

Macroprudential policy and its relationship to monetary policy

10 March 2011



*Marko Melolinna
Economist
Monetary Policy and
Research*



*Jukka Vaubkonen
Economist
Financial Markets and
Statistics*

Macroprudential policy is aimed at reducing the systemic risks that develop or gain strength within the financial system and whose realisation would have serious repercussions for the real economy. Successful macroprudential policy reduces the probability and potential severity of a financial crisis and thus promotes long-run economic growth. Macroprudential policy can increase the ability of the financial system to withstand a crisis eg by requiring financial institutions to maintain larger-than-normal capital and liquidity buffers during good times and allowing them to run them down when times are not so good. Having some common goals and transmission channels as well as occasionally being at odds provide a rationale for coordination of macroprudential and monetary policy.

One of the key lessons of the global financial crisis is that authorities responsible for financial stability need better tools for timely identification of systemic risks and for reacting swiftly.¹ Moreover, the scope of financial regulation should be enlarged beyond increasing the resilience of individual financial institutions to include a deep concern

¹ Identification of systemic risks and the metrics and tools for evaluating them are treated in more detail in the article below by Heidi Schauman and Katja Taipalus.

for strengthening the crisis-resistance of the entire financial system. The latter concern is the focus of macroprudential policy. This article examines macroprudential policy as regards its definition, tasks and links with monetary policy.

Events of recent years have shown that financial stability and thus the operating environment for macroprudential policy are influenced by a number of factors: international coordination of economic policies, current account imbalances in the global economy, risks associated with imprudent fiscal policies, the quality of financial regulation and supervision, and structural changes in the financial system. In this article we take a close look at the relationship between macroprudential policy and monetary policy.

There is a tight link between macroprudential and monetary policy because they share an ultimate goal: stable economic performance. Moreover, their impacts move through the same transmission channels, to affect demand, supply and terms for bank loans and other forms of finance. Because of similar goals and impact channels, macroprudential and monetary policy often reinforce each other. Nonetheless, in certain situations monetary policy aimed at price stability may not be consistent with financial stability. Later in this article, we examine the causes of these potential inconsistencies and the need to coordinate

monetary and macroprudential policies.

What is macroprudential policy and how is it carried out?

At present, there is no well-established definition of macroprudential policy. The Bank for International Settlements (BIS) has defined it as the use of the traditional tools of financial regulation and supervision so that their announced and primary objective is to reduce both 1) the procyclicality and internal imbalances of the financial system and 2) the threats to normal operation of the financial system that inhere in common exposures and interlinkages within the

system.² In contrast, the primary goal of microprudential policy, ie traditional financial supervision and regulation, has been to increase the viability of individual financial institutions (for more on the differences, see Table 1).

² Procyclicality of financial system: system operates so as to reinforce fluctuations in the real economy. The financial crisis showed that dangerous internally-caused (endogenous) risks can develop within the financial system. These risks can accumulate eg when a large number of financial companies take on seemingly small but similar risks. Together, these risks may prove to be excessive for the financial system as whole. As an example, before the crisis, financial institutions invested in instruments tied to US subprime mortgages. Dangerous exposures also form when an individual financial institution becomes so large or complex that its default or other large problems cause serious spillover effects on the rest of the financial system and the real economy.

Table 1.

Macro- and microprudential perspectives compared		
	<i>Macroprudential</i>	<i>Microprudential</i>
<i>Proximate objective</i>	<i>limit financial system-wide distress</i>	<i>limit distress of individual institutions</i>
<i>Ultimate objective</i>	<i>avoid output (GDP) costs</i>	<i>consumer (investor/depositor) protection</i>
<i>Characteristics of risk</i>	<i>seen as dependent on collective behaviour (endogenous)</i>	<i>seen as independent of individual agents' behaviour (exogenous)</i>
<i>Correlations and common exposures across institutions</i>	<i>important</i>	<i>irrelevant</i>
<i>Calibration of prudential controls</i>	<i>in terms of system-wide risk; top-down</i>	<i>in terms of individual institutions; bottom-up</i>
<i>Cyclical connection</i>	<i>countercyclical</i>	<i>independent</i>
<i>Institutional distinctions</i>	<i>tighter scrutiny of systemically-important institutions</i>	<i>somewhat tighter for bigger institutions</i>
<i>Sources: Borio (2010) and authors.</i>		

The primary goal of macroprudential policy is to minimise society's output losses.

An important objective of micro-prudential policy is to protect the assets of retail depositors and investors by reducing the risk of individual financial institutions falling into difficulties. Especially prior to the latest financial crisis, it was generally believed that risks to the financial system came largely from the outside and that supervision of viable institutions in combination with other economic policies would serve to maintain an adequate level of financial stability.

