

Monetary policy in the United States and in the euro area during the crisis

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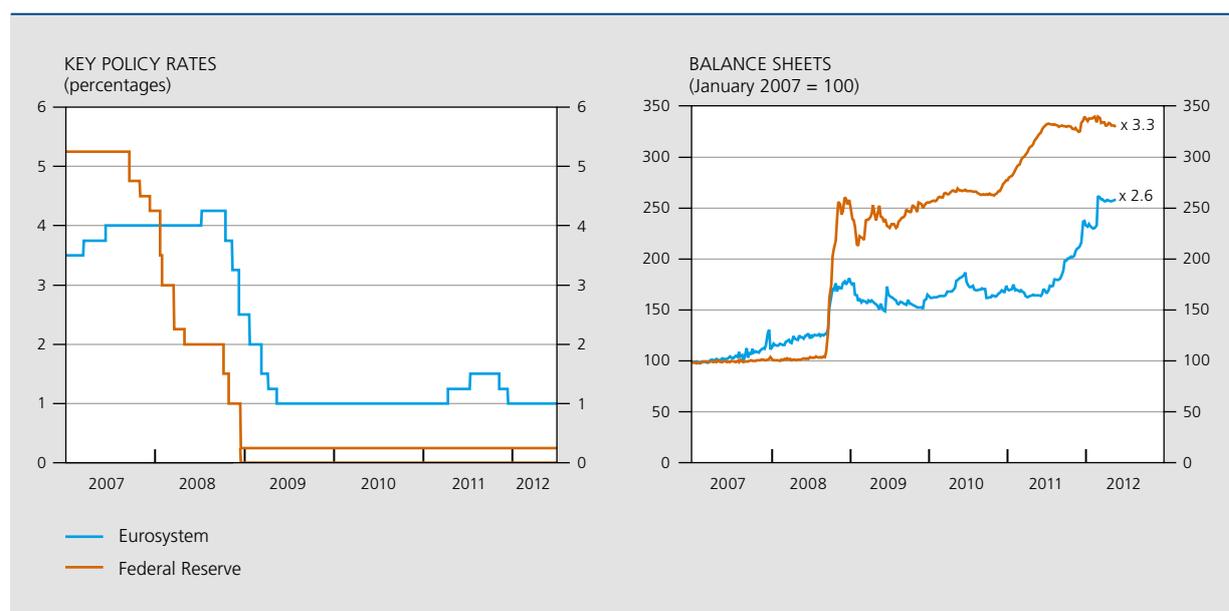
Introduction

On both sides of the Atlantic, the initial shocks of the financial crisis were experienced in the form of tensions on the money markets. These then quickly spread to the other segments of the financial markets before affecting the real economy. The announcement of the insolvency of the bank Lehman Brothers on 15 September 2008 transformed the ongoing financial turmoil into a general financial panic and a major worldwide economic crisis.

These events gave rise to unprecedented challenges for the world's main central banks, which responded with strength.

In the context of the crisis, the Federal Reserve and the Eurosystem made profound changes to the conduct of their respective monetary policies. In order to prevent the collapse of the financial system and to support the economy, they implemented rapid and substantial falls in their key policy rates, which reached historic lows. Moreover,

CHART 1 KEY POLICY RATES AND BALANCE SHEETS OF THE FEDERAL RESERVE AND THE EUROSISTEM



Sources: Federal Reserve, Thomson Reuters Datastream, ECB.

they adopted numerous non-conventional measures to provide liquidity and purchased securities on a massive scale, strengthening their role as an intermediary and considerably expanding the size of their balance sheets.

This article aims to present and analyse the policy responses of the Federal Reserve and the Eurosystem during the various stages of the crisis. The first part shows that, in spite of considerable differences in the action undertaken, the challenges encountered by both central banks were largely similar from the summer of 2007 until the autumn of 2009. The second part outlines the diverging evolution of the challenges in the course of the period that followed and the specific action undertaken by each of the central banks to cope with them. It also looks at the relationship between monetary policy and fiscal policy and the effects that the crisis has had on it. Lastly, the third part attempts to shed some light on the challenges posed by monetary policy at the present time. It is particularly concerned with the possible secondary effects of the non-conventional policy measures adopted during the crisis, the heterogeneity that prevails today in the euro area and the risks inherent in conducting an accommodating monetary policy over a long period.

1. Similar challenges up to autumn 2009

In the early stages of the financial crisis, the Federal Reserve and the Eurosystem largely pursued similar goals, that is preserving financial stability and the effective transmission of monetary policy. Whilst taking very different actions, they each adapted their operational framework so as to accommodate dysfunctional money markets and fully played their role of lender of last resort with respect to the financial sector. In the course of the period that preceded the collapse of Lehman Brothers, the two central banks mainly adjusted the composition of their balance sheets. The crucial role of intermediary that they adopted subsequently was in turn reflected in an unprecedented expansion of the size of these balance sheets.

1.1 From the appearance of tensions on the money markets to the failure of Lehman Brothers: August 2007 – September 2008

1.1.1 Tensions on the money markets and financial turmoil

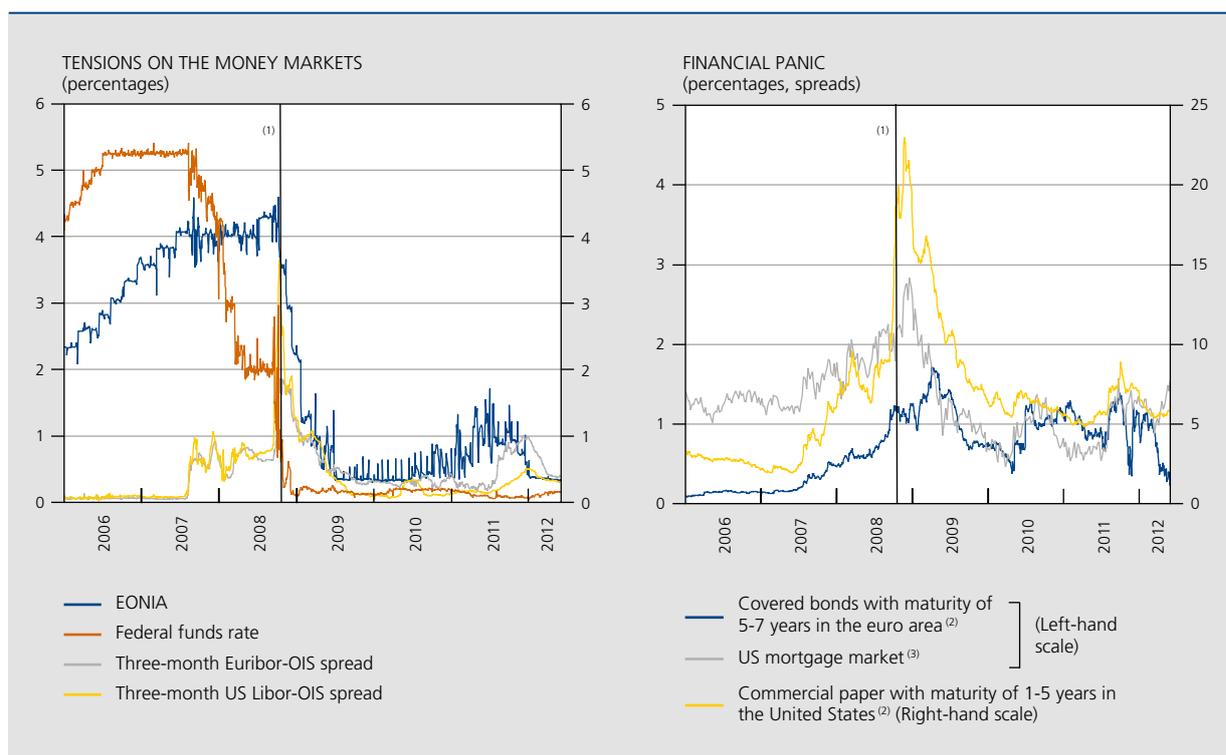
Following the sudden reversal in the US real-estate market and the rise in interest rates, payment defaults on mortgage loans granted to households with modest income and poor creditworthiness (subprimes) multiplied as from the first half of 2006. The prices of the securities backed by these mortgage debts then began to fall, bringing growing losses for the financial organisations that owned them, mainly in the United States, Europe and Asia.

On 9 August 2007, the French bank BNP Paribas announced that it couldn't fairly value three of its funds made up of securities backed by portfolios of debt (asset-backed securities or ABS), in particular mortgage debts. It adduced the non-liquidity of the assets held by the funds after the collapse of the securitisation market in the United States and, confirming existing fears of a worsening of the subprime crisis, sparked off the disturbance of the functioning of the money markets. Suddenly, the banks became concerned about the solvency of their counterparties and were more reluctant to lend to each other. They feared, moreover, having to financially support their investment vehicles holding securities backed by real-estate assets. This situation gave rise to the retention of liquidity by the financial institutions and the rapid deterioration of financing conditions on the interbank markets. The Eonia and the US federal funds rate, the rates on the overnight money market respectively in the euro area and the United States, were suddenly faced with huge volatility whilst, on the three-month money market, the differences between the rates of unsecured loans and those without risk soared. Whereas it typically settled at less than 10 basis points, the spread between the Euribor and the US Libor at three months on the one hand and the OIS rates at three months⁽¹⁾ on the other hand thus rapidly reached 50 basis points. Whilst posting high volatility, it climbed markedly above that in the subsequent period, raising fears for the effective transmission of monetary policy through the interest rate channel.

In parallel with these tensions on the money markets, the risk premiums on the other segments of the financial markets very largely followed an upward trend, starting from the end of July 2007. These movements were the expression of a correction in the perception of risk, which had been underestimated up to then, and drove up the borrowing costs of economic agents in the private sector. With regard to enterprises and households in the United

(1) Overnight Index Swap: the fixed rate paid by the counterparty of an interest-rate swap contract receiving the overnight rate (Eonia) for three months.

CHART 2 FINANCIAL DEVELOPMENTS IN THE UNITED STATES AND THE EURO AREA



Sources: Freddie Mac, Thomson Reuters Datastream.

(1) 15 September 2008: the date on which the bank Lehman Brothers was declared insolvent.

(2) Spread with respect to the corresponding sovereign bond with the same maturity.

(3) Spread between the 15-year fixed rate on the "prime" mortgage market and the rate of the 10-year Treasury securities.

States, the relative increase in yields on commercial paper and the rates on mortgage loans as compared to the yields on Treasury securities bears witness to this in particular. In the euro area, the widening of yield spreads between covered bonds and sovereign bonds in turn illustrates the increase in borrowing costs for the credit institutions.

In March 2008, risk premiums reached an initial peak in the aftermath of the near failure of the investment bank Bear Stearns and its buy-out by JP Morgan Chase with the assistance of the Federal Reserve. They would literally go through the roof following the sale of Merrill Lynch to Bank of America and the collapse of Lehman Brothers on 15 September 2008.

