

# MONETARY POLICY AND FINANCIAL STABILITY: AN OPEN DEBATE\*

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## ABSTRACT

The recent global financial crisis triggered the need to better understand the link between the financial sector and the macroeconomy and the role of central banks in addressing financial stability concerns, in particular regarding the interaction with monetary policy. This paper surveys the main contributions from the economic literature on this issue. There is a wide set of perspectives on how monetary policy should take into account financial stability. Proposals range from strengthening the understanding and monitoring of macro-financial interactions to more drastic ones that propose to add financial stability as an additional objective for monetary policy or use monetary policy for financial stability purposes. We conclude that given the importance of the financial system for the monetary policy transmission mechanism, financial stability concerns need to be taken into account in monetary policy. On the other hand, monetary policy, including unconventional measures, contributes to financial stability (it is even crucial to it under certain circumstances). However, the monetary policy primary objective should remain focused on price stability. It should also be noted that, in general, price stability does not guarantee financial stability and potential conflicts between the two are highly unfavourable. Therefore, it is essential for other policies, in particular micro and macro-prudential ones, to maintain a close surveillance of the financial system and, whenever needed, act to reduce the likelihood of systemic events and minimize the negative effects on the economy.

## I. Introduction

The financial turmoil that started in the summer of 2007 turned into a severe global economic and financial crisis. The crisis made it apparent that monetary stability does not guarantee financial stability and that financial liberalisation and innovation imply that finance plays a bigger role in macroeconomic dynamics than previously thought. The recent developments triggered the need to better understand the link between the financial sector and the macroeconomy. It also reignited the debate on how to rethink the role of central banks in addressing financial stability concerns, in particular regarding the interaction with monetary policy, both in “normal” and in crisis periods. The purpose of this article is to discuss this issue by conducting a survey of the relevant literature.

Before analysing the interaction between financial stability and monetary policy, first it is necessary to clarify what is meant by both concepts. This is particularly the case for “financial stability”, which is difficult to define. Schinasi (2004) emphasises that the concept of financial stability is broad, encompassing the role of financial infrastructure (legal system, financial regulation, supervision and surveillance), institutions and markets. According to Schinasi, a stable financial system should be “capable of facilitating

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(rather than impeding) the performance of an economy and of dissipating financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events". We will take this definition as our reference for the meaning of financial stability.

Monetary policy, in turn, can be seen as the institutional arrangements and the use of the monetary authority instruments in order to maximise social welfare. The usual monetary policy instrument is a short-term interest rate, which is set using open market operations and other procedures that are part of the central bank operational framework. The current dominant view is that, in normal times, the liquidity management of the central bank is not part of the monetary policy stance and the interest rate is the single instrument. However, in crisis periods, the central bank can use liquidity management actively, or make other changes to its balance sheet, that can have effects on the economy beyond the interest rate. Such measures are frequently called non-standard monetary policy measures.

Similarly to financial stability, monetary policy has several dimensions and also involves financial infrastructure, institutions and markets. In order for monetary policy to be effectively conducted, the central bank needs to have a great deal of influence on money market interest rates and changes in such rates need to be transmitted to the rest of the economy. An unstable financial system would hamper the transmission mechanism of monetary policy. Beyond the setting of interest rates, the broad monetary policy implementation framework has also important implications for the financial system. Indeed, operational aspects, such as liquidity management, the collateral framework and the counterparties of monetary policy, influence the decisions of financial intermediaries and, consequently, financial stability, as has been clearly illustrated in the recent financial crisis. Finally, communication can also be seen as a monetary policy tool which may influence financial stability through its impact on agents' expectations.

The above definitions highlight the clear interactions between monetary policy and financial stability. In this article, we analyse these by first examining the implications of financial (in)stability for the monetary policy strategy, in particular regarding the question of if and how to react to asset prices and financial imbalances. Secondly, we review the relevance of the financial system for the monetary policy transmission mechanism. Thirdly, we look at the impact of financial instability on the monetary policy implementation. Finally, we briefly discuss the future role of macro-prudential policy and its interaction with monetary policy.

## **II. Implications of financial (in)stability for monetary policy**

### **II.1. Implications for the monetary policy strategy**

The monetary policy strategy should take into account issues related to financial stability. However, there is no consensus in the literature and among practitioners regarding the best way to do this. One important point in this context is how to deal with asset price bubbles or misalignments. In particular, should the monetary authority address this issue ex post or ex ante and which elements of the monetary policy strategy framework should (if any) be modified to integrate financial and asset price stability issues (for example should they be taken into account in the monetary policy goals or in policy rules). Several perspectives have been proposed in the literature.

#### **II.1.1. Asset prices in the price index objective**

A simple approach to take into account asset price movements in monetary policy is to include asset prices in the price index that constitutes the objective of the central bank. If the central bank reaches its price objective then, as a corollary, also the objective of avoiding disruptive asset price movements would be achieved. This view is based on the pioneering research on the theory of inflation measure-

ment by Alchian and Klein (1973) who focused on “a lifetime cost of living” index as the relevant one from a welfare perspective. A lifetime cost of living includes not only the prices of goods purchased in a particular year but also expected prices of future purchases.

The need to include prices of expected future purchases, which are very difficult to measure, renders this concept impractical. Nevertheless, some authors argue that asset prices contain information about future price developments and so could be used as proxies of expected goods prices. Goodhart and Hoffmann (2000, 2002) and Goodhart (2001) proposed to replace conventional inflation measures such as the CPI with a broader measure that includes housing and stock market prices with the argument that asset prices help to predict future consumer price inflation. Monetary policy would target an inflation measure that is given by a weighted sum of conventionally measured inflation and asset price inflation:

$$\pi = \alpha\pi^{CPI} + (1 - \alpha)\pi^{AP}$$

where  $\alpha$  is the weight on the conventional inflation measure ( $\pi^{CPI}$ ) and  $(1 - \alpha)$  the weight on asset price inflation ( $\pi^{AP}$ ). The use of this broader measure of inflation as a monetary policy target implies that strong asset price increases could prompt tighter monetary policy even if conventionally measured inflation was low and stable.