But from the macroprudential perspective, the instruments of financial regulation should be selected and used so as to achieve the core objective of minimising society's output losses by reducing the probability and severity of financial crises. Efforts in this direction can take the form of countercyclical financial regulation that becomes tighter during an upswing of credit, leverage and asset price cycles and leaner during a downswing of these cycles. Another tack is to apply tighter regulations to large and complex – systemically important – financial institutions than to other financial entities.

Goals of macroprudential policy

The goals of macroprudential policy can be further divided into reducing the probability of systemic risks and enabling the system to better withstand the impact of a crisis. Risk-realisation probability can be reduced

eg by restraining bank lending or indebtedness, if they are judged to be excessive, by setting limits on the growth of lending or on the size of loans to households. The ability of the financial system to withstand a crisis can be strengthened eg by requiring banks to accumulate capital and liquidity buffers during good times and tapping into them when times are difficult.

Officials responsible for macroprudential policy need to decide on the weights to ascribe to those complementary goals. The BIS³ argues that macroprudential policy should not be aimed primarily at reducing business cycle fluctuations, which it sees as an excessively ambitious goal at this stage. A more realistic goal is to strengthen the financial system's resistance to risk.

The BIS rationale is based partly on experiences to date with the employment of macroprudential policy tools. For instance, the dynamic loan loss provisioning employed in Spain and some Asian countries have not significantly dampened price fluctuations in housing loans and in the housing market, albeit they have made the financial institutions more resilient.⁴ More effective constraint of financial gyrations would require an extensive degree of discretion in the use of macroprudential instruments,

³ BIS (2010), p. 90.

⁴ CGFS (2010).

something the BIS sees as unrealistic at this juncture.

Ideally, requiring banks to have extra-normal capital and liquidity buffers should serve to maintain banks' lending capacity even during economic downswings and prevent banks' solvency or liquidity problems from forcing them to sell assets in a falling market. In a country like Finland, in which banks are highly capitalised, a credit crunch and fire sales of assets are not currently listed among the major risks associated with financial cycles. An important domestic goal is to be able to deflate dangerous credit and debt bubbles sufficiently early and so to protect companies, households and the economy at large from the dire consequences of a bubble burst.⁵

The macroprudential policy toolkit

The objectives of macroprudential policy must be taken into account when setting priorities among the tools. If the primary goal is to improve the risk-bearing ability of the financial system, a reasonable set of tools would include the above-mentioned countercyclical capital requirements and dynamic loan loss provisions.

National requirements regarding countercyclical capital buffers are part of the comprehensive revision of banking regulation carried out by the Basel Committee on Banking

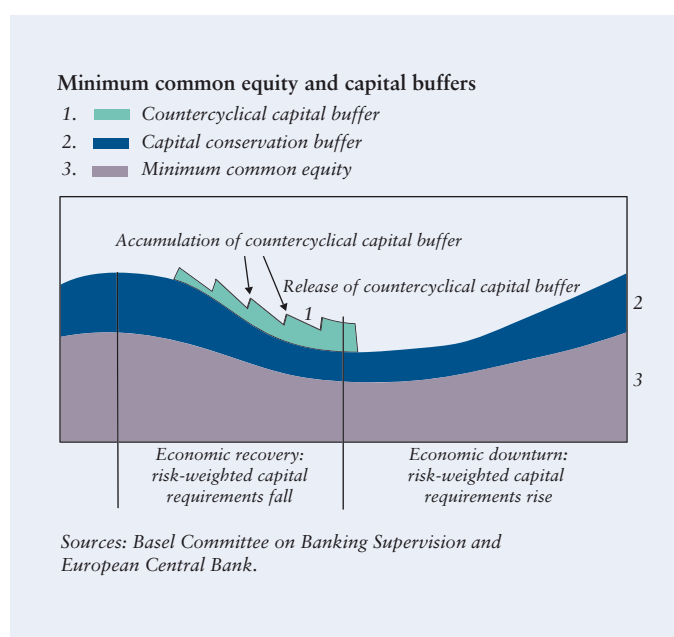
⁵ This is clearly directly at odds with the BIS recommendation.

Supervision and known as Basel III. According to the projected regulations, national authorities will have discretionary power to invoke extra capital buffer requirements for banks if it is determined that the amount of credit extended to domestic customers is excessive.⁶ The total amount of such a buffer is not to exceed 2.5% of the bank's risk-weighted assets.

