. Two months later, the Securities Markets Programme (SMP) was designed to deal with the sovereign debt crisis. The ECB bought outright large quantities of bonds mainly issued in the crisis countries. Here again, the amounts were significant.

However, given the budgetary impact of the rapidly deteriorating economic situation, with historically profound recessions in the crisis countries, these actions failed to quiet down market anxiety. No matter how large the purchases by the ECB, they were not commensurate with the sizes of public debts of countries actually or potentially in crisis. This led to the long awaited need to cap the interest rates on public bonds. These premia revealed the increasing perception that some governments would have to default (leading to a default risk premium), or would leave the Euro Area (the currency redenomination risk premium), or both. Announced in the Summer of 2012, the Outright Market Transactions (OMT) programme in effect took the ECB a step towards accepting its responsibility as lender in last resort to governments.¹ This is why the OMT programme marked a turnaround in the sovereign debt crisis, without the ECB even having to spend one euro.

¹ The argument for such an action was spelled out in my Briefing Note of June 2011 (Wyplosz, 2011).

5. DIFFERENT NON-STANDARD POLICIES?

Figure 1 may leave the impression that the ECB carried out non-standard policies on a lower scale but similar to those adopted by the Federal Reserve and the Bank of England. This is not a correct conclusion. The objectives were radically different. The Federal Reserve and the Bank of England considered that an expansionary policy stance was required to bring to an end the recession generated by the financial crisis. Having brought their interest rates down to zero, they looked for other means of supporting growth. They focused on the classic channels of monetary policy:

- The interest rate channel: flatten the yield curve by lengthening the maturity of instruments and by making long term commitments regarding the path of the policy rates (forward guidance).
- The credit channel: encourage banks to lend to households or corporations by providing targeted liquidity and, in the US, by absorbing toxic assets held in commercial banks.
- The exchange rate channel: partly an unavowed by-product of the other channels, partly through “talking down” the currency.

Until early 2014, the ECB never indicated that its objective was to use monetary policy, if needed in non-standard forms, to support economic growth. Its use of unusual instruments and enlargement of the balance sheet were always presented as efforts to preserve the banking system, in line with the separation principle. This explains the choice of instruments, in particular the relative short maturities (maximum three years for the SMP). Indeed, the aim was to reassure banks regarding access to liquidity over the likely duration of the financial squeeze. This is one reason why the ECB always refused to use the term quantitative easing. Its mantra was that monetary policy was already very expansionary.

It is only recently that the ECB has indicated its intention to adopt an expansionary monetary policy stance. The immediate justification is the decline in the inflation rate, itself a consequence of the deep recession of 2011-12 and of the so far lacklustre recovery. This, in itself, is an implicit recognition that monetary policy has not been expansionary enough for at least one year.

The shift has seen the ECB adopt several of the instruments previously used by the Federal Reserve and/or the Bank of England:

- The policy rate has been brought down to zero. The ECB has even innovated by setting a slightly negative (-0.1%) rate for bank deposits. This is mostly symbolic but symbols may matter for expectations that drive financial markets.
- The ECB has started to provide forward guidance by stating its intention to keep its stance for a long period.
- The ECB has only indicated that it is studying instruments designed to revive credit.

In other words, QE is still on the drawing board. The ECB is not yet fully adopting non-standard policies. In fact, its balance sheet has shrunk since it reached a peak in 2012, a reflection of the reduced concern for access to liquidity by banks following the OMT programme. That it allowed this shrinkage to happen at a time of a recession and declining inflation is a further confirmation that the ECB never pursued QE.

6. LENDING IN LAST RESORT

As noted, the ECB has been most reluctant to act as lender in last resort to banks and governments, a reluctance not shared by the Federal Reserve and the Bank of England, the latter after some hesitation. The question arises whether lending in last resort is standard or non-standard.

Lending in last resort is not macroeconomic policy and therefore cannot be compared to what is usually called non-standard policy. On the other side, its use may have macroeconomic side effects. Clearly, one can argue that the sovereign debt crisis would have been avoided had the ECB acted as lender in last resort to governments. Similarly, it can be argued that the debt build-up in Ireland and Spain could have been contained had the ECB acted as lender in last resort to banks.

Before the crisis, central banks used to assert that lending in last resort was not ruled out but highly unlikely. One of the legacies of the crisis is that lending in last resort is now recognized in the US, the UK and many other countries, as an essential central bank tool. In that sense, it has moved from non-standard to standard.

The shift is a consequence of a broader transformation of central banks. Before the crisis, they only accepted responsibility for macroeconomic developments, chiefly inflation and, sometimes growth or employment. The growing adoption of macro-prudential tools is recognition that central banks are also responsible for financial stability. In fact, that was always the case, but central banks were loath to recognize it for fear of encouraging banks to take excessive risks. The crisis has shown that this approach has not worked and that it is better to directly address bank risk-taking with micro- and macro-prudential regulation and supervision.

The ECB has embraced this shift. It is associated with the macro-prudential authority (ESRB), it operates the micro-prudential authority (SSM), and it is cooperating with the EBA for bank stress testing. The ECB's oft stated rejection of lending in last resort is an unsustainable position.

7. CONCLUSION

The crisis that lasts since 2007 has shaken many long-standing central bank principles. Early on, the ECB has been at the forefront by providing quickly liquidity to banks when the interbank markets froze. Afterwards, the ECB has lagged behind the leading central banks and behind the evolution of the economic situation. It has finally made a decisive move toward carrying non-standard policies, but the price of this resistance to change has been enormous: it is possible that both the sovereign debt crisis and the duration and depth of the recession could have been avoided. It is reassuring that the ECB has finally started to rise to the challenge, but we need a post-mortem analysis of why it has taken so long.

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NOTES



DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

The (not so) unconventional monetary policy of the ECB since 2008

Gregory CLAEYS

IN-DEPTH ANALYSIS

Abstract

The global financial and economic crisis forced major central banks to act swiftly and to innovate to avoid a free fall of their economies. This paper reviews in depth the measures adopted by the European Central Bank, and compares them with the ones adopted by the Federal Reserve and the Bank of England since 2008. The ECB has been very active since the beginning of the crisis and its actions helped the financial sector to avoid a complete meltdown. However, the ECB adopted measures that were mainly directed at ensuring the provision of liquidity and repairing the bank-lending channel, through changes to its usual framework for the implementation of monetary policy. By contrast, the Fed and the Bank of England quickly pursued unconventional monetary policies by implementing quantitative easing programmes that appeared to have a positive impact on financial variables and also on the real economy. Today, the ECB is confronted by inflation well below 2% and has reacted by implementing a broad package of fairly conventional measures. This analytical note pleads for the ECB to implement a large-scale asset-purchase programme and makes recommendations about the design of such a programme.

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EXECUTIVE SUMMARY

- The global financial and economic crisis that started in 2008 forced major central banks around the globe to act swiftly and to innovate in order to avoid a complete meltdown of the financial sector, and to limit the consequences for the real economy.
- The ECB's policy response to the crisis was mainly oriented towards ensuring the provision of liquidity and repairing the bank-lending channel. In order to do that, the ECB mainly modified its existing monetary policy tools. It increased the average maturity of its refinancing operations from months to years. It eased the collateral requirements to access those refinancing operations, and liquidity was allocated at a fixed rate and full-allotment basis. Retrospectively, those measures appear to have been a very appropriate and effective way to deal with the liquidity crisis of 2008-2012.
- The ECB also introduced more unconventional measures with the Securities Market Programme and the Covered Bonds Purchase Programme, which it used to buy particular assets – government bonds from troubled countries and covered bank bonds – in order to repair the monetary transmission channel in the euro area. However, the scope and impact of those measures was limited and short-lived. The ECB also announced the Outright Monetary Transactions programme, in order to purchase unlimited amounts of government bonds of member states subject to a European Stability Mechanism (ESM) programme. This measure has not been used, but its announcement had a significant impact on government bond yields of the EMU member states because it demonstrated the determination of the ECB to maintain the integrity of the euro area.
- The Federal Reserve (Fed) and the Bank of England chose a more radical and unconventional path in terms of monetary policy when they decided very quickly to implement large-scale asset-purchases programmes as their main response to the crisis. The sizes of these programmes were very significant (grossly equivalent to 20-25% of GDP) and, although it is very difficult to estimate their impact, there is a broad consensus in the literature that those measures had a positive impact on financial variables and also on GDP and inflation in the US and the UK.
- The liquidity crises that have plagued the euro area in the last few years seem to be behind us. The ECB's main problem now is the continuous decline of inflation in the euro area to a level well below its definition of price stability of close but below 2%. In order to counteract this fall and to bring inflation back to 2% in the medium term, the ECB announced a broad package of measures at its June 2014 Governing Council meeting. However, although we welcome the fact that the ECB finally recognised that inflation will be too low for a too-long period and decided to act, we believe that the measures it proposes arrive too late, are too limited, and might be too "conventional" to solve the current problem. That is why we urge the ECB to implement a large-scale asset-purchase programme as soon as possible. To do that, we propose monthly purchases of €35bn of ESM/EFSSF/EIB bonds, corporate bonds and asset-backed securities (ABS) in order to anchor inflation expectations and bring euro-area inflation back to 2% in the medium-term.

INTRODUCTION

Since 2008, the central banks of the main advanced economies have been very active in order to avoid the complete meltdown of their financial sectors and limit the adverse consequences for the real economy. However, central banks around the globe chose different paths to take action. The main aim of this paper is to compare these different paths since the beginning of the crisis and to assess the impact of those policies. Another goal of this paper is to determine what kind of unconventional policies the ECB should adopt today in order to fulfil its price stability mandate for the euro area.

In the first section of the paper, we will see that the ECB has mainly preferred to adapt its usual monetary policy framework to ensure the provision of liquidity to the banking sector and to repair the bank-lending channel to try to revive credit in the euro area, rather than to implement a more radical monetary policy. In the meantime, the Fed and the Bank of England embarked quickly on unconventional monetary policies by implementing quantitative easing programmes that seemed to have a positive impact on financial variables but also on the real economy through various channels.

The second section of this briefing paper essentially summarizes and updates the analysis and recommendations of Claeys et al (2014a and 2014b). It describes the main challenge faced by the ECB today, i.e. the current downward trend in inflation. During its June 2014 Governing Council, the ECB decided to react to this dangerous situation by implementing a broad package of measures. We will try to assess if these measures are enough to bring inflation back to 2% in the medium term, and we will see what kind of unconventional monetary policy could be implemented to achieve price stability in the medium term in the euro area.

1. UNCONVENTIONAL MEASURES IMPLEMENTED BY THE ECB, THE FED AND THE BANK OF ENGLAND SINCE 2008

1.1. ECB 2008-2013: saving the banking system, solving the liquidity crises

The ECB's policy response to the crisis was mainly oriented towards ensuring the provision of the liquidity needed by the banking sector at a point at which the interbank market and other sources of short-term funding were almost frozen.

1.1.1 Modifications to the ECB's refinancing operations

Together with the lowering of the policy rate from 4.25% to 1% between October 2008 and May 2009 (and later down to 0.15% from December 2011 to June 2014), the ECB introduced a number of measures to provide "enhanced credit support" to the economy.

Liquidity started to be allocated, through main refinancing operations (MRO) and long-term refinancing operations (LTRO), at a fixed rate and full-allotment basis, meaning de facto that banks had unlimited access to central bank liquidity, on the basis of the provision of adequate collateral.

Collateral requirements were in turn eased a number of times, and on top of that, the maturity of LTROs – originally of 3 months only – was lengthened, introducing operations with maturity of, first, 6 months, then 1 year and eventually by conducting two massive very long-term refinancing operations (VLTROs) with a maturity of 3 years (in December 2011 and February 2012). The cumulative take-up of these two operations exceeded €1 trillion (although part of it substituted the borrowing through other maturities). As a consequence, the maturity of the ECB's balance sheet has lengthened. Figure 1 shows that about 80% of all the liquidity provided to the banks – which constitutes the biggest component on the asset side of the Eurosystem's consolidated balance sheet – has now a maturity of 3 years.

Not surprisingly, the use of the LTRO facility has been skewed towards certain countries, with banks in Spain, Italy, Greece, Ireland and Portugal accounting for 70 to 80% of the total borrowing since 2010. Symmetrically, banks from the North – which had benefited from inflows of capital in search of safety – reduced their reliance on the ECB operations to minimum levels. The VLTROs was constructed as a euro area-wide policy – i.e. open and directed to all banks in the euro area, but banks from the South of the euro area ended up using it more than the others because they were the most affected by the liquidity crisis taking place at the time in the European banking sector.

The empirical literature analysing LTROs suggest that those operations were very useful in improving monetary conditions at the height of the crisis². While LTROs were a very appropriate and effective measure to deal with the liquidity crisis of 2011-12, these operations did little to trigger additional lending to the private sector (even though they might have helped to prevent the collapse of existing lending). To a great extent, banks either deposited the cheap central bank funding at the ECB for rainy days, or purchased higher yielding government bonds. Thereby, the LTROs in effect supported liquidity, ensured stable long-term (three-year) financing of banks, subsidised the banking system and helped to restore its profitability, and temporarily supported distressed government bond markets. Considering the alternative of a potentially escalating financial crisis, these developments were beneficial.

1.1.2 The Securities Market Programme (SMP), Outright Monetary Transactions (OMT) and the Covered Bonds Purchase Programme (CBPP)

Under the SMP, initiated in May 2010, the ECB bought around €220 billion of Greek, Irish, Portuguese, Italian and Spanish government bonds. At the time, the ECB announced that the bonds would be held to maturity and that the purchases are entirely sterilised. The intervention was justified in light of the severe tensions in certain market segments that were hampering the transmission of the ECB's monetary policy. At present there are €175.5bn of SMP bonds left, the maturities of which are not publicly disclosed by the ECB. The empirical literature³ has tried to assess the impact of SMP and concludes that it had a positive but short-lived effect on market functioning by reducing liquidity premia and reducing the level as well as the volatility of European government bond yields.

However, the programme was stopped in September 2012, when the ECB introduced the new Outright Monetary Transactions (OMT), the announcement of which had a remarkable effect on European bond yields even without the programme having ever been used. The programme allows the ECB to purchase essentially unlimited amounts of government bonds of member states that are already subject to a European Stability Mechanism (ESM) programme, as long as the member states in question respect the conditions of the ESM programme. The ECB contends that this policy could be necessary on monetary policy grounds, namely to safeguard "an appropriate monetary policy transmission and the singleness of the monetary policy"⁴.

