DE GRUYTER OPEN

UDK: 336.711(4)
DOI: 10.1515/jcbtp-2016-0002

Journal of Central Banking Theory and Practice, 2016, 1, pp. 25-52
Received: 22 July 2015; accepted: 15 August 2015

***Cécile Bastidon*[*], *Philippe Gilles*[**], *Nicolas Huchet*[***]**

* *LEAD, Université de Toulon, France*

E-mail: bastidon@univ-tln.fr

** *LEAD, Université de Toulon, France*

E-mail: ph.gilles@univ-tln.fr

*** *LEAD, Université de Toulon, France*

E-mail: huchet@univ-tln.fr

The ECB, Between Conservatism and Pragmatism

Abstract: The 2008 and 2011 crises have durably affected the conditions of monetary policy transmission, particularly in the euro area. However, it is generally considered that the European Central Bank's (ECB) monetary policy truly became unconventional only at a late stage. Our contribution is threefold. We first show that the notion of "conventional" monetary policy, which is the reference of this assessment, is a recent theoretical construction. Secondly, the mandate of the ECB, which is its institutional expression, may raise specific difficulties in managing major financial crises, particularly with regards to the forward guidance of expectations and the commitment to an accommodative policy. Finally, the resulting policies have, at this stage, paradoxically achieved acceptable levels of macroeconomic and overall financial stability, but failed to restore a private funding supply to the banking sector enabling it to play its normal role in financing economic activity.

JEL Classification: E58 (Central Banks and Their Policies), G01 (Financial Crises),G12 (Asset Pricing, Trading Volume, Bond Interest Rates), G21 (Banks; Other Depository Institutions; Micro Finance Institutions; Mortgages; Foreclosures)

Keywords: European Central Bank, unconventional monetary policies, generations of crises, financial stability, money markets.

Introduction

The 2008 (banking and financial) and 2011 (sovereign debt) crises have durably affected the conditions of monetary policy transmission, particularly in the euro

area. However, it is often considered that the European Central Bank's (ECB) monetary policy truly became unconventional only at a late stage. Our contribution is threefold. We show first that the notion of "conventional" monetary policy, which is the reference of this assessment, is a recent theoretical construction. Secondly, the mandate of the ECB, which is its institutional expression, may raise specific difficulties in managing major financial crises, particularly with regards to the forward guidance of expectations and commitment to an accommodative policy. Finally, the resulting policies have, at this stage, paradoxically achieved acceptable levels of macroeconomic and overall financial stability, but failed to restore a private funding supply to the banking sector enabling it to play its normal role in financing economic activity.

The remainder of this paper is organized as follows. Section 1 explores theoretical underpinnings of central banking, especially in the euro area, from a traditional conduct of crises management via the lender of last resort function to the legitimating of unconventional monetary policies (UMPs). Section 2 shows how the ECB has adapted the use of its monetary policy tools to this evolution and Section 3 that there might exist a circular relationship between this use and financial strains in the euro area. We conclude with some monetary policy recommendations.

1. The evolution of central banking conduct and the ECB monetary policy in the 2000s: a theoretical perspective

1.1. Financial stability as a public good

Public goods and common goods

The principal aspect of the qualitative assessment of central banking is the ability of Central banks to manage and prevent economic, monetary and financial crises. This assessment essentially depends on your choice of an economic *paradigm*. In the hypothesis of market efficiency, then this assessment is positively connected with minimal public authorities intervention. In this case, public involvement is restricted to information transparency and market discipline measures. On the opposite, in the hypothesis of natural instability of financial markets, central banking and public intervention are both legitimate and necessary. Indeed, the stability of monetary, banking and finance systems is a "public good" since each economic agent benefits from this stability. But at the same time, they do not properly take into account the aggregated costs of financial instability, hence the need for strong public intervention (Gilles & Bastidon, 2014).

Furthermore, if financial stability can be considered a "public good", it is *not* a "common good". There are some economic agents who do not have an interest in financial stability because their benefits are strictly derived of financial markets volatility. Finally, in the context of economic globalization, "market failures" are sometimes associated with "State failures" (Stiglitz, 2000). International financial stability is a "global public good" (Kindleberger, 1986) or a "regional public good", for instance at the European level. Thus, it would be necessary to design public and, in particular, central bank policies at the international or regional level. Otherwise, the production of these goods by each government tends to be suboptimal since all the other states benefit from this production. The evolution of banking regulation is quite exemplary: central bankers have realized since the 1980s that domestic regulation is deficient in a context of international portfolio diversification and interdependent national systems, hence the Basel banking supervision Accords. This analysis in terms of "public goods" also helps to explain one of the causes of the euro area crisis: in 2010, Greece, a small domestic economy, could have been saved at little cost by European solidarity. Today, a majority of countries in the Euro zone have to deal with the risk of a deflation, in the context of massive sovereign debts and public deficits, which explains the declarations of Mario Draghi (January 22, 2015) in favour of a quantitative easing in the ECB monetary policy (see Section 2.1.).

Public goods in the context of financial globalization: the historical nature of financial crises

With the advent of globalization, meaning both instability of domestic financial systems and an extensive use of market finance, a short term capital account constraint replaces the medium term economic development constraint. Countries become more vulnerable to external shocks, particularly liquidity shocks. Moreover, this submission of state sovereignty to the individual interests of a part of market operators increased market risks.

In this context, national frameworks of political, economic, financial and monetary regulations are *ineffective*. International capital markets become the main source of balance of payments financing, for both financing needs and exchange rates adjustments. In this context, financial crises, possibly combined with currency crises (twin crises) made the history of the last three decades. Thus, the evolution of central banking has to be put in proper perspective of the historical nature of these crises. Dornbusch (2001) has distinguished between "old-style crises", caused by real exchange rates distortions and external imbalances; and "new-style balance sheet crises" resulting from bank fragility. The Eichengreen, Rose and Wyplosz (1995) typology of crises consists of first, second and third

generation crises. Each type of crisis is theoretically explained by a specific model and all legitimate, in various degrees, last-resort lending.

Particularly, in the third-generation crises[1], which refer to financial intermediation failures, the lender of last resort intervention is required to reduce self-fulfilling liquidity outflows and contagion. In this case, Bastidon, Gilles & Huchet (2008) have shown that last-resort lending should be used to manage and prevent crises if and only if the International Lender of Last Resort (which could be the IMF for instance) and the domestic Central bank are informed on the subject of domestic markets and banking systems. Therefore, they will act at a macroeconomic level, as an usual lender of last resort, and at a microeconomic level, since there will be selective lending to commercial banks according to a *broad-sense Bagehot rule with three types of banks*.

* The first group of banks (liquid and solvent) can face the run without advance liquidation of assets, but have to be bailed out in the logic of a catalytic effect in order to avoid domestic deposits withdrawals caused by widespread contagious risk aversion.

* The second group of banks (illiquid but solvent) can face the run by liquidating all or part of their long term assets, but the resulting liquidation costs require a bail-out in a recapitalization logic.

* The third group of banks (insolvent) should not be bailed out.

In this framework, the efficiency of last-resort lending requires two levels of selective bail-out: first, the eligibility of crises countries; secondly, the possible eligibility of banks from those recipient countries. So in the context of contagious liquidity crises, globalized markets, and systemic risk, there is a *need for international cooperation*. This mechanism is not taken into account in generational crises models but has to be considered in order to define the current practice of last-resort lending. The issue of an international lender of last resort with a true international monetary authority and the ability to "bail in" the private sector has to be addressed.