During an economic upswing, bank lending typically expands rapidly as banks lower their estimates of credit risk. The decline in estimated credit risk in turn reduces the banks' risk-based capital requirements (Chart 1). In a downswing, we see the

⁶ For more on countercyclical capital buffers and Basel III, see Vauhkonen (2010).

Chart 1.



flipside: banks' measured credit risks and risk-based capital requirements increase. The tightening of capital requirements along with banks' possible loan losses may, in a downswing, chip away at banks' capital adequacy and at worst force banks to sharply curtail their lending. The aim of countercyclical capital buffers is to reduce the procyclicality of lending and risk-based capital requirements.

In Spain the operating principle for dynamic (statistical) loan loss provisioning is like that of countercyclical capital requirements: banks are required to increase their general loan loss provisions during an upswing, when specific provisions are usually small, and vice versa during downswings. In this way, dynamic loan loss provisioning reduces the

procyclicality of banks' loan losses and income.

If macroprudential policy's primary objective is not the building up and running down of banks' buffers but instead to halt excessive lending and indebtedness, tools that directly impact credit demand and supply or debt accumulation could be highly effective. Such tools might include maximum loan-to-value (LTV) ratios for banks, maximum debt-to-income (DTI) ratios for households, limits on the growth of banks' lending, and taxes on banks' short-term market-based funding (Table 2).

Macroprudential tools (Table 2) include both rules-based (permanent) and discretionary (flexible) tools. Rules-based tools are automatically countercyclical and work without policy decisions based on economic conditions. Dynamic provisioning is the best example of this type of macroprudential tool. Discretionary tools become operative only if macroprudential authorities make specific decisions to use them.

The use of some macroprudential tools can be both rules-based and discretionary. For example, under the Basel III reform, the basis for countercyclical capital buffers is the Basel committee's defining calculation rule, but national officials can also use their discretion in deciding on buffer requirements.

The table does not include numerous changes in financial rules

Chart 2.

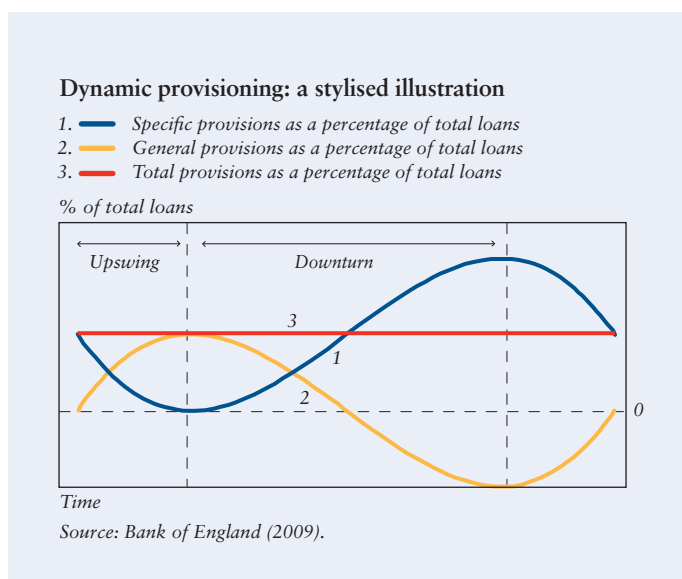


Table 2.

Examples of potential macroprudential tools	
Primary objective	Tools
Accumulation and run-down of countercyclical buffers	Countercyclical capital buffer requirements, dynamic loan loss provisioning, countercyclical haircuts on loan collateral, risk-based deposit guarantee premia
Restraint of lending	Limits on total amount of customer lending (LTV, DTI) or growth of bank lending, changes in risk-weights in capital adequacy calculation, banks' minimum reserve requirements
Restraint of banks' acquisition of short-term funding	Tax on short-term (or non-deposit) funding
Reducing incentive for banks' overall risk taking	Limiting discretion vis-à-vis salaries and dividends or taxing them
Regulations based on banks' systemic importance	Capital requirements or bank tax based on systemic importance

Source: Bank of Finland.

that are in the preparatory or planning stage, which will reduce systemic risks and strengthen financial institutions' ability to carry risk but which are not primarily aimed at reducing the procyclicality of the financial system. For example, the major part of regulations concerning banks' capital adequacy and liquidity are beyond the scope of this article.

We still have very little experience and analytical findings on the use of macroprudential tools.⁷ One of the biggest challenges to macroprudential policy is to find policy tools that can target the key factors in the formation and realisation of systemic risks, that impact quickly,

and that work automatically or can be swiftly implemented.

