EUROPEAN CENTRAL BANK

EUROSYSTEM

THE GREAT FINANCIAL CRISIS

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LESSONS FOR FINANCIAL STABILITY AND MONETARY POLICY

AN ECB COLLOQUIUM HELD IN HONOUR OF LUCAS PAPADEMOS

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Address
Kaiserstrasse 29
D-60311 Frankfurt am Main
Germany

Postel address
Postal 16 03 19
D-60066 Frankfurt am Main
Germany

Telephone
+49 69 1344 0

Internet
http://www.ecb.europa.eu

Fax
+49 69 1344 6000

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Lucas D. Papademos and Jean-Claude Trichet

WELCOME ADDRESS

JEAN-CLAUDE TRICHET, EUROPEAN CENTRAL BANK

INTRODUCTION

The subject of this colloquium – "the great financial crisis" – could be no other since Lucas Papademos' tenure will be remembered for the immense challenges for financial stability and monetary policy that have arisen since the trigger of the subprime crisis in 2007.

Lucas played a key role at both the global and European levels in tackling these challenges. He was among those who were prescient about the considerable build-up of risks in the years before the crisis. He placed significant efforts in developing and adapting financial stability analysis to the fundamental and far-reaching changes in the financial system we have witnessed in the past decade, particularly as a result of increasing financial integration and innovation. When the crisis unfolded, Lucas was one of the foremost policy-makers in devising the actions required to stabilise the financial system. He also played a substantial part in setting the ground for regulatory reform, namely through his participation in the Financial Stability Forum, later Board, and in several European and Eurosystem fora, a number of which he chaired himself.

I am therefore delighted that we were able to organise this colloquium with such a set of distinguished speakers, all of which have their exceptional professional standing deeply associated with the financial crisis, either as policy-makers, crisis managers, academics or proponents of regulatory initiatives.

My introductory remarks this afternoon are organised around the title of this colloquium. My aim is to review policies in the last few years and draw some policy conclusions. I will first touch upon some of the lessons for financial stability, where Lucas's contribution was especially important, as responsible for the financial stability function, and then turn to the experience with monetary policy.

LESSONS FOR FINANCIAL STABILITY

The financial crisis erupted in August 2007, when off-balance sheet vehicles that had been set up by banks to manage portfolios of complex structured credit securities ran into funding liquidity problems. Although initially a liquidity squeeze, concerns about counterparty credit risks quickly spread as uncertainties intensified about the nature and extent of exposures of banks to what we now call "toxic assets". And, as we know, these escalating tensions culminated in the bankruptcy of Lehman Brothers in September 2008, an event which triggered an unprecedented surge of volatility across mature-economy financial markets and a broad-based decline of asset prices. With this, an adverse feedback between the condition of the financial system and real economic performance was unleashed, contributing to a sharp economic slowdown across the developed economies. Now we are observing renewed tensions, as the costs of supporting financial

sectors, fiscal stimulus and automatic stabilisers brought the focus to public finances across many countries both within and outside the euro area.

With hindsight, the financial crisis has reminded us that the seeds of financial instability are often the same: balance sheet mismatches, high leverage (on or off balance sheets) and very rapid growth of financial institutions. Essentially all of these elements were at play in one form or another in this episode. Now what are the lessons for financial stability monitoring and assessment frameworks as implemented by the responsible authorities?

A first observation I would like to make in this respect is, that we, as other central banks, had been drawing attention in our semi-annual Financial Stability Review, which Lucas was overseeing for many years, to the risks that were building up. For at least two years before the turmoil began, we issued clear warnings about vulnerabilities that were building up on account of an increasingly aggressive hunt for yield which was underpinning significant under-pricing of risks across a variety of asset classes, not only credit derivatives. And, I should also say that, the same warnings were communicated by several other central banks. A second observation is that in parallel with our financial stability assessments, we also repeatedly warned euro area governments of the risks of not consolidating fiscal positions in accordance with the rules of the Stability and Growth Pact.

Although in many respects the crisis that unfolded in 2007 and 2008 can be seen as the direct result of vulnerabilities and imbalances which had been growing steadily and which had been identified fairly early-on, they combined in such ways that few would have anticipated their potential severity for the functioning of the financial system. This notwithstanding, we and other major central banks reacted swiftly to mitigate the stresses in the functioning of money and other affected markets.

Against this background, to build a safer financial system it is of paramount importance that the responsible authorities enhance their financial sector surveillance while at the same time financial institutions play a decisive role by enhancing their risk management practices. A key challenge for policy-makers will be to design appropriate responses to enhance the stability of the financial system – including improving the detection and understanding of risks and vulnerabilities and translating these into concrete risk warnings and policy recommendations – without imposing restrictions that would unnecessarily hamper financial innovation and reduce the efficiency of the system. Many improvements, including the new Basel II Capital Accord, were already under way when the crisis erupted, and they address several of the weaknesses that have been identified. However, the ferocity of the financial turmoil and its fall-out which spread well beyond the financial sector call for more far-reaching reforms in the area of macro-prudential supervision.

In this context, a key initiative is the proposal for the establishment of a European Systemic Risk Board (ESRB), which will be supported analytically and logistically by the ECB and for which Lucas has already initiated a lot of groundwork.

The ESRB will be an independent body responsible for conducting macro-prudential oversight of the EU's financial system as a whole. Once the legislative process is completed, the creation of this new European policy function will fill a significant gap in the ability to detect, assess and ultimately contain the build-up of risks. In particular, the ESRB will be tasked to collect information relevant for systemic risk from across the EU. This should help overcome the significant information gaps which have hindered a comprehensive risk surveillance thus far, for instance with regard to the interlinkages among the major cross-border financial institutions.

The ESRB should be seen as the component of a global framework of macro-prudential oversight. This should support its effectiveness by also allowing it to contribute to the assessment and containment of global risks, which in turn may also contribute to the mitigation of risks in Europe. The Financial Stability Board, the IMF, as well as national authorities, are all actively engaged in the development of a comprehensive framework of macro-prudential supervision, which also takes into account the risks arising from systemically important financial institutions. The crisis demonstrated that only internationally coordinated initiatives are truly effective in addressing risks and vulnerabilities in the closely integrated financial system.

LESSONS FOR MONETARY POLICY

With regard to monetary policy, in many respects recent events have served to confirm the approach adopted by the ECB since the outset of Monetary Union in 1999. Most fundamentally, the primacy of price stability as the objective of monetary policy has been confirmed. Indeed, at times of financial stress, the credible maintenance of price stability becomes even more important. Were the anchoring of inflation expectations to weaken, financial market tensions would intensify further and corrective measures would prove less effective. Moreover, our recent experience of financial crisis – with its roots in the evolution of bank balance sheets, and thus monetary and credit developments – has vindicated in my view the importance attached by the Governing Council to a close and regular monitoring of the monetary data.

In the design of the ECB's monetary policy strategy, it was always foreseen that the close monitoring of monetary developments would provide a framework for policy makers to consider asset price developments and potential misalignments. 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. Recent research provides a vastly enriched framework for conducting such monitoring in a systematic fashion, and offers a real possibility that asset price disequilibria and associated financial distress may be identified at an early enough stage for corrective measures to be taken by the policy authorities. Further development of this framework promises to support financial and macroeconomic stability, within an overall strategy focused on achievement of our primary objective: price stability.

Such considerations, in concert with the development of a new framework for macro-prudential oversight, should permit to reduce the frequency, duration and economic impact of financial crises. These are themes that will be discussed in depth in the course of today's colloquium. We have to make sure that the global financial system, as well as continental and national ones, are made much more resilient. Yet, it would be unrealistic to believe that financial crises can be eliminated. Recent experience has also demonstrated the need for central banks to be timely and agile in managing financial crises without ever – in any circumstances – losing their sense of the medium to long-term orientation to price stability.

As regards the ECB, in the face of financial crisis, monetary policy was eased significantly through conventional means in late 2008 and early 2009, with key interest rates being reduced significantly.

Moreover, non-standard measures, in the form of the ECB's enhanced credit support were introduced. These aimed at maintaining an efficient transmission of monetary policy by supporting market functioning. Such measures were instrumental in the maintenance of price stability, since, in the face of downside risks to price stability, they ensured that the easing of the monetary policy stance was transmitted into a broader easing of financing conditions. In particular, the ECB expanded scope for central bank intermediation of transactions between banks, thereby offering an alternative to the malfunctioning private inter-bank money market. At the same time, the measures supported financial stability objectives by containing and mitigating the systemic consequences of liquidity tensions in the money market.

To conclude, let me say a few words on the recent decisions of the Governing Council taken on 9 May and announced on 10 May. As I already said publicly, I will sum up in five points the Governing Council's position.

1. The ECB is fiercely independent and takes all its decisions independently of governments, social partners and pressure groups of any nature.

2. We are inflexibly attached to price stability, our primary mandate. Our successful track record since the inception of the euro is remarkable.

3. Our present monetary policy stance is appropriate. Our decisions taken on 9 May have confirmed it. We are not engaging in any form of "quantitative easing".

4. The 'Securities Markets Programme' is designed to ensure an effective functioning of the monetary policy transmission mechanism by helping to resolve a malfunctioning of some segments of the euro area debt securities markets.

5. The liquidity provided through this programme is withdrawn in its entirety through tenders of term deposits.

CONCLUSION

I would like to end my remarks by acknowledging the outstanding contribution that Lucas has made to the conduct of monetary policy and the safeguarding of financial stability in these demanding and historic times, as I have just described. I cannot stress enough the important role he has played at the ECB, as well as in Europe and globally, to successfully ensure the sound pursuance of these essential policies, ultimately for the benefit and well-being of the societies and citizens which we serve. We are all very grateful to Lucas.

Jürgen Stark, Markus K. Brunnermeier, Paul Tucker,
Jaime Caruana, Vítor Constâncio (Chair) (from left to right)

SESSION I

THE GREAT FINANCIAL CRISIS: LESSONS FOR FINANCIAL STABILITY POLICIES

THE GREAT FINANCIAL CRISIS: LESSONS FOR THE DESIGN OF CENTRAL BANKS

JAIME CARUANA, BANK FOR INTERNATIONAL SETTLEMENTS

It is a privilege to be asked to participate in a colloquium in honour of Lucas Papademos. Lucas embodies the qualities admired by central bankers around the world: intellectual rigour, thorough knowledge and good judgment. All of us who have served on the ECB's Governing Council during Lucas' tenure have heard him dissect difficult policy issues and summarise complex discussions clearly, succinctly and in a manner that strikes a fine balance among competing intellectual arguments. These qualities have helped him to shape our thinking about the nature of central banking, and it is this thinking that I would like to explore today.

The global financial crisis has shed new light on central banks' role in promoting financial stability. The governance arrangements needed for central banks to fulfil such a role continue to be debated. But I think three general conclusions are widely shared:

- One, central banks will almost always be the first public institution to act when a financial crisis hits. The response to recent turmoil in European sovereign bond markets is consistent with this observation. This raises the question of how to differentiate the central bank's responsibilities in a crisis from those of the government.

- Two, central banks must have realistic financial stability objectives that are consistent with their primary monetary policy responsibilities. Macroprudential policy aims to achieve these financial stability objectives, but cannot be conducted in a vacuum. It needs to take account of and be supported by other policy actions, in particular monetary policy.

- Three, central banks must have the powers and instruments to meet such objectives – or institutional arrangements should enable them to shape the actions of the supervisory authority that control such instruments.

In my remarks today I shall consider some of the implications of these three points.

I CENTRAL BANKS IN A CRISIS

The crisis showed that central banks have to act immediately when a systemic financial crisis occurs. Their responsibility for the interbank payment and settlement system puts them on the front line. Only they are able to provide almost unlimited system-wide liquidity at very short notice. During the crisis, they did so not only in huge amounts but also in innovative ways that met unprecedented needs. This exposed them to financial and reputational risks, and, in some cases, raised questions about the legal or political basis of their actions.

The statutory basis for central bank liquidity provision in a crisis varies widely from one central bank to another. As monetary policymakers, central banks have an abiding interest in the functioning of financial markets and the monetary transmission mechanism, which links the policy interest rate to term interbank rates, and to the broader money and credit markets. Almost all central banks can provide liquidity to banks against good collateral. Some have explicit powers to provide it also in other circumstances – "unusual and exigent" circumstances, to use the language in Section 13.3 of the Federal Reserve Act. In providing liquidity, central banks will of course try to avoid propping up insolvent banks. But the distinction between liquidity and solvency support is tenuous and shifts over time as a crisis unfolds.

The ability of the central bank to provide funds in its own currency in a crisis can forestall the potential catastrophe that systemic illiquidity could cause. But such actions can have unintended consequences:

- First, aggressively expanding the central bank balance sheet may substitute for markets for longer than intended. In crisis conditions, private financial institutions will prefer counterparties of unquestioned soundness, and it may be difficult to wean them of dependency on the central bank.

- The shifting boundary between illiquidity and insolvency can also lead to unintended consequences. The central bank may find that, by providing liquidity to a bank in distress, it allows some of the bank's creditors to escape before an eventual insolvency. This may increase the fiscal cost of the bank's failure.

- Third, although central banks can help to stabilise markets in the worst moments of a crisis by accepting paper shunned by the market, they could also inadvertently impair the operation of the money market if they were to drain the supply of high-quality collateral needed by market participants. For these reasons, central banks need to strike a balance between the need to protect their financial position and the broader policy objective of making markets work.

In order to be able to provide liquidity at short notice and fulfil their lender of last resort role, central banks need more information about the condition of individual banks before a crisis. For example, they need to know the scale of the

risk-taking and maturity transformation of some banks. This may require extensive information sharing between agencies and the capacity to obtain information directly from financial firms.

But most importantly, just as central banks must react rapidly and not ignore financial disruptions during a crisis, they cannot evade the responsibility for financial stability during the build-up phase of financial imbalances. A more symmetric approach to deal with financial imbalances is needed. This would be consistent with the idea that monetary policy should act not only on the basis of a central scenario but also taking into account the distribution of risks.

What financial stability mandate would be appropriate for central banks? What powers are needed for different mandates? What mechanisms can be used to hold the central bank to account for discharging its financial stability function?

2 CENTRAL BANK FINANCIAL STABILITY MANDATES

There is considerable diversity across central banks with regard to the source of their financial stability mandates. Sometimes the mandate is set out explicitly in legislation. Sometimes it is derived from specific provisions, such as responsibility for the payments system. Sometimes it is based on a general understanding about the central bank's responsibility for the smooth functioning of the financial system. Whatever their source, existing mandates have permitted central banks to respond flexibly to the challenges generated by the crisis. What they will need in the future is a clearly articulated strategy for promoting financial stability. This may not require new legislation, but it will require clarity of thinking and lucidity in communication about what central banks will do to promote financial stability.

Articulating a coherent financial stability strategy is not easy. Financial stability is by its very nature less amenable to precise specification and measurement than price stability. The absence of bank failures is not an objective: some degree of creative destruction is indispensable in a vibrant economy. Nor is stabilising market levels an objective, for much the same reason. We would, of course, all like to have a precise operational objective for financial stability. It would also be very tidy to separate financial stability from the price stability objective; however, recent events in European sovereign bond markets underscore that financial instability can put the monetary transmission mechanism at risk, and confirm that the two objectives are interrelated and complementary, particularly when longer time horizons are considered.

Such a tidy separation is neither realistic nor desirable. Monetary policy choices have implications for the financial system. And, conversely, macroprudential choices have implications for monetary policy. As you know, central banks are now seeking to integrate financial analysis into the macroeconomic frameworks they use to formulate monetary policy.

Another factor that militates against a precise, quantitative objective is the nature of systemic risk. The crisis has taught us that a narrow focus on the safety and soundness of individual institutions is not sufficient to secure systemic stability. The interlinkages and externalities are too great. In addition, the financial system tends to be procyclical and amplify macroeconomic or global financial shocks, or even to generate instability on its own. Those responsible for financial stability therefore need to have a broader, more systemic vision.

Two jobs central banks are already doing make them naturally suited to furthering this macroprudential agenda. Central banks have a key role in overseeing the payments and settlement infrastructure that is central to the modern financial system. They also devote considerable resources to analysing macroeconomic and financial trends.

In addition, since monetary policy actions affect financial conditions, central banks need to ensure that the two policies are mutually supportive. This will require judgment. Policy rates are adjusted more frequently than regulatory policy settings. It may be necessary to resist calls to first try regulatory measures when the source of a problem is macroeconomic. But macroeconomic measures may also need the support of appropriate macroprudential policy.

If macroprudential settings were to be adjusted in response to cyclical developments, monetary policy decision-making could face further complications. Central banks setting monetary policy would need to know how and when cyclical developments would be likely to influence macroprudential policies, which in turn would affect economic prospects. If an institution other than the central bank is responsible for macroprudential policy settings, some coordination mechanism will have to be designed.

This illustrates a more general point: financial stability, unlike price stability, is likely to be a shared responsibility. The decisions of other government agencies, such as the fiscal authorities, non-central bank supervisors and the competition authorities, affect financial stability. The implication is that we cannot define specific and quantifiable financial stability objectives for the central bank alone.

So there is no simple "one size fits all" answer to the question of how to define the financial stability mandate of a central bank. Nevertheless, the case for such a mandate – even if imprecise – is overwhelming. Those responsible for public policy often have to make do with imprecise objectives. And new policy frameworks inevitably involve a willingness to adapt in the light of experience.

3 ENSURING THE CENTRAL BANK HAS THE REQUISITE POWERS FOR FINANCIAL STABILITY

Giving the central bank macroprudential responsibility would require providing it with the power and tools it needs. It would also require developing the necessary structures of accountability. So far, the precise nature of the

macroprudential toolkit has yet to be specified, but in general terms it would consist of administrative or regulatory instruments used to mitigate threats to systemic stability.

Historically, central banks have had administrative powers that have permitted them to impose liquidity requirements on banks. Many central banks in emerging market economies have made active use of reserve requirements to restrain banks during booms and to help banks when market liquidity evaporates. Some years ago (when financial markets were less developed than they are today), such powers were used even by central banks in advanced economies mainly to implement monetary policy and to influence credit creation. The use of these same instruments for financial stability purposes is now being mooted. The crisis has certainly shown that banks in the advanced economies need stronger liquidity buffers. Central banks have a particular interest in the design and surveillance of such buffers.

The challenge now is to decide on the instruments that would make the macroprudential perspective operational. A recent review conducted by the CGFS/BIS revealed a very large number of instruments that had been used (or were under active consideration). But many tools have been tried in only one or two jurisdictions.

In designing macroprudential instruments, one of the key questions is what the right balance is between discretionary decisions and built-in automatic stabilisers that can dampen systemic risk even without deliberate policy decisions. After all, fiscal policy works even in the absence of explicit changes in tax rates or discretionary changes in expenditure thanks to strong built-in stabilisers. Similarly, fixed prudential ratios can exert powerful stabilising forces. It is more difficult, although in my view desirable, to design macroprudential instruments that vary with the cycle, but there are precedents, such as dynamic provisioning and changes in reserve requirements. The current efforts to develop countercyclical capital buffers offer hope that such instruments can be deployed effectively. Certainly this would ease pressures on decision-making.

A larger toolkit has distinct advantages. Central banks can target the source of a problem more precisely. Using loan-to-value ratios for mortgage lending, for instance, might protect the asset quality of banks better than raising interest rates, which may have undesirable side effects for growth or for the exchange rate. In using an expanded toolkit, central banks will have to calibrate the effects. This will not be easy, because we have little or no historical experience of the interactions between different instruments. In deciding how much to target specific sectors, the central bank will need to avoid distorting credit allocation and inducing banks to seek ways around such measures. Remember that monetary policy in developed economies moved away from direct instruments to avoid such distortions and inefficiencies.

The conduct of macroprudential policy more generally involves the identification of vulnerabilities, the evaluation of policies to mitigate them (including a cost-benefit analysis and feasibility assessment) and the design of specific

regulations. The central bank naturally has a prominent role in all these activities. Different jurisdictions envisage different roles in each phase.

In the approach being considered in the EU, central banks would play a prominent role in diagnosis and prescription, but a more limited one in implementation and resolution. The process of identifying systemic risks and determining the most effective means for mitigating them will be assigned to the European Systemic Risk Board (ESRB), with representatives primarily from central banks and supervisors. The ESRB will lean heavily on the expertise of central banks and supervisors, and the ECB will provide the secretariat. The ESRB will not have direct authority over any policy instruments, but will instead have the power to make recommendations and to warn the competent authorities. Such recommendations will be difficult to ignore if they are made public and contain a "comply or explain" obligation.

A different role for the central bank is envisaged in the mainstream proposals for a macroprudential framework in the United States. According to these proposals, the central bank would be responsible for the regulation and supervision of systemically significant institutions. Because of its macroeconomic perspective and its understanding of the operation of financial markets, the central bank is better placed than other authorities to design and implement regulations that will address the risks that arise from the size, business models and the interconnectedness of systemically important financial institutions. The central bank would also be one of a number of members of the multi-agency council with macroprudential responsibilities.

WHAT ARE THE IMPLICATIONS FOR ACCOUNTABILITY AND AUTONOMY?

A wider financial stability mandate will have significant implications for central bank accountability. Financial stability decisions require greater interaction with the government than monetary policy decisions. Determining how to organise such interaction will not be easy because the boundary between monetary policy and financial stability objectives is inevitably rather blurred. The wider the scope of the central bank's financial stability mandate, the greater the scrutiny in the political process, and indeed by the public itself, will be. It is not a coincidence that the frequency of interaction between the central bank and the government is greater in countries where the central bank has a wider financial stability mandate.

Greater interaction with the government need not compromise central bank autonomy. But it does mean that the mechanisms for coordination must be well specified. Indeed, the arguments in the area of monetary policy in favour of making the central bank independent from short-term political pressure apply with equal force in the area of financial stability. In addition, there is a need to shield day-to-day decision-making from the commercial interests of the financial industry. In fact, one argument for assigning financial stability responsibilities to the central bank is that it already has independence to conduct monetary policy.

Greater clarity about the central bank's financial stability mandate and strategy will help promote accountability. Although it is not possible to set out measurable financial stability objectives, it is possible to require clarity about actions and the decision-making process. A clearly articulated strategy for promoting financial stability will make this form of disclosure meaningful. The central bank can then be held to account. Accountability for decisions can be achieved by disclosing information to the public or in reviews by the legislature. Both procedures are widely used for both monetary policy and financial stability policy. To date, however, the disclosure of information on financial stability actions has been less extensive and less frequent than the disclosure of information on monetary policy. This probably needs to change.

The way decision-making arrangements are structured affects both accountability and autonomy. Because macroprudential policy is in its infancy, it is not clear whether it is better to have a single board that decides on both monetary policy and financial stability matters or to have separate committees each making decisions in their own areas. The former facilitates coordination; the latter permits dedicated expertise to be brought to bear and separate accountability mechanisms to be applied. Both approaches are found in about equal measure in the central banking world. Brazil, Sweden and the ECB all have a single board for policy decisions, though particular meetings may be dedicated to monetary policy decisions. By contrast, financial stability and monetary policy decisions are made by separate but overlapping bodies in Malaysia, Thailand and the United States. Joint membership by the Governor and other senior officials helps to ensure the separate decisions are consistent.

Japan has dealt with the issue of accountability and autonomy by adopting double veto arrangements for financial stability decisions. For example, the prime minister and the Minister of Finance may, when they find it necessary for the maintenance of the stability of the financial system, request the Bank of Japan to provide loans. The central bank, however, retains the ultimate discretion as to whether to lend and has articulated the principles it will follow when making these decisions.

CONCLUSIONS

The financial crisis will have significant implications for central banks as public policy institutions. They will need to pay greater and more symmetric attention to financial considerations in framing their monetary policy. The synergies and complementarity that exist between monetary policy and financial stability are so great that these policies are often difficult to separate in practice, as recent events in European sovereign bond markets underscore. Central banks will have an important role in any macroprudential policy framework – even when they are not solely responsible for its detailed implementation. The crisis has also shifted the balance of arguments about the locus of supervision, at least with respect to systemically important financial institutions.

But wider responsibilities require greater accountability. Financial stability actions are by their nature more political than monetary policy decisions. The challenge will be to refine and develop the governance mechanisms for central banks so that they retain the independence needed both to conduct monetary policy and to discharge its responsibilities for financial stability. This will require greater clarity about their financial policy strategies. It will also require well articulated mechanisms for cooperating with other public authorities and the flexibility to address new types of financial risk.

None of this will be easy. There will be no lack of public criticism – particularly when central banks decide on restrictive policies. Higher interest rates are almost never popular. The inherent uncertainties both in measuring systemic risk and in any quantification of the impact of new preventive measures are bound to make it challenging for regulators to justify their policies to the public. This new world of central banking will require that central banks show the professional skills, acumen and integrity that Lucas Papademos has demonstrated in such ample measure throughout his career.

THE GREAT FINANCIAL CRISIS: LESSONS FOR FINANCIAL STABILITY POLICIES

COMMENT

PAUL TUCKER, BANK OF ENGLAND

Let me start by thanking Lucas for being a great colleague and friend over the years. One of the best things about being a central banker is the friends and support that, happily, one accumulates overtime. For any of us who have been in central banking for a long time it has been of immeasurable support during this crisis to know that there are people elsewhere struggling with the same problems and sometimes having solutions from which we can draw.

Jaime Caruana set out a splendid and thought-provoking survey of the position in which we find ourselves – because there is no doubt that we face huge challenges over the next decade or so. In doing so, he touched on the institutional responsibilities of central banks. I hope that colleagues will forgive me if I step away from commenting on those parts of Jaime's talk, because at present in the UK there is an ongoing debate about the functions and responsibilities of the Bank of England and that is properly the realm of democratically elected politicians, not officials.

So what I thought I would do, if I may, is touch on a small handful of the substantive issues Jaime covered and on which, one way or another, Lucas has been engaged over recent years: macroprudential policy; regimes for resolving distressed firms, which I think was implicit in part of what Jaime said; and then, finally, central bank liquidity provision, which will lead me on to some thoughts on the liquidity of markets and Basel's fundamental review of capital requirements for trading positions.

1 MACROPRUDENTIAL

Macroprudential policy was at the centre of Jaime's presentation. There is an active debate about this in our world, which will continue over the next year or so.[1] It has the potential to bring about the biggest change in the policymaking environment for a generation. We can not yet be absolutely sure whether macroprudential regimes will definitely be embraced across countries, and so we need to be suitably modest in our objectives, but the debate has made quite a lot of progress over the past year or so. So I would make three concrete remarks: first, about what the 'macro' in macroprudential means; secondly,

1 For an early UK contribution to the post-crisis debate, see Tucker PMW (2009), "The Debate on Financial System Resilience: Macroprudential Instruments", followed by Bank of England (2009), "The Role of Macroprudential Policy – Discussion Paper".

about the interactions with monetary policy; and thirdly, about macroprudential instruments.

'MACRO' IN MACROPRUDENTIAL

On the first issue, I think it is worth reminding ourselves that, at least as originally envisaged by Andrew Crockett and the people around him at the BIS a decade or so ago, the 'macro' in macroprudential did not stand primarily for macro*economic*. It meant taking a *system-wide* perspective on the resilience of the financial system as a whole, and the banking system in particular, when designing and applying microregulatory instruments. If bank supervisors focus solely on the health of individual firms, they can easily miss system-wide vulnerabilities. That is an old insight that, thankfully and not before time, is now being revived.

There are two elements to the macroprudential enterprise. First, identifying vulnerabilities or faultlines in the financial system, and remedying them so as to make the system more resilient. Second, leaning against threatening imbalances, including excessive exuberance in the credit cycle.

I shall say more today about the latter element of macroprudential policy. That would of course affect macro*economic* conditions. If, for example, we take steps to buttress the resilience of the banking sector during the upswing of a credit cycle, that for sure will affect credit supply conditions, which will affect macroeconomic conditions more broadly. But the objective is one, surely, of making the financial system more resilient in the face of stress; and, in the process of doing so, to dampen an excessive upswing in the credit cycle in order to temper the degree to which the system becomes unduly vulnerable. In other words, in part, we want to moderate those fluctuations in credit conditions that would otherwise threaten stability.

MACROPRUDENTIAL POLICY AND MONETARY POLICY

The second thing I want to comment on is the relationship between the countercyclical dimension of macroprudential policy and monetary policy.[2] We at the Bank of England have been quite clear, as I think you are at the ECB, that the objective of monetary policy should remain to steer nominal demand so as to achieve an inflation target, which means anchoring medium-term inflation expectations. We should not ask monetary policy to do too much. It is now plain to everyone that while nominal stability is a necessary condition for economic prosperity, it is not sufficient. It does not preclude terrible credit cycles. So the macroprudential debate is, in an important respect, a debate about missing instruments; and, as I have said, in part that is about recovering a system-wide perspective in the use of micro prudential instruments.

2 See Tucker PMW (2009d), "The Debate on Financial System Resilience: Macroprudential Instruments, pp. 8-9, and also from my colleagues at the Bank: Bean, C.R. (2009), "The Great Moderation, the Great Panic and the Great Contraction" and Dale, S. (2009) "Inflation Targeting: Learning the Lessons From the Financial Crisis".

But, on the other hand, we do not serve ourselves well if we claim, as perhaps some analysts and central bankers at times appear to have claimed or implied, that monetary policy is irrelevant to credit booms and asset price booms. I'm going to say something very obvious, which somehow can get lost or obscured when we communicate with a broader public.

When we reduce interest rates very sharply, or when we announce that we expect to keep them low for a prolonged period, or when we inject money into the economy on a vast scale, central banks are expecting asset prices to go up, other things being equal. Those are fundamentally warranted shifts in asset prices. But this can – it does not inevitably, but it can – create the conditions for a credit boom. Because sometimes markets extrapolate forward into ex-ante required returns the ex-post windfall gains that flow from a sharp easing of monetary conditions. That can occur. When the initial appreciation in asset prices was warranted by a breakthrough in technical progress, truly enhancing the economy's productivity. But we can not pretend that it does not also happen sometimes when the initial impetus comes from monetary policy. And when the market does try to sustain such high headline (or risk-*un*adjusted) rates of return, market participants often discover they can do so only by taking more risk – most obviously, but most worryingly, by increasing leverage and maturity mismatch. For a while – sometimes quite a while – that can fuel a boom. As it proceeds, more and more investors and traders try to get in on the game, in an environment where, all too often, performance is assessed in terms of relative ex post returns. We end up with a herd – and a herd that faces a big collective action problem; it does not know how to stop. It is hard to be the one who steps off the dance floor.

That is not caused in some deep sense by monetary policy. But it does mean that when we ease monetary policy dramatically or progressively, then the authorities should surely be alert to having created conditions in which over-exuberance might gain traction in markets. The financial stability side needs to be alive to what the monetary policy side is doing. Resolution of the collective action problem often needs help from outside; at a party, the grown ups turn down the music or turn up the lights. Which, in the financial world, means somehow operating on the self-feeding extension of leverage and maturity mismatch. Warnings are not always enough. For the market to heed the authorities, they need to believe that there is something we can *do*.

MACROPRUDENTIAL INSTRUMENTS

The debate about possible macroprudential instruments is, therefore, of first order importance. But, as Jaime said, we do not yet, as a community, have a precise specification of the instruments. Despite some overlap, it is useful, as I suggested earlier, to distinguish between, on the one hand, policies to address vulnerabilities and faultlines in the financial system and, on the other hand, instruments to lean against overly exuberant credit conditions that threaten stability.

Many of the latter, on which I am focussing today, are plainly microregulatory instruments used to system-wide ends. They may sometimes be headline capital requirements. At times they may also be risk weights – i.e. the capital required

against specific types of exposure – because some booms stem from conditions *within* the financial sector or lending to specific sectors of the real economy, such as real estate. An example of the former: if only regulators had stepped in and moved away from applying a zero weight to 364-day lines of credit, we might have blocked one of the ingredients of this crisis – the explosion of vehicles relying on bank backstops. (And, as an aside, I would comment that our community needs to be much readier to make running repairs to the Basel Capital Accord when faultlines are exposed by regulatory arbitrage or the passage of time.) Others have aired – or, as in Asia, have actually used – Loan-To-Value limits or, equivalently, haircuts.

So there is likely to be a repertoire of instruments, perhaps varying across countries. The CGFS has already published two reports on this – with the ECB contributing actively.[3]

But, as we continue this work, we need to be clear with the public and parliaments that this is not to do with keeping the economy on some perfectly efficient path. This is to do with avoiding complete disasters. Both elements of the macroprudential toolkit – reducing faultlines, and leaning against exuberance – can help to keep the system away from the edge of the cliff. It is an alluring prospect. But also a demanding one given the need for new analytical tools and much richer data on the flows of funds and risks around the financial system.

2 RESOLUTION OF DISTRESSED FIRMS

Macroprudential is one of the great new areas that we confront. The other, I believe, is in the area of resolving big and complex firms in an orderly way without taxpayer solvency support.

Many of the elements of the regulatory-reform debate are concerned with making major improvements to things that the authorities have been doing for a long time: capital requirements, liquidity policy and so on. But, just as with macroprudential instruments, we have entered new territory in trying to develop regimes for resolving the largest and most complex firms. Success could well bring a revolution. This is right at the heart of the 'Too Big to Fail' debate. It is about making it possible for firms to fail without economic disaster.

It has been a great mistake, around the world, for national authorities to declare, over many decades, that regulatory regimes are not meant to eliminate failure, when they had not thought through how, in fact, they would cope with failure.

For medium-sized domestic commercial banks, there is a viable toolkit – developed by the FDIC in the USA and the CDIC in Canada. The UK learned, to our cost, that it needed that kind of resolution regime; and we now have one. But

3 See the Committee on Global Financial System (CGFS) reports, "Macroprudential instruments and frameworks: a stocktaking of issues and experiences" (May 2010) and "The role of margin requirements and haircuts in procyclicality" (March 2010).

the agenda *has to be* more ambitious. The goal is to be able to resolve the *largest and most complex* firms, with losses falling, of course, to equity holders but also, if a bank's equity cushion is inadequate, to creditors rather than to taxpayers. And to do so without terrible disruption in the provision of financial services to the economy.

This is a formidable challenge. But there are ideas around. One of them – based on the FDIC's bridge company technology – is in the US Dodd-Frank legislation. Another is the possibility of giving the authorities an instrument akin to a speeded-up Chapter 11 for reconstructing a bank's balance sheet. Over a weekend operation, senior unsecured creditors-bond holders and even uninsured depositors could have their claims haircut and partly converted into equity *in a going concern*. It would be a going concern because, if the underlying franchise remained viable, the business would be released back into the market on the Monday morning.

I am very obviously skipping over a lot of important details, but I think it will be clear enough that something along those lines could be a big step towards reintroducing market discipline back into the financial system. Because in that world, debt holders would have a strong incentive to monitor the risk from bank balance sheets, business models and management teams. The G20 Financial Stability Board is exploring this seriously as part of preparing broad guidelines on the features of sensible resolution regimes for its autumn package.