---

[1] Defined as "first-generation crises, with underlying deteriorated fundamentals (...), resulting from private microeconomic decisions" (Aglietta & de Boissieu, 1999). Those microeconomic decisions are conditioned by both speculative logic and asset (including equities and currencies) prices expectations and mimetic polarizations. This relationship between microeconomic and macroeconomic levels can possibly cause a systemic risk dynamics with contagion mechanisms.

1.2. From 2007 to date

Peculiar characteristics of the 2007-2008 crisis

The scenario of the recent major crises, which is once again a banking system crisis, is remarkable for three reasons. In fact, it could even be called a fourth-generation crisis :

* Firstly, this crisis originated in the failure of securitization which led to a contagious contraction of liquidity in money and overall capital markets;

* Secondly, systemic contagion is not primarily linked with aggregated insolvency, but the illiquidity of financial intermediaries. Normally, deposit banks should enable customer payments in conformity with bank loans, and investment banks should provide market intermediation liquidity, and contribute to a proper amount of securities trading and thus reduce trading fees and foster market prices convergence to their fundamental values. If some of these banks are illiquid, smooth operating of these systems is disrupted.

* Finally, public policies that were conducted to manage this illiquidity crisis have significantly deepened government deficits and debts, and in turn created the conditions of the euro area sovereign debts crisis.

This *central role of liquidity* is visible in the consequent increase in risk premiums just before banks' failures, or government defaults. So that these crises results from a liquidity shortage in credit markets much more than deteriorated fundamentals. Consequently both regulation of bank capital, and fiscal policy rules regarding deficit and debt ceilings are inadequate.

The fourth generation of crises?

The "fourth-generation" crisis then would be the "third-generation" crisis resulting in a sovereign debt crisis, in the particular context of asymmetric information generated by technicality of financial innovations, controlled or even developed by banks themselves. This is a *historical benchmark* with respect to central banking: in the case of the first three generations of crises, the role of central banking is limited to conventional lending of last resort (cf. *supra*). Conversely, in the recent crises, UMPs are definitely necessary.

These UMPs are threefold: large official interest rate cuts, with a commitment to keep them durably at extremely low levels; new credit facilities; and large assets

purchases. These measures have radically and probably definitively modified the issue of central banking.

1.3. Short chronology of unconventional monetary policies

A coordinated action

After the collapse of Lehman Brothers in 2008, market strains significantly intensified. Financial intermediaries built up larger stocks of liquid assets, reduced their balance sheets, and credit market conditions tightened. Total lending to private non-financial agents contracted, and confidence indicators dramatically deteriorated. In this context, central banks in advanced economies decided to act together. On 8 October 2008, a coordinated action of the FED, Bank of Canada, Bank of England, ECB, Swiss National Bank, and Bank of Sweden reduced their official interest rates by 50 basis points. Although the ECB had raised its main refinancing rate by 25 basis points to 4.25% only three months earlier, the Council decided to turn back and reduce it to 3.75%. The ECB kept lowering its official rates until 7 May 2009. The main refinancing rate was reduced to 1%, its lowest level since the creation of the EMU. The deposit facility rate was set at 0.25% and the marginal lending rate at 1.75%. Since then, rates have not been raised, except for a short 8-month period between April and December 2011 (Figure 1). Meanwhile, the ECB conducted long-term refinancing operations. The first 12-month operation (in June 2009) consisted of a 442 billion euro liquidity injection, which is an unprecedented amount in a single operation. The following 12-month operation was conducted 3 months later (in September 2009) and the demand for loans remained high at 75 billion euro. During the December 2009 12-months operation, the demand for loans was 96 billion euro. Of course, these three operations had a significant impact on the size of the ECB balance sheet.

Unconventional monetary policies: the ECB

At the end of 2009, easing strains on financial markets led the ECB to begin gradual exit from unconventional measures, in order to avoid a market dependency on central bank liquidity provision. Foreign currency liquidity injections and variable rates tender procedures in the regular three-months longer-term refinancing operations were interrupted (until March 2010). But during this period, the ECB actually was pragmatic and accepted, in April 2010, to delay the decision to return to the initial collateral rule of long-term refinancing operations. The reduced rating thresholds were maintained.

This practical approach allowed the rescuing of Greece when Greek (and also Spanish and Portuguese) debt was downgraded for the first time by Standard & Poor's. This is the context of the 110 billion euro Greece rescue package decided by the euro area countries, with the support of the IMF. Furthermore, the ECB decided to suspend the rating threshold collateral rule of long-term refinancing operations in case of the Greek debt. In spite of these measures, contagion risk increased, threatening the stability of the whole euro area. So in May 2010, the euro area countries decided, with the assistance of the IMF, to create a 750 billion euro fund to bailout Greece and help other struggling governments like Portugal, Spain and Ireland. After this episode, the ECB *involvement* remained at high level. On 10 May 2010, the ECB Executive Board decided:

* Firstly that the ECB would conduct private and also public bonds buyouts;

* Secondly that the exit strategy from unconventional measures would be temporarily interrupted, and the ECB would conduct 6-month fixed rate refinancing operations;

* Thirdly that the dollar swap lines with the U.S. Federal Reserve System would be reactivated in order to provide dollar liquidity to the euro area.

1.4. A need for theoretical models

Unconventional measures and the mandate of the ECB

All these measures were taken in accordance with the ECB mandate. The primary objective of the ECB is, as we have seen, to maintain prices stability. But *Article 105* of the Treaty establishing the European Community mentions that the ECB should also promote the smooth operation of payment systems. This is why the ECB Executive Board stressed that the decision to buy back private and public debts would not affect the orientation of monetary policy.

The ECB and FED both took unprecedented measures in order to limit the extent of the global financial crisis and its impact on real economy. They both lowered official interest rates to the lowest levels ever, and used unconventional monetary policies (UMPs) to provide markets and financial institutions with liquidity. Of course, the exact measures of the ECB and FED differ because of *differences in their statutory mandates and governance,* and because of specific economic and financial backgrounds. The statutory mandate of the FED includes maximum employment, stable prices, and moderate long-term interest rates. In this context, the magnitude of the subprime mortgage and housing crises in the United

States justifies the decision to conduct massive bonds buy outs since late 2008. Conversely, since the financing of the European economic activity is less dependent on financial markets than in the USA, the action of the ECB has been more oriented towards banks, even if massive assets purchases will also be conducted since the beginning of 2015 (see Section 2.).

Academic literature: baseline studies

Firstly, global financial crises trigger off specific large amplification effects that increase financial acceleration (Adrian & Shin, 2009). Those amplification effects allow shocks to a single market to propagate through the whole financial system, leading to both fast and dramatic drops in financial assets prices one the hand, and large increases in external financing costs of non-financial agents on the other hand (Blanchard, 2009). In this context, the crisis occurs in two steps: i) initial shock is transmitted to the interbank market, ii) generalized financial crisis follows. This crisis timeline, with a key role of the interbank market, is described for instance by Bordo (2008) or Freixas & Jorge (2008).