The ECB also introduced in 2009 a Covered Bonds Purchase Programme (CBPP), which was not sterilised and aimed at reviving the covered bond market, which plays an important role for the financing of banks. The ECB initially bought covered securities such as Pfandbriefe worth an aggregate volume of €60 billion within a one-year period. In November 2011, the ECB launched a second CBPP with a total volume of €40 billion, but it decided to interrupt it in October 2012, after covered bonds totalling €16.4 billion had been purchased.

² See Angelini et al. (2011); Lenza et al. (2010); Darracq Pariès and De Santis (2013); Abbassi and Linzert (2011)

³ See Manganelli (2012); De Pooter et al. (2012); Ghysels et al. (2012)

⁴ European Central Bank, 2012. "6 September 2012 - Technical features of Outright Monetary Transactions." Available at http://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_1.en.html

1.1.3 Introduction of a Forward Guidance strategy

In July 2013, the ECB formally introduced forward guidance as a new monetary policy tool when President Draghi announced during the introductory statement of the press conference that “the Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time”⁵.

Initially, the main idea behind forward guidance, introduced by Krugman (1998) when analysing the deflation and liquidity trap problem of Japan in the 1990s, was that central banks could gain traction on the economy at the zero lower bound if they manage to convince the public that they will pursue a more inflationary policy than previously expected after the economy recovers, what Krugman calls a “credible promise to be irresponsible”. This policy should indeed result in low short-term rates for an extended period of time and an increase in inflation expectations, which should both have a negative effect on real long-term rates today and should therefore boost investment and consumption.

However, the main problem of forward guidance is time-inconsistency. Central bankers do not want to commit themselves to future policy decisions and they will always have an incentive to raise rates when inflation returns to preserve their credibility to fulfil their price stability mandate. But if forward guidance is not time consistent, it is not credible and agents anticipate that rates will be raised earlier and it will therefore not be effective. To be credible it is possible that forward guidance needs a commitment or a time-consistency device to work better, a role that a massive asset purchase programme could play, given the potential delays resulting from a gradual and ordered exit strategy (as demonstrated by the current slow US QE tapering process).

Contrarily to what was advocated in the theoretical academic literature, the ECB clarified⁶ quickly its forward guidance strategy by saying that it did not promise either “irresponsibility” or a suspension – even temporarily – of its usual strategy. The ECB considers only forward guidance as a new way to communicate its strategy in order to better anchor expectations about the future path of interest rates, and not at all as a commitment to keep rates lower longer than necessary in order to have a more significant immediate impact of monetary policy. This may have therefore reduced the effectiveness of the measure.

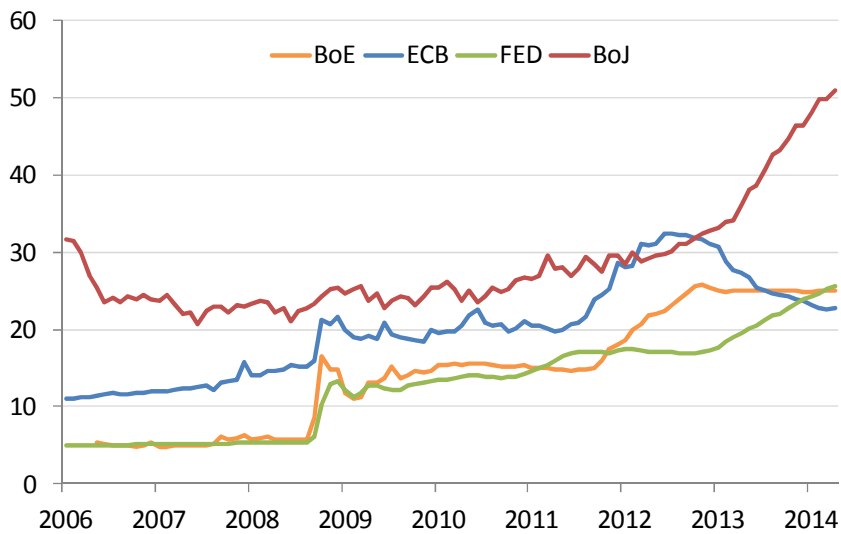
1.2. Unconventional measures adopted by the FED and the BoE: the quantitative easing experience

In response to the global financial and economic crisis, the Federal Reserve (Fed) and the Bank of England engaged in large-scale asset purchase programmes, or quantitative easing (QE)⁷. From the beginning of 2009 to March 2014, the Federal Reserve purchased \$1.9 trillion (11.9 percent of US GDP) of US long-term Treasury bonds and \$1.6 trillion (9.6 percent of US GDP) of mortgage-backed securities. Between January 2009 and November 2012, the Bank of England purchased £375 billion (24 percent of GDP) of mostly medium- and long-term government bonds. In addition to such asset purchases, these central banks also implemented programmes to support liquidity in various markets. All those measures resulted in a significant expansion of the central banks’ balance sheets (see Figure 3). Unlike the two other major central banks, the ECB has made few asset purchases so far but reacted to the crisis by providing liquidity to the banking system as we have seen before.

⁵ European Central Bank, 2013. “Introductory statement to the press conference (with Q&A)” available at <http://www.ecb.europa.eu/press/pressconf/2013/html/is130704.en.html>

⁶ Praet P. (2013). “Forward guidance at the ECB”, <http://www.voxeu.org/article/forward-guidance-and-ecb>

⁷ The expression credit easing is also used when private sector securities are purchased.

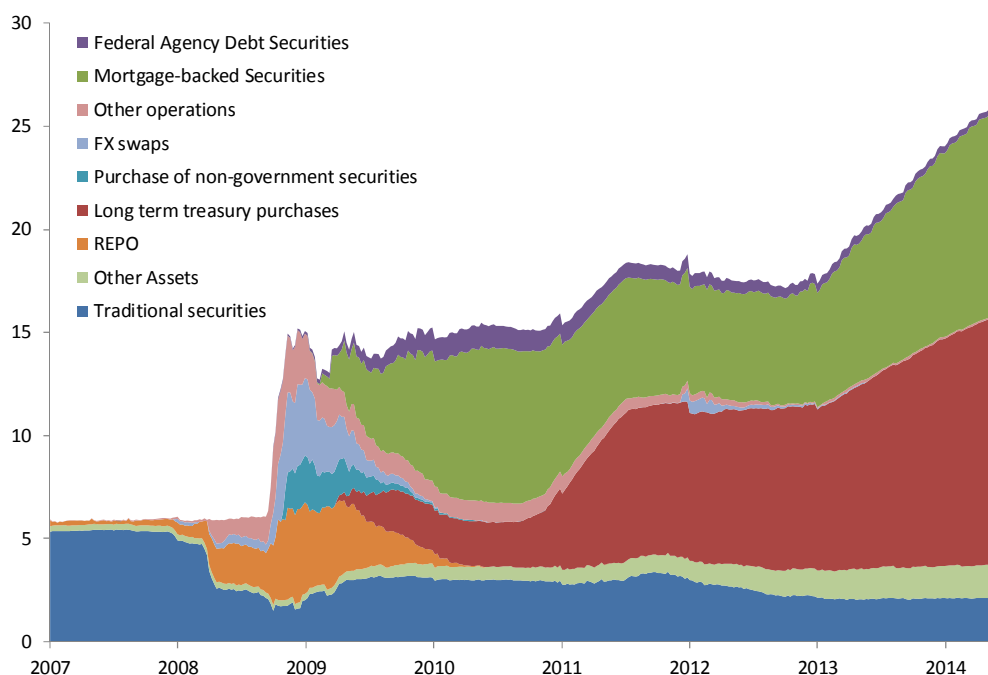
Figure 3: Size of balance sheets of various central banks, in % of GDP

Source: FRED, IMF.

1.2.1 Unconventional monetary policy in the US

In the US, quantitative easing (QE) began immediately in November 2008 and is on-going. In total, it has expanded its balance sheet from \$860 billion at the beginning of 2007 to \$4.2 trillion today. The Fed announced in December 2013 a 'tapering' of its programme, and has reduced gradually its monthly purchases from \$85 billion to \$35 billion.

On top of its QE policy the Fed also introduced some short-term liquidity measures, such as the Commercial Paper Funding Facility, which purchased 3-month unsecured and asset-backed commercial paper with top tier credit rating, to support the commercial paper market and reduce the rollover risk. Another programme, initiated in November 2008, was the TALF (Term Asset Backed Securities). This was aimed at addressing the funding liquidity problem in the securitisation markets for consumer and business ABS (Asset-Backed Securities) and CMBS (Collateralised Mortgage-Backed Securities). Under this programme, the Federal Reserve extended term loans collateralised by securities to buyers of certain high-quality ABS and CMBS, with the intent of reopening the new-issue ABS market. The programme provided both liquidity and capital to the consumer and small business loan asset-backed securities markets: the Fed lent money against asset-backed securities while the Treasury Department provided \$100 billion in credit protection from its Troubled Asset Relief Program (TARP) to the TALF (as a cushion against losses on the ABS collateral). On top of this asset-buying programmes, the Fed also introduced a number of facilities aimed at helping the banks to meet their liquidity needs, such as the Term-Auction Facility (TAF) that was intended to provide liquidity with a maturity of one month against the same kind of collateral that could be used to borrow overnight at the Fed's discount window, but without the 'stigma effect' that was associated with the use of the discount window.

Figure 4: Size of asset side of the Fed's balance sheet, in % of GDP

Source: FED

As noted in Joyce et al (2012), there is a broad consensus in studies estimating the impact of QE on financial markets that it has been successful in reducing government bonds rates. More precisely, Gagnon et al (2011) shows that the Fed's QE1 between December 2008 and March 2010 had significant and long-lasting effects on longer-term interest rates on a variety of securities, including Treasuries', agency mortgage-backed securities and corporate bonds. Estimations suggest a fall in 10-year term premium by somewhere between 30 and 100 basis points overall⁸ and substantial effects on international long-term rates and the spot value of the dollar. Concerning the MBS purchase programme, Hancock and Passmore (2011) focus specifically on whether it has lowered mortgage rates, and conclude that the programme's announcement reduced mortgage rates by about 85 basis points in the month following the announcement, and that it contributed an additional 50 basis points towards lowering risk premiums once the programme had started.

As far as liquidity measures are concerned, Ashcraft et al (2009) assess the effectiveness of the TALF by observing volumes and patterns of ABS and CMBS issuance as well as liquidity conditions in these markets. Overall, they find that improvement in market conditions and liquidity in the term ABS and CMBS markets in 2009 was dramatic, particularly in view of the lower-than-expected volume of lending through TALF. A total of \$71.1 billion in TALF loans was requested and the volume of outstanding loans peaked in March 2010 at \$48.2 billion, although the programme was authorised to reach \$200 billion and at one point up to \$1 trillion in loan volume was envisioned. Through the TALF programme, the Federal Reserve seems to have been able to prevent the shutdown of lending to consumers and small businesses, while limiting the public sector's risk.

Estimating the macro impact of QE poses a number of difficult challenges given other potential factors that could also have influenced the economic developments of the period in which QE has been implemented. Therefore, the various results found in the literature

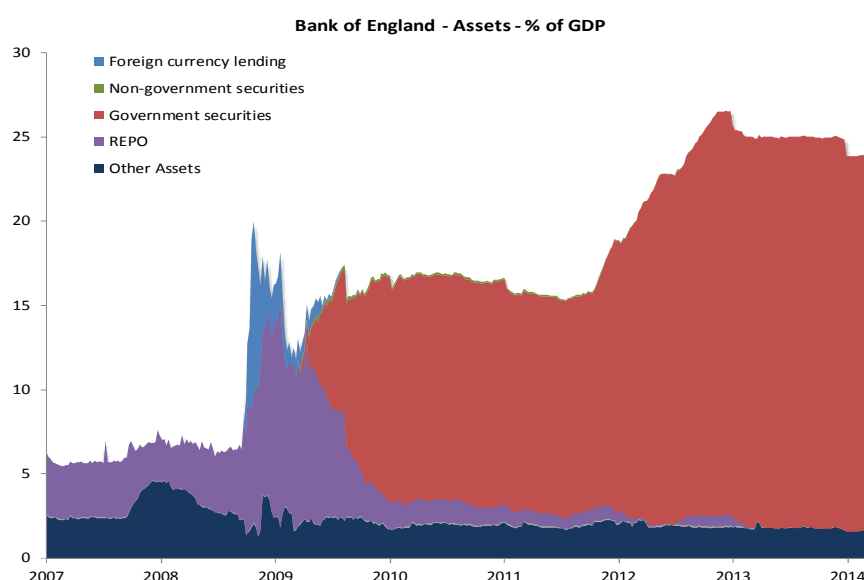
⁸ Other papers suggest similar results: D'Amico and King (2010), Krishnamurthy and Vissing-Jorgensen (2011), Neely (2012) and Hamilton and Wu (2012).

have a higher variance. That's why we would recommend focusing on the sign of the effect more than on its size. According to Chung et al (2012), the combination of QE1 and QE2 raised the level of real GDP relative to baseline by 3%, and inflation is 1% higher than if the Federal Reserve had not carried out the programme. They calculate that this would be equivalent to a cut in the federal funds rate of around 300 basis points from early 2009 to 2012. In contrast, Chen et al (2012) find that QE2 policy increased GDP growth by 0.4% on impact and has a minimal impact on inflation (equivalent to an effect of a 50-basis point cut in the federal funds rate). These findings show that QE has been effective (even though the effect can appear to be quite small in comparison to size of the asset purchases in terms of GDP). In terms of choice of the asset to buy, some papers such as Woodford (2012) and Krishnamurthy and Vissing-Jorgensen (2013) suggest that QE is much more effective when it takes the form of credit easing, i.e. when private assets are bought.

1.2.2 Unconventional monetary policy in the UK

The Bank of England began its quantitative easing programme in January 2009 and purchased £200 billion worth of mostly medium- and long-term government bonds from the non-bank private sector by January 2010. It made further purchases in 2011 and 2012, which took the total amount to £375 billion.