3 LIQUIDITY

CENTRAL BANKS' PROVISION OF LIQUIDITY INSURANCE

As Jaime said, the bedrock of the central banks' role in financial stability is liquidity provision. This is an area where central banks have learnt from each other during the crisis. At the Bank of England we have certainly learnt from the ECB and, indeed, the Federal Reserve and others, thanks to an exercise chaired in Basel by the ECB's Francesco Papadia. For example, at the Bank of England, we are plainly ready, consistent with our history, to lend against a wide range of collateral when the chips are down. That being so, we decided that we may as well say so in advance and make clear the terms on which we would do so. But how on earth can a central bank stand ready to do that without exacerbating moral hazard? And here, I have to say, we are still in a somewhat different place from the ECB. The Bank of England charges a higher rate, the more that a firm borrows from us and the less liquid the collateral that we are given.[4] So that is an ongoing debate in our community.

4 For more detail see consultation document, Bank of England (2008), "The Development of the Bank of England's Market Operations" and the March 2010 (updated) Market Notice for the Bank's Discount Window Facility. The underlying policy analysis was set out in: Tucker PMW (2009b), "The Repertoire of Official Sector Interventions in the Financial System: Last Resort Lending, Market-Making and Capital".

But the two thoughts I really want to inject today on liquidity is where all this takes us.

The first is that I believe that, as a community of central banks, we are not going to be able to avoid debating 'market maker of last resort'. Because a few times over the past couple of years one or more of us have confronted situations where lending to intermediaries was not enough to sustain liquidity in our capital markets. At the Bank of England we stepped in to underpin the liquidity of the corporate bond markets, standing ready to buy small amounts via auctions. And my sense is that that is, in some respects, what the ECB has been doing recently in standing ready to buy euro area government bonds: trying to underpin the liquidity of those markets rather than trying to buy a whole mass of those bonds. And yet we have not collectively articulated clear principles that can guide us in those circumstances. We should probably do so.[5]

Second, by specifying our criteria for taking a wide range of collateral, central banks are entering, albeit indirectly, into the design of capital markets. That is especially important when those markets are new or have problems. Both the ECB and the Bank of England have in recent months put out for consultation ideas on a whole range of requirements on the information that we should receive when we take collateral in the form of ABS or portfolios of raw loans.[6] Our motivation is, of course, primarily to protect our own balance sheets. But, whether by design or not, it will also play into debates about the development of those markets, in particular the ABS markets. At the Bank of England, we have said that the information we require should be made public. Why? Because when a counterparty defaults, we end up holding 'collateral' outright and so care about the health of the underlying capital markets in which we might try to sell.

That kind of indirect intervention in the capital markets will, I think, play in turn into the regulatory debate.

THE FUNDAMENTAL REVIEW OF THE BASEL TRADING-BOOK CAPITAL REQUIREMENTS

Which brings me to a final thought, one going a little beyond Jaime's material but still bearing on the *kind* of contribution central banks can make to the reform of the financial system.

Many of the problems that the financial system have weathered over the past few years arose because banks held in their trading books, and so marked to market, instruments that, in truth, had no place there: because they were not at all liquid and would never have been liquid when the music stopped. So when the music did stop, prices collapsed, leaving the net worth of many banks severely impaired.

5 A longer discussion of market-maker of last resort can be found on pp. 13-16 of Tucker PMW (2009b).

6 See, Bank of England (2010), "Extending Eligible Collateral in the Discount Window Facility and Information Transparency for Asset-backed Securitisations: A consultative paper".

This will, I believe, need to be tackled in the Basel Supervisors Committee's fundamental review of capital requirements for the trading book – a major task for 2011.

Over the past decade or so the stance has been that whether an instrument is in the banking book or the trading book should depend on whether a bank intended to hold an instrument to maturity or expected to trade it. In terms of capital requirements, that is a missed step. Instead, capital requirements should depend *in part* on whether the underlying markets in those instruments can be expected to be *resiliently* liquid.

Some markets are *not* resiliently liquid. The effect of the current regime was to leave banks holding far too little capital against the risk of swings in liquidity premia.

If we think about it like that, then the bones of a new policy approach might go along the following lines. If a market is resiliently liquid, and a bank wants to trade in it actively, well then it could get a pure trading book treatment. If the market is manifestly and unquestionably illiquid then it should get a banking book treatment. Between those extremes, there would be a weighted average of the banking book and trading book approaches.

How should we recognise resilient liquidity? I would argue that a necessary condition is that there should be a body of 'real money' unlevered demand for a type of asset, because then the banking system can sell to pension funds, insurance companies and mutual funds, who will not depend on borrowing from banks to finance their purchases. On this test, a lot of what brought the banking system down – notably AAA tranches of structured-finance paper – would have failed the test of resilient liquidity and would not have got a pure trading book capital treatment.

My point, though, is really a broader one. Central banks need to bring a combination of their analytical skills and their deep knowledge of the markets and the financial infrastructure (the plumbing) to their contributions to the regulatory debate. We sometimes should not accept the terms in which the regulators themselves want to cast the debate. That is part and parcel of a macroprudential perspective. It is what central bankers can offer.

Lucas has done so much to sponsor practical steps towards such a macroprudential perspective – not least through his preparations for the European Systemic Risk Board. And today is for Lucas. I have found in the many international meetings that I go to that Lucas manages to shift a debate forward, through the application of calm reason drawing on deep experience. Thank you *very much* for our collaboration.

MACROPRUDENTIAL REGULATION: OPTIMIZING THE CURRENCY AREA

MARKUS K. BRUNNERMEIER, PRINCETON UNIVERSITY

This paper addresses two challenges that the European Central Bank (ECB) faces and makes concrete suggestions for ways to resolve them.[1]

The first challenge concerns financial stability, which historically was the initial motivation for setting up central banks. My first suggestion is to refocus the rationale for the ECB's monetary pillar toward financial stability. This would provide clear guidance for designing the appropriate monetary aggregates as inputs for monetary policy decisions.

The second challenge concerns the large and persistent dispersion in price stability across the member states of the euro area. For many years, inflation has been significantly higher in some states than in others. Imbalances have been building and are likely to lead to difficult adjustments in the future. My second suggestion is to actively use a regionally differentiated "haircut policy" and "national macroprudential regulation" as monetary policy tools.

For example, mortgage-backed securities that are based on mortgages granted in a euro member with high inflation should be subject to higher haircuts. This recommendation is a sharp departure from the ECB's current policy, which sets haircuts more from a risk management point of view that attempts to minimize default risk. The beauty of a regionally differentiated approach is that, while the ECB can set only one short-term interest rate, it can set regionally specific haircuts, which should translate into differentiated long-term rates for risky loans.

SUGGESTION 1: REFOCUS THE MONETARY PILLAR TOWARD FINANCIAL STABILITY

Monetary aggregates are at the heart of the ECB's monetary analysis. Currently, they are used only for cross-checking and to capture the longer-run aspects of monetary policy. The underlying rationale is the quantity theory of money, which states that a prolonged increase in the money supply will translate into an increase in the price level in the medium and long run (given a constant level of money velocity).

The new rationale for the monetary pillar should be financial stability. The theoretical underpinning of this rationale relies on a richer monetary theory that puts special emphasis on the redistributional effects of monetary policy.

1 My suggestions are also part of a forthcoming book *Liquidity Provision, Crisis Management and Monetary Policy: Monitoring the ECB*, a joint effort with Charles Goodhart, Pierre-Olivier Gourinchas, and Rafael Repullo.

The starting point is a change in our definition of risk. Since risk can be building in the background during a bubble phase and materialize only during a crisis, measures of current volatility are not good risk indicators. It is therefore important to follow growing imbalances and bubbles and lean against them. This is especially important when a bubble is accompanied by excessive credit growth. Adopting such a perception of risk will lead to more proactive monetary policy and regulation compared with the existing paradigm.

When risk materializes and a bubble bursts, the financial intermediary in particular typically suffers, as it is hit on both sides of the balance sheet. For one thing, asset values erode. But also, as balance sheets are shrinking, the amount of inside money in the economy is reduced. The result is deflationary pressure à la Fisher (1933), which increases the real value of the intermediaries' liabilities (for a formal analysis, see Brunnermeier and Sannikov 2010). The overall effect is a reduction in intermediation, with the potential for dragging the whole economy into a severe and prolonged recession.

In addition, the usual monetary transmission mechanism might become impaired. Lax monetary policy is necessary to indirectly recapitalize the financial sector. The monetary authorities are busy handling the crisis and give the impression of being driven by events rather than of being in control and guiding the events. In addition, explicit bank bailouts can lead to high public deficits. Both policies have the potential to increase inflation expectations in the very long run. In the short and intermediate term, the environment will be characterized by heightened uncertainty.

In sum, unlike the quantity theory of money, which delivers the straightforward prediction that an increase in monetary aggregates leads to higher price levels, the financial stability view leaves a different time stamp. Excessive credit growth and imbalances can lead to financial instability and deflationary pressure. The monetary authorities' efforts to clean up after the crisis can lead to higher inflationary pressures in the very long run.

My suggestion to refocus the monetary pillar is based on the following reasonings. First, I will stress the importance of monetary policy leaning against growing imbalances and bubbles by countering each of the five arguments often brought forward in favor of a "benign neglect" policy toward bubbles. Monitoring quantity aggregates is key in detecting these imbalances. Second, I will argue that focusing the monetary pillar on financial stability helps in designing better monetary aggregates. I conclude by arguing that monetary stability and financial stability cannot be treated separately, as they are closely intertwined.

The first argument I will counter is that it is very difficult to identify bubbles and hence we should not act against them. This argument can be advanced against any sort of policy making. Any decision making is performed under uncertainty, and one can never know the right action other than to employ a risk management approach: If it is sufficiently likely that a bubble has emerged, then one should lean against it.

Sometimes simple anecdotes, like the one in which people flip houses in a few days, are useful signs that imbalances are building.

The second argument often brought up is that one need not lean against a bubble since it is possible to clean up after it has burst. I think the recent crisis has shown that, in that respect, there is a huge difference between an asset price bubble and a credit bubble. It is possible to clean up after an asset price bubble like the dot-com boom, but if the bubble is financed with credit as was true with the housing bubble – or as in the 1920s, when many investors bought stocks on margins – then it is much harder to clean up afterward. The lesson is that we have to be much more conscious of credit bubbles than asset bubbles.

The third argument often heard is that interest rates are not the most effective tool for pricking bubbles and hence should not be used. Indeed, higher interest rates are quite ineffective in the late phases of a bubble. When a bubble has already gained momentum and euphoria breaks out, an interest rate increase of half a percentage point might not make much of a difference. The Bank of Japan's failed attempt to burst a bubble with higher interest rates is consistent with this view, which suggests that credit controls are a more effective method for bursting a "ripe bubble." However, higher interest rates can be an effective tool in the early phase of a bubble, because an interest rate spike has a huge signalling component. A higher interest rate might also make it less attractive to buy structured products, since their short-term financing becomes more expensive.

A fourth and related argument frequently advanced is that interest rates are too crude a tool to burst bubbles. However, it is true that bubbles affect a large part of the economy and therefore policy makers should be willing to use this tool, along with others. To the extent that other, more targeted policy measures are at its disposal, the central bank should make use of them as well. Indeed, I will argue later that the ECB should use a policy of different haircuts for different member states in order to lean against imbalances within the euro area.

Finally, a major argument against pricking bubbles is that it can lead to disastrous outcomes. The burst of the U.S. bubble in 1929 indeed led to an economic disaster. The Bank of Japan brought the bubble down in 1989 – not through high interest rates, but through "total volume control," which limited credit growth to the real estate sector. The burst of the bubble was followed by at least two "lost" decades. However, the real question is what would have happened if the bubble had grown even further – say, over another two or three years. Then an even bigger bubble would have had to burst. The real problem is that the action was taken too late, and hence the bubble burst too late.

All of these reasons lead me to the conclusion that central banks should lean against the build-up of imbalances.

Monitoring quantity aggregates in addition to price and interest rate variables is essential for detecting bubbles and growing imbalances. Refocusing the ECB's monetary pillar toward financial stability gives clearer guidance concerning which credit and monetary aggregates to follow. Risk builds in the background

if bubbles and imbalances are accompanied by excessive credit growth. Credit growth is only partially captured by the current monetary aggregates, like M3. Hence, policy-makers might want to consider incorporating other credit elements into monetary aggregates.

Special attention should be given to newly extended credit lines, since simple measures of credit growth might be misleading. Firms might draw on existing credit lines just for precautionary reasons when they foresee financial difficulties. That is, excessive draws on credit lines can be a sign of upcoming trouble. On the other hand, newly extended credit lines signal more directly that banks are willing to lend.

The central bank should also pay special attention to the maturity structure of credit. The credit maturity structure typically shortens during a bubble phase. Optimistic borrowers think that they can easily roll over short-term debt, while pessimistic lenders find it safer to lend short-term. In the run-up to the subprime crisis, the debt market became more and more short-term. One sign was the excessive growth of the overnight repo market in the United States. As mentioned earlier, growth of short-term credit accompanied by an asset price bubble is a dangerous mix.

Finally, it is important to note that financial stability and monetary stability are strongly interlinked. They cannot be separately analyzed and handled in the policy domain. For example, one consequence of lax monetary policy is to recapitalize financial intermediaries – an activity that is at the heart of financial stability as well. Whether monetary policy is the cheapest and most effective way to recapitalize financial intermediaries is a different question, but one should not ignore the fact that monetary policy has significant redistributive effects (see Brunnermeier and Sannikov 2010).

SUGGESTION 2: HAIRCUTS AS A POLICY TOOL TO OPTIMIZE CURRENCY AREAS

Europe's second challenge is the large and persistent dispersion in inflation within the euro area. Figure 1 depicts the price index for various countries in the euro area, starting at a level of 100 in January 1999, when the euro was first launched. Two features stand out. That overall inflation in the euro area seems to be contained is primarily due to the modest inflation rates in some large countries like Germany and France. In contrast, other countries, such as Greece, Spain, and Ireland, experienced much higher inflation.

The second notable feature is that the lines hardly cross. In other words, some countries consistently had higher inflation rates for almost a decade. This persistence in inflation dispersion within the euro area, combined with current account imbalances and regional housing bubbles, should have been warning signs that risk was building in the background.[2]

2 It is unlikely that this difference can solely be attributed to the Balassa-Samuelson effect.

The question is how to control these regional differences and lean against regional bubbles and imbalances within the euro area. The traditional "optimal currency area" literature has no answer for this, since it assumes the central bank has only one policy instrument at its disposal: a single short-term interest rate for the entire currency area. Introducing a common currency eliminates the possibility of fine-tuning the interest rate for specific regions. That is, the central bank is forced to set the same interest rate for all members of the currency union. Exchange rate movements, which typically play the role of a shock-absorbing valve, are also switched off.

As a consequence, the traditional literature on optimal currency areas concludes that countries should join a currency union only if they do not face large asymmetric shocks, have high labor mobility, and are capable of fiscal integration. Indeed, Galí and Monacelli (2008) argue that members should use coordinated fiscal policy as a second instrument. Since I do not think a highly integrated transfer union is politically feasible for the euro area in the near future, I intend to focus on what the ECB can actually do in the current environment to optimize its currency area.

It is important to note that while the short-term interest rate across the currency union has to be identical, the long-term rate for risky loans need not be. It is this risky long-term rate extended to firms and home buyers that affects real economic activity. The difference between the long-term interest rate and the short-term rate, the term spread, as well as the difference between a risky long-term rate and the risk-free rate, the credit spread, can also be influenced by the monetary authorities.

Viewed from this angle, the ECB has more "regional tools" at its disposal to overcome the shortcomings of a common currency area than is traditionally thought. Stated differently, the euro area, which might not be an ideal currency area from the viewpoint of the traditional literature, can be "made optimal" by using tools that directly affect the regional credit and term spreads.

Unconventional monetary policy allows central banks to influence term and credit spreads directly by buying or selling long-term risky assets. In this paper, I focus on two other instruments: 1) haircut policy, and 2) regional financial regulation. For example, the ECB should impose haircuts and stricter collateral requirements for mortgages or loans issued in member countries that experience high inflation and excessive capital inflows.[3] This makes refinancing these products more costly and ultimately leads to higher term and credit spreads in these countries.

Macroprudential regulation can also tighten bank financing in certain member countries. It would therefore be advantageous if macroprudential regulation could be regionally fine-tuned and centrally coordinated via the European Systemic Risk Board. In this respect, the Bank of Spain deserves some credit. Its dynamic provisioning imposed tighter regulation on Spanish banks during the recent

3 For a more formal academic analysis of this idea, see Brunnermeier and Gourinchas (work in progress).

upswing. Even though the Spanish tightening was not strong enough, it can serve as a role model for which direction to go.

Note that using haircuts to lean against regional imbalances is in sharp contrast to the ECB's current policy. Currently, the ECB uses collateral and haircut policy purely as a risk management tool, i.e., to minimize potential losses from lending against certain assets. Furthermore, there is a tendency to treat all member countries the same and avoid any differentiation. This makes all spreads more uniform across the membership countries – the opposite effect of what a targeted active policy that leans against regional imbalances would prescribe.[4]

Using monetary tools to lean against imbalances might arguably be more effective than imposing sanctioning mechanisms based on some sort of modified Maastricht criteria. The case of Ireland highlights the advantage of my approach. Ireland satisfied all the Maastricht criteria throughout the "bubble years." Yet, during those years, large macro imbalances accumulated – especially private debt levels – and inflation was persistently high (see Figure 1).

Any sanctioning mechanism based on Maastricht criteria would not have made any difference. Ireland's ratio of public debt to GDP was well below the limits. High private debt levels and current account imbalances are not accounted for in the Maastricht criteria. In contrast, regional monetary tools can be directly targeted wherever the imbalances appear, and they directly impact certain term or credit spreads. By using monetary tools to lean against the imbalances, the ECB not only can increase financial stability, but also can reduce dispersion of inflation within the euro area.

Finally, the tools described above, such as an active regional haircut policy, have another important advantage: They can be implemented immediately without requiring a modification of the Maastricht treaty, which needs to be ratified by all the EU member states.

In conclusion, I have tried to convey two messages. First, I would encourage the ECB to maintain its monetary pillar, but to give it a more solid footing by refocusing it on financial stability. This should help avoid crisis periods that can lead to deflationary pressures and, potentially, to long-run price instability. Second, the ECB should use its haircut policy and regional fiscal regulation as an active policy tool to lean against regional imbalances and persistent regional inflation. Such an approach would bring the euro area closer to an optimal currency area without requiring any legislative changes.

4 Buiter and Sibert (2005) point out the distortionary effects of this uniform treatment of haircuts across sovereign debt.

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COMMENT

BY JÜRGEN STARK, EUROPEAN CENTRAL BANK

I very much appreciate the opportunity to discuss Professor Brunnermeier's presentation, which I found very insightful and constructive. I appreciate in particular his effort to map his thoughtful academic diagnosis into a number of concrete proposals on how the ECB could contribute to maintaining orderly macroeconomic conditions in the euro area – whether in the financial system or in the economy more broadly.

His proposal is essentially twofold:

The ECB should refocus the rationale of its monetary pillar toward identifying risks to financial stability. This shift in focus should underpin a leaning-against-the-wind policy in the face of asset price bubbles.

The ECB should use macro-prudential regulation and what he refers to as non-standard policy tools – among which he includes contingent changes to the collateral framework – to address regional credit and asset price booms. This would contribute to making the euro area "an optimal currency area."

THE ECB'S MONETARY PILLAR AND FINANCIAL STABILITY

Starting with the first proposal, I agree on the substance, I disagree on the way the proposal is framed.

I agree on the substance: the ECB has long argued that its monetary pillar is an analytical framework with a double mission. First and foremost, it helps identify underlying trends in consumer prices which would take years to be revealed by other forms of analysis. In econometric terms, we say that money trends and price trends have a high degree of coherence: they move together over the long term. Extracting the money trend helps extract the long-term underlying trend in prices.

At the same time, persistent deviations of monetary indicators – money and credit – from their norm raise questions about the stability of the financial system. When you observe protracted deviations of money holdings from what money demand models – for example – would indicate as the normal liquidity conditions – given the prevailing level of income, wealth and prices – then you start asking questions about the stance of policy, about the soundness of financial intermediation, about the sustainability of the monetary conditions that you observe.

So, you see that the monetary pillar raises important questions about financial health. It raises important questions about asset price formation, about the extent to which the financial system has over-extended itself. This is where I agree with Professor Brunnermeier's analysis.

But you see where I disagree: the ECB does not need to refocus its monetary pillar. Its monetary pillar has performed this double function since the very beginning.

Let me quote from a Monthly Bulletin Article which the ECB published in April 2005, long before the big financial crash. It says: "Monetary analysis can contribute to assessing the extent to which generously valued assets can be traced to – and at the same time become a source of – excess creation of liquidity and over-extension of credit. Detecting and understanding this link helps the ECB form an opinion on whether an observed movement in asset prices might already reflect the inflating of an unsustainable bubble." I think I would not change a word with the hindsight of the financial crisis that started in 2007.

Let me elaborate further on the nexus between price stability and financial stability. I want to do this because Professor Brunnermeier contests the quantity theoretic foundations of the ECB's monetary pillar.

What is the role of the monetary pillar in this nexus? In the long run, there is no trade-off between price stability and financial stability. Price stability contributes to financial stability by eliminating inflation-related distortions in financial markets. At the same time, financial stability, by ensuring an orderly functioning of the transmission mechanism of monetary policy, enables the central bank to accomplish its mandate of price stability. Therefore, from a longer-term perspective, financial stability and price stability are mutually reinforcing. The ECB's monetary pillar ensures that the ECB does not disregard the quantity theoretic long-run link between inflation and money growth and hence – importantly – contributes to the maintenance of both long-run price stability and long-run financial stability in the euro area.

At shorter horizons, financial stability and price stability may appear to not always go hand in hand. The developments in the run-up to the global crisis have shown that low and stable inflation rates may well be consistent with the build-up of financial imbalances. In turn, financial imbalances can create serious risks to price stability down the line. You can call this a policy dilemma: price stability seemingly and paradoxically conflicting with financial stability.

However, such a perceived short-term trade-off between price stability and financial stability can only arise if the central bank's focus is on short-term, rather than medium-term price stability and if the indications of monetary developments are not appropriately taken into account.

Leaning-against-the-wind strategic elements can help a central bank reconcile the dilemma. Basically, leaning-against-the-wind means that a central bank should make sure that the price and the quantity of credit never behaves pro-cyclically. The financial system – as Professor Brunnermeier has long pointed out in his studies – has an inherent tendency to generate pro-cyclical credit conditions: credit is cheap and abundant when the economy booms, and it becomes scarce and expensive when the economy contracts.

A leaning-against-the-wind approach to policy mandates the central bank to the task of resisting this tendency inherent in the financial system. Importantly, resisting this tendency is justified by a strategy of maintaining price stability over

long horizons. It is not justified by a mandate of maintaining financial stability. I will come back to this point in the last part of my remarks.

Now, it is difficult to communicate a leaning-against-the-wind attitude for a central bank. Leaning against the wind can easily be interpreted as a policy of targeting asset prices. However, a central bank can mimic a leaning-against-the-wind approach and at the same time avoid the pitfalls of directly responding to asset prices by introducing money and credit considerations in its strategy. This is because liquidity and credit conditions are empirically associated with risk valuations in financial markets. The ECB's monetary pillar, which involves a close and detailed monitoring of money and credit aggregates, represents a reinforcing strategic mechanism which can induce the correct response to a destabilising asset price cycle. Asset price cycles are destabilising when they are associated tightly with a credit cycle. By reacting to the credit cycle, a central bank reacts to the toxic side of the asset price cycle.

To summarise: Professor Brunnermeier's claim that the current rationale of the ECB's monetary pillar is primarily based on a simple quantity theory of money is somewhat misleading. The ECB's monetary pillar involves a broad based analysis of monetary developments, taking into account "developments in a wide range of monetary indicators including M3, its components and counterparts, notably credit, and various measures of excess liquidity": here I am quoting from the ECB's May 2003 press release on the evaluation of the ECB's monetary policy strategy.

At the same time, as I tried to demonstrate, the ECB has consistently stressed the empirical association between monetary developments and asset price dynamics and the resultant usefulness of the monetary pillar to mimic leaning-against-the-wind policies. This has happened in official communication as well as on the analytical side, where ECB staff have pioneered research on the interlinkages between monetary developments and asset price dynamics. It has also been part of the four avenues of the research programme for enhancing the monetary analysis at the ECB pursued over the last three years.

THE ECB AND REGIONAL FINANCIAL IMBALANCES

I now come to Professor Brunnermeier's second proposal, that the ECB should be equipped with, or develop macro-prudential tools to counteract regional financial booms in the euro area. Here, I am sceptical.

While monetary policy can make an important contribution to financial stability by effectively maintaining medium-term price stability, central banks cannot use monetary policy to effectively pursue financial stability mandates besides their original price stability mandates. As I said before, there is no dual mandate. An effective and efficient economic governance framework requires a clear allocation of policy objectives to policy instruments in order to ensure a credible and effective pursuit of the allocated institutional tasks.

The responsibility for safeguarding financial stability should ultimately lie with prudential policies.

In this context, macro-prudential tools are an important new element of economic governance. They complement the regulatory policy toolbox with instruments that can enhance the ability to more effectively address systemic risk and safeguard financial stability. This will also facilitate central banks' task of maintaining price stability.

Professor Brunnermeier essentially suggests allocating macro-prudential tools to the ECB. This – in his view – would not violate the principle for the need of a clear allocation of responsibilities, because a central bank could in principle pursue price stability with its monetary policy and financial stability with its macro-prudential tools. However, such an arrangement would in my view give rise to a number of significant risks. Let me highlight just three:

First, even if the central bank had separate instruments for pursuing price stability and financial stability, there is a significant risk that the duality of instruments might translate into a duality of objectives. The ECB is a central bank and a central banks' primary task is and remains to maintain price stability. As I said before, preventing credit conditions from becoming pro-cyclical under a leaning-against-the-wind approach to policy is a pre-condition for the ECB to be able to accomplish price stability in the medium to long term. It does not mean having a dual mandate.

Second, if the ECB were to take responsibility for financial stability in the euro area, it would also take responsibility for the sharing of the burden of financial instability across countries in EMU. This would ultimately drag the ECB into political quarrels that would pose a risk to its independence.

Third, there is also the risk that the ECB would become deeply involved in national economic policies – and national politics! – if it were to start targeting national financial sectors via macro-prudential policy. Such an involvement would significantly complicate the ECB's pursuit of its original price stability mandate for the euro area as a whole. Needless to say, it would erode the integrity of the monetary policy framework.

Against this background, I see the currently pursued arrangements as the superior alternative. The creation of the ESRB as the new macro-prudential supervisory body in the EU will be an important advance in the EU economic governance framework. It is important to note that the ESRB will not be responsible for maintaining financial stability in the EU. The ESRB's task will be to monitor and identify systemic risks in the EU, to express warnings if the risks are deemed significant, to issue recommendations for remedial policy actions and to monitor the follow-up to the issued warnings and recommendations. It will be for national supervisory authorities to act.

It is also important to note that the assignment to the ECB of specific tasks concerning the functioning of the ESRB is welcome, as it enhances the ECB's contribution to financial stability. But, once more, this new task should not be seen as constituting an additional objective of monetary policy. Rather, this new task should contribute to financial stability, without compromising on the primary objective of price stability.

José Viñals, Erkki Liikanen, Philipp M. Hildebrand, Charles Goodhart, Stanley Fischer, Mario Draghi, Alexandre Lamfalussy (Chair) (from left to right)

PANEL DISCUSSION SESSION I

MARIO DRAGHI, BANCA D'ITALIA

Let me first say how honoured and moved I am today by being here for Lucas Papademos. I can proudly say that we were classmates and students of Franco Modigliani, like Stanley Fischer here. But Stan has an additional responsibility, because Lucas and I were his students as well!

Much has been said before about Lucas' intellectual qualities, but I would like to comment on another aspect of his personality. Lucas is clearly very serene, he is balanced; he argues in a peaceful way, disagreeing without being disagreeable; he does not enjoy being disagreeable. Lucas produces an atmosphere of reciprocal respect, which I think is essential in a collegial institution such as ours for taking important decisions.

On Alexander Lamfalussy's questions, it is clear that among the causes of the crisis there are both regulatory and monetary policy faults. Yet, regulatory flaws were at the core of the crisis, having favoured the creation of a high and misperceived level of leverage in the financial sector. Let me give you some examples of events that happened between 2002 and 2006/7 and that are at the roots of this phenomenon.

First of all, there was the massive explosion of complex instruments formed by sub-prime assets – sub-prime in the literal sense – whose pricing was very problematic because of their opacity and complexity.

Another factor was the removal in the US of leverage limits on investment banks in 2004, which produced a huge expansion of activities and vastly increased the complexity of their risk management.

A third occurrence was the amazing market power that a handful of large issuers, especially large investment banks, had developed vis-à-vis the credit rating agencies.

Finally, the explosion of the CDS market basically broke the link between lenders and borrowers; the monitoring by the lender of the borrower was essentially wiped out. Moreover, it became very difficult to understand where credit risk was really lying.

I quote these facts because they are at the centre of the Financial Stability Board (FSB) agenda. It includes the Basel Committee program, with the reform of Basel II, in particular the revision of the capital framework for banks, with the establishment of more and higher quality capital and the introduction of liquidity requirements. I think Nout Wellink will say something about how the program is developing, but clearly this is the most important part of the FSB project. The other problem the FSB wants to address is the moral hazard associated with systemically important financial institutions (SIFIs), or the "too big to fail" (TBTF) problem. Let me say a few words on this issue.

We aim at achieving three objectives. The first is to reduce the probability and the impact of failures. The second is to set up resolution mechanisms so that if we have a failure, we know how to manage it in an orderly manner. The third is to make the system more resilient and robust with respect to contagion, in particular by improving infrastructures for derivatives trading.

On the first objective, reducing the probability and the impact of failures, there are a variety of measures that have been proposed, ranging from capital surcharges or taxes on various components of the balance sheets according to the systemic importance of the institution concerned, to what Adair Turner calls the "subsidiarisation" of different institutions. This latter option arises because the host supervisor of a very large cross-border international group has to be convinced that the group is simple enough, so that an eventual failure can be managed in its own jurisdiction. If it is not simple enough, the supervisor could favour a breakdown into different subsidiaries, with their own legal personality, capital and liquidity regulations. Another proposal is to adopt some variant of the so-called Volcker rule, that is, breaking up institutions according to different businesses or lines of business.

In addition (and this looks like a more immediate prospect) there is a need to establish a much more intrusive supervision of systemically important institutions than we have had in the past. Reinforced supervision should deal with issues such as board composition, governance, dividends distribution, and compensation schemes.

On the second objective, setting up effective resolution mechanisms is absolutely crucial to ensure that financial institutions will operate according to a correct set of incentives in the future. In this respect, we must recognise that it will be very difficult to have a unique resolution mechanism for the entire world. The reason is that such mechanisms are the by-product of bankruptcy laws that are very different across countries. The 27 countries in the European Union have 27 different bankruptcy laws. At least it should be possible to have some coordination on those aspects of resolution mechanisms that become essential in the case of failure of a group that operates across borders. Paul Tucker leads the FSB working group that is investigating this issue.

The third objective, to strengthen infrastructures and increase transparency for over the counter (OTC) derivative contracts, including CDSs, is absolutely crucial. Whatever initiative governments want to undertake on CDS derivatives it has to start from a full knowledge of these markets. And unless the CDS trading is centralised in platforms or regulated exchanges and, in any case, fully reported to trade repositories, it will be very difficult to understand what risks lay behind it. On the other hand, if we are able to standardize derivative contracts, centralise their trading and impose full reporting on all exchanges, we will be able to

know much more about capital, collateral and other important elements of such transactions, and thus on what needs to be done to avoid trouble.

One important aspect to consider, when dealing with global regulatory reform, is that we cannot expect full international convergence in all fields. In some areas, such as the introduction of specific requirements for SIFIs, we should aim at a minimum harmonisation: a common floor, basic common principles, on which national supervisors would introduce specific measures to be implemented in a flexible manner. The various forms of the Volcker rules so far proposed, for example, would probably not be particularly appropriate for Europe.

In other areas, such as the reform of Basel II on capital and liquidity requirements and the derivatives trading regulation, we should aim at the maximum level of convergence and harmonisation; if we fail to have exactly the same standards globally in these fields, regulatory arbitrage would simply destroy all efforts.

Coming finally to the important issue of how to mitigate the procyclicality of the financial sector, the reform of Basel II by itself will do a lot to take care of this problem, with the introduction of capital buffers, early losses recognition and provisions against them. However, I also believe that some anti-cyclical policy action lies with the monetary policy itself, as said before by Jürgen Stark. I think we have all learned some lessons from the crisis that I will quickly summarise.

First of all, monetary policy should be proactive and lean against the wind at times of growing financial imbalances, even without immediate dangers for inflation.

Second, the use of macro-prudential instruments, such as time-varying capital ratios or loan-to-value ratios, to counteract cyclical fluctuations in lending may be beneficial (although the benefits could be small in 'normal' times) – this is also confirmed by ongoing research at the Bank of Italy.

Third, concerning the efficacy of unconventional monetary policy measures, we learned that credit support measures, aimed at preserving the working of the credit system and the credit flows to the economy, is essential in avoiding a crunch and is more important than quantitative easing, i.e. simply increasing the quantity of "money" or "liquidity". In a crisis, preserving credit flows is paramount.

Fourth, the benefits of having a sound monetary framework have become more, not less, apparent in a crisis. Had we not been able to control inflation expectations during the crisis, the room for manoeuvre for monetary policy would have been much more narrow and difficult.

Finally, it is clear that the view from the inflation-targeting approach – that in setting monetary policy the behaviour of credit and asset prices should only be considered insofar as they affect the inflation forecast – has shown its limitations. This is because it is based on the belief that we can rely on a relatively stable model of how the macroeconomy works and how inflation is determined. This view needs

to be supplemented, especially when we deal with the transmission of monetary policy channels at times of crisis, by the analysis of changes that take place in the financial intermediaries' balance sheets and of the non-linearities affecting the relationships among variables. For example, constraints in credit availability that are irrelevant in normal times become a major issue at times of crisis.

Like everyone here, I am honoured to participate in this colloquium in honour of Lucas Papademos. Mario Draghi generously said that Lucas was my student at MIT, but in fact Lucas, more than almost anybody else, was Franco Modigliani's student. They wrote several important papers together – and that in itself is an achievement, for Franco in addition to being a wonderful and loveable man and economist, was also a demanding perfectionist and a very active participant in the writing of any jointly authored paper.

I would also like to second what Mario said about the importance of Lucas' personality to his effectiveness and to the pleasure that everyone has in interacting with him.

Lucas has a remarkable CV. There are a few people here who are proud to have a degree from MIT. Well, Lucas has three: he started with a Bachelor of Science in Physics; he moved on to a Master of Science in Electrical Engineering; and with no other frontiers to conquer, he decided to do a PhD in Economics. This is a very impressive record because none of these is an easy degree.