In this context of amplification effects, conventional monetary policy instruments are not sufficient to contain the crisis (Gertler & Karadi, 2011). Official interest rates are lowered as long as the minimum level ("zero lower bound," Bernanke & Reinhart, 2004) is not reached. When this level is reached, central banks still have two instruments: 1/ massive use of last-resort lending, in addition to usual refinancing operations; and 2/ assets purchases, in order to affect their prices and returns (Caruana, 2010, Korinek, 2011). These three elements (rapid and large cuts in official interest rates, massive use of last-resort lending and assets purchases by the central bank) are constitutive of UMPs. In the case of banking crises ("bank runs"), combined with market liquidity crises ("twin runs"), UMPs then are conducted in accordance with a similar argument to last-resort lending: the aim is to restore market functioning while substituting for it, in order to limit financial instability.

There are many academic assessments of UMPs, though often focusing on the FED's action. Some of them demonstrated that they were effective and eased financial markets strains (Fahr and al., 2011, Sarkar & Shrader, 2010). Generally, DSGE models with financial acceleration effects show a positive impact of Central banks policies (Cúrdia & Woodford, 2009). Gertler & Karadi (2011) for instance go further with a model of an optimal unconventional response to financial intermediation disruption. But in their model the Central bank issues risk-free debt securities and directly finances economic activity: public finances constraints are not included. In this context, the event of another systemic crisis,

with an impossibility to use the official interest rate instrument and strong public finances constraints cannot be excluded, hence the importance of modeling Central banks' response in the context of *public debts markets strains*.

Central banks models in the context of public debt market strains: a crucial issue

Bastidon, Gilles & Huchet (2012) precisely intend to contribute to this search for a new consensus. In this model, the additional supply of government bonds, required to finance banking sector rescue programs and recovery policies, deteriorates market evaluation on public debts: even if there exists "flight to quality" effects concerning government bonds, the Central bank may have to purchase part of the issuances to maintain the desired level of liquidity. In this model a "modern" central bank quantifies the amount of asset purchases in public and private bonds markets, taking into account the additional issuance of government bonds resulting from the financial crisis. These assets purchases are a response to private liquidity shortages in these markets. On this basis, the model shows that the *amounts of bonds buyouts* depend on three key factors:

* Firstly, for a given additional supply of public bonds, resulting from financial crises management fiscal policies, the amount of public debt buyouts depends on the initial situation of public finances. If government deficit is structurally high related to GDP, the central bank will have to run large bonds buyouts in order to achieve its public debt market liquidity target. Otherwise, the Central bank's involvement is lower and thus its independence is strengthened.

*Secondly, the amounts of private and public bonds buyouts depend on the initial level of official interest rates. If this level is relatively high, the central bank has an additional instrument. The higher the initial level of interest rates, the lower the amount of bonds buyouts for the same results.

*The third key element is the relationship between the interbank market and other markets. If there is a strong correlation, the amplification of the initial shock, which in the first phase was limited to the interbank market, will cause widespread liquidity shortages. In this case, the central bank will have to run large bonds buyouts.

Finally, the model shows that from the time when financial amplification effects exist: 1/ fiscal policies should preferably be cautious and coordinated; 2/ crisis management monetary policies should be strictly limited in time; and 3/ central banks should conduct a particularly careful monitoring of liquidity indicators of the markets which are most correlated to the interbank market.

2. The ECB's action from 2007: pragmatism and conservatism

Besides the 2007-2009 crisis, the ECB has recently faced a sovereign debt crisis (in 2011-2012) and a deflation (since the beginning of 2014), in a context of severe unemployment and weak economic growth. Face to the current distressed economic situation, the ECB's mandate may have prevented for a better management of successive crises. After a description of the ECB's action from 2007 (2.1), it is possible to highlight some inconsistencies or inappropriate policies (2.2). This allows drawing conclusions as regards responsibilities and brings out current strengths and weaknesses of the euro area (2.3).

2.1. An unprecedented reaction to the successive crises

In September 2008, after the collapse of Lehman Brothers, liquidity vanishes in interbank markets and assets prices fell and triggered a solvency crisis, with close interactions between financial and money markets. On 8 October 2008, together with other Central banks, the ECB sharply lowered its main policy interest rate, from 4% to the record low of 1% since May 2009 (Figure 1). In 2011, 2012 and then 2014, its main interest rate was again lowered and reached 0.05 % in September 2014. The main feature of UMPs also lies in assets purchases (Figure 2): according to the type of assets, the central bank notably aims at funding private sector and cleaning-up banks' balance sheets. Assets buyouts also affect relative asset prices and investors' incentives.

On May 2010, the central banks of the Eurosystem started purchasing securities in the context of the Securities Markets Program (SMP), which empowered the ECB to buy 240 euro billion of sovereign bonds (Greek, Irish, Italian and Spanish bonds). On September 2012, the ECB announces technical features regarding Outright Monetary Transactions (OMTs), which replaces the SMP. This program consists in transactions in secondary markets (i.e. Spain, Italia) for "*safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy.*" [2] Even if "*no ex ante quantitative limits are set on the size of Outright Monetary Transactions*", the liquidity provided is fully sterilized.

In July 2009, the ECB also launched its first Covered Bond Purchase Program (CBPP1). In November 2011, the second program (CBPP2) was announced and in October 2014, the Eurosystem started purchases of covered bonds under the third program (CBPP3), which is supposed to last for at least two years.

[2] Text in italics is quoted from the ECB's website.

Among technical modalities (minimum issue volume, maximum residual maturity, underlying assets…), we note that the minimum rating is just BBB- (or equivalent) for at least one of the major rating agencies.

Another program is still active: the Asset Backed Securities Purchase Program (ABSPP), set up on November 2014 and also supposed to last for two years. Presented as a part of larger package of measures aiming to support the transmission of monetary policy, "*the ABSPP will help banks to diversify funding sources and stimulate the issuance of new securities. Indeed, ABSs can help banks in several ways to fulfil their main role: providing credit to the real economy*". ABSPP holdings amount 2,266 € billion in January 2015 and 9,377 € billion in July.

Face to the persistence of deflationary pressures, on 22 January 2015, the ECB decided to buy private and public claims for 60 € billion per month (the whole program is likely to reach 1,140 € billion). To this end, the existing CBPP3 and ABSPP are complemented by the Public Sector Purchase Program (PSPP) to define the Expanded Asset Purchase Program (APP). Such asset purchases testify voluntarism and pragmatism of the ECB. However, critical points may concern their size: in particular, the Fed's balance sheet rose from 900 USD billion in September 2008 to 2,830 USD billion three years later.

Non-standard monetary policies also include massive liquidity provision in order to ease liquidity conditions and influence expectations. Over the period, long-term refinancing operations (LTROs) increase comparatively to main refinancing operations. The ECB soon adopted a fixed rate tender procedure with full allotment, which was again set up from March 2011. In December 2011, reserve requirements were lowered and the list of eligible collateral is enlarged in order to favour liquidity furniture to the banking system. As banking credit risks deter interbank lending, regular operations were complemented by two LTROs with a three-year maturity, in December 2011 and February 2012 (Figure 3). First, funds affected the deposit facility, but the excess liquidity rapidly pushed down market interest rates (Figure 1). Since June 2014, the ECB cut the deposit facility interest rate to 0.10%: for the first time, a negative rate applies to excess reserves. From September 2014 to March 2015, three targeted long-term refinancing operations (TLTRO) were (fully) allotted, with a fixed interest rate that corresponds to the MRO's interest rate with a 10 basis points' spread.

