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# ECB Policy Responses between 2007 and 2014: A Chronological Analysis and an Assessment of Their Effects

**Summary:** The paper analyses the monetary policy responses of the European Central Bank (ECB) to the global financial crisis and the European sovereign debt crisis. Our goals are on the one hand to explain chronologically the main measures in conventional and unconventional policies adopted by the ECB and on the other hand to analyse their effects on key interest rates, monetary aggregates and the money multiplier. The assessment is that the ECB's monetary policy responses to the crisis have been "too little, too late", constrained by the institutional framework, which prevents the ECB from acting as a true central bank with the role of lender of last resort.

**Key words:** ECB, Unconventional monetary policy, Money multiplier, Monetary aggregates, European crises.

**JEL:** E52, E58, F15, N14.

"There was a time, not too long ago, when central banking was considered to be a rather boring and unexciting occupation [...] I can confidently say that this time has passed". These words by Mario Draghi (2013) reflect the change in the way monetary policy has been conducted following the bursting of the global financial bubble. Since the outbreak of the international financial crisis, central banking's dull times have been left behind and instead a more active monetary policy has been implemented by the ECB and by other major central banks.

However, the effects of all the measures implemented have not been as expected. The increases in the ECB's balance sheet and the change in its composition have not been translated into back-to-normality credit flows and nor has the regularisation of the traditional channels of the transmission mechanism; there has also been no steady recuperation of the Eurozone economy. This paper analyses the ECB's monetary policy responses to the global financial crisis and the European sovereign debt crisis. We organise the numerous measures (conventional and unconventional) adopted by the ECB since the beginning of the crisis chronologically in four different phases. In addition, we explain the effects of these measures on key interest rates, monetary aggregates and the money multiplier. In the light of this assessment, we argue that the ECB's monetary policy responses to the crisis have been "too little, too late", constrained by the institutional framework, which hinders it from acting as a true central bank in its traditional role as lender of last resort.

The paper analyses the monetary policy responses of the ECB to the global financial crisis and the European sovereign debt crisis. After a brief introduction setting up the scene we discuss in the second part the main differences the literature considers might be established between conventional and unconventional policy measures. In the third part a chronological revision of the ECB policy is made by distinguishing between four different phases running from 2007 to 2014. In the fourth part we move on to analyse the effects of that measures on prices (interest rates) and quantities (money aggregates and the money multiplier). The paper ends with some final remarks.

## 1. Introduction

Various empirical papers have analysed the ECB's monetary policy during the financial and the European sovereign debt crises. Within this body of research, two points have been highlighted: the change in the transmission mechanism during the crises and the heterogeneity and fragmentation of the Eurozone. In the first case, for instance, David Aristei and Manuela Gallo (2014) argue that in episodes of financial distress, the bank lending rate to households and non-financial corporations show a reduction in pass-through from the money market rates. Analysing the bank lending channel during the crisis, Leonardo Gambacorta and David Marques-Ibanez (2011) find that bank business models affected the supply of credit. In addition, bank risk is an important determinant of the loan supply and a prolonged period of low interest rates could boost lending. Furthermore, no significant changes have been detected in the average impact of monetary policy on bank lending. Finally, non-standard measures have had a positive effect on bank lending. In another paper, Matteo Ciccarelli, Angela Maddaloni, and José-Luis Peydró (2013) analyse the way in which financial fragility affects the transmission mechanism of monetary policy in the Eurozone. Their results show that the transmission mechanism is time-varying and is influenced by the fragility of sovereign debt, firms, banks and households.

Regarding the second point, Ali Al-Eyd and S. Pelin Berkmen (2013) show that financial markets in the Eurozone remained fragmented, with higher retail rates in stressed countries than in core countries disrupting the credit flow and the sound functioning of transmission channels. Roberto A. de Santis and Paolo Surico (2013) note that the effects of monetary policy on bank lending are significant and heterogeneous for Germany and Italy, but not so for Spain and France which exhibit more homogenous effects, such effects depending on the degree of concentration of the banking system. In this line, Matteo Barigozzi, Antonio M. Conti, and Matteo Luciani (2014) investigate the asymmetries within the Eurozone member countries facing changes in monetary policy. In this regard, the adoption of the single currency has contributed to a more homogeneous response among member countries. However, there still remain some differences between Southern and Northern countries in terms of achieving similar outcomes in prices and unemployment rates. Ansgar Belke, Joscha Beckmann, and Florian Verheyen (2013) analyse the interest rate pass-through from money market rates to various loan rates and show substantial differences in the pass-through mechanism. In addition, the transmission to interest rates is incomplete and the dynamics are asymmetric for money market rate decreases or

increases. Finally, pass-through is more complete for loans to non-financial corporations than for those to households.

Since the outbreak of the financial crisis, the ECB and other major central banks (CBs) have implemented measures beyond their standard toolkit. For instance, the ECB has introduced full-allotment loans with fixed rates, an expansion of the list of assets eligible as collateral and longer-term liquidity provisions in the euro and other currencies. It has also changed the reserve ratio required, implemented outright purchases of specific securities, modified interest rate corridors and introduced new communication tools.