Among the topics that the Great Recession has brought to the fore, macroprudential stability is high on the list, and many countries are struggling with the issue of how to redesign institutions to make sure that the issue is dealt with properly. But before getting to that topic, I would like to comment on an assumption that is often implicit in discussions about the optimal design of institutions and the optimal allocations of responsibilities. Namely, there is a tendency to argue as if it is optimal to have one institution per goal. This tendency is evident when one hears – as is not uncommon – that there would be a conflict of interest if the central bank were given responsibility for both price and financial stability. The argument seems to be that the central bank should concentrate on price stability and that if it were to take financial stability into account when setting the interest rate, it would be deflected from its concentration on its main task. This is one of the key sources of the not infrequent conclusion that it would be optimal to give the responsibility for price stability to the central bank, and the responsibility for financial stability to another institution.

It is very likely that if the central bank were given responsibility for both price and financial stability, it would take financial stability considerations into account when setting monetary policy. But that is a good thing, it is what such a central bank should do, for if there is at times a tradeoff between price and financial stability, some policymaker or group of policymakers, somewhere in the system, has to take that tradeoff into account in setting policy.

The question is who does the coordinating. Among the solutions being proposed at present are committees of supervisors, with the central bank as another possibility. I believe it should be the central bank. With regard to a committee of supervisors: committees of coequals have a difficult time making policy decisions, and unless the committee has the authority to require actions by individual regulators, such committees tend not to be effective. In addition,

the central bank is the lender of last resort, and in this role will always be involved in supporting financial stability, both in crises and in preparing for them. To be able to fulfil this role effectively, the central bank has to be in touch with and understand the balance sheets and risks of all the institutions it might have to help. Although there is no definitive answer, independent of a country's financial history and institutional structure, as to where to locate the coordinating function, there is a very strong case that the best institution to carry out this responsibility is the central bank – a conclusion that the new British government has reached and that is also implied by the reform of the system of financial regulation to be set up in the United States. Further, it is a conclusion that is fully consistent with the responsibility of the central bank for supporting financial stability that is contained in most modern central bank laws.

In any case, the story that some central bankers used to tell, that we do or should focus only on price stability was never the whole story. For the truth is that all central banks also take into account the implications of monetary policy actions for the level of activity – hence the invention of flexible inflation targeting, and of the addition of the phrase "in the long run" to the statement that monetary policy affects only inflation. And it is a good thing too that central banks take output effects into account in setting monetary policy, for it would be extremely destructive of economic stability to become – in Mervyn King's terminology – inflation nutters.

If the responsibility for macroprudential supervision is given to the central bank, then the question arises of the optimal decision-making set-up in the central bank. The answer turns on what powers the central bank has in issuing instructions to regulators or to the institutions they regulate. If the central bank has the responsibility for macroprudential supervision, or to support financial stability, but without any policy tools, then all it can do is offer advice to the regulators and the government, and provide information to the public. But since this is an area in which it is often dangerous to go public with concerns before acting on them, the central bank will most often not be able to go public – and its influence on other regulators is likely to be very limited. That is to say, the central bank will have been given a responsibility without the means of fulfilling it.

So let us assume that the central bank has at least the responsibility and authority for bank supervision. The question then is how to combine its decision making with regard to macroprudential supervision with its decision making for monetary policy – one committee or two? The new arrangement for the Bank of England will include two committees, with overlap of the membership of the two committees providing the mechanism for coordinating the two aspects of policy. Alternatively, there could be one committee, of which the bank supervisor could be a member, or could participate as a non-voting member on an as needed basis. I doubt there is a unique optimal arrangement, and in trying to narrow the range of possibilities, we shall have to learn from the experience of the next few years as different institutional arrangements are implemented in different countries.

Even if the central bank is responsible for bank supervision, there is a need to define the responsibilities of the regulators appropriately. In the case of Israel,

the bank supervisory function is located in the Bank of Israel, which also has a responsibility for supporting financial stability. In internal discussions, the supervisor of banks has sometimes remarked that it would be problematic for him to issue instructions for macroprudential reasons that are not necessary for the stability of the banking system, which he regards as his chief responsibility. This is a potential conflict, which has not yet been a serious issue, but could become one. The issue can be resolved in our case, because the law empowers the governor to overrule the bank supervisor – although that is the sort of power that should be used only rarely.

I was glad that in his comments Paul Tucker defined for us what the "macro" in "macro-prudential" stands for, namely that it is "macro" in the sense of relating to the stability of the financial system as a whole, rather than "macro" in terms of the tools that can be used to affect financial stability. This is particularly important since there are very few macro supervisory tools, except perhaps for countercyclical capital requirements. So a central bank that has the responsibility for macroprudential supervision will likely end up using the microprudential instruments of the supervisors to that end.

To make that point clear, let me describe the situation in which we find ourselves currently (May 20, 2010) in the Israeli central bank. In aggregate, credit growth at the aggregate level is very low, close to zero. The money aggregates grew fast during the period in which we cut the central bank interest rate from 4.25% to 0.5% (October 2008 to April 2009). But M1 growth has been declining and is now converging to reasonable numbers – and M2 growth has been lower throughout. However mortgage credit is rising rapidly and housing prices are rising at an annual rate of about 22%. In the Israeli context, in which housing prices two years ago were at about the level of a decade earlier, a growth rate of housing prices of about 20% is reasonable for a year or two. But a few short years down the road, if this rate of increase of housing prices continues, we will find ourselves with house prices having doubled. What should we do? I do not believe the satisfactory behaviour of the monetary and credit aggregate data imply that we do not have to do something about housing prices. We have the possibility of raising the interest rate, but that is a blunt tool for the particular problem we face. We cannot wait for definitive evidence of a bubble before acting and so we will have to act soon to deal with this issue.

Soon after the colloquium in honor of Lucas, we announced in our monetary policy decision of May 24 – in which we left the interest rate unchanged – that the supervisor of banks would require banks to increase provisioning against mortgage loans with a loan-to-value ratio in excess of 60 percent. The move led to a great deal of public discussion and criticism, on the grounds that we were discriminating against young couples. It remains to be seen whether the measure will affect housing prices sufficiently; if not we shall have to strengthen this measure and/or find others.

Two concluding points: first, is the focus on macroprudential supervision a fad? The difficulty of defining macroprudential measures and of setting up appropriate institutional arrangements may suggest that. But I do not believe it

is a fad. I believe that although much of the blame for the financial crisis rests with inadequate microprudential supervision, there was an element – the housing and real estate bubble at least – that justifies the emphasis on macro-prudential supervision.

Second, as Philipp Hildebrand has said on another occasion, we appear to be going back to the future, in that in dealing with this new responsibility, we will end up using a variety of instruments which our predecessors gave up in the 60s, 70s and 80s. So be it.

When appropriate, we will also have to consider another policy tool that has been used in the past – open-mouth policy. In 1996 Jacob Frankel announced to the Israeli public that there was a bubble in the stock market. The stock market promptly went down sharply. In 1999, Lucas Papademos succeeded in bursting a Greek equity price bubble also through use of open mouth policy. But sometimes even the most credible of governors does not succeed: Alan Greenspan's 1996 "irrational exuberance" speech did not have a lasting effect on stock prices.

In conclusion, we are still at a very early stage of developing our approach to the issue of how to fulfil our financial stability role. We need to act when we see a problem. But as we build up experience over the course of time, we will have to continue to refine our policies and our approaches to these critical issues.

CHARLES GOODHART, LONDON SCHOOL OF ECONOMICS

The previous speakers have all emphasised what a splendid central banker and colleague Lucas has been. I, as an academic, would like to underline how good he has been as a monetary economist. I particularly remember the work on money supply, by Modigliani and Papademos, in the Handbook of Monetary Economics. This is one of the very few excellent papers on money supply, a subject which has not usually been treated well.

Jean-Claude, Markus and Jürgen have all emphasized that the use of the monetary pillar has been one of the strengths of the ECB, and I very much agree with that. But I want to delve a little more into the utilisation of this pillar, while accepting that the pillar has been a suitable mechanism, an appropriate approach. Could you, if you want to follow me, look at page 2 of Jordi Gali's paper, which is in this collection, and you will see in that a diagram showing the path of the broad monetary aggregates over the course so far of the ECB. What you will see there, first, is that there is a small, relatively temporary, excess of monetary growth above the reference value in the years 2001-2003. That event was analysed excellently, and it was decided that this was not an excessive growth in money and credit, but instead arose from a shift in portfolio preferences; and the ECB correctly decided that they would do nothing in response to that.

You will then see, after a short reversion back to the reference value, a much larger and longer-lasting period of growth in excess of the reference value from about 2004 to about 2007. This excess growth did play *some* role in strengthening the ECB's aim and actions in raising interest rates a little bit more than they might otherwise have been raised, perhaps a little bit quicker. But in so far as an outsider like me can tell, the effect really was relatively small, possibly in terms of, at most, 25-50 basis points. I do not blame the ECB for this; they were operating their monetary pillar against pervasive academic criticism at that time. Jean-Claude may recall the 2006 colloquium, where the ECB came under severe academic criticism. Also when you are trying to undertake countercyclical policy you are always operating against the market, against the temper of the times. It is very difficult to do that. One of the conclusions, or implications of that, is that Central Banks do need to try and support discretion with some element of a rules-based system, because otherwise you have to be enormously self-confident and determined as a central banker, to operate against the drive of the market and, indeed, of the politicians of the time. You will remember in 2005/2006 that sub-prime, which is now demonised, was regarded as one of the great financial engineering innovations of the age, and to have acted to stop sub-prime would have been very, very unpopular at that particular moment.

But we now move on to the most remarkable developments in the monetary and credit aggregates, which is a precipitous decline, (as in Israel, which Stan has just mentioned), from about 2008 through to the present; very, very sharp indeed! If there *ever* was a time when you would have expected the use of the monetary pillar to come into its own, it would have been in the last few years.

And yet there has been virtually no reference to it – it has been downplayed. It has been downplayed for a number of reasons. Again, there is an overlap with

what all my colleagues have been saying. One of the suggestions is that this is just off-setting the earlier excesses. Well, it certainly does not feel like that to me. Moreover, if it was just offsetting the earlier excesses, you would expect that to show up in the formal regressions, and it generally does not. Nobody knows what the underlying trends and velocity may have been , so you just do not know how much excess, if any, there was throughout 2007. All you know is that there has been a precipitate decline subsequently. Surely that should have led one to try and do something about it.

Other kinds of argument are that this is due to the yield curve being much steeper, but again if so, this should show up in regression analysis. And though this undoubtedly is a factor, I do not believe it to be a sufficiently significant factor to explain a precipitate decline of this extent.

A further comment is that this is always what happens during a severe recession: a passive approach to the monetary aggregates. But the purpose of having a monetary pillar is *not* to be passive, it is actually to offset major deviations from the desired trend. In my view the ECB has been doing a lot better than their communications with regard to the monetary pillar might allow one to think. Their approach in expanding liquidity through the long-term refinancing measures are important and, indeed, were effective. And I would go further than that. I would actually say that measures to undertake purchases of bonds will have a positive effect on bank liquidity at just the time when it is necessary.

Perhaps the ECB, for reasons of its own, has decided to try and say that there is no effect on liquidity. I just think that is wrong. I think that there is an effect on liquidity and I think it is the *correct* effect on liquidity. The ECB should be a lot more positive in mentioning the efforts it has taken to try and counter this downwards shift in the monetary and credit aggregates, rather than imply that it just does not matter, and that it is taking a purely passive approach.

What I want to move on to now is something that Stan again has already mentioned. The ECB, like other Central Banks, is now focussing on financial stability. But financial stability is not uniform. It is not uniform between areas, for example there was much more of a housing crisis in countries such as Ireland, Spain and the UK, than was the case in Germany or Italy. Again, different sectors expand at different rates, and you can have a bubble in one set of assets, but not in others. So, if you want to try and interrelate monetary variables with financial stability and asset price variables, you need to spend much more time looking at disaggregated variables. Disaggregated virtually by every facet you can imagine: by country, direction of lending, and so on. Again there has been something of a tendency for the ECB to say, "We are only concerned with the overall euro-zone aggregates". This has been taken too far. I hope that in the future, in so far as the ECB is now providing, for example, the secretariat for the ESRB, they will spend much more time in looking at disaggregated variables. Disaggregated in every way that they can.

There is a consequential of all that. The consequential is if asset price cycles are not uniform, that vary between sectors and vary between regions and countries,

then you will have – in so far as one can use one's macro-prudential instruments – one will be applying macro-prudential instruments differentially with regard to different regions and with regard to different sets of assets. That is going to mean that you are all going to face the serious problem, that I think arises in this field, of complaints from the private sector that there is not a 'level playing field'.

How do you deal with raising, for example, risk-weightings for capital requirements of banks lending in one particular area or banks lending to one particular sector, when they will simply say that such measures will shift business elsewhere? So the level playing field problem, is one that has to be taken seriously. You just have to face it down, and I do not quite know how you will actually manage to do that.

Finally, any fool can make banks safer. All you have got to do is to raise capital requirements, liquidity requirements, leverage ratios, put on Pigouvian taxes on banks. You could all do it. So why have we not made banks safer? We have not made banks safer in large part, because if we do this, we actually make the position of banks more difficult and more costly.

So ultimately there is a cost-benefit relationship between the kind of rate of expansion of bank lending, of bank intermediation that you want within your economy, and the safety that you want to see. There is a real need to take this cost-benefit analysis very seriously indeed, and to try and work out in advance of imposing all or many of these regulations, many of which do need to be imposed, but to work out carefully just what the effect is likely to be on bank intermediation and credit expansion over coming years. It is possible to introduce excessive regulation and to have an adverse effect on potential recovery from the present recession. We certainly do not want to do that.

PHILIPP M. HILDEBRAND, SWISS NATIONAL BANK

POLICY OPTIONS FOR REDUCING THE LIKELIHOOD OF HAVING TO DEAL IN THE FUTURE WITH A SYSTEMIC CRISIS

I want to thank Jean-Claude Trichet for the kind invitation for today's colloquium. It is a great honour for me to be here today to celebrate Lucas' accomplishment as a central banker. Lucas, you are leaving our community at a critical juncture. We will miss you. It has been a tremendous privilege to work with you. Thank you for your support and wise council during the past years.

I would like to focus my remarks on what I believe are the core regulatory reforms needed in order to truly reduce the likelihood of future systemic crisis.

The complexity of the events of the last years have left me deeply convinced that we need to aim, perhaps somewhat paradoxically, for simple but comprehensive regulatory responses. Fully in line with the core agenda of the FSB, they should focus on strengthening the capital and liquidity framework and emphasizing ways to mitigate the terrible too-big-to-fail problem.

I usually make it a rule not to speak about the experience of a very small country when visiting a big country. Today, I will make an exception to that rule. I thought it might be instructive if I draw on the Swiss case to underline the need to reform fundamentally regulation for systemically relevant financial institutions.

Most of you know why the Swiss case might be of particular interest in the context of the too-big-to-fail problem. With regard to potential vulnerability to a severe financial crisis, Switzerland is in a unique position. Bear in mind the situation we face: currently, total assets of the Swiss banking sector are nearly 7 times Swiss GDP. Even after significant retrenchment since the outbreak of the crisis, the combined balance sheet of the two biggest banks is still more than 4 times Swiss GDP.

This extreme potential vulnerability has convinced the Swiss authorities that, competitive considerations notwithstanding, it was unwise to wait for the international regulatory process to be completed before embarking on domestic regulatory reforms.

At the end of 2008, the authorities therefore initiated ambitious capital and liquidity reforms in the midst of the unfolding crisis.

In doing this, the Swiss National Bank also invested a great deal of time and resources to play an active and hopefully constructive role in the FSB-centred international regulatory reform discussions.

Already at the end of 2008, the Swiss regulator FINMA issued decrees imposing significantly higher capital charges on the two big banks as well as requiring

higher quality capital.[1] As a complement, a leverage ratio was introduced.[2] To prevent a procyclical impact, the new targets will apply as of 2013, giving the banks enough time to recover from the crisis. Anti-cyclicality is further enhanced by the provision that banks must build up their capital buffers in good times so that they are available in bad times in order to absorb losses. This countercyclical effect of the capital requirements is critical.

With regard to liquidity, a comprehensive liquidity requirement reform for the two big banks was adopted one month ago.

These completed reforms effectively amount to preventive measures. They can be expected to strengthen the resilience of the financial system.[3] But these measures do not address the fundamental problem that systemically relevant banks cannot currently be allowed to fail.

If we are committed to a market-based system, failure as a sanction against excessive risk-taking or managerial incompetence must be allowed.

In the event that large, systemically relevant financial firms face the threat of failure in a future crisis, the financial system of the future must allow for their orderly resolution. Such a system needs to ensure that failure of a large bank does not have severe negative consequences for the provision of financial services to the real economy.

Let me briefly outline the decisive efforts the Swiss authorities are making in an attempt to address the too-big-to-fail problem.

Last autumn, the Swiss government appointed an expert commission on the Limitation of Economic Risk from Large Companies. Importantly, the Commission includes representatives from the two big banks. This Commission released its interim report a few weeks ago.

This report proposes a set of measures in the areas of capital, liquidity and organisation structure.

In line with the FSB's work to ensure that the level and quality of capital and liquidity reflect the systemic importance of financial institutions, the Expert Commission calls for specific regulatory requirement for institutions deemed to be systemically relevant.

Specific indicators of systemic relevance are market share of the domestic credit and deposit business, payment systems as well as the risk profile of a specific institution.

1 The lion's share of the capital base must consist of Tier 1 capital.
2 In good times, the capital base has to account for at least 5% of the total adjusted assets. Several adjustments were made to total assets. Most importantly, the domestic lending business is excluded.
3 Moreover, they address the most obvious shortcomings of Basle II.

Crucially, the report identifies the need for additional and progressive capital requirements for systemically relevant institutions. The progressive nature of such requirements is to be a function of the degree to which a specific institution is systemically relevant.[4] The report specifically refers to the possibility of using a variety of contingent and convertible capital structures to enhance the additional capital buffers.

With regard to liquidity, the key focus is on making sure that the liquidity buffer is sufficiently large in order to gain enough time to prepare crisis resolution measures. In this respect, the new liquidity requirements I mentioned at the beginning, which are much more stringent than the previous provisions, make a significant contribution.

Such additional capital and liquidity requirements set incentives for a reduction of risk and size. This is particularly true if the requirements are progressive in nature.

Again in line with the FSB's work, the report also specifically addresses the structure and the organization of systemically relevant institutions. It spells out a framework within which banks are compelled to demonstrate that in the event of insolvency, functions essential to the economy can be maintained and orderly resolution of the rest of the bank is possible.

If banks are unable to demonstrate an enhanced resolution procedure, the Expert Commission spells out specific organizational measures that the authorities can impose on a bank. They include the imposition of business-aligned legal entities or a holding structure with separate business lines or limitations of intra-Group funding interconnectivities.

Finally, the report calls for a legislative framework that allows a specific regulatory treatment of systemically relevant institutions. In doing so, the Expert Commission echoes a repeated call by the SNB that a legislative amendment is an urgently necessary ingredient in our wide-ranging efforts to address the too-big-to-fail problem.

The SNB feels that the Expert Commission's interim report is a major step forward in the efforts by the Swiss authorities to address the too-big-to-fail problem.

Nonetheless, important challenges still lie ahead. Ultimately, all proposed and accepted measures must become operationally viable. This will be a challenging task.

Now, as the FSB has repeatedly said, if we really want to make progress on being able to respond in the midst of a crisis by a combination of preserving essential

4 The progressive regime is to apply to risk-weighted capital requirements as well as to the leverage ratio.

functions and proceeding with orderly resolution mechanisms for the remainder, we will need to address these issues in a cross-border context.

This is a key point. Our collective goal must be an internationally agreed and orderly process to allow for the winding down of large, systemically relevant financial institutions in the event of a severe crisis.

I am aware that national resolution regimes will continue to coexist. A fully global resolution regime is an unrealistic goal at this stage. But the framework for global cooperation can be improved. One possibility is to work towards mutual recognition arrangements of compatible national resolution regimes. Another possibility is to consider mutually accepted bail-in procedures that would allow for the conversion of pre-designated debt into equity, sufficiently large to avoid a situation in which a government would have to step in to recapitalize a bank. I am convinced that what the Expert Commission in Switzerland is now advocating at the national level can be a constructive step towards seeking global cooperation in this area.

Let me leave you with a final observation:

It is absolutely crucial that we keep our regulatory focus on the core of the FSB agenda, that is capital, liquidity and the mitigation of the too-big-to-fail problem, and rapidly find an agreement at the international level.

The importance of this point cannot be overstated. We are on the homestretch. Just as in a race, the homestretch is difficult and crucially important. As public frustration with the ongoing financial turmoil grows, it is natural that politicians will be tempted to respond by launching national initiatives that are politically expedient, but fail to address the need to strengthen the financial system. This temptation must be resisted if it comes at the expense of undermining the core FSB agenda. It is natural that a certain amount of what has been called "constrained national discretion" will occur. After all, the formulation and implementation of measures at the national level must take into account the specificities of the country concerned.

But unless we complete the core FSB agenda, we will in the end come up empty handed. One of the few positive aspects of this financial crisis has been the unprecedented scale of international cooperation in fighting it and in trying to respond to it subsequently. We must not jeopardize that cooperation now. Let us continue to work together and complete the core FSB agenda.

Lucas, you have worked hard to sustain international cooperation among central banks. In that way and in so many other ways, you represent what is best about central banking.

ERKKI LIIKANEN, BANK OF FINLAND

ON THE EUROPEAN RISK BOARD AND MACRO-PRUDENTIAL SUPERVISION

I will approach the ESRB's contribution to macroprudential supervision from three angles:

1. What will likely work well?
2. What might not work so well?
3. How to fix the latter part?

WHAT WILL LIKELY WORK?

- For the first time, there will be a European body dedicated to macroprudential supervision. This carries a great deal of importance in itself.
- Until now, macroprudential responsibility has, to a regrettable extent, been a regulatory no man's land.
- *The ESRB* has:
  - A clear mandate.
  - Access to both supervisory and central-bank specific information.
  - Sufficient distance from the national level.
  - A European-wide reach, which is indispensable in integrated financial markets.
- All this puts the ESRB in a much better position to identify and prioritize risks to financial stability, and to give authoritative opinions on how to deal with them.
- At this point, the ESRB needs to get up and running. Hopefully, this can happen in early 2011 as planned.

WHAT MIGHT NOT WORK SO WELL?

- *The ESRB's setup is less well suited* for ensuring, once a threat to financial stability is identified, that effective policy action takes place.

- The primary problem is not the fact that the ESRB only has powers to make recommendations. On the contrary, the ESRB's recommendations – combined with the "act or explain" requirement – will probably carry a great deal of authority.

- The primary challenge is that the ESRB, as a rule, operates in someone else's field of competence, and that is a recipe for institutional conflict.

- Suppose the ESRB identifies a threat to financial stability in a particular country and issues a recommendation to take particular action to the relevant national supervisor.

- Fundamentally, such a recommendation would say two things: i) that risks in the country's financial system are large enough to merit a response, and ii) that the national supervisor has failed to respond to those risks.

- The second message would be institutionally humbling for the supervisor; the second message could, at worst, be destabilizing for the financial system.

- How would the national supervisor react to such a recommendation? In many cases, the reaction would likely be defensive. The national supervisor would seek to protect its reputation by proving the ESRB's concerns groundless. The result could be more "explaining" and less "acting"; i.e. embarrassing institutional conflict without effective prudential action.

- Such institutional conflict would be in no one's interests and all parties would work to avoid it. Instead of the ESRB issuing candid recommendations, there would be negotiations and compromises that could seriously undermine the ESRB's effectiveness.

HOW TO FIX IT?

- To fix the situation, the ESRB needs direct powers to act, not just powers to recommend.

- This is easier said than done, for obvious reasons. It is very difficult to give the ESRB the power to override national supervisors, at least as long as crisis management is a national responsibility. The setup of the ESRB is the result of difficult negotiations and strikes a carefully crafted balance between national powers and European powers.

- A paper prepared in the Bank of Finland proposes an interesting way to provide the ESRB more direct authority without reducing the powers of national supervisors.

- The idea is very simple. The relevant supervisory parameters are divided into two components, a European component and a national component. The ESRB gets full authority to adjust the European component – which of course would be the same for each EU country – while each national supervisor retains authority its own national component.

- Here is how it would work:

  – The ESRB identifies a European-level risk for financial stability and decides to adjust a European supervisory parameter.

  – The ESRB's decision enters fully into force in all EU countries, without further action by national supervisors.

  – Each national supervisor retains the option to adjust the corresponding national parameter to partly or even fully offset the ESRB's action.

- Why would this model work better? For many reasons:

  – The ESRB decision would not be a judgment on any national supervisor's performance, so there would be no institutional conflict to hinder effectiveness.

  – The ESRB's effectiveness would not depend on active participation by national supervisors, so regulatory capture would be less of an issue.

  – Finally, even if each national supervisor could, in principle, offset the ESRB's action, peer pressure would have a much better chance to keep everybody in line.

- Clearly, this is a medium-term vision rather than a short-term plan. In the short term, the ESRB needs to get up and running.

- But building a European macroprudential framework is a big task and we should not assume we get it right the first time.

- We should be prepared to re-examine and adjust the ESRB's role and instruments as needed.

JOSÉ VIÑALS, INTERNATIONAL MONETARY FUND

REFLECTIONS ON FINANCIAL STABILITY

It is a privilege for me to participate in this panel on this very special occasion honoring Lucas Papademos. My relationship with Lucas goes back twenty years and during this time I have learned to admire him both as a superb central banker and economist and as an extraordinary human being. I, like all of us, wish him all the best in his life after the ECB.

Since I was asked to talk about the lessons of the present crisis for financial stability, let me begin by noting the obvious: when designing measures to avoid future crises, there is no silver bullet. We must proceed with a multi-faceted approach that addresses the variety of problems that arose. These will include a number of reforms, starting with improving our traditional micro-prudential policies and adding a macro-prudential element to target the systemic nature of the crisis.

In this light, I would like to focus on four issues, some of which do not always get the attention they deserve: risk management, the role of supervision, systemic liquidity, and the relationship between monetary policy and financial stability.

1. Although larger capital buffers will undoubtedly help to prevent institutions from declaring insolvency, attention to the quality of their *risk management* is essential. More conservative regulatory capital requirements are necessary but not sufficient to protect an institution from insolvency. Enhanced capital standards must be supported by robust practices of risk identification, assessment, measurement, mitigation and management. Weaknesses in any of these areas of corporate risk governance are likely to lead, as they did in the recent crisis, to an underestimation of the level of risk with serious consequences. Banks were caught off guard and unprepared for the rapid deterioration in credit quality that occurred in many of their assets, and which undermined the financial system.

Fortunately, corrective policies have already been identified and are being implemented. For example, there is renewed attention to the application of more conservative underwriting standards, increased due diligence, improved disclosures, better pricing of risk and stress testing practices by financial firms, more conservative and consistent valuation practices, and more prudent compensation standards.

Nevertheless, in an environment where a range of activities are increasingly carried out by unregulated or lightly regulated entities, there is a potential for the build-up and transfer of high levels of risk outside the regulatory perimeter where it may not be well understood or managed. Hence, there is a need to extend the regulatory perimeter to obtain a more complete picture of the risks being assumed by less regulated institutions and markets, and to assess the exposure of the currently regulated institutions to these other institutions and markets.

2. Another key insight from the crisis is that regulation is only as good as the quality of its implementation. As a result, implementation of regulations depends on *strong and thorough supervision, particularly of the more risky institutions.* Unfortunately, supervision in some countries has come up short in this crisis as supervisors did not always take effective and timely action. There must be agreement among national authorities on the need to strengthen the "ability" and "willingness" of supervisors to say 'No' – that is to act forcefully and on a timely basis. Instituting these essential elements of good supervision in national and regional arrangements needs to be given sufficient attention alongside the regulatory reforms that are being contemplated.

3. The extent to which *systemic liquidity risks* can emerge and the difficulty of predicting and addressing systemic liquidity problems is now clear. We have a better understanding of how funding and market liquidity risks are intertwined and how interconnections across institutions can exacerbate runs and market malfunctions. It is now obvious that wholesale runs can occur, and be far worse than more traditional retail deposit runs. This suggests two priorities: to prevent systemic liquidity risks from building up; and to improve their management when they do materialize.

As regards prevention, the proposed regulations on bank liquidity by the Basel Committee are a welcome step to strengthen individual institution's ability to fund themselves. This micro-prudential approach is a step in the right direction, but does not prevent the possibility of systemic liquidity difficulties – when whole market shuts down and multiple institutions (banks and non-banks) have difficulty obtaining the funding for their operations.

Of course, dealing with systemic liquidity risk is far from being easy. To start, we should have better tools to measure systemic liquidity risks and to better understand the mechanisms through which idiosyncratic liquidity shocks can be transmitted across institutions, markets, and national borders and eventually become systemic. Moreover, as liquidity is more likely to evaporate in funding markets characterized by bilateral, over-the-counter trades (such as derivatives, interbank, government securities, and repo markets), thought needs to be given to strengthening the infrastructure in these markets. While the recent proposals to clear a critical mass of OTC-derivatives through Central Counterparties is a step in the right direction, there is a need to enhance the flow of information in these various funding markets so as to avoid unnecessary confusion in stressed times out of concern about counterparty risk.

Yet, while these improvements in prevention should reduce the likelihood and intensity of systemic liquidity crises, these could still materialize. It is thus essential to draw the right lessons from the present crisis regarding how best to enhance the policy frameworks of central banks in this domain in a manner that improves their robustness and flexibility while containing moral hazard.

4. Let me tackle now the relationship between *financial stability and monetary policy*. In my view, we must start from the observation that during the crisis financial stability was lost while price stability was maintained. This suggests

that while major changes are needed in financial regulation and supervision to secure financial stability, monetary policy may just need some adjustments in the manner it pursues price stability.

Let me point out two issues concerning monetary policy:

First, we need to take better account of financial developments in the decision making process for monetary policy since our understanding of the financial sector and macrofinancial linkages is far from adequate. Second, while it is the main responsibility of regulatory policies to preserve financial stability, it would help to add a macro-prudential dimension to monetary policy. This means non-mechanistically leaning against the build-up of financial imbalances by paying more attention to the evolution of variables like overall credit and indebtedness, particularly where accompanied by rapidly rising asset prices and external deficits. This will make monetary policy more symmetric over the cycle since there will be more 'leaning' in good times and, hopefully, less need for 'cleaning' in bad times.

This does not imply at all that monetary policy should have any target other than price stability. Indeed, containing financial imbalances is beneficial for price stability over the medium term. But the devil is in the details: how can the concept of non-mechanistically leaning against financial imbalances be operationalized? There are different ways of doing it. For example, as the ECB has explained, its monetary pillar provides a structured way of taking the above considerations into account and serves to complement the information coming from the economic pillar. But different arrangements may also be possible for other central banks such as, for instance, lengthening the effective horizon over which price stability is reached to become truly medium-term. Of course, this raises the question of how the adequacy of monetary policy decisions can be monitored over such longer horizon. A possibility is to focus more on the extent to which inflation expectations remain well anchored.

This is an area – like the others that I have mentioned during my intervention – where fresh, deep, and sensible thinking is required. The type of thinking that Lucas has consistently been providing for many years.

Dinner speech by Benjamin M. Friedman

DINNER SPEECH

LEARNING FROM THE CRISIS

BENJAMIN M. FRIEDMAN, HARVARD UNIVERSITY

President Trichet, members of the Bank's Executive Board, governors of the other central banks represented here this evening, fellow students of central banking, and above all dear Lucas and Shanna:

I am privileged to take part this evening in honoring our colleague and friend, Lucas Papademos. Lucas has been a kind, and generous, and intellectually stimulating friend to me over the better part of four decades. I confess, however, to being here as a stand-in. The person who should be speaking about Lucas tonight is Franco Modigliani. Franco was Lucas's advisor at MIT. He was Lucas's frequent collaborator and co-author. And he was, I think it is fair to say, Lucas's mentor far more generally in matters of monetary economics and monetary policy. As Serena Modigliani put it, after Franco's death, she and Franco regarded Lucas and Shanna as their children. Alas, Franco is no longer with us, nor is Serena. Standing in his place tonight, and humbled to be doing so, I will try to think of how Franco would have addressed the subject of this splendid colloquium in Lucas's honor: What we can learn from the astonishing experience through which we have just lived?

The years of Lucas's service as vice president of the European Central Bank have encompassed one of the most significant sequences of economic dislocations since World War II. In many countries the real economic costs – costs in terms of reduced production, lost jobs, shrunken investment, and foregone incomes and profits – exceeded those of any prior post-war decline. It is in the financial sector, however, that this latest episode primarily stands out. The collapse of major financial firms, the decline in asset values and consequent destruction of paper wealth, the interruption of credit flows, the loss of confidence both in firms and in credit market instruments, the fear of default by counter-parties, and above all the intervention by central banks and other governmental institutions, have been extraordinary.

Large-scale and unusual events often present occasions for introspection and learning, especially when they bring unwanted consequences. Even if no one is at fault for causing some event in the first place (an earthquake, for example), it is only natural to ask what might be done to mitigate the consequences should a similar catastrophe recur. When what went wrong was the result of human action, the question at issue is not merely containment but prevention.

The harder question is to what extent the lessons from such unusual events are applicable in more normal times. No one expects the massive traffic jams typical when residents evacuate a coastal city in advance of a hurricane to occur at other

times. Learning to manage such evacuations is helpful for occasions when they occur, but the knowledge has limited relevance for controlling ordinary traffic patterns. As economists and policymakers sort out the wreckage from the recent financial crisis and the economic downturn that it triggered, these distinctions should be central to any normative lines of inquiry.

One lesson of this experience that certainly would not have surprised Franco Modigliani is that what matters for such purposes is not money but credit. Indeed, I think he would have argued, the economics profession's half-century-long fixation on money – how to measure it, how to control it, why households and firms hold it – appears today in retrospect as mostly a distraction. The causes of this crisis and downturn, in most countries, lay elsewhere: specifically, in restricted credit flows and depressed asset prices. The series of papers that Franco and Lucas co-authored in the 1980s often had the word "money," or even the phrase "money supply," in their titles. But they were really about the economy's dependence on credit, and how the central bank's influence over the volume of banks' liabilities gives it an influence as well over the asset side of lenders' balance sheets. Viewed from today's perspective, it is the Modigliani-Papademos line of thinking that has stood the test of time. What matters for economic activity is credit: its volume, its price and its availability.

By contrast, a second lesson would, I think, have surprised Franco. Contrary to the standard textbook model, which in this case Franco accepted – indeed, which Franco helped create – most central banks today do not normally set interest rates by open market operations increasing or decreasing the volume of reserves that they provide to their banking systems.

The traditional understanding of how a central bank sets a (presumably short-term) interest rate involves its varying the supply of bank reserves, or some other subset of its own liabilities, in the context of an interest-elastic demand for those liabilities on the part of the private banking system and perhaps other holders as well (including the nonbank public if the measure of central bank liabilities taken to be relevant includes currency in circulation). Long before the recent crisis, however, this standard textbook account had ceased to bear a visible relationship to the actual conduct of monetary policy by most of the world's major central banks.