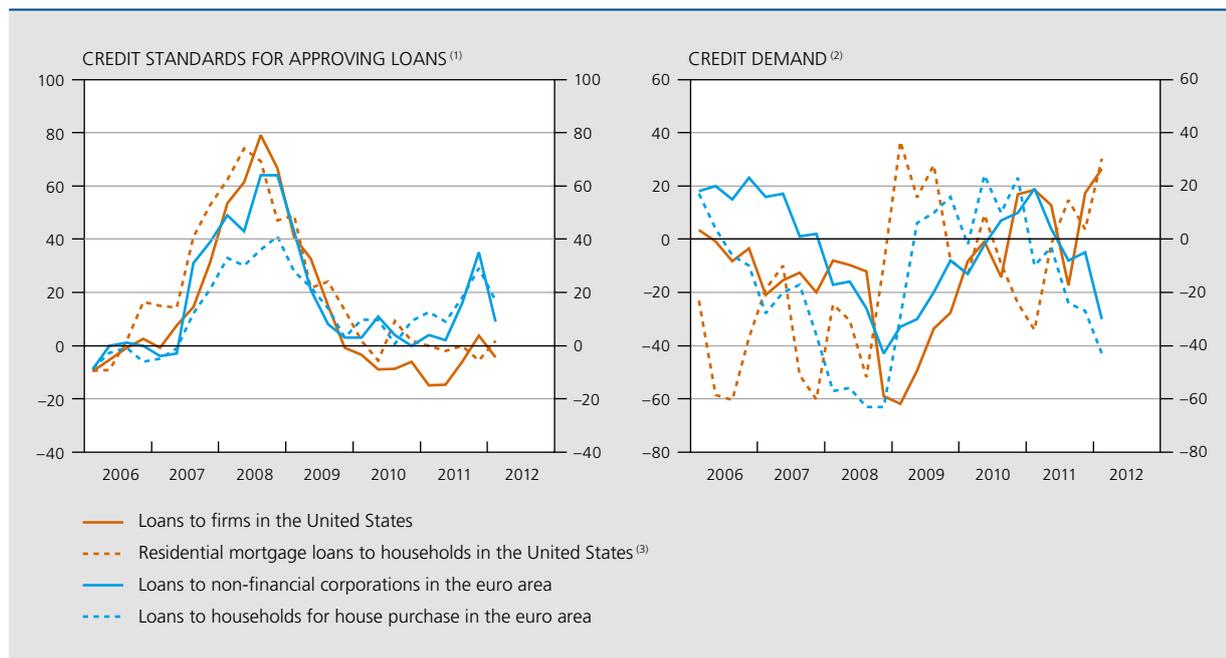
1.1.2 Disturbances in the monetary transmission mechanism

The disturbances on the money and financial markets directly affected the banks' profitability, liquidity position and capacity to fund themselves. This was all the more true since the banks had considerably increased their recourse to short-term market financing in the course of

the years that preceded the crisis. These developments therefore drove the credit institutions to adjust their balance sheets and to restrict lending to the non-financial private sector, that is to say households and enterprises. In these conditions, successive tightening of credit standards from 2007 illustrates the critical role played by the banks in the propagation of shocks from the financial sphere to the real economy. In the euro area, this was strengthened by the predominance of the banking sector in the external financing of the non-financial private sector. Whilst the reduction in demand in a worsened economic context contributed to a large degree to the fall in bank lending, it seems that, over the period 2007-2009, the balance-sheet constraints linked to the disruption of banks' access to wholesale funding and the banks' liquidity position played a very special role in the evolution of loans to the private sector in the euro area⁽¹⁾. However, it seems that, overall, tighter credit standards targeted price conditions rather than the quantities allocated. The growing risk of a dysfunctional monetary transmission mechanism explains the essence of the non-conventional monetary policy

(1) For further details, cf. Hempell and Kok Sørensen (2010).

CHART 3 CREDIT STANDARDS FOR APPROVING LOANS AND CREDIT DEMAND IN THE UNITED STATES AND THE EURO AREA



Sources : ECB, Federal Reserve Board.

(1) Net percentages of replies from the banks consulted. These percentages indicate the degree to which the credit standards have been tightened or eased (-).

(2) Net percentages of replies from the banks consulted. These percentages indicate the degree to which the demand for loans has increased or decreased (-).

(3) As from the first quarter of 2007, only "prime" loans are counted.

measures taken by the Federal Reserve and the Eurosystem between August 2007 and mid-2009.

1.1.3 Specific policy responses to similar challenges

In the first stages of the crisis, the Federal Reserve and the Eurosystem sought to rapidly accommodate the impaired functioning of the money markets. In order to preserve the banks' capacity to refinance themselves and to minimise the volatility of money market rates, the two central banks basically geared themselves up to accommodate more volatile demand for liquidity from the banks with their preference for longer-term maturities. The actions undertaken were largely sterilised, however, so that the size of their balance sheets was not fundamentally affected.

In spite of similar challenges, the measures adopted by the Federal Reserve diverged largely with respect to those taken by the Eurosystem from the early days of the crisis. This specificity is largely due to the differences between the two central banks in the normal conduct of their respective monetary policies. Thus, the Eurosystem typically holds a large liquidity deficit which it makes up for by way of its weekly refinancing operations – around

€ 300 billion over the first seven months of 2007 – and its three-month refinancing operations – around € 50 billion over the aforementioned period. Moreover, it accepts a large range of assets as collateral for its refinancing operations and deals with a large number of counterparties – more than 2 000 in total. The Federal Reserve intervenes comparatively little on the money market. Prior to August 2007, its open market operations conducted on a daily basis rarely exceeded \$ 10 billion and it only deals with about 20 counterparties – the primary dealers. Moreover, it only accepts three types of assets as collateral for its loan operations – Treasury securities, the debts of Government Sponsored Enterprises (GSEs) and the mortgage-backed securities (MBS) of the GSEs – and only the depository institutions have access to its permanent lending facility (discount window).

The limited role of the Federal Reserve with regard to providing liquidity in normal times forced it to develop new instruments and to make profound changes to the conduct of its monetary policy as from August 2007. Conversely, due to its broad and flexible monetary policy framework, the Eurosystem was able to respond to the initial tensions on the money markets basically by adapting the modalities of its existing framework.

Federal Reserve

When the crisis started at the beginning of August 2007, the first decision of the Federal Reserve was to expand the amounts allocated through its open market operations. Moreover, it quickly decided to extend the term and to lower the rate of the discount window in order to facilitate access to it. In spite of the lower rate, however, the banks entitled to use the loan facility remained reluctant to have recourse to it, owing to the stigma associated with it. What is more, the small number of primary dealers limited the capacity of the Federal Reserve to distribute liquidity where it was really needed in a period of turmoil.

In order to compensate for these obstacles to the refinancing of the financial institutions, the Federal Reserve developed, at the end of 2007 and the beginning of 2008, new programmes aimed at extending the availability of emergency and longer-term financing to the primary dealers and the depository institutions. Amongst the main programmes was the Term Auction Facility (TAF) which was launched in December 2007 and which appears as a remodelling of the discount window. It is aimed at the depository institutions and is innovative particularly in that it offers the guarantee of anonymity to the institutions that use it, as well as granting liquidity in the form of auctions. Two other new facilities were adopted in March 2008. The first is the Term Securities Lending Facility (TSLF) which extends the list of securities accepted as collateral and the term of the existing programme for loans of Treasury securities of the Federal Reserve. This has the aim of easing the tensions on the collateralised market by allowing securities that have developed poor liquidity to be exchanged temporarily for Treasury securities. The second facility was introduced in the aftermath of the rescue of the bank Bear Stearns. To counteract the lack of access to the discount window for the primary dealers, the Federal Reserve decided to create the Primary Dealer Credit Facility (PDCF) which is intended to offer the investment banks wider and more direct access to its liquidity.

In cooperation with other central banks, the Federal Reserve also took measures intended to ease the pressure on the interbank market in US dollars at the global level. Most foreign banks do not in fact have access to the facilities of the Federal Reserve, and their meagre stock of dollar deposits makes them particularly dependent on the interbank market for refinancing their dollar-denominated assets. To make up for this situation, the Federal Reserve announced, in December 2007, the establishment of currency swap agreements with the ECB and the Swiss National Bank (SNB). These agreements would allow them to provide liquidity in dollars directly to their own credit institutions.

Lastly, beyond its operations aimed at increasing the provision of liquidity, the Federal Reserve played a special role during the rescue of Bear Stearns. In order to facilitate its acquisition by JP Morgan Chase, it lent close to \$ 30 billion on a ten-year term in order to finance the buy-out of a portfolio of securities by a fund set up with the aim of sheltering them. The company created for the occasion was called Maiden Lane from the name of the street that runs alongside the Federal Reserve Bank of New York, in Manhattan.

So as not to affect the size of its balance sheet, the Federal Reserve largely financed the new measures adopted through the sale of Treasury securities. Its policy up to September 2008 can thus be described as credit easing, in the sense that only the composition of its balance sheet was changed.

Eurosystem

In order to contain the rise in the money market rates and to keep Eonia close to the main policy rate, the Eurosystem, for its part, responded to the initial tensions by conducting a certain number of fine-tuning operations as from 9 August 2007. Subsequently, it largely accommodated the banks' new preferences in terms of liquidity provision without, however, changing its monetary policy stance, thus applying a "separation principle" between the stance and the implementation of its monetary policy. On the one hand, the Eurosystem largely satisfied the greater preference of the banks for longer-term maturities by expanding the number and volumes of its longer-term liquidity-providing operations. On the other hand, it increased the maximum duration of its long-term operations to six months as against three up to then. Lastly, with the aim of counteracting the excessive volatility of the Eonia rate, the Eurosystem responded to the banks' desire to meet their reserve requirements at an early point, by granting relatively larger volumes of liquidity at the beginning of the reserve maintenance periods and more limited volumes towards the end of the periods (front-loading). Following the swap agreements with the Federal Reserve, moreover, the Eurosystem took steps to supply liquidity in dollars to banks in the euro area in exchange for collateral in euros. The amounts of and the conditions for granting this liquidity varied considerably all through the crisis.

Whilst the empirical literature is not in agreement on the matter, the different actions undertaken by the central banks between August 2007 and September 2008 seem to have had some beneficial effects on risk premiums and the volatility of rates on the money market. The success achieved by several measures bears witness in itself to

their importance⁽¹⁾. Whilst they calmed the tensions on the money markets, the liquidity measures adopted did not, however, allow the underlying problems of the financial sector to be resolved, that is to say the exposure of many institutions to “toxic” assets and the need to raise

capital to absorb the losses. These weaknesses would become evident with the failure of Lehman Brothers in September 2008.

(1) For a review of empirical studies devoted to the effectiveness of the measures adopted by the Federal Reserve and the Eurosystem, cf. Cecioni *et al.* (2011).

Box 1 – Conventional monetary policy decisions

The financial crisis and the collapse of economic activity which stemmed from it prompted the central banks to lower their key policy rates with unprecedented vigour and scope. In spite of largely comparable macroeconomic situations, the Federal Reserve and the Eurosystem adopted differing attitudes in the course of the first few months of the turmoil. However, the failure of Lehman Brothers would quickly prompt each of them to reduce policy interest rates to historically low levels.

The Federal Reserve was the first to lower its key policy rates. After having reduced its discount rate by 50 basis points in August 2007, it began to reduce its target for the federal funds rate as from September 2007. Faced with the deterioration of the economic situation and despite a high level of inflation, it subsequently pursued this course and the cumulative reduction in its target rate reached 325 basis points in the spring of 2008. For its part, the Eurosystem kept its main policy rate unchanged at 4 % during this same period, pointing to healthy fundamentals for the economy of the euro area and high risks weighing on price stability. In the face of accelerating inflation following the continuous price rises for energy and other raw materials, and in order to prevent second-round effects – which have always been more pronounced in the euro area in the past – it even opted for a 25-basis-point increase of its key policy rates in July 2008, in spite of signs of a slowdown in economic activity.

These opposing attitudes of the Federal Reserve and the Eurosystem with regard to their interest rate policy in the initial stages of the crisis can be explained in part by a relatively more favourable economic context in the euro area but they are also due to differences in terms of mandate. Whereas that of the Eurosystem is centred on price stability, the Federal Reserve is entrusted with a dual mandate which forces it to concentrate on both price stability and full employment. In addition, whereas the Federal Reserve had no such target at the time, the Eurosystem had already had a clear quantitative objective since its inception, requiring it to keep inflation at a level below, but close to 2 % in the medium term. Lastly, it should be noted that, beyond its mandate, the greater determination of the Eurosystem to combat inflation can also be explained by its relative youth and by the still-felt need to prove itself in order to establish its credibility.

In the wake of the failure of Lehman Brothers, plummeting economic activity and the reversal of upside risks weighing on price stability at the global level would, however, quickly change the established order and prompt each of the central banks to adopt a decidedly accommodating monetary policy orientation. The Federal Reserve, the Bank of Canada, the Bank of England, the Eurosystem, the SNB and the Sveriges Riksbank decided by common accord on 8 October 2008 to each lower their key policy rates by 50 basis points. With regard to the Eurosystem, this downward movement was the first in a long series, which brought the main policy rate to a historic lower level of 1 % in May 2009. In the United States, the Federal Reserve pursued its course and established, in December 2008, a range for the federal funds rate of between 0 and 25 basis points, thus practising a policy of near-zero rates for the first time in its history.

