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Putting Macroprudential Policy to Work

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Foreword

Klaas Knot

In Europe, we are entering a new financial era with a centralised banking union and a largely decentralised macroprudential policy. This reflects the need to promote strong supervision, while also addressing diverging financial cycles between countries.

This era is by any measure a challenging one. In recent years, we have learned that not addressing systemic imbalances can have high costs. Now that we know that we should employ macroprudential policy to address these imbalances, we are faced with the difficulty that we only have limited practical experience to go by. Policy making in the coming years will thus inevitably be a process of 'learning by doing'. Moreover, the situation in Europe is perhaps even more complex than in other parts of the world, as there are several layers of decision making in macroprudential policy. While the mandate rests predominantly with national authorities, the ECB will soon be empowered to tighten national policy measures.

Throughout this process, we will come across tough questions for which we have to find an answer. How ambitious should macroprudential authorities be? Which instruments should they use? When should they use them and in what measure? Who should be involved in the decision-making process? How do we deal with uncertainty and how do we counter the inaction bias? How does macroprudential policy interact with other policy areas?

These questions were discussed at a high-level seminar hosted by DNB on 10 June 2014. The event brought together senior policy makers, supervisors and academics at the forefront of macroprudential policy implementation. Their contributions are bundled in this DNB Occasional Study. The various papers provide substance and inspiration on this essential new policy area, enriched with practical experiences in various parts of the world.

Let me illustrate the importance of macroprudential policy with an example close to home and dear to my heart: the Dutch mortgage market. Since the mid-1990s, mortgage debt in the Netherlands grew unabatedly to a level which now exceeds our annual GDP. The root causes of this tremendous mortgage growth are of a structural nature: a generous tax treatment of mortgages and supply-side rigidities in the housing market. Credit growth was further fuelled by lax lending standards.

Notwithstanding clear signs that excessive credit growth carried large risks, policymakers were reluctant to take action. For instance, it was recognized that the preferential tax treatment of mortgages helped spur the boom. Nevertheless, tax deductibility remained intact. Loan-to-Value (LTV) restrictions were considered, but not applied. DNB suggestions to limit these ratios met fierce resistance. It was argued that public authorities should not intervene in private contracts between banks and their customers. In all fairness: DNB, in its capacity as a microprudential supervisor, did not push for LTV restrictions either. We believed our microprudential mandate did not empower us to address macrofinancial risks, such as those on the housing market.

Even a proposal to limit the extension of interest only mortgages, coming from the banking industry itself, was rejected by the Dutch competition authority. It judged that such a limit would unduly restrict consumers' freedom of choice.

In sum: everybody cared, but nobody took action. The consequences have been unfortunate. House prices have fallen by more than 20% since the financial crisis erupted in 2008, and 30% of Dutch mortgages are currently 'under water'. More than a million households are cutting their expenditures and raising their savings to bring their finances back in order, thereby amplifying the economic downturn.

This experience in the Netherlands – but also similar episodes in Ireland and Spain – has demonstrated the importance of addressing real estate imbalances early on. When remedial actions are not taken, the need for adjustment does not disappear, but actually becomes larger. Indeed, over the past two years, the Dutch government has taken several important steps to stabilize the mortgage and housing market. These include lowering the maximum LTV ratio step-by-step (by 1 % point a year, on current plans to 100% in 2018), stimulating mortgage debt amortization and gradually reducing the tax deductibility of interest payments on mortgages. But there is still quite a way to go.

We need to ensure that next time will be different. It is encouraging that many countries have taken steps to bolster their institutional framework. Macroprudential authorities with explicit financial stability mandates have been created. In Europe, since the beginning of this year, these authorities have novel policy instruments at their disposal. Moreover, a recent ESRB survey reveals that more than 15 EU countries have employed or are about to employ one or more of these instruments. Indeed, countries like Belgium, Denmark, Sweden and the UK, who are currently confronted with rising household debt and sharply rising house prices, have taken initial macroprudential steps to dampen the financial cycle.

These developments show that countries around the world are progressing in the operationalisation of macroprudential policy. I hope that this Occasional Study brings them inspiration in this challenging task.

1. Introduction

Aerdt Houben, Rob Nijskens and Mark Teunissen

The great financial crisis of 2007-2009 again illustrated the enormous costs of financial imbalances. Since the crisis, advanced economies have suffered a cumulative output loss of 33% relative to its pre-crisis trend, an increase in public debt amounting to 21% of GDP and direct fiscal costs totaling around 4% of GDP.[1] These losses demonstrate the need for macroprudential measures that reduce the incidence and impact of systemic crises.

This need has been acknowledged by economists and policymakers alike, and much has been written on the theory of macroprudential policy. Now the time has come to put these insights to work. To bring together key players in this new policy arena, DNB organized a high-level seminar on 10 June 2014; the speakers' contributions are bundled in this Occasional Study. In this introductory chapter, we first identify 10 key take-aways from the seminar. Subsequently, we zoom in on an important prerequisite for making macroprudential policy a success: establishing a clear bias for action.

1.1 Key take-aways

(1) Macroprudential policy should be ambitious. It should smooth the financial cycle, besides enhancing the resilience of the financial sector.
From a welfare perspective, relying on enhanced resilience and improved resolution regimes to weather a crisis is important but insufficient. Although the effects of macroprudential policy are uncertain, authorities should strive to smoothen the cycle in order to reduce the risk of large, systemic shocks that can trigger the need for lender-of-last-resort financing or other forms of public support.

Moreover, macroprudential policy should target the financial cycle, not the business cycle. This contributes to macroeconomic stability by containing unsustainable credit booms and by reducing the impact of shocks on the provision of credit to the economy. Beyond this, macroprudential policies should not be overburdened with a broader role in macroeconomic

management of the real economy, nor in correcting shortcomings in other macroeconomic (fiscal, monetary) policy fields, as this would mix up policy responsibilities and create moral hazard.

(2) *Macroprudential policy is expected to be more important in the euro area than elsewhere, because Europe has a bank-dominated financial sector that is fragmented along national lines and that lacks common macroeconomic instruments to address diverging financial cycles.*
The euro area economy relies heavily on bank credit. As the macro-prudential toolbox operates predominantly through the banking sector, macroprudential policy will be more powerful than in economies which are more market-oriented (such as the US). European banks operate mostly in local retail markets, with distinct structural and fiscal characteristics, and cross-border bank penetration is relatively low. Because of this fragmentation, national macroprudential policy is relatively effective in influencing domestic financial conditions.

Moreover, in a currency union such as the euro area, macroprudential policy is especially important for dealing with diverging financial cycles, given the absence of country-specific monetary and exchange rate policies in combination with institutional constraints on fiscal policy.

(3) *Real estate is often at the heart of financial crises. Reducing the cyclicality of real estate developments should therefore be a prime goal of macroprudential policy.*
Real estate is generally not only the largest component of household wealth, it is also primarily financed by banks and plays a key role in monetary policy transmission and labor mobility. The real estate sector is thus crucial for financial stability. Limiting real estate cyclicality and strengthening resilience to real estate shocks may require keeping loan-to-value (LTV) ratios at or below the level where homeowners

can readily absorb potential price shocks. A similar measure can be implemented in commercial real estate markets.