The point is most obvious today in systems like the Euro-system, in which the central bank maintains standing facilities both for banks' deposits of reserves and for marginal lending of reserves to the banks. The result, under normal circumstances, is the absence of any day-to-day relationship between the volume of reserves supplied and movements in the central bank's policy interest rate. The "corridor" system instead operates by maintaining a constant degree of supply-demand pressure in the market for reserves, *at the margin*, regardless of the total quantity supplied. As long as bankers managing their institutions' liquidity positions perceive an equal likelihood of having to deposit excess reserves and having to cover any deficiency by borrowing from the marginal lending facility, the market will clear at (approximately) the midpoint between

the two designated rates. Hence the central bank can move its policy interest rate without necessarily making any change in its own balance sheet.

But even in the United States – where in principle the standard textbook story ought to have applied most naturally because of the prevailing institutions (most importantly, until October 2008 no interest paid on reserve balances) – before 2000 the amount by which the Federal Reserve System increased or decreased bank reserves in order to move the federal funds rate was not only extremely small but becoming smaller over time. On many occasions moving the federal funds rate required no, or almost no, central bank transactions at all. Since 2000 the amount by which reserves have changed on days of policy-induced moves in the federal funds rate has become noticeably larger on average. But in a significant fraction of cases – one-third to one-fourth of all policy-induced rate changes – the movement in reserves has been in the wrong direction: a *decrease* in reserves accompanying a *reduction* in the interest rate, or vice versa.

This separation between the central bank's balance sheet and the influence it is exerting on short-term interest rates bears two significant implications. At a fundamental level, it represents a departure from the role of central bank liabilities that has underpinned much of monetary economics for more than a century. According to Wicksell's classic analysis, what was necessary to keep the market interest rate below the "natural" rate, and thereby expand economic activity, was not just a one-time injection of additional reserves but a continual increase in the supply of reserves. As a result, the "accelerationist" view of inflation, according to which real economic activity maintained at greater than its natural rate would lead not to a one-time increase in prices but to a perpetual increase (in some renderings, a perpetual increase in the rate of increase), was consistent with the classical notion of a fixed relationship between prices and money (in this case, central bank money). By contrast, if a corridor system for interest rate setting enables the central bank to hold interest rates at a sub-"natural" level without increasing the supply of its liabilities, then at least one relationship in the chain running from interest rates to real activity to prices to money must break down.

The crisis and the policy response to it have also brought to light a further, more practical implication. At least over some period of time potentially sufficient to matter for macroeconomic purposes, central banks have not one instrument of conventional monetary policy, as traditionally assumed, but two: not the short-term interest rate *or* the quantity of central bank liabilities, but the short-term interest rate *and* the quantity of central bank liabilities.

A reductionist form of this proposition had already become evident from the "quantitative easing" program undertaken by the Bank of Japan earlier in this decade. But in that case the central bank did not actually have two effective policy instruments; the occasion for the quantitative easing in the first place was that the Japanese short-term risk-free interest rate had reached the zero lower bound, so that the quantity instrument was a replacement for the interest rate instrument. In a narrow sense, the same is true in the United States today: the federal funds rate is likewise at the zero lower bound.

But this focus places too narrow a construction on the point at issue. The import is that with the institution of interest paid on reserve balances, the central bank no longer faces the constraint of choosing one point along a fixed, downward-sloping reserve demand schedule. It can use one policy tool (the reserve remuneration rate) to determine the interest rate at which banks' demand for reserves becomes horizontal, and another (open market operations) to fix the quantity of reserves. Hence the size of the central bank's balance sheet is potentially independent of the policy interest rate that it sets.

Although this lesson of the last few years would probably have surprised Franco, once he had seen the principle in action he would immediately have intuited a highly significant consequence. Presumably there is little policy import to expanding banks' reserves via open market operations only to re-absorb them through a standing facility by which banks deposit, and the central bank remunerates, excess reserve holdings. But once the size of the central bank's balance sheet is, in effect, an independent instrument of monetary policy, the *composition* of the assets that the central bank holds represents a further degree of freedom. Here the Federal Reserve presents the most striking case.

In October 2008, at the height of the crisis, the Federal Reserve established its Commercial Paper Funding Facility. The spread between the interest rates on commercial paper and equal-maturity OIS rates had widened to unprecedented levels. In parallel, the volume of new commercial paper issuance had virtually collapsed. As the CPFF's holdings grew, reaching some $350 billion by early 2009, the commercial paper-OIS spread narrowed sharply, and new-issue volume recovered. A Harvard thesis that I supervised this year, using an estimated model of supply-demand equilibrium in the commercial paper market, concluded that the CPFF's purchases reduced the AA-rated three-month finance paper-OIS spread by 50 basis points – hardly a small amount in these markets, and a very welcome contribution to the markets' recovery. Franco, with his theory of "preferred habitats" and segmented markets, would not have been surprised.

By far the largest use of the Federal Reserve's balance sheet has been its purchase of residential mortgage-backed securities. The Federal Reserve established a Term Asset-Backed Securities Loan Facility in March 2008, but it did not begin to purchase securities until March 2009. Purchases of mortgage-backed securities then increased rapidly, and they continued through early 2010. As of last week, the volume held was approximately $1.1 trillion.

The spread between the interest rates on U.S. thirty-year fixed-rate mortgages and ten-year Treasury bonds, which is normally some 140-180 basis points, had widened to 300 basis points by late 2008. The spread began to narrow, after the announcement of the Federal Reserve's new program but before it had actually bought any securities – just as would be expected, in a market for long-term assets, if market participants anticipated an action that would affect the prevailing supply-demand equilibrium. By mid 2009 the spread was back to normal. I am not aware of a formal econometric analysis of this sequence of events comparable to what my thesis student did for the CPFF, but the rough-level

correspondence is sufficiently strong that in all likelihood such research, once it is done, will likewise find a significant and substantial impact.

Much of today's discussion of U.S. monetary policy in the financial press focuses on the supposed need for the Federal Reserve to "unwind" these large mortgage-backed securities holdings in order to "exit" from its zero federal funds rate policy, once the nascent economic expansion gains sufficient momentum that monetary policy needs to play its customary role in preventing the accumulation of potentially inflationary pressures. The lesson we have learned from the recent experience, however, is that such an "unwinding" is not necessary for the "exit." Now that the U.S central bank is able to pay interest on banks' holdings of excess reserves, it can exploit what amounts to the horizontal segment of the reserve demand schedule to raise short-term interest rates without shrinking its balance sheet. Selling off its portfolio of mortgage-backed securities, thereby reducing its balance sheet to the pre-crisis scale, may or may not be a wise course of action for the Federal Reserve. But it is in no way necessary for pursuing any given trajectory for short-term interest rates. At least over business cycle frequencies, the central bank's use of its interest rate instrument and the size of its balance sheet are largely independent.

This colloquium in Lucas's honor is not merely about monetary policy, but financial stability as well. Here too, the experience of the crisis has educated us. Perhaps the most important lesson in this regard – one that Franco Modigliani surely knew all along, given his life experience – is that a democracy gets the regulation it chooses. If voters elect public officials who do not believe in regulation, and those officeholders appoint people who also do not believe in regulation to head the key agencies within the state's regulatory apparatus, then there will not be effective regulation no matter what the prevailing statutes say.

A further lesson of the crisis, which makes this basic principle of democratic governance all the more important, is that self-regulation by private firms is insufficient to meet the challenges presented by today's complex financial markets. These firms' need to raise their own capital in speculative financial markets, the distorted incentives created by a variety of features of modern corporate financial structures (beginning with limited liability), and the weakness of traditional forms of corporate governance in a world of widely dispersed share ownership, overwhelm any effective tendency toward self-regulation. Further, vigilance by creditors and counter-parties is no effective substitute for regulation either. Whether because they too face faulty governance and perverse incentives, or because they have become convinced that governments will issue blanket guarantees of insolvent firms' obligations, the idea of restraint effectively exercised by creditors and counter-parties is no longer credible. The essential implication is that regulation is necessary and that it is the responsibility of public policy to provide it.

Finally, the crisis experience has taught us something about lender-of-last-resort policy too. As seems to happen whenever the banking industry encounters difficulties, over the past two years we have repeatedly heard pious pronouncements to the effect that if central banks only adhered to the classical principles laid

down by Henry Thornton and Walter Bagehot, two centuries ago and a century and a half ago, respectively, all would be in order. It is worth recalling that in Henry Thornton's time all London banks except the Bank of England had to be partnerships – no other limited-liability "joint stock banks" allowed – and with a maximum of six partners, each one personally and fully responsible for the bank's obligations. Walter Bagehot's presumption that the overwhelming majority of banks were soundly managed and solvent likewise seems charmingly naive today. (What remains unchanged, however, is the potential fall-out from the failure of a large bank; as Bagehot wrote, "no cause is more capable of producing a panic, perhaps none is so capable, as the failure of a first-rate joint stock bank in London.")

More important for purposes of lender-of-last resort policy today, the difficulty of assessing a proper value for illiquid assets has rendered Bagehot's famous rule – lend freely, at a penalty rate, against good security – impossible to implement. In situations like the recent crisis, in which banks held large volumes (compared to their capital) of securities that were not trading, and for which prospects for future cash flows were highly uncertain, distinguishing what was or was not a "good security" was precisely the sticking point.

For just the same reason, the familiar corollary of Bagehot's rule – come to the rescue of illiquid firms but not insolvent ones – has become equally impossible to implement in such a crisis. For practical purposes, the distinction between illiquidity and insolvency has disappeared in this kind of setting. Depending on the hypothetical value attached to these illiquid securities with uncertain future cash flows, any given bank was either solvent or not. Further, what these securities were worth – and hence whether any given bank was solvent – was itself endogenous to the decisions to be made by central banks and other policy authorities. Simply rescuing illiquid banks but not insolvent ones, as if the difference were both observable and independent of the policy actions to be taken, was not an operational strategy.

The events through which we have just lived have been historic in both character and proportion. We have already learned much, and there is far more to be learned. Research in monetary economics will surely play a large role in that process. As Lucas finishes his term at the Bank, I trust that he will continue his close involvement in that effort. As a product of Franco Modilgiani's shaping, how could he not? But as President Trichet has emphasized, tonight is also an occasion to look back, and to say thank-you. We admire Lucas's contribution to the ECB throughout these tumultuous years. He has shown that, like his mentor, he is a European patriot. Even those of us who are not Europeans are grateful.

Lucrezia Reichlin, Athanasios Orphanides, Axel A. Weber,
Jordi Galí, Miguel Fernández Ordóñez (Chair) (from left to right)

SESSION 2

THE GREAT FINANCIAL CRISIS: LESSONS FOR MONETARY POLICY

THE MONETARY PILLAR AND THE GREAT FINANCIAL CRISIS[1]

JORDI GALÍ, CREI, UPF, AND BARCELONA GSE

I INTRODUCTION

The Great Financial Crisis that has swept the global economy since mid-2007 and whose strong ripples are still being felt, has posed serious challenges for central banks. The European Central Bank (ECB) has been no exception. The nature of both the challenges and the responses that they have triggered has had (and keeps having) several dimensions: the need for stimulus, coping with dysfunctional money markets, bank support, the ongoing debt crisis, etc. Rather than attempting an overarching review of the possible lessons from the crisis for monetary policy, I will focus on a much narrower aspect, one that is largely specific to the ECB: the performance of the so-called monetary pillar during the crisis and the lessons that we can draw from the latter regarding the "future of money" at the ECB.

Over the past six years, which include both the financial crisis episode and the run-up to it, the euro area has experienced large and persistent swings in M3 growth. This is clearly illustrated by Chart 1, which displays the annual growth rate of M3 since the birth of the euro in January 1999.

Thus, between May 2004 and October 2007 annual M3 growth in the euro area increased from 5% to 12.5%, an increase of more than 7 percentage points, leading to an eventual 8 percentage point deviation from the reference value of 4.5%. Since then, it has declined gradually but steadily. At the time of the fall of Lehman in September 2008, annual M3 growth was already down to 8.7%. It has kept declining ever since, almost monotonically. It turned negative in November 2009 for the first time since the creation of the euro. In March 2010 (the latest month with available data) it stood at -0.1%, implying a negative deviation from the reference value of nearly 5 percentage points. The peak-to-trough decline in the growth rate during the recent episode has thus been of more than 12 percentage points. That experience provides the material for a "case study" that may shed some light on the potential advantages and drawbacks of the monetary analysis at the ECB.

Such large and highly persistent swings in M3 growth should have raised concerns at the ECB, for the main tenet of the monetary pillar is that shifts in "underlying monetary growth" are expected to bring about inflationary (or deflationary) pressures in the medium to long run, thus imperiling the goal of price stability. But have those concerns been raised in practice at the ECB,

1 I thank Axel Weber, Lars Svensson and conference participants for their comments, and Tomaz Cajner and Lien Laureys for excellent research assistance.

Chart 1 M3 growth in the euro area

Source: ECB.

and have they influenced its policy? Or is the evolution of money growth effectively viewed as a sideshow, to which some lip service has to be paid to? As I discuss below, a reading of the monthly bulletins, including the articles devoted to this specific issue do not provide, in my view, a clear answer to those questions.

Before I turn to that discussion, I provide some background on the monetary pillar, as well as a quick summary of some of the main criticisms it has drawn.

2 THE TWO-PILLAR STRATEGY OF THE ECB

2.1 BACKGROUND

Since its inception, a most distinctive – and controversial--feature of the ECB monetary policy strategy has been its "two-pillar" structure. As explained at its announcement on 13 October 1998, that strategy consists, in addition to a quantitative definition of price stability, of two key elements:

- A prominent role for money, with a reference value for the growth of a monetary aggregate (the "monetary pillar")

- A broad-based assessment of the outlook for price developments (the "economic" pillar)

In December 1998 the Governing Council announced a reference value for M3 growth of 4.5% per annum, a rate deemed consistent with the ECB's

own definition of price stability.[2] The ECB made clear from the time of the announcement of its strategy that the reference value should *not* be taken as a target, but only as a benchmark. Deviations from that value should thus not lead to an automatic adjustment of monetary policy, but instead they should prompt further analysis to identify the nature of that deviation, and its implied risks to price stability.

Despite this important qualification, the large and persistent deviations of M3 growth from that benchmark, shown in Chart 1, have not gone unnoticed, and the ECB has made a considerable effort to offer an explanation of their nature and the extent to which they constitute or not a threat to price stability.

In particular, and at least since the review of its monetary policy strategy in 2003, the ECB has chosen not to attach much weight to raw measures of M3 growth, aiming instead much of its monetary analysis effort at uncovering potential shifts in "underlying monetary growth." The latter is viewed by the ECB as the relevant factor for the assessment of the risks to price stability in the medium-to-long term. Uncovering potential shifts in "underlying monetary growth" involves a broad-based analysis of monetary developments, encompassing a detailed study of "the components and counterparts of M3, including loans to the private sector, and various money gap measures and concepts of excess liquidity" (ECB (2003)). Whether the concept of "underlying monetary growth" is a well defined one and has been applied in a consistent manner by the ECB is the subject of further discussion below.

2.2 THE MONETARY PILLAR AND ITS CRITICS

Since the inception of the ECB, a majority of academic economists have expressed skepticism about the two-pillar structure of its strategy.[3] In particular, the critics have questioned the need for, and the desirability, of a separate monetary pillar, both on theoretical and practical grounds. Next I summarize the main criticisms, before addressing the questions raised above regarding the role of the monetary pillar in the crisis and its aftermath.

A first and, in my view, most fundamental criticism of the monetary pillar has aimed at its justification based on Friedman's celebrated dictum that "inflation is always and everywhere a monetary phenomenon" along with the evidence, presented in its support, of a strong long-run correlation between money growth and inflation.[4] But, as it has been argued by many authors, neither the dictum nor the companion evidence imply that a central bank must necessarily target or even monitor closely the evolution of monetary aggregates in order to keep price inflation close to a pre-specified target level. The latter proposition is clearly borne by modern monetary analysis, which illustrates how a variety of policy

2 The reference value was determined under the assumptions of an average growth rate of potential GDP of 2-2.5% and an average decline in velocity of 0.5-1% each year.

3 See, e.g., Svensson (1999), Galí (2003, 2008), Alesina et al. (2001), Galí et al. (2003), and Woodford (2008, 2009), among many others.

4 See, e.g. Papademos (2008) for a description of the theoretical and empirical case for the monetary pillar.

rules may achieve an acceptable degree of price stability, with no reference whatsoever to monetary aggregates. Furthermore, such policy rules can be generally shown to be more efficient at achieving the central bank's desired price/output gap objectives than conventional monetary targeting rules, especially (but not exclusively) in the face of large money demand disturbances.[5] Instead, the observed high long-run correlation between money growth and inflation can be interpreted, through the lens of modern monetary theory, as an unavoidable consequence of equilibrium, given a reasonably stable demand for real balances by households and firms. It is no different in that regard from the evidence of a high long-run correlation between inflation and the nominal interest rate or the rate of exchange rate depreciation, even though that evidence has not been used to justify the existence of an interest rate or an exchange rate "pillar" as part of the ECB monetary policy strategy.

A second criticism of the ECB two-pillar strategy has focused on the dilemma that significant discrepancies between the diagnoses arising from the two pillars could potentially pose on policymakers. Thus, and at least on paper, it is not obvious how the ECB should respond to a situation in which the outcome of both the monetary and economic analyses pointed to strong threats to price stability, but of an *opposite* sign.

Possibly due to its relatively short life, the ECB has not had to live through a dilemma in such stark terms. Yet, one can uncover several instances in which a strong acceleration of M3 and other monetary aggregates should have signaled the presence of inflationary pressures, even though the latter were not backed by the outcome of the "economic analysis." In none of those instances, however, the signals from the monetary analysis seem to have been given much weight in actual monetary policy decisions. And in at least one of them--namely, the period between April 2001 and July 2003--the inflationary pressures signaled by a strong and persistent acceleration of monetary aggregates were altogether ignored if one is to be guided by the fact that they were met by a round of interest rate cuts that brought the policy rate down to 2% from an all-time high 4.75% level.

It is a widely held view among academic economists (which I largely share) that the monetary policy stance of the ECB, as reflected in its interest rate decisions, has been, in general terms, appropriate, i.e. in accordance with a conventional economic analysis of the medium-term risks to price stability facing the euro area at each point in time. In other words, I believe it would be very hard for an external observer to point to specific decisions that would not have been taken had the ECB followed a "conventional" inflation targeting strategy, attaching no distinctive weight to monetary developments. Yet, the fact that monetary factors may not have influenced significantly the policy decisions of the ECB (at least up to this date) does not necessarily render the monetary pillar totally innocuous. To the extent that monetary policy consists of "expectations management" more than anything else, the conspicuous presence of the monetary pillar in ECB communications (e.g. as a fixture of the editorial of the monthly bulletin, and the subject of a full chapter of the monthly bulletin) could be a source of noise that could potentially distort the

5 See chapter 4 in Galí (2008a).

public understanding of ECB policies, rendering the latter less effective. Whether this has occurred in practice, and to what degree, is an open issue.

A final criticism that has been raised regarding the role of money in the ECB strategy pertains to the use of monetary aggregates as explanatory variables in reduced form forecasting equations for inflation. As argued by Fischer et al. (2008) in their detailed account of the monetary analysis at the ECB, the fact that some monetary aggregates appear to have predictive power for future inflation, above and beyond that of other macro variables, had led to a newfound role for money in recent years (at least before the recent crisis), and one that had become increasingly important. But, while it is hard to deny that potentially useful role for money and its relevance in informing monetary policy decisions, it is not obvious why this would make money special and deserving of its own "pillar" relative to other macro variables that have similar properties. Leaving that formal question aside, in my discussion of Fischer et al. (2008) I raised two weaknesses regarding the forecasting role of money.[6] Firstly, while money-based forecasts seem to get the mean of inflation more or less right, their performance at tracking future movements in that variable seems rather poor. This should not be viewed as surprising in an environment in which inflation displays relatively small and transitory fluctuations around its target. Secondly, reduced form forecasting equations involving inflation and money growth do not represent a structural relationship. As a result their coefficients are likely to vary over time as a result of structural changes in the economy, including changes in the monetary policy regime or as a result of instability of money demand equations. Thus, money may have predictive power for inflation over a certain period, but may lose it after a while. This is precisely what may have occurred in the euro area: much of the significance of adjusted M3 growth in the bivariate inflation-forecasting equations considered by Fischer et al. (2008) seems to originate in the strong low frequency comovement between those two variables during the 80s, a property which seemed to have vanished by the 1990s and early 2000s.

3 THE MONETARY PILLAR IN PRACTICE

The ECB has described in some detail the role played by its monetary analysis during the recent crisis in ECB (2009). A similar description, applied to the period leading to the crisis can be found in ECB (2007). In addition, a real-time perspective of the outcome of the monetary analysis during the crisis can be found in the ECB's Monthly Bulletin, whose Editorial invariably includes an early paragraph summarizing the conclusions of that analysis that are relevant to policy, with the more detailed description of the underlying analysis being found in Section 2 of the same publication.

A reading of those publications sheds some light on what monetary analysis at the ECB is about in practice and, in particular, on how that analysis may have helped the ECB interpret some key developments during the recent financial crisis and the period leading to it.

6 See Galí (2008b).

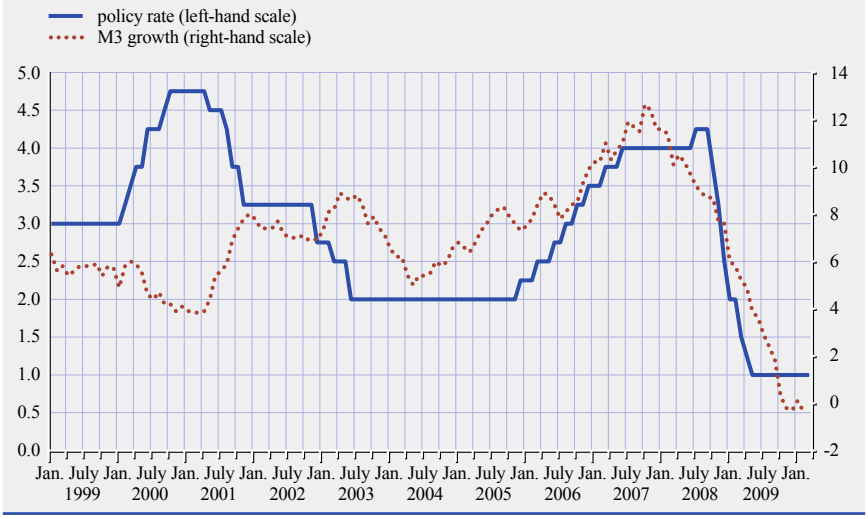
What follows offers my personal interpretation of the monetary analysis at the ECB, its content, objectives and potential uses, with a focus on the recent crisis episode and the run-up to it. Needless to say, many of my observations are likely to be inaccurate or plain wrong. But in all cases they reflect what I view as an objective reading of the documentation available to the public.

3.1 THE MONETARY ACCELERATION IN THE RUN-UP TO THE GREAT FINANCIAL CRISIS

Starting sometime in mid-2004, the euro area began to experience a rapid increase in the growth rate of M3 and other monetary and credit aggregates, i.e. a "monetary acceleration". More specifically, between May 2004 and October 2007 annual M3 growth in the euro area increased from 5% to 12.5%, an increase of more than 7 percentage points, leading to an eventual 8 percentage point deviation from the 4.5% reference value.

That monetary acceleration led the Governing Council, as early as the fall of 2004, to identify growing upside risks to price stability on the basis of its monetary analysis. In later statements the ECB pointed to that diagnosis as a key input to the Governing Council's decision in December 2005 to start raising its policy rate, after a two-year long spell with the latter unchanged at a 2% level. At the time the decision to raise the policy rate was made, the annual growth rate of M3 was standing at 7.3%, having reached a level of 8.3% in September. The sequence of interest rate rises, from a low of 2% in December 2005 to 4% in June 2007, did not prevent a further acceleration of M3, whose growth rate reached a peak of 12.5% in the fall of 2007. This is clearly illustrated in Chart 2, which plots both the policy rate and the annual growth rate of M3 from January 1999 to the present.

Chart 2 M3 growth and the policy rate



Source: ECB.

The ECB's explanation for the monetary acceleration since mid-2004 stressed the following factors:

- The low level of short-term interest rates and a flattening of the yield curve combined to lower the opportunity cost of holding monetary assets. Though the observed decline in velocity was larger than in similar past episodes, this could have been due to a higher sensitivity of money demand to interest rate changes in an environment characterized by low interest rates. The overall conclusion seemed to be that conventional money demand determinants can account reasonably well for changes in M3 growth, as well as shifts between components of M3 (in particular, the varying contribution of M1 to that growth).

- Some additional, less-conventional factors that may have also accounted for the strength of M3 include (i) the creation of "retail derivatives," (structured deposits and the like), (ii) the increase in the demand for deposits by non-monetary financial intermediaries linked to banks through loan securitization schemes, (iii) the expansion of monetary assets associated with transactions with the rest of the world, in an environment with high global liquidity, (iv) the rapid expansion of overall wealth, driven by the boom in stock and housing prices, and, especially relevant after the rise in short-term rates, (v) an increase in the demand for short-term deposits and related assets for portfolio management reasons, due to the risk of capital losses on longer term bonds.

Interestingly, and as shown in Chart 2, another episode of robust monetary acceleration had taken place in the euro area between 2001 and 2003. In particular, annual M3 growth reached a peak of 8.9% in April 2003, i.e. a growth rate slightly above that observed in December 2005. Yet, the former episode was accompanied by a loosening of monetary policy, as reflected in a series of interest rate cuts, from a level of 4.75% down to 2%.

What led the ECB to conclude that the observed monetary expansion posed some risks to price stability that would justify the rise in interest rates in the recent episode? Why was the apparently similar monetary acceleration of 2001-2003 viewed as benign and, even more, consistent with the downward risks to price stability identified by the economic analysis?

The discussion in ECB (2007) suggests that the differential diagnosis was based on the following observations, regarding the underlying components and counterparts:

- M3 growth in the recent episode was mainly driven by high growth in M1, its *most liquid* component. By contrast, in 2001-2003 it was largely driven by "marketable instruments" included in M3-M2, and arguably the least liquid component of M3.

- From a sectoral perspective, the increase in M3 growth starting in mid-2004 was driven by strong growth in the deposits of non-financial corporations and

non-monetary financial intermediaries, along with a more gradual, but steady growth in household deposits. This is interpreted as signaling a potential shift in underlying trends. By contrast, during the 2001-2003 episode, the bulk of the increase in M3 growth resulted from a dramatic and sudden rise in household deposits, caused by the flight to safety in an environment characterized by heightened financial market volatility.

- Looking at M3 counterparts, the increase in M3 growth in the run-up to the crisis has come hand in hand with an increase in the growth rate of loans to households and non-financial corporations. By contrast, growth of loans during the 2001-2003 showed a declining pattern, consistent with an environment characterized by weak consumer and business confidence and relative stagnation of economic activity.

The outcome of the monetary analysis, summarized above, led the ECB, as early as mid-2005, to the conclusion, that "the strengthening of monetary growth signaled clear medium to longer-term risks to price stability," thus contributing, according to the ECB itself, to the decision to start raising interest rates in December 2005. Was that conclusion founded? And if so, were the arguments leading to that conclusion consistent with the intellectual framework underpinning the monetary pillar? Before I try to address these questions I summarize the ECB's analysis of monetary developments during the crisis episode, starting in mid-2007, and up to the present.

3.2 THE MONETARY DECELERATION DURING THE GREAT FINANCIAL CRISIS AND BEYOND

Conventional accounts of the Great Financial Crisis take August 2007 as the date marking the beginning of the period of financial turmoil. Annual M3 growth in that month had already reached a rate of 11.7%, and would keep increasing until it reached a maximum of 12.5% in October of the same year. After that, it declined gradually but steadily. At the time of the fall of Lehman in September 2008, annual M3 growth was already down to 8.7%. It has kept declining ever since, almost monotonically, despite the (mild) turnaround in GDP by mid-2009, and the end of the short-lived period of negative HICP inflation. M3 growth in the euro area turned negative in November 2009 for the first time since the creation of the euro. In March 2010 (the latest month with available data at the time of writing) it stood at -0.1%, implying a deviation from the reference value of nearly 5 percentage points. The peak-to-trough decline in the growth rate during the recent episode has thus been of nearly 13 percentage points.

The analysis of the monetary developments by the ECB during this period, described in detail in ECB (2009), led it to conclude that "monetary trends point to subdued inflationary pressures, but not to a deflationary outcome." This assessment has been confirmed by more recent statements once M3 growth had already shown negative readings for several months. Thus, the Monthly Bulletin of April 2010 states that "the underlying pace of monetary expansion is moderate and that, in the medium term, the inflationary pressures associated

with monetary developments are low." "All in all", it concludes, "the Governing Council expects price stability to be maintained over the medium term." In other words, the existence of an unprecedented monetary implosion does not trigger any concerns about possible deviations on the downside from the price stability objective, including the possibility of deflation.

In order to justify such conclusions, the ECB argues that "aggregate M3 growth is likely to have overstated the decline in the underlying rate of monetary expansion" (ECB (2009)). According to the ECB, there are a number of factors that warrant that assessment:

- The decline in economic activity experienced by the euro area since the spring of 2008 can account for the moderation in the growth of monetary assets. In particular, this is a likely factor behind the strong decline in M3 holdings by non-financial corporations, which tend to be more cyclical.

- The steepening of the yield curve, due to the decline in short-term interest rates, has raised the opportunity cost of holding M3 assets, and induced portfolio reallocations into non-monetary assets, especially among non-monetary financial intermediaries, which are particularly sensitive to changes in the configuration of interest rates.

- The higher uncertainty regarding future economic and financial conditions should be expected to increase monetary holding for precautionary reasons. This may account for the resilience in households' M3 growth, and may be reflected by the strong one-off increase in currency holdings after the intensification of the financial turmoil in the fall of 2008. But this has been more than offset by the large outflows from short-term deposits, due to the rising opportunity cost.

- Holdings of M3 by households – which are argued to have a stronger and more immediate link with consumer price inflation than corporate holdings – continue to exhibit more resilient growth.

- A protracted period of low or even negative growth may be required in order to unwind the excess monetary balances built over recent years.

The previous observations have led the ECB to downplay the steady decline in M3 growth over the past two years, notwithstanding the fact that the current growth rate has been hovering about a plateau well below the reference value of 4.5% for several months at the time of writing this piece. Even though no explicit measures of "underlying monetary growth" are reported by the ECB, they must be sufficiently high not to warrant any warnings of risks to price stability in the medium run.

Having described succinctly the key elements and outcome of the ECB analysis of monetary developments in the euro area over the past few years, including the crisis and the run-up to it, I next turn to a critical discussion of that analysis.

3.3 DISCUSSION

The analysis by the ECB of euro area monetary developments before and during the financial crisis episode, summarized above and discussed in more detail in ECB (2007, 2009), can be largely viewed as a multi-faceted effort to understand the factors behind variations over time in M3 growth. The analysis combines various formal models (which are not always made explicit) as well as detailed, more qualitative, institutional information, and includes a more or less systematic analysis of the evolution of the M3 components, counterparts and sectoral distribution. The ultimate goal of that analysis is to detect potential shifts in "underlying monetary trends" that could pose risks to price stability in the medium to long-term.

My concerns with such "monetary analysis in practice," as illustrated by its working over recent years, are manifold. But they can be summarized in the following proposition: *The concept of "underlying monetary growth" does not seem well defined, in practice*. More specifically, it appears to take different meanings at different times.

Thus, the notion of underlying money growth is sometimes presented as a "statistical" concept, corresponding to the permanent (or unit root) component in M3 growth (e.g. ECB (2009), Chart 3 and related discussion). Since an important component of short-term fluctuations in M3 is the result of transitory variations in the "regular" factors explaining money demand (the pace of economic activity and the opportunity cost of holding monetary assets), as well as other "extraordinary" factors that may be specific to a given episode (e.g., possible portfolio shifts triggered by increased uncertainty in the wake of the Lehman collapse), uncovering and analyzing the behavior of both those "regular" and "extraordinary" factors may help assess the extent to which observed variations in M3 growth are likely to be permanent or not and, hence, whether they may represent a genuine shift in underlying monetary trends or not.

On other occasions, however, the emphasis is placed on a more qualitative assessment of the "content" of M3 growth, one that gives unequal weights to different components. Thus, the behavior of M1 is sometimes given a special weight in the discussion, given its "stronger liquidity." Thus, for instance, the differential behavior of M1 is pointed to as the first reason why the acceleration in M3 after 2004, but not that between 2001 and 2003, is perceived as a risk to price stability (see, e.g., ECB (2007)). Similarly, the risks to price stability associated with the recent deceleration of M3 growth have been downplayed on the grounds that "holdings of M3 by households – which have a stronger and more immediate link with consumer price inflation--continue to exhibit more resilient growth." Under that view, the analysis of the components and counterparts of M3 – rather than the evolution of the latter variable itself-- would take center stage, in the monetary analysis.

Of course, the often emphasized *broad-based* nature of the ECB monetary analysis may be such that all those dimensions are taken into account simultaneously, and that any attempts by an outsider to reduce it to a single variable or indicator is

necessarily bound to provide a oversimplified – and hence distorted – view of the nature of that analysis and its uses by the ECB.

But if such broad-based view is to be meaningful, each of its elements or dimensions must have *some* merit when considered in isolation, even if none may be decisive in itself. Whether this is true in the case in the case at hand, however, is not clear. For the sake of concreteness let me focus on the two perspectives mentioned above to argue my point.

First, it is not clear why a permanent change in M3 growth should necessarily signal a risk to price stability, at any horizon. To illustrate this, assume a stylized money demand function

$$m_t - p_t = y_t - \eta i_t + \xi_t$$

where m denotes (log) nominal money holdings, p denotes the (log) price level, y is (log) output, i is the relevant nominal interest rate and ξ is an exogenous liquidity preference shifter. Taking first differences, and evaluating the previous condition along a steady growth path we have

$$\Delta m = \Delta p + \Delta y + \Delta \xi$$

It should be clear that permanent changes in average output growth (Δy) and/or velocity growth (which corresponds to minus $\Delta \xi$) *require* a permanent change in average money growth if average inflation is to remain unaltered. Stationarity in output or velocity growth may often be a convenient assumption in theoretical macro models. In practice, however, permanent changes in trend GDP growth or velocity growth are not only possible but likely: there is no reason to believe that either variable must necessarily revert back to some constant value, determined by some deep, time-invarying factors. To illustrate this point, note that when determining its reference value for M3 growth (December 1998), the ECB assumed a trend GDP growth in the range of 2-2.5%, and an average annual decline in velocity of 0.5-1%. By way of contrast, over its first eleven years, the euro area has experienced an average GDP growth of 1.4% and an average decline in velocity of 3.6%, both representing quantitatively important deviations from the original assumptions. Neither deviation has prevented the ECB from keeping inflation close to its 2% target, though this has required accommodating an average annual M3 growth of 7%. Since there is no reason to rule out further permanent changes in either trend GDP growth and/or trend velocity growth, it is hard to think of a justification for allocating much effort at trying to identify potential permanent changes in M3 growth, since the latter are unlikely to signal by themselves any risks to price stability at any horizon.