1.2 Central banks faced with financial panic and recession: autumn 2008 – autumn 2009

1.2.1 Financial panic and general economic crisis

The collapse of the bank Lehman Brothers marks the point at which the crisis entered a phase of financial panic and net contraction of world economic activity. Apart from the direct or indirect losses incurred by the counterparties of Lehman Brothers, its disappearance sent a strong signal to the financial markets. This was expressed in an abrupt and very clear reassessment of risk as well as a generalisation of distrust, which brought with it a drying-up of liquidity, the modern version of a bank run. The spread of the financial crisis which occurred in the United States was accelerated by the effects of financial innovation, which made it difficult to identify the bearers of risk, and by the strong interdependence prevailing between the financial institutions throughout the world. In this context, the real economy was hit very hard: whilst a clear slowdown had already been observed in the course of 2008, both the United States and the euro area saw economic activity collapsing in the fourth quarter of 2008 and at the beginning of 2009, in parallel with the spectacular contraction in world trade. In the same period, inflationary pressure which had been increasing up to then due to repeated

energy and other commodity price rises steadily reversed, offering greater room for manoeuvre for the action of central banks.

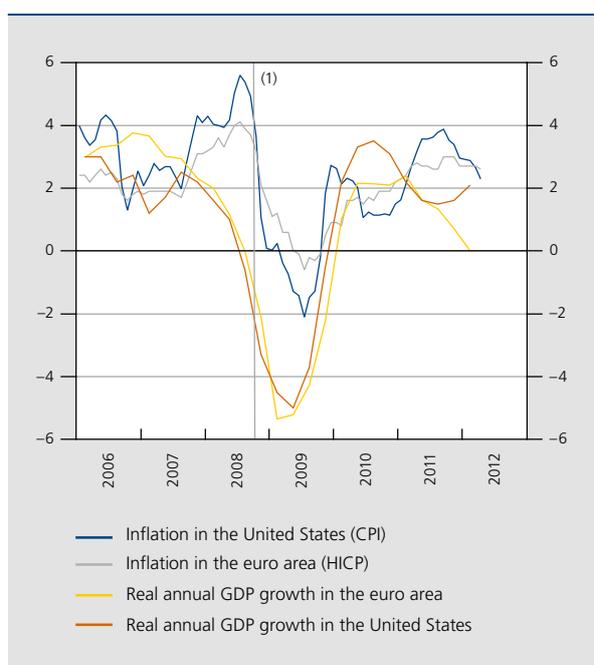
1.2.2 Upheavals in the conduct of monetary policy

In the wake of the collapse of Lehman Brothers, each of the two central banks made radical changes to the conduct of its monetary policy, playing a more active role as an intermediary, market-maker and “lender of last resort”. In contrast to events in the previous period, the new measures adopted were no longer being sterilised and resulted in a spectacular expansion in the size of their balance sheets, in addition to the radical changes made to the composition of the latter. Whilst the objective of maintaining financial stability and the effective transmission of monetary policy continued to be largely shared, differences in terms of the types of action undertaken were somewhat accentuated, reflecting both the specific nature of the two economies’ operational frameworks for monetary policy and external financing structures. Since the weighting of the banking sector was greater than 70% in the external financing of households and non-financial corporations in the euro area, the Eurosystem concentrated all its action on the banks. On the other hand, with close to 60% of the external financing of households and 80% for that of firms originating from other sources in the United States, the Federal Reserve broadened its interventions to other actors in the financial sector. More specifically, in the United States, the collapse of the markets for mortgage lending and securitisation, as well as the absence of manoeuvring room once key policy rates had fallen to rock-bottom levels, prompted the Federal Reserve to adopt a policy of purchasing long-term securities, a first stage along the road to quantitative easing.

Federal Reserve

After the failure of Lehman Brothers, the Federal Reserve quickly realised that the supply of liquidity to the primary dealers and the depository institutions would not be enough to curb the panic that had taken hold of the markets. Amongst the financial institutions most affected by the slump in asset prices and the drying-up of liquidity were those in the shadow banking system, such as money-market funds, investment vehicles and hedge funds. These institutions had played an increasing role in the financing of the economy since the mid-1980s but, unlike the depository institutions, they do not take deposits and do not enjoy any direct access to the liquidity of the central bank. Yet they are likely to come up against the same lack of trust and the same financial difficulties as the banks. In order to prevent a collapse of the US financial system and to support the financing of firms and

CHART 4 MACROECONOMIC DEVELOPMENTS IN THE UNITED STATES AND THE EURO AREA



Source: Thomson Reuters Datastream.

(1) 15 September 2008: the date on which the bank Lehman Brothers was declared insolvent.

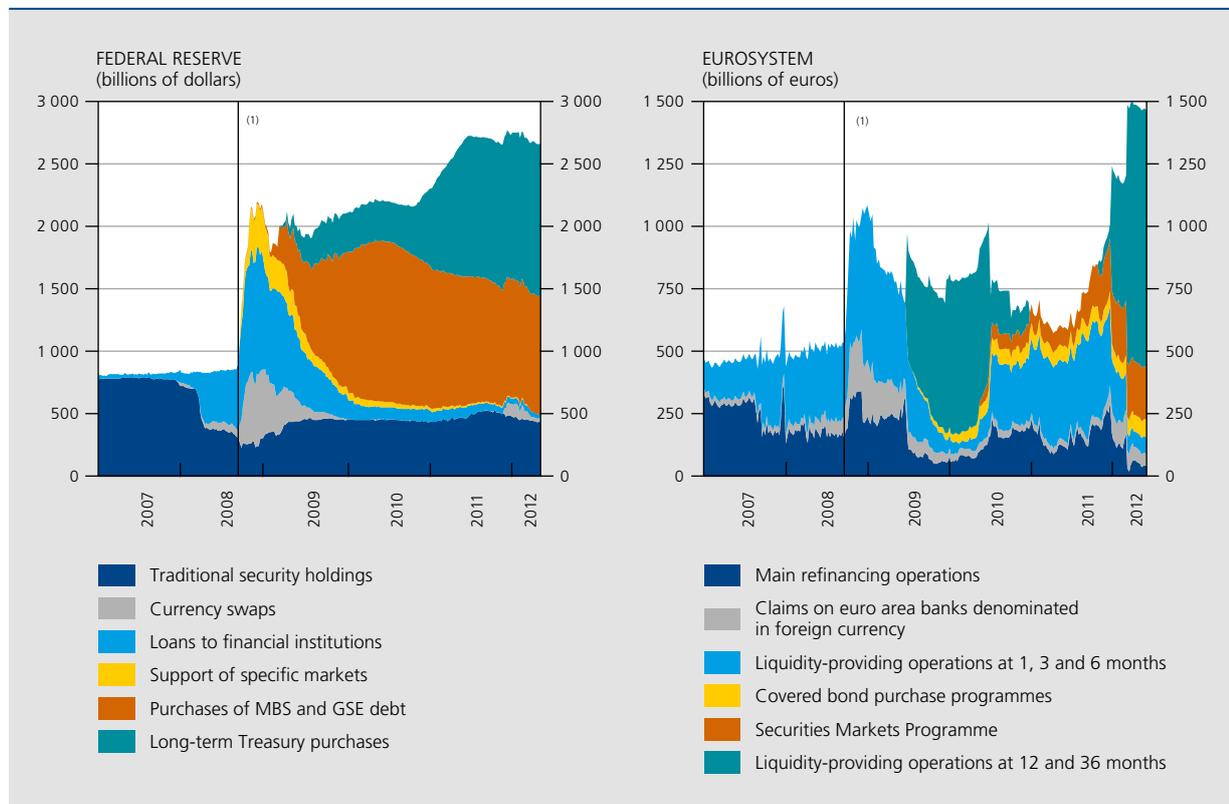
households, the Federal Reserve thus decided to expand its existing programmes but also to develop new tools for the benefit of other categories of financial institutions and specific market segments.

Three programmes played a special role. The first is the Asset-Backed Commercial Paper Money Market Fund Liquidity Facility (AMLF) announced on 19 September 2008 and by way of which the Federal Reserve made loans to banks in exchange for high-grade asset-backed commercial paper (ABCP) acquired from the money market funds. The latter had been put under great pressure after the failure of Lehman Brothers and were facing major withdrawals that were endangering their operations. The AMLF was set up to maintain their financing by supporting the price of commercial paper and by limiting fire sales. The second programme, which pursued a similar objective, is the Commercial Paper Funding Facility (CPFF). It was announced by the Federal Reserve on 7 October. Following the collapse in demand for commercial paper coming from the money market funds, a number of issuers found themselves in difficulty. The CPFF thus had the objective

of assisting the latter by offering them a temporary line of credit. Lastly, the Term Asset-Backed Securities Loan Facility (TALF) was put in place on 25 November with the aim of promoting lending to private individuals and small firms by providing long-term loans in return for newly issued asset-backed securities (ABS). The facility was later extended to commercial mortgage-backed securities (CMBS). As with the two previous programmes, the loans were established under the form of non-recourse repos. This type of arrangement is not without risk in that it offers the borrower the option of giving up his guarantee rather than repaying his loan if the value of the first is lower than the second.

Beyond the new facilities established and the pursuit of the policy of credit easing it started at the beginning of 2007, the Federal Reserve also turned its attention, towards the end of 2008, to the acquisition of long-term securities. Faced with the deterioration in the borrowing costs of the GSEs and the negative consequences for the mortgage market in the United States, it announced, in November 2008, a first programme for purchasing

CHART 5 MAIN ASSETS ON THE BALANCE SHEETS OF THE FEDERAL RESERVE AND THE EUROSISTEM (daily data)



Sources: ECB, Federal Reserve Bank of Cleveland.

(1) 15 September 2008: the date on which the bank Lehman Brothers was declared insolvent.

securities specifically intended for the GSEs. It thus envisaged purchasing debt from the GSEs for an amount of \$ 100 billion and purchasing mortgage-backed securities (MBS) guaranteed by the GSEs for an amount of \$ 500 billion. In March 2009, following the renewed weakening of economic activity and in the face of the dismal prospects on the real-estate market, the Federal Reserve extended its purchasing programmes, increasing them to \$ 200 and \$ 1 250 billion respectively for the debts of the GSEs and the MBS guaranteed by them. Lastly, with the aim of exerting a favourable influence on financing conditions in general for the private sector, the Federal Reserve announced at the same time its intention to acquire, over a period of six months, long-dated US Treasury securities for a total amount of \$ 300 billion. This was a first stage in the transition towards a policy referred to as quantitative easing (QE1) or Large-Scale Asset Purchases (LSAP1), which consists in expanding the size of the balance sheet without, however, affecting its quality in terms of credit risk. This decision was taken in order to stimulate the recovery at a time when the key policy interest rate had reached its zero lower bound.

As had already been the case with Bear Stearns in March 2008, the Federal Reserve was moreover involved in a number of rescue operations, such as that of AIG in September 2008. This intervention gave rise to the creation of the Maiden Lane II and Maiden Lane III funds. Lastly, at the same time, the currency swaps set up with the ECB and the SNB were broadened to include other central banks and their amounts were increased.

Given the scope of the amounts committed, the Federal Reserve was no longer in a position to sterilise all its new operations by the sale of Treasury securities, and the measures that it adopted as from September 2008 were thus expressed by a considerable rise in the size of its balance sheet. The latter increased from less than \$ 900 billion in August 2008 to \$ 2 100 billion at the end of 2009, that is to say a rise of 130 %. Whilst they represented the bulk of the assets on the balance sheet at the end of 2008 and the beginning of 2009, the support operations for the financial institutions and the specific markets quickly decreased in importance, however, and gave way to the asset purchase programmes. In terms of liabilities, the substantial expansion of the Federal Reserve's balance sheet was reflected in an increase in the deposits of the US Treasury and, in particular, substantial growth in the reserves held by the banks.

