THE ROLE OF CENTRAL BANKS IN THE FINANCIAL CRISIS:
LESSONS FOR THE FUTURE

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Introduction

In summer 2007 a relatively minor financial development –an increase in non-performing loans in the high-risk mortgage segment in the United States– triggered a financial crisis which, as it subsequently gathered speed as a result of the bankruptcy of the US investment bank Lehman Brothers, reached unprecedented proportions and geographical extension. True to the behaviour pattern identified by Carmen Reinhart and Kenneth Rogoff (see Reinhart and Rogoff, 2009), this financial crisis eventually led to a crisis in the real sector whose effects became apparent in late 2008 and were particularly severe in the following year, when the world economy underwent the sharpest contraction seen since the end of the Second World War.

At the time of writing of this article, this situation is far from having returned to normal, particularly in Europe, where the sovereign debt markets continue to be subject to strong tensions and three euro area countries (Greece, Ireland and Portugal) are under financial support programmes of the European Union and the International Monetary Fund. Despite this, the world economy has taken a path of progressive, although bumpy, recovery which is being clearly led by the emerging economies, and the general conditions in the international financial markets seem to be tending towards a gradual return to normality, within a climate of enormous uncertainty associated with the serious sovereign debt crisis afflicting the euro area and with the risk of falling back into recession which, although unlikely, has not been sufficiently ruled out. All in all, the most likely scenarios for the coming years suggest that the world economy has managed to circumvent the serious danger of repeating an episode similar to the Great Depression of the 1930s.

The path of the world economy would unquestionably have been very different if economic policy had not responded rapidly and forcefully to apply the lessons in macroeconomic thinking learnt from the mistakes committed in the 1930s. The recourse to expansionary demand policies and to the activation of financial rescue mechanisms managed to detain the process of feedback between tensions in the real and financial sectors usually seen in crises of this size and which began to feature dangerously in the world economy from the closing months of 2008. More specifically, governments widely adopted discretionary measures to stimulate spending and quickly designed and put into practice plans to support their respective financial systems and restore investor confidence. These actions, moreover, were carried out following common basic principles decided at world level in the G20. It is important to realise that, like the crisis itself, the attempt at widescale international coordination of economic policy responses was historically unprecedented. It thus comes as no surprise that its undeniable virtues were tempered by shortcomings and hesitancy.

The action of governments was accompanied by a no less timely and forceful reaction from central banks, which led to a relaxation of the general monetary policy stance in the

1 This article is the authors' contribution to the forthcoming report "Mecanismos de prevención y gestión de futuras crisis bancarias" coordinated by Fundación de Estudios Financieros, where the original Spanish version can be found.

INTERBANK - OIS SPREADS

CHART 1

SOURCES: European Central Bank and Datastream.

main economic areas and to changes in scope in their respective operational frameworks. In fact, given the greater flexibility with which monetary policy can act, it was the reaction of central banks that took the leadership in operations and was instrumental in dealing with the risk of widespread liquidity crises, which, had it materialised, would have triggered a dangerous contractionary vicious circle which other branches of economic policy could have done little or nothing to combat. This article seeks precisely to analyse in detail this reaction of the monetary authorities, comprehend their contribution to overcoming the tensions and draw the appropriate lessons from this experience. More specifically, our work focuses above all on the actions of the European Central Bank (ECB) and the US Federal Reserve (Fed). The singular geographical pattern of this crisis, centred on this occasion on the advanced economies, and the importance of the United States and the euro area in this context justify this selective approach which, moreover, allows a comparison of the European and US experiences. As will be seen below, this comparison will allow us to extract some important teachings on the design of monetary policy strategy and operational framework. This does not imply that experiences of great interest are not to be found in the specific reaction of other central banks or that all the cases fit one of these two patterns, although it is true that debate has polarised around these two models. For this purpose, after this introduction we review the measures adopted by the ECB and the Fed from the outbreak of the crisis (Section II), consider the main challenges and possible lessons to be learned (Section III) and close with a brief set of conclusions (Section IV).

The reaction of central banks to the crisis

The effects of the financial crisis which erupted in summer 2007 were quickly felt in the European and US money markets, thus impacting a key link in the monetary policy transmission mechanism. A commonly accepted indicator for calibrating the level of tension in these markets is the spread between the EURIBOR interest rate on a deposit in the interbank market and the rate on an overnight interest swap (OIS) of the same maturity.[2] Chart 1 shows this spread for terms of three and 12 months. It can be seen that risk levels rose considerably from August of that year. They then remained relatively steady until the bank-

2 In both cases the underlying transactions are between financial institutions operating in the money markets, but while in the first the risks affect both the interest and the principal of the transaction, in the second there is no principal risk since the transaction is only a swap of interest rates of different maturities. Given the greater relative weight of principal risk in a short-term interbank deposit, the changes in this yield spread are a good approximation of the behaviour of general counterparty risks in the money market.

ruptcy of Lehman Brothers in autumn of the following year triggered a fresh, sharper surge in tensions.