In this context, Sweden has introduced an LTV cap of 85% in 2010, to mitigate the risks associated with rapid mortgage credit growth in the household sector. This LTV cap has had a dampening effect on debt accumulation: most Swedish households currently have mortgages below 85% of the value of their home, and households with LTV ratios above 85% amortize at a more rapid rate. To enhance the resilience of the Swedish financial system and to further dampen credit growth, the LTV cap has been accompanied by other macroprudential measures: an increase in bank capital requirements, the introduction of risk-weight floors on mortgage loans and, very recently, the activation of the countercyclical capital buffer at 1%.

(4) The macroprudential toolkit should be expanded to give macroprudential authorities the flexibility to address a wide variety of systemic threats, while keeping economic distortions to a minimum.

The CRR/CRD IV provides a range of macroprudential instruments, which mainly affect banks' capital requirements. However, there is merit in expanding the toolkit with instruments that depend less on costs/incentives and more on quantitative limits. There is evidence that the latter are more effective in actually limiting excessive debt build-up.

A wider range of policy instruments broadens the ability of the macroprudential authority to address systemic threats while limiting macroeconomic distortions. Reliance on several instruments can help distribute potential adverse side-effects of an intervention across a broader range of actors and sectors in the financial system. The envisaged toolkit extensions include LTV and debt-to-income ratios, loan-to-deposit ratios, time-varying leverage ratios, margins/haircuts in financial markets, as well as large exposure limits for sectors (real estate, sovereign) and not just for individual clients.

The benefits of using multiple instruments can be illustrated by the case of South Korea, where banks were heavily reliant on market funding in foreign currency (FX) in the run-up to the recent crisis. In 2010, the authorities introduced both a leverage cap on FX derivatives and a levy on non-core (market) liabilities denominated in foreign currency. These measures stabilized the funding of the Korean banking sector and reduced its dependence on foreign capital inflows.

(5) *Historical evidence indicates that there is no long run negative relationship between capital ratios and economic growth.*
In the short run, there can be a negative impact on growth, as banks seek to deleverage to comply with higher capital requirements. This can be mitigated by demanding capital increases in absolute (nominal) terms.
In the long run, however, historical evidence indicates no significant negative relationship between capital ratios and economic growth. Empirical studies of the capitalization of US, UK and Dutch banks show that very different levels of capital have coincided with similar rates of economic growth.
From a social perspective, higher capital requirements have mainly positive effects.

(6) *Central banks should play a leading role in macroprudential policy, in line with their expertise, responsibility for financial stability and independence.*
The central bank has a comparative advantage in systemic risk identification, has clear incentives to safeguard financial stability as a prerequisite for effective monetary policy, and is independent from political pressure.
By implication, the macroprudential policy response should generally be quicker with greater central bank involvement. At the same time, involving the relevant supervisory and regulatory agencies in the decision-making process is crucial. Not only because their insights can enrich the risk identification, but also because macroprudential policy tools are generally implemented through microprudential capital and liquidity requirements.

(7) The cross-border impact of macroprudential measures needs to be taken into account. Reciprocity is essential in this process, especially in the EU Single Market.
When countries take macroprudential measures to address systemic risks, this can be expected to have a positive impact on other countries as well, as it will be conducive to the resilience of the overall financial system. However, particularly in the EU Single Market, reciprocity is crucial to enhance the effectiveness of macroprudential measures. Reciprocity avoids cross-border arbitrage, fosters a level playing field and simplifies coordination between Member States and EU authorities.

(8) The perimeter of macroprudential policy should be wider than banks.
If risks are held by those actors that have the greatest capacity to hold them, risk-bearing capital is allocated efficiently and the resilience of the financial system is buttressed. However, macroprudential policies create incentives for regulatory arbitrage and can drive financial intermediation towards the unregulated shadow banking system. This may undermine the resilience of the financial system.

The perimeter of macroprudential policy should therefore be wider than banks, and include insurance companies, investment funds and the shadow banking sector. This will facilitate risk sharing among these sectors, while limiting the scope for regulatory arbitrage. Inter alia, this requires developing policies for addressing systemic risks in the shadow banking sector.

(9) The institutional framework should create a 'bias for action'.
Macroprudential policy is subject to an inaction bias: the combination of certain short-term costs and uncertain long-term benefits creates incentives to postpone policy action. This should be countered through an institutional design that stimulates timely macroprudential action. To strengthen both the ability and the willingness to act, a designated

authority should be given an explicit macroprudential mandate coupled with adequate policy instruments and strong accountability.

Providing this authority with 'constrained discretion' can further overcome the inaction bias. This means that the use of judgment is firmly anchored by a clear set of principles and guided by quantitative indicators and thresholds. Constrained discretion should thus incentivize authorities to take, rather than delay, precautionary action.

(10) The governance of macroprudential policy in Europe is too complex, creating inefficiencies and strengthening the inaction bias.
The coexistence of five layers in decision-making – national authorities, the ECB, the ESRB, the European Commission and the Council – makes the European system of macroprudential policy overly complex. This governance structure needs to be streamlined to overcome the inefficiencies and inaction bias stemming from such complexity.

1.2 Inaction bias

These ten take-aways are useful guideposts for decisive macroprudential policy actions in the future. The overarching challenge is how to counter the inaction bias. This is also a key lesson of the recent past. Looking back, despite signals that imbalances were building, policymakers failed to take mitigating action in the run-up to the crisis. Overcoming this bias can be helped by a clear understanding of what drove inaction. Three main causes can be identified.

A first motive for the failure to act was (and is) the limited understanding of systemic risks. Clearly, systemic risks are inherently difficult to identify: they materialize only in tail events, experience is limited, there is a shortage of leading indicators and the risks are often not reflected in market prices.[2] However, the vulnerabilities underlying the credit crisis were not

completely invisible to policymakers. In fact, in the run-up to the crisis financial stability reports spelt out concerns about the search for yield, excessive credit growth and financial innovation, together boosting leverage and a mispricing of risks in the financial system. But authorities did not translate these analyses into mitigating macroprudential measures. They underestimated the magnitude of the systemic risks and succumbed to an inaction bias.

Yet, even if systemic risks can be correctly identified, the burden of proof is generally much higher for policy action than for inaction. Macroprudential policy actions have tangible and potentially substantial short-term costs, but intangible long-term gains: how does one measure the benefits of a crisis avoided? On top of that, the transmission mechanism of macroprudential instruments to the final objective of financial stability (and intermediate objectives such as limiting credit growth) is diffuse and uncertain. These uncertainties have strengthened the tendency to delay policy action, to only require further analyses and to wait for more information.

Besides the uncertainties about systemic risks and macroprudential policy transmission, a second source of inaction has been the institutional environment, which provided no incentives for taking concrete measures. In fact, prior to the crisis, very few countries had designated macroprudential authorities with explicit financial stability mandates. Policymakers generally felt confident that the suite of monetary, fiscal and microprudential policy instruments, supported by market discipline, would deliver financial stability. These instruments could have been used to address macroprudential concerns, but in absence of an explicit mandate, other policy priorities prevailed. This held for monetary policy (focus on price stability), fiscal policy (focus on redistribution and sustainability of government finances) and microprudential policy (focus on individual institutions). There were no policies to address the build-up

of risks in the financial system as a whole. In particular, persistently low inflation allowed an extensive period of accommodating monetary policy in advanced economies. Low interest rates contributed to an unsustainable build-up of credit and leverage. Likewise, from a microprudential perspective, the development of institution-specific internal risk models allowed banks to reduce their capital holdings. This resulted in regulatory capital requirements that were significantly lower than needed to withstand a system-wide crisis, when negative feedback loops emerge. A major shortcoming of these requirements is that they did not account for the potential consequences of systemic risk.