Eurosystem

As from October 2008, the Eurosystem also adopted a range of new measures bringing major innovations into its operational framework. Firstly, it agreed to the supply of liquidity – still in return for collateral – to the credit institutions in the euro area in unlimited quantities and at a fixed rate, for all refinancing operations. This decision enabled it to provide all the desired liquidity to credit institutions with certainty – both in terms of rate and quantity – and thus substantially contributed to stabilising the banking sector. Subsequently, the Eurosystem extended the list of assets accepted for use as collateral and increased the maximum term of its refinancing operations to 12 months. As it announced in May 2009, three operations with a term of twelve months were thus carried out, in July, September and December 2009 respectively. Whilst they were still carried out at a fixed rate, it was agreed that the rate for the December operation would correspond to the average rate of the main refinancing operations over the life of the operation. The Eurosystem also launched a programme for purchasing covered bonds in order to support a market of crucial importance for the financing of the banks in the euro area. In this context, it acquired securities for a total amount of € 60 billion over the period stretching from July 2009 to June 2010. Lastly, it re-opened and broadened its swap lines with the Federal Reserve and put in place swap lines with a certain number of other central banks such as the SNB, the Bank of England and the Bank of Denmark. The agreements with the Federal Reserve prompted it, beyond the supply of liquidity in dollars in exchange for collateral in euros, to carry out euro/dollar currency swap operations with credit institutions in the euro area. Since these operations only yielded limited success, they were, however, abandoned in January 2009.

All these non-conventional monetary policy measures were referred to as “enhanced credit support” because they were aimed at maintaining the availability of funding at an affordable cost for the non-financial sector. They were reserved for the banks, due to the predominance of the latter in the external financing of the private sector in the euro area. These measures considerably expanded the role of intermediary played by the Eurosystem in a situation of serious disturbances on the money market, which, as for the Federal Reserve, resulted in a significant expansion of its balance sheet. Between August 2008 and the end of 2009, the latter increased from around € 1 450 billion to close to € 1 900 billion, or in other words a rise of 38 %. This represented a small increase in comparison to that of the balance sheet of the Federal Reserve, but the Eurosystem's balance sheet was markedly larger prior to the crisis. The refinancing operations to

credit institutions, for their part, jumped by more than 60 % over the period, a trend which reflected in particular a more massive recourse to longer-term liquidity-providing operations. As regards liabilities, the substantial rise in the balance sheet was expressed in an unprecedented growth in recourse to the deposit facility of the Eurosystem, the counterpart in the euro area of the excess reserves held at the Federal Reserve. More details on this matter are contained in the third part of the article.

The new monetary policy measures taken by each of the central banks after the failure of Lehman Brothers complicated the interpretation of the monetary policy stance. In particular, the measures adopted in the euro area placed greater importance in this respect on the interest rate paid on the deposit facility, due to the fact that the sharp rise in excess reserves resulting from it brought the rate on the money market close to the rate on the deposit facility. Moreover, the stronger intermediary role of the Federal Reserve and the Eurosystem substantially increased their exposure to risk, even if the latter was offset by the adoption of conservative measures for controlling risk such as the application of haircuts to the collateral pledged.

2. Growing differences between the challenges for the Federal Reserve and those for the Eurosystem as from 2010

Whilst the monetary policies conducted by the Federal Reserve and the Eurosystem respectively were fairly similar during the initial phases of the crisis, if account is taken of the specific organisation of the financial system, this was less and less the case as from 2010. The Federal Reserve continued its near-zero interest rate policy, and applied a wider and wider range of non-conventional monetary policy instruments in order to be able to conduct a more expansionary monetary policy (section 2.1). The Eurosystem was also obliged to broaden its monetary policy instruments by including a programme for purchasing debt securities, in response to the emergence of the sovereign debt crisis (section 2.2). The improvement in the macroeconomic climate in the euro area enabled to conduct a slightly less accommodating interest rate policy in the first half of 2011 (section 2.3). However, the intensification of the sovereign debt crisis during the summer of 2011, which reached a peak in November 2011, forced the Eurosystem to conduct a particularly accommodating monetary policy once again (section 2.4).

(1) Cf., for example, Ball (2012), Stone *et al.* (2011) and Bernanke and Reinhart (2004).

2.1 Federal Reserve: pursuit of an expansionary monetary policy at near-zero rates

In a macroeconomic context characterised by the persistence of high unemployment and low levels of inflation expectations in the United States, the Federal Open Market Committee of the Federal Reserve (FOMC) decided in summer 2010 to pursue an expansionary monetary policy stance by keeping interest rates at virtually zero, that is to say to keep the target on federal funds rate within a range of between 0 % and 0.25 %. In addition, the FOMC decided in August 2010 to keep the holdings of debt securities unchanged, by reinvesting in government securities those debt securities issued or covered by the GSEs reaching maturity. Moreover, it was agreed in November 2010 to acquire, before the end of the second quarter of 2011, longer-term Treasury securities for an amount of US \$ 600 billion, under the LSAP2 programme (or QE2).

According to the economic literature, a wide range of instruments is available for pursuing a policy of monetary stimulus when interest rates are near zero⁽¹⁾. In view of the options chosen by the Federal Reserve in the last few years, a clear preference has emerged for a range of instruments that can be grouped into three large categories or channels.

The first channel is that of communication, by which an attempt is made to guide expectations relating to future key policy interest rates in order to align them with those of the central bank. The promise to keep key rates at a low level in fact exerts a downward effect on the yield curve for most financial assets, in particular at the short-term end. If the central bank manages to exert a downward influence on the interest rate expectations of economic agents, it thus provides support for economic activity. The FOMC used this channel by declaring that interest rates would remain at an exceptionally low level “for some time” (December 2008) and “for an extended period” (March 2009).

This so-called Forward Policy Guidance with regard to the expected level of key policy interest rates, in this case the maintenance of the status quo between 0 % and 0.25 %, was subsequently strengthened when phrases such as “for some time” and “for an extended period” were replaced by explicit calendar-date statements. Both the announcement made in August 2011 (“at least through mid-2013”) and that in January 2012 (“at least through late 2014”) clearly exerted a downward influence on expectations of key interest rates. Although this undoubtedly improved the transparency of monetary policy, some prefer to see this promise as dependent on an economic event

TABLE 1 SUMMARY OF THE FEDERAL RESERVE'S MAIN PROGRAMMES FOR PURCHASING SECURITIES

		Financial asset	Amount (in \$)
November 2008	LSAP1	Purchases of debt securities issued or covered by the GSEs	600 billion
March 2009	LSAP1	Purchases of Treasury securities	300 billion
		Extension of the portfolio of debt securities issued or covered by the GSEs	Up to 1 450 billion
August 2010		Reinvestment of maturing debt securities issued or covered by the GSEs in Treasury securities	
November 2010	LSAP2	Purchases of Treasury securities	600 billion
September 2011		Reinvestment of maturing debt securities issued or covered by the GSEs in securities of the same type	
	Maturity Extension Program	Purchases of longer-term Treasury securities and sales of an equivalent amount of Treasury securities with remaining maturity of less than 3 years	400 billion

Source: Federal Reserve.

(for example Evans (2012)). Thus, this commitment could be linked, for example, to a decline in the unemployment rate or an acceleration in inflation to a level previously announced, so as to allow economic agents to have a better understanding of the conditional nature of this promise.

In January 2012, the FOMC decided to introduce a quantitative target for inflation and to publish the level of interest rates expected by its members underlying their macroeconomic projections. By introducing an inflation target of this type, the Federal Reserve joins a global tendency in the domain of monetary policy strategy, which has already been observed for some decades. At the same time, the Federal Reserve continues to pursue a dual mandate. However, it is difficult to implement a quantitative target for a maximum employment rate, this being mainly determined by non-monetary factors that evolve over time⁽¹⁾. Due to the longer-term orientation of the inflation target, and in spite of the maintenance of its dual mandate, the Federal Reserve differs little from the other central banks (which are solely pursuing an inflation target) since these central banks, for their part, also apply so-called flexible inflation targeting. The focus on price stability does not imply that other central banks are not, for all that, completely insensitive to other economic considerations. Apart from the priority given to the primary objective (price stability), flexible targeting of inflation makes it possible to concentrate on other criteria

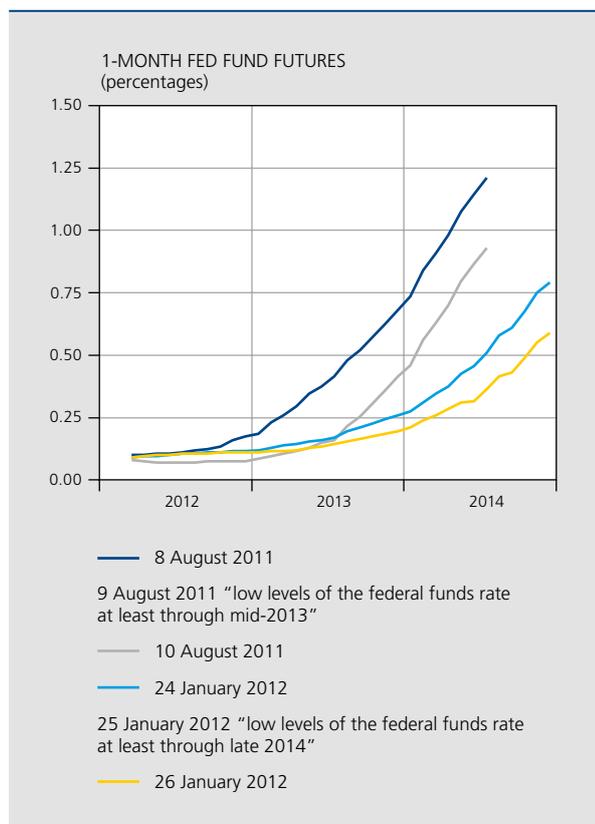
in the short term, such as economic activity. The aim is to prevent the excessive volatility, both in economic activity and nominal interest rates, associated with strict inflation targeting. Whilst the objective of price stability and the search for sustainable growth over the long term are not contradictory – they even complement each other – monetary policy in the short term may be faced with dilemmas, in the case of supply shocks, for example, and a gradual response is often recommended⁽²⁾.

Moreover, in addition to its individual members' expectations for economic growth, unemployment and inflation, the FOMC decided to publish their expected future level for the key policy interest rate, an aspect that helps to further enhance the transparency and accountability of monetary policy. These projections were published for the first time after the meeting of 25 January last. In concrete terms, they include the view of each member of the FOMC as to the level of the federal funds rate at the end of the next few calendar years and over the long term. Apart from the diversity in interest rate levels between the members of the FOMC, this publication could appear at first sight to be contradictory with respect to the outcome of the aforementioned meeting of the FOMC, that is to say the announcement of the maintenance of exceptionally low levels of the federal funds rate at least through late 2014. This disparity can be explained in part by the difference between the interest rate expectations of the FOMC members as a group and those of the FOMC members who had been allowed to take part in the vote during this meeting. Furthermore, these projections reflect the

(1) Cf. FOMC (2012).

(2) Cf. Svensson (1999).

CHART 6 FEDERAL RESERVE: FORWARD POLICY GUIDANCE



Sources : Bloomberg, Federal Reserve, Thomson Reuters Datastream.

interest rate views at the start of the meeting and they do not therefore necessarily correspond to the final decision adopted after discussion⁽¹⁾.

More generally, publication of the expected interest rate path may allay the uncertainty of households and enterprises with regard to their investment decisions. When the projections of the FOMC provide an indication of a downturn in inflation, for example, this makes it possible to determine more clearly whether this is attributable to a restrictive monetary policy or not. At the same time, it is important to emphasise the fact that the interest rate views published do not embrace any promise as to the future level of key interest rates. In fact, the level of key rates expressed by the members of the FOMC is subject to change in line with the economic context. If a central bank wishes to take full advantage of the effectiveness of this improved transparency, it is essential that the economic agents, for their part, also have a sufficient understanding of its conditional nature.