In the case of both the ECB and the Fed, the liquidity provided by the central bank to the financial system via its open market operations is subsequently redistributed among institutions, precisely through the money markets. Consequently, when the market tensions began to obstruct this task of liquidity redistribution, both monetary authorities took measures to mitigate their effects. Eventually, these measures led them to progressively take on that liquidity redistribution function which, under normal conditions, is carried out by the money markets.

At first, the two monetary authorities reacted fairly similarly. However, unlike in the case of fiscal and financial sector support policies, here one cannot speak of *ex ante* coordination between independent central banks or between these and governments, although it is true that, *ex post*, the actions taken by all of them tended to reinforce each other. In this initial phase, the actions taken by the ECB and the Fed were limited to liquidity management and did not, therefore, change their monetary policy stance, the size of their balance sheets or key aspects of their balance sheet composition.

More specifically, the ECB reacted by implementing a more generous liquidity policy, initially through more numerous fine tuning operations (four of them took place in the second week of August 2007) and, afterwards, through higher allotment volumes in its regular monetary policy operations.[3] This higher liquidity provision did not, however, lead to higher net volumes of liquid funds in circulation, since a substantial portion of the funds initially provided was reabsorbed by the ECB itself subsequently through its deposit facility, in which institutions placed a part of the liquidity that they had requested, not so much on the basis of their true needs, but as a precaution due to their lack of confidence in the proper functioning of the money markets. In fact, when the money markets function properly, the central bank, which is the ultimate supplier of the liquid funds required by banks, limits itself to meeting the net demand of the system, which is subsequently redistributed among banks through the money markets. By contrast, when the money markets are unable to efficiently intermediate between individual banks, the central bank receives the gross demands of each. To avoid friction, the solution is first to satisfy this gross demand and subsequently withdraw the related excesses through some other instrument.

Additionally, the ECB lengthened the average term of its monetary policy loans by increasing the relative weight of longer-term refinancing operations (LTROs) at the expense of main refinancing operations (MROs), the maturity of which is one week. More specifically, it increased the number of three-month LTROs and introduced new six-month operations in spring 2008. It also changed the distribution of the volumes provided by MROs over the maintenance period of the minimum reserve ratio. It increased the volume of MROs executed in the opening weeks of the maintenance period at the expense of those executed in the closing weeks of that period (frontloading), thus accommodating the desire of institutions to assure relatively early compliance with the requirements derived from that ratio.

3 Regular monetary policy operations include weekly liquidity providing operations with a maturity of one week (main refinancing operations) and monthly liquidity providing operations with three-month maturity (longer-term refinancing operations). Fine-tuning operations are not regular and may be either liquidity providing or liquidity draining. Readers interested in this topic can find a detailed description of the operational framework of euro area monetary policy in ECB (2011).

In short, with these measures the ECB accommodated the change that took place in the pattern of demand for liquidity from the central bank as a result of banks' progressive loss of confidence in the capacity of the money market to meet their needs and of a growing uncertainty as to their liquidity flows. It should be noted, moreover, that the ECB managed to make these changes without having to revise or reform the operational framework in place, which thus evidenced a notable degree of flexibility.

The Fed also exploited the room for manoeuvre offered by its operational framework[4] by lengthening, for example, the maturity of the loans offered through its discount facility. However, the limitations of this framework promptly became evident and, to accommodate a similar change to the European one in the liquidity demand pattern of its banks, it had to introduce new instruments not previously envisaged. In December 2007 it created the Term Auction Facility and, in March 2008, the Primary Dealer Credit Facility to enable it to make monetary regulation loans more flexibly. Additionally, it instituted mechanisms to increase the assets held by banks eligible for use as collateral in their bids and, therefore, to increase their ability to raise liquid funds from the Fed. More specifically, the Fed started up a facility to lend US Treasury bills, which are liquid assets discountable in monetary policy operations, in exchange for other ineligible illiquid assets such as those from mortgage securitisation transactions (mortgage backed securities).