Third, behavioral biases have hindered firm policy action. A number of biases stand out. Psychology shows that people generally underestimate risks that seem remote and that have not materialized for a long time: a phenomenon known as disaster myopia.[3] The unfolding of the financial crisis in Ireland is a case in point. As late as April 2008 the Irish authorities stated that '[…] Ireland has a healthy domestic banking sector with good shock-absorption capacity.'[4] The IMF had given a similarly reassuring message on Ireland in 2006, stating that 'the financial system seems well placed to absorb the impact of a downturn in either house prices or growth more generally.'[5] Moreover, policy makers tend to be biased toward information that is in line with their a priori beliefs, reflecting confirmation bias and cognitive dissonance. The IMF has identified this confirmation bias as one of the reasons for its continued focus, in the run-up to the crisis, on global imbalances and the US dollar's decline as the key risk to global financial stability. While this was a valid concern, it led the IMF to ignore other, financial sector related risks.[6]

Finally, level playing field considerations may act as a barrier for action. In particular, national macroprudential policymakers are likely to face opposition when they introduce measures that deviate from other countries. This may particularly occur in the European Union. Competition authorities

(and banks) will seek to counter any difference in the playing field, even when these differences reflect deviations in financial cycles or variances in macroprudential risks. The use of presumptive indicators and a clear-cut policy framework can serve to counter this bias. Over the long haul, this will lead to a more stable financial system which underpins the sustainability of the internal market.[7]

Conclusion

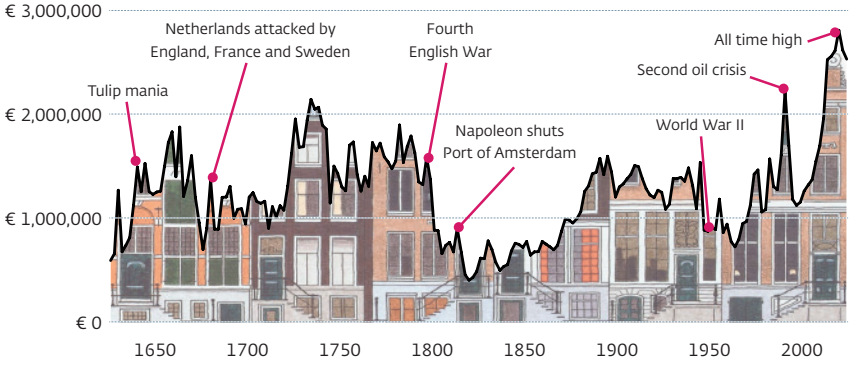
In short, the 2007-2009 global financial crisis and the subsequent sovereign and financial system strains in the euro area have underscored the importance of a macroprudential policy framework that fosters timely and decisive policy action. Encouragingly, a lot of progress has been made since 2009. Many countries have established designated macroprudential authorities with explicit financial stability mandates. Also, macroprudential toolkits have been developed; in the EU this toolkit has been formalized in the CRR/CRDIV.

Now that many countries have an institutional framework in place, the key challenge going forward is to make macroprudential policy truly operational, stimulating authorities to take action. Notable progress has been made in Asia. Policymakers in Hong Kong, India, Singapore, South Korea and Thailand have taken macroprudential measures to deal with the credit and asset price cycles driven by global capital inflows. Similar steps are being taken in Europe. Macroprudential authorities in for instance Belgium, the Netherlands, Norway, Sweden, Switzerland and the UK have taken pro-active steps to address systemic risks stemming from their housing and mortgage markets as well as from their large and concentrated financial sectors. Macroprudential policy is coming of age.

Addendum

Last but not least, the need for macroprudential policy is not new. The Herengracht index (depicted below) is evidence of four centuries of real estate cycles in the historical center of Amsterdam…

Four centuries of booms and busts on the canals



Price of a canal house on the Herengracht in Amsterdam, corrected for inflation.

Source: Eichholz (1997) and DNB

Notes

1 ESRB (2014), Flagship report on macroprudential policy in the banking sector.
2 Knot, K. (2014), Governance of macroprudential policy, in *Financial Stability Review* no. 18, Banque de France, 2014.
3 Houben, A.C.F.J. and Kakes, J.I. (2011), Risk identification and mitigation: lessons from the crisis, Chapter 5, in Regulation and banking after the crisis, *SUERF*, 2011.
4 Hurley, John (2008), Recent issues in financial stability, address by Governor John Hurley of the Central Bank and Financial Services Authority of Ireland to the Institute of Internal Auditors, 18 April 2008.
5 IMF (2006), Financial System Stability Assessment update Ireland, *IMF country report* no. 06/292.
6 IMF Independent Evaluation Office (2011), IMF performance in the run-up to the financial and economic crisis, evaluation report, 2011.
7 Houben, A.C.F.J., and J.I. Kakes (2013), Financial imbalances and macroprudential policy in a currency union, *DNB Occasional Studies* 11(5).

2. Making macro-prudential policy work

Vítor Constâncio

Let me begin by thanking De Nederlandsche Bank and Governor Klaas Knot for inviting me to speak at this very well-prepared seminar. My remarks briefly address the four main questions posed by the organisers that constitute the core topics of the sessions of the programme today. I will argue that macro-prudential policy should be ambitious in trying to smooth the cycle and, if so, it has to be prepared to be bold and intrusive. The set of instruments at the disposal of macro-prudential authorities needs to be widened and should be used aggressively, underpinned by robust empirical analysis. While monetary policy should normally not be employed to smoothen the credit cycle, under the principle of 'one objective, one tool', the macro-prudential policy function should be the responsibility of central banks, given the interactions between the two policy functions. This reflects the macro-prudential policy framework adopted for the European Central Bank (ECB)/Single Supervisory Mechanism (SSM).

How ambitious should macro-prudential policy be?

The aim of macro-prudential policy should definitely be about tempering the cycle, rather than merely enhancing the resilience of the financial sector ahead of crises. If it was all about strengthening resilience, we could impose capital ratios of 25 or 30% and a strict leverage ratio, believing that the world is a good approximation to the Modigliani-Miller (M&M) set-up, where the structure of liabilities does not influence a bank's market value or its funding costs. We would add a good resolution regime with all sorts of bail-in and, exaggerating somewhat, we could perhaps dismantle all the macro-prudential apparatus relying on the central banks to follow their 'mopping-up' approach after the crises. However, the world does not fully respect the M&M set-up, but as Miles et al. (2011) have shown, it does not correspond to the banker's world either,[1] a world focused on high returns on equity (ROEs) that are unadjusted to leverage and risk. Nevertheless, it seems unacceptable from a welfare perspective that, for instance, we

would passively watch the development of a bubble in housing and other asset prices, comforted by the idea that the banking sector is prepared to weather the storm and that the central bank would deal with the painful aftermath. To use a Dutch metaphor, this is not just about building dykes for resilience because, like King Canute, we have no hope of taming the tide. The analogy does not really work because financial instability is something man-made, and not an unassailable fact of nature.