Figure 5: Size of asset side of the BoE's balance sheet, in % of GDP



Source: BoE

There is also a broad consensus in the empirical literature that the Bank of England's quantitative easing had significant effects on gilt yields but also on corporate bond rates and on the sterling exchange rate⁹. As in the US, conclusions on the impact on GDP and inflation in the UK differ in magnitude, but all research papers report positive impacts. For instance, in a recent paper Weale and Wieladek (2014) estimated that asset purchases equivalent to one percent of GDP led, respectively in the US and the UK, to a 0.36 and 0.18 percentage-point increase in real GDP and to a 0.38 and 0.3 percentage-point increase in CPI after five to eight quarters.

⁹ For instance Meier (2009) shows that initial QE announcements reduced gilt yields at least by 35–60 basis points whereas Joyce et al. (2011) estimated that medium-to- long-term gilt yields fell by 100 basis points overall, summing up the two-day reactions to the first round of the MPC's announcements on QE purchases during 2009–10. They also found that similar falls occurred in corporate bond yields and that there were also announcement effects on the sterling exchange rate, therefore validating the existence of a portfolio rebalancing channel and exchange rate channel of QE.

2. 2014: ADDRESSING WEAK INFLATION IN THE EURO AREA

2.1 What is the current problem to solve in the euro area?

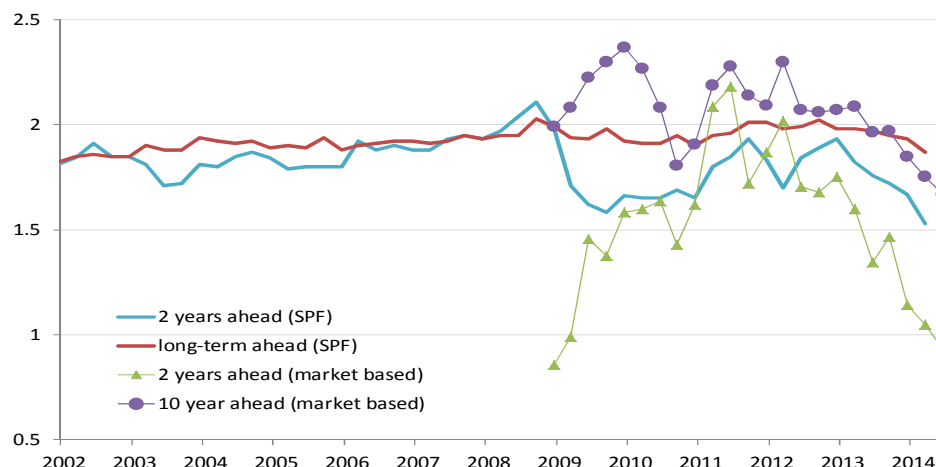
The ECB's current situation is very different from the one it faced in the immediate aftermath of the financial crisis. The liquidity crises in the banking sector and in the periphery's sovereign markets seem to be fading as speculation about the break-up of the euro area has clearly receded. The interbank market has been revived and European sovereign yields are now at very low levels, including for periphery countries, since uncertainty about the integrity of the euro area was dissipated by President Draghi's commitment to do "whatever it takes" to preserve it, when he announced the OMT programme in September 2012. On top of that, the structural weaknesses of the European banking sector are gradually being mended thanks to the ECB's Comprehensive Assessment currently taking place.

The main problem for the ECB at the moment is that inflation in the euro area has been falling since late 2011 and has been below one percent since October 2013. Core inflation, a measure that excludes volatile energy and food price developments, has developed similarly. Five of the 18 euro-area member countries (Cyprus, Greece, Portugal, Slovakia and Spain) have experienced negative rate of inflation in the last few months. Even in the countries that are not in a recession, such as Belgium, France and Germany, inflation rates are well below the euro-area target of close to but below two percent. More worryingly, the ECB's forecast suggests that inflation will not return to close to two percent in the medium term.

In the current European circumstances, low overall euro-area inflation implies that in some euro-area member states inflation has to be very low or even negative in order to regain competitiveness relative to the core. The lower the overall inflation rate, the more periphery inflation rates will have to fall in order to achieve the same competitiveness gains. Given that wages are often sticky and rarely decline, significant unemployment increases can result from the adjustment process. In addition, lower-than-anticipated inflation undermines the sustainability of public and private debt if the debt contracts are long-term nominal contracts. For governments, falling inflation rates often mean that nominal tax revenues fall, which makes the servicing or repayment of debt more difficult.

More worryingly for the ECB, inflation expectations have been falling since at least mid-2012. Figure 6 presents expectations from two sources (an ECB survey and a market-based indicator) and for two maturities. The two-year-ahead expectations are significantly below two percent and even below one percent according to the market-based indicator. In the period relevant for the ECB, inflation expectations have thus become de-anchored from 2 percent. Lack of ECB action when the ECB's own medium-term inflation forecasts fell below the two percent threshold was a signal to markets that probably resulted in the downward revision of longer-term inflation expectations. The ECB is now less effective in anchoring longer-term expectations to, or close to, the 2 percent level.

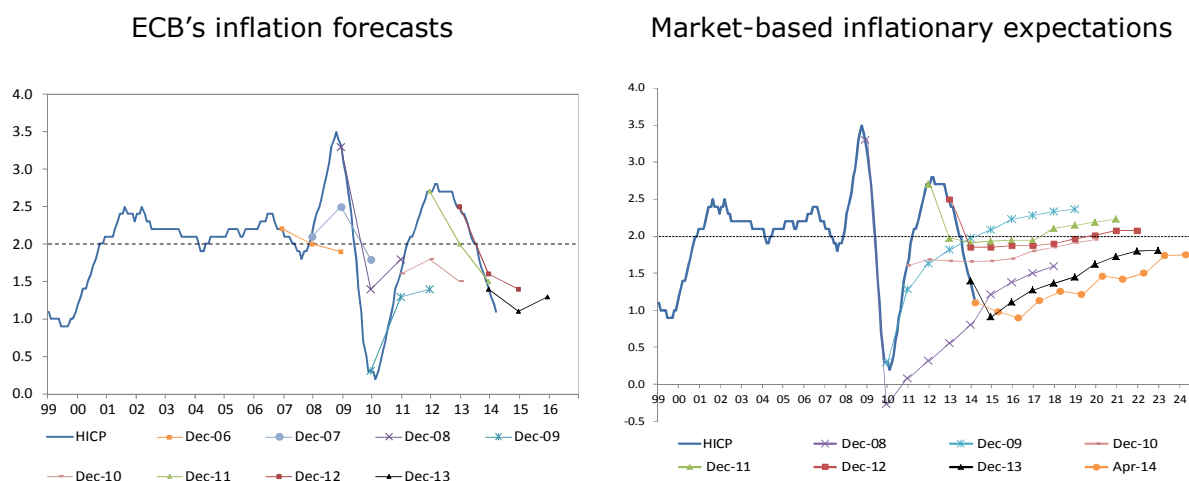
Figure 6: Inflation expectations: ECB’s survey of professional forecasters (SPF) and market-based inflationary expectations in the euro area, 2002Q1-2014Q2



Source: ECB’s Survey of Professional Forecasters and Datastream. Note: In the ECB’s survey the horizon of “Long term” is not specified. Market-based expectations refer to overnight inflation swaps (OIS), which can be used as a market based proxy for future inflation expectations. The 2014Q2 values of market-based expectations are the average during 1-23 April 2014, while the latest available values for the SPF are end of March 2014.

There are two other reasons that suggest that the ECB should have adopted additional monetary stimulus since the beginning of 2014. First, at a low level of inflation, the costs of deviation from the ECB’s forecast inflation are highly asymmetric. If inflation is higher than forecast, it would mean that inflation would be closer to the two percent threshold – a benign development. But if inflation is lower than forecast, then countries in the euro-area periphery would have to maintain even lower inflation or higher deflation, with risks for the sustainability of public and private debt. Second, the ECB’s inflation forecasts and market expectations have been unable to predict significant deviations from the two percent threshold (Figure 6). When there was a sizeable deviation, ECB forecasts and market expectations both predicted a gradual return to two percent, which happened in some cases (see, for example, the December 2011 forecast of the ECB), but most of the time did not.

Figure 7: Inflation forecasts/expectations and actual inflation in the euro area



Source: Datastream, ECB. Note: The HICP is defined as a 12-month average rate of change; in panel A, the ECB Staff projections indicate a range referred to as „the projected average annual percentage changes” (see <https://www.ecb.europa.eu/mopo/strategy/ecana/html/table.en.html>). For simplicity, we take the average of the given range. In panel B, market-based expectations refer to overnight inflation swaps (OIS), which can be used as a proxy for future inflation expectations.

Overall, inflation has been falling significantly and so have inflation expectations. Inflation forecasts have proved consistently too optimistic about the return of inflation to the two percent threshold in the euro area. The ECB's own forecast suggests that euro-area inflation will not return to close to two percent in the medium term, and we see a substantial risk that it will not return to this level even in the longer term.

2.2 Will the new measures announced in June by the ECB be enough to bring back inflation to the 2% threshold in the medium term?

As previously explained in Claeys et al (2014b), the ECB announced during its June 2014 press conference a broad package of measures to try to tackle the low inflation problem. The package aims to (a) ease the monetary policy stance, (b) enhance transmission to the real economy, (c) reaffirm the ECB's determination to use unconventional instruments if needed.

In our assessment, the package really aims to tackle (a) and (b) but it is not a serious attempt to change inflationary dynamics with quantitative easing. We expect that the bundle of measures will have an effect on inflation. However, it is not as aggressive as it may look at first sight and further measures will likely be needed later.

This package is really about a slight easing of monetary policy and about an attempt to improve monetary policy transmission by restoring the bank-lending channel. However, the small cut in interest rates (including putting the ECB deposit rate in negative territory) will have minor effects, while the effectiveness of the targeted longer term refinancing operation (TLTRO) will depend on whether banks will be ready to take up the liquidity. The problem with the euro area currently is, however, not the lack of liquidity but the lack of lending to the real economy. As explained earlier, banks actually pay back their previous LTROs. One of the main improvements of the TLTRO over the previous LTROs is that it will carry a fixed rate (current MRO rate + 10 basis points, i.e. 0.25% at the moment), and thereby a financial incentive to borrow from the ECB, as rates cannot go down further but instead can increase during the next four years. The other main improvement is that TLTRO is conditional on new lending to the real economy and to corporations in particular. However, all depends on the willingness of banks to use the TLTRO, but most importantly on whether there will be significant demand for credit coming from the corporate sector. In many countries, debt in the corporate sector is actually quite high and the sector is attempting to deleverage. So our take is that the TLTRO will help to reduce fragmentation but its effect on inflation may be less significant than hoped.

The decision to suspend the sterilisation of the liquidity injected under the Securities Markets Programme (SMP) is questionable. The SMP had a particular goal: to address the malfunctioning of securities markets and to restore an appropriate monetary policy transmission mechanism, while not affecting the stance of monetary policy. With this decision, its aim is now changed to affect the stance of monetary policy. Such a change of a key parameter of an ECB decision undermines the reliability of other ECB commitments, which in turn introduces uncertainty about the parameters of other longer-term ECB commitments. If the ECB wanted to inject €175 billion liquidity into euro-area money markets (the current amount of SMP holdings), it would have been preferable to announce a new asset purchase programme to this end.

In our view, the announcement of preparatory work for an ECB ABS purchase programme is more significant (even though the ECB has not provided any details about the size or the timing of those purchases). We expect this to lead to the emergence of a larger ABS market. However, the ABS market is currently very small, and the ECB intends to focus on ABS based on real loans to corporations (and not on complex derivatives, which is a good thing) and to exclude the ABS for residential mortgage-backed securities (RMBS), which is

by far the largest ABS market in the euro area (as explained in the next section). So in fact, if the ECB was to decide to buy, it would very quickly buy up the entire current market. Consequently, the ECB's asset-purchase programme might be quite limited in scope. Of course, one could hope that the market will increase if the ECB starts buying, but it needs to be seen if the market can develop sufficiently quickly, as there are some regulatory barriers. The effect of this measure is again going to be mostly via better credit conditions. It will not substantially operate through a portfolio re-balancing effect. In the absence of a large-scale ABS purchase programme and with subdued demand for credit, the impact on the exchange rate could be quite limited.

The element that is still missing in the package is a monetary policy measure that would substantially kick-start inflation in the core euro-area countries. A significant QE programme would have effects on core-euro area inflation as well as periphery inflation. The current package might not do that. Even though we welcome that the ECB has finally acted with a broad package, we think that further measure will likely be needed. We continue to believe that a more aggressive quantitative easing programme would anchor inflation expectations more significantly.

2.3 Towards a large-scale asset purchase programme?

As explained in detail in Claeys et al (2014a), we believe that the only option left for the ECB to be able to bring back inflation to the 2% thresholds as soon as possible is to follow the path of the Fed and the BoE and to adopt a quantitative easing strategy. However, given the differences between the euro area and the US or the UK, asset purchase will have to take a different form than in these countries. The following section summarises our recommendations on how a significant ECB asset-purchase programme should be designed to be effective and to bring back inflation and inflation expectations towards the 2% threshold in the euro area in the medium term.

2.3.1 Asset purchase: size of the programme

Setting the appropriate size of asset purchases is far from easy. Some analysis considered the total amount of asset purchases by the Bank of England and the Fed and suggested similar magnitudes for the euro area (20 to 25% of GDP, i.e. €1.9 to 2.4 trillion).

In our view, a more relevant benchmark is the amount of purchases by the Federal Reserve in its third round of quantitative easing (QE3), announced in light of the weak economic situation of the US economy at a time when the acute face of the financial crisis was over – a situation that has similarity to the current euro-area situation. In September 2012, the Federal Reserve announced it would purchase \$40 billion (€29 billion) agency mortgage-backed securities per month, an amount increased to \$85 billion (€61 billion) in December 2012 (by adding \$45 billion per month of Treasuries). Given that the euro area's economy is about 30 percent smaller than the US economy, the same size, as a share of GDP, would be between €20 and €40bn per month in the euro area.

2.3.2 Asset purchase: design principles

In our view, the ECB will have to choose which assets to buy using five main criteria.

- First, the ECB should buy assets that lead to the most effective transmission to inflation.
- Second, there should be sufficient volume of the asset available, to ensure that the ECB can purchase appropriate quantities while not buying up whole markets.
- Third, the ECB should try to minimise the impact on the private-sector allocation process. While QE by definition changes relative prices, the ECB should avoid

buying in small markets and distorting market pricing too much. The more the ECB becomes a player in a market, the more it can be subject to political and private-sector pressures when it wants to reverse the purchases.