Nonetheless, during this new age of central banking, there have been some fundamental features that have not changed. For instance, regarding the institutional framework, CBs' statutes have not been amended and independence, even when it has been questioned, is still present as a core idea. Moreover, the monetary policy strategy of the ECB is still focused on its main mandate, i.e. achieving an inflation rate below but close to 2% in the medium-term (Lorenzo Bini-Smaghi 2012a). Although the operational framework has not changed in a fundamental way, the ECB continues to lend while the Federal Reserve (FED), the Bank of England (BoE) and other CBs continue to buy and sell securities in their open market operations. This reflects, respectively, the bank-based financial system of the Eurozone and the capital market-based financial system of the US. These contrasting procedures in open market operations aid in understanding the difference in the evolution of the size and composition of the ECB and FED balance sheets and partly explain the effectiveness of the measures implemented. In addition, the effectiveness of ECB measures in comparison with those of the FED and BoE is also related to the absence of banking and fiscal union, market fragmentation and heterogeneities within the Eurozone (Jean Pisani-Ferry and Guntram Wolff 2012). Nevertheless, a fundamental change has been the adoption of a new mandate for the supervision of the Eurozone banking system (Zsolt Darvas and Silvia Merler 2013), beginning in late 2014.

The objective of the implementation of non-standard measures by the ECB has been to reactivate the traditional channels by which standard monetary policy operates (Al-Eyd and Berkmen 2013; Christophe Blot and Fabien Labondance 2013; Jérôme Creel, Paul Hubert, and Mathilde Viennot 2013), to complement standard measures (Philippine Cour-Thimann and Bernhard Winkler 2012; Matthieu Darracq Paries and De Santis 2013) and to avoid perverse effects in financial markets from an excessively fast deleveraging process (Bini-Smaghi 2012b). In a speech made in 2014, Naoyuki Shinohara (2014) noted some early positive effects of non-standard measures, such as helping to prevent the collapse of the financial system, reducing the risk of a euro area break up and supporting global economic activity in a broad sense.

## 2. Discussion of Conventional versus Unconventional Measures

There is no consensus on how to define the extraordinary policy measures implemented by the ECB, that is, standard or non-standard, conventional or unconventional, or whether the change in the balance sheet can be framed as quantitative easing (QE), qualitative easing, balance sheet policy, or credit easing.

If we focus strictly on what the ECB stated in its website teaching material, those measures implemented are framed as “non-standard, unconventional measures” and are considered part of its toolkit, but are “by definition exceptional and temporary in nature” (ECB 2014c)<sup>1</sup>; they are also targeted specifically at enhancing credit support.

The change in the conduct of ECB monetary policy is more obvious if we analyse the communication strategy according to the ECB monthly press conferences from January 2007 to July 2014. One of the first mentions of “non-standard actions” was made by Jean-Claude Trichet, former ECB President, when asked about the possibility of a liquidity trap in January 2009. A month later, Trichet framed the new measures implemented by the ECB as non-standard actions; from December 2009, he ensured the continuous monitoring of those (non-standard) actions to avoid “distortions associated with maintaining non-standard measures for too long”.

From June 2010 to August 2012, all those measures were explicitly considered “temporary in nature” in the way they were constructed (ECB 2011a). However, it was not until mid-2012, that is, when risk premiums for Spain and Italy reached their highest peak, that the ECB reflected three major changes in their communication tools. The first was presented in late July 2012, when Draghi (2012) affirmed that “[w]ithin our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough”. The second change appeared in April 2013, switching from “[non-standard measures are] temporary in nature” to the “policy stance will remain accommodative for as long as needed”. The third, in April 2014, showed the possibility of implementing unconventional instruments (for the first time the word *unconventional* was used in an ECB conference) due to the risk of an over-long period of low inflation. This was reaffirmed in June 2014, when Draghi assured the markets that the ECB had “decided to intensify preparatory work related to outright purchases in the [asset-backed security] ABS market to enhance the functioning of the monetary policy transmission mechanism”.

However, as mentioned above, there is no consensus on how to define the ECB’s extraordinary operating measures in place since the outbreak of the crisis. Are ECB measures unconventional? Claudio Borio and Piti Disyatat (2010, p. 53) affirm that the distinguishing feature of unconventional monetary policy is the active use by the CB of its balance sheet to affect market prices and conditions directly beyond a short-term interest rate, differentiating between balance sheet policies and interest rates policies. In terms of the ECB jargon, the typical division is between key interest rates - main refinancing operations (MRO) and corridor rates - and any others. However, even these two broad categories do not help much; setting a negative interest rate on the deposit facility may be considered a simple interest rate decision, but it is really unconventional. Under this broad division, ECB measures such as the securities markets programme (SMP), covered bond purchase programmes 1 and 2 (CBPP1, CBPP2), the implementation of six-month, one-year and three-year long-term refinancing operations (LTROs) and other measures, fall within unconventional measures. However, in *sensu stricto*, they are not unconventional because some of

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<sup>1</sup> This teaching material is not anymore available on the ECB webpage.

these policies were in conventional use in the 1960s-70s (Borio and Disyatat 2010, p. 54). Such measures are part of the not-so-unconventional balance sheet policy toolkit. In other words, they are partly non-standard measures (at least in recent times) intended to change the composition of the assets on the balance sheet, so-called qualitative easing (Michele Lenza, Huw Pill, and Lucrezia Reichlin 2010).