Trying to smoothen out the financial cycle, of course, poses far more challenges than the task of building buffers as it is about addressing exogenous and endogenous risks to system-wide stability with targeted measures. Admittedly, fully controlling the financial cycle is an unattainable objective, but it would not be worth setting up the macro-prudential policy area if it were to refrain from attempting to fulfil the ambitious goal of influencing the credit cycle.

The challenges are multifaceted. The financial cycle has an important endogenous component.[2] For instance, easier credit encourages investors to buy more assets, which in turn increase the value of collateral, thereby fuelling the credit boom further. Hence, the expansion of credit in good times can, by itself, lead to excessive leverage in the financial system and increase the probability of crises, only to reverse in a symmetric fashion during a bust.[3] This pro-cyclicality of the financial sector contributes to the endogenous build-up of financial imbalances.[4]

A macroeconomic downturn, for example, would impair the value of bank loans. What could happen then is that multiple financial institutions decrease their holdings of loans or other assets contemporaneously to meet certain capital ratios, and this could easily lead to a credit crunch and/or fire-sales.[5] The macroeconomic effects of an excessive shrinkage of bank's assets would eventually lead to a reduction in investment which would further dampen the economic cycle. This in turn would lead

to a more pronounced reduction in credit, creating a vicious circle for the economy. These considerations suggest that the macro-prudential approach to financial regulation needs to factor-in general equilibrium effects by considering the strategic interaction of banks and the interlinkages between the financial sector and the real economy.

Containing systemic risk can thus be achieved largely by tempering the financial cycle. Macro-prudential tools should be used as a pre-emptive policy in the context of credit and asset price booms, especially property prices. In particular, the use of macro-prudential policies offer an approach that is the most targeted to reduce the incidence of credit booms and decrease the probability of costly busts. Earlier and decisive action seems to be paramount in this respect.[6] Let me also emphasise that it is crucial to address the risk of inertia by providing policy-makers with strong incentives to speedily address the build-up of systemic risk in an early phase. Borio (2012) defines the financial cycle as 'self-reinforcing interactions between perceptions of value and risk, attitudes towards risk and financing constraints, which translate into booms followed by busts',[7] a set of fluctuations that could be parsimoniously described in terms of credit and property prices. In this vein, one can speculate that, further down the road, a concept of long-term credit equilibrium can become some sort of intermediate target for macro-prudential policy.

My conclusion is that we need to curb the financial cycle, using an adequate toolkit. I will therefore now turn to macro-prudential policy instruments and their effectiveness.

What instruments should we use?

Limited understanding of macro-prudential policies

In advanced economies, experience concerning the use of macro-prudential policies is relatively limited, if you ignore all sorts of administrative interventions that were usual in many European countries from the 1960s to the 1980s, interventions such as limits to credit (or even limits to deposits, as in the United Kingdom in 1971-72) or minimum down payments for consumer credit. It is true that this was done more in the name of monetary policy as the absence of deep money markets made it difficult to use interest rates and open market operations to conduct it. Nevertheless the instruments also played a containment role on the credit cycle, but these were times of less sophisticated financial systems. Nowadays, the transmission channels of typical macro-prudential instruments are not well understood, which makes their calibration especially hard. Furthermore, little is known about how long it takes for those policies to work through the financial system, how large their effects are, or how banks react to them. We will, by necessity, have to start with some trial-and-error, to help us identify and address the main operational issues.

Macro-prudential policies can address financial imbalances building up in specific sectors, by using targeted instruments. The possibility of targeting specific imbalances strengthens the macro-prudential framework. At the same time, however, the variety of possible combinations of macro-prudential instruments also makes the implementation of macro-prudential policy a complex endeavour, which has to take into account interactions, leakages and waterbed effects.

It is worthwhile to group macro-prudential policies into different categories. I like the distinction between structural and time-varying

policy measures. It partly overlaps with the more traditional approach of separating cross-sectional and time-dimensional policy tools. However, structural measures encompass cross-sectional policies to mitigate contagion, but go beyond that, as they also include financial regulation. Indeed, financial regulation should be decided from a macro-prudential perspective, and should be concerned with the design of a resilient financial system. In this broader sense, regulation is the first instrument of macro-prudential policy. Taxes, Pigouvian or other, should also be considered as useful tools for macro-prudential purposes.

It should be noted that the distinction between structural and time-varying measures, is not always straightforward. By adjusting the calibration of a structural measure over time, like foreseen in Article 458 of the Capital Requirements Regulation (CCR), the distinction between the two types of tools becomes blurred. Another relevant concept for characterising policy measures relates to the way in which they operate. A distinction can be made between measures that act through cost-price incentives, like capital instruments, and those that depend on quantitative limits, like large exposures or loan-to value (LTV) and/or debt-to-income (DTI) ratios.

How high should structural capital requirements be?

The area in which the design of macro-prudential tools is most advanced is probably that of capital requirements for banks. In particular, there is a broad consensus that it is important to ensure that sufficient buffers are built up in good times, to be available in bad times. This is, naturally, about ensuring the resilience of the system. However, let us not forget that changing capital requirements over time has also been proposed as a way of dealing with the smoothing of the cycle. Curiously, there seems to be a possible disconnect between the theoretical arguments used to defend strong capital ratios or strict leverage ratios and the reasoning behind a time-varying use of capital instruments. The structural strength is justified

per se and is considered as not being costly in terms of the credit financing of the economy and economic growth. On the contrary, when capital instruments are used in a time-varying fashion they are expected to have a significant impact in mitigating the cycle. This disconnect deserves some reflection.

The main economic benefit of demanding higher capital ratios stems from the reduced frequency of future crises. The prevention and mitigation of downside tail risks for the economy implies a sizeable reduction of the expected output losses associated with systemic events and, as such, contributes to more sustainable economic growth over the long term. To be more precise, a study by the Basel Long-term Economic Impact Group has estimated that banking crises occur, on average, every 20 to 25 years. This estimate means that there is a 4.6% annual probability of a crisis. The study shows that a 4 percentage point increase in the capital ratio lowers this annual probability to less than 1%.

Additionally, higher capital levels decrease the likelihood of taxpayers' involvement in bank bailouts, and therefore decrease moral hazard induced by too-big-to-fail situations. To avoid systemic risk and limit the costs of the associated economic meltdown, governments may have to rescue banks. But such rescues can be very costly to the taxpayers and society as a whole, both ex post – the cost of the bailout – and ex ante – the excessive risk-taking induced by too-big-to-fail. Furthermore, the recent turbulences in the euro area have shown that bank bailouts can trigger chain reactions that are hard to stop. For instance, some governments had to support their systemically important national banks, which weighed negatively on their own public debt ratios. This created a negative feed-back loop between banks and sovereigns that contributed to financial fragmentation in the euro area and impaired the transmission of monetary policy.

In Europe, the establishment of the Single Resolution Mechanism (SRM) and the Bank Recovery and Resolution Directive (BRRD) are crucial steps towards containing excessive risk taking due to bail-out expectations. High capital requirements are the first, ex ante step to get banks to have 'skin in the game' and to address moral hazard. An orderly resolution mechanism that credibly rules out bailouts, except in truly extreme circumstances, is an ex post measure with ex ante effects on risk-taking. The SRM puts in place a single authority responsible for the resolution of banks in the euro area and participating Member States. This will enable swift and unbiased resolution decisions, which will address, inter alia, cross-border resolution cases in an effective manner. Public money would only be required at the very end of the resolution process, which should, in practice, happen extremely rarely.