In short, these tools share the common goal of facilitating direct access to the Fed by a larger number of banks and enabling these to use a wider range of collateral. Hence the changes in the Fed's operational framework tended to make it more similar to that of the ECB, which since inception has, for diverse reasons including historical ones, admitted a wide range of counterparties and collateral.[5]

To conclude the review of this first phase, and as further evidence of the similarities that tended to predominate in it, mention should be made of the agreement concluded between the Fed, the ECB and other central banks to open currency swap lines with each other for the basic purpose of ensuring appropriate provision of dollar- or euro-denominated liquidity to credit institutions not resident in the United States or the euro area. That new instrument enabled each central bank to provide its counterparties with funds not only in its own currency, but also to cater for their current flows of income and payments in other currencies.

The bankruptcy of Lehman Brothers in September 2008 marked a qualitative leap in the evolution of the crisis. Tensions accelerated in the financial markets, including the money markets, as is clearly reflected in Chart 1. Moreover, the financial crisis began to also affect the real sector of the world economy. Thus the actions being taken to expedite and increase the provision of liquidity, which continued to be necessary, had to be supplemented in two ways. This was done, firstly, through an easing of monetary policy stance to accommodate it to a sudden cyclical change which fuelled deflationary risks and was sharper in the United States than on this side of the Atlantic. And secondly, through a fresh set of non-standard measures broadly designed to repair financial market segments which lie outside the money markets but are also important for the normal functioning of the monetary policy transmission mechanism.

4 For more details of the operational framework of the Fed's monetary policy, see Ennis and Keister (2008).

5 For example, the diversity of the assets eligible as collateral is not unrelated to the need, when the euro area was created, to assimilate the previous lists of eligible assets of the various national central banks.

In the field of liquidity management policies, the ECB was more proactive than the Fed. In October 2008 MROs and LTROs ceased to be executed through variable-rate tenders (at a minimal interest rate in the case of the former) and were changed to a fixed-rate full allotment procedure. This step consummated the progressive replacement of the money market's intermediary role by a mechanism based on a direct relationship between banks and the ECB.[6] Also, a new liquidity providing operation was created with a maturity coinciding with the minimum reserve maintenance period, so any banks that so desired could ensure, at the beginning of that maintenance period, the availability of the total volume of liquidity needed to meet their reserve requirements. Also, the list of assets eligible as collateral in monetary policy operations was extended temporarily to ensure that banks would not be constrained in their requests in this respect and, in May 2009, the average maturity of monetary policy operations was further lengthened through the inclusion of a special new operation with a 12-month maturity, also carried out under the fixed-rate full allotment procedure. The swap lines for the provision of US dollar liquidity were re-opened and strengthened.

The Fed's most significant action in this area was perhaps the decision to remunerate the reserves held by banks. This initiative, which represented an additional step in approximating the operational framework of US monetary policy to that of the ECB, permitted a clearer and more effective separation between decisions merely relating to liquidity management and those aimed at changing monetary policy stance.

Precisely with regard to changes in monetary policy stance, on 8 October 2008 the ECB and the Fed (in conjunction with other central banks such as those of the UK and Japan) cut 50 basis points from their respective official interest rates in coordinated action. This interest rate reduction marked the beginning of a period of progressive easing of monetary policy stance. By the end of the year the federal funds rate had dropped to 0-0.25%[7] from a value of 2% before the bankruptcy of Lehman Brothers. The process was even more drawn out in the case of the ECB, which also started from a higher level in line with its different cyclical position in autumn of that year. Between September 2008 and May 2009 the minimum interest rate on MROs dropped from 4.25% to 1%. In any event, both institutions set their official policy rates effectively, or in practice, at a short distance from the absolute minimum possible, thereby exhausting the room for policy response available under conventional measures.

The closely parallel course of the actions of the two central banks described above did not, however, extend to non-conventional measures. As argued by Lenza et al. (2010), the divergences are largely attributable to structural differences between the financial systems on one and the other side of the Atlantic: the European system based on a central role of credit institutions as intermediaries in the financial flows of the economy, and the US system, by contrast, much less dependent on banks and with a leading role played by markets. But it is also likely that the divergences observed in the use of non-conventional monetary policy tools reflect a differing perception and assessment of the risks assumed by the central bank in actions of this type.

In May 2009 the ECB started a programme to purchase covered bonds for a total amount of €60 billion. This measure aimed to improve the liquidity of this market segment, which

6 The movement was supplemented by the narrowing of the corridor formed by the interest rates on the ECB marginal lending and deposit facilities, which went from 200 to 100 basis points symmetrically distributed around the fixed interest rate of the MRO tenders.