Are some of the ECB measures a type of QE? The traditional definition of QE implies three conditions: (1) an explicit target for bank reserves providing ample liquidity to realise a current account balance target substantially in excess of the required reserves; (2) conditional commitment to maintaining high reserve levels into the future; (3) increased purchases of long-term government bonds to facilitate the attainment of the target bank reserves (Hiroshi Ugai 2007, pp. 2-3). ECB measures cannot be framed under the traditional definitions of QE because outright monetary transactions (OMT) have not been implemented and the SMP has been fully sterilised as of January 2015. Instead, expansion in the ECB balance sheet came primarily from increases in the extraordinary longer maturity loans with broader accepted collateral. Thus, ECB measures are not QE in the traditional sense, even when those measures can be framed as QE under a broader definition, for instance adopting the characterisation of Mark Spiegel (2001), according to which QE is aimed at reducing long-term interest rates when policy rates are close to zero.

Do ECB measures lie within the Bernanke definition of credit easing? The former FED president, Ben Bernanke, highlighted the different approach of the FED to supporting credit markets with respect to the Japanese QE in the period 2001-2006. In the words of Ben S. Bernanke (2009): “Our approach [...] involves an expansion of the central bank’s balance sheet. However, in a pure QE regime, the focus of policy is the quantity of bank reserves [...]; the composition of loans and securities on the asset side of the central bank’s balance sheet is incidental. [...] The] credit easing approach focuses on the mix of loans and securities that it holds and on how this composition of assets affects credit conditions for households and businesses”. In other words, credit easing is intended to restore specific interest rates or markets; that is, by buying/selling different assets (public and private), the CB affects specific interest rates and market conditions.

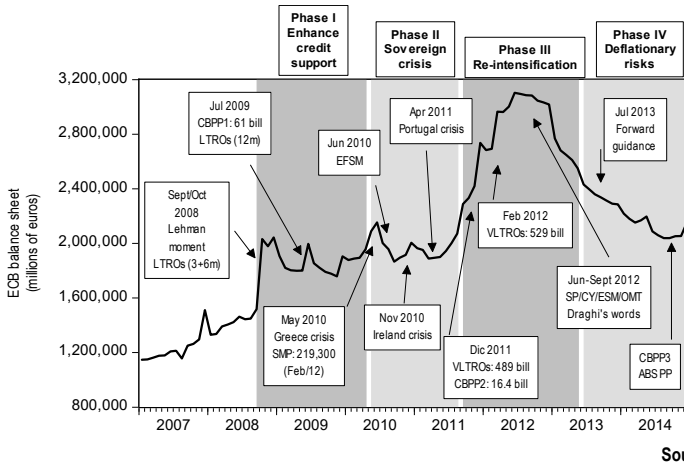
Because ECB measures have not involved the massive purchase of assets, they cannot be considered purely as QE or as credit easing. The fact that most of the transactions on the asset side of the ECB balance sheet are collateralised loans rather than asset purchases reflects the bank-based financial structure of the euro area (Brett W. Fawley and Christopher J. Neely 2013) and makes most of the balance sheet endogenously determined when full allotment is working. Taking into account the particular characteristics of the Eurozone, the measures implemented by the ECB can be framed as endogenous credit easing because of the focus on relaxing bank collateral requirements and funding liquidity constraints (Bini-Smaghi 2009).

In sum, since the start of the crisis, monetary policy has significantly changed, making it quite difficult to match new realities with old categories. This is most likely what the new norm for monetary policy is all about.

### 3. Chronology of ECB Measures since 2007

Since 2007, and mostly after the *Lehman moment*, the ECB has implemented a series of measures to address the effects of the financial and European sovereign debt crises (Sylvester Eijffinger and Lex Hoogduin 2012; Fabian Eser et al. 2012; José Luis Malo de Molina 2013; Antonio Millaruelo and Ana del Río 2013; Christiaan Pattipeilohy et al. 2013; ECB 2014a).

In normal times (ECB 2002), that is, until autumn 2008, the ECB estimated the liquidity needs in the banking system arising from autonomous factors plus reserve requirements and provided the system with this amount on a weekly basis through open market operations (OMOs) at the interest rate set by the ECB, the MRO rate. Commercial banks bid for the CB money (reserves) at a rate very close to the rate set by ECB and this rate aims to be transmitted to the whole yield curve.



Source: ECB (2015a)<sup>2</sup>.

**Figure 1** ECB Balance Sheet

Because the ECB sets the loan conditions in the Eurozone bank-based financial system, the monetary base (MB) is partially exogenously determined by the CB. The interbank rate (EONIA) fluctuates between the marginal lending facility rate (upper limit) and the deposit rate (lower limit). The difference between the marginal lending facility rate and the deposit rate is the interest rate corridor. This interest rate corridor was symmetric with respect to the MRO from April 1999 until November 2013. However, the corridor width has changed several times since the outbreak of the financial crisis. The downsizing of the corridor width reduces the volatility margin of the interbank rate, lowers interbank turnover and broadens the CB's balance sheet, currently helping to steer the interbank rate with greater accuracy (Ulrich Bindseil and Juliusz Jablecki 2011). The conventional ECB lending procedure, employed from June 2000 to October 2008, has been used in variable rate tenders,

<sup>2</sup> **European Central Bank.** 2015a. Statistical Data Warehouse. <http://sdw.ecb.europa.eu/> (accessed April 17, 2015).

minimum bid rates and fixed allotments. However, as a consequence of the financial crisis, the ECB has decided to follow a fixed rate procedure with full allotment.