This approach has been thoroughly debated in the academic and empirical literature and several problems have been identified.<sup>1</sup> First, the relationship between asset price inflation and consumer price inflation is somewhat imprecise. In particular, asset prices changes are not only related to inflation expectations but are also driven inter alia by changes in fundamentals. Second, targeting asset prices might create moral hazard problems as it might increase risk-taking by private agents in anticipation of monetary policy reactions to stabilise asset prices. Third, with rational forward-looking private agents, there is the problem of “inflation indeterminacy” which is the possibility of a circular relationship between monetary policy and asset prices: asset prices would partly determine monetary policy, while simultaneously expected future monetary policy determines today’s asset prices. Fourth, if the central bank targets CPI inflation, taking into account all indicators of inflationary pressure including signals from asset prices, targeting asset prices directly would amount to double-counting inflationary pressure derived from asset prices. Fifth, the weight assigned to asset prices in a combined price index is ambiguous. Sixth, central banks lack sufficient control of asset prices as in the long run asset prices are driven by fundamental factors and not by monetary policy. Finally, empirical analysis finds little evidence that including asset prices in an inflation target measure would reliably improve economic outcomes.<sup>2</sup>

### II.1.2. The “benign neglect” approach to asset prices

The so-called “benign neglect” approach claims that monetary policy should focus on its primary objectives – inflation (and economic growth/employment) – and that financial stability can either be addressed by the self discipline of the markets or by prudential regulation. Maintaining low and stable inflation was seen as the main contribution monetary policy could make to financial stability. Asset prices should only be considered to the extent that they may signal potential inflationary or deflationary forces. On analytical grounds this approach was supported by the work of Bernanke and Gertler (2001), who simulated different policy rules in a small scale macro model and showed theoretically and empirically that in case of a strong commitment to stabilizing expected inflation, it is neither necessary nor desirable for monetary policy to respond to changes in asset prices, except to the extent that they help to forecast inflationary or deflationary pressures. In this context it was widely accepted that the monetary

<sup>1</sup> A summary of the main problems is presented in Box 4 of ECB (2005).

<sup>2</sup> See for example Filardo (2000) for the US case.

authorities should take into account information from asset prices in their assessment of the current state of the economy and in the forecasting exercises.<sup>3</sup>

Some experts consider that the benign neglect view was prevalent at the Fed before the financial crisis. This view rests on three main arguments (Kohn, 2006). First, it is difficult to clearly identify an asset price boom. Second, the official interest rate is considered not to be adequate to counteract asset price booms as the required increases in the interest rate may be too large and could destabilise the economy. Third, there is the conviction that when bubbles burst the effects on economic activity can be easily counteracted through lower interest rates. Notice that this policy is only possible if the required interest rate does not reach the zero lower bound. Underlying this approach is the belief in the efficiency of financial markets to auto-correct imbalances. Potential systemic risks from financial market imperfections such as informational frictions, moral hazard and herding behaviour tend to be considered of second order importance compared to the cost of pricking the bubble. This type of asymmetric policy got to be known as the “Greenspan put”, by which the Federal Reserve did not react to the build up of financial imbalances and responded aggressively when bubbles burst:

*“We at the Federal Reserve considered a number of issues related to asset bubbles – that is, surges in prices of assets to unsustainable levels. As events evolved, we recognized that, despite our suspicions, it was very difficult to definitively identify a bubble until after the fact – that is, when it’s bursting confirmed its existence. Moreover, it was far from obvious that bubbles, even if identified early, could be pre-empted short of the central bank inducing a substantial contraction in economic activity – the very outcome we would be seeking to avoid. Such data suggest that nothing short of a sharp increase in short-term rates that engenders a significant economic retrenchment is sufficient to check a nascent bubble. Instead, we noted in the previously cited mid-1999 congressional testimony the need to focus on policies to mitigate the fallout when it occurs and, hopefully, ease the transition to the next expansion.” – Greenspan (2002).*

This strategy of “mop up after” the burst worked well in 2000-2002 when the dot.com bubble imploded, giving rise to the idea that it would also be successful in the future when other bubbles burst (Blinder and Reis, 2005). However, the recent financial crisis showed that bubbles are not alike as some are more problematic than others. In particular, bubbles that when burst erode the balance sheets of financial intermediaries are likely to have more significant economic effects and contribute further to financial instability (Mishkin, 2008). This led to a re-examination of the Fed’s position regarding this approach, but not to significant changes yet. In this context, FOMC members, while recognising that monetary policy could be used with financial stability objectives, continue to defend an approach closer to “benign neglect” as monetary policy is still considered to be too blunt a tool. Instead, the use of other instruments appears to be preferable, in particular prudential regulation:

*“Given the bluntness of monetary policy as a tool for addressing developments that could lead to financial instability, given the side effects of using policy for this purpose (including the likely increase in variability of inflation and economic activity over the medium term), and given the need for timely policy action to realize greater benefits than costs in leaning against potential speculative excesses, my preference at this time is to use prudential regulation and supervision to strengthen the financial system and lean against developing financial imbalances.” – Kohn (2010).*

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<sup>3</sup> However, some argued that due to the high volatility of asset prices their relative weight in central bank monitoring should be small compared to other indicators.

### II.1.3. The “leaning against the wind” approach

Another view that has gained increased sympathy in light of the recent financial crisis is the so-called “leaning against the wind” of asset price bubbles. The proponents of this approach argue that monetary policy should be used to contain or reduce an asset price bubble. In particular, monetary policy should be tightened in face of an inflating asset market even if near-term inflation pressures are not apparent (Cecchetti *et al.*, 2000, 2003, Borio and White, 2003). The motivation for such a policy would be to limit the build-up of significant asset price misalignments and the size of the eventual correction, thereby lowering the medium-term downside risks for the economy. Underlying this framework is the assumption of non-linear effects of asset price shocks: large shocks would have a comparatively higher impact on the economy than small/medium shocks (Stiglitz, 2009).

One of the main criticisms of “leaning against the wind” regards the difficulty in setting a clear criterium for determining asset price misalignments, defined as deviations from a level consistent with fundamentals. Those supporting the approach claim, however, that there is no need to determine with accuracy the degree of deviation from the fundamental value of individual assets and that it is a combination of developments that should raise concern.

A second criticism concerns the identification of the timing of the burst and the severity of the eventual crisis. The challenge for policy makers becomes then to discriminate *ex-ante* between asset price booms that are likely to end up in major economic disruptions and the ones that may not. The IMF (2010) points out that episodes of asset price upswings, where leverage and financial intermediaries involvement is significant, tend to deflate with major economic disruptions since there is an interaction between the deterioration of borrowers and lenders balance sheet. Rising asset prices increase collateral value and thus funding liquidity, which finances further purchases and additional price increases, further intensifying the cycle. Moreover, the larger the duration of a boom episode, the greater the likelihood of it resulting in a crisis.