Conduct of macroprudential policy

National authorities responsible for financial stability were not sufficiently aware of the risks facing the EU as a whole in the years immediately prior to the financial crisis. Based on the lessons learned from the crisis, it was decided to establish a Union-level body, the European Systemic Risk Board (ESRB), to monitor risks to the financial system as a whole. The board is part of the new European System of Financial Supervision (ESF), which includes three new EU-level groups of supervisory authorities.

The ESRB began to function at the start of 2011. Its task is to

⁷ CGFS (2010).

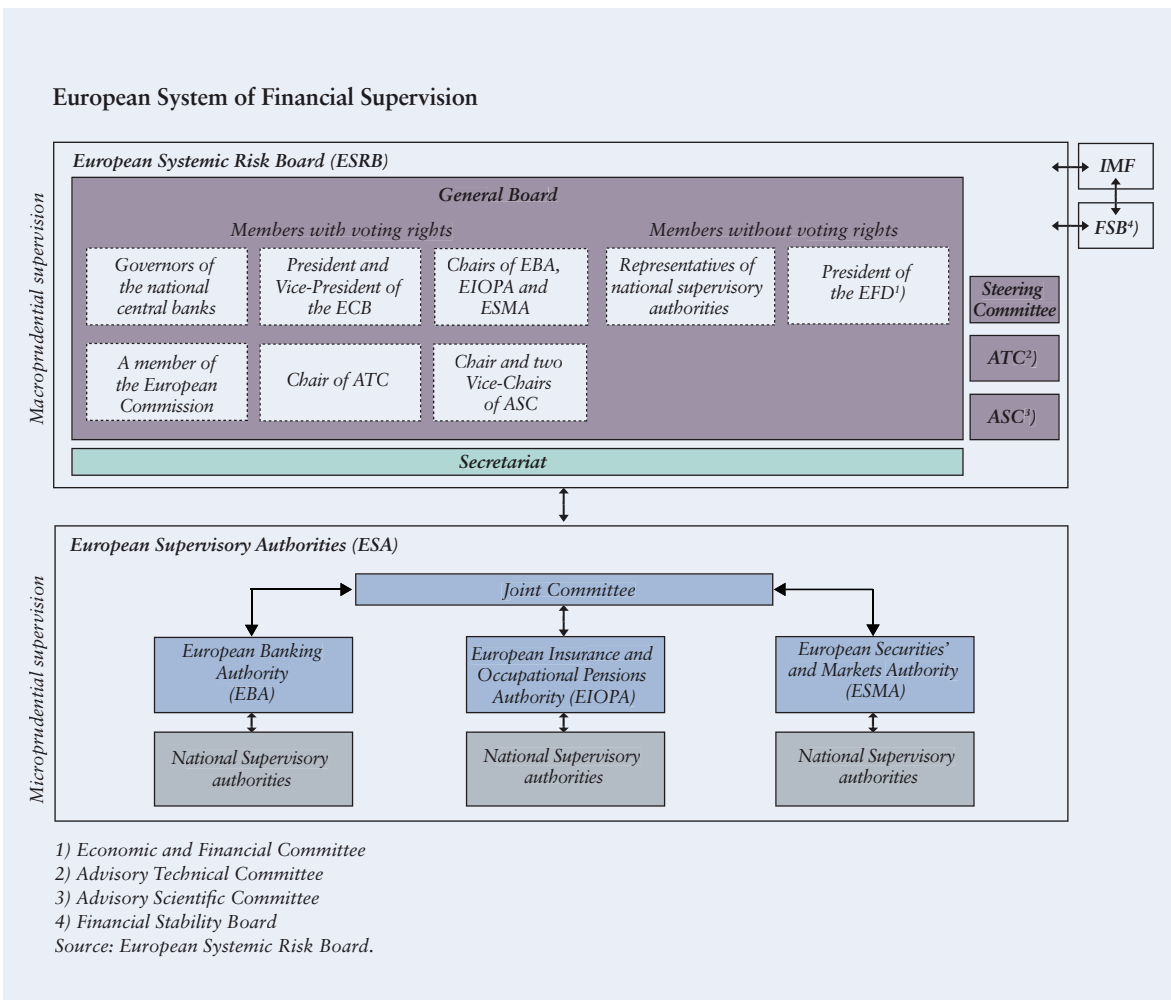
identify on-coming threats to the financial system. In order to prevent realisation of risks, the board can issue risk warnings and recommend measures to the EU as a whole, to individual or groups of member-states, to the new European financial supervisors, or to national financial supervisors.

The ECB and national central banks are at the core of the ESRB.