The second channel comprises modification of the composition of the central bank's balance sheet. By varying

the relative supply of a given financial instrument such as Treasury securities, the central bank can in fact influence its price. The third channel consists of an increase in the size of the balance sheet of the central bank. In this case, the provision of liquidity or the purchase of financial assets goes hand in hand with a rise in the central bank's supply of reserves. In the first place, this channel moderates the liquidity risk in the financial system. In the light of events, most of the central banks combine these two channels to improve the effectiveness of the non-conventional policy measures adopted.⁽²⁾

The second channel, that is to say modifying the relative supply of two separate financial instruments, was used in 2008 by the Federal Reserve before the financial crisis erupted in September of the same year (see Part 1). This allowed the central bank to focus its action on specific segments of the financial market in order to influence interest rates and risk premiums in these particular segments, so that activity picks up on these markets. Moreover, the sale of Treasury securities by the Federal Reserve made it possible for the counterparties to take out secured loans more easily on the interbank market. When it comes to a mere modification of the maturity structure of Federal Reserve holdings of Treasury securities, as applied in the Maturity Extension Program put in place in September 2011, then the main aim is to modify the slope of the yield curve of Treasury securities. The Maturity Extension Program provides for the purchasing, up to June 2012, of Treasury securities with a maturity between 6 and 30 years for an amount of US \$ 400 billion, as well as the sale, for a similar amount, of Treasury securities with a remaining maturity falling between three months and three years, so that the effect is limited to a lengthening of the average maturity of the portfolio of Treasury securities held by the Federal Reserve. This programme can therefore be compared to the operation Twist launched at the beginning of the 1960s which was aimed at flattening the yield curve by lowering long-term interest rates, whilst at the same time leaving short-term interest rates as a whole unchanged. Meaning and Zhu (2012) estimate that lengthening the average maturity of the portfolio of Treasury securities held by the Federal Reserve by a single month would bring about a fall of 3.4 basis points in the 10-year interest rate. These authors therefore assert that the Maturity Extension Program is capable of reducing the 10-year interest rate by 85 basis points, assuming that the stock and maturity of the outstanding Treasury debt remains unchanged. Part of the impact could in fact be neutralised if the US Treasury

(1) Cf. Evans (2012).

(2) See, for example, Borio *et al.* (2009) or Shiratsuka (2010) for a discussion of the size and composition of the central bank's balance sheet as an instrument of monetary policy.

decided to issue relatively more longer-term debt so as to take advantage of the decline in interest rates⁽¹⁾.

The programmes for purchasing securities put in place by the Federal Reserve combine the second and, in particular, third channels. These programmes, better known under the title LSAP or QE, comprise a significant instrument in the context of the recent crisis for generating monetary stimulus in the United States. The first programme, LSAP1 (November 2008 and March 2009), was basically aimed at providing support for the mortgage market, but also at influencing the interest rates on Treasury securities, a major benchmark for fixing the prices of a wide range of financial assets. This programme was strengthened by an additional purchase of Treasury securities in the context of the LSAP2 programme (November 2010).

A programme for purchasing debt securities by the central bank can have an influence on the relevant financial and macroeconomic variables by way of several channels. Various studies report a significant announcement effect⁽²⁾. In fact, the announcement of purchasing programmes reveals information about the future evolution of interest rates, in addition to what the central bank has decided and communicated up to then. Thus, the announcement may indicate that macroeconomic prospects are gloomier than was thought, which lowers the anticipated level of key policy interest rates and may even reduce uncertainty in this respect⁽³⁾. The effect of the announcement, therefore, pulls down the longer-term interest rates. By making use of a method referred to as 'event study', several authors propose a considerable and significant effect of these purchasing programmes on the relevant interest rates⁽⁴⁾. It is mainly the first purchasing programme LSAP1 which had a notable impact on the interest rates for Treasury securities, whilst the effect of the LSAP2 programme seems to have been more limited.

The element which undoubtedly assumes significance for economic activity is the degree to which these programmes can, over and above the announcement effect, lower long-term interest rates to lasting effect. This capacity to pull interest rates downwards comes from the fact that financial assets are not all precisely interchangeable. The purchasing of Treasury securities reduces their supply on the market. Since some investors prefer to hold (US) Treasury securities, they are willing to pay a higher price for these "scarce" securities, that is to say to accept a lower interest rate. This theory of the 'portfolio

rebalancing channel' goes back to Tobin's 'portfolio balance' model and to Modigliani and Stutch's theory of 'preferred habitat'. These theories start from the principle that investors do not all have the same preferences for the various financial assets. This limits the functioning of the arbitrage mechanism between the various financial assets and enables a key market player such as the central bank to influence, by purchasing and selling on a massive scale, the supply on the market to the point of influencing prices and interest rates. Thus, Gagnon *et al.* (2010) report a constant downward effect of 10 basis points on the 10-year interest rate on US Treasury securities, whilst D'Amico and King (2010) find an effect of 67 basis points for the massive purchasing of sovereign bonds. Certain studies also evaluate the macroeconomic implications. Chung *et al.* (2011) find a substantial upward effect on GDP growth, employment and inflation.

2.2 Eurosystem: first phase of the sovereign debt crisis

When, in May 2010, the sovereign debt market in certain euro area countries showed growing signs of becoming dysfunctional, the Governing Council of the ECB, taking account of the crucial role that this segment plays in the financial system of the euro area, decided to adopt a new non-conventional measure: the Securities Markets Programme. This programme makes it possible to purchase both public and private securities on the secondary market with the aim of re-establishing the proper functioning of the asset markets and consequently to restore an appropriate monetary policy transmission mechanism. In fact, the central bank can only have a direct influence on very short-term interest rates whilst the transmission of monetary policy decisions to the real economy takes place via the financial markets and bank lending. The government debt market plays a prominent role in this process by way of three channels: prices, liquidity and the balance sheet.

Via the price channel, the interest rates on sovereign bonds influence the financing conditions within the economy in that they constitute the benchmark *par excellence* for fixing the longer-term interest rates applied to households and enterprises. When the risk premiums contained within the interest rates on sovereign securities reach values that are no longer justified as a result of market malfunction, they threaten to disturb the transmission of monetary policy by creating upward pressure on financing costs within the economy. The liquidity channel operates because sovereign bonds constitute the main form of collateral for market financing of the banks. A fall in the price of sovereign bonds therefore exposes the banks

(1) Cf., for example, McCauley and Ueda (2009).

(2) Cf., for example, Cecioni *et al.* (2011), BIS (2011) for an overview.

(3) Cf. BIS (2011) and Williams (2011).

(4) Cf. Gagnon *et al.* (2010).

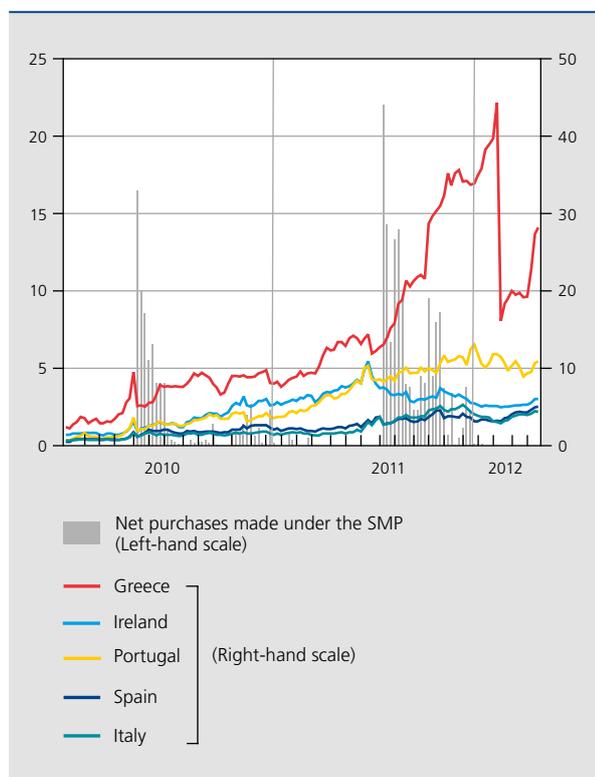
to a liquidity risk since they need to compensate for this reduction in value by providing additional collateral or by borrowing less. If the liquidity of these instruments dries up, this can paralyse the interbank market – as happened at the beginning of May 2010 – with the result that access to market financing was impeded and lending to the economy was jeopardised. The balance-sheet channel operates by the fact that a fall in the prices of sovereign bonds causes losses for their holders. That affects the capital of the banks, which may prompt them to reduce the volume of their lending. Furthermore, this situation rekindles doubts as to the solvency of certain banks and therefore makes it harder for them to obtain market financing.

The main objective of the programme was to restore the monetary policy transmission mechanism. It is therefore important to emphasise that the liquidity injected by purchases effected under the aegis of this programme are completely sterilised on a weekly basis, unlike most of the Federal Reserve's operations for purchasing securities which create additional central bank liquidity. Most

of the initial purchases made in the context of the programme were concentrated in May and June 2010. The total amount of purchases was € 55 billion at the end of June 2010.

An appreciation of the effectiveness of the programme is fairly complex given that, in the first place, a “normal” functioning of the monetary policy transmission mechanism is relatively difficult to summarise in a few clear criteria or indicators and that, in the second place, it is difficult, if not impossible, to determine the precise contribution of an individual non-conventional measure in a context largely characterised by the fall in the prices of sovereign bonds. Having said this, the purchases of securities carried out in the context of the programme seem to have had an effect, albeit short-lived, on yields on ten-year sovereign bonds, for example. This was the case in May 2010 for most countries and for Greece in particular. Moreover, the programme may have been able to help to contain the contagion effect regarding the problems of an individual country spreading to the other countries in the euro area⁽¹⁾.

CHART 7 PURCHASES MADE UNDER THE SECURITIES MARKETS PROGRAMME (SMP) AND SPREADS ON TEN-YEAR SOVEREIGN BONDS⁽¹⁾
(billions of euros, percentage points)



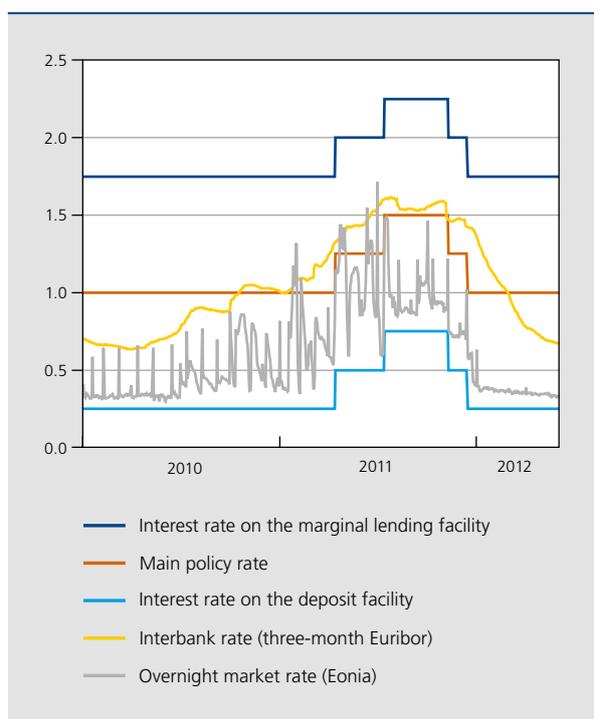
Sources: ECB and Thomson Reuters Datastream.
(1) Differences with respect to the German Bund.

2.3 Eurosystem: prudent economic recovery at the beginning of 2011

The first half of 2011 was characterised by a recovery in economic activity, which fuelled a certain optimism with regard to future economic growth. At the same time, upward pressure on inflation steadily strengthened under the impact of price rises for energy and the other raw materials. In order to prevent the upside risks for price stability from materialising in an environment of economic recovery, the Governing Council of the ECB decided to raise key rates in two stages. Having been held at the historically low level of 1% for close to two years, the main policy rate was thus successively increased to 1.25% on 7 April and 1.50% on 7 July. In spite of an overall improvement in the functioning of the financial markets in the euro area, in particular the money market, seen at the end of 2010 and the beginning of 2011, the Governing Council retained the non-conventional monetary policy measures that were in place at the end of 2010. This was decided given the continued disruption in certain segments of the financial markets in the euro area in the context of the sovereign debt crisis.

(1) Cf., for example, Boeckx and Dewachter (2012).

CHART 8 KEY POLICY RATES AND MONEY MARKET RATES IN THE EURO AREA (percentages)



Sources: ECB and Thomson Reuters Datastream.

2.4 Eurosystem: sovereign debt crisis and the risk of a credit crunch

During the summer of 2011, based on new worries as to the ability of Greece to repay its debt, a resurgence of tensions arose on several sovereign debt markets in the euro area. The spreads against the German Bund widened for all sovereign bonds and Italy and Spain were especially affected, marking a new stage in the contagion of the sovereign debt crisis. These changes were accompanied by a general increase in risk aversion and a clear deterioration in the situation on the interbank market. On the money market, the difference in rates between the Euribor and the three-month OIS rate climbed once again, whilst recourse to the liquidity-providing operations of the Eurosystem increased.