A third criticism relates to the uncertainty about the impact of monetary policy on bubbles. While there is significant evidence supporting that monetary policy has an effect on asset prices, results are scarce on the ability of monetary policy to have an impact on the path of a bubble. Bean *et al.* (2010) provide some tentative evidence for the US and the UK on how an aggressive “leaning against the wind” policy over 2003-2006 would have moderated the credit/asset price boom in these countries. They concluded that while this type of policy would have been effective in dampening real house price inflation, the impact on real credit growth would have been relatively limited and as such it would not be possible to conclude that this policy would have had a major impact on the probability of a crisis materialising. Posen (2006) argues that the connection between monetary conditions and the rise of bubbles is rather tenuous given that bubbles by definition are not based on fundamentals but “animal spirits”. It has also been frequently claimed that, to have an impact on the path of a bubble the interest rates hike must be of a magnitude that would severely damage the economy (Blinder and Reis, 2005 and Assenmacher-Wesche and Gerlach, 2010).

The proponents of “leaning against the wind” counterargue that the impact of monetary policy on asset prices is increased if additional monetary policy transmission channels are taken into consideration, namely the “risk-taking” channel.<sup>4</sup> Moreover, it is claimed that credible statements by monetary authorities of concern and determination to act could influence economic agents behaviour and moderate excesses in banking and credit markets and therefore on asset prices and spending (White, 2009). Indeed, an important channel of influence over asset prices that should not be overlooked is that of communication regarding monetary policy. Recent studies (Lambertini *et al.*, 2010) show that fluctuations in expectations regarding monetary policy can lead to boom-bust cycles in asset prices. In

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<sup>4</sup> See section II.2 of this article.

particular, Lambertini *et al.* (2010) find that unfulfilled expectations of future reductions of the monetary policy rate or of a rise in the inflation target lead to a boom-bust behaviour in most macroeconomic variables. Therefore, central banks should follow a clear and transparent communication policy when dealing with the markets and should avoid, as much as possible, monetary policy surprises, in particular those suggesting that monetary conditions will remain loose as this seems to create the right breeding ground for asset price imbalances.

### Different interpretations of “leaning against the wind”

There seem to be two slightly different interpretations of the exact meaning of “leaning against the wind”. One is that policy makers should take into account developments in asset prices and credit when assessing risks to price stability, thereby implicitly leaning against asset price imbalances. Another view is to understand leaning against the wind as keeping interest rates higher than warranted by risks to price stability if there is evidence of an asset price misalignment.

Among monetary authorities, the ECB has shown some support for the “leaning against the wind” approach viewed as a means of addressing risks to price stability (Trichet, 2005, 2010, ECB, 2005, 2010). Already from its inception, the ECB has stated that it attributes a more prominent role to financial variables than other central banks. This is particularly evidenced by having the monetary analysis pillar side by side with the economic analysis one. In fact, the ECB has frequently emphasized that its monetary policy strategy was designed to take into account asset price developments and potential misalignments in the context of the monetary pillar:

*«Responding to monetary and credit dynamics as part of a comprehensive assessment of the risks to price stability in the medium-term implies that interest rate decisions will tend to “lean against” accumulating financial imbalances and asset price misalignments» – Trichet (2010).*

Thus, from the beginning the ECB has monitored very closely the developments in money and credit. Nevertheless, it should also be recognised that the ECB monetary analysis has evolved over time. In the first years of the euro, monetary analysis was primarily based on concepts derived from the quantity theory of money and the emphasis was more on monetary growth rather than on financial imbalances or misalignments. Over time, however, this analysis has been broadened and deepened, recognising the need to have an encompassing view of the financial system to better monitor the risks to price stability stemming from monetary and credit developments and to cross-check the economic analysis pillar.

It should be noted that the ECB does not clearly endorse the second view on “leaning against the wind”, *i.e.*, that monetary policy should be over-tightened in face of an inflating asset market (Cecchetti *et al.*, 2000, 2003, Borio and White, 2003) or should be used to fight illiquidity (Diamond and Rajan, 2009).<sup>5</sup> Instead, the ECB recognises that in certain circumstances a trade-off between short-term price volatility and long-term price stability may occur, but the monetary policy response should be guided by the longer run risks to price stability (ECB, 2010).

### Implications for monetary policy frameworks

To make the approach of “leaning against the wind” operational some refinements in the monetary policy frameworks have been proposed. In particular, such an approach requires some tools to timely

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<sup>5</sup> Diamond and Rajan (2009) suggest that when the short-term interest rate is at a low level, banks have an incentive to finance more illiquid projects than desirable. The opposite occurs with a high interest rate. Therefore, to counteract these incentives, the central bank should signal a future increase in the interest rate when it is at a low level and a future cut when it is at an elevated level.

detect asset price misalignments or other financial imbalances. This could be based on the early warning system literature that grounds on empirical regularities of Kaminsky *et al.* (1998) and Kaminsky and Reinhart (1999). For instance, Reinhart and Rogoff (2009), Borio and Zhu (2008) and IMF (2009) present examples of early warning indicators of banking crisis: (i) deviation from trend of real exchange rate; (ii) percentage change of real housing prices;<sup>6</sup> (iii) market risk indicators, such as the risk premium (which can be assessed on the basis of interest rate spreads or market volatility indicators, for example); (iv) percentage change of real stock prices; (v) short-term capital inflows in percentage of GDP, current account balance in percentage of investment and international investment position.

This “signals approach” is a systematic exercise to deliver information as to whether an economy is showing one or more of the classic symptoms that emerge before a financial crisis. According to Reinhart and Rogoff (2009) the massive borrowing by the US from the rest of the world prior to the financial crisis should have been seen as a critical warning signal. The main constraint to the success of this approach is claimed to be the fact that policy makers and market participants may treat signals as irrelevant or outdated, assuming in particular that old rules of valuation no longer apply. In addition, in some cases policy makers may be reluctant to react due to the difficulty in predicting the timing of the crisis and the fact that they may be averse to commit type II errors (*i.e.* to react on a signal that turns out to be false).

## II.2. Implications of financial instability for the monetary policy transmission mechanism

As illustrated by the recent financial crisis, developments in financial markets have very significant effects on the overall economy. Given the pivotal role of the financial system, a breakdown in financial stability can disrupt the monetary policy transmission mechanism and so needs to be appropriately taken into account in order for the central bank to achieve its goals. On the other hand, monetary policy is not fully neutral from a financial stability perspective.

Chart 1<sup>7</sup> shows a very simplified representation of the monetary policy transmission mechanism. The transmission mechanism of monetary policy takes place through different channels, affecting different markets and variables that ultimately affect aggregate output and prices.