- Fourth, the ECB should buy only on the secondary markets in order to allow the portfolio-rebalancing channel to work effectively. Purchasing on the primary market would imply the direct financing of entities, which should be avoided.
- Fifth, the assets should only originate from the euro area and be denominated in euros, because of the February 2013 G7 agreement.

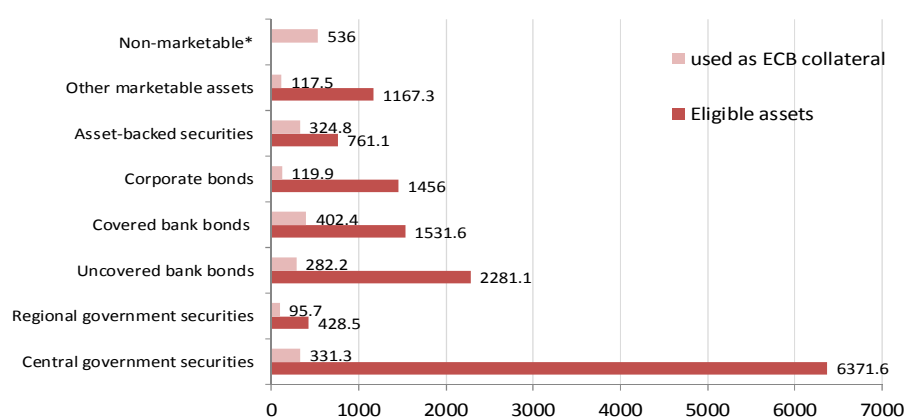
The Treaty gives a mandate to the ECB to maintain price stability, not to protect its balance sheet. Some criteria on riskiness should be adopted, but we recommend a reasonable low threshold for credit risk, such as restricting asset purchases only to the eligible collateral (without any additional eligibility criterion).

2.3.3 Asset purchase: composition

According to the ECB, total marketable assets eligible as collateral represented almost €14 trillion at the end of 2013 (Figure 8), equivalent to 146 percent of euro-area GDP¹⁰. About half of the Eurosystem's eligible collateral pool at the end of 2013 consisted of government bonds, while the other half was split between uncovered bank bonds, covered bank bonds, corporate bonds, Asset Backed Securities and other marketable assets (which include the debts of EU rescue funds and the European Investment Bank).

A natural starting point for an ECB asset purchase programme would be euro-area wide government bonds, which do not exist. The closest proxy would be the bonds of **European debt** such as bonds issued by the European Financial Stability Facility (EFSF), the European Stability Mechanism (ESM), the European Union and the European Investment Bank (EIB). The total available euro-denominated pool of these bonds is around €490bn (€230bn for EFSF/ESM, €60bn for EU, €200bn for EIB). Buying such pan-European assets would not affect the relative yields of euro-area sovereign debts and would not distort the market allocation process within the private sector.

Figure 8: Eligible assets and assets used as ECB collateral (€ bns)



Source: ECB,

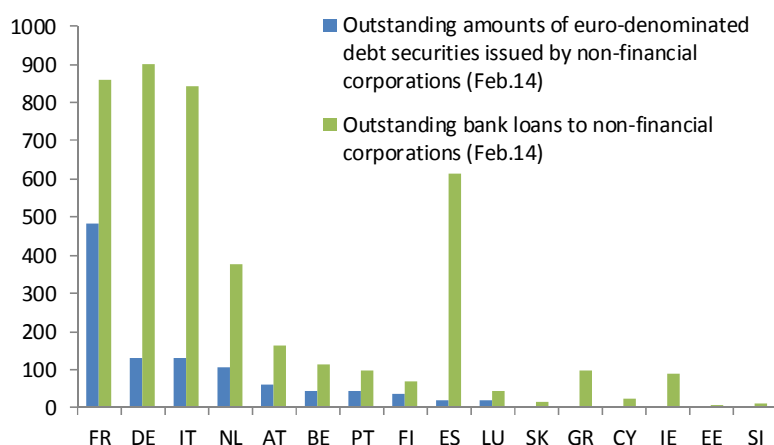
http://www.ecb.europa.eu/paym/pdf/collateral/collateral_data.pdf?ba3bb0e0c2611c6740a278aa2ee7818a; Note: Eligible assets are in nominal values; assets used as ECB collateral are after haircuts and valuation issues. Latest data available: 2013 Q4

¹⁰ In the *permanent* collateral framework, only euro-denominated securities are accepted, but under the *temporary* collateral framework introduced during the crisis, also assets denominated in USD, JPY and GBP are accepted. See: <http://www.ecb.europa.eu/pub/pdf/other/collateralframeworksen.pdf>

National sovereign debt would be a natural step as the bond market is very large and the positive effects of such a QE would be significant, via portfolio rebalancing, as well as the exchange rate, wealth and signalling channels. However, the purchase of national government debt is more complicated for the ECB as a supranational institution without a supranational euro-area treasury as a counterpart, than it was for the Fed or the Bank of England. First, with 18 different sovereign debt markets, the ECB would have to decide, which sovereign debt to buy. The purchase would alter the spreads between countries and change the relative price of sovereign debts, which may expose the ECB to political pressure and lead to moral hazard. Second, the treaty prohibits the monetary financing of government debt, and since the goal of asset purchase will be to meet the ECB's primary objective of price stability, purchase of government bonds would be allowed if the risk of monetary financing could be excluded. Experience proves that all ECB bond-buying programmes are controversial and politically sensitive in this respect. Third, the ECB has a well-defined sovereign bond purchase programme, the OMT, which is a tool to improve monetary policy transmission in countries under financial assistance. It is debatable whether a QE programme based on capital keys of the ECB would undermine the logic of the OMT programme, but this could be a risk and it should be avoided.

The second largest asset class is **bank bonds**, with €3.8 trillion available in eligible covered and uncovered bonds. Among the other effects, the reduction in market yields would also reduce the yields on newly issued bank bonds, thereby allowing banks to obtain non-ECB financing at a lower cost. This would improve bank profitability and could improve the willingness of banks to lend. However, bank bonds should be excluded from the ECB asset purchase programme until the ECB's Comprehensive Assessment is concluded. Until then, ECB purchases would lead to serious conflicts of interest at the ECB and would make a proper assessment by the ECB more difficult. Moreover, those banks, for which the outcome of the Assessment is unsatisfactory, should continue to be excluded from the ECB's asset purchases until they have implemented all the required changes to their balance sheets. This might take several months after the completion of the Comprehensive Assessment.

Figure 9: Bonds vs. loans: financing of EU non-financial corporations (€ bn)



Source: ECB. Note: The difference between the amount reported in this figure and the total eligible corporate bonds shown on Figure 10 comes from the fact that here we only consider corporate bonds issued by euro zone corporations, whereas eligible collateral include corporate bonds issued in the whole European Economic Area (EU countries and Iceland, Liechtenstein and Norway); see:

<https://www.ecb.europa.eu/paym/coll/standards/marketable/html/index.en.html>

While there is no precise data on their magnitude, we estimate that the lower bound of eligible **euro-area corporate bonds** would be €900 billion. In addition, the supply of

corporate bonds in the euro area has been growing considerably since 2009. The euro-area corporate bond market is highly concentrated (figure 9), with the main issuers of corporate bonds being French companies. However, for portfolio rebalancing to work, the origin of the corporate bonds is of less importance. The beneficial effect would come from the fact that the current owners of the corporate bonds would sell their bonds and use the cash for different purposes throughout the euro area. The purchases would encourage new issuance of corporate bonds everywhere and lead to a diversification of the sources of funding. Lower funding costs for corporations should induce more corporate investment.

Another class of assets that could be bought by the ECB is **asset backed securities (ABS)**. Yearly securitisation issuance – which peaked in 2008 – is much lower than in the US and has been decreasing since 2008. The total outstanding stock of securitised products has been stagnating at around €1.06 trillion for the euro area compared to €2.5 trillion in the US (AFME, 2014). Products eligible as collateral for the ECB amount to about €761 billion, but some of them originate from outside the euro area. We estimate that the lower bound of eligible euro-area ABS would be €330 billion. It is worth highlighting that defaults on ABS in Europe have ranged between 0.6-1.5 percent on average, against 9.3-18.4 percent for US securitisations since the start of the 2007-08 financial crisis¹¹. The regulatory landscape for securitised products has also changed considerably since the crisis and made the products safer and more transparent¹².

Considering the total amount of European ABS, more than half (€612 billion) is based on residential mortgages, while SME ABS constitute a smaller part (€116 billion). That is why we think that ECB should be buying also RMBS as they represent the biggest pool of ABS and would allow the ECB to have a more significant programme without buying the whole market. As shown in Wolff (2014), the ECB should not be afraid of a potential housing bubble in Germany given that the current price increase is not financed by a rise in the volumes of mortgages in Germany.

The ABS stock outstanding is unequally distributed across countries¹³, with the main issuers being different from the main issuers of corporate bonds. ABS purchases would be concentrated on the Netherlands, Spain and Italy and could therefore be a good geographical complement to corporate bond purchases, which would be concentrated in France, Germany and Italy. An ECB purchase could promote the development of securitisation in the euro area. The potential for securitisation is relevant, as many loans would qualify for securitisation and in March 2014 the outstanding amount of loans to non-financial corporation stood at €4.2 trillion and to household at 5.2 trillion in the EU¹⁴. From a monetary policy perspective, it would be very beneficial to create ABS that are based on a portfolio of European assets. Ideally, the credit risk should be pooled at the level of the private sector, thereby deepening cross-border financial integration. However, the ECB should not wait for developments in the ABS market to start buying securitised products.

¹¹ <http://www.bis.org/review/r140407a.htm>

¹² Retention requirements – which should induce seller of ABS to monitor carefully the underlying collateral – have been introduced in the context of the EU Capital Requirements Directive, and the EBA is working on the technical details (i.e. 5% retention requirement): <https://www.eba.europa.eu/-/eba-publishes-final-draft-technical-standards-on-securitisation-retention-rules>

¹³ See details in Claeys et al. (2014a)

¹⁴ According to the calculation in Darvas (2013), out of these €4.2 trillion, the stock of SME loans in the EU in 2010 represents approximately €1.7 trillion and the largest stocks of SME loans were in Spain (€356bn), followed by Germany (€270bn), Italy (€206bn) and France (€201bn).

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NOTES



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Non-standard monetary policy measures and the development of ESCB balance sheet in comparison to the Fed and the Bank of England

Anne SIBERT

IN-DEPTH ANALYSIS

Abstract

Over the course of the financial crisis the ECB has adopted a number of non-standard policy measures. The intention of this paper is to compare these actions with those of the Fed and Bank of England; to assess their differences, similarities and rationale. It also discusses the impact of the policies of the three central banks on the size and composition of respectively the balance sheets of the Eurosystem, the Federal Reserve System and the Bank of England.

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EXECUTIVE SUMMARY

- The ECB and the Fed responded decisively to the liquidity crisis of August 2007 to June 2008, but at first as if it were a pure monetary policy problem. The Bank of England delayed its response.
- The size of the balance sheets of the Federal Reserve System, the Eurosystem and the Bank of England were little changed over the course of the liquidity crisis, but their composition changed.
- During the solvency crisis of July 2008 to April 2010, the ECB, the Fed and the Bank of England provided liquidity, sought to support dysfunctional markets and undertook quantitative easing. The Fed stands out for the size of its quantitative easing and its blatant quasi-fiscal measures.
- The balance sheets of the Federal Reserve System, the Eurosystem and the Bank of England grew over the course of the solvency crisis and their composition changed.
- In the course of the sovereign debt crisis, beginning in May 2010, the ECB has mainly focused on restoring calm to disorderly markets while the Fed and the Bank of England have engaged in aggressive quantitative easing.
- The balance sheets of the Federal Reserve System and the Bank of England have expanded markedly over the course of the sovereign debt crisis and the Federal Reserve System's is still expanding. Notably, the expansion of the balance sheet of the Eurosystem was only temporary.

1. INTRODUCTION

Over the course of the financial crisis, the Federal Reserve (Fed), the European Central Bank (ECB) and the Bank of England have implemented a variety of monetary policy measures. The purpose of this paper is to analyze the impact of these measures on the composition and size of the balance sheets of the Federal Reserve System, the Eurosystem and the Bank of England. Furthermore, the reasons for the similarities of and the differences between the central banks' responses to the crisis and the appropriateness and effectiveness of their actions are set out.

Section 2 of this paper analyses policy measures during the "liquidity crisis phase" of the financial crisis (August 2007 to June 2008). Section 3 analyses policy measures during the "solvency crisis phase" (July 2008 to April 2010). Section 4 analyses policy measures during the "sovereign debt phase" (May 2010 to the present).

2. THE LIQUIDITY CRISIS OF AUGUST 2007 TO JUNE 2008

The liquidity crisis erupted in early August 2007 when markets for a wide range of financial assets became dysfunctional. On 9 August BNP Paribas, the largest French bank, froze withdrawals from three of its investment funds, claiming that a “complete evaporation of liquidity” in parts of the US securitization markets made it impossible to value their holdings.¹

2.1. Central banks responses to the liquidity crisis

What the ECB and other central banks should have done in this scenario was to have acted as market makers of last resort by conducting outright purchases and sales of the illiquid private sector securities or to have accepted the illiquid securities as collateral in their lending operations.² However, what the Federal Reserve and, especially, the ECB initially did instead was to flood the market with liquidity against *good quality* collateral, thereby addressing a problem that did not exist.

2.1.1. The initial response

The ECB undertook a 95 billion euro fine-tuning operation at its four percent policy rate against the usual collateral on 9 August with additional infusions in the following days. This did little to help illiquid markets or borrowers. Ignoring Bagehot’s advice, the Fed cut its primary discount rate from 100 basis points above the Federal Funds rate to 50 basis points without relaxing its collateral standards: a taxpayer subsidy for those with good quality eligible collateral.³ In September 2007 it cut its main policy rate by 50 basis points as well. What the Bank of England initially did in response to the liquidity crisis was nothing. It declined to supply additional funds; it did not cut its policy rates; it did not ease its collateral requirements; it acted neither as a market maker of last resort or a lender of last resort.

Both the Fed and the Bank of England went into the solvency crisis with collateral regimes that were significantly more restrictive than that of the Eurosystem. For the Bank of England, the failure to immediately adjust its collateral requirements and to provide emergency funding to apparently solvent financial institutions was to have a serious reputational cost. In the late summer of 2007 Northern Rock, a systemically unimportant UK bank that mainly funded itself by issuing mortgage-backed securities found itself unable to raise sufficient liquidity in the markets. While the government was in the delayed process of putting together a rescue loan there was a leak and the resulting news reports on the evening of 13 September coordinated a depositor run. If Northern Rock had instead been in the euro area it could have borrowed from the Eurosystem using its high-grade mortgages as collateral.