7 From December 2008 the Fed started to set its target for this type of funds in the form of a range.

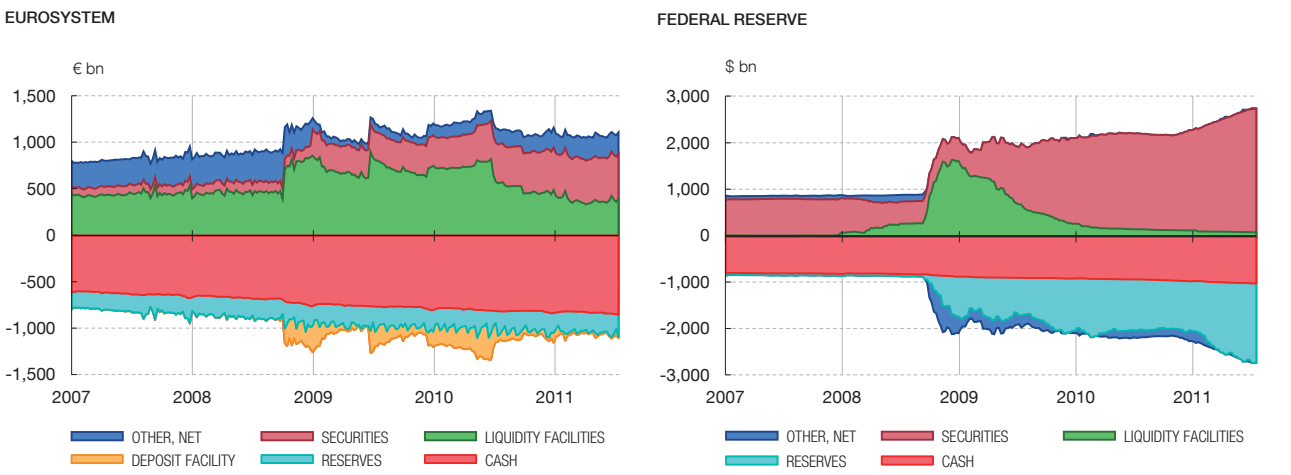
had traditionally played a major role as a supplier of wholesale funds to European banks and had been strongly affected by the crisis. It is evident from the size of the programme that the ECB did not in this case intend to replace this market, but rather to promote its recovery, pre-empting the possibility that its blockage might adversely affect the volume and cost of bank loans and consequently the satisfactory transmission of monetary policy.

A year later, the outbreak of the sovereign debt crisis in the euro area as a result of the Greek fiscal crisis made it necessary for the ECB to resort to a new asset purchase programme: the Securities Market Programme. The strong tensions then prevailing in euro area sovereign debt markets were manifested in the high spreads between the debt of the various countries, which, although partly reflecting certain vulnerabilities and risks to the sustainability of public finances in some member countries, also stemmed from investors' doubts as to whether the euro area's institutional architecture would be able to cope with the risks to the stability of the area as a whole, which, if not remedied, might spawn self-fulfilling expectations. These processes, which left to develop according to their own dynamic tended to spread the contagion to other euro area economies whose respective fundamentals were relatively independent, represented a serious threat to the monetary policy transmission mechanism, since they tended to upset the required minimum uniformity in the euro area. In those exceptional circumstances, when the crisis resolution mechanisms were in their incipient and complex processes of discussion, only the intervention of the ECB in the secondary debt markets was able to halt the destructive potential of the processes of contagion and stabilise the situation. Note that, unlike in the US model, these interventions did not seek to influence the yield curve so as to enhance the expansionary nature of monetary intervention, but simply to prevent the instability from spreading throughout the group of countries which combine national sovereignty in their public finances with a shared currency, since this would have seriously eroded the effectiveness of the single monetary policy.

The recourse to this programme represented the adoption of the non-conventional measure furthest removed from the ECB's usual operational framework, although it was, as noted above, intended to restore the conditions needed for proper transmission of monetary policy to the euro area as a whole. It was not an instrument for quantitative expansion of the monetary base. In fact, the effects that the purchases made under this programme had on the liquidity provided by the ECB were subsequently sterilised by liquidity-absorbing fine-tuning operations so as not to affect the net volume provided.

In the first few months of the programme, the purchases amounted to around €60 billion. The pace then slowed substantially and, from spring 2011, the balance remained steady at slightly above €76 billion. Subsequently, in summer 2011, when, owing to the need for a second Greek rescue, tensions flared up again in the debt markets and contagion spread to economies such as Italy and Spain and even affected other economies with an undisputed record of stability, it was necessary to reactivate the programme and make fresh purchases for the same purpose, although with the specific requirements derived from the greater size and depth of the debt markets affected by this fresh bout of instability. The reforms designed to strengthen euro area economic governance already envisaged the need for an institution able to carry out tasks to stabilise these markets. The agreements adopted made provision for the European Financial Stability Facility to carry out that function, but at that time it was not operationally feasible. During this second bout of instability the additional purchases of debt of countries subject to speculation against them in their secondary debt markets reached around €50 billion at the end of August 2011 (latest information available at the cut-off date of this article).