In a first stage, policy actions, taken on the basis of the respective monetary policy strategy, directly influence economic agents’ expectations and the way these are formed. They also directly influence the financial system (financial intermediaries, financial markets and the way they interact) which is also influenced by economic agents’ expectations.

The policy action triggers the necessary adjustments in the financial system that are then reflected in a set of variables that characterise monetary and financial conditions, such as asset prices, interest rates, money and credit, the exchange rate and volatility measures. These variables, together with agents’ expectations, determine consumers and firms’ behaviour and balance sheets, and the aggregate outcomes in terms of inflation, output and employment. Note that there are feedback mechanisms between the financial system and the non-financial sector which may amplify shocks. Finally, changes in economic activity, employment, inflation and inflation expectations feed back into policy decisions framed by the monetary policy strategy.

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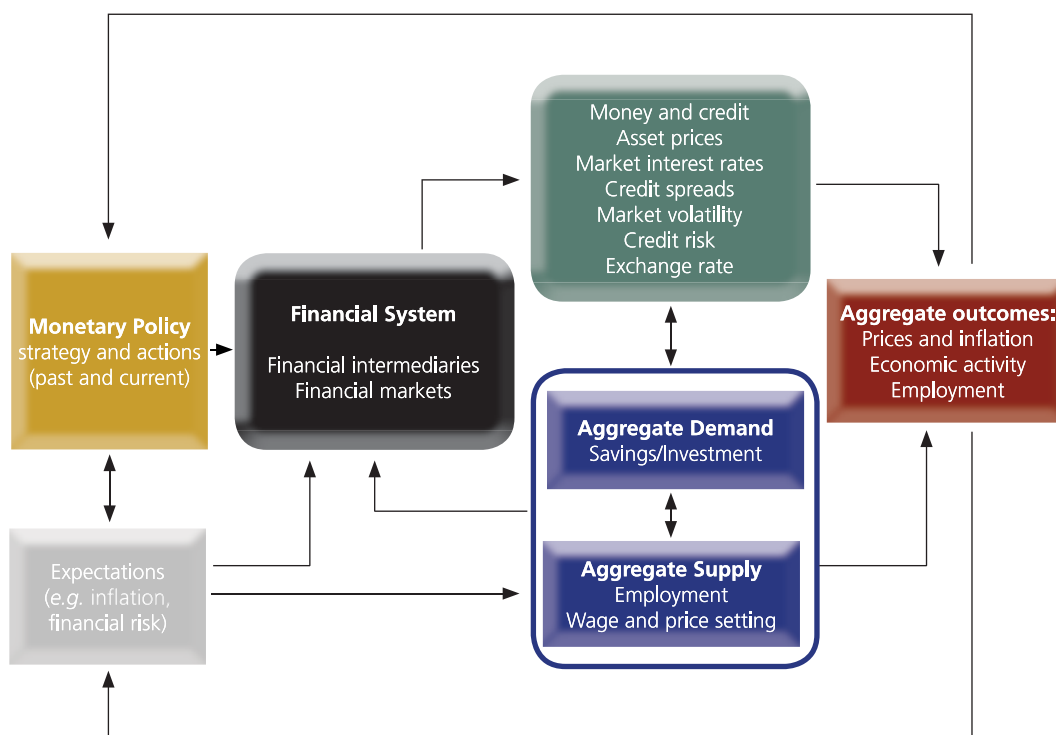
<sup>6</sup> Altunbas *et al.* (2009) find out that in the European Union and in the US, developments in housing prices prior to the crisis appear to have contributed to bank risk-taking. An inflation-adjusted house price growth rate that is 1 percentage point above its long-run average for six consecutive years leading up to the crisis increases the probability of default of the average bank by 1.5 per cent. This result is in line with the view that the housing market had a substantial role in the crisis and that banking distress was typically more severe in countries that experienced a more pronounced boom-bust cycle in house prices.

<sup>7</sup> This diagram was built with the input of Vitor Gaspar.



Chart 1

THE MONETARY POLICY TRANSMISSION MECHANISM



The recent literature has emphasised the increased importance of some monetary policy channels - such as the credit and the interest rate channels – and has also identified new channels – namely the risk-taking channel. Understanding the monetary policy transmission mechanism in an encompassing way is thus of utmost importance to develop frameworks that better take into account financial stability concerns.

**Credit channel**

The credit channel is one of the channels of monetary transmission that depends on a well functioning financial system to propagate central bank interest rate policy. One can identify two main elements of the credit channel on the transmission of monetary policy to the rest of the economy: the bank lending channel and the balance sheet channel. The former focuses on the impact of monetary policy on the quantity of credit which banks can provide to borrowers while the latter focuses on the impact of monetary policy on the financing ability of borrowers.

The bank lending channel is centered on the impact of monetary policy decisions on banks' balance sheet and their credit supply. The 'traditional' view relies on quantity-induced effects of policy and the concept of the money multiplier. A loosening of monetary policy via an expansion in bank reserves would raise deposits and, consequently, the amount of bank loans. With financial innovation and banking deregulation in the last decades, the effect of this channel has been weakening. However, in situations of financial fragility, such as during the recent crisis, quantitative effects of monetary policy operations may again play a role (see section II.3).



The theoretical framework of the balance sheet channel typically grounds on the financial accelerator mechanism (Bernanke and Gertler, 1989, 1995). This framework defines the “external finance premium” as the difference between the cost to a borrower of raising funds externally and the opportunity cost of internal funds. The external finance premium is generally positive due to market frictions and depends inversely on the borrower’s net worth, defined as the sum of the firm’s internal funds (liquid assets) and the collateral value of its illiquid assets. A deterioration of the borrower’s balance sheet position raises the external finance premium, making borrowing more costly, reducing investment and overall economic activity. This last result is at the center of the financial accelerator. To the extent that negative shocks to the economy (for instance, a monetary policy contraction) reduce the net worth of borrowers (or positive shocks increase net worth), the spending and production effects of the initial shock will be amplified, creating a channel through which otherwise short lived monetary, real productivity shocks and problems in the financial sector may have long and lasting effects. An additional perspective, more focused more on households, is related to the existence of credit constraint which depend on the value of the collateral (Kiyotaki and Moore, 1997). In these models, shocks (productivity, for example) impact on asset prices, which impact households’ credit ability, amplifying the initial effect.