The question is then whether banks can and should operate with capital ratios even higher than those agreed in the Basel III accord. The issue is quite thorny, since many commentators argue that increasing equity requirements for the banking system would excessively increase their cost of funding. As a consequence, intermediation would decline, which could seriously dent economic growth. But, in line with another strand of thought in the literature, such concerns about high capital ratios are not necessarily justified from a social point of view.

From a historical perspective, banks have long operated with more capital and with smaller implicit safety nets than today. Historical evidence seems to indicate that there is no relationship between the simple ratio of book capital to total assets (or its inverse, with leverage expressed as a multiplier) and economic growth. Haldane and Alessandri (2009) show that capital ratios for UK and US banks have declined steadily since 1880, until the first decade of the 2000s.[8] Miles et al. (2011) point out that in the United Kingdom, the leverage ratio as a multiplier over equity in the period from 1880 to 1960 was about half the level of recent decades.[9]

Similarly, Kashyap et al. (2010) demonstrate that the book value equity-to-assets ratio for US commercial banks has declined substantially over time: while the ratio exceeded 50% in the 1840s, it subsequently fell steadily to reach 15% in 1930s, and 6% in the 1940s.[10] The evidence for both countries indicates clearly that very different levels of capital coincided with similar rates of economic growth, showing no specific historical relationship between the two.

Turning to the relationship between simple book value capital-to-assets ratios and spreads or rates of business loans, neither Miles et al. (2011) nor Kashyap at al. (2010) find any evidence of a clear link between these ratios and bank lending rates in the United Kingdom since 1890 and in the United States since 1920 respectively.

Analysing a more recent period, Miles et al. (2011) find econometrically that doubling the capital ratio would not increase bank costs much. Kashyap et al. (2010) find that the long-run steady-state impact on loan rates is likely to be modest, falling in the range of 25 to 45 basis points for a 10 percentage point increase in the capital requirements.

Taylor (2012) documents that in advanced economies, 'the financial sector is now larger than it ever has been. The increase in size has been dramatic since the 1980s; after that date, compared with what had been the norm for more than a century, banks almost doubled their size relative to GDP measured by loan activity, and almost tripled measured by total balance sheet size'.[11, 12] Inter alia, the increasing socialisation of banks' costs – i.e. the safety nets which governments have extended to the banking system over time – that is not matched by a socialisation of banks' profits, which in fact remain private, can be responsible for the banks' relatively low equity buffers.[13] In other words, as the banking system became progressively too big to fail, it could operate with less own capital, thanks to increasing implicit guarantees from the government. On the other hand,

recent research at the ECB and at the Bank for International Settlements (BIS) shows that the continuing increase of the financial sector size has not always contributed to higher economic growth, in particular since the late 1990s.[14] In fact, some empirical evidence suggests that, above a certain threshold, the effects of finance on the growth potential weaken with the degree of economic development, as the effect of finance on growth is not necessarily monotonic. This phenomenon is connected to the complex non-linearities involved in the finance-growth nexus, causing the effect of finance on growth to peter out over the development cycle, as well as to the trade-off between growth and tail risk exacerbated by the expansion of the financial sector.

All the previous analyses seem to indicate that, from a social perspective, the cost of highly capitalised banks would in fact be relatively low. The relatively cheap cost of debt in comparison with the cost of equity is due, among other factors, to the widespread tax advantage that debt financing has over equity financing. It is also due to an implicit subsidy on debt funding that stems from implicit government guarantees for the banks, which is partly passed on to customers. A relatively higher level of equity funding reduces the riskiness of the banking system, and therefore the need of costly bail-outs, so that in the long run, taxpayers should be better off.[15]

The theoretical underpinning behind these ideas is the M&M theorem which states that if certain assumptions hold (symmetric information and rational behaviour of market participants, complete, frictionless markets, etc.), the funding structure of a firm is irrelevant for the value or funding costs of the firm. In an M&M world, the primary differences between the costs of debt and equity can stem only from their disparate tax treatment. The relevant point is that more capital reduces the volatility of the return on equity and increases the safety of debt, thereby it should reduce the

market's required returns on both equity and debt. This means that the equity risk for a bank should decline linearly with leverage.

These analyses, however, take a long-term view, whereas the problems may lie in the short-term effects. While the basic results of the M&M theorem may approximately hold in the long term, in itself a controversial statement after the crisis, financial markets are characterised, in the short run, by information asymmetries, myopic agents not optimizing inter-temporally and other frictions, which can be especially prevalent in distressed periods.

Another aspect stems from the fact that capital requirements are imposed in terms of ratios to risk-weighted assets which implies that banks have several possibilities to comply. Banks can raise capital, increase lending spreads, reduce dividends and/or downsize their (risk-weighted) assets or even adjust their internal models to decrease the denominator. In practice, it is likely that banks' adjustment is achieved through a combination of all these measures. There is empirical evidence, however, that in the short term, and in crisis periods in particular, banks react to capital (and liquidity) constraints by deleveraging and by tightening credit terms and conditions,[16] and that this can have a measurable impact on the loan supply, and thus on economic activity.[17] It is this short-term analysis with a greater distance from the M&M world that promises to add some efficiency to time-varying capital measures to smooth the cycle.

Macro-prudential policy: implementation issues and effectiveness

Regulators have recognised the importance of bank capital, notably by introducing not only a higher risk-weighted capital ratio, but also a counter-cyclical capital buffer (CCB) and a simple regulatory leverage ratio. I will discuss the latter two measures in turn.

In the Basel III framework, the CCB is the main counter-cyclical tool. It is designed to increase banks' resilience by making them set aside capital in good times, and to draw it down in bad times. If a release of the buffer in the downturn fosters bank lending in recessionary periods, the CCB will also have a counter-cyclical effect. Of course, the CCB can also contribute to stymieing the financial cycle in the upswing phase. However, I would see two limitations of the CCB.

First, given the relatively long lags in its implementation and impact, the CCB might not have a timely influence on the financial cycle. Indeed, the CCB should be activated relatively early in the cycle to give it time to display its effects. This increases the possibility of false alarms, which will, in turn, most likely lead to it being set at relatively low levels in order to mitigate the effect of a potential false alarm. In such a scenario, however, it runs the risk of being ineffective.

Second, such a tool could also be subject to so-called 'waterbed effects' or 'leakages'. In this regard, macro-prudential policies are not exempt from the usual search for regulatory arbitrage. Affected financial intermediaries may have incentives to circumvent regulation by moving activities outside the regulatory perimeter. By pushing financial intermediation towards the 'shadow banking' sector, the tool could even reduce the overall soundness of the financial system. Another possibility concerns the leakages towards branches of institutions from countries which do not use reciprocation. For example, for certain risks such as those of buoyant credit markets, the CCB can be set above 2.5%. In that case, the recognition of the higher buffer rate by other designated authorities would be voluntary. This lack of reciprocity might generate substitution effects towards branches of foreign banks, thus mitigating the intent of the buffer itself. Therefore, in order to make an effective use of the CCB, international cooperation will be key. At least in the euro area, the SSM framework helps to internalise some issues; for example, where necessary, the ECB can take action in the case of reciprocation.

Such leakages may explain why, in practice, macro-prudential policies seem, at times, to have had mixed results, which vary widely across countries. Most of the evidence on the effectiveness of those policies comes from experience in emerging market economies. Borio and Shim (2007), for example, argue that these measures have, in some cases, slowed down credit expansion temporarily and restrained imprudent practices.[18] It seems therefore possible, under certain conditions, to control financial developments in order to avoid the boom-and-bust cycle.