CENTRAL BANK BALANCE SHEETS (a) CHART 2



SOURCES: European Central Bank and Federal Reserve.

a In July 2011 the total on-balance-sheet assets of the Fed amounted to $2,282 billion and those of the Eurosystem to €1,957 billion.

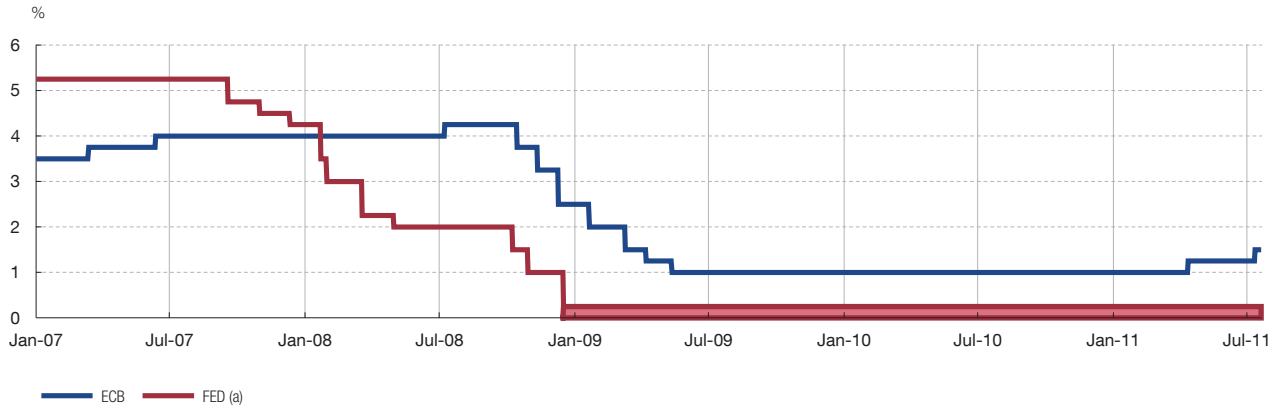
In any event, asset purchases were much more significant in the case of the Fed, which made them for a clearly different purpose. First, it participated actively in the government programmes to support the financial sector by making outright purchases of different securities arising from asset securitisation, most notably those issued by the agencies Freddie Mac and Fannie Mae, which play a central role in the US mortgage market. As in the case of the ECB's purchase of covered bonds, the basic idea here was to bolster a significant segment of the monetary policy transmission mechanism (that running from the official interest rate to the rates determining the house purchase decisions of households). However, the financial difficulties being faced at that time by these two agencies, the main issuers of the securities purchased, added an additional dimension to the Fed's intervention at the frontier between monetary policy and financial policy. In Europe, however, the securities purchased by the central bank had a wider variety of issuers.

March 2009 saw a far-reaching qualitative change when the Fed decided to set in motion the programme known as "Quantitative Easing I" to acquire outright assets amounting to $1,750 billion ($1,250 billion of State agency debt, $300 billion of Treasuries and $200 billion of other assets). This was a purchase of government debt on a scale far exceeding that of the ECB purchases and for the express purpose of making a lasting contribution to the easing of monetary and financial conditions, in consonance with the overall expansionary sign of policies to expand demand. Chart 2 shows the impact of this programme on the size of the Fed's balance sheet and compares it with that of the ECB's programmes.

As a result of the differing focus of these actions on one and the other side of the Atlantic, the boundary separating monetary policy from fiscal and financial stability policies became much less precise for the Fed than for the ECB. From the central European standpoint, the blurring of the boundaries between the various economic policy tools in the USA entails obvious risks for the independence and credibility of the monetary authority. Firstly, because it increases the demand for greater and closer coordination of the decisions taken in the various areas, which, on past experience, has nearly always tended to reduce the central bank's freedom of action in the pursuit of its main objective, particularly when this relates to achieving price stability. Secondly, the larger balance sheet of the monetary authority as a result of increased holdings of financial assets purchased outright entails a

MONETARY POLICY INTEREST RATE

CHART 3



SOURCE: European Central Bank and Federal Reserve.

a Since 16 December 2008, the Fed defines its interest rate in the form of a band between 0% and 0.25%.

higher risk of financial losses. Should these risks materialise in the form of significant losses, it would have to be recapitalised by the government in power at the time. Otherwise, the central bank would be unable to maintain price stability.