Traditionally, the balance sheet channel focuses on non-financial firms’ credit constraints. More recently, the literature has focused on similar effects occurring on financial intermediaries’ balance sheet. Disyatat (2010) considers it the revised bank lending channel, since it impacts the ability of credit institutions in providing credit to the non-financial sector. Banks are credit constrained since they cannot expand their balance sheet indefinitely without increasing costs. First, because there are restrictions brought about by the need to comply with regulatory capital requirements. Second, because banks’ (and other institutions providing loans) lenders demand an external finance premium which is negatively related to the banks’ capital cushion (Disyatat, 2010, Bernanke, 2007).

Financial instability can influence the power of the credit channel of monetary policy, significantly increasing the external finance premium, both of financial intermediaries and of non-financial firms. When the disturbances are on the financial sector, monetary policy actions, namely an easing in interest rates, might have a reduced impact on the non-financial sector, as financial institutions may need to tighten credit conditions to shield their balance sheet position, thereby “absorbing” the impact of the monetary policy easing. By contrast, if the financial system is working properly and the problems affect only the non-financial sector, then a monetary policy easing will have a stronger effect on the economy than in normal times as it will tend to reduce collateral constraints.

### **Interest rate channel**

The interest rate channel operates through the impact of official interest rate changes on real interest rates relevant for household and corporate spending and saving decisions. A decline in the real interest rate reduces the incentives for households to save and so consumption will tend to increase. At the same time, the real cost of capital declines which stimulates investment spending by corporations. This channel emphasises in particular the medium to long-term real interest rates, which are viewed as having the main impact on spending.

Financial instability may have several consequences in the functioning of this channel. To start with, financial instability may make it more difficult for the monetary authority to influence market interest rates. If these are distorted by risk premia, the central bank will find it harder to fix money market rates at the level it considers as appropriate. Furthermore, in order for this channel to be effective it is also necessary that a tightening or loosening of monetary policy is reflected in the prices of financial assets (bonds, equities, foreign exchange). For instance, a cut in interest rates should lead to changes in real interest rates, to a reduction of the incentives for households to save and to lower borrowing costs. These movements then should stimulate consumption, investment or purchases of durable goods and

housing. However, financial instability could lead to a higher level of precautionary savings thereby reducing the effectiveness of monetary policy. Similarly, if asset prices are volatile then their reaction to changes in the central bank's interest rates will be more difficult to predict thereby disturbing the wealth effects of monetary policy.

### Risk taking channel

According to recent contributions, the risk perception and tolerance of economic agents may change in the context of benign economic and financial conditions, affecting the risk taking behaviour of financial intermediaries. The link between low interest rates and financial intermediaries' risk-taking, points to the operation of a different channel of the monetary transmission mechanism, the so-called risk-taking channel. There are at least two ways in which this channel may operate. First, low returns on investments on safe assets may increase incentives for banks and institutional investors (such as pension funds) to take on more risk due to contractual or institutional commitments (for example, to meet a target nominal return) (Brunnermeier, 2001 and Rajan, 2005). Second, low interest rates affect asset price valuations and volatility, which in turn can determine adjustments in banks' balance sheets. In particular, as banks tend to target leverage ratios, an increase in stock prices and in the value of banks' equity encourages the expansion of their balance sheets. In this context, the transmission mechanism of monetary policy should take the liquidity and leverage of market based financial intermediaries explicitly into account. Financial intermediaries have an impact on financial conditions, affecting real economic outcomes, in particular GDP components that are most sensitive to credit supply (housing investment, durable goods consumption).

Borio and Zhu (2008) and Adrian and Shin (2008) find empirical evidence that balance sheet variables of financial institutions have important effects on macroeconomic dynamics. In addition, they find that expectations of an increase in the Federal funds rate target and also contemporaneous changes are associated with declines in investment banks assets. Gambacorta (2009), using a comprehensive database of listed banks from the European Union and the United States, finds evidence that when interest rates are low for an extended period of time banks' risk-taking tend to rise. In addition, using micro data for Spanish banks Jiménez *et al.* (2010) find out that monetary policy has an impact on the level of risk of individual Spanish banks in two conflicting ways. In the short term, low interest rates reduce the probability of default of outstanding variable rate loans, by reducing the interest burden of existing borrowers. In the medium term, however, due to the higher collateral values and the search for yield, banks tend to grant loans to riskier borrowers and, in general, to soften their lending standards: they lend more to borrowers with bad credit histories and with more uncertain prospects. Overall, these results suggest that low interest rates reduce credit risk in banks' portfolios in the short term – since the volume of outstanding loans is larger than the volume of new loans – but raise it in the medium term. These results are consistent with the existence of a risk-taking channel.

### II.3. Monetary policy implementation under financial instability

The monetary policy transmission mechanism begins when the central bank sets official interest rates. The central bank's ability to influence interest rates lies in its monopoly power to issue base money, as it can control the funding costs of primary liquidity and, consequently, steer short-term market interest rates.<sup>8</sup> Under "normal" conditions, the central bank cannot steer both prices and quantities.<sup>9</sup> Most

<sup>8</sup> We ignore cases where the central bank operates under a structural liquidity surplus, given the most common situation is of a structural liquidity deficit where the central bank controls interest rates by providing liquidity to the financial system. The liquidity deficit is mostly determined by the demand for banknotes and reserves.

<sup>9</sup> Goodhart (2010) mentions that liquidity management can have a degree of freedom from interest rate policy even when this is above the zero lower bound. He considers that the system of interest rates corridor allows for this independency between the setting of interest rates and liquidity management.

central banks aim at steering an operational target, usually a short-term interest rate, while promoting free and open market practices. Given the objective and strategy of monetary policy, the central bank monetary policy implementation is given by three elements: the definition of an operational target, the setting of the operational framework and the daily use of the instruments to attain the target (Bindseil, 2004). The definition of the operational framework should take into account the impact on the financial system and its main features.

The operational framework of monetary policy comprises three blocks: (i) the central bank balance sheet management, (ii) the counterparty framework and (iii) the collateral framework. The central bank balance sheet management involves managing the size and composition of the balance sheet. Regarding the size of the balance sheet, the central bank determines the overall liquidity deficit with which it operates and the reserve requirements, namely their mandatory or voluntary nature, the reserve ratio and the remuneration. The composition of the central bank balance sheet focuses mostly on the asset side and is related to the choice of instruments.<sup>10</sup> The counterparty framework defines the set of institutions with which the central bank interacts. Finally, the collateral framework defines the rules for financial assets being eligible as a guarantee to central bank operations, as well as the risk management measures.