¹ Quoted in Boyd, Sebastian, “BNP Paribas Freezes Funds as Loan Losses Roil Markets,” Bloomberg, 9 Aug 2007, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aW1wj5i.vyOg>

² See Buiter, Willem and Anne Sibert, “Central Banks in a Time of Crisis: a scorecard,” *Maverecon*, *Financial Times*, 20 Aug, 2007, <http://blogs.ft.com/maverecon/2007/08/#axzz34F4zCpBY>.

³ Bagehot’s fourth rule is that central bank lending in a financial crisis should be at a penalty rate. See, for example, Garcia, Cardiff, “What Bagehot said,” Alphaville, *Financial Times*, 23 May 2012, <http://ftalphaville.ft.com/2012/05/23/971111/what-bagehot-said/>.

2.1.2. The later response

In the autumn of 2007 the Bank of England began to adjust its attitude about what constituted acceptable collateral. Beginning on 26 September, it offered longer-term liquidity to the banking system against a wider range of collateral with a sequence of fixed-amount term auctions with a minimum rate that was 100 basis points above its main policy rate.

On 12 Dec 2007 the Fed, the ECB, the Bank of England, the Bank of Canada and the Swiss National Bank released a joint statement, whereby they announced measures to deal with the illiquidity in short-term funding markets. The five central banks also announced the Fed's provision of temporary swap lines of 20 and 4 billion dollars, respectively, to the ECB and the Swiss National Bank. The ECB, which had previously only made euro loans, announced the availability of US dollar funding to its counterparts.

At the onset of the liquidity crisis the Fed conducted its open market operations with a relatively small number of broker dealers as counterparts and against a narrow range of collateral, mainly US Treasuries. It made direct loans to banks at its discount window against a broad range of collateral only on a very short-term basis and solely with the intention of insuring against operational failures or other transitory problems. As part of the 12 December package, the Fed announced the creation of a temporary Term Auction Facility (TAF) enabling all depository institutions judged to be financially sound to secure longer-term funds from the discount window against a wide range of collateral.

In April 2008, the Bank of England introduced the Special Liquidity Scheme (SLS) to improve the banking system's liquidity position by allowing banks and building societies to swap their high-quality mortgage-backed and other securities for UK Treasury Bills for up to three years. The SLS was designed to finance part of the overhang of illiquid assets on banks' balance sheets by exchanging them temporarily for more liquid assets. Although the drawdown period for the SLS ended on 30 January 2009, the scheme remained in place for another three years and was closed on 30 January 2012, all of the drawings having been repaid.

As the liquidity crisis progressed, the Federal Reserve vigorously pursued a conventional monetary policy. By the spring of 2008 it had reduced its target federal funds policy rate by 325 basis points from its August 2007 level. In contrast, the ECB left its key refinancing policy rate unchanged during the liquidity crisis phase of the financial crisis, while the Bank of England responded slowly, not cutting its policy rate until 8 October 2007 and reducing it by a total of only 75 basis points to five percent by the spring of 2008.

2.2. How were the responses to the liquidity crisis similar or different and why?

The initial crisis responses of the ECB and the Fed were similar; they reacted decisively, but especially at first, as if the crisis were a monetary policy problem instead of a financial stability problem. They saw market benchmark interest rates in both the euro area and the United States threatening to rise above their associated policy rates and they focused on this rather than on the collapse in trading volume. By lending against good quality collateral, they expanded their lending to banks that did not need it, rather than to those in need.

A possible explanation for the initial failure of all three central banks to initially treat the scenario as a liquidity crisis was that after the relatively benign economic environment of the past decade both their policy makers and their staff had focused on monetary policy

and were not as accustomed to or adept in dealing with a complex microeconomic problem of dysfunctional credit markets.

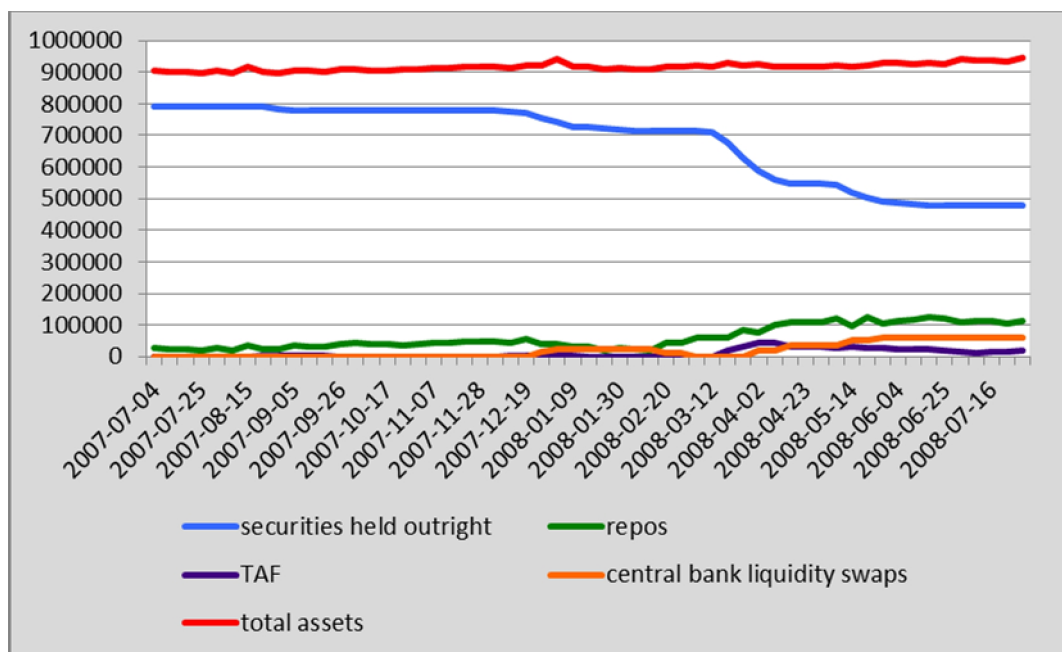
The delayed response of the Bank of England, with its history of acting as the Bagehot-style lender of last resort, is especially puzzling. Bagehot emphasized that the lender of last resort should stand ready to lend against *any and all* assets that would be indisputably good in *normal* times.⁴ Perhaps the Bank's hesitation was the result of a belief that the potential costs of moral hazard problems associated with more accommodative lending outweighed the benefits of restoring order to what might have been perceived as a temporary glitch in lending markets.

The marked contrast between the Fed's forceful rate setting policy and those of the ECB and the Bank of England might be a result of the Fed's relative lack of *de facto* independence and its multiple mandated objectives. While the ECB and the Bank of England remained focused on their inflation goals, the Fed policy makers must have felt under political pressure to be seen as doing everything possible to improve matters.

2.3. The liquidity crisis, monetary policy and central bank balance sheets

In July 2007, the Federal Reserve System was using relatively simple balance sheet structures. It had two main instruments for supplying liquidity. The first was outright purchases of securities. Between July 2007 and July 2008 all of these securities held outright were US Treasuries. The second instrument was what it calls 'repos' (repurchase agreement) while the Bank of England used 'reverse repos'.⁵

Figure 1: Assets of the Federal Reserve System during the Liquidity Crisis (in millions of dollars)



Source: Federal Reserve

⁴ See Humphrey, Thomas M., "Lender of Last Resort," *Economic Review*, Federal Reserve Bank of Richmond, Mar/Apr 1989, 8-16.

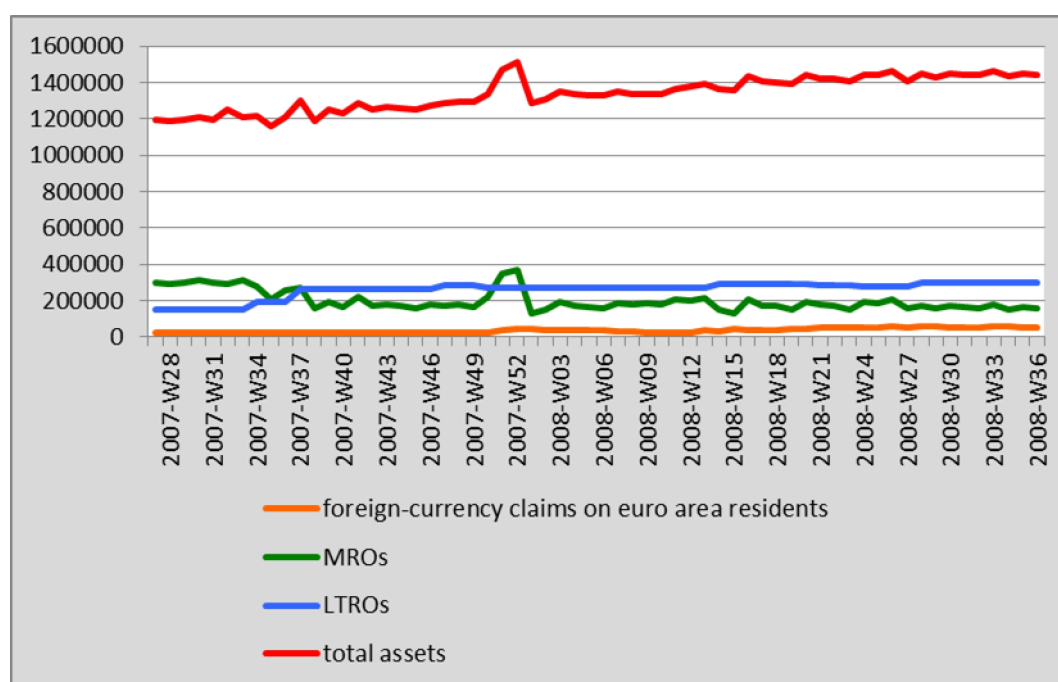
⁵ A repurchase agreement, also known as a repo, is the sale of securities together with an agreement for the seller to buy back the securities at a later date. A reverse repo is the purchase of securities together with an agreement for the buyer to resell the securities at a later date.

As seen in Figure 1, the size of the central bank's balance sheet (shown in red) was little changed over the course of the liquidity crisis, but its composition shifted markedly. In July 2007, 93 percent of its assets were US Treasuries (depicted in blue); in July 2008, only 53 percent were US Treasuries while 17 percent were TAF loans (shown in purple) and 14 percent were repos (shown in green).

In contrast to the Fed, the Eurosystem had a rather complex balance sheet at the start of the liquidity crisis – a result of combining and aggregating the balance sheets of the individual National Central Banks. Assets arising from current monetary policy operations made up a relatively small fraction of its total assets. Its primary instruments for supplying liquidity were its Main Refinancing Operations (MROs), which are repos with a maturity and frequency of one week, and its Long-Term Refinancing Operations (LTROs).

As seen in Figure 2, the ECB responded to the liquidity crisis by providing temporary extra liquidity, especially in December 2007, but mainly by changing the composition of the Eurosystem's lending. In July 2007, 26 percent of its assets were MROs (shown in green), 12 percent were LTROs (shown in blue) and only two percent were non-euro-denominated loans to euro-area residents (shown in orange). At the end of July 2008, 12 percent of its assets were MROs, 20 percent were LTROs and seven percent were non-euro-denominated loans to euro-area residents.

Figure 2: Assets of the Eurosystem during the Liquidity Crisis (in billions of euros)

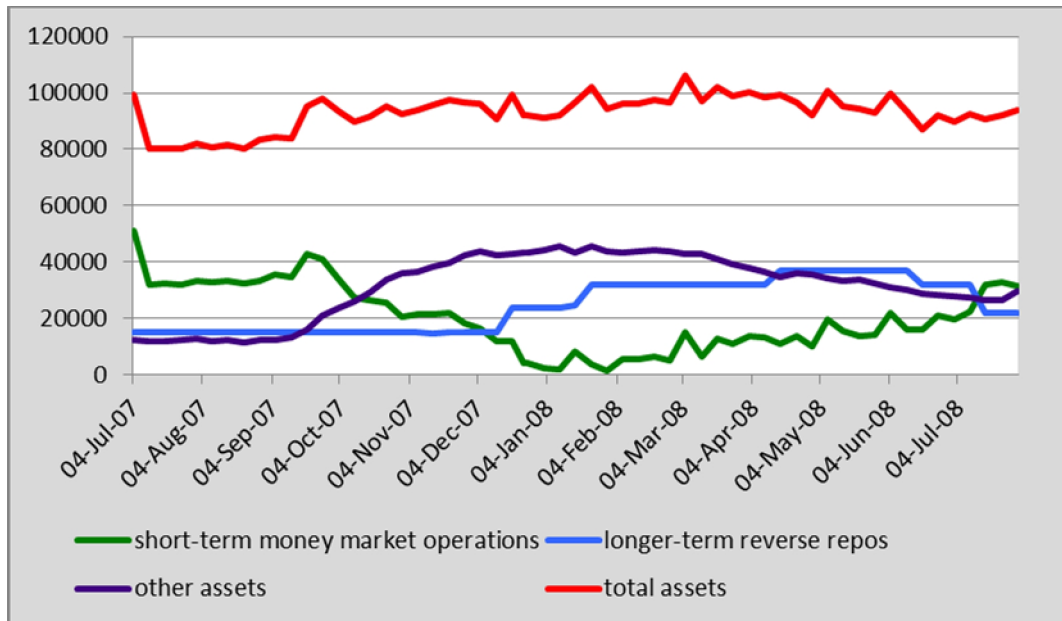


Source: ECB

Prior to the liquidity crisis, the Bank of England's operations primarily consisted of short-term open market operations, which were one-week reverse repos, and longer-term reverse repos, offered in variable-rate tenders at three-, six-, nine- and 12-month maturities. To produce long-run changes in the money supply, the Bank could also purchase and sell high-quality securities outright. In practice these securities were gilts (UK Treasuries) and the amount held constituted a relatively small and little changing share of the Bank's balance sheet.

As seen in Figure 3, the liquidity crisis had only a temporary significant effect on the size of the Bank of England’s balance sheet (shown in red). In December 2008, there was an important compositional change when short-term reverse repos against a narrow range of collateral (shown in green) became relatively less important compared to longer-term reverse repos against a wider range of collateral (shown in blue).