The President of the ECB serves as chairperson of the ESRB, and the governors of EU central banks and the Vice President of the ECB are voting members and supervisors of the ESRB.

Implementation of ESRB recommendations and other national macroprudential policy matters, however, remain in the hands of national authorities. The different

Chart 3.



countries are likely to have different frameworks for macroprudential policy. Alternative approaches include having a single authority or group (macroprudential committee) responsible for macroprudential policy.

Monetary policy and financial stability

Recent experience of financial crisis and new research findings have shown that monetary policy based on a long period of low interest rates can be conducive to excessive risk taking by financial institutions and other economic agents, which would render it inconsistent with financial stability. Here, we examine, in light of theoretical and empirical findings, the types of mechanisms that incentivise banks' risk taking.

Events of recent years have restarted an older debate about the extent to which financial factors should be taken into account in monetary policy decisions. In an ideal world, macroprudential risks are effectively prevented by macroprudential policies, and monetary policy can be totally focused on price stability. But we will not be able – at least not in the near future – to ensure financial stability in all situations via macroprudential policy alone. For this reason monetary policy may have a place also in promoting the stability of the financial system. The scope of the debate includes difficult questions about the need for monetary policy to

‘lean against the wind’ (LATW)⁸ and about the need to coordinate monetary and macroprudential policies.

Accommodative monetary policy may encourage excessive risk taking

It is widely agreed that one of the central causes of the recent financial crisis was excessively accommodative monetary policy in the United States, which incentivised financial institutions and households to take on too much debt and too much risk. The effect of keeping the policy rate at a low level on financial institutions' incentive to take on risk is referred to as the risk-taking channel of monetary policy.⁹

The risk-taking channel is important from the perspective of macroprudential policy for at least two reasons. First, the price stability objective of monetary policy can at times be at odds with financial stability, especially if the risk-taking channel is quantitatively important. Secondly, the need to coordinate macroprudential and monetary policies is the more acute, the more pronounced the inconsistency between price stability-oriented monetary policy and financial stability.

⁸ This refers to policy in which the central bank tries to take account of changes in asset prices in its policy-making. An LATW central bank may eg pursue monetary tightening more aggressively when asset prices are rising rapidly than would a central bank focusing on the traditional inflation objective.

⁹ Borio and Zhu (2008).

The recent theoretical literature includes the modelling of several transmission channels by which monetary policy may influence banks' risk taking. A low level of interest rates may encourage some financial institutions to increase the weight of high-risk loans and investments in their portfolios in order to hit nominal-return targets.¹⁰ Compensation systems based on nominal returns can have the same effect. A low level of interest rates can also induce financial institutions to relax the terms and granting criteria for loans.¹¹ But a certain type of asymmetrical monetary policy has also been found to encourage excessive risk taking by financial institutions. This can be the

¹⁰ Rajan (2005).

¹¹ Dell'Ariccia and Marquez (2006).

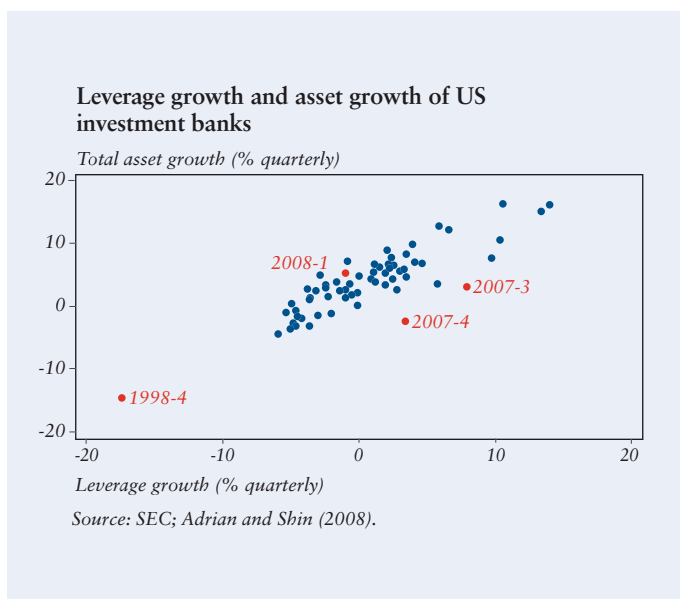
case if it is a known fact that the central bank acts in an asymmetric manner in the sense that it is passive during upswings in the financial cycle but active when problems began to appear.¹²

A low level of interest rates can also incentivise banks to excessively expand their balance sheets. A reduction in interest rates raises the value of assets and improves banks' profits, solvency, and possibilities to increase their collateralised funding. If banks aim at a fixed ratio of capital to assets, they will react to rising asset values by increasing their lending and investments.¹³ Adrian and Shin (2008) find that banks aim at such a fixed 'leverage ratio' over the course of the business cycle. Empirical results show that the leverage ratios of US investment banks were actually procyclical in the years immediately preceding the financial crisis. In other words, these investment banks simultaneously expanded both their balance sheets and their indebtedness in the years just before the financial crisis (Chart 4).