Euro area credit institutions can also receive Emergency Liquidity Assistance (ELA), i.e. "the provision by a Eurosystem national central bank (NCB) of central bank money […] to a solvent financial institution, or group of solvent financial institutions, that is facing temporary liquidity problems". The ELA constitutes

traditional lending of last resort with a penalty interest rate, but it also represents an innovative measure when banks do not have eligible collateral. During the 2011 Irish crisis, the Irish Central bank lent 70 € billion to national banks. In September 2012, 123 € billion were provided to Greek banks, and in March 2013, 11.7 € billion were lent to Cyprus banks.

2.2. Controversial aspects of the ECB's action

Even though UMPs cannot easily be assessed from a historical point of view, theoretical underpinnings highlight a possibly destabilizing ECB's action. Bernanke and al. (2004) showed that monetary policies might be less inflationary, so that central banks become more likely to reach the zero lower bound. In this context, UMPs consist in liquidity provision that changes the size of the central bank's balance sheet (qualitative easing), and assets purchases that also change its structure (credit easing), knowing that both may reduce liquidity and credit risks in monetary markets (Rogers et al., 2014). The commitment to keep policy rates at a very low level, through communication, is presented as a major feature of such policies. Eggertsson & Woodford (2003), and later Gertler (2013) and Jones & Kulish (2013), also found that forward guidance is likely to improve monetary policy transmission.

Sheltering behind its mandate, the ECB separated its interest rate policy related to macroeconomic purposes, and open market operations that are part of liquidity and financial stability purposes (as shown by the sterilization of the SMP). On the opposite, the Fed used to consider non-standard measures as the continuation of monetary policy. The difference lies in the consistency in the package of measures, as the separation of objectives has led to conflicting actions: ECB's policy rates increased in July 2008, hence a non-expected tightening of monetary policy; mostly, they increased in April and July 2011 because of excessive inflation expectations. Facing financial troubles notably in Spain and Italia (and after the replacement of J.C. Trichet at the head of the ECB by M. Draghi), the path changed again and interest rates were lowered. Here it is difficult to distinguish between misjudgement of the situation (the ECB was stating an "ongoing normalisation of conditions in financial intermediation") and maladjusted communication as regards the future path of interest rates. In any case, the ECB's rate policy and communication have not permitted to fully anchor expectations. As indicated by theoretical works (Adrian & Shin, 2010, Curdia & Woodford, 2010, Gertler & Karadi, 2011), contagion effects result in an increase in risk premiums in interbank markets, whenever the ECB increased its policy rates (Bastidon and al., 2014).

From July 2013, the ECB has finally developed a strategy of forward guidance. However, no triggering threshold is communicated, in line with the "no pre-commitment rule" (OFCE, 2013): this new communication strategy is given "for an extended period of time", conversely to the Fed or BoE, whose actions depend on explicit thresholds as regard inflation pressures but also financial stability. In 2014, one year after the beginning of the forward guidance strategy, consumer prices were decreasing, and in January 2015 the ECB had to entail a new large scale program, so the ECB strategy did not allow moving expectations in the right way.

Walsh (2009) argued that UMPs might be effective, if central bankers clearly indicate that financial instability becomes the overriding issue, which implies a middle term higher inflation. These considerations raise the question of the status of the ECB, as it is no longer appropriate to create money as long as prices do not increase, while bubbles spring (despite its mandate, the money growth before 2007 was excessive regarding the tenet), and then to keep monitoring consumer prices during the crises, when bubbles burst. Before booms and busts at the macroeconomic level, such a conflict results in strains in money markets (cf. post.). However, banking and financial stability is not the initial purpose of a central bank, and the ECB's conservatism for fifteen years also explains its current high degree of credibility.

2.3. Other responsibilities and perspectives for the euro area

The European regulatory framework recently experienced important changes, including the European Banking Authority through which the ECB performed macroprudential stress tests in 2011 and 2014. Then, banking supervision was improved in 2014 through the introduction of the Single Supervisory Mechanism (SSM), which is one of the two pillars of the European banking union, along with the upcoming Single Resolution Mechanism (SRM). More questionable improvements were made regarding microprudential regulation: as early as in 2011, the EU promised to adopt the new Basel recommendations. So from 2011, the corridor of banking actions has reduced as their priority is to reach new regulatory standards (the upgrading is supposed to last until 2019). We just know that previous prudential rules did not prevent financial instability. On the contrary, banking regulatory pressures might favour the growth of the shadow banking system (Adrian and al., 2012), which may in turn mitigate the effectiveness of a European banking Union.

A strong financial development perverts the usual relationship between money supply and price level and affects monetary policy transmission. Together with a tightened regulatory framework, it is more and more difficult to stimulate (or slow down) credit activity (Benmelech & Bergman, 2012): that is also why one is currently heading towards more securitization of lending. In this context, the mandate of the ECB is no longer suitable, as it does not allow the ECB to focus on financial stability in case of crises. So the ECB had demonstrated a welcome pragmatism for many years, but its inflation target has not allowed getting better results (as the prohibition of public sector financing). Such a contradiction is partly common to major central banks and refers to the call into question of the Jackson Hole consensus, but it is especially true for the ECB as it cannot shelter behind growth and employment targets. As a consequence, it cannot fully coordinate market expectations, conversely to the Fed (Farmer, 2012), which recently led to the current deflation. So the purpose is not to tear down the flexible inflation targeting, but to anticipate exceptional circumstances and the use of non-standard tools (Blinder, 2012): for example, the ECB should be in measure to give up the inflation rule for a limited period characterized by very abnormal sovereign bond spreads and/or money market spreads. Gertler (2013) studies other ways to integrate UMPs within a standard macroeconomic framework. Under conditions, the credibility of central bank would not be jeopardized.

3. An assessment of the ECB monetary policy through the prism of money markets strains

3.1. Funding costs, money market turnover, and the transmission of monetary policy

Monetary policy, financial strains and monetary markets

To conclude with this assessment of the ECB monetary policy, the study of the functioning of money markets in times of crisis is of particular interest for several reasons. On the theoretical side, the transmission of monetary policy to credit, and more broadly funding supply depends on prices and volume conditions in interbank markets via the interest rates and credit channels (Bernanke & Gertler, 1995). The inability of monetary policy to prevent interbank market rationing ("interbank rationing channel", Freixas & Jorge, 2008) and the effect of more or less accommodative monetary policy conditions on risk-taking ("risk-taking channel", Gambacorta, 2009) may cause specific malfunctions.

We provide a summary of development of the functioning of money markets in the euro area since the beginning of the 2000s, predominantly based on volume data gathered through the ECB Euro Money Market Surveys (with an annual basis) and synthesized in Euro Money Market Studies (with a biannual basis)[3]. We focus on three segments: unsecured interbank transactions, secured ("interbank repo") transaction, and OTC derivatives ("OIS" interest rate swaps and foreign exchange swaps in particular).

The motivation for this choice is twofold. In addition to the information provided directly by the comparative study of funding conditions in these segments, the corresponding interest rates are of particular importance for market practitioners and academics since they are used to calculate reference interbank strains indicators (Ait Sahalia and al, 2012): BOR - OIS spreads (difference between the costs of unsecured and interest rate swap transactions), BOR - repo spreads (difference between the costs of unsecured and interbank repo transactions), level and daily variations in the EONIA rate (unsecured overnight transactions).