Figure 3: Assets of the Bank of England during the Liquidity Crisis (in billions of pounds)



Source: Bank of England

3. THE SOLVENCY CRISIS OF JULY 2008 TO APRIL 2010

The beginning of the solvency crisis stage of the financial crisis might be the middle of July 2008, when reports about problems with Fannie Mae and Freddie Mac, guarantors of half of the United States' \$12 trillion mortgage market, were published. It was certainly in full swing in mid-September when on successive days Merrill Lynch was sold to Bank of America, Lehman Brothers filed for Chapter 11 bankruptcy protection – the largest bankruptcy in US history – and the US government bailed out the insurance giant AIG. Market interest rates rose sharply and trading volume in credit markets – all maturities except for the shortest term – dried up.

3.1. Central bank responses to the solvency crisis

The Federal Reserve adopted a three-pronged approach to the solvency crisis. First, at the likely behest of and in cooperation with the US Treasury it assumed a blatantly fiscal role, providing massive support to insolvent institutions such as AIG through its Maiden Lane vehicles.⁶

Second, to foster liquidity in short-term funding markets the Fed provided a vast amount of liquidity support to a wide range of counterparties against enlarged sets of collateral. On 22 September 2008 its Asset Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) made its inaugural loans; on 7 October its Commercial Paper Funding Facility (CPFF) came into being. By the end of the solvency crisis phase there were so many special funding facilities that listing and summarizing them all required a US legal-size page covered in small type.⁷ The Fed also enlarged its swap lines with the ECB, Bank of England, the Swiss National Bank and the Bank of Canada by \$180 billion on 18 September and added another \$30 billion and four more counterparty central banks on 24 September.

Third, the Fed pursued a 'muscular' policy of monetary easing. Having already slashed its policy rate in the liquidity crisis phase it lowered it further in a series of cuts in the autumn of 2008, including a coordinated move with other central banks on 8 October, to 0.00-0.25 percent on 16 December. Having no further scope to cut the policy rate, in late November 2008 it pursued a policy combining quantitative and qualitative easing. In what later became known as QE1, the Fed announced that it would purchase the direct obligations of the housing-related government-sponsored enterprises Fannie Mae, Freddie Mac, and the Federal Home Loan Bank and mortgage-backed securities backed by Fannie Mae, Freddie Mac, and Ginnie Mae. This action was intended to support conditions in the US housing market and in financial markets more generally.

The ECB's response to the solvency crisis was aimed at ensuring that solvent but illiquid financial institutions had access to funding. On 8 October 2008 the Eurosystem began conducting its MROs as fixed-rate tender procedures with full allotment at its main refinancing rate. On 15 October it expanded its LTROs and massively increased the set of collateral that it would accept. In 2009, it lengthened the average maturity of its open market operations, introducing LTROs with a maturity of one year and continuing its refinancing operations at full tender and its provision of dollar funding via its swap line with the Fed.

⁶ Maiden Lane vehicles refers to (three) limited liability companies created by the Federal Reserve Bank of New York in 2008 as a financial vehicle to facilitate transactions involving three entities: the former Bear Stearns company as the first entity, the lending division of the former American International Group (AIG) as the second, and the former AIG's credit default swap division as the third. The name Maiden Lane was taken from a street which runs beside New York Federal Reserve in Manhattan.

⁷ Irwin, Neil, *The Alchemists*, New York, Penguin Press, 2013, p. 151.

At the end of 2009, in reaction to improving market conditions, it began to roll back its program of credit enhancement, discontinuing its six- and 12- month LTROs and deciding to reintroduce variable-rate tender procedures for its three-month LTROs.

The ECB also followed a conventional expansionary monetary policy during the solvency crisis phase of the financial crisis. After raising its key policy rate by 25 basis points on inflation fears in July 2008, it joined in the coordinated cut on 8 October. In a series of further rate cuts between then and May 2009, it lowered its policy rate to one percent.

The Bank of England initially reacted to the solvency crisis with the provision of temporary liquidity. In January 2009 the UK Chancellor of the Exchequer authorized the Bank to create the Asset Purchase Facility (APF). Its original function was to promote liquidity in financial markets by purchasing good-quality assets financed by the UK Treasury issuing UK Treasury bills and depositing the proceeds with the Bank of England which then used these deposits to buy the good-quality assets. The Bank was permitted to use the facility for monetary policy purposes, purchasing UK government securities and good-quality private-sector securities in secondary markets, financed by issuing money. Between March and January 2010 the MPC used the APF to conduct a quantitative easing programme; purchasing 200 billion pounds of gilts, most with medium and long maturities. The Bank also purchased commercial paper and corporate bonds through the APF, but on a much smaller scale.

The Bank of England joined in the coordinated policy rate cut of 8 October with a 50 basis points reduction. In a sequence of further cuts, it reduced its policy rate to 0.50 percent on 5 March.

3.2. How were the responses to the solvency crisis similar or different and why?

During the solvency crisis, all three central banks undertook to provide liquidity to dysfunctional markets and all three engaged in rate cutting and quantitative easing. The Federal Reserve stands out, however, for also engaging in blatant quasi-fiscal policy and the amount of both quantitative and qualitative easing that was carried out.

The reason that the Fed undertook both its fiscal policy and aggressive liquidity provision was likely due to its lack of independence, the leadership of the US Treasury and the personality interaction between the Secretary of the Treasury and the Chairman of the Federal Reserve Board. It would probably have been politically impossible for the ECB to have acted as the Fed did and in the United Kingdom, the tripartite system for sharing responsibility for financial regulation that was set up by Gordon Brown in 1997 apparently never functioned as efficiently as intended.

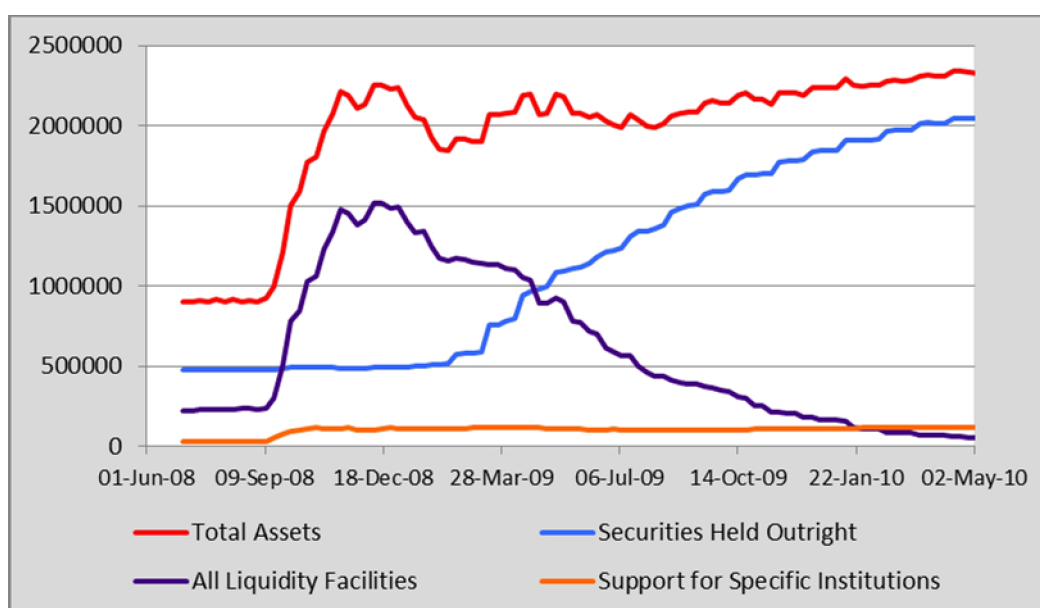
That the ECB was able to respond as effectively as it did in providing liquidity during the solvency crisis phase is remarkable. The Eurosystem was set up to provide low and stable inflation, the Treaty has little to say about a financial stability role and the ECB had no experience with financial crises. That the Bank of England did not respond more rapidly and effectively, given its history is also surprising. The personalities of the policy makers involved may have possibly played a key role. In addition, the ECB may have benefited from the lack of interference from a fiscal authority or an executive branch; the Bank of England may have been hindered by losing its supervisory and regulatory roles in 1997 and by the somewhat seemingly dysfunctional tripartite arrangement.

The more aggressive rate cutting carried out by the Fed during the solvency crisis phase was – as it was during the liquidity crisis phase – probably a result of the Fed's lack of actual autonomy and domestic political pressure.

3.3. The solvency crisis, monetary policy and central bank balance sheets

The impact of the Fed's actions on the asset side of its balance sheet during the solvency crisis is shown in Figure 4 below. Its support for specific institutions is depicted in orange. This relatively small component of its total assets (shown in red) rose in early September 2008 and remained stable throughout the period. The provision of liquidity facilities, shown in purple, caused the Fed's assets to rise dramatically during the autumn of 2008. These facilities were wound down throughout 2009 and early 2010. Beginning in early 2009, QE1 caused the Fed's securities held outright, shown in blue, to rise sharply, offsetting the falloff of the liquidity facilities' activities. At the end of April 2010, the Fed's total assets were two and a half times as large as they were at the end of July 2008.

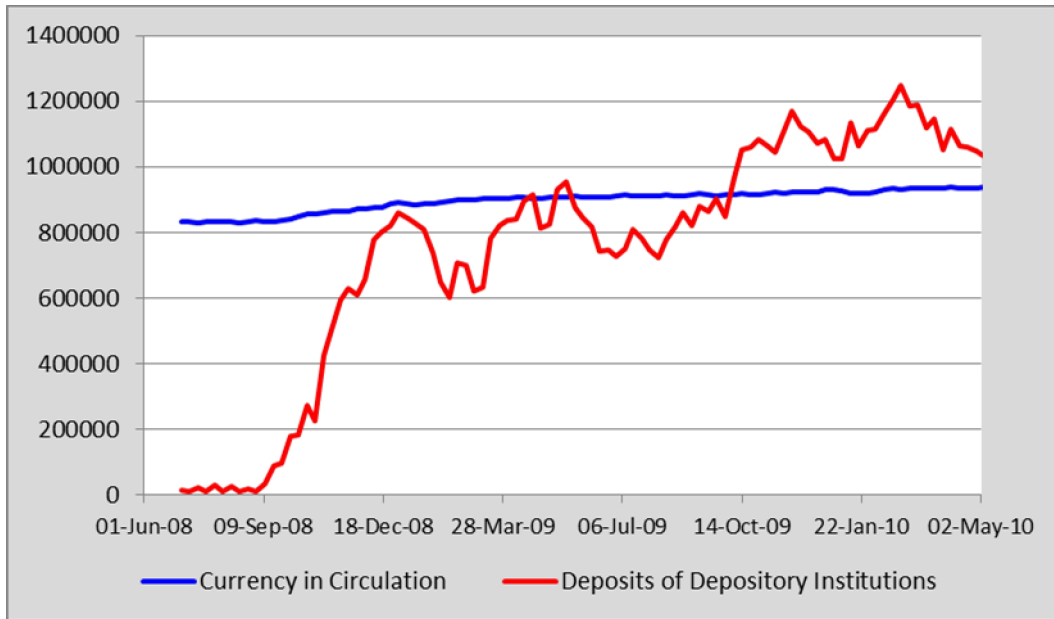
Figure 4: Assets of the Federal Reserve System during the Solvency Crisis (in millions of dollars)



Source: Federal Reserve

The Fed's quantitative easing – the increase in its balance sheet – and its qualitative easing – the change in composition of its assets – were undoubtedly crucial to restoring order to funding markets. Its quantitative easing was probably less successful at fostering economic growth through conventional monetary transmission channels. As seen in Figure 5, below, most of the money created to purchase securities ended up parked in depository institutions' deposits (shown in red) at the Fed.

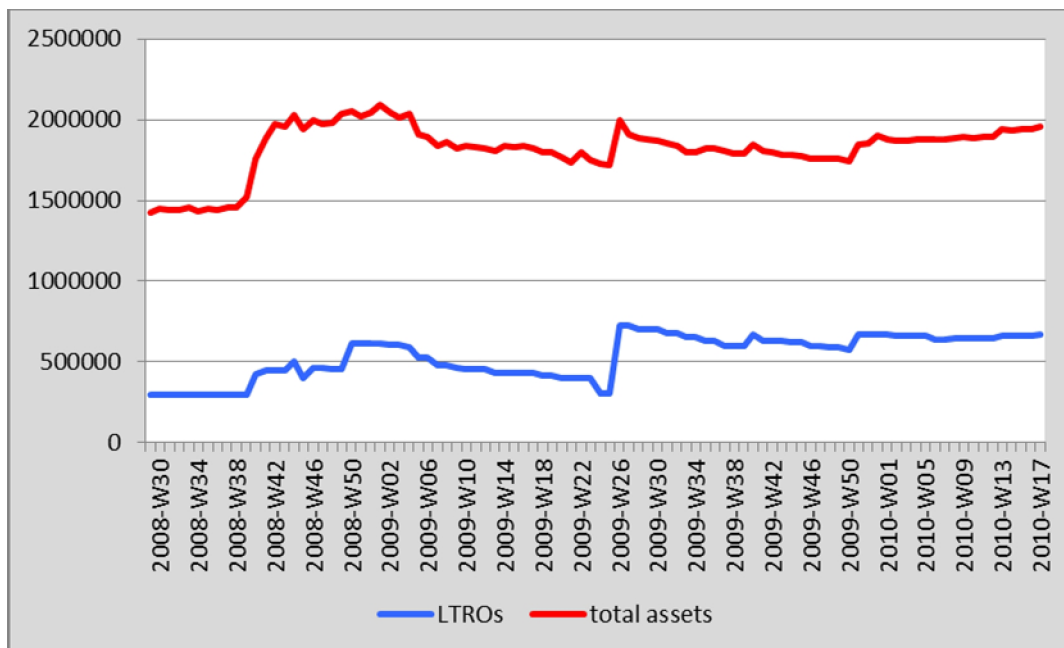
Figure 5: Selected Liabilities of the Federal Reserve System during the Solvency Crisis (in millions of dollars)



Source: Federal Reserve

As shown in Figure 6, the effect of the ECB’s liquidity provision on the Eurosystem balance sheet was not quite as impressive as the effect of the Fed’s monetary policy on the Federal Reserve System’s balance sheet. However, by May 2010 the Eurosystem’s total assets (depicted in red) were about 1.4 times as large as they were at the start of the solvency crisis, with about 70 percent of the increase accounted for by the increase in LTROs (shown in blue).