¹² Farhi and Tirole (2010).

¹³ According to the model of De Nicolò et al (2010), the effect of monetary policy on banks' risk taking incentive is more complex than is apparent in the literature. In their model, monetary policy affects the incentive to take risks not only via the search-for-yield but also via the reverse-effect of charter value. The latter works so that a fall in interest rates reduces banks' funding costs and thus raises the expected value of their earnings flows. An increase in charter value reduces the conflict of interest between a bank's shareholders and creditors and hence in its risk-taking proclivity. In certain economic conditions and certain types of banking systems, monetary easing may actually reduce banks' incentive to take risks.

Chart 4.



Recently published empirical studies have generally supported the above theoretical findings.¹⁴ But these studies do not provide sufficient information on the key transmission mechanisms of monetary policy and their quantitative significance.

What role for financial factors in monetary policy?

The economics literature has recently grappled with the question of how macroprudential factors should be taken into account in the conduct of monetary policy. Typically, the issue is how factors relating to financial institutions' risk taking affect the rules of monetary policy¹⁵, with special concern for the relationship between leaning-against-the-wind and more traditional monetary policy, based solely on an inflation target or output gap. This literature often also examines how a particular tool of macroprudential policy might affect the calibration of monetary policy and what effects the policy combination would have on overall social welfare.

Recent studies contain good examples of how the modern New Keynesian macroeconomic modelling paradigm can be employed to explicitly study the relationship

between LATW monetary policy and macroprudential policy. According to Woodford (2010), monetary policy should take account of the growth of economic agents' high-risk debts, as part of an effort to prevent financial crises, even though the central bank is unable to predict the formation of an asset bubble. He also advocates the use of separate macroprudential tools in the same fight, which would increase the effectiveness of LATW monetary policy.

Some of the studies have also found that the relationship between monetary and macroprudential policy depends on the types of shocks that impact the economy. Kannan et al (2009) and Angeloni and Faia (2009) use a New Keynesian framework, and incorporate a banking sector and a simple tool of macroprudential policy (such as the growth rate of lending or a countercyclical capital buffer). A special concern of these studies is to find monetary policy rules that produce the best end results after specified shocks. One finding is that in the event of a shock to the banking sector the optimal result is obtained if both monetary and macroprudential rules are employed; whereas, in the event of a productivity shock, macroprudential policy is less useful. Because of the simplicity of the models, these findings are only indicative, but they do suggest that, in choosing a policy combination, a large role should be given to discretion, because the nature of a

¹⁴ Eg Altunbas et al (2010) reviewed this literature.

¹⁵ Rules of monetary policy include the Taylor rules, which have been incorporated into many macroeconomic models. According to these rules, monetary policy settings are typically determined by prevailing inflationary pressures (usually compared to a target-inflation rate) and the output gap (between actual and potential output).

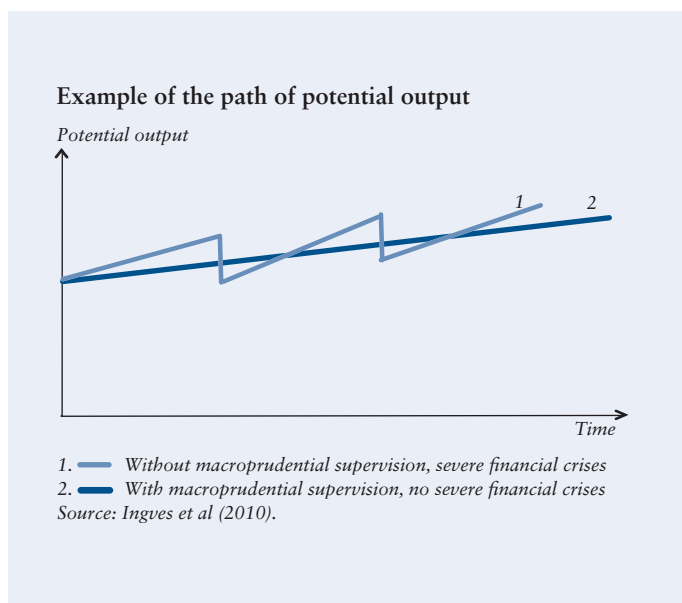
shock may differ greatly in different situations.