The previous criticism can be re-stated as follows. As long as the ECB is successful at stabilizing inflation in the medium-term (as it has been until now) inflation will display short-lived fluctuations around its 2% target. But if that is the case, there cannot be any permanent or persistent deviations of inflation that could be potentially predicted by persistent or even permanent deviations of M3 from target. Thus, by definition, the latter would be reflecting persistent

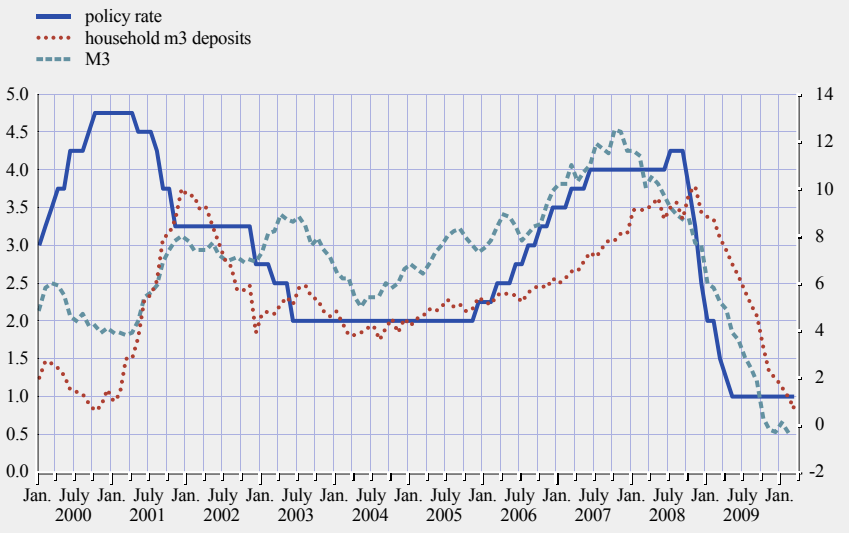
(or permanent) variations in velocity or GDP growth, and will be of no value in signaling risks to price stability. Any historical correlation between M3 growth and inflation in the euro area is the result of earlier regimes that did not guarantee the stationarity of inflation around a constant value.

Consider next the second perspective of the monetary analysis mentioned above, the one associated with a more detailed study of the "content" of M3 growth. A reading of the relevant sections and articles of the Monthly Bulletin gives one an impression of certain *ad-hocness* in the use of that analysis. To put it in other words: there are so many monetary components and counterparts, and so many factors that potentially underlie their relative movements that it must always (or most of the time) be possible to construct an ex-post narrative that could justify *any* diagnosis regarding the evolution of underlying monetary growth. Let me illustrate this point with an example pertaining to the recent euro area experience.

As discussed above, one of the reasons pointed out by the ECB to downplay the current deceleration of M3 growth is the sustained positive growth in household monetary holdings (in the form of short-term deposits), which are claimed to have a stronger link with inflation than M3. But a closer look at the evidence suggests a number of observations.

First, while the growth of household deposits remained resilient once the period financial turmoil of 2007 and accompanying rapid deceleration of M3 were underway, that seeming decoupling came to an end in early 2009. Since then, the growth rate of household deposits has followed a steep downward trend, reaching a historical low of 0.7% in the latest observation available (March 2010), as shown in Chart 3. Yet, the discussion of monetary trends in the most recent

Chart 3 M3, household deposits and the policy rate



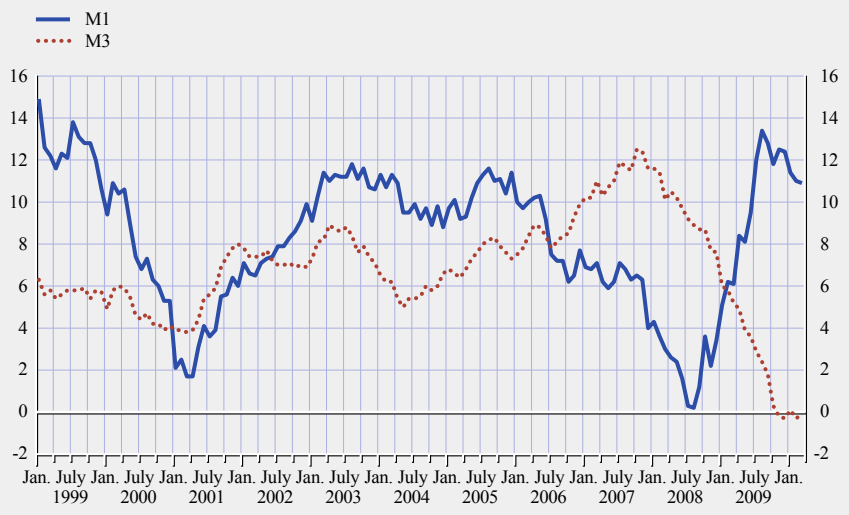
Source: ECB.

issue of the Monthly Bulletin (April 2010), while pointing to the observed rapid deceleration of household deposits, makes no reference its potential deflationary risks, even though its earlier "resilient" growth was singled out as a key factor to dismiss those risks.

Two other episodes suggest some inconsistency in the extent to which the differential behavior of household deposits is emphasized or not. Thus, when the policy rate was finally raised by the ECB in December 2005, the annual growth rate of household short-term deposits had reached a level of 5.4%, less than one percentage point above the 4.5% reference value, and well below the 7.3% growth rate for M3 as a whole. In fact, the December 2005 issue of the Monthly Bulletin was pointing to the rise in the growth of deposits held by non-financial corporations and other financial intermediaries as the main sources of the rise in M3 growth. Yet no case was made at that time for downplaying the acceleration of M3 growth on the grounds that the growth in household deposits remained moderate. Similarly, the low growth rate of M3 throughout 2000 (hovering around 4.5%) did not prevent a round of interest rate increases at that time (from 3% to 4.75%), despite the fact that household deposits were increasing at an even lower rate than M3.

Similar inconsistencies may apply in connection to the value attached to M1. When explaining the rationale behind its detailed analysis of M3 components, the ECB stressed the "particular attention" that must be given to highly liquid components like M1, for "they more closely reflect the transactions motive for holding money, and are thus the most tightly related to aggregate spending" (ECB (2003)). Thus, under the previous view, the current high growth of M1--close to 10%-- can be pointed to as a factor that would warrant interpreting

Chart 4 M1 vs. M3 growth



Source: ECB.

the near-zero growth in M3 as "understating the pace of underlying monetary growth" (ECB (2010)).

But, independently of its merits, the previous guideline seems to have been used in a rather selective way. Thus, as shown in Chart 4, in June 2002 the rate of growth for M1 overtook that of M3, and remained above the latter uninterruptedly for four years. In particular, between December 2002 and June 2004, the average annual growth rate of M1 was 10.8%, more than 3 percentage points above the corresponding growth rate of M3 over the same period. Yet, that observation did not prevent the ECB from downplaying the high growth of M3 (relative to its reference value) on several grounds (see discussion above), while expressing no concern regarding the even higher growth of M1. In fact, the ECB lowered the policy rate from 3.25% to 2% during that period, in response to the lower inflationary pressures suggested by the economic analysis, and associated to low output and employment growth.

Beyond the apparent inconsistencies pointed to above, there is a more general and, thus, more important issue at stake regarding the detailed analysis of M3 and its connection with the price stability objective: It is far from obvious why large, persistent changes in the most liquid components of M3 (e.g. M1 or household deposits) should be given any special status when assessing the medium-to-long term risks to price stability. In particular, it is not clear through which mechanism changes in those components of M3 could have a *direct* influence on the aggregate price level (or, at least, a stronger direct influence than the remaining components). On the other hand, if their eventual impact on inflation works through their possible influence on aggregate demand (or some of its components), and hence on output, employment and, ultimately, firms' marginal costs or competitive pressures, it is hard to understand why that detailed analysis of M3 components is not just turned into an important part of the so called economic analysis, at the same level as other indicators deemed valuable for forecasting aggregate demand (e.g. economic sentiment or, as discussed below, financing conditions).

4 RETHINKING THE MONETARY PILLAR

The implications for the monetary pillar of the ECB's 2003 evaluation of its monetary policy strategy were manifold. Firstly, its weight in the overall strategy was arguably reduced. Most visibly, this was reflected in the shift in the order of presentation of the monetary and economic analyses outcome in the President's introductory statement to the ECB's monthly press conference. It also manifested itself in the clarification that the monetary analysis "mainly serves as a means of cross-checking, from a medium to long-term perspective, the short to medium-term indicators coming from the economic analysis," (ECB (2003)) as well as the decision "to no longer conduct a review of the reference value on an annual basis." Both announcements were interpreted by many commentators as suggestive of a more limited role of the monetary pillar in the future. On the other hand, it was also made clear that the content of the monetary analysis had been extended over time beyond the assessment of M3 growth in relation to the

reference value. In particular, the "comprehensive" nature of that analysis was emphasized, with a combined use of models and institutional expertise, and a greater focus on a detailed analysis of "the components and counterparts of M3, in particular loans to the private sector, and from various money gap measures and concepts of excess liquidity" (ECB (2003)). In other words, far from dismantling the monetary pillar altogether, the ECB was signaling an effort to broaden the content of the monetary analysis and to enrich the tools at its disposal.[7]

Interestingly, though, the recent financial crisis and the challenges that it has posed to central banks, including the ECB, contains the seeds for a further and, in my view, natural and desirable re-assessment of the latter's monetary analysis. The essence of the proposed rethinking would consist in shifting the focus of that analysis from monetary developments to financial stability issues. The rationale for that shift in focus rests on two grounds, which I discuss in turn below.

- The importance of financial stability for monetary policy

- Many aspects of financial stability analysis are a natural evolution of the current monetary analysis

4.1 FINANCIAL STABILITY AND MONETARY POLICY

The recent crisis has brought to the fore the need for stronger financial regulatory and supervisory frameworks. It is widely agreed that an important dimension of that strengthening involves the need to further the macro-prudential orientation of those frameworks, i.e. an orientation that focuses on the financial system as a whole, as opposed to the individual financial institutions that constitute it. While the main supervisory and regulatory duties currently fall under the responsibility of national institutions (typically the central bank or the supervisory authority) and international organizations (e.g. the Basel Committee), the ECB cannot remain on the sidelines of that effort. In fact, the Treaty explicitly assigns it with the task of contributing "to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system."

To be sure, the ECB is already involved in a number of initiatives that share that motivation and which are already underway. Thus, since 2004, the ECB has published, in cooperation with the Banking Supervision Committee, the *Financial Stability Review*, a semi-annual report on the stability of the euro area financial system. Most recently, the ECB has been entrusted with the secretariat function of the newly created European Systemic Risk Board (ESRB), the main body responsible for the macro-prudential oversight of the EU's financial system. That secretariat function will entail, among other duties, the provision of analytical and statistical support to the ESRB.

7 The paper by Fischer et al. (2008) contains a detailed description of the evolution of monetary analysis, before and after the 2003 evaluation.

But the relevance of financial stability for monetary policy goes well beyond any "supporting role" that the ECB staff may provide based on its knowledge and capabilities. As the recent episode has made clear, the impact of financial crises on monetary policy is potentially huge, and likely to overshadow that of any other adverse shock impinging an economy. That impact has at least two dimensions:

First, the transmission of a financial shock to the real economy, amplified by well known adverse feedback loops, typically brings about a severe and long-lasting contraction of output and employment.[8] That contraction, in turn, could generate deflationary pressures that, were they to become entrenched in expectations, could seriously endanger the ECB medium-term inflation objectives. The challenges posed by that scenario are only aggravated by the possibility that the policy rate approaches or hits its zero lower bound, as well as the constraints on the possible size of discretionary fiscal stimulus programs, given the likely strains on public finances. The prolonged stagnation and deflation experienced by Japan after the banking crisis triggered by the burst of the housing bubble should act as a reminder that financial crises are far more than a sideshow, and can leave scars deeper than any other cyclical episode.

Secondly, and as illustrated by developments in the euro area money markets since the summer of 2007, a financial crisis is likely to disrupt the normal operation of the monetary transmission mechanism, thereby preventing policy rate decisions from being quickly passed through to the market interest rates that are relevant to consumption and investment decisions. Reducing the large and highly variable spreads that ensue may require the implementation of "non-conventional" monetary policy measures, some of which may stretch the mandate of the central bank and involve significant risk-bearing by the taxpayer.

The magnitude of the potential disruptions brought about by a financial crisis is sufficiently large to warrant the allocation of the necessary resources by the ECB to help prevent the occurrence of such a crisis to begin with, and were this to fail, to respond swiftly in order to minimize its damaging consequences on the economy, always in accordance with its medium-term price stability goal. Thus, a close monitoring of financial developments, broadly understood, but with a focus on the potential accumulation of the kind of imbalances that, time and again, have been shown to lie at the root of financial crises, should be given a high priority by central banks that have an stability-oriented strategy, including the ECB and the NCBs of the euro area countries. The indicators of potentially threatening imbalances are numerous, and their relative importance likely to be controversial, but they are likely to include the following:

- Stock and housing prices and corresponding price/earnings ratios

- Bank credit to households and non-financial corporations (e.g. relative to nominal GDP)

8 See, e.g. IMF (2008) for historical evidence pointing to the greater severity of recession that are preceded by a financial crisis.

- Leverage and liquidity measures for the banking sector
- Measures of household indebtedness (e.g. household debt/disposable income)
- Current account imbalances and composition of their financing.
- Government debts and deficits

The existence of imperfections of various kinds in financial markets, including poor information or distorted perceptions about risks, perverse incentives, and even plain herd behavior, may lead to inefficiently large movements in some of the variables above, and result in unsustainable imbalances. There is no reason to think of monetary policy – understood as the setting of short-term interest rates – as providing the optimal tool to respond to *any* of the imbalances above.[9] Other policy instruments – already in place or to be created – should be able to provide a more "surgical" response by targeting more closely the inefficiencies underlying those imbalances, without affecting "healthy" sectors of the economy. Thus, e.g., time-varying capital and liquidity ratios for banks and other financial institutions have often been pointed to as likely candidates to dampen excessive leverage or to enhance the liquidity of banks asset portfolios or cap their reliance on short-term funding. Minimum value-to-loan ratios for home mortgages may limit excessive risk taking by banks, limit household indebtedness, and dampen excessive fluctuations in housing prices. Cyclical variations in required margins, statistical loan provisions, or capital gains taxation are additional tools that are often mentioned as having the potential of being used more actively in order to help address some of those imbalances. To put it in the words of Borio (2008), a long time advocate of active macro-prudential policies, "the basic principle would be to encourage the build-up of cushions in good times, when imbalances emerge, so that they can be run down, up to a point, in bad times as imbalances unwind," while the range and flexibility of the tools potentially available would "permit the policy response to be tailored to the specific characteristics of the imbalances, which vary in shape and size, such as in terms of the sectors affected."

Does this mean that monetary policy should stay on the sidelines and watch passively the unfolding of some of those imbalances and their eventual winding-up, when they call for a response that may be in conflict with the price stability goal? The answer to that question is, in my opinion, a qualified no. To be precise (conceptually, not operationally), the following requirement should be met, in my view, to warrant the use of monetary policy in those circumstances: the imbalances remaining after the application of other financial stability policies must be perceived to imply a divergence between the levels of *natural* output (i.e. aggregate output in the absence of nominal rigidities) and *efficient* output (i.e. the level of output that would prevail in the absence of any imperfections, real or nominal). In that case a meaningful trade-off emerges for monetary

9 See Svensson (2010) for a discussion of the integration of financial stability concerns into an inflation targeting framework.

policy, which will generally imply the desirability of temporary deviations from the inflation target.[10] Thus, for instance, in response to an episode of excessive risk taking by banks and abnormally high growth of credit to households, the natural level of output is likely to rise faster than its efficient counterpart. This may warrant a tightening of policy and a temporary (though possibly persistent) negative deviation of inflation from target.

Needless to say, the previous criterion may not be easy to implement in practice, since neither the natural nor the efficient level of output are directly observable. The development and estimation of DSGE models for the euro area that incorporate realistic financial imperfections (in addition to the usual nominal frictions), already underway, should eventually prove helpful in guiding the response of the ECB to financial shocks and imbalances.[11]

4.2 FINANCIAL STABILITY ANALYSIS AS A NATURAL EVOLUTION OF MONETARY ANALYSIS

Once we accept the importance of financial stability--on its own and given its consequences for real and nominal stability – it is natural to inquire the place it should occupy and the status it should be given in the ECB's overall monetary policy strategy. Here I would like to put forward the proposition *that the analysis of financial stability in the euro area, insofar as it is relevant to the conduct of monetary policy, may be viewed as the natural evolution of the monetary analysis currently undertaken at the ECB*, and which has been discussed extensively above. In fact, that evolution – and its explicit acknowledgement by the ECB--would only be an additional stage in the process of rethinking the monetary pillar that has been ongoing since the creation of the ECB and the announcement of its monetary policy strategy in October 1998.

At the risk of oversimplification, and on the basis of the information published in the Monthly Bulletin and related outlets, one can identify three different stages so far in that evolution:

- *From the strategy announcement to its 2003 review.* A central element – and, arguably, the most distinctive feature--of the monetary policy strategy announced by the ECB Governing Council in October 1998 was the prominent role it gave to money, reflected in the establishment of a separate "monetary pillar" and the "signaling" of that prominent role by the announcement of a quantitative reference value for the growth rate of M3. The existence of a stable demand for M3 is viewed as an important requirement behind that approach, and one that is thought of as being satisfied for the euro area. Most revealingly, neither in the article devoted to a description of its strategy in the opening issue of the Monthly Bulletin (ECB (1999a)) nor in the one describing in more detail the monetary pillar in the second issue (ECB (1999b)) a reference can be found to the term "financial stability."

10 The above principle is an application to an environment with financial market imperfections of the one laid out in Blanchard and Galí (2007) in the context of labor market imperfections.
11 See Christiano, Motto, and Rostagno (2010) for recent work in that direction.

- *From the 2003 review to the financial crisis*. The monetary analysis is relegated to providing a medium to long-term cross-check of the risks to price stability emerging from the economic analysis. The reference value for M3 growth is de-emphasized, and its annual review suspended. The monetary analysis is broadened, with an emphasis on the study of all components and counterparts of M3 growth, in particular loans to the private sector. Alternative models of excess liquidity are used and expertise on institutional features is relied upon. The emphasis is shifted to the concept of underlying monetary growth.

- *The financial crisis and its aftermath.* Triggered by the financial crisis, the monetary analysis places a growing emphasis on a comprehensive discussion of the availability of credit to households and firms, beyond the simple measures of reported bank loans growth. That includes analyses of the funding of credit institutions, variations in the composition of their balance sheets, securitization, size of interbank market, etc. (ECB (2009)).

The evolution described above is facilitated by the fact that both the narrow monetary analysis of the early years and the one focusing on financial developments draw from similar information sources: ultimately, they both rely on the analysis of stocks and flows pertaining to the assets and liabilities of financial institutions, households, firms, and the government. A natural question, however, is whether the current emphasis on financial issues is only temporary, and will thus go away when the financial crisis comes to an end and financial conditions are back to normal. As argued above, I believe this would be a mistake, since financial considerations and, in particular, the continuous monitoring of the potential risk of systemic financial disruptions should be given a high priority by central banks, including the ECB. Interestingly, the ECB itself seems to recognize implicitly that the financial elements of its monetary analysis are likely to have an increasing importance in the future when it states, in the concluding remarks of its review of monetary analysis during the financial turmoil in which it has stressed those elements, that "*the necessity of generating a broader set of insights will remain a prevalent feature of monetary analysis, as was the case, for instance, during the period of extraordinary portfolio shifts into M3 between 2001 and 2003 and more recently during the financial turmoil*" (ECB (2009).

But the previous development also uncovers an interesting paradox: the elements of the monetary analysis that are gaining weight and that may end up being more useful are also the ones that are more disconnected with the original objective of that analysis, namely, to provide an assessment of the medium-to-long run risks to price stability *based on the "fundamental" link between money and the price level*.

In connection with the previous discussion it is worth referring to recent evidence by Schularick and Taylor (2009). Using long-run data for 12 developed countries, the authors uncover a generalized decoupling of money and credit aggregates since World War II, due to the large leverage increase in the financial sector. They also show that credit booms (but not monetary expansions) are a powerful predictor of financial crises. Similarly, one may argue that several

recent trends in financial markets brought to light by the crisis warrant a growing emphasis on credit and other financial variables, rather than on money and its components. In other words, much of the action takes place outside the scope of M3. Among those trends one can list the use of off-balance sheet vehicles to channel lending, the widespread use of non-deposit sources of funding, and the rise of the so-called "shadow banking system."

Given the questionable "practical usefulness" of the monetary analysis (as argued above), together with its weak theoretical underpinnings, many academics and commentators have long called for an overhaul of the two-pillar strategy of the ECB, including the abolition of the monetary pillar. The interest in financial stability triggered by the recent financial crisis, and the growing consensus on its connections with monetary policy, suggests an alternative route: *a "rethinking" of the monetary pillar as a financial stability pillar*. Interestingly, given the evolution that the ECB monetary analysis has experienced over the past eleven years, that transition could turn out to be a smooth one, in addition to a desirable one.

5 CONCLUDING REMARKS

Controversies around its monetary pillar have not prevented the ECB from carrying out its job effectively over the past eleven years: it has attained (at least to a reasonable degree) its quantitative objective for inflation; it has anchored medium-term inflation expectations around that objective; and it has responded effectively and pragmatically to the stream of challenges, big and small, that the crisis has given rise to. But "not being harmful" does not mean "being useful." The evidence reviewed in the present paper calls into question the usefulness for policymaking of the money-focused analysis, as illustrated by limited weight that the monetary analysis seems to have played during the crisis and in the run-up to it.

Paradoxically, the financial crisis may end up vindicating the monetary pillar, and restoring its weight in monetary policy analysis. But the resulting pillar is likely to be a highly reconstructed version of the original one, with a strong emphasis on financial stability issues rather than monetary developments.

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COMMENT

AXEL A. WEBER, DEUTSCHE BUNDESBANK

1 INTRODUCTION

First of all, I would like to join the others: Lucas Papademos is a particular friend and a great colleague of mine. With his balanced views, he has been the calm in the eye of the storm. I have always listened carefully to Lucas.

Next, I would like to thank the organisers for inviting me to discuss this stimulating and insightful paper by Jordi Galí. The paper reviews the role of Eurosystem's monetary pillar with a particular focus on the recent years of the financial crisis. In its first part, the paper takes a narrative approach by commenting critically on the ECB's monetary analysis as described in the Monthly Bulletins. In its second part, Galí suggests rededicating the monetary pillar into a financial stability pillar. Lastly, he points out that there may be trade-offs which justify monetary policy responses to financial imbalances despite acknowledging that, in principle, it would be preferable to use macro-prudential instruments. I would like to give you my views on all three of these aspects.

2 COMMENTS

2.1 ON THE NARRATIVE APPROACH

At the core of Galí's critique is some kind of irritation stemming from the ECB's practice of using statistical concepts as well as the analysis of the components and counterparts of M3 to identify those changes in money growth which constitute risks to price stability. Galí's concerns about this practice are summarised in his proposition that "the concept of underlying monetary growth does not seem well defined, in practice".

In my view – and from a conceptual perspective – "underlying monetary growth" has a clear definition: it is the monetary growth that creates inflationary dangers. However, I agree that operationalising this concept is anything but straightforward. Hence, the monetary analysis (in other words, the analysis that tries to identify underlying monetary growth) is complicated and cannot be summarised in a single variable. But this cannot mean that we should discard it. Research over the past decade has deepened our understanding of monetary developments and added to our tool box. However, our understanding is far from complete, and – given the dynamic environment we live in – it needs to be constantly reviewed and adapted. Of course, this is not only true of monetary analysis; it applies to other concepts as well, such as the Phillips curve, the output gap, core inflation and many more.

For this reason, the Eurosystem's monetary analysis does not rely only on a single statistical concept to identify changes in underlying money growth. Instead, we use a broad range of monetary data and methods (to detect breaks in underlying monetary growth, for example). In principle, this approach is comparable to the one guiding economic analysis, which looks at all relevant indicators and singles out those that trigger current events.

From this perspective, the complexity of the monetary analysis merely reflects a multifaceted interaction of money with the macroeconomy. In this spirit, I understand Galí's critical review as a reminder that the Eurosystem – despite its efforts – should explain its monetary analysis as clearly as possible. But this also calls for stressing increased uncertainty when monetary indicators do not uniformly point in the same direction. This should not be interpreted as intransparency, but rather the opposite. We are continuously working on this, not least because we are aware that clearer communication will, in turn, increase policy effectiveness.

Let me remind you that the Eurosystem's broad-based approach was particularly helpful during the financial crisis. It gave us a richer understanding of monetary developments since it allowed us to trace changes in banks' financing conditions and the adjustments taking place in the banking sector. Money and credit developments provided useful insights into the availability of credit to the private sector – which were not only useful in themselves but also relevant for policy decisions. Through our "enhanced credit support programme", we aimed to guarantee a steady flow of loans to euro-area households and firms. One visible effect of our programme was that EONIA was driven down to 0.35%, while the MRO rate remained at 1%. This demonstrates that, in a full allotment regime, the central bank's key policy rate alone may serve badly as an indicator of the monetary policy stance. Instead, quantities matter, as it is the demand side that determines the amount of central bank money at a given point in time. Because the banking system as a whole tended to demand more euro liquidity through refinancing operations than was actually needed, banks deposited the excess amounts in the deposit facility of the Eurosystem, which resulted in the unusual closeness of the interbank lending rate and the interest rate on the deposit facility.

Furthermore, the conclusions of our monetary analysis during the financial crisis pointed to subdued inflationary pressure, but not to a deflationary outcome.

These insights from the monetary analysis were reflected in our policy measures. First, the Eurosystem acted as the intermediary in dried-up money markets by moving to full-allotment fixed rate tenders. Second, the Eurosystem counterbalanced the deleveraging process based on its credit analysis and survey evidence such as the Bank Lending Survey (BLS). Lastly, the Eurosystem conducted a policy of credit easing rather than quantitative easing. I would like to recall that we decided to target our measures at the banking sector because of structural features of the euro-area economy, namely that the euro area's financial system is predominantly bank-based rather than capital-market-based.

2.2 ON REDEDICATION TO "FINANCIAL STABILITY PILLAR"

I do not share Galí's view that the traditional monetary analysis has no merit and that the monetary pillar should therefore be rededicated into a "financial stability pillar". Galí's arguments against the traditional monetary analysis are based on the monetary policy recommendations of the standard New Keynesian models (see Woodford 2006). By now it is well-known that giving monetary developments an important role in these models is a difficult task.

However, the usefulness of these models has, in turn, to be questioned, especially against the background of the ongoing financial crisis. For instance, these models are unable to capture the leading indicator property of money growth with respect to inflation, which is a robust feature of the data for the euro area and other countries. Furthermore, in standard New Keynesian models, the effectiveness of inflation control depends crucially on the reliability of the central bank's estimates of the output gap. However, historical data suggest that real-time estimates of potential output – and hence, the output gap – may be subject to large and persistent misperceptions. In this case, money-based estimates of trend inflation can serve as a useful cross-check for the prescriptions derived from standard Keynesian-style models (see Beck and Wieland 2007 and 2008). This holds even if money demand is unstable: Beck and Wieland provide evidence that recursive estimation techniques can cope with velocity shifts in real time. Hence, when assessing possible dangers to price stability, monetary cross-checking is still useful even in the event of sustained changes in trend velocity.

2.3 ON FINANCIAL IMPERFECTIONS IMPLYING A MONETARY POLICY TRADE-OFF

Galí rightly acknowledges the need for stronger regulatory and supervisory frameworks, notably in order to strengthen their macro-prudential orientation. Given the magnitude of the disruptions brought about by the ongoing financial crisis, a close monitoring of financial developments should be given high priority. He also rightly acknowledges that there is no reason to think of monetary policy as providing the optimal tool to respond to any of the numerous potentially threatening financial imbalances. Moreover, I agree that we need to keep in mind the bluntness of the interest rate instrument with respect to financial stability concerns. Hence, we need to develop new macro-prudential instruments.

Although it would be desirable to offset financial imperfections completely by using macro-prudential instruments, this might not be feasible. In that case, monetary policy may still be called upon to address financial imbalances. According to Galí, the use of monetary policy is warranted if the remaining imbalances imply a divergence between the levels of the natural output (in other words, aggregate output in the absence of nominal rigidities) and the level of the efficient output (that is aggregate output in the absence of any imperfections, real or nominal). For instance, in an episode of excessive risk-taking, the natural level of output may rise faster than its efficient counterpart, which may warrant a tightening of monetary policy beyond what would be required to achieve the inflation target.

Conceptually, Galí is right in that financial imperfections can give rise to a meaningful policy trade-off between output stabilisation and price stability, comparable to a cost-push shock. As is well known, in a New Keynesian model such a shock generates (exogenously or endogenously) a trade-off for the central bank, as it makes it impossible to simultaneously attain the target inflation and the efficient level of activity (see Blanchard and Galí 2007). Without the appearance of such a gap there is no such conflict ("divine coincidence"): stabilising inflation also stabilises the output gap. Similarly, Galí conjectures that financial imbalances give rise to a comparable policy trade-off that otherwise would not exist and monetary policy should deviate temporarily from its inflation target if the trade-off induced by financial imbalances emerges.

It is possible to formally underpin such reasoning in a New Keynesian model that explicitly embeds a credit friction. One way to introduce such a trade-off is to assume a time-varying wedge between the interest rate available to households on their savings and the interest rate at which it is possible to borrow (see Cúrdia and Woodford 2009). The model-consistent welfare criterion then asks the central bank also to minimise fluctuations of the credit spread beyond fluctuations of inflation and the output gap. Under such conditions, optimal monetary policy takes financial developments explicitly into account.

Yet a theoretically meaningful policy trade-off emanating from financial imperfections can also be established even if the natural and the efficient levels of output never fall apart. Notably, Carlstrom, Fuerst and Paustian (2009) show that in a New Keynesian model with agency costs, optimal monetary policy should be concerned about financial market conditions. This is because, in their model, financial shocks (shocks to the net worth of entrepreneurs) act like an endogenous mark-up shock and the welfare criterion includes an additional term that can be interpreted as a risk premium. However, the optimal deviation from inflation stability is small and, hence, the preferred interest rate rule features a strong anti-inflationary response. Price stability is still a good first-order approximation.

To date, this may be seen as a general prescription for policymakers facing multiple and conflicting objectives due to multiple distortions. True, focusing only on price stability may lead to suboptimal outcomes by worsening other economic distortions. Yet a common result in much of the literature focusing on multiple sources of distortions is that price stability is often a close approximation to the optimal policy (Walsh, 2010). I fully share this view.

I would like to stress an additional fact, namely that financial cycles are not exogenous to the strategic orientation of monetary policy. It has the potential to influence risk-taking behaviour, for example. Thus, monetary policymakers, taking these implications into account, should respond symmetrically to financial cycles. This will not prevent boom-bust cycles in asset prices, but might help to make financial cycles somewhat less volatile. The longer-term horizon of the monetary pillar incorporates such a symmetric approach.

3 CONCLUSIONS

As such, the experience of the past decade clearly does not point to giving less weight to the low-frequency money-inflation link. The opposite is true: the traditional task of monetary analysis – namely, a thorough assessment of the risks to price stability stemming from monetary developments – has gained even greater relevance. The experience of the past two years, in particular, has made clear that monetary analysis has much to say about financial imbalances, which also have implications for price stability. If anything, the recent past has strengthened the role of the Eurosystem's monetary pillar. However, the lessons from the financial crisis also pose challenges for monetary analysis. For instance, it has become evident that it will be necessary to learn much more about the relationship between money and credit, on the one side, and the financial system, on the other, in order to filter out the inflationary – or, in a wider sense, macroeconomic – implications of monetary developments.

Admittedly, the necessary task of integrating the interaction between asset markets and monetary developments into our current analytical framework is complicated by the fact that the theoretical foundations for doing so are still very shaky. The development and use of the CMR model at the ECB represents an important step in this direction. For the sake of robustness, it would be useful to develop further models which implement different kinds of financial frictions.

To conclude: the richer understanding of monetary developments obtained by enhancing the monetary analysis has not only reaffirmed the importance of monetary developments, it has also revealed the complex challenges faced in extracting policy-relevant messages from monetary data. Both observations lead me to the conclusion that we should continue to apply and improve our monetary analysis.

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MONETARY POLICY LESSONS FROM THE CRISIS[1]

ATHANASIOS ORPHANIDES, CENTRAL BANK OF CYPRUS

1 INTRODUCTION

The assignment I accepted for this paper is not straightforward. The task is to provide a policymaker's perspective on some lessons from the great financial crisis for monetary policy. Having studied earlier challenging episodes in monetary history, I am well aware of the pitfalls of attempting to draw lessons from a crisis while the experience is still raw. Better to wait a decade or more, to have time to evaluate with greater clarity whether, how and under what conditions things could have evolved differently. On the other hand, there is no time to waste on suggested improvements in the policy framework if the objective is to improve the odds of better outcomes for the future. What better opportunity to offer some early thoughts on the lessons, then, than the occasion presented by this colloquium honouring Lucas Papademos, taking place right after the last meeting of the Governing Council of the European Central Bank (ECB), before the end of his tenure as Vice-President of this institution.

I focus on questions in three areas. First, what lessons can be drawn regarding the institutional framework for monetary policy? Has the experience changed the pre-crisis consensus that monetary policy is best performed by an independent central bank focused on achieving and maintaining price stability? Should central banks be more or less independent? Should their aim be higher inflation instead of price stability, as some suggest?

Second, what lessons can be drawn regarding the monetary policy strategy that should be followed by a central bank? A perennial debate in monetary economics has raged over how ambitious monetary policy should be, how activist it should be in dampening fluctuations and tackling perceived disequilibria and imbalances. Where does the historical behaviour place the ECB in this debate? In the history of central banking, one can identify shifts in the consensus from waves of optimism that policies could be fined-tuned to achieve more to waves of caution when the limits of our knowledge are reconfirmed by reality. Has the recent experience shifted the centre of gravity in this continuing debate?

Third, is monetary policy pursuing price stability enough to ensure overall stability in the economy? Or is there room for improvement regarding how central banks can contribute to greater stability? Would greater central bank involvement in regulation and supervision pertaining to credit and finance allow better management of overall economic stability? Or should the role of monetary

1 I would like to thank Gregory Hess, Lucrezia Reichlin and George Tavlas for helpful comments and suggestions. The opinions expressed are those of the author and do not necessarily reflect views of the Governing Council of the European Central Bank.

Chart 1 Real GDP Growth

Notes: Year-on-year growth of euro area seasonally adjusted quarterly real GDP.

policy be seen as completely separate from the broader institutional environment governing financial markets and institutions in our economy?

It is not necessary to elaborate on the consequences of what became "the great financial crisis". Its severity is evident in the evolution of euro area real GDP (Chart 1). It suffices to note that the level of real GDP fell by nearly 5 percent from its peak in 2008Q1 to its trough in 2009Q2. Events during the crisis, the decisive policy responses, and implications for the future of macro-prudential supervision, were analysed by Lucas Papademos in a number of timely and insightful speeches (Papademos, 2007, 2008, 2009a,b,c,d, 2010). As the person responsible for both financial stability and economic research at the ECB during the crisis, Lucas has been in a unique position to provide insights into the events and guidance on the appropriate policy responses.