The divergences noted between the action of the Fed and the ECB have widened recently, against a background of uneven recovery in the respective economies. Last year the Fed extended its asset purchase programme by an additional $600 billion under its so-called "Quantitative Easing II" programme. In contrast to this further increase in the Fed's balance sheet, the ECB was letting its extraordinary six- and 12-month refinancing operations mature without rolling them over. Although the regular three-month operations reabsorbed a portion of the related demand for liquidity, the substitution was not complete (see Chart 2), and this had the effect of reducing the institution's balance sheet. However, the reawakening of the sovereign debt crisis tensions in summer 2011 prompted the ECB to reintroduce the six-month tender to alleviate the greater need for liquidity due to the heightened uncertainty.

The discrepancies have also extended into the terrain of the conventional measures relating to monetary policy stance. In April and July 2011 the ECB decided to raise the interest rate on its main refinancing operations by 25 basis points on each occasion, so that at the cut-off date of this article the official rate stood, as shown in Chart 3, at 1.5%. These decisions were justified by the progressive firming of the economic recovery in the euro area and by the emergence of risks to price stability associated with energy price movements and their possible second-round effects, with possible rises in indirect taxes as a part of the process of fiscal consolidation under way and with higher pressure from domestic demand, against a background of growing use of productive capacity in the euro area. These conditions made it necessary to adjust the markedly accommodative stance of monetary policy which for nearly two years had kept the official rate at an all-time low of 1%. The risks that might derive from holding interest rates exceptionally low for too long a time, when the euro area had already entered a phase of moderate but sustained recovery, influenced the decision to opt for a gradual normalisation of monetary conditions. However, the resurgence of financial tensions as the sovereign debt crisis spread meant that this trend had to be revised.

Lessons of the crisis and challenges for the future

As described in the previous section, both the ECB and the Fed have deployed a wide range of measures in response to the crisis. It is not, however, easy to assess empirically

the effectiveness of these actions. To the usual problems involved in any estimate of this nature must be added in this case an additional difficulty resulting from the absence of an adequate alternative (i.e. counterfactual) scenario against which to gauge the effectiveness of decisions. From a different standpoint, it is in any event hard to doubt that the joint coordinated (at least partially) action of the economic authorities stopped the dangerous spiral of financial deterioration and economic contraction in which the world economy found itself in the final stretch of 2008 and in the first few months of 2009.

Having said this, it should be noted that the empirical studies available tend, generally speaking and always subject to the proviso that they should be interpreted with extreme caution, to corroborate the effectiveness of both the conventional and the non-conventional monetary policy measures adopted (see, for example, the work on the euro area by Lenza et al., 2011 and the studies cited by them, and that on the USA by Chung et al., 2011). These works suggest that both the spreads approximating the degree of tension in the money markets and some of the main economic variables located towards the end of the monetary policy transmission mechanism (such as bank interest rates or credit) responded to central bank action with movements in the desired direction. The range of uncertainty to which the estimates are subject, however, does not allow the true magnitude of these effects to be determined with sufficient accuracy.

The effectiveness of the measures, moreover, depends also on their duration. In fact, precisely because of their exceptional nature, many of the measures taken have to be of limited duration so as not to compromise their efficacy or to avoid undesired secondary effects. It should not be a central bank goal, for example, to act permanently as an intermediary in liquidity flows between banks or to become permanently a kind of market maker in certain financial market segments. Prolonging these non-conventional actions beyond the strictly necessary limits would tend to generate distortions in those markets and perverse incentives between the agents participating in them. This is certainly the most important challenge facing the ECB and the Fed at this time: to define the most effective schedule for withdrawing these non-conventional support measures so as to safeguard against these perverse effects without, at the same time, prejudicing the progressive recovery of markets and growth. In this respect, as noted above, at this time the ECB is at a comparatively more advanced stage than the Fed.

Along with this more immediate challenge, another more distant but no less significant one can be identified: that of drawing useful lessons for the future conduct of monetary policy from the crisis and from the actions taken.

With the due caution befitting the high level of uncertainty still surrounding the performance of the main financial markets and of the US and European economies and hence how fast they will exit the crisis, a first lesson that can be drawn from the experience relates to the design of the operational framework of monetary policy. More specifically, the approach taken by the ECB at the outset of the crisis provided a high degree of flexibility which, in an extraordinarily convulsive financial setting, allowed it to accommodate substantial changes in its manner of monetary policy implementation and in financial system liquidity management without need for major modifications. In this respect, it should be noted that a significant part of the changes made to its operational processes by the Fed can be viewed as a shift by it to a framework more similar to the European one, based on the interaction with a large number of counterparties, the use of a wide range of instruments and the acceptance of a relatively extensive list of collateral including financial assets other than traditional government debt, albeit always with a sufficiently high level of soundness.