In the rest of this section, we present a chronological analysis of the ECB measures implemented since the outbreak of the financial crisis, dividing the six to seven year period into four clearly defined phases of the Eurozone economy. The phases were chosen as periods of stress/calm in the European economy and reflected in the expansion of the ECB balance sheet (see Figure 1).

### 3.1 Phase I: From Lehman Collapse to April 2010

During Phase I, ECB measures were targeted at providing “enhanced credit support” (ECB 2010). In the first part of Phase I (September 2008 to December 2009), there was an acute banking crisis in which the financial shock increased instability in the demand for CB money due, in particular, to greater precautionary holdings; in other words, instability arose from an increase in counterparty risk because of mounting insolvency and liquidity risks, exacerbated by asymmetric information. The ECB money auctioned turned out to be insufficient and money market rates started to increase, while liquidity demand was becoming unstable. After a long discussion through the autumn of 2008, the ECB decided to move to a fixed rate system with full allotment tenders. This move was intended to reassure market participants that if banks faced unforeseen liquidity shortages, they could refinance through the ECB at a known rate for a known period, for as much as they needed. This has made ECB money and bank reserves mostly endogenously determined since October 2008.

Regarding interest rate policies, the ECB cut the MRO interest rate (from 4.25 to 1.00) and reduced the interest rate corridor from 200 basis points (bp) to 100 bp until January 2009, increasing the corridor width again up to 200 bp until April 2009 and reducing it to 150 bp from May 2009.

Moreover, the ECB changed the loan conditions by implementing three- and six-month full allotment LTROs in November 2008 (300 billion euros) plus 12-month LTROs in June 2009 (442 billion euros). It lowered the rating threshold for collateral and agreed currency swaps with major CBs, including the FED, the BoE, the Swiss National Bank and the Bank of Japan. Finally, the ECB introduced CBPP1 to promote the ongoing decline in money market term rates, to ease funding conditions for credit institutions and enterprises, encourage credit institutions to maintain and expand their lending to clients and improve market liquidity in important segments of the private debt securities market. Despite the high expectations of CBPP1, this programme only reached 61 billion euros.

Nevertheless, all the liquidity injected during this acute banking crisis provoked a considerable increase in the balance sheet of the ECB for the first time in its short history, an increase of approximately 30% in less than a year, whereas in “normal times” the year-on-year increase was approximately 4%. From January to May 2010, market conditions appeared to improve slightly and corresponded to the phasing out of the non-standard measures. In fact, a small decrease in the balance sheet can even be observed.

However, fears on the part of the ECB that this type of abnormal monetary policy could be dangerous, particularly *too much* intervention by the ECB in the

money market, challenging the exit strategy, increasing potential inflation dangers and reducing incentives for banks to strengthen their solvency. In addition, the presumption that the crisis would be short-lived induced the ECB to insist that full allotment procedures, as with all non-standard actions, were “temporary in nature” (ECB 2011a).

### 3.2 Phase II: From the Start of the Eurozone Sovereign Debt Crisis to August 2011

Phase II corresponds to the first round of the sovereign crisis lasting from May 2010 to August 2011. The main point to make in this entire phase is that although the sovereign debt crisis was mounting rapidly, the ECB was reluctant to act as a lender of last resort for sovereign entities at a time when, in less than a year (May 2010 to March 2011), Greece, Ireland and Portugal were all bailed out. The sole measure worth mentioning is the initiation of the SMP, which reached 100 billion euros in August 2011 and was fully sterilised through fixed term deposits because of potential inflation fears.

During this phase, the ECB did not take relevant measures, notwithstanding the SMP. In fact, the ECB balance sheet did not significantly increase. In the last part of Phase II (April 2011 to August 2011), conditions seemed relatively stable again and hardly any interventions took place. The ECB even decided to increase interest rates from 1.00% to 1.25% in April 2011 and again to 1.5% in July 2011 “in the light of upside risks to price stability”. Moreover, the SMP was not renewed.

### 3.3 Phase III: Re-intensification of the Euro Area Sovereign Debt Crisis Coupled with Increased Banking Sector Strain

In the first part of Phase III (August 2011 to January 2013), there was an acute re-intensification of both crises - financial and sovereign debt - termed the “diabolic loop”, which forced the ECB finally to become a true committed lender of last resort for the banking system. This commitment was announced while declaring that the non-standard measures would be there as long as necessary. In fact, the mantra that “all our non-standard monetary policy measures are temporary in nature” proved to be counterproductive. It increased uncertainty among banks, led to even more liquidity demand for precautionary reasons and resulted in rapid deleveraging that generated a credit crunch. During this phase, Draghi’s (2012) words helped reduce uncertainty about the future of the actual configuration of the Eurozone. Finally, at the start of this phase and after the re-intensification of both crises, the ECB decided on an extension of the maturities of LTROs. The ECB had no option other than to provide unlimited funding to the banking system; in August 2012, the ECB declared that the non-standard measures would be in place as long as necessary.

Regarding interest rate policies, negative bond market developments were observed in Italy and Spain in late July 2011, which led the ECB to cut the MRO interest rate to 0.75%. In addition to interest rate policies, the ECB reactivated the SMP in July 2011, achieving a maximum purchase amount of 220 billion euros in sovereign bonds of stressed countries in February 2012. It also implemented CBPP2, which



reached a high of 16 billion euros. However, most likely the most significant measure was the announcement in September 2012 of the OMT programme. Since that time, the OMT programme has been available but no operations have been conducted thus far.