2 THE INSTITUTIONAL FRAMEWORK OF MONETARY POLICY

The founders of the European Union ensured that the ECB, more than any other central bank that has ever existed, would be an independent institution fully committed to ensuring price stability.

The independence of the ECB as well as its clear mandate are enshrined in the Treaty on the Functioning of the European Union. According to the Treaty, the primary objective of the ECB "shall be to maintain price stability". In light of this mandate, the Governing Council of the ECB aims to maintain inflation rates at levels below, but close to, 2 percent over the medium term. Inflation is measured by the year-on-year rate of increase in the Harmonised Index of Consumer Prices (HICP).

It should not be necessary to remind ourselves why price stability is so important. The economic costs of inflation are well known.[2] High and variable inflation is detrimental to productivity and growth; uncertainty and unpredictability about future prices lead to inefficient decisions. The social costs of failing to preserve price stability can be far reaching. Inflation is one of the most virulent and corrosive forces in a democratic society, eroding the functioning of a market economy.

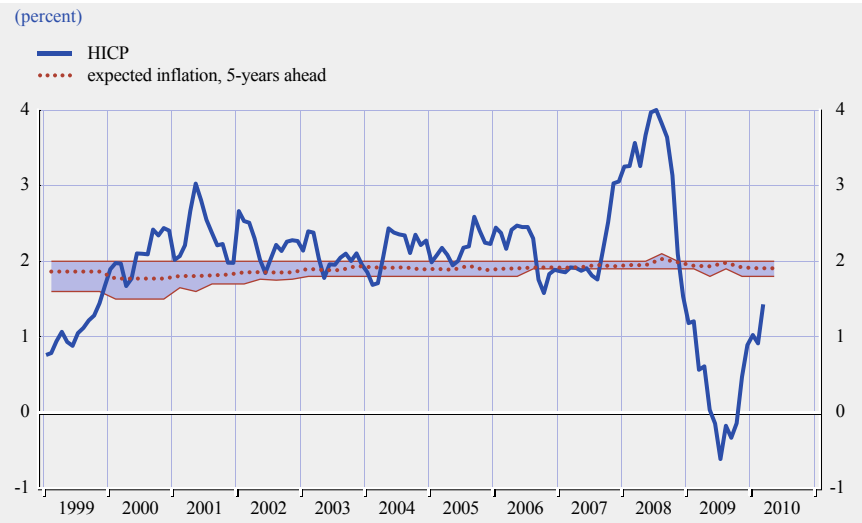
The key to securing price stability is to ensure that businesses and households do not need to worry about protecting themselves from the inflationary disease. Temporary upward and downward fluctuations in inflation may occur but they must not be embedded permanently in high inflation or deflation. This result is assured only when inflation expectations over suitably long horizons are well anchored at levels of inflation sufficiently low to constitute effective price stability. The ECB's definition of price stability, that is, a rate of increase of the HICP close but below 2 percent a year, meets this criterion. Delivering on this goal of price stability is the best way monetary policy can contribute to economic welfare over time.

Since the birth of the euro, the ECB has been successful in delivering on this task. Chart 2 plots HICP inflation as well as the long-term expectations regarding inflation from the ECB's quarterly Survey of Professional Forecasters (SPF).[3] As can be seen, the average of the SPF responses (the red dashed line)

2 See, e.g. Fischer and Modigliani (1978) and Fischer (1981, 1984). See also Papademos (2001) for a more recent ECB perspective.

3 The survey has been conducted towards the end of the first month of every quarter since 1999. Its results are published in the ECB Monthly Bulletin of the second month of each quarter.

Chart 2 Inflation and Long-Term Inflation Expectations



Notes: HICP shows the rate of increase of the index over 12 months. Expected inflation is the average five-year ahead forecast reported in the ECB SPF. The thin red lines denote the 25% and 75% percentiles and the shaded area reflects the interquartile range of the cross-sectional distribution of the individual responses.

has consistently been in line with the ECB's price stability mandate despite fluctuations in actual inflation which, over the past three years, have been relatively large. There are differences of opinion among the survey respondents that are also informative. The thin red lines in the chart show the 25th and 75th percentiles of the cross-sectional distribution of responses in each quarter. As can be seen by the fairly narrow width of the shaded area, disagreement, as measured by the interquartile range of responses, has been limited. This speaks volumes for the credibility of the ECB.

But price stability cannot be assured by a central bank unless it enjoys absolute political independence that can be used to shield it from short-sighted political inflationary pressures that harm the common good over the long haul. The temptations are asymmetric and well known. Inflationary policies can temporarily ease budgetary pressures, buying time for profligate governments. Necessary adjustments may be delayed. A democratically elected government facing an unfriendly electorate, could be tempted to pursue inflationary policies that might temporarily raise employment and income and its electoral prospects. The detrimental effects of inflation, which far exceed any temporary gains for society, would only appear later on. An unavoidable social cost of a democratic society is that the damage from irresponsible government policies sometimes can be hidden from the electorate until after the next election.

The problem, and its obvious solution, have been recognised for a very long time. Early in the 19th century, English economist and member of Parliament David Ricardo explained the main concern that led him to the conclusion that a central bank responsible for the issuance of paper money should be independent as follows:

> "It is said that Government could not be safely entrusted with the power of issuing paper money; that it would most certainly abuse it; and that, on any occasion when it was pressed for money to carry on a war, it would cease to pay coin, on demand, for its notes; and from that moment the currency would become a forced Government paper. There would, I confess, be great dangers of this, if Government – that is to say, the Ministers – were themselves to be entrusted with the power of issuing paper money" (Ricardo, 1824).

Ricardo thought it critical for the bank to be governed by individuals who, in his words, would be "entirely independent" of the government's ministers and stressed that the individuals governing the bank "should never, on any pretence, lend money to Government, nor be in the slightest degree under its control or influence". The object of Ricardo's inquiry was the Bank of England, but his analysis has had lasting appeal and was adopted when the ECB was created. By the end of the twentieth century, the need for an independent central bank to ensure price stability became the consensus view. Increasingly, independence was granted to more and more central banks (including the Bank of England in 1997). Today virtually all of the world's major central banks enjoy a substantial degree of independence.

The credibility that an independent central bank can establish with its actions over time does not only facilitate the success of monetary policy in normal times.

It can be invaluable during critical times when unusual actions may be required that might otherwise risk raising questions regarding the central bank's continued commitment to price stability.

A complicating factor, especially since the last quarter of 2008, has been that numerous central banks around the world, including the ECB, the Federal Reserve and the Bank of England, have reduced interest rates to or near historical lows and, as a result, considerations regarding the zero bound on nominal interest rates have become pertinent. When policy operates very close to the zero bound, unconventional policy measures may be undertaken for engineering additional monetary policy easing.[4] These measures operate through expanding or changing the composition of the balance sheet of the central bank. At times, monetary policy and fiscal policy may blur as some monetary policy decisions may unavoidably have a temporary fiscal dimension.[5] Under such circumstances, an independent central bank that is credibly committed to ensuring that inflation remains low in line with price stability, can have much greater flexibility to take actions that would otherwise risk stoking inflationary fears.

Events during the past three years have provided practical demonstrations of these points. One example has been the massive provision of liquidity by the ECB and other central banks, first when money markets malfunctioned in August 2007 and then during subsequent periods of stress. Were it not for the independence of the central banks in question, and the credibility earned by their earlier success in maintaining price stability, the ensuing rapid increases in the monetary base could have raised the spectre of inflation in the public's conscience.

Some purchases of assets by central banks over the past two years may also be seen as examples of such unusual actions. These actions were taken either to repair market functioning or, in light of the zero bound, to engineer further monetary policy easing and defend against deflation, or both. In the United States, for example, the Federal Reserve bought large quantities of asset-backed securities to prop up an ailing financial sector and the housing market and to stimulate economic activity. In the United Kingdom, the Bank of England engaged in quantitative easing by purchasing UK government bonds. And very recently, the ECB decided to conduct targeted interventions in some euro area public and private debt securities markets to address their dysfunction. In each of these cases, the unusual central bank interventions could potentially have been questioned if the central banks undertaking these interventions were not seen as independent, credible and committed to safeguarding price stability.

One lesson I draw from this experience is that the greater the independence and credibility enjoyed by a central bank in ordinary times, the greater the flexibility to engage in unusual and forceful corrective policy measures during times of crisis. Independence and credibility cannot be taken for granted, however, and must be

4 See Bernanke et al (2002), Clouse et al (2000), and Yates (2002) for reviews of unconventional tools available to a central bank at the zero bound, and Curdia and Woodford (2010) and Gertler and Karadi (2010) for recent equilibrium models.

5 See Goodfriend (2010).

continuously defended, especially in jurisdictions where the independence of the central bank is not enshrined in a constitutional treaty. The risk that the corrective actions taken by a central bank during a crisis become part of a short-sighted political agenda cannot be ruled out.

Another issue that has surfaced in academic debates concerns the appropriateness of price stability as the primary objective of a central bank. The zero bound on nominal interest rates suggests that if interest rates are already low under normal circumstances, the scope of engineering a conventional monetary policy easing by cutting rates is limited. In light of the recent experience, when several central banks cut short-term nominal interest rates close to zero, it has been suggested that the price stability objective should be replaced with the objective of aiming for a stable higher rate of inflation, say 4 percent. This, it is argued, would provide flexibility for greater policy easing, if needed in the future.

Such proposals to abandon price stability seem to be the unfortunate consequence of a fundamental misconception about monetary policy. They seem to draw on the false premise that the zero lower bound on nominal interest rates poses a limit on the effectiveness of monetary policy to protect against deflation. But when policy rates are close to the zero lower bound, they no longer suffice as indicators of the monetary policy stance and of how expansionary monetary policy may be. In these circumstances, unconventional policy measures acquire an elevated role. To evaluate policy, it is important to look at the complete policy package, accounting for both conventional and unconventional policy easing. In fact, monetary policy can continue to engage in unconventional policy easing even without changing very short-term interest rates near the zero bound. The room for conventional easing may be limited but the ammunition for unconventional policy easing is unlimited. A more legitimate concern is that we have much less experience with unconventional policy-easing measures and face greater uncertainty in calibrating their impact. But this uncertainty is only a matter of degree. Policymakers also face considerable dynamic multiplier uncertainty with respect to conventional policy changes.

One of the lessons that can be drawn from the experience with near-zero interest rates over the past year or so is that, when needed, unconventional monetary policy measures can be effectively deployed to engineer additional easing to prevent deflation. With this in mind, I see absolutely no reason to tolerate corrosive higher inflation in order to reduce the probability that policy rates may occasionally have to be very close to zero.

3 THE STRATEGY OF MONETARY POLICY

There are a number of areas of broad consensus regarding what constitutes good monetary policy practice. Two such elements are common to the monetary policy strategy of numerous central banks around the world today, including the ECB. The first is the usefulness of a clear definition of the central bank's price stability objective, as discussed in the previous section. The second is a forward-looking policy orientation and the associated monitoring of economic projections and,

in particular, close attention to inflation forecasts and inflation expectations. Since long and variable lags are an inherent feature of monetary policy, a forward-looking approach is a necessary part of policy stategy.

Monitoring short-term inflation expectations is valuable because expectations are important determinants of actual price- and wage-setting behaviour and thus actual inflation over time. Monitoring the stability of inflation expectations is also important to gauge the extent to which a central bank can respond to real economic disturbances without compromising its price stability mandate. When private inflation expectations become unmoored from the central bank's objectives, macroeconomic stabilisation can be considerably harder to achieve. Well-anchored inflation expectations facilitate the monetary policy response to adverse supply shocks, thereby enabling central banks to better stabilise economic fluctuations. Indeed, one lesson from the crisis is the confirmation of this stabilising role of well-anchored inflation expectations when the economy is under stress.

There is less agreement, however, about a third aspect of monetary policy strategy. This aspect concerns the degree of policy activism that should be employed as a central bank seeks to dampen economic fluctuations and address perceived disequilibria. We may distinguish between two alternative views: the activist view and the stability-oriented view. The activist view suggests that, in addition to price stability, an equally important goal of monetary policy is to guide the economy towards attainment of its ideal "potential" level of activity. That is, an important guide to policy is the "output gap", which measures how far GDP deviates from its potential. In contrast to the activist view, the stability-oriented approach could be characterised as attempting to dampen economic fluctuations by promoting stable economic growth over time, subject to a primary focus on maintaining price stability. The stability-oriented view more closely describes the monetary policy strategy of the ECB than the activist view. A perennial debate in monetary economics has raged over how activist policy should be in terms of closing output gaps. In the next two sections, I review in greater detail some lessons that can be drawn from the experience of the ECB regarding these two approaches.

4 MONETARY POLICY ACTIVISM

The activist view is motivated by the fact that the academic literature sometimes poses the monetary policy problem as the solution to a maximisation problem with not one but two main objectives: getting inflation as close to its assumed target, consistent with price stability, and getting real economic activity close to its ideal "potential" level, defined as the equilibrium or natural level of output that is consistent with price stability.[6]

6 Equivalent definitions may also be expressed in terms of the natural rate of employment and unemployment and are robust to alternative models of the process of inflation determination, as explained by Modigliani and Papademos (1975) in the discussion that defined the NIRU (non-inflationary rate of unemployment) concept.

Let p and q denote (the logarithms of) the price level and real output, respectively, and define the rate of inflation $\pi \equiv \Delta p$. Then, using "stars" to mark the ideal target values of respective variables, we can use π^* to denote the numerical definition of price stability and q^* to denote the level of potential GDP.

The activist approach to monetary policy imparts greater symmetry on closing the inflation gap $(\pi - \pi^*)$ and the output gap $(q - q^*)$ than alternative approaches. Thus, to the extent that this is feasible, activist policies prescribe that monetary policy should not only focus on achieving its price stability objective (that is, closing the inflation gap) but also on closing the output gap. A constraining factor to achieving both results is presented in the form of a Phillips curve. A policy tightening can, by opening a negative gap, lead to dampening inflation pressures and vice versa.

There are two types of activist policies: those that rely on a simple activist policy rule and those that claim broader optimality properties. The latter can be seen as attempting to devise a policy plan that balances the inflation and output gaps in the outlook, accounting as precisely as possible for model dynamics.[7,8] The alternative approach, that is, relying on an activist monetary policy rule to achieve an approximate balance, is simpler. A common reference to the latter approach is the Taylor (1993) rule:

$$i = r^* + \pi + \theta_\pi(\pi - \pi^*) + \theta_q(q - q^*) \qquad (1)$$

where i is the policy rate and r^* the natural or equilibrium rate of interest.[9]

Either approach to activism potentially suffers from a crucial practical pitfall: the need of accurate measurements of the level of potential output to measure the output gap, $(q - q^*)$. Output gaps are notoriously difficult to construct in real time, and without reliable estimates these activist approaches can run into problems.[10]

Next, I review some illustrative evidence regarding the potential usefulness of the activist approach drawing on the recent experience of the ECB. However, since

7 The so-called flexible inflation-targeting approach to monetary policy is sometimes presented in this manner by some authors. See, among others, Svensson (2002) and McCallum and Nelson (2005).

8 The intellectual underpinnings of the approach relate to the optimal control approach to monetary policy that was developed in the 1970s. This was an active area of research to which Lucas Papademos, starting with his Ph.D. thesis, contributed considerably (Athans et al (1977), Papademos (1977, 1981), Modigliani and Papademos (1976, 1978)).

9 Taylor (1999), Orphanides (2003b) and Taylor and Williams (2010) review the development and rationale for this and related simple monetary policy rules. The specification of such simple rules for a central bank's policy rate abstracts from the zero-lower-bound problem. As mentioned earlier, unconventional policy measures come into play when short-term rates approach zero.

10 This is not the only difficulty. Another related problem is associated with the need of reliable estimates of the natural rate of interest. For expositional ease, I focus on the output gap issue here, which I consider to be more critical in practice. See e.g. Clark and Kozicki (2005), Laubach and Williams (2003), Orphanides and Williams (2002) and Orphanides and van Norden (2002) for additional discussions of these measurement issues.

the ECB's policy cannot be characterised by this approach and the ECB does not even publish estimates of the output gap for the euro area, this illustrative evidence must be based on other sources.

In what follows, I rely on the pertinent analysis presented by the International Monetary Fund (IMF) in its World Economic Outlook (WEO) publications. The WEO is useful for two reasons: First, it presents the necessary data and analysis either in the publication or in the associated electronic databases. And second, in the years examined, the policy recommendations appear to have been influenced by readings of the output gap and, in this sense, they have had an activist bent.

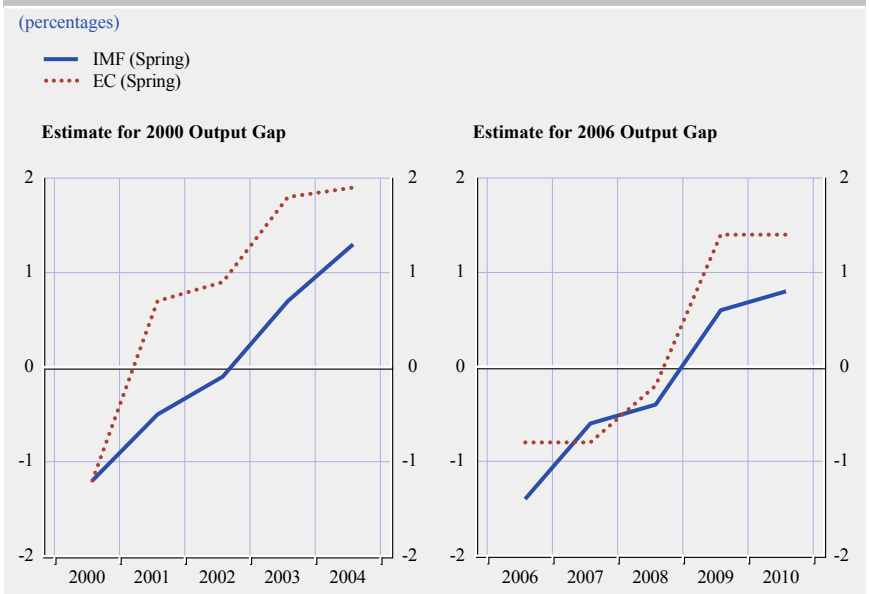
Two specific episodes, when the ECB was concerned about inflation and was in a policy tightening mode, present interesting case studies. They correspond to the Spring 2000 WEO and the Spring 2006 WEO. On both occasions, the economy was growing at a brisk pace, but, according to the IMF analysis at the time, had not reached its potential. These are occasions when the differences between the activist and stability-oriented approaches become easier to isolate.

In the Spring of 2000 WEO, the IMF analysis suggested that the euro area suffered from a significant output gap that was projected to persist into 2001. (The forecasts suggested an output gap equal to -1.2 percent for 2000 and -0.5 percent for 2001.) This was a factor in the assessment that inflation prospects appeared benign and a policy recommendation that the ECB should hold back on a rapid tightening. Specifically, the IMF noted:

> "Higher energy prices will temporarily affect headline inflation in the short term, but inflationary pressures should remain subdued due to the large output gap (projected at about 1 1/4 percent in 2000) and increased competitive pressures caused by the deregulation and restructuring across the area. While the ECB needs to maintain a strong anti-inflationary stance, and a gradual shift to a less accommodative stance is to be expected as slack is absorbed, inflation prospects remain benign and it is important currently to avoid holding back the ongoing recovery through a rapid tightening of policy" (IMF, 2000, p. 18).

A similar analysis is present in the Spring 2006 WEO, and brings us closer to the crisis. Again, the IMF projected a significant (negative) output gap for 2006 that was seen as persisting into 2007. Specifically, the forecasts suggested a euro area output gap equal to -1.4 percent for 2006 and -1.3 percent for 2007. Indeed, the significant negative output gap on this occasion was seen as a global phenomenon. Drawing on these estimates, the Spring WEO noted: "Quiescent inflation, partly because of a significant global output gap, allowed monetary policy to be very accommodative. Now as the global output gap narrows, monetary accommodation is being withdrawn" (IMF, 2006, p. xii). The IMF went on to suggest that the ECB should hold back on its policy tightening: "[W]ith underlying inflationary pressures contained and domestic demand still fragile, there appears to be no need to rush to normalize rates" (IMF, 2006, p. 25-26).

Chart 3 Evolution of Output Gap Estimates: Two Examples



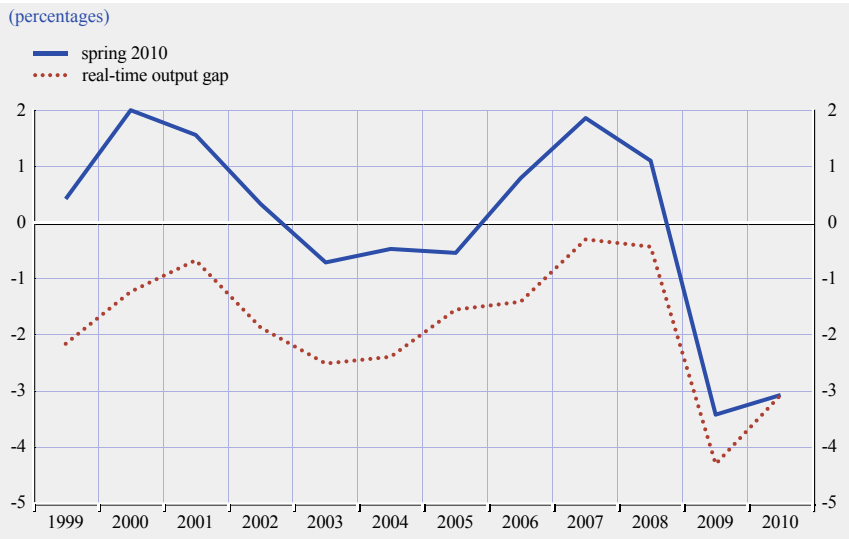
Notes: Evolution of IMF and European Commission (EC) estimates of the output gap for year 2000 (left panel) and year 2006 (right panel). IMF estimates are from the Spring WEO of each year. EC estimates are from the Spring forecast of each year, except for 2001 when only the Autumn estimate is available.

On both of these occasions, the ECB emphasised the risks to inflation and continued its tightening. In retrospect, this proved to have been the right call. Retrospective analysis using the IMF's subsequent estimates of the output gap can be read as confirmation of the ECB's policy. How is this so? Simply, the large real-time negative output gap readings for these two years were subsequently revised away, and eventually became positive estimates of the output gap. The annual evolution of the estimates for the output gap for 2000, from Spring 2000 to Spring 2004, and that for the output gap for 2006, from Spring 2006 to Spring 2010, are shown in Chart 3. As can be seen, on both occasions, the real-time estimate proved to be of the wrong sign and was revised by more than 2 percentage points over the subsequent four years. Such revisions are not specific to the IMF estimates of the output gap. The pattern of revisions is rather typical of other estimates as well. For comparison, the Chart shows the evolution of corresponding estimates of the output gap prepared by the European Commission (EC) each Spring.[11]

How much does this matter for policy? To get a sense, recall that Taylor (1999) suggested considering two values for the output-gap response coefficient in rule (1), θ_q =1/2 (the classic rule), and θ_q = 1 (the more activist revised rule). Thus, a 2 percentage point revision in the output gap corresponds to differences 100

11 These are typically produced one month after the IMF estimates. The 2001 estimate of the 2000 gap in the chart is from the Autumn 2001 forecast, as it is missing in the Spring forecast of that year.

Chart 4 Real-time vs Retrospective Output Gap Estimates



Notes: The Spring 2010 series shows the historical output gap estimates from the latest IMF WEO (Spring 2010). The real-time series shows, in each year, the output gap estimate from the IMF Spring WEO of that year.

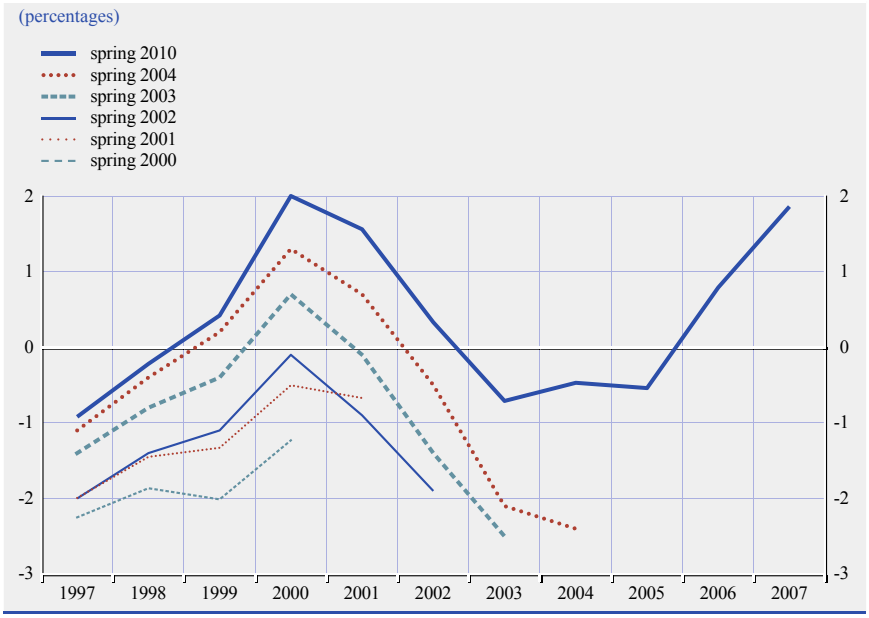
basis points difference in the classic rule and 200 basis points in the revised rule. Considering the size of typical policy changes, these are remarkably large.

Chart 4 plots the time series of real-time estimates of the output gap from each Spring WEO against the latest vintage (Spring 2010). Note also that the real-time estimates appear to be systematically biased downward. Since the birth of the euro, the real-time estimate of the euro area output gap in the Spring WEO has been negative every single year. Looking at the first ten years of this sample (1999 - 2008), on seven of ten occasions, the sign of the 2010 estimate of potential output is the reverse of the sign of the real-time estimate.[12] The average bias for the first ten years is quite large, around 2.1 percentage points. The pattern of revisions is consistent with a gradual downward update of the rate of growth of potential GDP, which characterises various estimates over the past decade.

One reason for the pronounced difference between the real-time and the recent estimates of the output gap is the dramatic revisions in prospects regarding potential GDP, partly as a result of the recent crisis. Chart 5 traces successive vintages of the output gap, starting with Spring 2000 to show how large the revisions were in the early years of the euro area. Chart 6 plots the successive vintages of the output gap from 2006 to the present. As can be seen, these estimates vary rather little for the early part of the sample shown but are drastically different for the past few years. The crisis has forced a reevaluation of the euro area's productive capacity, as it has elsewhere in the world. According to the Spring 2010 IMF analysis, the output gap of all advanced economies

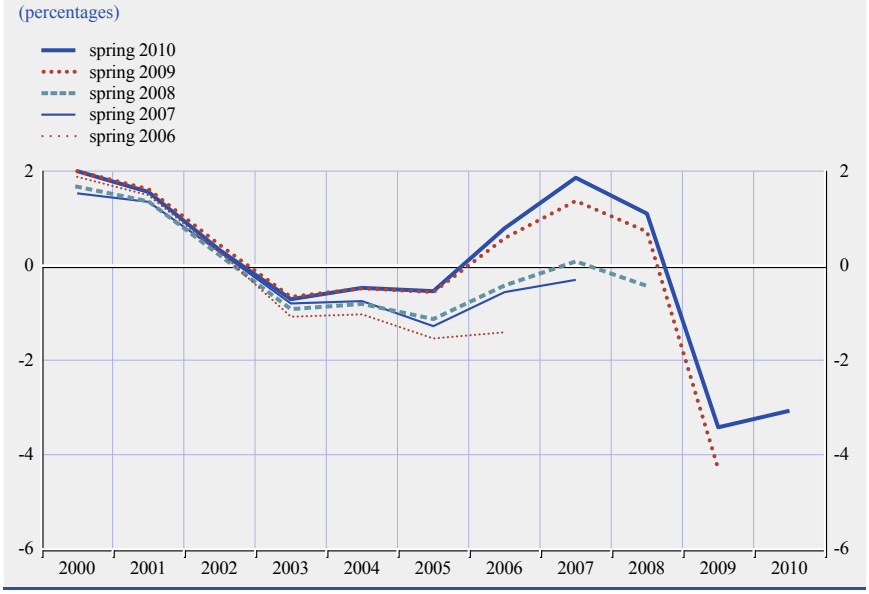
12 Random selection would have suggested that five out of ten times the sign should be expected to be correct.

Chart 5 Evolution of History of the Output Gap from 2000 on



Notes: Each line shows IMF output gap estimates from the corresponding Spring WEO.

Chart 6 Evolution of History of the Output Gap from 2006 on



Note: Each line shows IMF output gap estimates from the corresponding Spring WEO.

for 2006 and 2007 is now estimated to have been large and positive (+0.9 and +1.5 percent, respectively) and not significantly negative as was projected in 2006 (-0.6 and -0.5 percent, respectively).

Thus, the crisis has reconfirmed the lesson that activist monetary policy cannot work, simply because of our inability to possess reliable estimates of the output gap in real time. All in all, the size of revisions in estimates of the output gap for the euro area, as shown in the IMF analysis, suggests that the ECB is correct to eschew the activist approach to policy. This lesson against activism in monetary policy is not new. It is just a reconfirmation of earlier similar experiences, for example the disastrous experience of the Federal Reserve during the 1970s, when warnings against the activist approach were not heeded.[13]

5 THE STABILITY-ORIENTED VIEW AND ROBUST SIMPLE RULES

It is not necessary to rely on activist guidelines to formulate effective monetary policy. The alternative, stability-oriented approach appears less ambitious. Its relative strength is in consistently preserving price stability, stressing robustness over optimality. As an illustration, in this section I provide an example of a simple policy rule along these lines that I have found useful to monitor, among other things, over the past several years.[14]

The policy rule is a simple difference rule that can be thought of as providing prescriptions for quarterly changes of the policy rate based on the evolution of inflation and real GDP growth:

$$\Delta i = \theta_{\pi}(\pi - \pi^*) + \theta_{\Delta q}(\Delta q - \Delta q^*). \qquad (2)$$

Rules of this type have been extensively investigated in quantitative evaluations and have been found to be robust to various sources of misspecification and to the possibility (in reality the certainty) of imperfect knowledge on the part of policymakers and of businesses and households in the model economies.[15]

The intellectual underpinnings of this rule connect with the writings of Knut Wicksell at the end of the 19th century and those of Milton Friedman in the middle of the 20th century, as well as numerous other authors. The common thread is the desire to find a simple monetary policy guide that can lead to reasonably robust policy without requiring precise information about theoretical concepts such as the various "natural rates" (e.g. the definition of full employment or potential output, or the equilibrium real interest rate) that cannot be reliably observed or measured when policy is set. Estimates of output gaps are not needed for guiding policy in this approach, only a sense of the economy's trend growth, which is subject to considerably less uncertainty.

13 See e.g. Orphanides (2003a) and Orphanides and Williams (2005, 2010).
14 This is based on a similar illustration I originally presented at *The ECB and Its Watchers VIII conference* in May 2006.
15 See e.g. Orphanides and Williams (2002, 2008) and the references cited therein.

The link to Friedman comes from the idea that a robust rule for ensuring long-term monetary stability is for the central bank to maintain a constant rate of growth of the money supply – Milton Friedman's k-percent rule. This is an example of a policy rule that does not require knowledge of either the natural rate of output or the natural rate of interest, but with a money instrument (Friedman, 1960). The Friedman rule draws on the equation of exchange that can be expressed in growth rates (approximated with log-differences) as follows:

$$\Delta m + \Delta v = \pi + \Delta q \tag{3}$$

where m and v are (the logarithms of) the money stock and its velocity, respectively. Selecting the constant growth of money, k, to correspond to the sum of a desired inflation target, π^*, and the economy's potential growth rate, Δq^*, and adjusting for any secular trend in the velocity of money, Δv^*, suggests a simple rule that can achieve, on average, the desired inflation target, π^*:

$$\Delta m = \pi^* + \Delta q^* - \Delta v \tag{4}$$

Further, if the velocity of money were fairly stable, this simple rule would also yield a high degree of economic stability. Unpredictable fluctuations in the equilibrium velocity of money that may take time to ascertain and operational difficulties in controlling the money supply in the short run for all but the most narrow monetary aggregates, however, do not speak well for relying on the money supply as the main instrument for monetary policy. While monetary aggregates can serve to cross-check the stance of monetary policy, especially with regard to medium-to-long term risks to inflation, short-term nominal interest rates are usually more suitable to serve as day-to-day policy instruments.

The simple interest rate rule (2) may be seen as relating to Friedman's k-percent rule described above. To see the relationship between rule (2) and money growth targeting, substitute the money growth in rule (4) into the equation of exchange so that the rule can be stated in terms of the velocity of money:

$$\Delta v - \Delta v^* = (\pi - \pi^*) + (\Delta q - \Delta q^*). \tag{5}$$

Consider now the simplest formulation of money demand as a (log-) linear relationship between velocity deviations from its equilibrium and the rate of interest. In difference form this is

$$\Delta v - \Delta v^* = a\Delta i + \mathrm{e}, \tag{6}$$

where $a > 0$ and e summarises short-run money demand dynamics and temporary velocity disturbances. To reformulate the k-percent money growth rule in terms of an interest rate rule, while avoiding the short-run velocity fluctuations, e, one may substitute the remaining part of (6) into (5). This yields rule (2) for some $\theta = \theta_{\pi} = \theta_{\Delta q} > 0$.

The link to Wicksell derives from his work on interest and prices, where he argued that price stability could be maintained in an economy if the market

interest rate were always equal to the economy's natural rate of interest, r^*. Wicksell examined how the central bank might adjust the rate of interest to achieve price stability. Recognising that the natural rate of interest is unavoidably an abstract concept, however, Wicksell did not advise that the central bank first take a stand on what the natural rate is in order to formulate policy: "This does not mean that the bank ought actually to *ascertain* the natural rate before fixing their own rates of interest. That would, of course, be impracticable, and would also be quite unnecessary" (Wicksell, 1898 [1936], p. 189, emphasis in the original). Rather, Wicksell pointed out that a simple method for a central bank to maintain approximate price stability would be to follow a simple prescription adjusting its interest rate in a systematic manner to developments in prices: "If prices rise, the rate of interest is to be raised; and if prices fall, the rate of interest is to be lowered; and the rate of interest is henceforth to be maintained at its new level until a further movement in prices calls for a further change in one direction or the other" (p. 189). In algebraic terms, Wicksell's proposal can be interpreted as rule (2), but ignoring the response of interest rates to the difference between the economy's growth from its potential, that is, $\theta_\pi > 0$ and $\theta_{\Delta q} = 0$.