Considering the earlier studies leads one to ponder the extent to which the recent financial crisis has left a mark on the models presently employed. The current approach usually starts with the idea that excessive risk taking by banks is somewhat damaging as regards the maximisation of economic welfare and that such behaviour should be discouraged by means of LATW monetary policy or macroprudential policy. But is it possible that in non-crisis times such monetary tightening would produce, on average over the long run, a result that is worse in welfare terms than that produced by a monetary policy that gives less weight to macroprudential concerns?

This question has not received much attention in the literature. A kind of consensus has arisen that LATW monetary policy combined with a macroprudential aspect based on a simple metric may be more effective than traditional monetary policy. Nor does Woodford (2010) see any great danger that a traditional monetary policy rule would be undermined by a macroprudential aspect, which in terms of the central bank's objective would mean simply adding one more term to the rule equation, in addition to inflation and output gap.

Ingves et al (2010) looked at the relation between monetary and macroprudential policy specifically in terms of the implications of an increase in banking regulation for long-run stability of the economy and for welfare. Although output fluctuations are diminished, it is not clear that the average level of output rises when regulation is increased. It is possible that macroprudential policy instead would lead to a larger 'regulation premium' embedded in the true level of interest rates than would be the case for a traditional monetary policy regime, because banks' lending costs would increase also in non-crisis times (Chart 5), and would raise the economy's total financing costs. Overall, the academic literature is not yet able to give an unambiguous answer as to how the relative weighting of monetary and macroprudential policy affects overall social welfare.

Chart 5.



Coordination of monetary and macroprudential policy

The relationship between monetary and macroprudential policy is closely related to the question of their coordination. Three issues are involved: 1) Is coordination necessary? 2) How should coordination be accomplished? 3) Who should be responsible for implementing macroprudential policy?

Is coordination necessary?

In the recent economics literature, there has been a definite swing towards the idea that it would be useful to have a separate tool (in addition to monetary policy tools) for macroprudential policy. This conclusion does not seem to depend on whether monetary policy is of the traditional or LATW variety. The need for coordination also seems highly intuitive in light of the fact that the two types of policy affect each other. Hence it is difficult to imagine a situation in which the use of a tool of one regime would not affect the use of a tool of the other regime.

Whatever the need for coordination, the usual economic situation is one in which monetary policy and macroprudential policy would be mutually compatible. A typical example is that when there is economic overheating both inflationary pressure and macroprudential risks are on the rise, and both

policy tools need to be in tightening mode. At other times, a situation of conflict in the use of the tools may prevail, which will underline the importance of macroprudential policy.¹⁶ This can occur eg if the need for traditional monetary tightening is muted because there is very little inflationary pressure while at the same time the macroprudential metrics are signalling a need to tighten (push me-pull you problem).

At worst, failure to coordinate could lead to a situation wherein a macroprudential policy failure causes overindebtedness of the economy, and when the bubble bursts the need to reduce indebtedness would compromise the economic-stimulus effect of accommodative monetary policy. Bean et al (2010) examined this problem using a simple New Keynesian model with the built-in assumption that monetary and macroprudential policies are conducted in an uncoordinated manner. The result was a non-optimal solution for the real economy, in which both macroprudential policy and monetary policy are overly aggressive. This result again underlines the need for coordination.

How should coordination be accomplished?

If we accept the need for coordination, the question arises as to how to accomplish it. One theoretical approach is to apply the analogue of

At worst, coordination of monetary and macroprudential policies could render an excessively indebted economy unable to benefit from monetary stimulation.

¹⁶ De Nicolo et al (2010).

monetary-fiscal policy coordination. Lambertini and Rovelli (2004) have presented an idea based on game theory: in a situation where the players (central bank and fiscal authority) take turns making their – individually optimal – moves, it is best for both that the fiscal authority would move first. Once the fiscal authority has made the first move, the central bank takes into account the new situation in deciding on its own move. This model is also intuitively reasonable because the decision mechanisms and transmission channels of fiscal policy are usually slower and more complex than those of monetary policy. This line of reasoning seems equally natural as regards the coordination of monetary policy and macroprudential policy: the stance of macroprudential policy can be treated as a given when a monetary measure is contemplated.

Who should be responsible for implementing macroprudential policy?