The main change in the size of the ECB balance sheet came from two very long-term refinancing operations (VLTROs), the first one in December 2011 amounting to 489 billion euros and the second in February 2012 with an amount of 529 billion euros, both with a 36-month maturity and the option for early repayment after one year. In addition to these measures, the ECB reduced the reserve requirements from 2% to 1% in mid-2012. The sum of all these measures led to a peak in the balance sheet of close to 3 trillion euros and nearly 800 billion euros in excess liquidity.

In the last part of Phase III (January 2013 to May 2013), tensions in the money markets and bond markets receded somewhat and banks started to repay loans, which translated into a decreasing trend in the size of the ECB balance sheet and of excess liquidity.

### 3.4 Phase IV: Back to Normal Times? Deflationary Risk Says Not Really

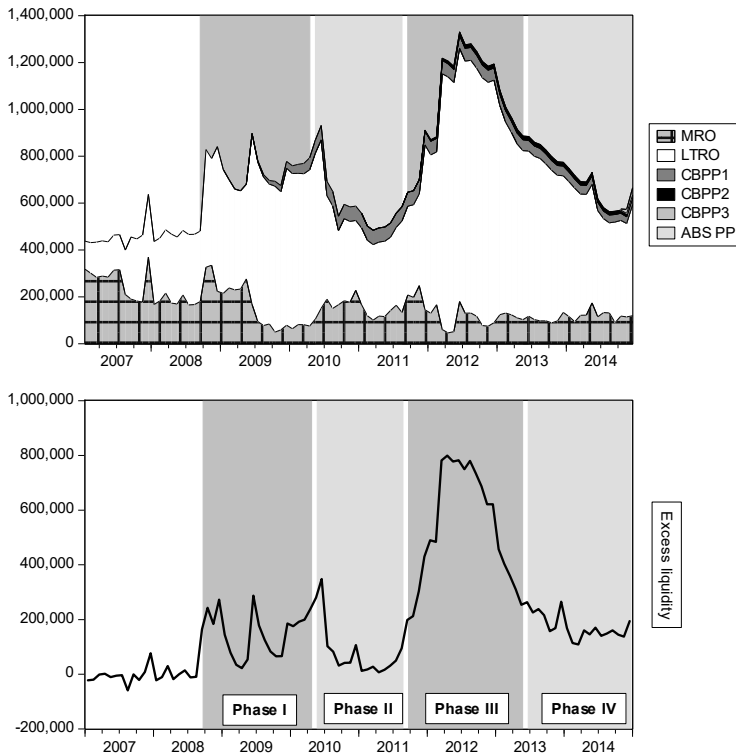
The main characteristic of this phase (from June 2013 to December 2014) was the sharp decrease in the size of the balance sheet and of excess reserves, which is explained by the early repayment of the 1 trillion VLTROs. On the one hand, this may be interpreted as good news because it reveals that banks are not heavily dependent on ECB liquidity to obtain funds; on the other hand, it means that banks have not been using these excess reserves to grant credit and also that banks preferred to de-leverage. Moreover, this fast decrease in excess reserves has been pushing up the EONIA rate towards the MRO rate.

In Phase IV, money market interest rates displayed significant volatility, reflected in the variability of the EONIA rate. The response of the ECB to this situation and to the overall assessment of the inflationary outlook was to cut the MRO rate by 25 bp to 0.25% in November 2013. The marginal lending facility rate was cut to 0.75% and the deposit rate to 0.0%, reducing the corridor width from 150 bp to 75 bp and making it asymmetric.

In mid-2013, the ECB introduced a type of *forward guidance*, an innovation in its communication strategy, to clarify the future path of key interest rates, reducing uncertainty and interest rate volatility (Andrew Filardo and Boris Hofmann 2014). Forward guidance is a communication policy instrument consisting of the announcement of conditional future behaviour of key policy instruments (ECB 2014b), which depends on the credibility of the commitment and is conditional, given that the future path of the policy instrument depends on the evolution of the two pillars of the ECB, economic and monetary analysis. In Draghi's words: "[t]he Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time [...] we will monitor all incoming information on economic and monetary developments" (ECB 2013). However, the type of forward guidance implemented by the ECB has been loosely defined and does not include benchmark or numerical thresholds based on relevant variables, or indeed temporal, through a

predefined period of time (Paul Hubert and Labondance 2013); this potentially reduces the effectiveness of the measure.

During 2014, the ECB reduced reference interest rates twice, in June and September. In the first case, in June 2014 ECB announced a series of measures to address the deflationary risks (Grégory Claeys et al. 2014) present in the Eurozone since late 2013. One of these measures was the preparatory work related to outright purchases of ABS and a prolongation of fixed rate, full allotment tender procedures. The MRO interest rate was cut by 10 bp to 0.15%, the marginal lending facility rate to 0.40% and the deposit rate to -0.10%, with the corridor reduced from 75 bp to 50 bp and becoming symmetric; thus, the zero bound had technically been reached. On this interest rate, policies highlighted the fact that for the first time deposit rates were negative. Moreover, the ECB announced the suspension of SMP sterilisation. Another innovation was the implementation of targeted long-term refinancing operations (TLTROs) with a four-year maturity aimed specifically at refinancing all types of loans to non-financial institutions (NFIs), except for house purchases and sovereign bonds. The rates for LTROs would have a spread of 10 bp over the MRO rate and an initial amount of 400 billion euros.