ECB policy rates and interbank funding costs

The analysis of the evolution of the EONIA rate enhances a better understanding of the differentiated dynamics in the various segments of money markets before and after the Global crisis of 2008 and European sovereign debts crisis of 2011 (Figure 1).

First, as regards the level of EONIA rates, since the end of 2008 and for the first time, there is a drop-out of the interbank rate compared to the MRO target rate. This anomaly lasts during five years, where the EONIA level is on average close to the deposit facility rate. This finding is symptomatic of a situation in which liquidity supply in interbank markets is very high (because of the ECB liquidity injections policy, see Section 2.); and simultaneously banks would be likely to carry out credit rationing and make extensive use of the ECB deposit facility. In spite of the lowering of the deposit facility rate, in July 2012, this anomaly persists until the end of 2013. The interbank rate is then positioned in the upper part of

[3] According to the ECB (2014), "[The Euro Money Market Survey] has been conducted on an annual basis since 1999, and always compares data for the second quarter of the current year with data for the second quarter of the previous year. It is prepared by experts from the European System of Central Banks, i.e. the ECB and the national central banks of the European Union. The survey uses a constant panel of 101 banks wherever longer term comparisons are made, but also includes data provided by the full panel of banks, which has grown over time, in order to obtain a more complete picture of the market. The full panel currently comprises 154 banks". See Table 1.

the corridor defined by the deposit facility and the MRO rate, without, however, focusing on the latter. This can be interpreted as the beginning of a normalization of the price mechanisms of the euro area interbank markets.

In connection with the observation of this long-lasting anomaly in the level of the EONIA rate in the post-crisis, the daily variations in this interbank rate also have particularities ("Delta Eonia" series). While the 2001 crisis is preceded and managed with no significant impact on these variations, the 2008 and especially 2011 crises cause major anomalies. The 2008 crisis is preceded between 2005 and 2007 by a period of unusually low variations. Then there is a gradual amplification and daily variations remain at a high level until the end of 2011, despite the first tipping point of the ECB to the unconventional practice of monetary policy. At that stage, with the second tipping point, the daily changes in the EONIA decrease both suddenly and dramatically.

In brief, this first approach to the functioning of euro area money markets by price mechanisms suggests an impact which is both considerable and highly differentiated of the 2008 and 2011 crises on one hand, and non-standard measures taken by the ECB during these crises on the other hand. The 2008 crisis and monetary policy measures result in a sharp decline in the EONIA, almost to the floor of the corridor, and a sharp rise in its daily variations. To the contrary, the 2011 crisis and its management reduced these variations to almost zero. These anomalies in price mechanisms have a significant impact, as well as they are fed by the malfunctions of money markets, both from the perspective of aggregate volumes and the distribution of operations (market segments and maturities).

3.2. 2013-2014: a lasting normalization?

Survey data, the ECB communication, and agents expectations

It is particularly interesting to compare raw survey data (Euro Money Market Survey) and the ECB own assessment (press releases related the publication of Euro Money Market Studies, and Euro Money Market Surveys). Two periods, in particular, are of specific interest. In the 2012 Euro Money Market Study, for the first time the ECB explicitly presented some of the distortions of money markets, particularly a decline in the overall turnover volume as a result of its own liquidity provision policy ("as a result of the two three-year follow-term refinancing operations (LTROs) in December 2011 and February 2012"). This liquidity provision policy was presented in the previous study (in 2010) as a response to a market failure. This may suggest the existence of a circular relationship between

distortions in the functioning of money markets and unconventional monetary policies, which theoretical exploration is yet to be done.

Table 1. Main characteristics of the Euro Money Market Surveys and Studies

	Data	Analysis / comment	Basis
Euro Money Market Survey	Volume data ("large set of charts showing developments in the euro area money market")	None (except in the ECB press releases)	Annual
Euro Money Market Study	Volume data (t and t-1 Euro Money Market Surveys) ("charts from the survey and additional data")	Detailed analysis and comments, including the effect of monetary policy measures ("comprehensive analysis of the market's structure and functioning")	Biannual

The bracketed parts of the text are taken from the on-line ECB database.

In general, the assessment of raw data by the ECB is broadly conditioned by the need to guide expectations (see Section 2.). For example, the 2014 Survey data press release focuses on increased transactions volumes in the unsecured segment (+ 54% for borrowing and + 24% for lending). In fact, the total volume of unsecured transactions in 2014 accounts for only one-third of its 2003 level and ranks only fifth among money markets segments. In 2014, its volume is only 1/8 of that of secured transactions, while it was almost 3/4 in 2003 (Figure 4).

The ECB monetary policy and turnover volumes in money markets: aggregate level

In the detail of volume data (Figure 4, Figure 5, Figure 6, Figure 7), it emerges that risk aversion of the euro area banking sector, which has risen sharply since 2008, remains high, despite a slight improvement in funding conditions in 2013 and especially 2014. This persistence is primarily evidenced by the stagnation of aggregate volumes, usually since 2006 in the range of 70 to 80 billion euros. In 2014 the aggregate turnover is approximately the same than in 2007, but still 11% lower than in 2011.

Three other outstanding features are also in line with this finding of a lasting strong risk aversion. First, in the unsecured loans segment, turnover did not only decline, but the opinions on funding conditions remain very unfavourable. Between 2008 and 2013, the transactions volume divided by 4 (Figure 4), and this segment is still marked by 2/3 of negative opinions (Figure 6). Secondly, credits remain largely concentrated on maturities of less than one week (98% of unse-

cured transactions in 2008 and 94% in 2014), forcing funding demand for highest maturities to redirect in part onto the foreign exchange swaps segment (Figure 5). This segment takes now the second rank of the euro area monetary markets (Figure 4). This shortening of maturities has been a feature of the market since the outbreak of the financial turmoil, as a greater weight attached to counterparty credit risk has led to reduce longer-term exposures. Thirdly, the euro area money markets are characterized by a stronger home bias than before the crisis, despite a notable decline in 2014 (52% of national counterparties in 2013 and 41% in 2014, but only 25% in 2006 for unsecured transactions) (Figure 7).

Despite this persistence of a high risk aversion, there was a sharp decline in interest rate risk hedging transactions (OIS) until 2013 which is due to both the low level and low volatility of interbank interest rates, including the EONIA, as seen above. A gradual return to a less atypical dynamics of this rate in 2014 coincides with the return to a rise in turnover volumes in the OIS segment.

Finally, this first approach of trading volumes in the euro area money markets confirms the hypothesis of a significant gap between the communication of the ECB regarding the most recent data (2013 and 2014), returning to a merely positive tone after several years of statement of malfunctioning partly attributed to its own monetary policy measures, on one hand; and the reality of an improvement which is achieved from very low starting levels. These durable malfunctions question the procedures of measuring interbank market strains since among the three markets (secured, unsecured, and OIS segments) whose prices are used to calculate the most commonly used interbank spreads, two of them (unsecured and OIS segments) now are of minor importance, their turnover having sharply decreased not only in proportion but also in absolute terms since 2008.