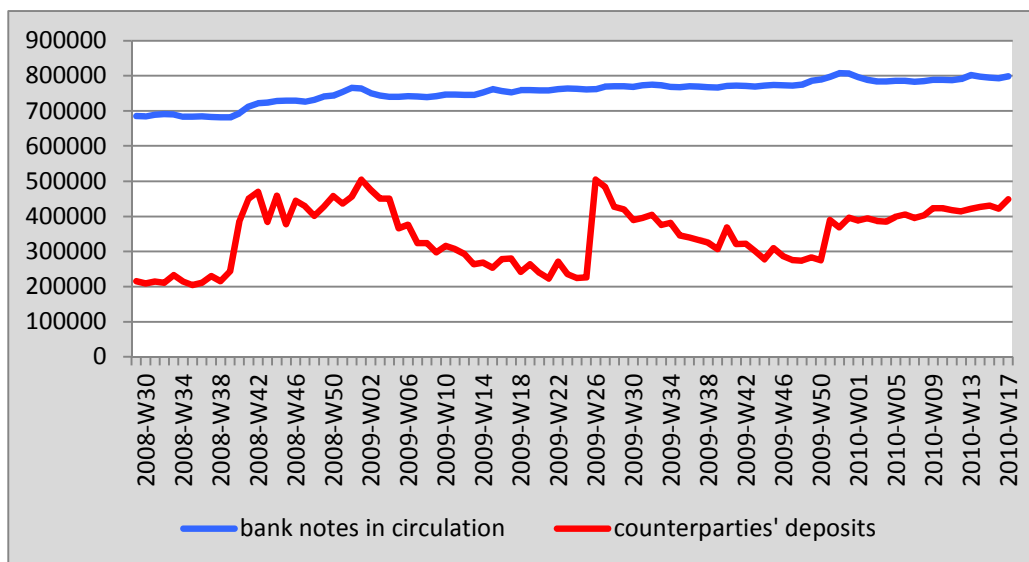
Figure 6: Assets of the Eurosystem during the Solvency Crisis (in millions of euros)



Source: European Central Bank

As in the case of the Fed, the ECB’s qualitative easing undoubtedly helped calm the credit markets. However, also as in the case of the Fed and as seen in Figure 7, most of its additional lending ended up in its counterparties’ deposits at the National Central Banks (shown in red).

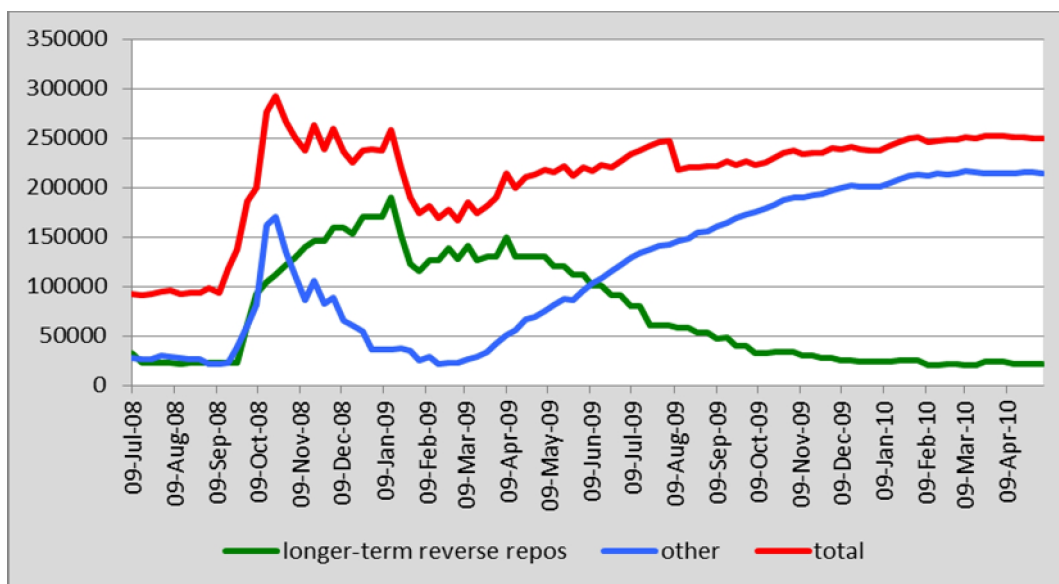
Figure 7: Selected Liabilities of the Eurosystem during the Solvency Crisis (in millions of euros)



Source: European Central Bank

The impact of the Bank of England’s monetary policy on its balance sheet during the solvency crisis is shown in Figure 8 below. Following the onset of the crisis, the Bank provided temporary liquidity. A longer-term expansion of its balance sheet did not occur until the MPC’s March 2009 decision to use the APF to conduct a quantitative easing policy. The gilts purchased by the Bank under this program are part of the Bank’s other assets, shown in blue in Figure 8.

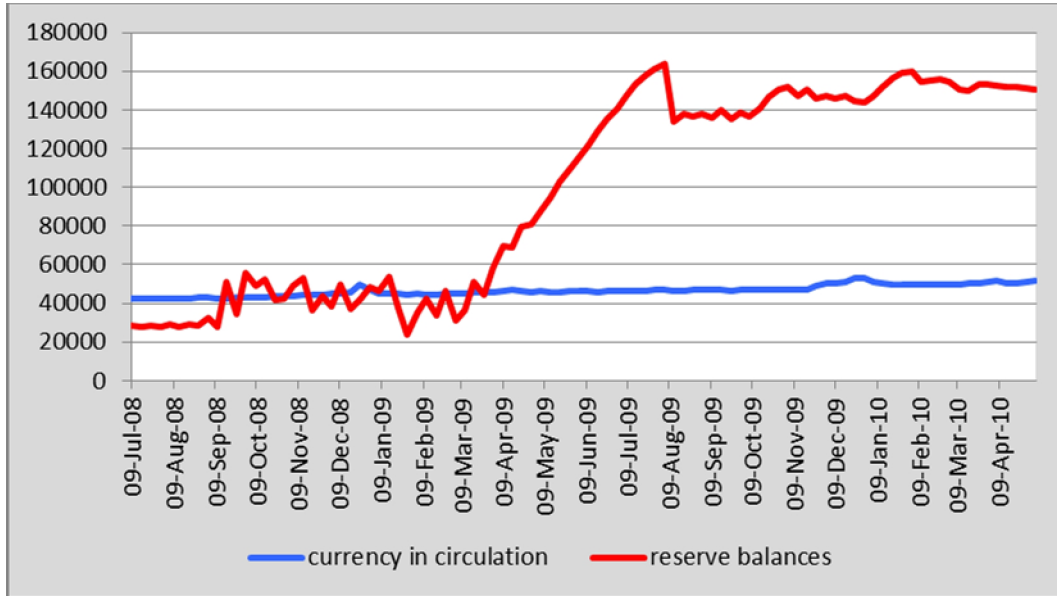
Figure 8: Assets of the Bank of England during the Solvency crisis (in millions of pounds)



Source: Bank of England

As was the case with the Federal Reserve and the ECB, the counterpart on the liability side of the Bank of England’s balance sheet to the increase its assets is the increase in depository institutions’ reserve balances at the central bank. This is seen in red in Figure 9.

Figure 9: Selected Liabilities of the Bank of England during the Solvency crisis (in millions of pounds)



Source: Bank of England

4. THE SOVERIGN DEBT CRISIS: MAY 2010 TO SPRING 2014

In late April 2010 Standard & Poor's downgraded Greek debt to junk and in early May the interest rate differential between Greek and German ten-year government debt suddenly spiked to 10-1/2 percentage points. A sovereign debt crisis arose.

4.1. Central bank responses to the sovereign debt crisis

The immediate need in the solvency crisis was to restore order to euro area sovereign debt markets. This required the ECB to do something that it was never envisioned it would do: act as lender of last resort to both solvent - but illiquid - and insolvent euro area sovereigns.

4.1.1. Response to the debt crisis

On 9 May 2010, the ECB unveiled its Securities Markets Programme (SMP), deciding to 'conduct interventions in the euro area public and private debt securities markets to ensure depth and liquidity in those market segments which are dysfunctional.' The operations were sterilized with fine-tuning operations and although they enlarged the balance sheet they did not affect the quantity of base money.

In early December 2011, the ECB announced two 36-month full-allotment LTROs whose interest rates varied with the refinancing rate. These were probably intended to restore bank lending, which had become moribund, to calm financial markets and as way of ensuring the private financial sector purchase of sovereign debt in the new-issuance market.⁸

4.1.2. Promoting recovery

Since May 2010, the Fed, the ECB and the Bank of England have attempted – in various degrees – to spur the economic recovery. Their main tools have been quantitative and qualitative easing.

By June of 2010 all of the Fed's special liquidity facilities that had supported markets during the liquidity and credit crises had been closed. However, in response to external dollar funding needs the Fed re-established its swap lines with the ECB, the Bank of England and other central banks. During the course of the sovereign debt phase of the solvency crisis the Fed has pursued a large-scale programme of both quantitative and qualitative easing.

In August 2010 the Fed decided to reinvest the principle payments from agency and agency mortgage-backed securities debt (MBS) in longer term Treasuries. In November 2010 the Fed announced its intention to purchase an additional \$600 billion in longer-term US Treasury securities by the end of June 2011. This quantitative easing combined with a maturity twist is referred to as QE2. In September 2011 the Fed engaged in further qualitative easing, deciding to extend the average maturity of its US Treasuries and to reinvest the principle payments from MBSs in MBSs, rather than Treasuries.

In September 2012 the Fed announced what is now called QE3. It would continue to extend the average maturity holdings of its US Treasuries and it would begin buying \$40 billion worth of MBSs per month. In December 2012 it announced that it would augment its MBS purchases with purchases of \$45 billion US Treasuries per month. In December 2013 the

⁸ See Sibert, Anne, "Non-Standard Policy Measures: A First Assessment," Briefing paper for the Committee on Economic and Monetary Affairs (ECON) of the European Parliament, Apr 2012.

Fed decided to begin tapering off its asset purchases. After a sequence of reductions it was announced at the end of April 2014 that the Fed would purchase MBSs at a rate of \$20 billion worth per month and longer-term US Treasuries at a rate of \$25 billion worth per month.

During the sovereign debt phase of the solvency crisis, the ECB has focused more on calming disorderly markets and less on efforts to promote growth. However, on 5 May 2014, the ECB cut its refinancing policy rate to 0.15 percent and in an attempt to increase bank lending to the private sector, it cut the rate that it pays on its counterparties' deposits at the Eurosystem to minus 0.1 percent. It also announced two four-year maturity Targeted LTROs (TLTROs) that will provide financing to banks that make loans to the non-financial private sector. These LTROs will be held in September and December and banks can borrow up to seven percent of their loans to households and firms, other than mortgages, up to a total of 400 billion euros. Furthermore, the ECB announced that it will no longer sterilize its past purchases of government bonds under the SMP and that preparatory work was underway to launch a programme for the outright purchase of asset-backed securities.

During the sovereign debt crisis phase of the financial crisis, the Bank of England continued its programme of sizable asset purchases. In early Oct 2011 the MPC mandated an increase in gilt purchases of 75 billion pounds. This was followed by a further 50 billion pound increase in mid-February and another 50 billion pound increase in early July 2012.

4.2. How were the responses to the sovereign crisis similar or different and why?

The ECB's fiscal policy response to the sovereign debt crisis through the SMP was similar to the Fed's bailing out AIG during the solvency crisis without the authorization of the US Congress. It was no doubt distasteful to the policy makers involved; it must have damaged the legitimacy of both the ECB and the Fed; it was unfortunately preferable to the alternative.

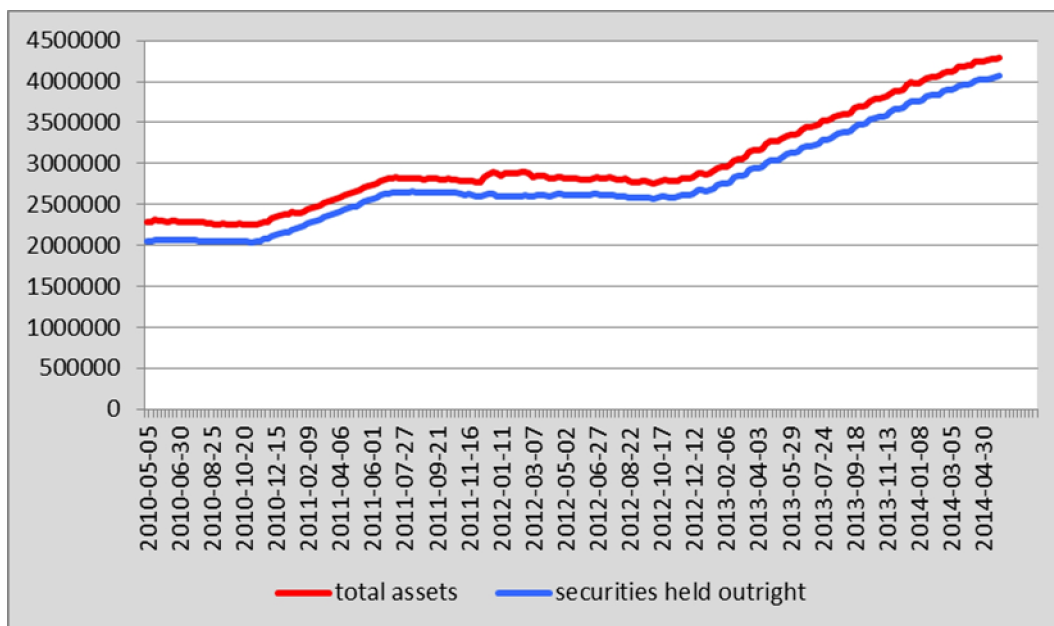
The ECB policy response was effective at calming markets. Moreover, Mario Draghi's 2012 assertion that he would do whatever it takes to preserve the Eurosystem was apparently plausible, eliminating the need to actually intervene. The more credible the lender of last resort is that it will do whatever it takes, the less likely it is that there will be a speculative attack on an illiquid borrower based solely on self-fulfilling expectations.