One of the fundamental functions of central banks at their origin is the lender of last resort (LLR) function, which comes from the monopoly and virtual unlimited ability to print money. According to the “classical” theory of the LLR (Bagehot, 1873), the central bank should be available to provide funds, with known rules *ex-ante*, to illiquid but solvent banks, at a penalty rate with adequate collateral. The objective of the LLR role is to guarantee financial and macroeconomic stability. The credibility and widespread acceptance of central bank money means that agents perceive that the central bank can provide liquidity to distressed institutions in order to preserve systemic stability. This role is not attainable solely by banking and financial regulation and supervision. Therefore, there is a clear and necessary interaction between monetary policy (more specifically, the liquidity management function) and financial stability purposes (Gaspar, 2006). This interaction is at the origins of central banking and is essential to it.

The current literature considers that there is a LLR role available for central banks when there is asymmetric information, namely when it is difficult to correctly evaluate financial institutions’ balance sheets, to distinguish between solvency and liquidity, and when interbank market spreads are elevated (Freixas *et al.*, 2004). This makes the LLR acting more likely to occur under stress situations.

To illustrate the broad role of the LLR, we compare the situation in a well functioning financial system to that of a crisis period. Under normal conditions, the central bank provides liquidity such that it meets aggregate demand for liquidity by the banking system, in order to steer money market interest rates in line with policy rates. In these cases, funding markets are assumed to function properly without frictions, such that individual liquidity imbalances net out in the aggregate, *i.e.*, banks and other financial intermediaries trade among each other and the market clears, as shown in chart 2.

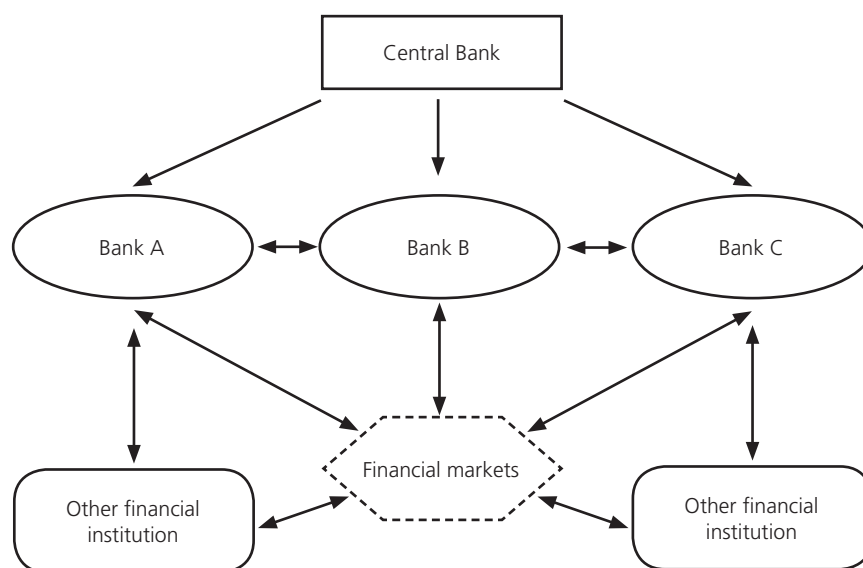
In crisis situations, counterparty risk makes individual banks’ liquidity positions matter (Heider *et al.*, 2009). Overall, banks prefer to hold more liquidity due to precautionary reasons, and so increase the price for liquidity, *i.e.*, market interest rates. At the same time, banks perceived to be riskier may be excluded from market funding and transactions (e.g. Bank C in chart 3). In this case, the central bank has to provide more liquidity to the banking system in order to keep steering interest rates towards the target. Note, however, that this higher liquidity provision may not be enough to guarantee an adequate distribution of liquidity within the banking system. For the banking system as a whole there might be excess liquidity, but this may be concentrated in a group of banks, who prefer to deposit the funds in excess back at the central bank (at a penalty rate) than to lend to other financial institutions given the high counterparty risk (e.g.: Bank A in chart 3). If a solvent and systemically relevant financial institution

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<sup>10</sup> We assume a closed-economy perspective where foreign currency reserves and operations are not relevant.

Chart 2

## LIQUIDITY FLOWS UNDER 'NORMAL' MARKET CONDITIONS



is excluded from funding markets because its credit risk is perceived to be elevated, the central bank should intervene as LLR and avoid contagion risk to other financial institutions. Note that this may imply the provision of liquidity to financial institutions that are not regular counterparts in monetary policy operations. This example shows that during the crisis, the objectives of financial stability and monetary policy become very much intertwined, as a collapse of the banking system would inevitably carry with it serious downside risks to price stability in a context of a seriously hampered interest rate policy.

When the disruptions in financial intermediation are very severe, as in a major financial crisis, interest rate policy may not be enough to counter downside risks to price stability. Once the zero lower bound (ZLB) is reached, liquidity management may cease to be solely geared to implementing the interest rate target but may also be used with monetary policy purposes (Goodhart, 2010). In these cases, monetary policy actions contribute both to price stability and financial stability objectives and therefore becomes more difficult to distinguish from macro-prudential policy.

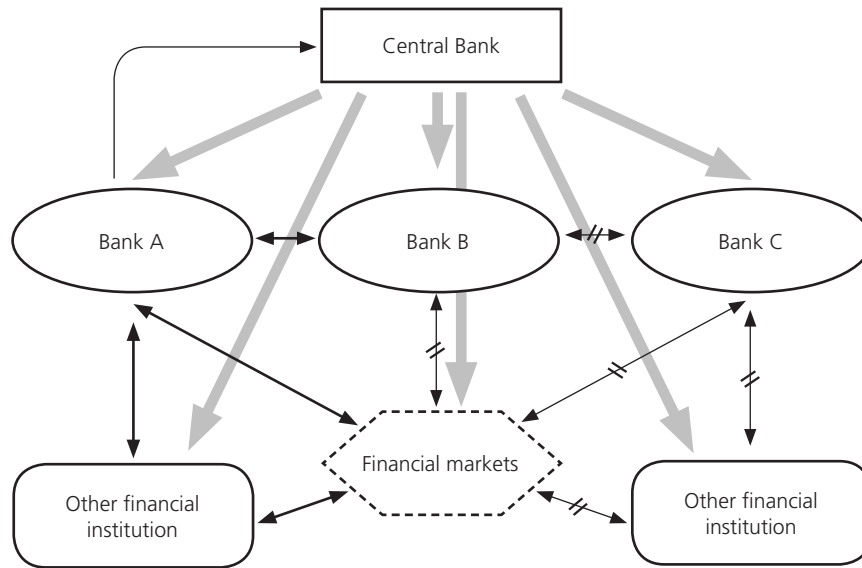
One important instrument available to the central banks in these circumstances is credit policy which aims at stimulating credit to the economy by providing funds at longer maturities, for instance, by buying public or private debt securities thereby restoring the normal transmission mechanism of monetary policy. The concept of credit policy should not be confused with quantitative easing (*i.e.* the expansion of central bank money). In fact, credit policy can be implemented with or without resorting to monetary issuance. In addition, quantitative easing may be implemented to counteract downside risks to price stability but with no specific goal of restoring financial stability or the normal flow of credit to the economy.