This new turmoil, generated by a worsening of the sovereign debt crisis, drove the banks to raise their credit standards and therefore posed a threat to the effective transmission of monetary policy. In this context, and in order to relax the borrowing constraints applying to the credit institutions, the Governing Council of the ECB steadily took new non-conventional monetary policy measures. It decided, firstly, to undertake, as from August

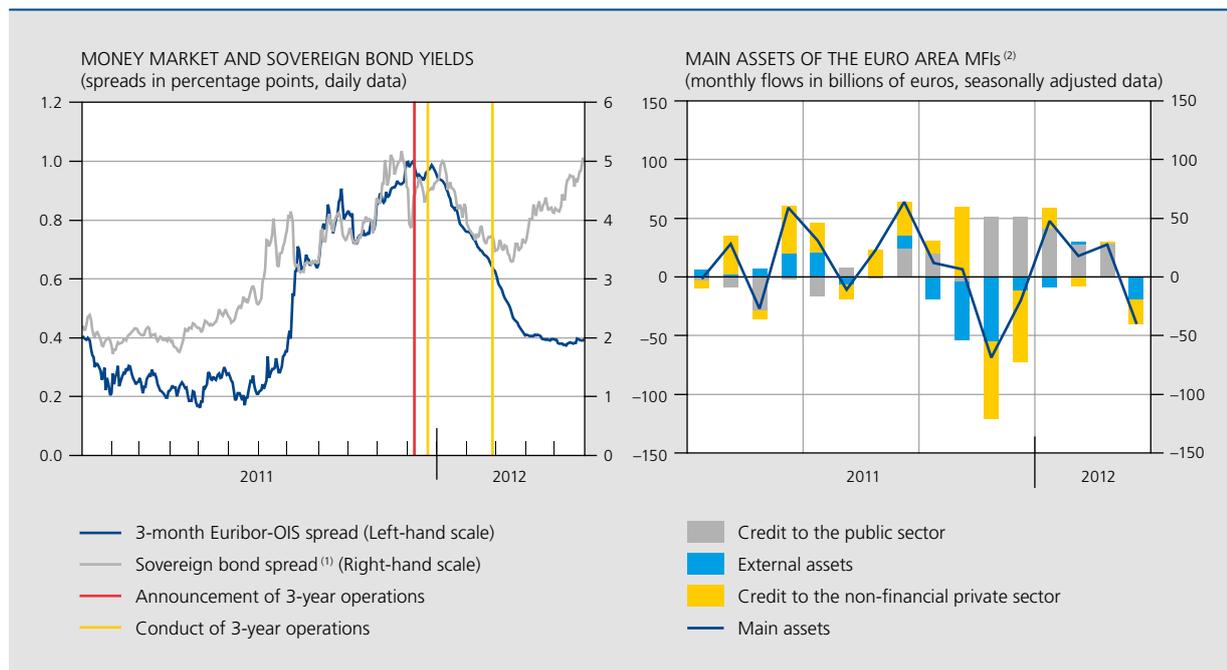
2011, a new six-month liquidity-providing operation and to reactivate the SMP⁽¹⁾. In September, it subsequently agreed to carry out three additional liquidity-providing operations in United States dollars. These operations complemented the seven-day operations already implemented on a weekly basis. In October, a new package of measures was adopted: in order to further reduce uncertainty with regard to refinancing for the banks, the Governing Council decided to conduct two additional longer-term liquidity-providing operations, one with a maturity of twelve months and the other with a maturity of thirteen months. Moreover, it announced that it would continue the full allotment policy for all refinancing operations at least until mid-2012, at a fixed rate corresponding to the average rate of the main refinancing operations over the entire life of the operation. Lastly, it agreed to launch a second covered bonds purchase programme, for a total of € 40 billion over a period of a year starting in November 2011.

In the face of worsening economic prospects and the anticipated reduction in upside risks weighing on price stability, the Governing Council of the ECB lowered its key rates by 25 basis points at each of its meetings in November and December. In December, faced with the growing risk of a rationing of the granting of funding to the private sector, it adopted a new series of measures aimed at supporting the liquidity of the banks and the funding to the economy. The main measures announced include the conduct of two very long-term refinancing operations with a maturity of 36 months, the broadening of the list of eligible collateral for the Eurosystem loans and the reduction of the reserve ratio from 2 to 1% as from January 2012. The two 36-month operations conducted on 22 December 2011 and 1 March 2012 led to the allocation of € 489.2 and € 529.5 billion respectively, for a total net injection of liquidity of around € 520 billion.

According to the results of the April 2012 euro area bank lending survey, these longer-term operations helped to improve banks' access to market financing and their liquidity position. Moreover, they benefited various governments, such as those of Spain and Italy, which saw their borrowing costs fall considerably following the purchasing of sovereign bonds by the banks. More generally, they generated a resurgence of optimism on the markets in the weeks that followed, in particular on the money market, as witnessed by the clear narrowing of the spreads between the Euribor and the three-month OIS rate. However, in a worsened economic context characterised by weak demand for funding, these long-term operations

(1) At the end of May 2012, the total amount of sovereign bonds held by the Eurosystem under the SMP was € 212 billion, as against € 74 billion at the beginning of August 2011.

CHART 9 SOVEREIGN DEBT CRISIS AND RISK OF CREDIT CRUNCH IN THE EURO AREA



Sources: ECB, Thomson Reuters Datastream, US Department of Agriculture.

(1) Differences in yields on ten-year sovereign bonds for Belgium, Spain, Ireland, Italy and Portugal with respect to the German Bund, GDP-weighted average.

(2) Monetary financial institutions excluding the Eurosystem.

did not translate into an evident improvement in loans to the private sector. Moreover, at the end of March, their favourable effects on the markets had faded somewhat and the sovereign spreads turned upwards again in several countries. These trends show that the Eurosystem's liquidity measures, whilst relieving the banks and allowing some

time to be gained, are not a substitute either for raising capital or conducting healthy fiscal and structural policies that promote lasting growth and the stability of the European economy⁽¹⁾.

(1) Cf. Draghi (2012).

Box 2 – Monetary policy and fiscal policy

While the options for the political authorities to intervene in the conduct of monetary policy are limited on both sides of the Atlantic, the differences between the two central banks in terms of mandate and institutional characteristics specific to each of the economic zones give rise to very dissimilar attitudes with regard to the purchase of sovereign bonds. Moreover, the financial crisis has to some extent shifted the dividing lines that prevailed between monetary and fiscal policy.

Independence and purchasing of Treasury securities

Economic theories and empirical evidence have given rise to a consensus according to which it is preferable to entrust the management of monetary policy to independent institutions. In fact, it is acknowledged that this arrangement makes it possible to isolate the conduct of monetary policy from political pressure which could

potentially generate inflation, and that it thus provides a more stable environment which promotes economic growth and employment. This principle of independence has increasingly guided thinking in the advanced economies from the end of the 1970s; and it has become the rule at the Federal Reserve and in the Eurosystem since it was created. It was accompanied by an affirmation of the objective of price stability and, in concrete terms, it was expressed in particular by the prohibition of monetary financing of government deficits and the proscription of purchasing government debt on the primary market by central banks.

The principle of central bank independence thus limits the possibility of the latter to purchase Treasury securities. But it does not outlaw it since this is potentially a powerful instrument of macroeconomic policy. Whilst the Federal Reserve and the Eurosystem purchased sovereign bonds during the crisis, the attitudes and objectives pursued in this respect were different, however, reflecting differences both in terms of mandate and institutional characteristics.

In the euro area, the Eurosystem's mission and primary objective is to maintain price stability. It has moreover a "unique" level of independence. In the first place, its independence assumes a virtually constitutional status in the sense that it is laid down in the Treaty on European Union which can only be amended by a unanimous vote of the Member States. Furthermore, due to the very structure of the euro area, the Eurosystem is not directly accountable before any national executive or legislative authority and it cannot accept instructions from any level of government whatsoever. These aspects largely explain why the purchases of sovereign securities made up to now were reduced to those made in the context of the SMP, with the objective of preserving the transmission of monetary policy in those countries that found themselves at the heart of the sovereign debt crisis.

In the United States, the purchase and sale of Treasury securities are key instruments of traditional monetary policy, whether in the form of outright purchases or repurchase agreements. The status of being a "risk-free" and very liquid asset for Treasury securities explains why they are practically the only collateral that the Federal Reserve typically holds in its portfolio and accepts in its daily liquidity-providing operations. Moreover, the dual mandate of the Federal Reserve more clearly imposes on it the task of stimulating the economy when the situation so demands. The continuing sluggishness of economic activity and the rock-bottom level of key rates thus explain why it undertook massive purchases of Treasury securities during the crisis. Lastly, it is worth noting that the independence of the Federal Reserve is referred to as "within government", which expresses the fact that the conduct of monetary policy in the United States is delegated to the Federal Reserve by the US Congress. Although it is autonomous on the financial and decision-making levels, it is thus officially responsible before Congress which, if it so wishes, has the power to amend its governing rules and the breadth of its responsibilities by law. Moreover, it is envisaged that the Federal Reserve "must work within the framework of the overall objectives of economic and financial policy established by the government". For some, these institutional characteristics, together with the uniqueness of fiscal policy in the United States, make the Federal Reserve subject to certain political pressure, in particular in the run-up to elections.

Monetary policy and fiscal policy in the context of the financial crisis

The combination of a serious financial crisis and major fiscal imbalances has sown some discord both in the United States and the euro area as to monetary policy perimeters and the role of the central bank, in particular in its relationship with fiscal policy.

On the one hand, as the crisis progressed, the central banks took measures that blurred the distinction between monetary policy and fiscal policy. For example, the Federal Reserve threw itself into support programmes for specific markets such as commercial papers and ABS. It also purchased assets such as debts of government-sponsored enterprises (GSEs) and MBS in order to support the real-estate market. Lastly, it was widely involved in the rescues of Bear Stearns and AIG and it undertook massive purchasing of Treasury securities. In the euro area, the Eurosystem

in turn launched two programmes for purchasing covered bonds and the Securities Markets Programme, which was expressed in the purchasing of sovereign bonds on the secondary market. Moreover, the national central banks of the euro area provided arm's-length support for several banking institutions by supplying emergency liquidity assistance (ELA). Some of the actions adopted during the crisis thus changed the allocation of funding between market segments and advantaged or disadvantaged some economic agents. Although they were limited in particular by the application of haircuts, most of the measures also caused certain risks to weigh on the public finances of the States, whether through the capacity of the central banks to distribute the benefits of seigniorage or by way of potential losses. Moreover, the actions of central banks in territory that is close to fiscal policy is not devoid of risks for the central banks themselves. Once they have entered the domain of fiscal policy, they could in fact find themselves more easily subject to pressure from the private sector, the financial markets or governments, in order to pursue the use of their balance sheets to substitute for fiscal policy decisions⁽¹⁾. A situation of this kind may generate moral hazard in that it leads to a reduction in fiscal discipline. Moreover, it increases the risk of fiscal domination of monetary policy and therefore constitutes a potential threat to the independence and the credibility of the central bank, in particular in the case of monetary financing of losses or government debt.

On the other hand, the need to compensate for the financial difficulties that many States are faced with, while at the same time stimulating economic activity, has sparked off new discussions on the objectives and the role of central banks. There are those who argue against the strict objective of price stability which has been assigned to the central banks and the Eurosystem in particular. Some regard the tolerance of a higher level of inflation as an effective way of stimulating the economy at low cost. The arguments put forward range from the devaluation of government and private debts to the strengthening of the central banks' ability to respond in times of crisis⁽²⁾. Others are in favour of the Eurosystem performing a true role as "lender of last resort" for the benefit of the States⁽³⁾. Whereas the Eurosystem has already acted as a provider of liquidity on certain sovereign bond markets, when their sudden drying-up harmed the transmission of monetary policy, they advocate an unlimited commitment in this sense. These two paths pose however a question in the sense that they open the door to a monetisation of government debt and, possibly, to the emergence of an inflationary spiral. They thus present potential dangers for the independence and the credibility of central banks. In this context, and swimming against the current of certain ideas, it is significant that the Federal Reserve equipped itself in January 2012 and for the first time in its history with a long-term target for inflation of 2%.