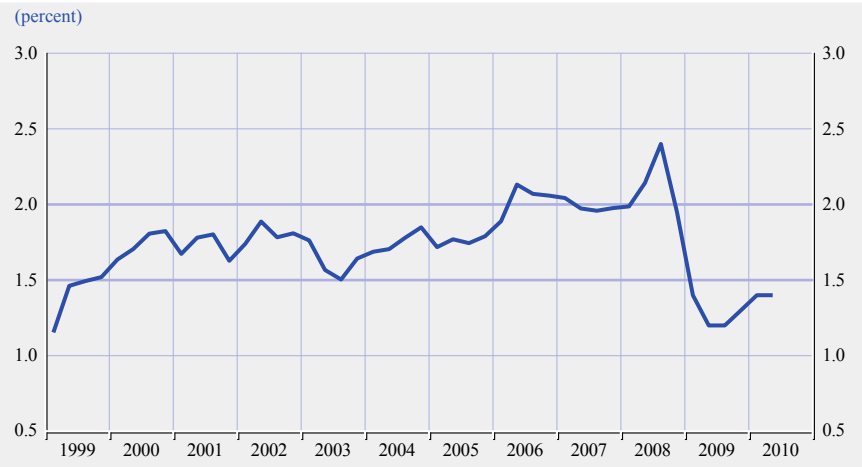
Implementation of rule (2) at a quarterly frequency requires summary indicators of the quarterly evolution of inflation and output growth, an assessment of trend or potential output growth and, of course, a numerical definition of price stability, π^*. Implementation also requires the rule coefficients which are set to $\theta_\pi = \theta_{\Delta q} = 0.5$ for this illustration.

Since monetary policy is forward looking, near-term forecasts are more useful summary indicators of inflation and output for guiding policy. For the illustration presented here, I therefore rely on the ECB's SPF. Specifically, I employ the average of the survey responses regarding year-on-year forecasts for inflation and output growth with horizons ending about one year ahead from the data available when the survey is conducted. These "year-ahead" forecasts have approximately the same horizon from quarter to quarter.

Chart 7 shows the one-year ahead inflation forecast from the SPF together with two numerical guides for the definition of price stability to be used in the rule: an upper guide of 2 percent and a lower guide of 1.5 percent. Comparing the inflation forecast with the corresponding guide, therefore, indicates whether the rule prescribes that the policy rate should be raised or lowered on account of the near-term inflation outlook.

Chart 8 shows the one-year ahead GDP growth forecasts from the SPF together with two alternative indicators of what trend or potential GDP growth is. One indicator is from the survey itself, the average response to a question asking what GDP growth is expected to be five years ahead. Because cyclical dynamics are expected to dissipate in a few years, this long-term forecast provides information about what the respondents view as the long-term growth potential of the economy. The second indicator is a rough real-time estimate of potential GDP growth based on the analysis presented in the IMF's WEO. In each year, the chart plots the potential GDP growth estimate for that year as reflected in the Spring WEO. The same estimate from the Spring WEO is plotted for all four

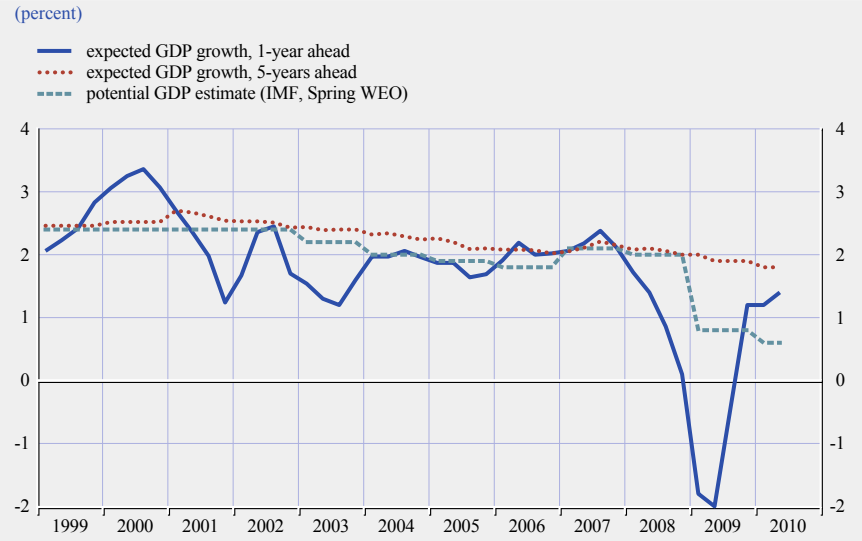
Chart 7 Outlook for Inflation



Notes: Expected inflation, one year ahead, is the average response in the ECB SPF.

quarters of the year. As can be seen, the WEO estimates are generally close to the five-year ahead SPF forecast. A substantial difference appears for 2009 and 2010, however. The WEO estimates reflect an unusually large drop in potential GDP growth, not seen in the SPF forecast. According to the WEO analysis, however, this drop is expected to be temporary: thus, the implied five-year ahead forecast of potential output growth would be much closer to the corresponding SPF forecast shown in the chart (IMF, 2009). The comparison of the GDP forecast with its underlying estimated trend indicates whether the economy is expanding

Chart 8 Outlook for GDP Growth



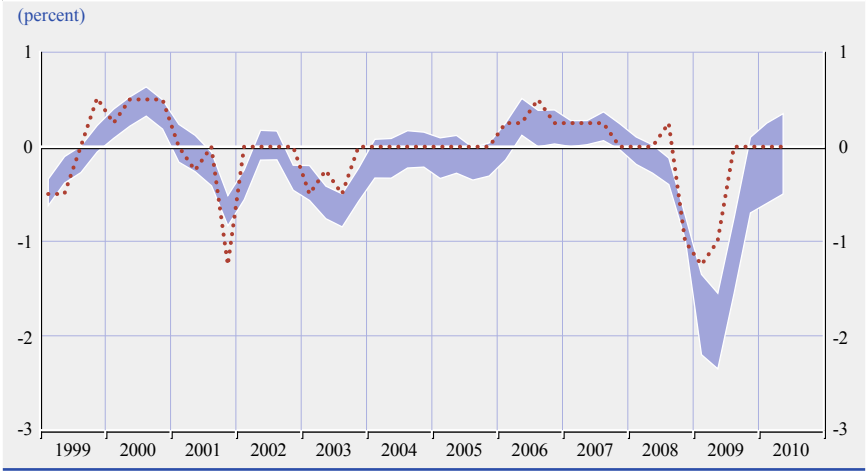
Notes: Expected growth one year ahead and five years ahead are the average responses in the ECB SPF. Potential output growth in each year reflects the real-time estimate from that year's IMF Spring WEO.

faster or slower than its normal limit in the near term, and therefore signals whether the rule prescribes that the policy rate should be raised or lowered on account of the near-term inflation outlook.

The combination of two alternative estimates for trend GDP and the upper and lower guide for the definition of price stability results in four different values for the quarterly change in the policy rate suggested by the rule. Chart 9 compares the resulting envelope of rule prescriptions (the shaded area in the chart) with the actual quarterly change in the ECB policy rate (more precisely, the rate on the main refinancing operations, MRO). For actual policy, in each quarter I use the MRO rate following the policy meeting of the second month of the quarter. This provides the closest match to the timetable of the SPF. As already noted, the survey is conducted towards the end of the first month in every quarter and the results are available to the Governing Council at the policy meeting of the second month. Chart 10 shows the prescriptions for the level of the policy rate that emerge from applying the prescribed quarterly changes to the level of the policy rate a quarter earlier.

As can be seen in the charts, the contours of the policy prescriptions from this simple robust rule line up reasonably well with the actual policy decisions taken by the Governing Council of the ECB. In that sense, this rule is also descriptive of ECB policy. However, several complications should be kept in mind in treating the resulting illustration as an exercise in description. These complications would imply that the rule implemented as described above may suggest distorted policy prescriptions. The complications arise from the fact that the inputs to the rule may not coincide with either the ECB/Eurosystem staff analysis or the Governing Council's views. Thus, the rule prescriptions would be tighter than indicated if,

Chart 9 Policy Rate and Simple Rule Prescription: Quarterly Change



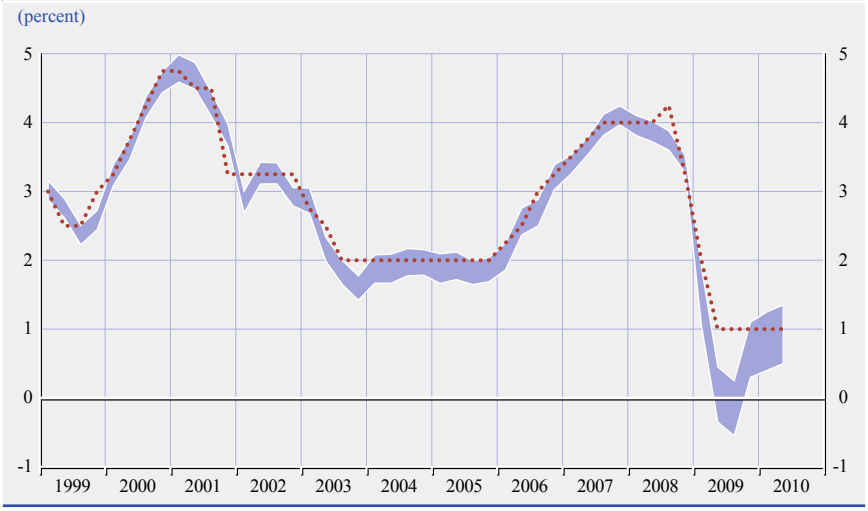
Notes: The shaded area represents the envelope of prescriptions from the simple policy rule: $\Delta i = \frac{1}{2}(\pi - \pi^*) + \frac{1}{2}(\Delta q - \Delta q^*)$. $(\pi - \pi^*)$ reflects the deviations in the SPF one-year ahead inflation forecasts from either of two bounds as shown in Chart 7. $(\Delta q - \Delta q^*)$ reflects the deviations in the SPF one-year ahead GDP growth forecasts from either of two trend measures as shown in Chart 8. The dotted line shows the quarterly change in the ECB policy rate (MRO) following the policy meeting of the 2nd month in each quarter.

for example: (i) the inflation forecast were higher, (ii) the output growth forecast were stronger, or (iii) the potential output growth were more pessimistic than assumed in the exercise.

Even if a simple rule such as the one shown captured actual policy decisions reasonably well most of the time, deviations would be expected, reflecting factors that may importantly influence policy on some occasions but are not captured by the simple rule. Two such noteworthy deviations in the period since the financial turbulence began can be seen in Charts 9 and 10.

The first deviation concerns the policy rate increase in 2008Q3, reflecting the tightening on 3 July 2008. According to the rule prescriptions, the evidence that the economy was weakening would have argued against the tightening during that summer. An important consideration at the time was a serious concern that inflation expectations risked becoming unmoored, a concern not adequately reflected in the summary indicator reflecting the near-term deterioration in the inflation outlook. In the summer of 2008, the euro area, together with other parts of the world, experienced an inflation scare. This was toward the tail end of a long spell of increases in energy and commodity prices. For many months, despite some signs of weakness in the economy and despite continuing tensions in financial markets, there were successive deteriorations in the outlook for headline inflation. Signs of the emerging inflation scare appeared in financial market indicators and also in survey expectations. For example, as seen in Chart 2, the ECB's SPF showed a shift in the distribution of forecasters'

Chart 10 Policy Rate and Simple Rule Prescription



Notes: The shaded area represents the envelope of prescriptions from the simple policy rule, $\Delta i = \frac{1}{2}(\pi - \pi^*) + \frac{1}{2}(\Delta q - \Delta q^*)$, that emerge from applying the prescribed change to the level of the policy rate a quarter earlier. $(\pi - \pi^*)$ reflects the deviations in the SPF one-year ahead inflation forecasts from either of two bounds as shown in Chart 7. $(\Delta q - \Delta q^*)$ reflects the deviations in the SPF one-year ahead GDP growth forecasts from either of two trend measures as shown in Chart 8. The dotted line shows the ECB policy rate (MRO) following the policy meeting of the 2nd month in each quarter.

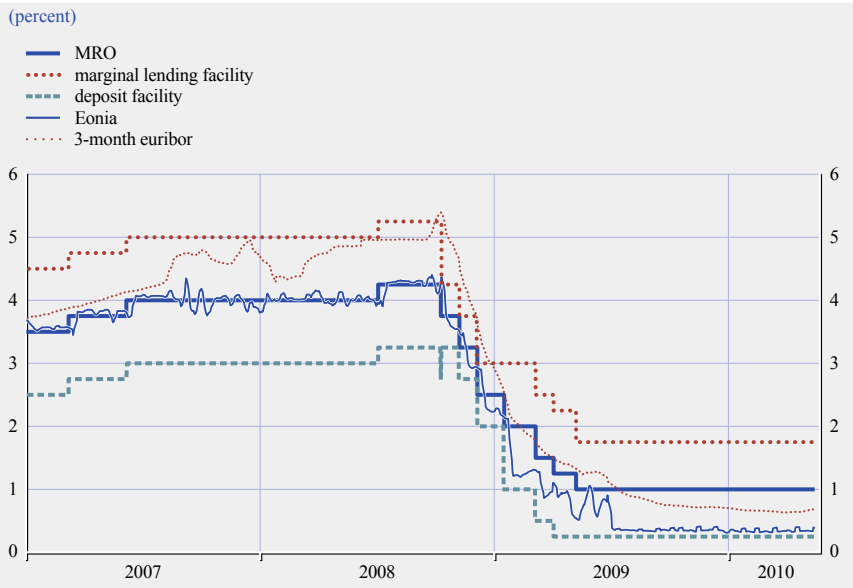
responses regarding their expectation of inflation five years ahead. As seen in the Chart, the survey that was published in August 2008 was the only one in the history of the survey where more than a quarter of the respondents thought inflation five years ahead would exceed 2 percent. The mean of the forecasts, also shown, was the highest recorded in the history of the survey and slightly exceeded 2 percent (although the reading still rounded to 2.0). This was also the only occasion in the history of the survey when forecasts for the calendar year after next and two years ahead exceeded 2 percent. (They both registered 2.1 percent.)

In the Introductory Statement released after the meeting, the Governing Council stressed that: "Against this background, it is imperative to ensure that medium to longer-term inflation expectations remain firmly anchored at levels in line with price stability" (ECB, 2008). On this occasion, ensuring that long-term inflation expectations remained well anchored proved to be a decisive factor.

Another deviation from the policy rule is evident during 2009. According to the policy rule prescriptions shown in Chart 10, additional policy easing (reflected in the reduction of the ECB policy rate on main refinancing operations) would have been suggested by the simple policy rule. The lower bound of the range even suggests that, according to the rule, the policy rate would have been set to a negative number for a couple of quarters, if that were possible. This episode, of course, involves near-zero short-term nominal interest rates. As already noted, under these circumstances, the stance of monetary policy cannot be adequately represented by the conventional policy changes embedded in short-term interest rates alone. On this occasion, faced with the zero nominal interest rate bound, the Governing Council supplemented its conventional policy easing that brought the main policy rate (MRO) to the historically low 1 percent level with unconventional policy measures, including liquidity provision at longer maturities and the purchases of assets for monetary policy purposes. Some of these measures were unprecedented in scale and scope. Indicatively, I mention the decision to offer unlimited liquidity for one year at the rate of 1 percent, upon presentation of adequate collateral, which resulted in the unprecedented liquidity injection of 442 billion euro in June 2009. The decisive unconventional policy measures adopted in the first half of 2009 drove overnight interest rates considerably below the policy rate and also influenced other interest rates and asset prices. A comparison of the behaviour of overnight interest rates (eonia) as well as the three-month interbank rate (euribor) compared to the policy rate (MRO) illustrates the point. As seen in Chart 11, for example, since the Spring of 2009, the three-month euribor has been trading consistently substantially below the policy rate, whereas under normal circumstances it should exceed it.

This analysis suggests that the simple rule illustrated above can be seen as an informative proxy of the ECB's economic analysis, aiming at assessing the role of short-run forecasts of inflation and economic activity on policy. In this sense, it may form a useful element in policy discussions. However, it should not be misinterpreted as coming close to providing the full range of considerations pertinent to any policy decisions. It should be recalled, for example, that the ECB's two-pillar approach to policy cross-checks economic analysis with

Chart 11 Money Market and ECB Policy Interest Rates



Note: Eonia is the 5-day trailing moving average.

the monetary analysis that focuses on a longer-term horizon. This two-pillar approach is designed to ensure that no relevant information is lost in the assessment of the risks to price stability and that appropriate attention is paid to different perspectives in order to come to an overall judgement on the risks to price stability.[16]

6 ACTIVISM AND ASSET PRICES

Another area of continuing debate regarding the monetary policy strategy concerns the treatment of suspected asset price misalignments. In light of the large costs of the recent financial crisis, the origins of which could be related to such a misalignment, a re-assessment of the role of central banks in promoting financial stability is certainly in order. But how activist should monetary policy be in order to counter suspected asset price misalignments?

Broadly speaking, there are two main strategies for dealing with financial imbalances and suspected asset price bubbles. The conventional, non-activist strategy advocates that a central bank should focus its attention on the total risks to the outlook of inflation and real economic activity in evaluating policy alternatives.[17] Interest rate policy adjustments should only react to suspected asset price misalignments to the extent that changes in asset prices might affect

16 See Beck and Wieland (2007, 2008) for a formalisation of this cross-checking.
17 Bernanke (2002), Greenspan (2010), Kohn (2006, 2009) and Posen (2009), among others, have argued in favour of this approach.

prospective output and inflation prospects over the pertinent horizon. Thus, if a suspected bubble translates into ebullience in consumption and investment decisions, a policy tightening responding to the demand imbalance would be in order. And if a suspected bubble bursts, thus dampening aggregate demand, a monetary loosening would reduce the possible damage – the so-called mop-up approach to treating financial bubbles.

The alternative, more activist approach to responding to suspected asset price misalignments suggests that monetary policy should "lean against the wind" of emerging financial imbalances over and above the implicit policy reaction suggested by the effect of the suspected asset price developments on the evaluation of the risks to the outlook for inflation and real economic activity.[18] This approach calls for "extra action" to be taken on account of asset price movements (Kohn, 2006). The suggested rationale is that tempering emerging financial imbalances while they are developing can reduce the probability of costly financial instability in the future.

There are a number of practical concerns that bring into question the appropriateness of this activist approach. Even if the presence of a bubble is ascertained, one concern regards the difficulty in calibrating the size of an "appropriate" interest rate response. Another concern regards the appropriate direction and timing of an activist monetary response to suspected asset price misalignments. Should policy tighten to arrest a brewing bubble or ease in anticipation of its crash? The most obvious concern, however, is that suspected asset price misalignments cannot be identified with enough accuracy in real time. Early identification is intrinsically difficult as it presupposes the ability to determine the fundamental value of assets when market forces fail to do so. This problem is fundamentally similar to the difficulty in assessing real-time estimates of the output gap for stabilisation policy. Only here the difficulty is far greater. Policymakers are asked to take a definitive position questioning the collective wisdom reflected in market valuations.

The non-activist approach need not mean that suspected asset price misalignments are ignored in setting interest rates, however, and if the risk evaluation framework is sufficiently encompassing, it may nest the concerns of the proponents of the activist view. In particular, to the extent that a misalignment is detected, and concerns regarding the possibility of a financial collapse emerge, these concerns can and should be mapped into the risk analysis concerning the outlook of the economy. An asset boom stokes inflationary dynamics. And an asset price collapse can create the risk of a deflationary dynamic in the economy. These undesirable outcomes that are associated with asset price booms and busts can be accounted for as part of the overall risk analysis for monetary policy, provided the horizon for the analysis is sufficiently long. Indeed, as Papademos (2009c) points out, because asset price booms are often associated with robust money and credit expansion, accounting for the longer-term risks reflected in the ECB's monetary analysis provides an appropriate framework for incorporating

18 Borio and Lowe (2002), Borio and White (2003), Cecchetti et al (2002) and White (2006), among others, have argued in favour of this approach.

the pertinent information in formulating policy. Closely monitoring money and credit can alert policymakers to the potential for financing unsustainable runs in asset prices in the medium to long run. An advantage of the ECB monetary policy strategy in using information from the monetary analysis pillar in this manner, is that it can account for the risks from potential misalignments in an integrated risk management approach, without the need to take a definitive position on identifying asset price misalignments (Issing, 2009a,b).

The pertinent trade-off may be viewed as one regarding a comparison of the risks to price stability over shorter horizons against tail risks at longer horizons. If an adjustment in interest rates can reduce the tail risks to price stability associated with a suspected price misalignment at a more distant horizon, without significantly raising risks of deviating from price stability over nearer horizons, such an adjustment would seem warranted. That said, the interest rate does not seem to be the most appropriate instrument for minimising the tail risks associated with a possible asset market collapse at distant horizons. Interest rates have always been and remain too blunt a tool for this purpose.

Enhancing financial stability is certainly a worthwhile goal. The great financial crisis has provided a reminder of the value of longer-term risk analysis, such as reflected in the ECB's monetary analysis pillar. But it has not provided concrete additional evidence that monetary policymakers should use their interest rate policy instrument to respond to emerging financial imbalances over and above what could be justified by a thorough analysis of the risks to price stability. Rather, regulatory tools should be brought to bear in order to minimise the risks associated with suspected asset price misalignment. Which brings us to the question regarding central bank involvement in regulation and supervision.

7 IS PRICE STABILITY ENOUGH?

The crisis has confirmed that a central bank with a price stability objective and insufficient regulatory powers cannot ensure broader financial stability in the economy. The question is broader than that regarding the treatment of asset price misalignments and extends to other suspected imbalances in the economy such as overextended households and businesses, high levels of private and public debt, persistent current account deficits, highly leveraged positions in finance, etc.

The crisis has revealed a general underappreciation of systemic risks in micro-prudential supervision, and highlighted the need for a more system-wide macro-prudential approach towards supervisory oversight to ensure overall stability in the financial system. By definition, micro-prudential supervisors focus on individual institutions and cannot effectively assess the broader macroeconomic risks that pose a threat to the financial system as a whole. This is a task best suited to central banks.

However, for central banks to better enhance financial stability they must be provided with the right tools. In general, a central bank does not face a trade-off between price stability and financial stability. Rather, most of the time these two

goals tend to reinforce each other. But there may be occasions when interest rate policy directed at preserving price stability is clearly insufficient to reduce risks to financial stability. Consider, for example, an episode of persistently high credit growth in an environment of price stability. Adjusting the interest rate tool is unlikely to be the most appropriate response. Ideally, under such circumstances, the central bank should have at its disposal macro-prudential levers with which to contain the risk of a potential financial disturbance. These could comprise the power to vary capital requirements, leverage ratios, loan-to-value ratios, margin requirements and so forth.

This highlights the importance of ongoing efforts to strengthen the macro-prudential supervision role of central banks (de Larosiére, 2009). Macro-prudential policies could aim to contain the build up of financial imbalances and ensure that the financial system is sufficiently resilient to withstand a disorderly unwinding (Papademos, 2009d).

The task of the central bank in its role as macro-prudential supervisor is to identify and assess risks and, if needed, to issue warnings and recommendations for remedial action. An issue that remains open, however, is the degree of effectiveness of such warnings and recommendations in the absence of an appropriate enforcement mechanism for heeding such warnings. Can macro-prudential supervision succeed in preventing the accumulation of large imbalances without the tools of enforcement? Can the macro-prudential recommendations issued by a central bank be enforced without the intimate involvement of the central bank in regulation and supervision pertaining to credit and finance?

Prior to the crisis, there was a tendency to separate monetary policy from supervision and regulation, though both could be viewed as central banking functions. Although, in numerous jurisdictions, the functions of bank supervision and regulation have traditionally been the responsibility of the central bank, in some cases these functions were separated from the core monetary policy function of the central bank. A lesson from the crisis is that this trend should be reversed. Indeed, some jurisdictions have already moved in that direction.

The crisis has revealed not only the need for more effective micro- and macro-prudential regulation and supervision but also the need for better coordination between the micro and macro parts. Considering the important informational synergies between micro-prudential supervision and systemic risk analysis, bringing micro-supervision under the same roof as other central bank functions seems an attractive proposition. Central banks can benefit from, and rely on, extended access to supervisory information and intelligence, especially on systemically relevant intermediaries, in order to better assess risks and vulnerabilities of the financial system as a whole. Overall, a lesson of the crisis is that greater central bank involvement in regulation and supervision pertaining to credit and finance should contribute to better management of overall economic stability. In turn, by reducing the prospects of tail events, this would contribute to the enhancement of price stability.

8 CONCLUDING REMARKS

Unlike the natural sciences, in central banking we do not have the luxury of running controlled experiments to improve our understanding of the world. Our only guide is history. As a result, crises are unique "natural experiments" that we can mine for information to advance our learning. Reflecting on lessons from the current crisis, Lucas Papademos observed that not only has it been "great" and "beyond compare", but that it has also been "a learning experience 'beyond compare' for market participants and policymakers, including central banks" (Papademos, 2009c). From the numerous ensuing lessons, I would like to end by returning to two fundamentals of which the crisis has reminded us. First, *principles*: By staying true to its principles, by always being committed to preserving price stability, a central bank can have the credibility and flexibility required to take forceful corrective measures and serve as the cornerstone of stability during a crisis. Second, *humility*: We must always strive to avoid hybris. We must avoid the temptation to overpromise on what monetary policy can achieve and remain mindful of the limits of our knowledge.

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COMMENT

LUCREZIA REICHLIN, LONDON BUSINESS SCHOOL AND CEPR

I INTRODUCTION

As Athanasios confesses in the first paragraph of the introduction of his paper, providing a perspective on lessons from the recent financial crisis for monetary policy is not an easy task. The financial disruption which we have experienced since August 2007, and, in particular, after the collapse of Lehman Brothers, has required "creative'' monetary policy action and will provide food for thought to academics as well as central bankers for years to come.

Yet, in his piece, Athanasios has chosen to convey a rather conservative message and emphasize continuity rather than change. He has used the occasion of this conference to state that, no matter how deep the turmoil and how unconventional some of the policy responses have been, the basic principles of the art of monetary policy remain intact. These principles are central bank's independence and a clear objective of price stability.

The paper is also an occasion for Athanasios to restate the principle, dear to his heart, but more controversial amongst academics and policy makers, that central banks should follow robust simple rules rather than pursuing activism. The normative message goes hand in hand with positive analysis: the ECB, according to his empirical analysis, has historically followed such a robust rule with the significant exception of the third quarter of 2008 and 2009: in July 2008 the ECB increased the main refinance operation (MRO) rate above the level prescribed by the rule and during 2009 kept it too high.

The third point addressed in the paper is more speculative and supports the view that a stability oriented rule is also compatible with a broader monitoring of financial risks and misalignments in asset prices provided the analysis is sufficiently encompassing. The paper supports the view that the ECB's emphasis on monetary analysis provides a tool to identify tail risks since asset price booms are associated with high growth of broad money. This message suggests that the institution will be well equipped for its new function in macro-prudential supervision.

The ground covered is obviously very broad and I will limit myself to some observations on monetary policy rules when financial markets are dysfunctional and on monetary analysis as a tool to identify financial imbalances. On the latter issue I will describe some empirical results from research conducted at the ECB and outline what, in my view, is an important line of future research.

2 MONETARY POLICY RULES: WHICH INTEREST RATE?

2.1 THE CRISIS AND MONEY MARKET RATES

One of the clearest signals of the financial crisis, and in particular of the drying up of liquidity, has been the spiking in money market interest rate spreads. At its peak, following the failure of Lehman on 15 September 2008, the spread between unsecured interbank deposit rates (euribor) and the secured repo rate at three months maturity, reached 200 basis points in the euro area (see Chart 1). Clearly, in such a situation, financial conditions could not have been summarized in terms of a single interest rate and any policy rule expressed in terms of only one interest rate would have been inappropriate.

The facts are well known. Soon after the coordinated interest rate cut on 8 October 2008, the ECB announced several important innovations in its operational procedures (for a detailed descriprion of the events and ECB policy, see Lenza, Pill and Reichlin, 2010). Key amongst these was the decision to shift to a 'fixed rate/full allotment' (FRFA) tender procedure in the Eurosystem monetary policy operations, which implied satisfying the market's demand for central bank liquidity in full. Taken together, these measures considerably expanded the scope for central bank intermediation to substitute for a money market subject to severe disruption.

Indeed, demand for liquidity to conduct such central bank intermediation exceeded the aggregate liquidity consistent with the fulfilment of reserve requirements over the maintenance period as a whole. With the FRFA procedure in place, such a situation led to ample liquidity conditions in the overnight money market. The ECB chose to reabsorb this excess liquidity by having banks with excess cash make recourse to the deposit facility, rather than conducting

Chart 1 Spread between 3-month EURIBOR and 3-month GC repo rate

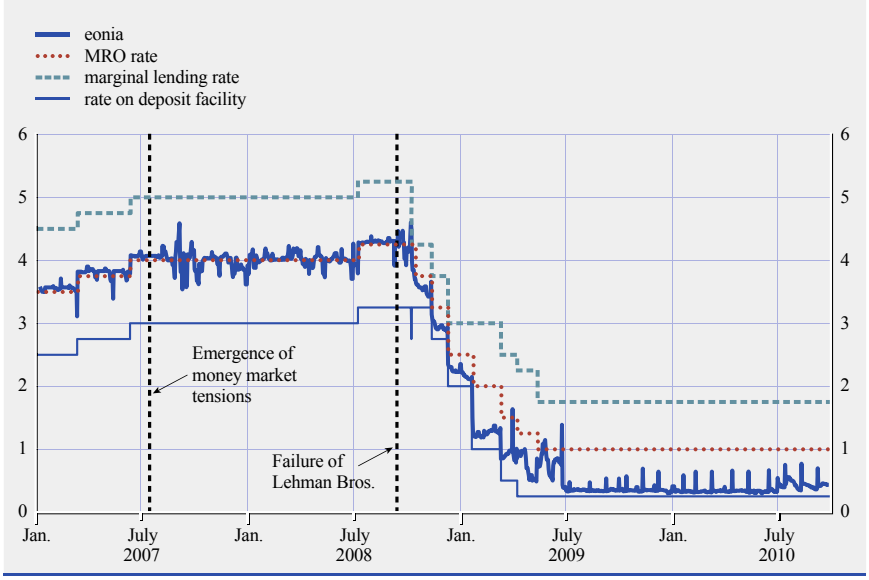
Source: Reuters.

fine tuning operations (FTOs). As a result, holdings at the deposit facility – and thus the monetary base, increased substantially. Given the strength of counterparty demand and the decision not to reabsorb excess liquidity via FTOs, a chronic situation of ample liquidity emerged in the euro money market with the consequence that the overnight money market interest rate (EONIA) moved systematically away from the policy rate (Main Refinancing Operation) rate and fell towards the rate on the deposit facility (see Chart 2).

As argued in Lenza, Pill and Reichlin, 2010, in such a situation, the MRO rate became a less effective proxy for the monetary policy stance, as the emergence of spreads in the money market rendered it a less effective basis for assessing market rates and the starting point of the transmission mechanism. Over time, the ECB's official communication reflected the fact that the MRO rate was no longer an adequate indicator of the monetary policy stance and indicated that, in the exceptional times, the stance was better understood in terms of the level of market rates at various maturities. Indeed, with the EONIA persistently below the MRO rate, money market rates of all types and at all maturities adjusted downwards. Thus the specific liquidity measures introduced by the ECB exerted a clear effect on the level of very short-term interest rates – and thus the monetary policy stance – from autumn 2008 onwards.

There are two messages from this narrative. The first is normative. One of the lessons of the crisis is that, in period of financial disruption, monetary policy should have an eye on interest rate spreads and should not follow a rule expressed in terms of inflation and real economic activity only. The second is positive: one way of interpreting ECB action since Lehman is indeed that the institution's

Chart 2 ECB interest rate corridor – evolution of EONIA relative to ECB key interest rates



Source: Giannone, Lenza and Reichlin (2009).

goal has been to keep the overnight rate (eonia) close to the deposit rate and the effective market rate (euribor) close to the eonia. This is why it is surprising that Athanasios' rule does not fit the data for 2009. In the empirical specification of the policy rule, the author considers the 3-month euribor. If my narrative is accurate, that is, if it is true that the goal of the ECB's non standard monetary policy measures have been to compress the spread between the euribor and the secured repo rate and to keep the effective market rate close to the deposit rate, an empirical rule using the euribor as the relevant interest rate should fit the data in 2009. Either my interpretation of ECB policy is inaccurate or Orphanides's specification of the policy rule is inappropriate. Results from my own research with colleagues at the ECB (Giannone, Lenza and Reichlin, 2009) show that, with a richer specification, the path of the euribor in 2009, conditional on output and inflation behaviour, is not exceptional. I report some findings in the next section.

2.2 LONG TERM INTEREST RATE STICKINESS

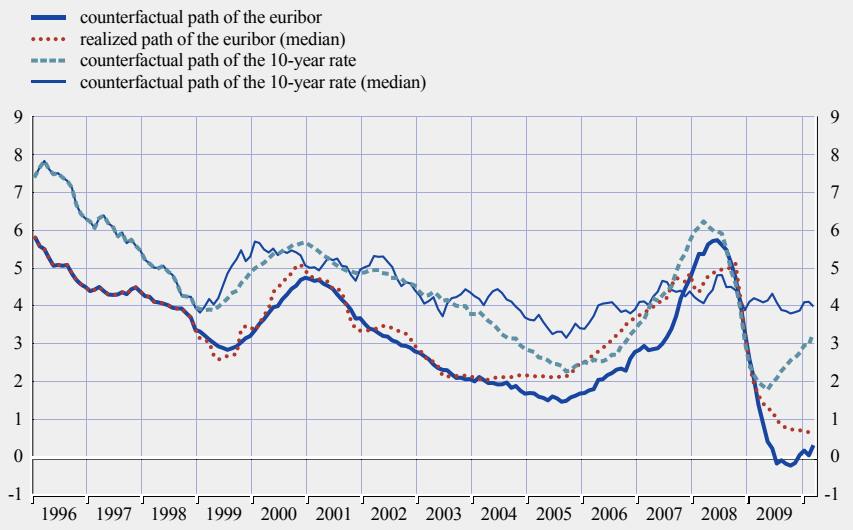
Although, as mentioned and shown below, the behaviour of the euribor, given ECB policy, has not been exceptional during the crisis, we detect an instability in the relation between short and long rates. In the last fifteen years we have seen a remarkable stickiness in the long rate, beyond what is predicted by the textbook expectation hypothesis. This implies that an essential piece of the transmission mechanism is impaired and reveals once again the difficulty of capturing the stance of monetary policy by a unique interest rate.

In Giannone, Lenza and Reichlin, 2009 we have shown empirical regularities of credit, monetary variables and interest rates on the basis of a large dynamic model. One useful exercise we can do with our framework is to estimate the model with historical data (from 1990 to the end of 2007, the pre-crisis year) and then compute the expectation of key variables over the crisis years 2008-2010, given the estimated historical correlations and the realized path of industrial production, inflation and unemployment in 2008-2010. Doing this exercise for interest rates at different maturities allows us to ask the question of whether there have been anomalies during the crisis. That is, whether the dynamics of some of the variables in that sample cannot be explained by business cycle conditions and inflation alone.

Chart 3 shows the realized and the counterfactual paths for the euribor and the 10 year interest rate. In contrast to Orphanides' findings, we find that there are no anomalies in the behavior of the euribor (most likely thanks to ECB action in the money market which replace the overnight interbank market by acting as intermediary of last resort) but that the long rate is exceptionally flat; in other words, since 2008, we have seen an exceptionally steep yield curve.

When there are frictions in financial markets and financial intermediation matters, monetary policy needs to take into account more than one interest rate (see recent attempts to formalize this point by Curdia and Woodford, 2010).