Credit policy should help reduce market interest rates, contributing to the stability of financial institutions and to improve the functioning of some financial market segments. Central banks can provide credit via the banking system, via other financial intermediaries or directly to the non-financial sector.

In the short-run, increased central bank intermediation is very important for stabilizing the financial system. However, in the medium to long-run, it carries greater operational and rollover risks for the counterparties, possible efficiency and social costs related to moral hazard issues and the crowding-out of money market activity, besides greater credit risks to the central bank. De Walque *et al.* (2010)

Chart 3

LIQUIDITY FLOWS UNDER STRESSED MARKET CONDITIONS (SIMILAR TO THE FINANCIAL CRISIS WHICH STARTED IN 2007)



mention that, in the long run, increased central bank intermediation in response to financial crisis can lead to a higher persistence of the original negative shock.

Credit policy has also potential adverse effects on financial stability, since it might reduce liquidity in the segments for which the central bank buys the assets, or even create adverse incentives for banks to invest in those assets given that they rely on central bank purchases. However, these effects can be greatly mitigated through an appropriate design of credit policy. Given that the banking sector is able to better monitor debtors than the policy authorities, credit policy can also have large potential social costs related with moral hazard behaviour by debtors and the maintenance of inefficient (“zombie”) banks and firms.

Recent research has not yet provided conclusive results on the effectiveness of credit policy. Some authors argue that credit policy should only be activated following an increase in credit spreads which reflects severe financial disturbances (Cúrdia and Woodford, 2009 and 2010). Gertler and Kiyotaki (2010) results favour more strongly the use of credit policy in response to financial shocks, with credit policy being able to almost eliminate the effects from financial frictions. Overall, there seems to be a consensus that both enhanced liquidity provision and credit policy should be seen as temporary measures to be used only in crisis periods.

### III. The future role of macro-prudential policy and its interaction with monetary policy

From the discussion above, it can be concluded that monetary and financial stability can be complementary. However, there are also situations in which conflicts between the two policies can arise (Gaspar, 2010). An example is the case when there are financial frictions whose effects can be reduced by forfeiting the price stability goal. For instance, Di Fiore *et al.* (2010) find that the optimal policy would deviate from the traditional outcomes of a simple Taylor rule when there are financial frictions (internal and external funds are imperfect substitutes, firms’ assets and liabilities are denominated in

nominal terms and debt-contracts are not state-contingent). In particular, if there is a negative shock to internal funds, it is optimal to engineer a controlled period of inflation to allow firms to deleverage and to avoid bankruptcies.

It should be noted that the above prescriptions arise in settings when no other instrument is used to address financial instability such as macro-prudential policy. Macro-prudential policy is here understood as the administrative and regulatory powers and the set of instruments aiming at ensuring financial stability in two dimensions: (i) a robust financial system able to absorb shocks without major disturbances to the real economy and (ii) the contention of the accumulation of systemic financial risks and fragilities. Macro-prudential policy is thus closer to macroeconomic policy in terms of objectives but also closer to micro-prudential policy in terms of instruments (Bank of England, 2009).

Several macro-prudential instruments have been put forward; for example, prudential ratios, counter-cyclical capital buffers, loan-to-value ratios for mortgage lending, margin requirements and liquidity ratios. There is a strong relation between macro- and micro-prudential instruments, in the sense that the latter can be designed also for macro-prudential objectives. These instruments affect credit and asset prices and thus are likely to affect the monetary policy transmission mechanism, as shown in chart 4 (Cohen-Cole and Morse, 2010). In turn, monetary policy influences financial institutions decisions and asset prices and, consequently, financial stability and the macro-prudential policy assessment (De Graeve *et al.*, 2008). Thus, monetary and macro-prudential policies will need to consider each others' impact, while it is also important to ensure the presence of mechanisms that facilitate the necessary interaction. An adequate combination of policies will necessarily depend on the specific situation. Angelini *et al.* (2010) find that monetary policy alone leads to a better result when the economy is hit by supply or demand shocks. When the economy is hit by a financial shock, macro-prudential policy is useful and coordination of policies improves total gains, coming from lower volatility in output and loans-to-output ratio, compensated by a larger volatility in inflation and interest rate (according to the authors, monetary policy "lends a hand" to macro-prudential policy).

Although a more active macro-prudential policy and the complementarity between monetary and prudential policies seem to be consensual, the institutional arrangements are still not yet clear. Some defend that the responsibility for macro-prudential stability should be assigned to the central bank (Caruana, 2010).<sup>11</sup> This would imply assigning to the central bank regulatory and supervisory powers that eventually will lead to the development of new structures within the central bank. Another possibility, that has been followed in Europe and in the US, is to assign the responsibility for macro-prudential stability issues to new institutions, in particular regarding the prevention and containment of systemic risk. In any case there are strong reasons for the involvement of central banks in these new institutions. In the European Union a new body – the European Systemic Risk Board (ESRB) – was created with the aim of increasing the focus on systemic risk within the framework of financial supervision. The ESRB has two main policy tools: it can issue risk warnings and it can provide recommendations for action for the European Union as a whole, to one or more Member States, to one or more European Supervisory Authority or to one or more national supervisory authority. This new body together with the other three European Supervisory Authorities (European Banking Authority, European Insurance Authority and European Securities Authority) constitute the European System of Financial Supervision. In the US the Financial Stability Oversight Council was created with the task of mitigating systemic risk and maintaining system-wide financial stability.<sup>12</sup> The main duties are: (i) identifying threats to the financial