The ECB monetary policy and turnover volumes in money markets: dynamics

The analysis of the dynamics of unsecured (Figure 8 and Figure 9), secured (repo transactions, Figure 10 and Figure 11) and foreign exchange swaps (Figure 12 and Figure 13) segments allows further clarification. Over the whole period, the most notable turnover decline takes place in the unsecured market, with a notable acceleration after the 2011 crisis (- 36% in 2012). In 2014, market activity in the unsecured market remains highly concentrated in the overnight segment (more than 85%), while turnover beyond one month remains around 1%). This contraction in the unsecured market and shortening of maturities can be explained primarily by the greater aversion to counterparty risk. At the same time, stricter regulation requirements tended to reduce the supply of unsecured interbank

lending and the high level of liquidity provided by the ECB reduced interbank credit demand.

The only market segment where activity picked up significantly during the last decade (with the exception of 2014) was the foreign exchange swaps market (Figure 12). Foreign exchange swaps remained an important liquidity tool for European banks. Since they are considered less risky, partly because they are settled mainly via large multicurrency cash settlement systems, foreign exchange swaps have profited from moving away from unsecured transactions. Another sign of the resilience of this segment is that it responded to the demand for the lengthening of maturities (Figure 13).

Finally, the study of funding conditions in the euro area money markets since the beginning of the 2000s confirms that they have been greatly altered, having in addition a circular relationship with monetary policy measures, especially of unconventional type. In particular, it appears that a decline in the level and volatility of funding costs in interbank markets, as measured by interbank rates, coincides with the period of strongest rationing. This raises questions on the shape of the private interbank funding supply function. After the 2011 crisis, in 2013 and especially 2014, prices and turnover volumes in the euro area money markets began a normalization process which, given the existing degradation, should be relatively long. In addition, this normalization at this stage concerns much more aggregated turnovers than the breakdown between the various segments and the term structure of transactions. Under these circumstances, if we can consider that unconventional monetary policy measures eventually allow to return to an acceptable level of macroeconomic and overall financial stability (*Figure 14*), there is no doubt that private supply of funding and hedging to the banking sector is still far from enabling it to carry out its normal funding role of economic activity in the non-financial sector.

Concluding remarks

Until the end of April 2014, European current account surpluses (due to low growth and low imports) and a possible normalization of the U.S. monetary policy were raising the euro. In addition to liquidity provision and inherent changes in private balance sheets, the latest program of the ECB is supposed to lower the euro and then stimulate exporting industries. Besides money supply and interest rates, the purchase program is supposed to redirect investors towards riskier assets such as stock and money markets. A strength of the euro area lies in the banking sector's balance sheets recovered soundness. Whatever the previous possible

shortcoming in the ECB policy measures, the die is cast and the whole range of these measures are yet to be displayed. The euro area stands at a crossroad. In the good scenario, the ECB monetary policy is effective. Member states undertake structural reforms and the Juncker investment plan helps to promote growth, together with low oil prices and convenient exchange and interest rates. In this recovery case, there are still risks as the ECB may increase its policy rates (especially if the euro falls too low) and thus exert downward pressures on growth. In a bad scenario, a decline in consumer prices and recession feed each other, while banks are no longer interested in credit activity, compared with other possible investment. However, the major weaknesses are *quasi* unchanged in the euro area: first, they rely on public debt levels and procyclicality, together with inadequate tax harmonization; second, consideration must be given on how to conciliate a coherent monetary policy and the new banking intermediation frameworks in times of high financial strains.

References

1. Adrian, T.and Shin, H. S. (2009). Money, Liquidity, and Monetary Policy, *The American economic review*, 99 (2), may, 600–605.
2. Adrian, T. and Shin H. (2010). Financial Intermediaries and Monetary Policy, in: B. M. Friedman and M. Woodford (ed.), Handbook of Monetary Economics, edition 1, vol. 3, ch. 12, elsevier, 601-650.
3. Adrian, T., Ashcraft, A., Boesky, H., Pozsar Z. (2012). Shadow banking, *Staff Reports*, 458, Federal Reserve Bank of New-York.
4. Aglietta, M. and de Boissieu, Ch. [1999]. Le prêteur international en dernier ressort dans *Varii Auctores*, *Architecture financière internationale*, Rapport du Conseil d'Analyse Economique (CAE) n° 18, Paris, La Documentation française, 97-127.
5. Aït-Sahalia, Y., Andritzky, J. Jobst, A., Nowak S., Tamirisa N. (2012). Market response to policy initiatives during the global financial crisis, *Journal of International Economics*, 87(1), 162-77.
6. Bastidon, C., Gilles, Ph., Huchet, N. (2008). The international lender-of-last resort and selective bail-out, *Emerging markets review*, 9 (2), june, 144-152.
7. Bastidon, C., Ph. Gilles & N. Huchet (2012). Amplification effects and unconventional monetary policies, *Theoretical and Applied Economics*, 19 (2), 13-30.
8. Bastidon, C., Huchet N., Kocoglu Y. (2014). "Unconventional monetary policy in the euro zone : a lack of forward guidance", 2nd International Conference on Debt Crises and Financial Stability: Global Issues and Euro-Mediterranean Perspectives, Toulon, France.
9. Benmelech, E. and Bergman, N. (2012). Credit Traps, *The American Economic Review*, 102 (6), 3004-3032.
10. Bernanke, B. S. and Reinhart, V. R. (2004). Conducting monetary policy at very low short-term interest rates, *The American economic review*, 94 (2), may, 85-90.
11. Bernanke, B. S., Reinhart, V. R., Sachs, B. P. (2004). Monetary policy alternatives at the zero bound: An empirical assessment, *Brookings Papers on Economic Activity*, n° 2, 1-78.
12. Bernanke, B. S. and Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy Transmission, Working Paper 5146, National Bureau of Economic Research.
13. Blanchard, O. J. (2009). The crisis: Basic mechanisms, and Appropriate Policies, *IMF working papers*, International Monetary Fund, n° 09/80.
14. Blinder, A. (2012). Revisiting Monetary Policy in a Low-Inflation and Low-Utilization Environment, *Journal of Money, Credit and Banking*, 44, 141-146.

15. Bordo, M. (2008). An historical perspective on the crisis of 2007-2008, NBER working paper series, n° 14569.
16. Caruana, J. (2010). Unconventional monetary policies in times of crisis, SUERF studies, n° 1, 113-123.
17. Cúrdia, V. and Woodford, M. (2009). Conventional and unconventional monetary policy, Federal Reserve Bank of New York staff reports, n° 404, November.
18. Cúrdia, V. and Woodford, M. (2010). Conventional and Unconventional Monetary Policy, Federal Reserve Bank of St. Louis, May, 229-264.
19. Dooley, M. (1997). A model of crises in emerging markets, NBER working papers series, n° 6300.
20. Dornbusch, R. (2001). A primer on emerging market crisis, NBER working papers series, n° 8326.
21. ECB (2014), Monetary Markets Statistics: Euro Money Market, https://www.ecb.europa.eu/stats/money/mmss/html/index.en.html
22. Eggertsson, G. B. and Woodford M. (2003). The zero bound on interest rates and optimal monetary policy, *Brooking Papers on Economic Activity*, n° 1, 139-211.
23. Eichengreen, B., Rose, A., Wyplosz, C. (1995). Exchange market mayhem: the antecedents and aftermath of speculative attacks, *Economic policy*, 21, October, 249-312.
24. Fahr, S., Motto, R., Rostagno, M., Smets, F., Tristani, O. (2011). A monetary policy strategy in good and bad times. Lessons from the recent past, ECB working paper series, European Central Bank, n° 1336.
25. Farmer, R. (2012). The effect of conventional and unconventional monetary policy rules on inflation expectations: theory and evidence, *Oxford Review of Economic Policy*, 28 (4), 622-639.
26. Freixas, X. and Jorge J. (2008). The Role of Interbank Markets in Monetary Policy: A Model with Rationing, *Journal of Money, Credit and Banking* 40 (6), 1151–1176.
27. Gambacorta, L. (2009). Monetary Policy and the Risk-Taking Channel, SSRN Scholarly Paper ID 1519795. Rochester, NY: Social Science Research Network.
28. Gertler, M. (2013). Monetary Policy after August 2007, *Journal of Economic Education*, 44 (4), 329-338.
29. Gertler, M. and Karadi P. (2011). A Model of Unconventional Monetary Policy, *Journal of Monetary Economics*, 58 (1), January, 17-34.
30. Gilles, Ph. and Bastidon-Gilles, C. (2014). Central banking since the eighties, in Ari A. (ed.), The European Debt Crisis. Causes, consequences, measures and remedies, Newcastle, Cambridge Scholars Publishing, 195-215.