Source: ECB (2015a).

**Figure 2** Selected Components of the ECB Balance Sheet (Millions of Euros)

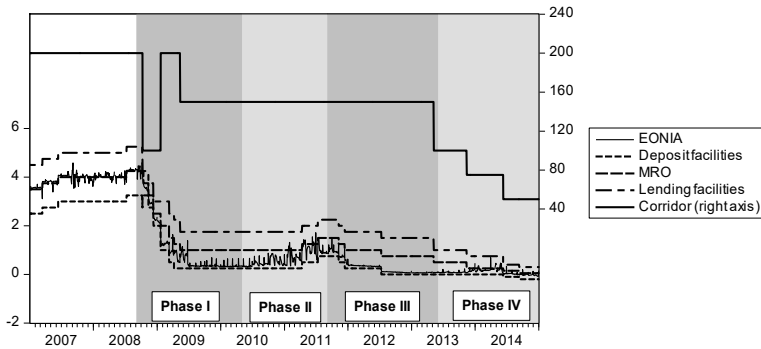
In September 2014, the ECB cut the MRO interest rate to 0.05, the deposit facilities rate to -0.20 and the marginal lending facilities to 0.30. In the face of serious deflationary risk and a weak recovery of the Eurozone economy, the ECB announced the purchase of non-financial private sector assets under an ABS programme to facilitate new credit flows to the economy and the start of CBPP3, both measures starting by October 2014. However, in addition to the weak Eurozone recovery, the sharp fall in oil prices in the second half of 2014 put more downward pressure on prices. As deflationary risk still remained, the ECB showed the possibility of implementing a more aggressive unconventional policy, including the massive purchase of public assets.

Another way of looking at the evolution and effects of these measures is to analyse the assets and liabilities on the ECB balance sheet in a simplified version (see Figure 2). By adding net autonomous liquidity factors plus reserve requirements, we obtain the liquidity needs of the banking system. If the ECB accommodates exactly these liquidity needs through loans (MROs and LTROs), there is no excess liquidity in the banking system. This was the normal working mode of the ECB before the crisis: excess liquidity close to zero (ECB 2002). However, following the outbreak of the crisis, we can see in the graph the evolution of the excess liquidity or excess reserves and the changing composition of the assets on the balance sheet. Regarding excess liquidity, it is worth remembering that it started to reach a considerable amount, particularly since Phase III saw a re-intensification of the crisis. Excess liquidity reached approximately 800 billion euros in the summer of 2012, but it started to decrease rapidly at the beginning of 2013 once banks began to repay the 1 trillion VLTROs. It is also quite clear that this important reserve amount was injected by the ECB by switching from MROs to LTROs and through the very timid purchasing of CBPP1 and CBPP2.

#### 4. Effects of ECB Measures on Interest Rates, Money Aggregates and Money Multiplier

The main purpose of this section is to analyse the effects of the measures taken by the ECB during the reference period on key interest rates, monetary aggregates and the money multiplier. Within the transmission mechanism of monetary policy, interest rates play a crucial role. However, when nominal interest rates reach the zero bound, CBs may try an additional stimulus by providing bank reserves in excess of what they need with the intention of provoking an increase in the money supply through the money multiplier. That is why it seems to be crucial to assess the effectiveness of the ECB measures in terms of the evolution of interest rates and the relationship between bank reserves and the money supply.

As mentioned in the above section, due to the ample liquidity in the banking system associated with special LTROs, EONIA was close to the deposit facility rate from late 2011 (see Figure 3). However, early repayment of loans by banks and the consequent reduction in excess liquidity made the EONIA rate converge towards the MRO rate from late 2013. Nevertheless, a clear effect of ECB decisions is that EONIA and EURIBOR were historically low, having technically reached the zero bound.



Source: ECB (2015b)<sup>3</sup>.

**Figure 3** Key ECB Interest Rates

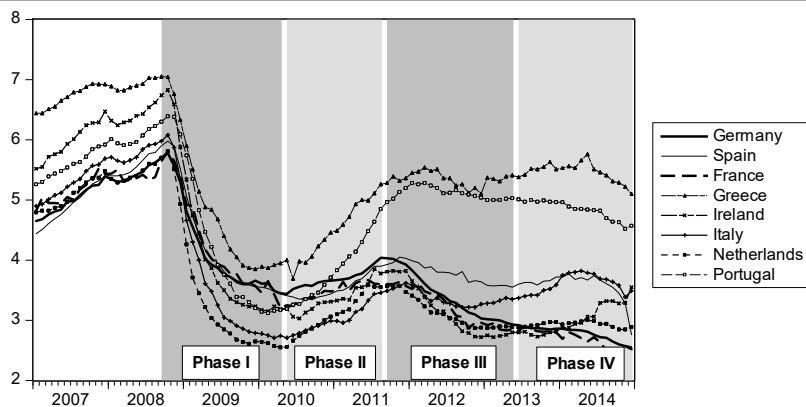
The pathway of the MRO rate towards the zero bound forced the narrowing of the corridor width. Decisions regarding the interest rate corridor width deserve some comments because of the potential effects on the level and volatility of the EONIA rate. A narrower corridor, which seems to have been the option decided on by the ECB, allows CBs to steer money market interest rates more accurately and avoid larger fluctuations. However, the counterpart is that a narrower corridor requires more frequent intervention by CBs in money markets and more frequent changes in the ECB balance sheet. If the upper limit of the corridor had been maintained 100 bp above the MRO rate, as was the norm previously, with such low interest rates (1.00%) the EONIA could have risen to 2.00%, doubling the interest rate and provoking a clearly tighter monetary policy stance. Avoiding this potential risk was the main argument for the ECB to reduce the upper margin of the corridor. Regarding the bottom limit, if MRO rates approximate the zero bound, the deposit facility rate must necessarily become negative, otherwise the corridor becomes asymmetric. A negative deposit rate is new territory and makes it possible, although unlikely, that the EONIA will become negative for banks with excess reserves.