For it to have long lasting effects, macro-prudential policy must be used decisively, and it may be necessary to use several instruments at the same time. In addition, to avoid that imbalances spill over into other parts of the financial sector, possibly out of reach of supervision, the borders of the banking sector need to be carefully patrolled. Two telling examples are Singapore and China. Singapore has been a pioneer in the use of macro-prudential policies to moderate financial stability risks arising from the housing market. Since 2009, a series of measures targeting housing have been implemented, with a tightening of the LTV ratio for individual borrowers from 90% in 2009 to 40% in 2013. The cumulative impact of these measures has been slow, and residential property prices have stabilised only recently. In China, the introduction of an LTV ceiling of 80% in 2001 did not have much of a bite until it was complemented with DTI limits of 50% in 2005-06. But even then, the combination of the two measures was credited with reducing mortgage credit growth by only 2 percentage points of GDP over the period from 2004 to 2008. That is a sobering fact when one notes that LTV/DTI ratios have so far been the most efficient types of macro-prudential instrument. This illustrates that, to be effective, macro-prudential policy has to be pre-emptive, deployed in a timely manner and aggressively. Contemplating these results, we may doubt that, on the scale they have been foreseen, capital instruments, such as the CCB with a maximum of 2.5 percentage points, can be sufficiently effective to achieve more than a contribution to the robustness of the

banks in a downturn, after a boom which it was not high enough to mitigate, let alone to prevent.

Capital instruments, from the CCB to sectoral capital requirements, have their impact on the evolution of the cycle mainly through their effect on the cost/price of credit, and this may not be enough to offset the prospects of gain that seem readily available when every asset price is going up. Instruments with quantitative limits like the LTV/DTI ratios, as we have just recalled, can be more effective, but even these measures face difficulties if not used in a draconian way in certain cases.

The leverage ratio is another capital-based instrument that at least has the virtue of simplicity. It is a rougher measure than the CCB, and has been touted as a backstop to prevent risks that are not fully captured by risk weights from inflating banks' balance sheets. In fact, in some jurisdictions such as the United States, it is still the main constraint for most banks. It has the advantage of being simple to understand and implement, which is an attractive feature in an increasingly complex world.

However, the leverage ratio in its current static form cannot reduce pro-cyclicality. In good times, asset values typically go up, and profits and retained earnings increase, which in turn increases book capital. This can help to continue to increase credit, without going beyond the regulatory leverage threshold.

More in general, the impact of capital-based measures on banks' risk-taking has to be taken into account. Banks choose jointly a capital structure and an asset composition which maximises shareholders' return, subject to the constraint of having a low probability of default – this is where supervision comes in. If, in order to make sure that this probability of default is sufficiently low, we ask banks to keep a relatively high level of capital, they will increase their returns by taking on more risks on their

assets side. If capital is risk-weighted, banks will look for assets with undervalued risk weights. Typically, this is the case for assets that carry systemic risk, which is difficult to measure and to price. I am not advocating letting banks choose higher leverage in the hope that they will reduce risk in their assets; but I wonder whether we can really tailor risk weights to underlying idiosyncratic and systemic risk in a constantly evolving world.

The conclusion I draw here is that the leverage ratio can be a useful structural measure to contain risk-taking, as long as it is binding. If the leverage ratio is too low, it will not be a meaningful backstop to catch failures of the system of risk weights. After the recent new definitions for calculating the leverage ratio with some netting, the initially proposed level of 3% now seems too low and should be increased in the announced future decision on the final calibration. Perhaps capital is not the only instrument we should think of in order to control risk-taking and ensure resilience. Stricter rules on portfolio diversification might be a useful complement, as I will argue in a moment.

All in all, while macro-prudential tools should make an important contribution to effective policy making, we can already foresee that certain activities in the financial system may not be properly covered by the available instruments. Typically, a credit boom is more pronounced in only one or a few sectors, and it is mostly related to real estate. When exposures to certain sectors become especially problematic, they may need to be targeted by additional macro-prudential measures, e.g. capital surcharges on these specific exposures, or large exposure limits at the sectoral level. To identify such critical situations and intervene timely, macro-prudential authorities will need a sound system of risk monitoring across individual banks. To this end, it is necessary that macro-prudential authorities have full access to bank-level data. This would allow macro-prudential models to be fed with detailed high-quality and timely information. Moreover, it would allow micro- and macro-prudential analysis to be fully consistent.

Equally important is the need to gain a better understanding of how affected financial institutions react to the adopted policy measures and how this feeds back into the financial sector and into the economy. This would allow policy-makers to choose the appropriate instruments to address financial imbalances.

Macro-prudential tools in the EU are governed by two legal texts: the Capital Requirements Regulation (CRR) and the Capital Requirements Directive VI (CRD IV). The appropriate analytical underpinning needs to be gathered for the adequate design and calibration of tools at the disposal of macro-prudential authorities. At the same time, the range of tools might need to be expanded. The counter-cyclical capital buffer (Articles 130 and 135-140), the systemic risk buffer (Articles 133-134) and the capital surcharge for systemically important institutions (Article 131) fall under the CRD IV. The CRR includes (under Article 458): minimum capital requirements, large exposure limits, the capital conservation buffer, sectoral risk weights (in the residential and commercial property sectors) and intra-financial sector exposures, whereby higher risk weights can be set for financial sector exposures. Furthermore, it includes liquidity requirements (the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR)) and requirements on public disclosure aimed at enhancing market discipline and mitigating informational asymmetries.

While the range of tools might appear quite broad, it would gain in being supplemented with some instruments that are less dependent on costs/incentives and more on quantitative limits, such as large exposure limits for sectors and not just for clients. Other possible toolkit extensions to consider are the LTVs or DTIs ratios, the loans to deposit ratio, or the margins and haircuts used in some financial markets.

A final consideration relates to the fact that the cyclical behaviour of those parts of the financial sector that fall outside of the scope of regulation and

supervision needs to be influenced by other policies, possibly by monetary policy. For a central bank with macro-prudential responsibilities, the link between macro-prudential and monetary policy is therefore of particular relevance.

Interactions with monetary policy and governance issues

Let me first recall that financial stability is a precondition for the efficient conduct of monetary policy. Monetary policy that is successful in delivering price stability relies on the effectiveness of the monetary transmission mechanism. The central bank only has direct control over short-term interest rates. Monetary policy decisions on the level of interest rates work their way through the economy via various channels and affect both expectations and a broad range of asset prices. It is clear that financial instability would affect the transmission of monetary policy.

At the same time, price stability is supportive for financial stability. For example, unstable inflation developments could complicate the pricing of assets and blur the signals from relative price adjustments, with detrimental effects on resource allocation and the inter-temporal choices of savers and investors.

However, price stability is not a sufficient condition for financial stability. The developments in the run-up to the global financial crisis have shown that low and stable inflation rates may well be consistent with the build-up of financial imbalances, leading to an increase in systemic risk and, ultimately, to serious risks to price stability further down the line. More generally, as a result of the establishment of credible low inflation regimes in many parts of the world in the course of the last two-and-a-half decades, unsustainable economic developments seem to manifest

themselves primarily in the build-up of financial imbalances and asset bubbles, rather than in traditional inflationary pressures.