There are also significant teachings to be had from the crisis in the area of monetary policy strategy. More specifically, this episode is providing an interesting testing ground to improve our understanding of the limitations of this economic policy tool for dealing with certain types of shocks (e.g. those underlying the current tensions) and of the risks entailed in trying to move beyond them. In this respect, it should not be overlooked that this crisis originated and initially developed in the financial area. Frictions in a relatively limited segment of the US mortgage market, no matter how strong, cannot cause tension on the scale seen recently except as a consequence of much deeper structural weaknesses. We now know that the strong dynamism of the prices of some financial and real assets and the growing leverage of the financial and non-financial private sector were based on a general underestimation of risk by investors and an inability of the economic authorities to detect that underestimation and remedy its negative effects in time.

The generally accepted primary objective of monetary policy is to maintain price stability. However, the events before and during the crisis are more directly and immediately related to problems of financial stability. It comes as no surprise, then, that the crisis has reactivated the deep discussion over the part played by the monetary authority in achieving financial stability. The wide range of positions in this debate extends from the maximalists, who defend the inclusion of express targets in terms of the price stability of financial assets (and some real assets, such as houses), to what may be termed the "Greenspan doctrine", expounded by the then Chairman of the Fed at the meeting of central bankers in Jackson Hole in 2002, according to which all that the monetary authorities should do in this field is to limit themselves, in the event of an outbreak of financial instability, to ensuring that it does not degenerate, via recession, into deflation. More or less equidistant between these two positions is the "BIS doctrine" (see Borio and Lowe, 2002), which can be briefly summarised as asserting that monetary policy should take into account *ex ante*, rather than just *ex post,* the possible effect of financial instability on inflation, paying special attention above all to potential frictions which, although relatively unlikely, could be particularly harmful if they materialised. The monitoring of asset prices and credit behaviour would thus play a key role in the design of monetary targeting strategy, with complementary tasks in the dual pursuit of price and financial stability.

The experience garnered from this crisis indeed confirms that monetary policy is fully equipped to act effectively, as argued by Greenspan, against the risk of deflation associated with a bout of marked financial instability. However, the huge cost of the crisis seems to point to the need to seriously consider how to include in monetary policy strategic design the considerations derived from the focus of the BIS economists, without detriment to the priority of the price stability objective. This need not signify the broadening of central bank objectives to include that of maintaining financial stability, since this could dangerously dilute the responsibility of central banks, given that the management of short-term interest rates, which is the tool used by monetary policy, has a limited ability to influence the behaviour of financial asset prices. In a certain sense, the recourse by the ECB and the Fed to extraordinary unconventional measures to correct the frictions detected in certain financial market segments relevant for the transmission of monetary policy illustrates this limitation. The difficulties increase additionally if that single instrument has to serve simultaneously to meet two objectives which, as shown by the experience of low inflation and accumulation of financial imbalances that preceded the crisis, do not always reinforce each other.

Unfortunately, when it comes to assuming the objective of financial stability, similar objections and difficulties may be raised in the case of other economic policy instruments such

as microprudential supervision or fiscal policy. As regards microprudential supervision, the financial crisis has made it clear that the individual soundness and solvency of banks is not a sufficient condition for the stability of the financial system as a whole. For its part, fiscal policy, because of the instruments it uses and, more importantly, the inertia and lags with it acts, is not a sufficiently precise tool to halt the build-up of financial imbalances.

In view of the evident limitations of the readily available tools, it is generally acknowledged that there is a need to develop a specific new area of economic policy with an eminently preventive focus and the express objective of ensuring the stability of the financial system as a whole and minimising the effects of potential tensions on the real economy: macroprudential policy. This seems to be one of the most unanimously accepted lessons to be learned from the crisis. A completely different matter is the existence of operational proposals capable of endowing this new branch of economic policy with well defined objectives and instruments. This should not be cause for discouragement, however, if we think back on how much time and effort it took to construct the current framework of conventional macroeconomic policies.

Actually, macroprudential analysis is not a completely new concept in economic policy (see, for example, Borio, 2003). As a precedent, mention may be made of the relatively common practice among numerous central banks of preparing regular financial stability reports assessing the risk to the global stability of financial systems and making economic policy recommendations with an eminently macroprudential focus. The Spanish experience of the introduction of dynamic provisioning in 2000 can also be considered a pioneering case of macroprudential response to an evident risk of financial instability. In a certain sense, these experiences underlie the creation of the Financial Stability Board by the G-20 in April 2009 or the recent entry into operation of the European authority in this field, the European Systemic Risk Board, responsible for maintaining financial stability in Europe together with the three supervisory authorities established at European level (for the banking, securities market and insurance and pension fund sectors, respectively).