As seen in Figure 4, notwithstanding the reduction in the ECB's key rates, there was still financial fragmentation and credit flows were decreasing, this even when market interest rates began a gradual process of convergence in late 2014; the differences remain significant. In addition, the crises led to increased heterogeneity of the banking structures within the euro area (Yannick Lucotte 2015). Fragmentation within the Eurozone was higher in peripheral countries during the crises, which relates to the counterparty risk and country-specific factors, including banking sector openness, the debt-to-GDP ratio and the size of the financial sector (Sergio Mayor-domo et al. 2015).

Moreover, regardless of the strong expansion of the ECB balance sheet and the substantial increase in liquidity, access to credit was still severely constrained. However, the main arguments put forward to explain the still stagnant credit flows in

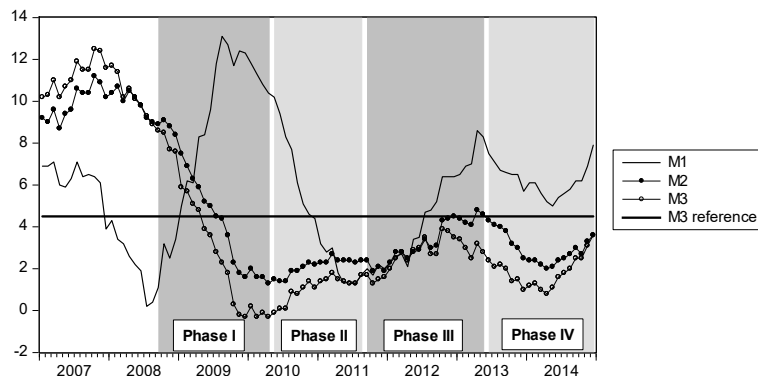
<sup>3</sup> **European Central Bank.** 2015b. Key ECB Interest Rates. <http://www.ecb.europa.eu/stats/monetary/rates/html/index.en.html> (accessed April 20, 2015).

the Eurozone were from the supply point of view, the ongoing deleveraging process in the banking system facing more demanding capital requirements and the coming asset quality review (AQR) in a situation in which getting new capital is a more expensive option. In addition, credit demand has remained weak because it lags behind the business cycle.



Source: ECB (2015a).

**Figure 4** Fragmentation in the Eurozone: MFI Interest Rate of Loans (over 1 to 5 Years) to Non-Financial Corporations



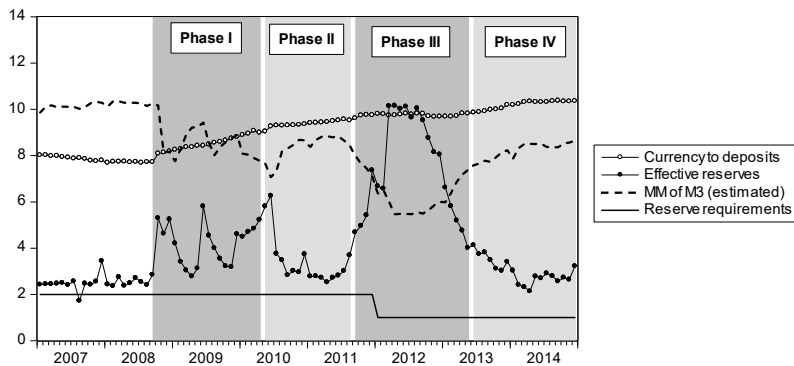
Source: ECB (2015a).

**Figure 5** Monetary Aggregates (Annual Growth)

Turning to the evolution of money aggregates (M1, M2 and M3) and the money multiplier (MM), it is evident from Figures 5 and 6 what happened during these years. During Phase I, which corresponds to the period of the acute banking crisis, there was a clear run for liquid assets, not only by banks, but also by non-financial corporations. This increase in liquidity preference shows as a portfolio switch from M3 (M2) to M1. The M1 increase reached a figure close to 14%, whereas M3 growth became negative in the last part of this period (-2%). Phase II

shows a convergence towards very low growth for all monetary aggregates, coinciding with the start of the credit crunch. From Phase III, a low growth regime becomes the norm - growth well below the long-term reference for price stability (4.5%). This should have clearly alerted the ECB to deflationary risks a long time before because this behaviour still maintains its monetary pillar and an M3 growth rate of 4.5% as a long-term reference to cross check for price stability. However, the ECB did not take any explicit measure to counteract deflationary risks until June 2014.