Indeed, what has been experienced most recently is not the only case in which financial distress has occurred in an environment of stable price developments. The recent period of extensive financial liberalisation, which started in the early 1980s, has been interspersed by a number of financial stress events. To name but a few, the financial crises in the Nordic countries, Japan, eastern Asia and Mexico all took place in circumstances in which inflation was not a threat. Also the dot-com bubble in the late 1990s was characterised by a rise in stock prices to unrealistic levels around the globe, and the most recent housing price bubbles in the United States and some European countries show that asset prices can deviate from their fundamental values even when the markets for consumer goods and services are stable.

As argued before, the fact that the financial crisis led to large disruptions in the economy is a strong reason to make the financial cycle a subject of stabilisation policies.[19] Monetary policy has traditionally been defined in terms of the business cycle. While not disconnected from the business cycle, the financial cycle has larger amplitude and is at least twice as long as the business cycle. Furthermore, its dynamics are driven more directly by credit and property price developments.

As part of its monetary policy strategy, the ECB already assigns a prominent role to financial developments, by taking into account the medium-term effects of booming credit and asset markets for the assessment of risks to price stability. Nonetheless, standard monetary policy may not be the most appropriate tool to address all the underlying forces driving the financial cycle.

First, it is not clear what would be the appropriate magnitude of changes in the policy rate to curb excessive developments in asset prices and credit. There is evidence that monetary policy could be a powerful instrument in a boom that is driven by increasing leverage. In such a situation, profits may be sensitive to relatively small changes in interest rates.[20] However, as just mentioned, the financial cycle differs from the business cycle in its amplitude, which could at times require much larger shifts in the policy rate than would be warranted by the outlook for inflation. It is obvious that such interest rate changes could cause collateral damage in the real economy.[21]

Second, financial cycles across euro area countries are still heterogeneous, while monetary policy is the same across the board. In fact, the vigorous growth in money and credit observed at the euro area level before the crisis was largely driven by developments in specific regions and sectors. The ECB's monetary policy is responsible for ensuring medium-term price stability in the euro area as whole. Tailoring monetary policy decisions to specific sectoral or regional differences in credit or asset price developments might have inappropriate side effects in other areas.

In the spirit of Tinbergen, these considerations suggest that two different objectives warrant the use of two different sets of instruments. The objective of monetary policy remains the safeguarding of medium-term price stability. As I have mentioned earlier, the main task of macro-prudential policy is to address risks to financial stability and to ultimately curb the financial cycle, so that the risk of financial crises occurring is reduced and real economic effects of financial crises are dampened. This separation is also consistent with the 'principle of effective market classification', according to which policies should be linked to those objectives on which they have the strongest impact.[22]

Whether the two different policy functions give rise to friction depends on the degree of complementarity of the respective policy objectives.

Usually, 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 facilitates the central bank's task of maintaining price stability by contributing to a stable monetary transmission mechanism – a precondition for a central bank to be able to discharge its task – and by avoiding that risks to price stability emanate from financial instability. Therefore, in those cases, the respective objectives of macro-prudential policy and monetary policy are mutually reinforcing.

In certain situations, however, the two policies may have different stances, one restricting, while the other is expanding, without this implying that they are in conflict, but that they can be complementary. That is precisely what happened at the time of the so-called 'great moderation', as well as what is happening at present. During the period of 'great moderation', monetary policy was loose enough to allow large increases in credit and leverage; there was a need for restrictive macro-prudential policy, but this policy area did not yet exist. At present, the low nominal growth requires a very accommodative monetary policy with low interest rates and the possibility of activating the 'the risk-taking channel'[23] and a search for yield. This environment calls for restrictive macro-prudential measures in the asset market where some froth is emerging.

In general, the two policy areas interact, and their effects on each other have to be considered. Macro-prudential policy influences credit conditions, and thereby also feeds back into the overall economy and, hence, the outlook for price stability. Monetary policy can, in the pursuit of price stability, affect systemic risk via a number of transmission channels. In particular, the risk-taking channel of monetary transmission suggests that the stance of monetary policy is probably an important determinant of financial activity and the overall level of risk in the financial system. These interactions gain force by being taken fully on board by decision-

makers, which is an argument in favour of having both competences under the same roof – that of the central bank. The alternative, used in several countries, is to give the macro-prudential policy mandate to a committee in which the central bank is given a prominent role, a solution that may well work, but is not as efficient as the other option.

Macro-prudential policies and the ECB's medium-term-oriented monetary policy strategy can therefore be seen as essential and mutually reinforcing elements of a policy framework that is conducive to effectively maintaining price stability in the medium run, and to mitigating systemic risk, and therefore safeguarding financial stability. The interaction effects of monetary policy and macro-prudential policy that I have just described suggest that coordination between the two policy functions is beneficial. The need for coordination and the fact that both monetary policy and macro-prudential policy take a macroeconomic perspective provide a strong motivation for integrating the two policy functions within one institution, the central bank, an entity with broad knowledge of markets, financial stability and the independence to take bold decisions when needed.

The Governing Council of the ECB is well placed to internalise the potential spillover effects between the two policy domains. The ECB's primary objective remains the maintenance of price stability over the medium term. The SSM Regulation also assigns macro-prudential responsibilities to the ECB, under which the ECB will be able to apply tighter macro-prudential requirements than the designated national macro-prudential authorities. We know that there are gains to be reaped from coordination if spillover effects are sizeable.[24] When coordination is key, it is best achieved within a single institution. In such a case, all relevant data can be shared promptly, and a common institutional culture and mission ensures internal communications and trust. Furthermore, if policy-makers are members of the same institution, they can decide in a flexible and pragmatic way on where to stand in terms of trade-offs between objectives and

instruments that change over time, while discussions in the alternative case of a committee of independent institutions might often turn around the limitations of their respective legal mandates and result in (possibly inferior) non-cooperative equilibria.

It has therefore been decided that the Governing Council will have a prominent role to play in matters related to macro-prudential policy. Regular joint meetings with the Supervisory Board of the SSM will be held to assess the relevant financial stability situation in the euro area and in each of its member countries.

Conclusion

Let me conclude. Macro-prudential policy is an offspring of the financial crisis. It is now being tested in advanced economies, with some encouraging results, notably with respect to the use of LTV ratios to contain housing price booms.

We lack good models for the analysis, with precision, of the transmission mechanisms of macro-prudential policy instruments. Economic theory is still centred far too much on the perfect world of rational agents, with stable and well-defined preferences who always optimize inter-temporally, in markets that eventually clear. Frictions can be added on top of these assumptions but, so far, they appear to be insufficient to adequately capture the stylised facts and non-linearities of the financial world. Policy-makers have to live closer to the real world of incomplete, imperfect markets, of myopic agents with herd behaviour, of distorted taxation and many other messy realities.

For the decisions we have to take, we will have to rely more on empirical studies of real experiences and sometimes precarious econometric evidence. This means that we have to accept uncertainty and cautious

experimentation when we decide what is necessary to stabilise an unstable financial system. Macro-prudential policy faces a major test going forward: will there be determination and boldness to try to smooth the financial cycle, or will the authorities just take refuge in strengthening financial institutions and in hiding behind monetary policy expected to 'mop-up' the mess created by the boom/bust feature of the financial system. Only time will tell, but in my view, the demands of the task are such that some measure of success can only be achieved if central banks are allowed to play a prominent role in macro-prudential policy decision-making.