The scope of the crisis and the rapid progression of events very largely justify the unprecedented extension of the central banks' activities during the last few years. Whilst at the same time maintaining a firm anchoring of inflation expectations, the measures adopted made it possible to prevent the collapse of the financial system and to support economic activity. However, it is important to bear in mind that monetary policy also has its limits. Whilst the crisis demands a rethink on how macroeconomic policy is conducted, it is necessary to remain alert to potential diversions in a context of historically high government debt. The independence of the central banks draws strength from their credibility, and it is vital that the crisis does not sweep away this principle which is so essential to the stability and the prosperity of the economy.

(1) Cf. Plosser (2012).

(2) Cf. Blanchard *et al.* (2010).

(3) Cf. De Grauwe (2011).

3. Key challenges for monetary policy

The monetary policy conducted during the last few years clearly illustrates the breadth of the challenges that confronted decision-makers. The impact of non-conventional monetary policy in particular has been and continues to be uncertain. However, it is already possible to state that

the monetary policy of the United States and the euro area have made a crucial contribution to preventing a complete collapse of the economic and financial system. At the same time, it is worth bearing in mind the risks and challenges to come, which this policy created in turn. Three of these will be examined in this section: firstly, that of the implementation of monetary policy in a context of a large central-bank

balance sheet and major excess liquidity; secondly, the presence of a strong heterogeneity in the euro area both with regard to the transmission mechanism and macroeconomic prospects; thirdly, preventing undesirable secondary effects of a particularly accommodating monetary policy.

3.1 Monetary policy in a context of high excess liquidity

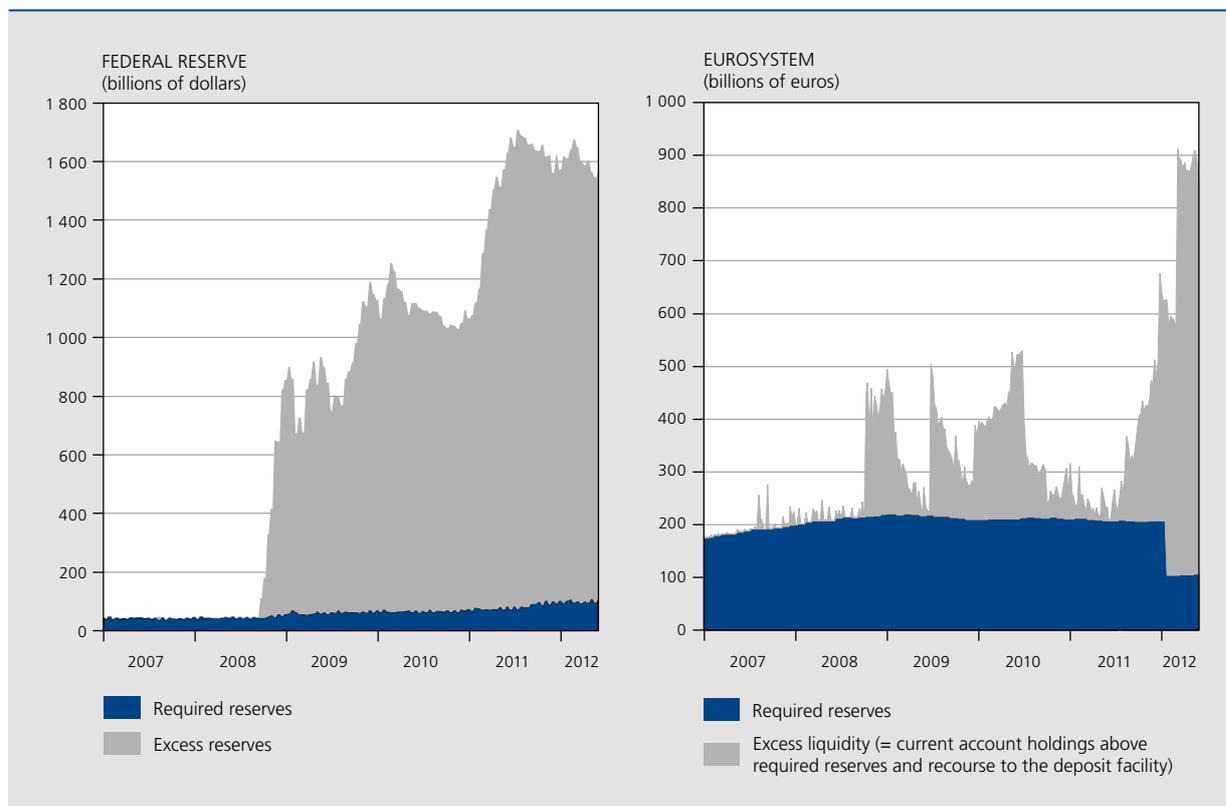
So far, the effects of non-conventional monetary policy had been analysed mainly from the viewpoint of the asset side of the central banks' balance sheets. Recently, however, attention has shifted more towards the liability side, in particular since the sharp rise in the Eurosystem's balance sheet following the three-year refinancing operations. In fact, the scope of the liquidity surplus and its possible impact on monetary growth, bank lending and, not least, inflation are giving rise to more and more questions.

(1) The exceptions to this principle comprise changes in autonomous factors which the central bank does not control directly, such as fluctuations in the demand for banknotes in circulation, government deposits and the monthly outstanding amount of the required reserves.

(2) For more information on the liquidity surplus in the Eurosystem and the use of the deposit facility, see Boeckx and Ide (2012).

The expansion of central bank liabilities is an automatic consequence of policy measures relating to the asset side of the balance sheet and which has made it possible for the central banks to support the financial markets, the institutions in the financial sector and/or the transmission of monetary policy during the crisis. Every time the central banks supply additional liquidity, whether via refinancing operations or the purchase of assets, the corresponding amount is credited to the current account of the counterparty. An individual bank can reduce its excess of liquidity, for example by granting loans, which is not the case for the banking system taken as a whole. Even if the banks lend the central bank liquidity, or use it to purchase securities, as many times as they wish, it changes nothing as regards the liquidity surplus of the banking system as a whole. It is therefore clear that the liquidity surplus is almost entirely determined by the actions of the central bank⁽¹⁾. With regard to the Federal Reserve, these actions take the form of reserves held by the depository institutions. In the Eurosystem, only a very limited, and non-interest bearing, part of the liquidity surplus is maintained on the current account, the bulk being transferred to the deposit facility, which bears interest at a specific rate⁽²⁾.

CHART 10 LIQUIDITY SURPLUS IN THE UNITED STATES AND THE EURO AREA
(selection of liability items)



Sources: ECB, Federal Reserve.

In order to understand the relationship between bank lending on the one hand and the liquidity surplus on the other, it is important to regard the liquidity surplus as one of the many items on the asset side of a commercial bank's balance sheet. Holding this asset item does not therefore need to be regarded as undesirable but rather as the result of a risk/return trade-off. The reserves of a central bank constitute an extremely liquid asset that is devoid of risk, bearing a low interest rate (that is to say the interest on reserves in the United States and the rate on the deposit facility in the euro area, both currently at 0.25%). The fact that this substantial liquidity surplus does not bring about an unbridled credit growth (or, as the manuals say, the monetary policy multiplier remains low) is explained by an opportunity cost that is too low for the holding of this liquidity surplus. In other words, the banks prefer to hold an extremely liquid asset, devoid of risk and bearing interest at 0.25% rather than granting credit to an enterprise or a household or purchasing an asset with a higher interest rate. This preference for holding assets that bring a low rate of return but are free of risk in the current macroeconomic and financial context also stems from the low level of yields on German government securities, for example, that those investors who do not generally have access to the facilities of the central banks are inclined to accept.

The current economic and financial context, in particular in the euro area, is such that there is a greater risk of seeing a credit rationing (credit crunch) and an over-valuation of risk (overpricing) than an uncontrolled expansion of credit. It is also in this context that the liquidity surplus is not necessarily accompanied by a strong upward inflationary risk. However, if the opportunity cost of the excess liquidity were to grow to the point where the banks wish to change the composition of their assets by providing credit or acquiring other assets, with the consequence of the emergence of high inflationary risks, the central bank could, however, tighten its policy. In this way, the opportunity cost of holding excess liquidity would decrease again.

It is in this context that it is worth appreciating the significance of the introduction by the Federal Reserve, in October 2008, of the interest rate paid on reserves (interest on reserves) which can be considered equivalent to the interest rate on the deposit facility in the Eurosystem. This rate tends to create a lower bound, or floor, to prevent the overnight market rate (the federal funds rate) moving to close to zero in the case of considerable excess reserves in the United States. In contrast to what had been expected, however, it does not constitute an absolute floor in that many financial institutions do not have access to the system of interest-bearing reserves and that the necessary arbitrage has not taken place. Nevertheless,

it should assume some importance when the central bank estimates that a rise in rates is required owing to macro-economic conditions.

It can be seen, therefore, that it is not the volume of the liquidity surplus but rather its price, that is to say interest rate received on excess liquidity, that will determine the effect on credit growth, the real economy and inflation. However the volume of the liquidity surplus may have an impact on the overnight market rate within the corridor of interest rates. This can be seen clearly in the euro area since the implementation of the fixed rate full allotment policy, in which the demand for central bank liquidity by the banks is fully met. Thus, variations in the demand for liquidity by the banks in addition to their liquidity requirement always bring about fluctuations in the overnight market rate (Eonia). When the liquidity surplus was substantial, the overnight market rate approached that of the deposit facility, as was clearly the case between June 2009 and June 2010, and again since the end of December 2011 (see Chart 8). When the liquidity surplus was less than an amount falling between € 100 billion and € 200 billion, however, this was clearly less so. This does not take away the fact that this may impact on the monetary policy stance, to the extent that the difference between the overnight market rate and the main policy rate is passed-through other interest rates. In order to counteract its potentially inflationary effect, either the corridor can be narrowed or the liquidity surplus can be absorbed, for example by offering term deposits at a higher rate of interest than that on the deposit facility.

3.2 Heterogeneity in the euro area

3.2.1 Asymmetric transmission of monetary policy

The current financial crisis, in particular the sovereign debt crisis, underlined or even strengthened the heterogeneity between the States in the euro area, to the extent that the domestic banking sector and the national authorities were interconnected. This situation brought with it a greater heterogeneity in the transmission of monetary policy, as shown by the increased dispersion of interest rates on loans to non-financial corporations in the different countries of the euro area. Whereas the maximum dispersion hovered around 2 percentage points prior to the crisis, it grew after its onset to reach 4 to 5 percentage points. Moreover, it is important to note the dispersion increased both upwards and downwards. Thus, during the first few months of 2012, this interest rate settled below the level of 3% in countries such as Belgium, Netherlands, Austria and Germany, whereas in Portugal and Cyprus, for example, the interest rate climbed above 6%.

Several factors may explain this increased dispersion. Thus, the funding cost for the banks, such as the interest rates paid on bank deposits and the rates on their own debt securities issuances, are characterised by increasing differences between the countries in the euro area. In the same way, access to market financing has become more difficult in certain countries, an aspect that has caused a further rise in funding costs. In order to maintain their profitability, the banks are constrained to pass on this rise on their lending rates.