In a situation where monetary policy is conducted by a traditional central bank and microprudential policies are handled by financial supervisors, the question naturally comes to mind as to who should be responsible for macroprudential supervision. Based on our present knowledge, it is difficult to take a firm stand on the issue. The above-mentioned idea,¹⁷

¹⁷ De Nicolo et al (2010).

that the connection between macroprudential policy and monetary policy is more complicated than generally understood, can be seen as an argument for having the central bank handle macroprudential policy. A similar rationale supports the idea that coordination of monetary and macroprudential policy requires much discretionary leeway to react to the different kinds of shocks that hit the economy.¹⁸ On the other hand, the idea that macroprudential policy could divert attention from the price-stability goal if the central bank is responsible for both policy segments, argues for some other solution.

Consensus on macroprudential policy is essential

The analytical tools for identifying systemic risks and the policy tools for reducing them are currently a hot topic for research around the world. What is important is that we arrive at a consensus on the definition and primary goal of macroprudential policy. An overly broad definition of macroprudential policy could at worst blur the borders of responsibility between authorities, hinder the organisation of macroprudential policy, raise expectations too high regarding the effectiveness of macroprudential policy, and ultimately reduce the credibility of macroprudential policy.

¹⁸ Kannan et al (2009); Angeloni and Faia (2009); Bean et al (2010).

The challenges related to coordination of monetary and macroprudential policies are central to the analysis of combined effects of the two policy segments. The need for coordination would seem most essential in two situations. The first is the above-mentioned scenario in which a long period of low-interest monetary policy creates significant threats to the stability of the economy. The second is where a lending and debt cycle is approaching culmination, and halting the process would require both tight macroprudential policy and LATW monetary policy.

The potential benefits of monetary and macroprudential policy coordination in these two situations depends acutely on the relative effectiveness of the two policies in preventing systemic risk. In an ideal world, macroprudential risks would be tackled by macroprudential policy

and monetary policy would be free to focus on price stability. The size of the gap between reality and the ideal as well as the huge costs to the macroeconomy that are engendered by a financial crisis argue for a broader-than-before focus on financial factors in making monetary policy decisions.

Key words: macroprudential policy, macroprudential tools, monetary policy, monetary policy rules, European Systemic Risk Board

References

- Adrian and Shin (2008) Financial intermediaries, financial stability and monetary policy. Federal Reserve Bank of Kansas City. Symposium at Jackson Hole.
- Angeloni and Faia (2009) A tale of two policies: prudential regulation and monetary policy with fragile banks. Kiel Institute for the World Economy Working Papers No. 1569. October.
- Altunbas, Gambacorta and Marquez-Ibanez (2010) Does monetary policy affect bank risk taking? BIS Working Papers No. 298.
- Bank of England (2009) The role of macroprudential policy. Discussion paper.
- Bean, Paustian, Penalver and Taylor (2010) Monetary policy after the fall. Federal Reserve Bank of Kansas City Annual Conference. Jackson Hole, Wyoming 28 August 2010.
- BIS (2010) 80th Annual report.
- Borio (2010) Implementing a macroprudential framework: blending boldness and realism. Speech, 22 June 2010.
- Borio and Zhu (2008) Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism. BIS Working Papers No. 268.
- CGFS Papers (2010) Macroprudential instruments and frameworks: a stocktaking of issues and experiences. CGFS Papers No 38.
- Dell’Ariccia and Marquez (2006) Lending booms and lending standards. *Journal of Finance* 2006, 61(5).
- De Nicolò, Dell’Ariccia, Laeven and Valencia (2010) Monetary policy and bank risk taking. IMF Staff Position Note No. 10/09.
- Farhi and Tirole (2010) Collective moral hazard, maturity mismatch and systemic bailouts. Mimeo, October 2010.
- Ingves, Apel and Lenntorp (2010) Monetary policy and financial stability – some future challenges. *Riksbank Economic Review* 2/2010.
- Kannan, Rabanal and Scott (2009) Monetary and macroprudential policy rules in a model with house price booms. IMF Working Paper No. 09/251.
- Lambertini and Rovelli (2004) Monetary and fiscal policy coordination and macroeconomic stabilization: a theoretical analysis. Università di Bologna. Mimeo.
- N’Diaye (2009) Countercyclical macroprudential policies in a supporting role to monetary policy. IMF Working Paper No. 09/257.
- Rajan (2005) Has financial development made the world riskier? Proceedings. Federal Reserve Bank of Kansas City. August.
- Schauman and Taipalus (2011) How can we identify risks to macrostability? *Bank of Finland Bulletin* 1/2011.
- Vauhkonen, Jukka (2010) Basel III -uudistus parantaa pankkien riskinkantokykyä. *Euro & talous* 3/2010.
- Woodford (2010) Inflation targeting and financial stability. Presentation at the conference ‘The Future of Monetary Policy’. Rome 30 September 2010.