31. Jones, C. and Kulish, M. (2013). Long-term interest rates, risk premia and unconventional monetary policy, *Journal of Economic Dynamics and Control*, 37 (12), 2547-2561.
32. Kindleberger, Ch. P. (1986). International public goods without international government, *The american economic review*, 76 (1), march, 1-13.
33. Korinek, A. (2011). Systemic risk-taking, amplification effects, externalities, and regulatory responses, ECB working paper series, European Central Bank, n° 1345.
34. OFCE, (2013). Politiques monétaires: est-ce le début de la fin, *Revue de l'OFCE*, Observatoire français des conjonctures économiques, 130, 225-262.
35. Rogers, J., Scotti, C., Wright, J. (2014). Evaluating asset-market effects of unconventional monetary policy: a multi-country review, *Economic Policy*, 29 (80), 749-799.
36. Sarkar, A. and Shrader, J. (2010). Financial amplification mechanisms and the Federal Reserve's supply of liquidity during the crisis, FRB of New-York staff reports, Federal Reserve Bank of New-York, n° 431.
37. Stiglitz, J. (2000). Principes d'économie moderne, Bruxelles, de Boeck, coll. "Ouvertures économiques".
38. Walsh, C. (2009). Using monetary policy to stabilize economic activity, Jackson Hole Symposium on Financial Stability and Macroeconomic policy, August.

Appendix

Appendix 1 Main features of the ECB monetary policy measures since 2007

Figure 1: ECB policy rates and EONIA (percentages, sources ECB and European Banking Federation)

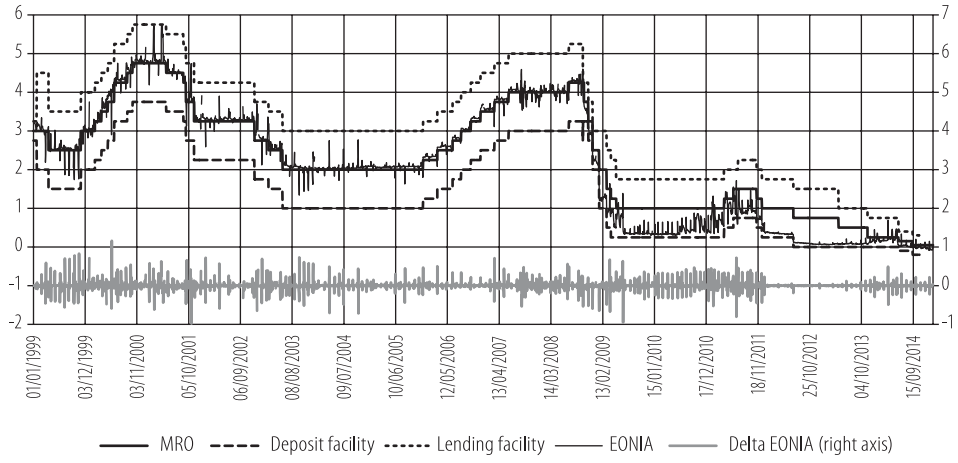


Figure 2: Securities held for monetary policy purposes (Millions of euros, Eurosystem)

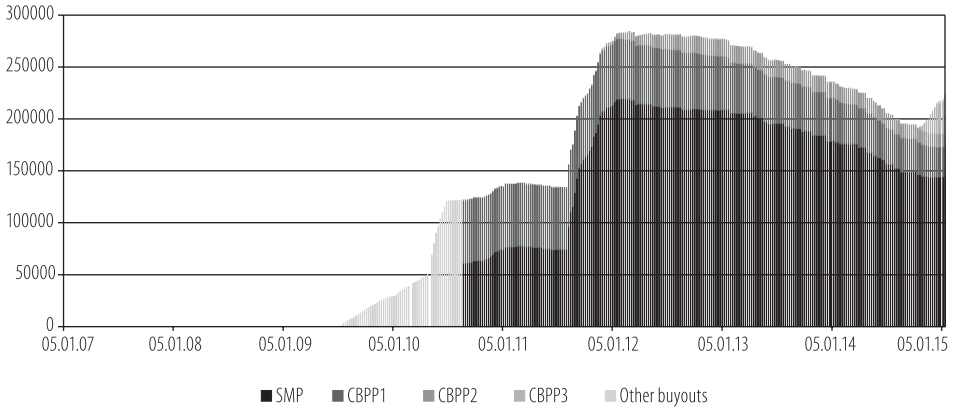
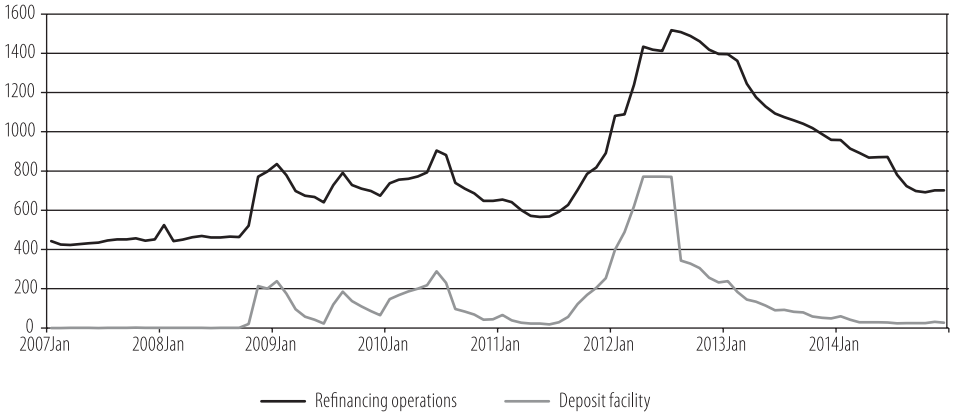


Figure 3: Refinancing operations and Deposit facility (Billions of euros, Eurosystem)



Appendix 2 Euro Money Market survey panel

Source ECB (Euro Money Market Survey 2014). Q2 of each year, panel: 154 credit institutions.