A traditional way of analysing the effectiveness of monetary policy is through the money multiplier, which assumes a mechanical relationship between the monetary base and money supply, a relationship linked by the behaviour of banks as passive intermediaries between NFI credit demand and CB money. In this respect, particularly when interest rates are close to zero, the analysis of the effectiveness of monetary policy through this method of modelling may shed some additional light on this issue.



Source: Own calculations based on ECB (2015c)<sup>4</sup>.

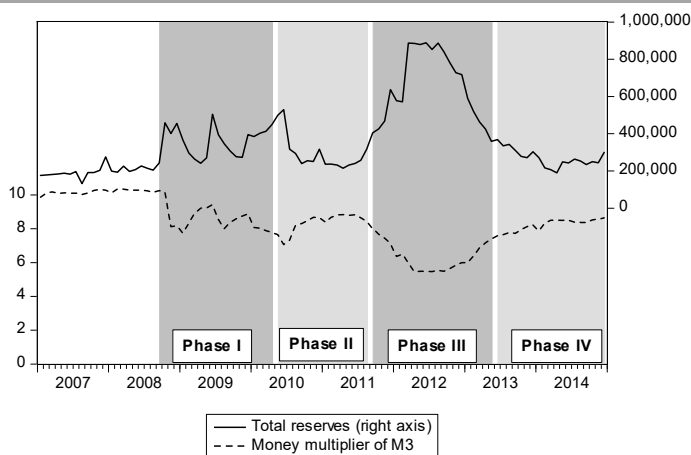
**Figure 6** Bank Reserves, Liquidity and Reserve Requirements

As can be seen in Figure 6, from the beginning of the crisis, the evolution of the money multiplier of M3 illustrates the ineffectiveness of the monetary policy: most of the liquidity injected into the banking system was hoarded (Hansjörg Herr 2014) in the deposit facility and consequently the bank reserve ratio rose from the required ratio of 1% to 10% in mid-2012. In addition, currency-to-deposit ratios increased from 8% to 10%. The increase in the deposit ratio at the beginning of the crisis in Phase I may be explained by fears of bank runs. However, curiously it continues increasing thereafter. Apparently, the crisis had a lasting effect on the cash preference of NFIs that may have had a permanent effect on the money multiplier and on the analysis of monetary developments in the Eurozone.

In Figure 7 it is even more evident what happened: the downward trend of the money multiplier of M3 compensated almost totally for the upward trend in total bank reserves and as a consequence the M3 trend in Figure 7 is almost flat. Thereby,

<sup>4</sup> **European Central Bank.** 2015c. Minimum Reserves and Liquidity. <http://www.ecb.europa.eu/stats/monetary/res/html/index.en.html> (accessed April 20, 2015).

the significant reduction of the money multiplier from 10 to 7 during most of the period analysed explains that the nearly 1 trillion increase in bank reserves following VLTROs did not have the expected expansionary effect on the broad money supply (M3). A similar finding, but for a shorter period, is also obtained in an analysis of the effects of the money multiplier on money supply by the ECB (2011b). In short, the mechanical relationship that the MM framework assumes between the expansion of bank reserves and the money supply did not hold during this period. The increase in bank reserves did not trigger the portfolio allocation envisaged by the multiplier approach.



Source: Own calculations based on ECB (2015d)<sup>5</sup>.

**Figure 7** Money Multiplier and Total Reserves (Millions of Euros)

## 5. Final Remarks

Since the outbreak of the financial crisis, the ECB has taken many *unusual* measures, but most likely “too little, too late”. With the benefit of hindsight, its strategy can be considered backward looking in times when principal actors should be more proactive and take greater risks to counteract such negative scenarios. The ECB has acted as a lender of last resort to the banking system, providing banks with ample liquidity and avoiding the collapse of the system; yet it did so hesitantly until the end of 2011, four years after the outbreak of the financial crisis, when the 1 trillion VLTROs were placed and the ECB stated that non-standard measures would be available *as long as necessary*. Simultaneously, the FED and the BoE had already embarked on QE long before.

As a lender of last resort to stressed sovereign entities of the Eurozone, the actions of the ECB were even more cautious and belated and therefore had some perverse effects. The ECB did not prevent the public debt market from settling into a

<sup>5</sup> **European Central Bank**. 2015d. Statistics. <http://www.ecb.europa.eu/stats/html/index.en.html> (accessed April 20, 2015).

type of negative equilibrium during Phase III; the former generated a full-fledged sovereign crisis that mutated rapidly into a bank solvency crisis.

Two years after the bailout of Greece, when the euro was close to breaking up in the summer of 2012 and long after the banking system in Southern countries was already seriously contaminated, Draghi proclaimed the magical words. However, the OMT programme was still not released and SMP purchases remained sterilised (until mid-2014) for fear of inflation. The fragility of bank solvency determined the frailty of the transmission mechanism, financial market fragmentation and minimal credit flows. This partially explains the past recession and the expected deflationary outlook for the euro area.

Why too little and so late? Because the ECB has too tight a straitjacket and a narrow mandate: price stability. Until this is amended and the ECB becomes a *real* CB, all the blame is not attributable to the ECB alone, but to politics as well (Casimir Dadak 2011). This means a change in the legal framework of the ECB is necessary to include not only its function as a lender of last resort, but a triple mandate: price stability, maximum employment and banking supervision and regulation (Blot et al. 2014).



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