In order to counteract this heterogeneity between countries with regard to the transmission of monetary policy, the Eurosystem had recourse to the measures referred to as non-conventional. Alongside the purchasing of securities in the context of the SMP instituted in May 2010, the main measure was undoubtedly the fixed-rate-full allotment procedure established in October 2008, which made it possible for all the banks (counterparties) in the euro area to obtain financing at the key policy rate, on condition of having sufficient collateral. With the decision of the Governing Council on 8 December 2011 to put forward two three-year refinancing operations, this certainty was offered over a longer term. Moreover, the Governing Council decided to widen the range of assets accepted as collateral for the refinancing operations of the Eurosystem, by lowering the rating threshold for certain asset-backed securities (ABS) and by allowing the

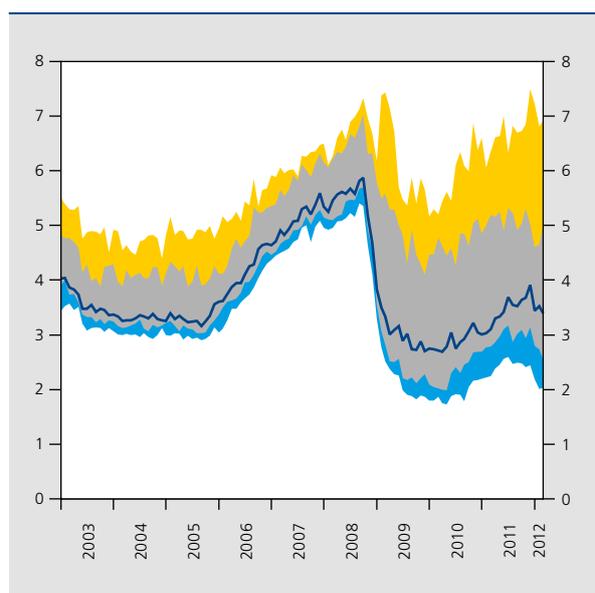
national central banks to accept as collateral additional performing credit claims (namely bank loans) that satisfy specific eligibility criteria. In addition, the reserve ratio was reduced from 2% to 1% from the maintenance period starting on 12 January 2012, thereby reducing the consolidated liquidity need of the credit institutions and freeing up assets used as collateral for refinancing operations of the Eurosystem.

3.2.2 Macroeconomic differences

The monetary policy of the Eurosystem faces heterogeneity not only in the transmission of monetary policy but also in macroeconomic developments. In Ireland and Greece mainly, but also in Italy, Portugal and Spain, the prospects for economic growth remain lower than those of the group DE, FI, LU and NL, and Germany in particular. This is expressed in turn by discrepancies with regard to national inflation as measured by the harmonised consumer price index (HICP) excluding energy and food products. This divergence can be illustrated with the aid of a synthetic measure, that is to say a normative Taylor rule⁽¹⁾. The latter gives an indication on the desirable policy rate as a function of inflation and economic growth. In this exercise, the desirable policy rate in nominal terms is equal to the nominal equilibrium interest rate (equal to the sum of the real equilibrium interest rate and the inflation target) adjusted by the difference compared to, respectively, the inflation target and the potential output⁽²⁾. It thus turns out that the desired key policy rate in the group of countries where the balance sheets of the credit institutions and the public authorities have remained relatively healthy (DE, IF, LU and NL) is currently higher than that of the group of countries where this is not the case (IT, ES, PT, IE and GR). For the euro area as a whole, the desired rate is hovering at present, according to this criterion, between 0.5% and 1%, which is close to the current level of interest rates.

Since the implementation of the Eurosystem's monetary policy is aimed at maintaining price stability in the euro area as a whole, the Governing Council evaluates the monetary policy stance for the euro area as a whole. The national trends form part of the available information on which the monetary policy decisions are based but the latter are never tailored to the benefit of one country in particular. It is not the first time that the euro area has seen strong macroeconomic divergence, but at that time the groups of countries occupied opposite positions to those that they occupy currently. In those days, the rule

CHART 11 MFI LENDING RATES IN THE EURO AREA COUNTRIES: LOANS TO NON-FINANCIAL CORPORATIONS
(percentages, quartiles, all maturities combined)

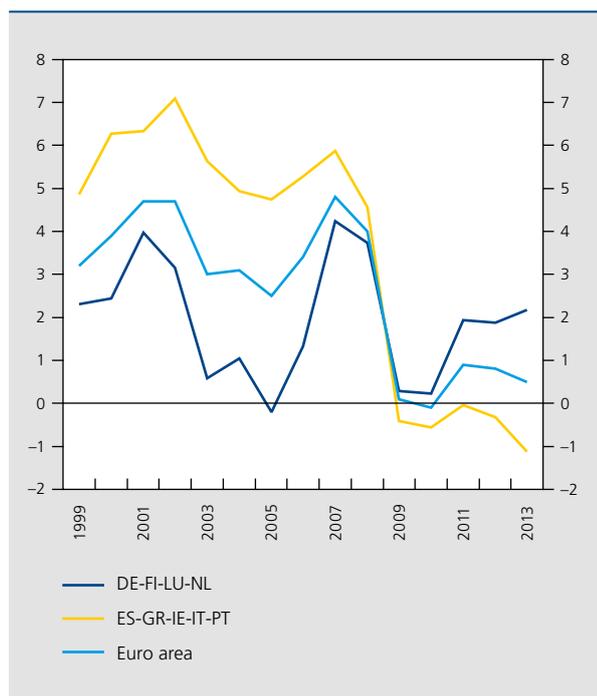


Sources : ECB, NBB.

(1) Cf. Taylor (1993).

(2) Measurement of the potential level of activity is, in particular since the recent recession, mired in numerous uncertainties. Consequently, the precise level of the key policy rate desired as prescribed by a normative Taylor rule must be interpreted with all the necessary caution. Nevertheless, it is not inappropriate to state that alternative criteria for measuring economic activity would not invalidate the finding of a substantial divergence within the euro area.

CHART 12 NORMATIVE TAYLOR RULE ⁽¹⁾



Sources: December 2011 OECD Economic Outlook, calculations by the NBB.
 (1) The normative Taylor rule as applied is: $i_t = R^*_t + \pi^* + 1,5(\pi_t - \pi^*) + 0,5(\text{output gap}_t)$. R^*_t = equilibrium real interest rate approximated by the potential output growth during the year t , π_t = inflation measured by the harmonised consumer price index (HICP) excluding energy and food products, π^* = inflation target = 1,9 %. The groups of countries are weighted by GDP. DE-FI-LU-NL represent around 37 % of the euro area GDP, ES-GR-IE-IT-PT around 34 %.

was the same: monetary policy was conducted for the benefit of the euro area as a whole but, during the period 2002-2007, the desirable key rate according to the normative Taylor rule settled a little above the main policy rate of the ECB.

3.3 The risks of a highly accommodating monetary policy over a prolonged period

Whilst it is not easy to determine its exact scope, the highly accommodating nature of the respective monetary policies of the Federal Reserve and the Eurosystem at the present time is in no doubt. At 1 % for the Eurosystem and sitting within a range of 0 % to 0.25 % for the Federal Reserve, the key policy rates are in fact standing at historic lows. In real terms, they have now been largely negative for around two years. Moreover, owing to the liquidity surplus prevailing on the money market, the Eonia rate in the euro area is situated at a level close to the rate on the deposit facility, that is to say 0.25 %. Lastly, in the euro area, the opportunity offered to the banks to obtain the entirety of the liquidity demanded at a fixed rate indexed to the main policy rate is a guarantee for them

that they are able to refinance themselves on particularly advantageous terms.

This accommodating nature of monetary policy is justified by the continued weak financial and macroeconomic situations. However, in order to prevent any perverse effects in the future, it is important to keep an eye on the potential secondary effects. Various risks may result from the conduct of a particularly accommodating monetary policy over a long period. In this article, seven of these are presented.

The first risk is that of delaying the necessary adjustments of the balance sheets. Very low interest rates and generous liquidity provision in fact reduce the opportunity costs for the banks of holding non-performing assets. They offer time to adjust balance sheets but do not resolve the solvency problems⁽¹⁾. As far as the public sector is concerned, moreover, low yields are keeping interest rate charges at a low level, something which may give the impression that the debt is sustainable or even that it can swell further.

The second is that of encouraging risk-taking and indebtedness. Experience shows that particularly low interest rates tend to encourage carry-trade operations, which are aimed at speculating on differences in yields. The search for high yields in turn promotes risk-taking and the development of speculative bubbles. Moreover, the combination of low interest rates over a long period and the rise in the value of the assets that it generates tends to reduce the perception of risk. It may thus bring about excessive credit growth and indebtedness.

The third is the loss of markets' capacity for correct price-setting in a context where the purchasing and lending operations of central banks may considerably affect this price-setting for certain assets. The holding of large quantities of assets by the central banks may thus weaken the signal sent by the market or reduce it to a simple reflection of the market's expectations with respect to the central banks' future action. Moreover, changes in the criteria for the assets accepted as collateral for liquidity-providing operations may also be a source of distortion for prices on the markets.

Fourthly, and not unrelated to the previous risk, an overly significant role of the central banks in the capacity of market-maker may simply result in the atrophy of the markets and a situation where the central bank acts in the capacity of financial intermediary in the place of the private sector. Moreover, with regard to the money

(1) Cf. Hannoun (2012).

market more specifically, it has been observed that a low interest rate had a squeezing effect on the market. When the operational costs linked to the execution of operations are higher than the rate received, the participants tend in fact to turn away from these operations, something which reduces the size of the market⁽¹⁾. Currently, the question thus arises of knowing whether the money market will one day recover the activity as it was prior to the crisis or whether the central bank will retain a more pronounced intermediary's role in the future.

Fifthly, a highly accommodating monetary policy is a potential source of inflation. On the one hand, a rapid and unexpected credit expansion could generate an increase in domestic demand and upward pressure on prices. On the other hand, a rise in the holding of assets, and sovereign bonds in particular, by the central bank could kindle fears of monetary financing and could be expressed in an upward revision of expectations for inflation. This is the risk linked to the fiscal dominance that was examined in Box 2.

Sixthly, the combination of low short-term interest rates and a steeper yield curve intensifies the exposure of economic agents to interest-rate risk. In fact, it makes long-term investments more profitable but tends to promote short-term loans, an aspect which magnifies the refinancing risk in the case of an unexpected increase in interest rates.

Seventhly and lastly, the longer the policies remain in place, the more difficult it is to exit from them. The combination of delayed adjustments, new sources of fragility, a disturbed market signal and the atrophy of the market may make the central banks more reluctant to normalise policies⁽²⁾. The addiction of many banks in the euro area to the Eurosystem and, potentially, of the US government to the Federal Reserve complicates matters additionally. It is essential that the fundamental problems are compensated for by way of adequate measures (budgetary rebalancing, structural reforms and restoration of the banks' capital base), at the risk of an overly slow and overly delayed exit. Moreover, the fact that highly accommodating policies are being conducted at the same time by the world's main central banks globalises the reach of the risks attached to them.

(1) Cf. BIS (2010).

(2) Cf. Hannoun (2012).

Conclusion

Beyond the lowering of their key policy rates, the Federal Reserve and the Eurosystem both responded to the financial crisis by adopting numerous non-conventional monetary policy measures. From the appearance of the initial tensions on the money markets up to the months that followed the insolvency of Lehman Brothers, the two central banks were largely faced with the same challenges, namely preserving financial stability, maintaining the effective transmission of monetary policy, stimulating economic activity and ensuring price stability. Whilst each of them revised the operational framework of its monetary policy, the initial monetary policy framework and the predominance of the non-banking financial sector in financing the economy in the United States forced the Federal Reserve towards more substantial changes.

Since the beginning of 2010, however, the challenges have clearly diverged and elicited more specific responses. In order to stimulate growth and reduce the risk of deflation in a context of historically low rates, the Federal Reserve, for example, undertook massive purchasing of Treasury securities with the aim of applying pressure to long-term rates and developed its communication policy in order to influence expectations. For its part, in order to preserve the effective transmission of monetary policy in the context of the sovereign debt crisis, the Eurosystem launched its Securities Markets Programme. In the face of the improvement in the economic situation and the upside risks weighing on price stability at the beginning of 2011, it raised its key rates before reducing them again at the end of the year, following a worsening of the tensions on the sovereign debt markets and a deterioration in the macroeconomic outlook. In order to prevent a credit rationing, it moreover took additional, non-conventional measures of monetary policy.

The action taken by the central banks in the course of the last few years has largely made it possible to prevent the collapse of the financial system and to support economic activity. However, this in turn presents its own share of challenges and risks. Whilst the current high level of excess liquidity is not a direct threat to price stability, conducting an accommodating monetary policy over a long period may bring with it numerous perverse effects. It is important to remain aware of the limits of monetary policy, which is not a substitute either for the capital strengthening or the conduct of healthy fiscal and structural policies. Whilst the crisis demands a rethink on how macroeconomic policy is conducted, it is moreover essential, in a situation of high government debt, to safeguard the principles on which the credibility of the central banks is based.

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