Figure 4: Quarterly turnover in the euro money market (EUR trillion)

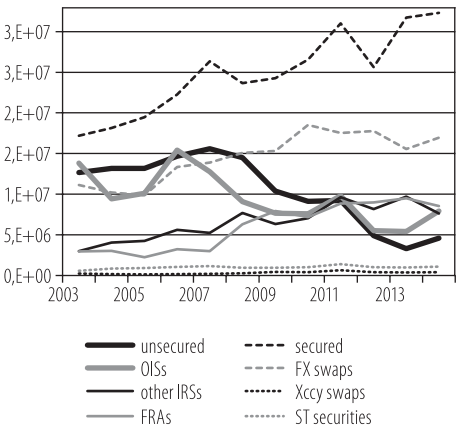


Figure 6: Is the euro money market efficient? (2014, percentages of total)

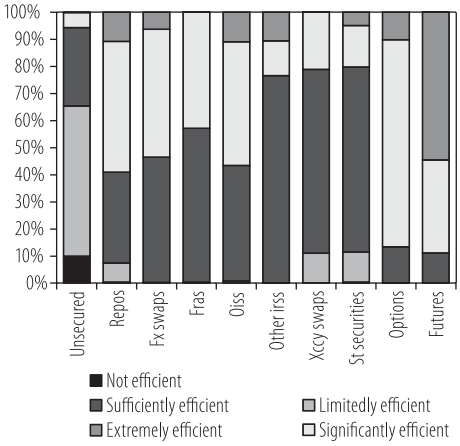


Figure 5: Maturity breakdown for various money market segments in 2014 (percentages of total)

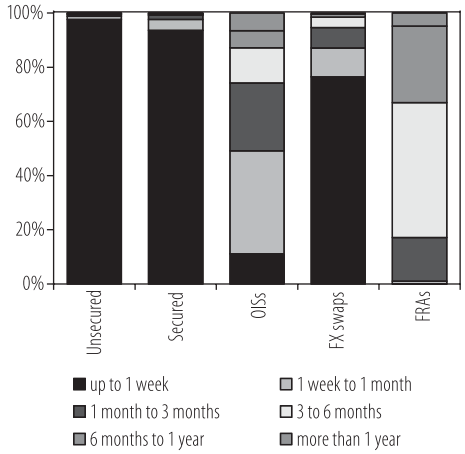


Figure 7: Counterparty structure of various money market segments in 2014 (percentages of total)

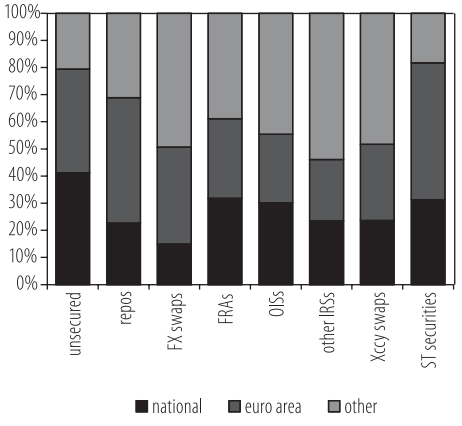


Figure 8: Cumulative quarterly turnover in unsecured cash lending and borrowing (cash lending volume in 2003 = 100)

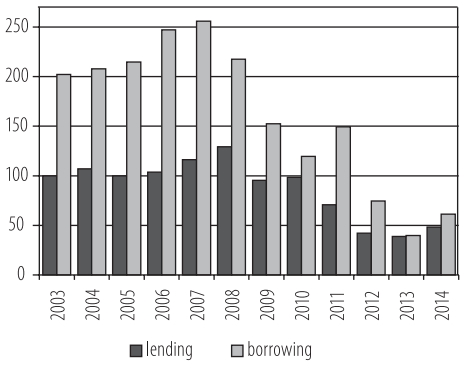


Figure 9: Counterparty structure of unsecured transactions (percentages of total)

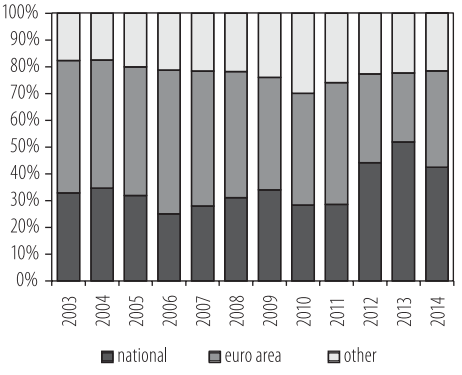


Figure 10: Cumulative quarterly turnover in secured cash lending and borrowing (cash lending volume in 2003 = 100)

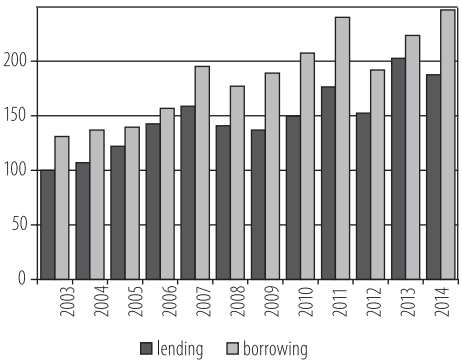


Figure 11: Breakdown of total secured market

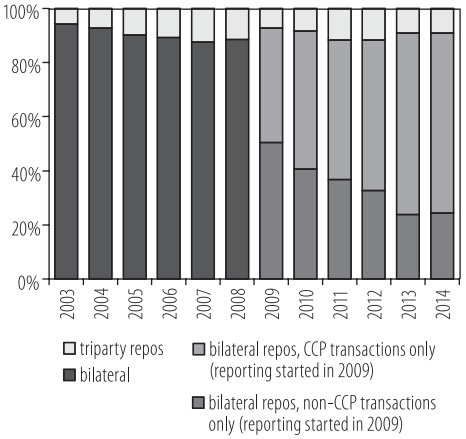


Figure 12: Cumulative quarterly turnover in various OTC derivatives markets (index: OTC derivatives volume in 2003 = 100)

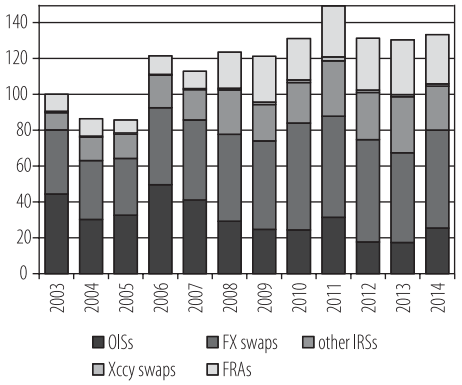


Figure 13: Development of maturity breakdown for cumulative quarterly turnover in the FX swaps and forward

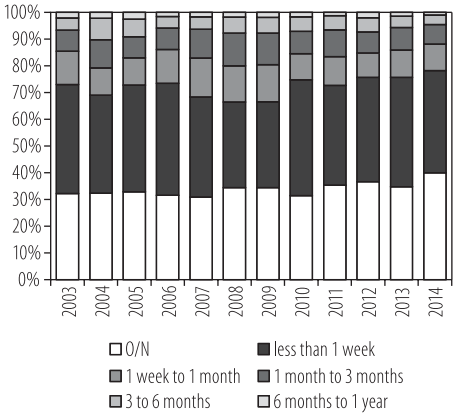


Figure 14: Consumer prices, growth and assets prices in Europe (source OECD)