Chart 3 Actual and counterfactual term-spread



Source: Giannone, Lenza and Reichlin (2009).

The ECB, as other central banks, through their non standard policies, has managed to compress money market rates but has been less successful in affecting the term spread.

3 MONETARY ANALYSIS AS A TOOL FOR MACRO-PRUDENTIAL RISK?

As Otmar Issing once said "money is a beast" and, I would add, a very poorly understood one. A point made recently by some ECB communication (e.g. Papademos, 2009) and supported by Athanasios Orphanides's paper is that monetary analysis, since it reveals long term risks to price stability, also signals financial imbalances which are related to them. By responding to monetary developments, the central bank therefore responds to asset prices ("leaning against the wind").

Research backing this conjecture is based on the empirical link between broad money (M3) and asset prices. Evidence of this link, however, is controversial (see Alessi and Detken, 2009 for supporting evidence and Assenmacher-Wesche, and Gerlach, 2010 for a contrarian view).

Rather than taking sides in this discussion, let me make a different point that supports the view that monetary analysis, as conducted at the ECB, could be particularly useful as a complement to the projection exercise when there are important frictions in financial markets. The key fact is that the dynamics of different monetary aggregates reflect those of interest rate spreads. Therefore,

when the monetary transmission mechanism is impaired and interest rates do not co-move, the behaviour of monetary aggregates carries information beyond the policy rate.[1]

Let me show some empirical facts to support this point.

Chart 4 shows the correlation between the growth rate of the difference between M3 and M1 (essentially saving deposits) and the term spread (the ten year minus the two year bond rate): there is an almost perfect negative correlation!

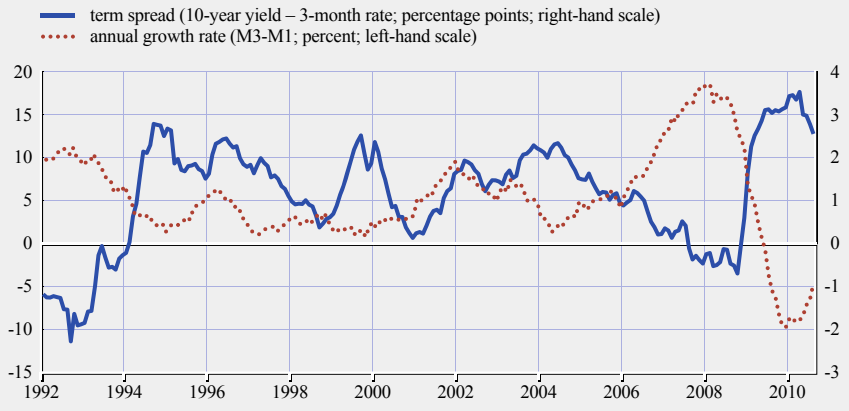
Going beyond this observation, more can be learned from the analysis in Lenza, Giannone and Reichlin, 2009.

The authors perform the same counterfactual analysis of the interest rates which I described in the last Section, for the growth rates of M3 (Chart 5), of (short-term) loans to non financial corporations (Chart 6) and of M1 (Chart 7).

Starting with M3, results indicate that, since the beginning of the monetary policy tightening at the end of 2005, until the end in the Summer of 2008, M3 showed a higher rate of growth than its counterfactual path while, with the easing, it collapsed below it. If we couple this result with that shown in Charts 3 and 4, we can conjecture that the unusual surge in deposits and their subsequent fall are associated with the unusual flattening and subsequent steepening of the yield curve. In other words, anomalies in M3 reflect anomalies in the long rate.

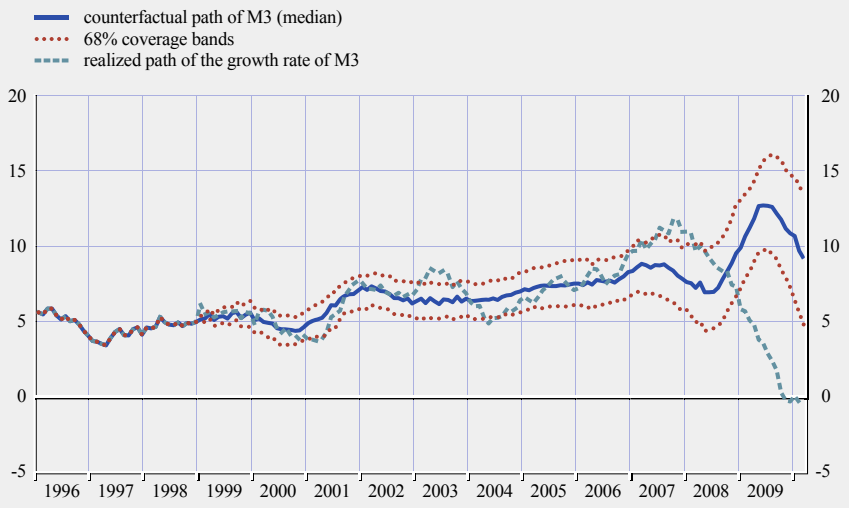
1 The idea that money conveys information about monetary conditions not summarized by the short term interest rate is generally attributed to monetarist scholars such as Brunner, Friedman and Schwartz and Meltzer. For a more recent discussion of this point, see Nelson, 2003.

Chart 4 Growth rate of M3-M1 and term spread



Source: Giannone, Lenza and Reichlin (2009).

Chart 5 Actual and counterfactual growth rate of M3

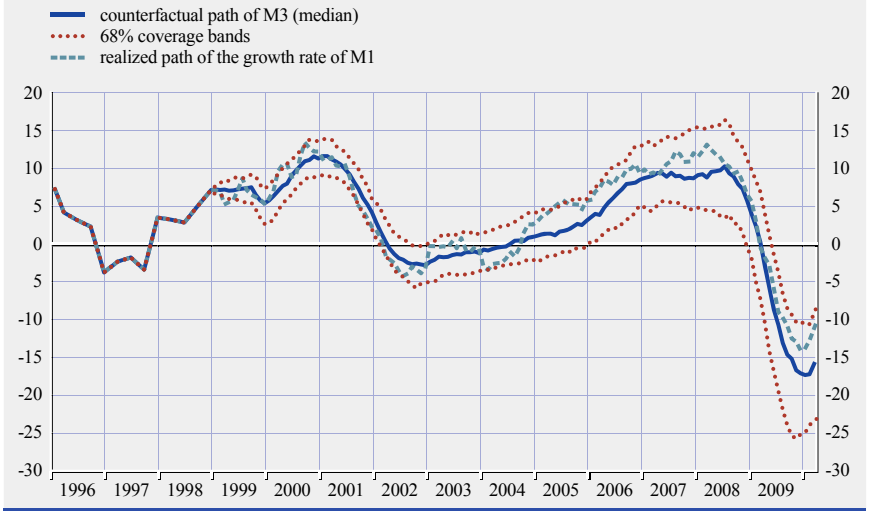


Source: Giannone, Lenza and Reichlin (2009).

Interestingly, there is no anomaly in loans to non financial corporations: their actual behaviour since the crisis is very close to that we would have expected given business cycle and inflation dynamics. Clearly, the liability side of the banking sector (M3) conveys information which cannot be captured by the analysis of the asset side (loans).

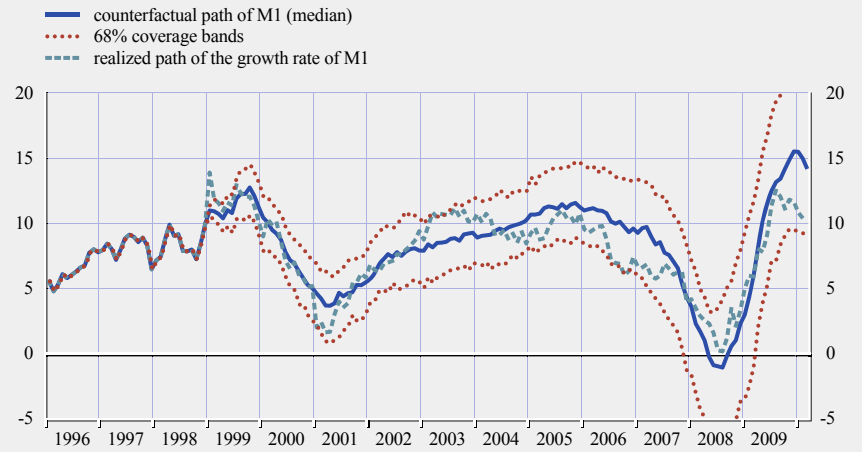
Chart 6 Counterfactual 3: actual and counterfactual path of the growth rate of short term loans to non financial corporation

(up to one year)



Source: Giannone, Lenza and Reichlin (2009).

Chart 7 Actual and counterfactual paths of the growth rate of M1



Source: Giannone, Lenza and Reichlin (2009).

Even more telling is the contrast between M1 and M3. Chart 7 shows that M1, unlike M3, behaved as expected, given business cycle conditions. Since M1 contains overnight deposits net of the interbank market, the fact that no anomalies are identified in the crisis suggests that the ECB, by keeping alive the interbank market by essentially replacing financial institutions in lending overnight, succeeded in compressing money market spreads and in supporting M1.

While, on the one hand, the dynamics of M3 reflect the inability of the ECB to affect the long rate, on the other hand the dynamics of M1 show the ECB's effectiveness in compressing money market spreads.

This analysis suggests that indeed monetary analysis might be useful when financial markets are imperfect and intermediation matters since the behaviour of broad money reflects portfolio decisions which are linked to an array of interest rates. I believe this is a promising line of research, potentially useful for building an analytical framework for the understanding of the relation between money, interest rates and asset prices.

4 CONCLUSIONS

To conclude, my view is that Athanasios Orphanides's message is fundamentally right but also excessively conservative. Although I believe that the fundamental principles of sound monetary policy remain valid, it is difficult to deny that the crisis has challenged monetary practice and monetary theory and much work is still to be done to understand the implications of this challenge. Some of this work started at ECB research under the leadership of Lucas Papademos.

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Christian Noyer, Donald L. Kohn, Joaquín Almunia,
Andrew Crockett (Chair) (from left to right)

PANEL DISCUSSION SESSION 2

JOAQUÍN ALMUNIA, EUROPEAN COMMISSION

Let me start by thanking Lucas for the invitation to participate in these discussions. Of course, I am not a central banker. I have never worked within a central bank and I am not familiar with the technicalities of the speeches and presentations just heard.

But I am very happy to be here since I have cooperated and collaborated with Lucas during almost 6 years as European Commissioner for Economic and Monetary Affairs, specifically between April 2004 and February 2010 when I moved to other responsibilities within the Commission. During this entire period I have appreciated the human qualities of Lucas and his solid academic and professional background. I have learnt a lot from his interventions since listening to Lucas is always an opportunity for learning. I have appreciated Lucas' constructive approach in the discussions both with the Commission and in the Eurogroup, the Ecofin and other international institutions.

So, I am very happy to be here to tell Lucas personally and all of you how much I appreciated his human, academic, and professional qualities.

My perspective in this panel is different from previous speakers although I will start from the last point that Andrew Crockett mentioned in his presentation: the debt and more broadly the fiscal issues and how they link with your responsibilities.

What are the lessons of fiscal policy to be learnt from this crisis? I will make 5 very quick points.

First, fiscal deterioration happens much faster than fiscal consolidation.

It is an informative lesson to see how the consolidation efforts of some Member States in the euro area, in preparation of the Economic and Monetary Union and subsequently to comply with the Stability and Growth Pact requirements, have quickly given place to significant fiscal deterioration.

In some cases, this did not come as a consequence of policy decisions adopted before the crisis against the discipline establish by the Pact. I can give two examples of very good fiscal policy performers in the years before the crisis, Ireland and Spain. The two countries had different circumstances and different conditions but very good fiscal policy performance. And yet both have registered a very rapid deterioration of their fiscal positions since the beginning of the crisis, well beyond the direct impact of their discretionary fiscal measures.

In my view, given the current state of some fiscal positions, getting back to the situation before the crisis will take six to ten years, during which we will have to live with strong asymmetries. Some Member States will suffer from large fiscal imbalances while others will exhibit a sounder position. This is true not only in the Member States that did not pay attention to public debt consolidation before 2007 and have only focused on complying with the deficit criteria of the

Treaty. Again, Ireland or Spain or some European Member States outside the Euro area had very low public debt-to-GDP ratios immediately before the crisis and the increase in their debt levels has been extremely sharp.

The second lesson is that market discipline will now be felt with greater intensity. During the first nine or ten years of the EMU, the market discipline was almost invisible, and concomitantly spreads were extremely low. The highest spreads before the crisis – for Italy and Greece – were 20-22 basis points. And I still remember some discussions in the Eurogroup in 2009 where one minister from a country directly affected by the crisis responded to my warnings saying "we should not worry because in a few months, the spreads will go back to where they were before the crisis".

So, there will be tough market discipline after the crisis and this is a new factor that we need to take into account. This discipline will not only affect individual Member States, which will continue to be under strong pressure over the next years, but it will also impact the economic governance of the Euro area as a whole. In the current crisis we have had to face these novel and difficult situations with no crisis resolution mechanisms in place. This is unlikely to happen again.

Third point, the opportunity for using fiscal stimulus should be carefully assessed. There was consensus at the beginning of the crisis that fiscal stimulus was needed under the present circumstances. Fiscal stimulus was not implemented at the same pace or to the same degree in the different Member States, but there is now a need to assess how useful or how irrelevant these fiscal stimuli and this fiscal policy have been.

In any case, it is evident that the lack of coordination of the different national stimulus plans has aggravated the large fiscal deficits. There was no attempt to evaluate any positive spill-over of the different fiscal policy measures and instruments within the Economic and Monetary Union.

My fourth point, and I will not elaborate on this because it is too evident, is that all the macroeconomic imbalances matter, and not only fiscal imbalances. During my tenure as Commissioner for Economic Affairs, we discussed every month at the Eurogroup all the macroeconomic imbalances that needed to be tackled at a euro area level but it was, I can say it now, mostly a last minute and hurried discussion. It is evident now that these macroeconomic imbalances require quick diagnosis and adequate treatment.

And, last but not least, my final point refers to the importance of preserving the credibility of the Stability and Growth Pact. The two biggest economies of the euro area challenged the Stability and Growth Pact in 2003, triggering the credibility loss of the euro area budgetary framework. Those who participated in that crisis, and not only those who are suffering the negative consequences of the present one, should learn once and for all the lesson that if you attack fiscal discipline at any time, the credibility of this framework will not only deteriorate in the short term, but will also be seriously affected for a long period of time.

I believe that we are now suffering the loss of credibility of the euro area fiscal framework that was triggered by the serious challenges in 2003.

Let me end with some positive remedies.

First, the governments of the euro area should realize that they need from now on to pay very strong political attention to the functioning of EMU. This is not a technocratic point in their agendas. They should be aware that the euro area requires their political ownership. At the same time the top leaders of our euro area Member States should work together with the Finance Ministers and de-centralise the implementation of their political decisions. The fiscal and macroeconomic solutions that the euro area requires will not be found in the so-called political discussions. They will require strong professional expert input similar to what central bankers receive and share in these kinds of discussions.

Second, the fiscal surveillance will have to expand beyond the sole surveillance of annual deficits. There needs to be public debt surveillance including medium-to long-term sustainability targets. This will in turn require a better link to the discussion on structural reforms, which will influence the evolution of the public expenditures and revenues over the medium term. In this way, the macroeconomic framework should be better integrated in the fiscal surveillance procedure. This will promote a sound and solid implementation of fiscal policy supported by macroeconomic objectives in support of monetary stability.

Finally, fiscal surveillance and fiscal policies need to be better articulated with financial stability concerns. The link between the work of the Systemic Risk Board and the proposals for fiscal surveillance and fiscal policy orientations in the euro area needs to be further reinforced.

I believe these three governance principles will contribute to putting the European Union and the euro area in particular on the path of a more stable and sustainable growth.

DONALD L. KOHN, FEDERAL RESERVE SYSTEM

I am honoured to be invited to participate in this panel and symposium. Lucas, unlike many others here, you and I do not go back to MIT days, but we do go back about eight years, when we both joined the policy committees of our central banks, and our collaboration has intensified over the last three years of financial turmoil.

I always came away from the numerous meetings and telephone calls we have had in recent years with a much better perspective than I had going in. Your sound, thorough analysis, based on solid economic reasoning and grounded in facts, left me with a much better understanding of the European situation, and a better perspective on global developments, including what was happening in the United States. It has been a real pleasure and privilege to have these interactions and to get to know you, and I thank you.

For this panel, I will talk about some of the lessons learned about monetary policy in the crisis – mostly, but not entirely, from a US perspective. I will start with a few words on liquidity facilities. This was a very important part of central bank responses, and we have not paid it as much attention as it merits at this symposium.

A critical lesson we learned is that central banks need to innovate – to adapt to the particular circumstances and the changing structure of financial markets – in order to have effective backup liquidity facilities. For commercial banks, the disruption to funding markets was prolonged and profound. They were especially vulnerable to such disruption because they had increased the degree of maturity transformation they were undertaking. Problems arose from considerable uncertainty about the creditworthiness of counterparties, about their own liquidity needs, and about the valuation of assets collateralising borrowing. This uncertainty bred fear and distrust among banks and other lenders supplying credit to banks, and in order to get the liquidity they needed, banks had to turn to the central bank.

In these circumstances, to contain the damage that this funding disruption was causing, central banks had to change the way they supplied the liquidity needed. We all innovated with regard to rates, maturities, collateral, and even the location of liquidity supply, with the Federal Reserve making US dollars available in Europe and other places. And we initiated auctions to overcome stigma problems.

In the United States we had to deviate more from traditional liquidity supply operations than other central banks, largely because securities and securitisation play a larger role in credit intermediation in the United States than in Europe or elsewhere. Consequently, we needed to open our discount window to non-banks – to primary dealers and money market funds – and to broad market segments such as commercial paper and securitisation markets. These extensions were required as a result of the evolving character of our financial intermediation system and the growing links between the banks and the securities markets. Runs outside

the banking system posed as much threat to financial stability as runs within the banking system.

Importantly, in expanding and adapting access to central bank liquidity, we continued to adhere to the time-tested principles for central bank lending established by Walter Bagehot – i.e. to lend early and often to solvent institutions at a penalty interest rate against good collateral. To be sure, as Ben Friedman pointed out last night, solvency and liquidity shortfalls can be difficult to distinguish in the middle of a panic situation. And I also agree with him that the value of collateral is hard to determine under such circumstances when liquidity premia get built into the prices of assets. But we can approximate underlying collateral values and make judgements about solvency, and adhering as best we can to the Bagehot principles has had very positive benefits. The facilities are being unwound without a loss to the central banks to date, and that implies that we were indeed supplying liquidity – not capital – to commercial banks and other intermediaries in keeping with our traditional role. Adhering to these principles reduced, but did not eliminate, the moral hazard resulting from our lending. Still, one of the consequences that we are dealing with now is the fact that opening these liquidity facilities did, nonetheless, create considerable moral hazard; institutions and their creditors will operate as if the facilities will be available if liquidity is impaired again in the future. We are countering this with new liquidity requirements for banks and other intermediaries. In the crisis, central banks bore far too much of the liquidity tail risk; institutions need to bear more.

Now I will turn to lessons learned as regards the interest rate-setting aspects of monetary policy. One lesson is that once the policy rate is at zero or close to zero, expectations about future interest rates – the future path of policy – are even more important than they are when policy rates have room to move. When the policy rate is near zero, those expectations are one of the few margins you actually have to work with to lower intermediate and long-term interest rates. A number of central banks, including the Federal Reserve and the Bank of Canada, provided more guidance than usual about the future path of short-term rates. In my view, this has worked: providing additional information about central bank policy intentions has helped reduce longer-term interest rates, bolstering asset prices and encouraging spending.

But when central banks provide this kind of guidance, it is critical that it be seen as conditional on developments in inflation and output. It is not always easy to credibly convey the appropriate degree of conditionality, and the Federal Reserve has worked hard to clarify this aspect of its guidance. Rate guidance is a potentially effective tool, but it needs to be used and interpreted correctly.

A second lesson is that stable, anchored inflation expectations are even more critical than usual when policy is at the zero lower bound and central banks are engaged in unconventional policy actions. The risks to inflation expectations are two-sided. One is that the use of unconventional policies could raise inflation expectations, which, if it occurred, would constrain our ability to engage in unconventional policies to stimulate the economy.

The other risk, however, is that inflation expectations follow inflation down, raising real interest rates, with a negative effect on an already weak economy. Having inflation expectations anchored in this situation has been critical to the effectiveness of our policy and our ability to carry out unconventional measures. Understandably, central bankers have not been receptive to suggestions that we raise our inflation target in these situations. Unanchoring inflation expectations would be far too risky and potentially far too costly both now and in the future.

The third lesson is that buying large amounts of longer-term or unusual assets has worked to lower interest rates and ease financial conditions at the zero lower bound. Central bank purchases of assets are particularly helpful when markets are illiquid and normal arbitrage is disrupted, as we saw in the reactions to our purchases in the United States and in the reactions to ECB actions in sovereign debt markets in recent days.

Asset purchases do raise a number of issues, however. For one thing, we have no experience with this type of policy action, and calibrating how much to buy and under what circumstances is very hard. Moreover, we have experienced some potentially constraining considerations that I did not fully anticipate.

One involves inflation expectations. The central bank has to be careful that its actions do not increase inflation expectations, perhaps because investors see its independence as possibly being eroded as it acquires more government debt. Another consideration is the potential for some categories of purchases to involve the central bank in credit allocation in addition to providing liquidity to the whole economy. Unless the bank is operating in the government market, some allocative effects are inevitable, but nonetheless uncomfortable for the monetary authority. The third consideration that can limit asset purchases is the need for an exit strategy. We cannot allow the purchases to impinge on our ability to tighten policy at the appropriate time.

A fourth lesson for monetary policy from our actions in the crisis is that the effects of much higher levels of reserves – quantitative easing – are quite uncertain and to date of very limited power. We have had a huge volume of reserves in the US banking system for some time; those reserves do not seem to have had much effect – if any – on money, credit or interest rates. In the United States bank credit is falling, money supply growth is very weak, and the spread between bank lending rates and market rates remains quite high. Whether quantitative easing is effective – whether and how a larger central bank balance sheet and higher levels of reserves influence behaviour – remains a very open question. To date, the effect of the increase in reserves seems to resemble a Keynesian liquidity trap more than it does a standard monetarist view of reserve increases leading to increases in money and credit.

My fifth lesson for monetary policy is that exit tools are very important, as I have said before. The central bank must know how it is going to raise interest rates when the time comes. And it needs to convince people that it has both the means to absorb the reserves and raise interest rates and the will to do so at the appropriate time.

As Ben Friedman pointed out last night, for the United States, the newly acquired ability to pay interest on reserves was an important addition to our toolkit. We now have an option that we did not have before, and we will be able to raise interest rates when it becomes appropriate for macroeconomic stability. In addition, we are also developing tools to absorb reserves, as you have done in Europe. Absorbing reserves may be important in order to transmit a rise in the rate of interest on reserves more predictably to market interest rates and to counter any effect the quantitative easing channel might begin to have as the economy recovers.

Finally, I will address the question that has preoccupied us for an awful lot of this conference, which is whether the setting of a short-term interest rate should take account of asset price misalignments, credit growth and financial imbalances beyond their effects on the medium-term inflation outlook. The last time I sat on this stage was four years ago. Then, I answered that question with an unequivocal "no": the central bank should keep its focus on price and macroeconomic stability; efforts to lean against asset mispricing per se were likely to do more harm than good.

Given all that has transpired in the past few years, I am not so sure any more. We have seen that macroeconomic stability and price stability are not sufficient to ensure financial stability. Indeed, macroeconomic stability can work against financial stability: the settled conditions of the "Great Moderation" encouraged people to become very complacent and willing to take on risk. Moreover, we have also seen that some episodes of financial instability can be so severe that the central bank does not have the tools to clean up after the bubble bursts without having the economy put through a very severe recession such as the one we are experiencing now.

I agree with those who have said that policy reactions should be symmetrical. If the central bank is going to concentrate on a medium-term price stability objective, it ought to pursue potential overshoots and undershoots of inflation consistently and with equal vigour. Similarly, I would argue that if it is going to lean against bubbles or asset price misalignments, it ought to lean against them symmetrically – both perceived undershoots and overshoots. The discussion in this arena seems to be almost entirely about prices that are too high or credit growing too fast, but policies ought to be symmetrical if they are going to be understood by the public and promote economic stability and efficient resource allocation.

I agree that credit-driven asset price increases can be, and have been, very dangerous for financial stability. To some extent, policy-makers can counter these by simply lengthening the horizon for achieving price stability without encountering any trade-offs as a result of pursuing multiple objectives at the same time with one interest rate instrument. But there will be circumstances in which taking account of asset prices in setting interest rates will entail some costs with regard to medium-term inflation and output objectives, and if policy is to be used for multiple objectives, we need to think about how to balance those

objectives. At times, addressing perceived asset price misalignments will entail greater variability in output and inflation.

I also agree that central banks need to pay much more attention to indicators of financial imbalances and financial instability. The cost of realising tail risks can obviously be very high and we need better information on when the tails are getting fat. The question is what to do about it when the central bank sees a potential problem developing.

And in that regard, I continue to have some concerns about the active use of monetary policy to lean against perceived asset price misalignments and financial imbalances. Monetary policy is a blunt tool. Often the misalignment is in a particular sector. For example, the economy might be weak and credit slowing, but the housing sector very strong. Tightening monetary policy in a situation like that penalises business capital spending and net exports in addition to spending in the sector that is experiencing the problem. Interest rates certainly affect asset prices, but how interest rates relate to speculative activity is a much more open question. Markus Brunnermeier noted yesterday that once the bubble has got going, small changes in interest rates probably do not have much effect on it. That has been our experience. Raising interest rates in 1999 and in 2004, 2005 and 2006 seemed to have no effect on the asset price bubbles that were building at those times. What Markus said was that you have got to raise interest rates early to influence asset price bubbles. But that is very difficult, especially since we find it very difficult to specify the fundamental value of an asset. Judging when an asset is beginning to move away from its fundamental value is practically impossible. It is only in retrospect that the beginnings of an asset bubble are clear. How policy interest rates interact with these asset bubbles and these imbalances is still a very open question.

Moreover, timing an interest rate intervention to produce more benefits than harm is very difficult. For example, if you lean against the asset bubble shortly before it breaks, you are just going to make the situation worse. The central bank will have tightened interest rates, weakening the economy and reducing inflation, and then the asset price will break, putting further downward pressure on the economy.

My conclusions are that, given the current state of our knowledge, the cost-benefit calculation is likely to favour strengthening micro and macro-prudential tools to deal with financial imbalances and asset price misalignments, rather than using short-term interest rates. I think the right way to assign these tools is to dedicate prudential regulation to financial imbalances and financial weaknesses and to dedicate monetary policy to macroeconomic stability if there is any potential for conflict between these goals.

But the question is still open, and we have a lot to learn about the interaction between policy rates and asset prices. In situations in which prudential regulation is not successful in dampening down a dangerous development, say widespread and rapid growth in credit, particularly outside regulated sectors, monetary policy may be all that stands between the economy and a serious problem.

We need much more thinking and research on these complex issues. I agree with José Viñals' call for fresh, deep and sensible thinking. We now have the basis for empirical studies of these questions in that some central banks, such as the ECB, say they did lean against financial imbalances, while others, like the Federal Reserve, did not. As much as I might wish it were otherwise, the crisis did give us data to test hypotheses.

An appropriate tribute to Lucas will be to apply sound, empirical research and economic analysis to these very difficult issues. A rigorous approach to tough issues is one of your legacies, Lucas, to the ECB, as well as to the rest of us in central banking.

CHRISTIAN NOYER, BANQUE DE FRANCE

IMPLICATIONS OF THE GREAT FINANCIAL CRISIS FOR MONETARY POLICY

I will make some remarks about our own experience, in the Eurosystem, and then try and draw some lessons for the future, especially on the monetary pillar.

1 WE HAVE BEEN FORTUNATE TO ENTER THE CRISIS WITH A VERY APPROPRIATE FRAMEWORK AND SET OF TOOLS:

- *First and foremost, our mandate:* it is a "hierarchical" mandate, giving clear and unambiguous priority to achieving price stability; and, once this objective has been met, it allows us to pursue other goals. Financial stability easily fits into the set of those "secondary" objectives and we could act decisively at moments when the financial system was in danger of paralysis.

  This clear priority was understood by the markets. It was most apparent in our decision to raise policy rates in July 2008. It was essential to give us the necessary leeway to act decisively later without compromising our credibility.

- *Second our two pillar strategy,* something invaluable for now and for the future, a subject to which I shall come back later

- *Third, a very broad set of eligible counterparties and collateral.* So, we could adjust to the shocks in money and credit markets without creating new facilities, with the small exceptions of the covered bonds and, more recently, government bonds purchases.

2 FROM THAT FRAMEWORK WE WERE ABLE TO DRAW FOUR VERY IMPORTANT BENEFITS:

1. *At no time during the crisis have inflation expectations significantly deviated from our definition of price stability.* This was most apparent, and crucial, during those months when headline inflation stayed in negative territory, the output gap was itself strongly negative and the risks of deflation could have materialized.

2. With inflationary expectations strongly anchored around 2%, *the "zero lower bound" never really was a problem.* Short term real interest rates were brought at negative levels , with sufficient speed to help stabilize the economy despite the unprecedented shock which followed the Lehman failure.

3. *We have been able to maintain a clear separation between monetary policy and liquidity provision.* Obviously, a major step was taken in October

2008 when we moved to full allotment fixed rate. Although it was not communicated as such at the time, this move truly marked a shift into an "unconventional" approach to monetary policy. Basically, we ensured that the banking system would face no uncertainty in access to liquidity. At the same time, we (implicitly) accepted that the marginal deposit rate would play, for a time, a stronger role as a policy rate. But we never committed to any specific path or trend. We always kept the possibility, while providing the banking system with unlimited amounts of liquidity to change the interest rates of all our facilities. And, obviously, this remains true today.

4. Finally, because asset purchases played a very limited role in our operational framework, *the unprecedented expansion in our balance sheet was never a source of concern.* By essence, repo facilities are self expiring and self exiting. A vivid illustration will come in July when the one year LTRO expires and our balance sheet contracts by a third. A very useful complement comes from the systematic sterilization of our more recent asset purchases.

3 LET ME NOW TURN TO ONE INTERESTING QUESTION: THE FUTURE OF OUR MONETARY PILLAR.

The monetary pillar is still a matter of debate in the academic community and amongst policymakers. But the crisis has brought a change. No one questions its usefulness any more. Rather, we are facing a reverse problem: it is now clear that the monetary pillar serves two different purposes. First, it fulfills a monetary function by helping to detect long term risks to price stability. And, second, it has a financial stability role as a broad indicator of incipient financial imbalances.

In a way, we have always known about this duality. The crisis gives us an opportunity to fully acknowledge those two functions. Our challenge, for the future, will be to define more clearly how they interact with each other.

In theory, this could be done through the following sequence in our analytical approach:

A first step could be to use a "classical" financial stability analysis by looking at credit growth, the evolution of leverage, asset prices, capital flows and the behavior of financial intermediaries. This is basically what is already done in our financial stability reviews and leads to an assessment of risks and potential imbalances in the short and medium run. Such an assessment will have to be produced, on a regular basis, for the ERSB.

Then, in a second step, the inputs and outputs of this analysis could be integrated in a monetary framework. It has been clear, for a long time, that asset prices, financial wealth and leverage play a central role in the dynamics of monetary aggregates. In my view, they are responsible for the regularities – and irregularities – in the income velocity of money. I have always thought that there was, up to 2008, a very regular trend decline in money velocity and that it could be explained by the parallel increase in households and firms financial wealth (which, everything equal, increases money demand). Velocity has naturally become more instable

with the crisis. But it is worth developing efforts to build for the Euro area a money demand function that incorporates, in addition to income, asset prices and stocks, as main determinants, and that could help disentangle the long term money dynamics from the shorter run financial perturbations..

The final step, of course, would be to use our knowledge of monetary dynamics to assess long run risks to price stability. Again, we have today a somehow similar approach when we try and isolate low frequency movements in monetary aggregates.

In practice, this is obviously an ambitious program. It will necessitate a lot of analytical work as well as a lot of judgment. But I am convinced progress can be made in those directions.

I believe Lucas has played a great role in pioneering an integrated approach to monetary and financial analysis. And I want to strongly pay tribute to his contribution.

PROGRAMME

DAY 1 – THURSDAY, 20 MAY

2.30 p.m. Registration / coffee

3 p.m. **Welcome address**
Jean-Claude Trichet (President, European Central Bank)

3.15 p.m. **Session 1: The great financial crisis: lessons for financial stability policies**
Chair: **Vítor Constâncio** (Governor, Banco de Portugal)

The great financial crisis: lessons for the design of central banks
Presenter: **Jaime Caruana** (General Manager, Bank for International Settlements)
Discussant: **Paul Tucker** (Deputy Governor, Bank of England)

Macroprudential regulation: optimizing the currency area
Presenter: **Markus K. Brunnermeier** (Professor, Princeton University)
Discussant: **Jürgen Stark** (Member of the Executive Board, European Central Bank)

4.30 p.m. Coffee

4.45 p.m. **Panel discussion**
Chair: **Alexandre Lamfalussy** (Former President of the European Monetary Institute)

Mario Draghi (Governor, Banca d'Italia)
Stanley Fischer (Governor, Bank of Israel)
Charles Goodhart (Professor, London School of Economics)
Philipp Hildebrand (Chairman of the Governing Board, Swiss National Bank)
Erkki Liikanen(Governor, Suomen Pankki)
José Viñals (Financial Counsellor and Director Monetary and Capital Markets Department, International Monetary Fund)

6.45 p.m. Transfer from hotel to dinner venue
Meeting point: hotel lobby

7 p.m. Welcome reception

7.30 p.m. Dinner
Speeches by:
Jean-Claude Trichet, President, European Central Bank
Benjamin M. Friedman, Professor, Harvard University
Nout Wellink, President, De Nederlandsche Bank

DAY 2 – FRIDAY, 21 MAY

9.30 a.m. **Session 2: The great financial crisis: lessons for monetary policy**
Chair: **Miguel Fernández Ordóñez** (Governor, Banco de España)

The monetary pillar and the great financial crisis
Presenter: **Jordi Galí** (Professor, CREI and University Pompeu Fabra)
Discussant: **Axel A. Weber** (President, Deutsche Bundesbank)

Monetary policy lessons from the crisis
Presenter: **Athanasios Orphanides** (Governor, Central Bank of Cyprus)
Discussant: **Lucrezia Reichlin** (Professor, London Business School)

10.45 a.m. Coffee

11.15 a.m. **Panel discussion:**
Chair: **Andrew Crockett** (President, JP Morgan Chase International)

Joaquín Almunia (Vice-President, European Commission)
Donald L. Kohn (Vice Chairman of the Board of Governors, Federal Reserve System)
Christian Noyer (Governor, Banque de France)

12.30 p.m. **Concluding remarks:**
Lucas D. Papademos (Vice-President, European Central Bank)

12.45 p.m. Buffet lunch

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