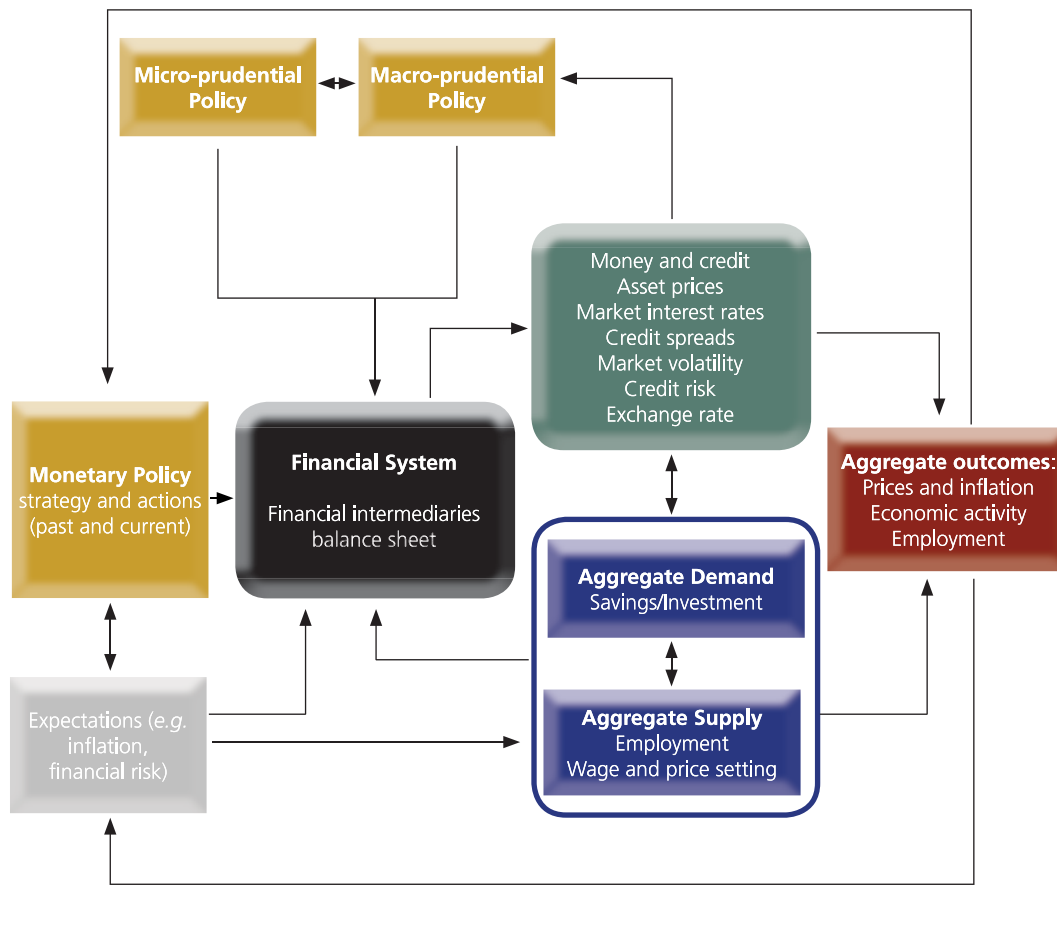
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<sup>11</sup> Goodhart (2010) argues in favour of a closer coordination between the Treasury and the authorities responsible for systemic stability, liquidity management and interest rate policy, which he considers that do not have to necessarily rely all with the central bank.

<sup>12</sup> The Financial Stability Oversight Council is a new agency created together with the Office of Financial Research, and the Bureau of Consumer Financial Protection by the "Dodd-Frank Wall Street Reform and Consumer Protection Act" on 21 July 2010.

Chart 4

THE MONETARY TRANSMISSION MECHANISM WITH MACRO-PRUDENTIAL POLICY



stability from both financial and non-financial organizations, (ii) promoting market discipline by eliminating expectations that the Government will shield them from losses in the event of failure, and (iii) responding to emerging risks to the stability of the financial system. The Council is an interagency body.

Whatever the institutional scheme implemented some principles of governance will have to be satisfied to preserve the central bank credibility and safeguard the correct functioning of monetary policy. In particular, it is important to define clear mandates for monetary policy and macro-prudential functions and effective communication policies regarding the decisions taken. There seems to be no reason to change the primary focus and responsibility for monetary policy on price stability, while macro-prudential policy should aim at strengthening the resilience of the financial system to adverse real and financial shocks and prevent the emergence of macroeconomic imbalances. In addition, given the central role played by the financial system in the monetary policy transmission mechanism, macro-prudential decisions must be taken into account by monetary policy and the exchange of information between the two relevant authorities should be promoted.

**IV. Conclusions**

The recent crisis showed that monetary policy must take into account financial stability issues. The crisis has not, however, overturned the idea that the primary focus and responsibility of monetary policy should be to maintain price stability. In this respect, one should not overlook the fact that, in spite of the



dimension of the recent crisis, monetary policy remained highly successful in maintaining price stability.

The adjustment of the monetary policy frameworks to take into account financial stability has recently received a lot of attention in economic policy debates. Several proposals that involve different degrees of changes to the conventional framework have been put forward. These proposals range from strengthening the understanding and monitoring of macro-financial interactions to more drastic ones that propose to add financial stability as a distinct policy objective and even the use of monetary policy for financial stability purposes. Several efforts are being done to build models with explicit and more detailed financial sectors. In particular, central banks have responded to the challenges posed by the ongoing financial crisis by putting high priority on modelling the financial sector, within both traditional and dynamic stochastic general equilibrium (DSGE) models. These modelling efforts have mostly focused on including particular financial variables and/or frictions, and, in some cases, on developing satellite models. In addition, some efforts are being done to develop complementary modelling approaches, by exploring alternative expectations formation mechanisms or by including heterogeneous agents within possibly nonlinear models. However, more fundamental research is needed regarding the development of macroeconomic models with complex financial sectors, before their use in forecasting and policy analysis is feasible.

The recent financial crisis has also illustrated the importance of financial stability for the monetary policy transmission mechanism. The recent literature emphasised the increased importance of some channels and has identified new channels of transmission. In addition, it has also been shown that there are other instruments that can be used for monetary policy in crisis times beyond interest rates, which also contribute to financial stability. These findings suggest that the existing models should be enhanced to capture in more detail these interactions with the financial system. Regarding the use of non-standard monetary policy measures, the consensual view is that, in normal times, there should be a complete separation of monetary policy from liquidity management. In crisis periods it is difficult to disentangle the two and monetary policy and financial stability objectives interact strongly.

The new consensus recognises that the build-up of excesses need to be addressed by a combination of policies and not by monetary policy alone. In particular, macro-prudential policies, regulatory policies (e.g. loan-to-value ratios, capital requirements, liquidity ratios) and even fiscal policy should be enhanced to address financial instability. However, it would be desirable to avoid excessive activism or fine tuning from such policies, in particular regarding credit growth and asset prices, as such measures could complicate the operation of monetary policy and reduce the social benefits from financial intermediation. Instead, the policies should aim at containing systemic risk on a structural basis and ensuring that the financial system is sufficiently robust to absorb large shocks.

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