The ECB's quantitative easing programme during the solvency crisis has been strikingly different from those of the Fed and the Bank of England. The Bank of England accumulated a massive amount of gilts. While the expansion of its balance sheet has stopped, it continues to hold the gilts. The Federal Reserve's balance sheet has ballooned and it continues to purchase securities, albeit at a reduced pace. The ECB on the other hand, did not renew (until the announcement of the TLTROs) the LTROs as banks began to repay them and did not engage in outright purchases of private or government securities to make up for the resulting contraction of its balance sheet, which is now down to about where it was at the start of the solvency crisis.

4.3. The sovereign debt crisis, monetary policy and central bank balance sheets

Figure 10 depicts the total assets of the Fed (in blue) and its holdings of securities (in red). The special liquidity facilities and support for specific institutions that were shown in Figure 4 are no longer depicted: the liquidity facilities were they were closed by the end of the first half of 2011 and the support for specific institutions, always a relatively small component of total assets, had already declined significantly.

Figure 10: Assets of the Federal Reserve System during the Sovereign Debt Crisis (in millions of dollars)



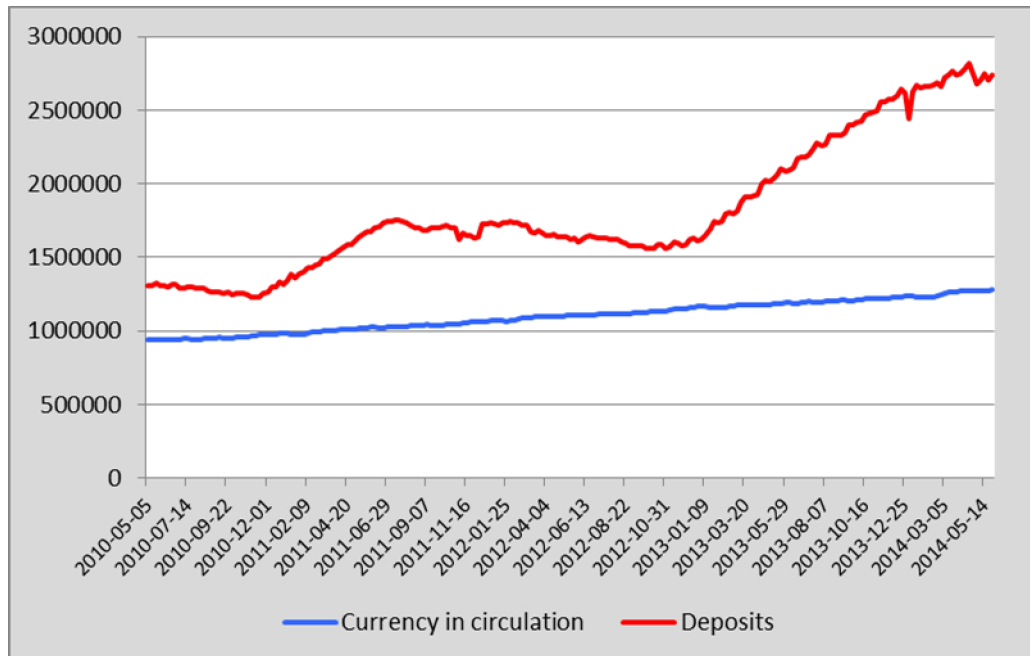
Source: Federal Reserve

As seen in Figure 10 above the Fed's QE2 caused its balance sheet to expand through the first half of 2011 and its QE3 caused it to again rise sharply again in the Autumn of 2012. The tapering of asset purchases is barely visible in the Figure as a decline in the rate of increase of asset accumulation in early 2014.

As of 11 June 2014, the total assets of the Federal Reserve System had mushroomed to about five times their size on 26 July 2007. The proportion of assets made up of securities held outright is little changed from 93 percent to 95 percent. However, in July 2007 all of the securities were US Treasuries, now only 58 percent are Treasuries and the rest are MBS.

Selected liabilities of the Fed are shown in Figure 11. As in the solvency crisis phase, the quantitative easing of the Fed in its QE2 and QE3 programs has primarily resulted in increased reserved deposits held at the Fed.

Figure 11: Selected Liabilities of the Federal Reserve System during the Sovereign Debt Crisis (in millions of dollars)

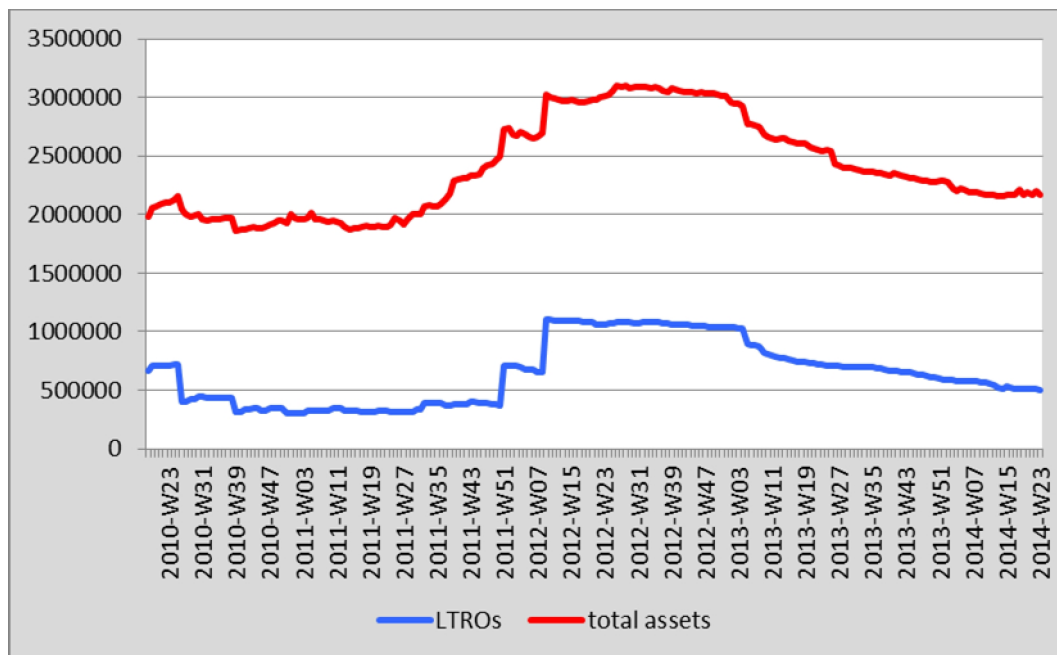


Source: Federal Reserve

As a consequence of its two LTROs, the balance sheet of the Eurosystem swelled in 2012. However, unlike the asset purchase programmes of the Fed and the Bank of England, these measures were purely temporary and the Eurosystem's total assets are little changed from early May 2010. Currently, the ECB holds 167 billion euros of bonds purchased under its SMP.

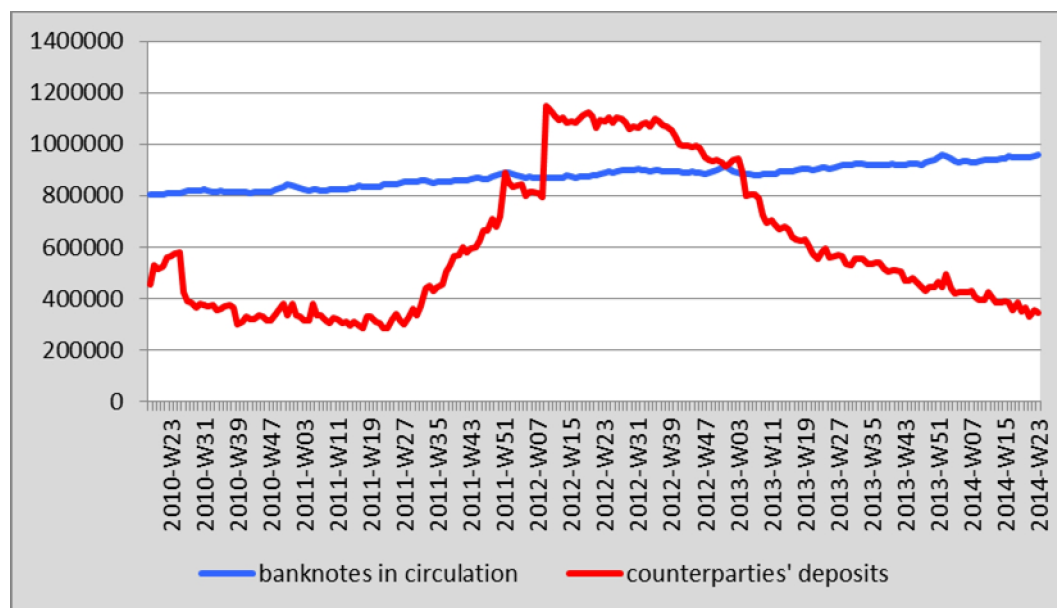
The new measures announced in June 2014 will begin to affect the asset side of the balance sheet in the autumn. If the full amount of 400 billion euros under the TLTROs were to be taken up, total assets would be almost twenty percent higher than their current level.

Figure 12: Assets of the Eurosystem during the Sovereign Debt Crisis (in millions of euros)



Source: European Central Bank

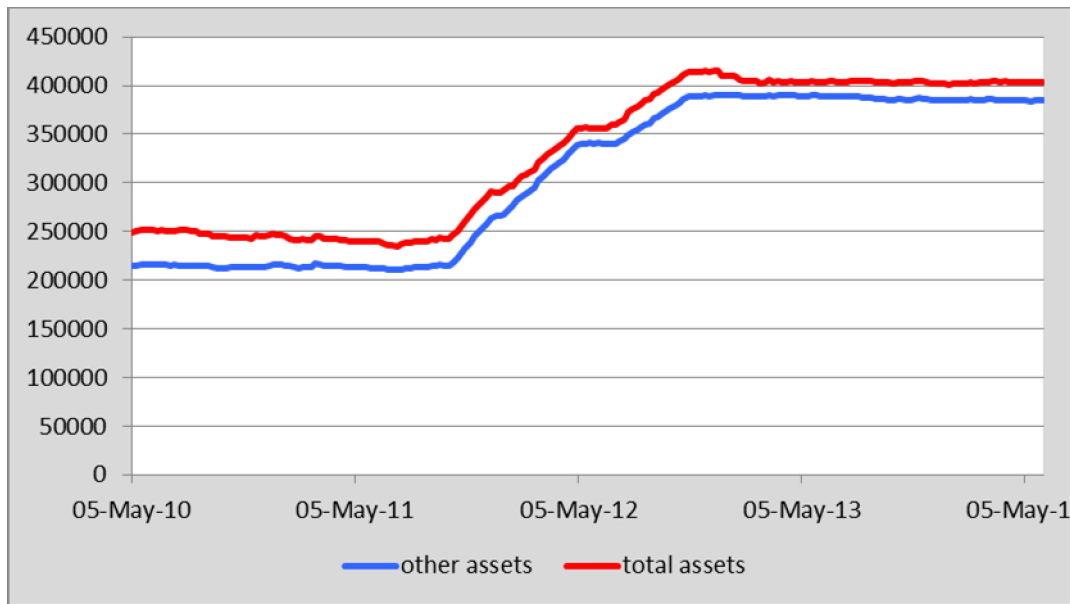
Figure 13: Selected Liabilities of the Eurosystem during the Sovereign Debt Crisis (in millions of euros)



Source: European Central Bank

Figure 14 below depicts the impact of the Bank of England’s gilt purchases through the APF on its balance sheet. At the start of the period of the sovereign debt crisis about 80 percent of the Bank of England’s assets, shown in red, were made up of the 200 billion pounds of gilts that had already been purchased. These are part of the Bank’s other assets, shown in blue. Three additional rounds of purchases brought total gilts purchased up to 375 billion pounds and produced the sharp rise in both the Bank’s other and total assets over the period of autumn 2011 through autumn 2012.

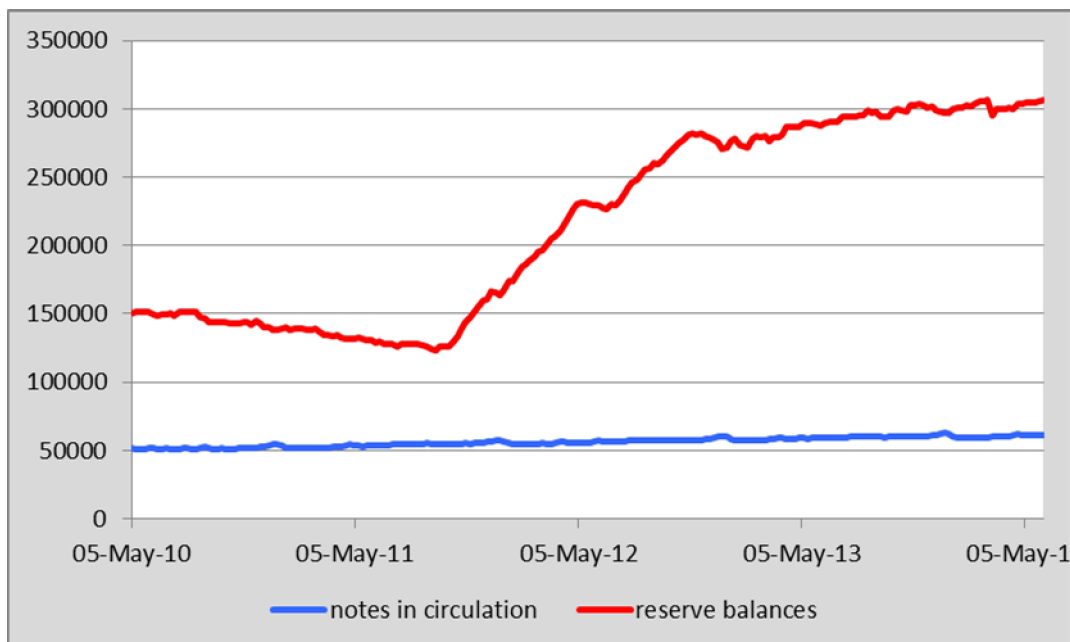
Figure 14: Assets of the Bank of England during the Sovereign Debt Crisis (in millions of pounds)



Source: Bank of England

Similarly to other central bank expansions of assets during the financial crisis, the Bank of England’s enlargement of its balance sheet mainly produced an increase in reserve deposits at the Bank.

Figure 15: Selected Liabilities of the Bank of England during the Sovereign Debt Crisis (in millions of pounds)



Source: Bank of England

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ISBN 978-92-823-9973-6 (paper)
ISBN 978-92-823-9974-3 (pdf)

doi: 10.2861/115261 (paper)
doi: 10.2861/126496 (pdf)