Finally, this short and necessarily synoptic assessment cannot be concluded without mentioning, although it departs a little from the strict arena of central bank conduct, that the crisis has forcefully shown how quickly in situations of this type the room for fiscal policy response tends to become exhausted. Keynesian stimulation policies and even financial sector support measures heighten the risks to debt sustainability, particularly in a setting in which population ageing weighs heavily on the future prospects for government indebtedness. Shifting, directly or indirectly, the burden of adjustment to monetary policy carries high risks for the independence, and thus the credibility, of the central bank. The economic costs of a possible disanchoring of price stability expectations are well known in the advanced economies since the 1970s oil crises. In these situations, action has to be taken through supply-side policies underpinned by structural reforms to allow economies to function more flexibly and increase their growth potential, thereby increasing their ability to absorb and recover from negative shocks. But these measures are always hard to digest in the short run and only yield benefits in the long run, so it is not always easy to convince the general public that they are needed. Governments too have to make the necessary educational effort to overcome this obstacle.

Conclusions

Responding to the serious international crisis which broke out in 2007 posed significant challenges for central banks, which had to face problems unknown in the preceding decades in relation to liquidity provision and to the stability of the markets through which monetary policy is transmitted. Expansionary Keynesian fiscal policies implemented rela-

tively concertedly by the governments of the industrialised countries were accompanied by strong action by the world's main central banks which gave rise to widespread easing of monetary policy stance and to the introduction of far-reaching changes in their respective operational frameworks.

Faced with the emergency of blocked interbank markets, the main central banks, including the Fed and the ECB, had to take on directly the task of redistributing liquidity. In the early stages the Fed and the ECB, although they did not coordinate their responses, reacted fairly similarly in that they both provided a generous monetary base to meet the gross needs of banks. The ECB used its flexible array of financial instruments, while the Fed was forced to introduce new forms of intervention broadening its scope of action and to adapt its operational framework more closely to the European style based on numerous counterparties and an extensive range of collateral.

When the crisis worsened after Lehman Brothers went bankrupt, it became necessary to take stronger action. This action required the use of non-conventional monetary policy measures on both sides of the Atlantic which reflected differing practices rooted in the respective characteristics of their financial systems. The ECB changed its liquidity providing tenders to a fixed-rate system with unlimited amount and, to remove uncertainty, increased their maturity up to one year. It also set up a programme to purchase covered bonds and subsequently introduced the Securities Market Programme to ensure proper transmission of monetary policy stimuli during the serious shocks of the sovereign debt crisis. This programme entailed the adoption of the non-conventional measure furthest removed from the ECB's customary operational framework, the primary objective of which was to restore the conditions necessary for transmission of monetary policy to the euro area as a whole. It was not a quantitative easing instrument. In fact, the effects of the purchases made under this programme on the liquidity provided by the ECB were later sterilised by liquidity-absorbing fine-tuning operations, so the volume injected in net terms was not affected. By contrast, the Fed's asset purchases reached a significant scale with the successive rounds of quantitative easing because they were based on the belief that purchases of government securities helped to ease monetary conditions and to facilitate their transmission to the cost of financing over the whole of the yield curve, although this blurred the separation of responsibilities in the different economic policy areas.

These divergences in the use of non-conventional tools reflected differing perceptions and assessments of the risks that may be assumed by central banks. The US strategy involved, as noted above, a greater blurring of the boundary which separates monetary policy from fiscal and financial stability policies. That blurring entailed risks for the monetary authority's independence that the ECB, as the central bank of 17 countries with full sovereignty in other monetary policy areas, must not and cannot assume.

In any event, the reaction of the two central banks evidenced the great flexibility of response under the current monetary policy models and the ability of monetary policy to innovate in unexpected adverse situations and avoid the errors which led to the Great Depression of the 1930s.

The crisis has also served to reactivate the debate on the contribution which monetary policy, above and beyond its primary objective of price stability, makes to financial stability. It is not evident from the experience of the crisis that monetary policy objectives should be broadened to include that of maintaining the stability of financial asset prices, given the limited role that interest rate management can play in this task. By contrast, there do seem

to be more grounds for defining a new field of action of economic policy centred around the concept of macroprudential analysis. It would have the purpose of identifying risks to macrofinancial stability and developing an adequate array of instruments to pre-empt or counteract them. This is a task on which central banks, given their privileged position in the mechanics of financial markets, will have to cooperate with other regulatory and supervisory authorities, although without relinquishing their autonomy in monetary policy.

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