Notes

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4 See Boissay, F., Collard, J.-E. and Smets, F., Booms and Banking Crises, ECB Working Paper 1514, 2014; Hahm, J.H., Shin, H.S. and Shin, K., Non-Core Bank Liabilities and Financial Vulnerability, mimeo, Princeton University, 2011; and Shin, H.S., *Risk and Liquidity*, Clarendon Lecture in Finance, Oxford University Press, 2010.

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7 Borio, C., 'The financial cycle and macroeconomics: What have we learnt?', *Working Paper Series*, No 395, Bank for International Settlements, 2012.

8 Haldane, A.G. and Alessandri, P., 'Banking on the Stare', paper based on a presentation delivered at the Federal Reserve Bank of Chicago's 12th annual International Banking Conference on 'The International Financial Crisis: Have the Rules of Finance Changed?', Chicago, 25 September 2009.

9 Miles, D., Yang, J. and Marcheggiano, G., 'Optimal bank capital', Discussion Paper Series, No 32, Bank of England, 2011, p. 6.

10 Kashyap, A.K., Stein J.C. and Hanson, S., 'An analysis of the impact of 'substantially heightened' capital requirements on large financial institutions', *mimeo*, 2010, p. 19.

11 Taylor, A., 'The Great Leveraging', *NBER Working Papers*, No 18290, National Bureau of Economic Research, 2012

12 A number of factors can explain these trends in capital levels, such as financial liberalisation and deregulation, as well as financial innovation, including the increasing role of shadow banking, and securitisation.

13 See Haldane and Alessandri, op. cit.

14 See Manganelli, S. and Popov, A., 'Finance and diversification', *Working Paper Series*, No. 1259, ECB, 2010; Popov, A., 'Financial liberalization, growth, and risk', *mimeo*, ECB, 2011; and Cecchetti, S. and Kharroubi, E., 'Reassessing the impact of finance on growth', *Working Paper Series*, No 38, Bank for International Settlements, 2012.

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22 See also Mundell (1962) who discussed this question in the context of monetary and fiscal policy.

23 The risk-taking channel suggests that monetary policy affects risk premia via lenders' or investors' willingness to take risk, e.g. via sticky return targets or an inherent counter-cyclicality of investor risk aversion (see Borio, C. and Zhu, H., 'Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism?', *Working Paper Series*, No. 268, Bank for International Settlements, December 2008, and the references therein).

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3. Systemic Risk and Macro-prudential Policy

Martin Hellwig

Introduction

Since the financial crisis of 2007-2009, authorities all over the world have begun to add macro-prudential policies to their arsenal of measures against risks to financial stability. Judging that 'the Union needs a specific body responsible for macro-prudential oversight across its financial system, which would identify risks to financial stability and, where necessary, issue risk warnings and recommendations for action to address such risks', the European Union has created the European Systemic Risk Board (ESRB), one of the new European Supervisory Agencies (ESAs), with the specific mission to 'conduct… macro-prudential oversight at the level of the Union.'[1] Member States have created new macro-prudential authorities or asked existing institutions, such as central banks or traditional bank supervisors, to take on the additional task of macro-prudential oversight.

For all their prominence in the legislation, however, there is no established definition for what the term 'macro-prudential' actually means. Nor is the legislation clear about how 'macro-prudential oversight' and macro-prudential policies relate to 'systemic risk' and to 'micro-prudential' supervision. The term 'systemic risk', which also figures prominently in the legislation, is equally unclear. A lawyer might suggest that, if these terms figure in the legislation, it is up to the courts to provide precise definitions. However, before leaving these matters to the lawyers and the judges, it may be useful to explain why the terms are unclear. In spelling out the different possible interpretations, one comes to realize that policy concerns and policy mandates are ambiguous and sometimes in conflict with each other. The conflicts need to be spelled out so that the resulting tradeoffs can be properly assessed.

The term 'macro-prudential' seems to have been created in a speech that Andrew Crockett, then the General Manager of the Bank for International Settlements (BIS), gave before the Eleventh International Conference of

Banking Supervisors in 2000.[2] In this speech, he pointed out that prudential supervision must be concerned with developments of the financial system at a macro level, as well as the micro level of each individual institution. He warned that trying to ensure the safety and soundness of individual institutions, one by one, might 'deliver too little, because … unless the authorities take into account the impact of the *collective behaviour of institutions on economic outcomes*, they may fail to monitor risks and take remedial action appropriately.' A system crisis is much more damaging than an individual bank failure, and system risks cannot be understood without a system perspective.

At the time, Crockett's warning was not heeded. Spain introduced countercyclical capital provisioning, a measure which we now see as a key macro-prudential policy, but even that seems to have been motivated by monetary policy concerns, rather than macro-prudential considerations; the Bank of Spain worried that the decrease in interest rates that accompanied Spain's entry into the European Monetary Union might lead to excessive inflation. Subsequently, this measure came to be seen as a stroke of genius, providing Spanish banks with an extra buffer that reduced the impact of losses in the initial stages of the financial crisis. By this time, it had become evident that, just as Crockett had warned, micro-prudential supervision had not been able to appreciate the buildup of risks in the years before the crisis, let alone to act on that information, and hindsight suggested that a macro-prudential view might have provided some warnings.

The notions of 'macro-prudential' oversight and 'macro-prudential' policies seem to have emerged as an amalgam of Andrew Crockett's warnings, the experience of 2008 showing that these warnings were justified, and the Bank of Spain's already having used a policy that may be called 'macro-prudential'. By its very nature, this amalgam does not provide us with a good basis for understanding what is really involved.

In Crockett's (2000) speech, macro-prudential concerns were related to 'systemic risk', understood as 'the likelihood of the failure, and corresponding costs, of significant portions of the financial system.' The term 'systemic risk' has of course been in use for a long time. Traditionally, it referred to *risks arising from the propagation of shocks inside the financial system*. In the most extreme version, problems at one, possibly small, bank would have repercussions for others that might end up endangering the entire financial system. In the wake of Crockett's warnings, and of the events of 2007 - 2009, the term 'systemic risk' has come to be used more generally for any *risks to the financial system* as a whole. In the political arena, it has also come to be used for *risks to the economy that might arise from problems in the financial system*. When the different concerns are seen in combination, they also give rise to concerns about *feedback effects* by which shocks to the financial system can have repercussions in the real economy, which in turn feed back into the financial system, etc.

These different notions of systemic risk differ from each other. For example, in the S&L crisis in the US in the 1980s, savings institutions were in trouble because they had followed similar strategies and were similarly exposed to the risks of a hike in interest rates and a downturn in real estate markets. Propagation inside the financial sector played no role, nor did the S&L crisis have much of an effect on the macro-economy. It did, however, impose a major burden on taxpayers.[3] The Swedish crisis of 1992 was also due to different banks' having pursued parallel strategies, which led to parallel exposures, again to the risks of a hike in interest rates and a downturn in real estate markets. In this episode again, propagation inside the financial system played a minor role (except between real-estate subsidiaries and parent banks), but the crisis induced a severe credit crunch, making the Swedish recession of the early nineties the sharpest since the Great Depression of the thirties. Finally, the severity of the financial crisis of 2007-2009 was due to contagion, mechanisms of shock propagation that greatly magnified the impact of initial losses from US real-estate funding.[4]

For analytical purposes, it is important to take account of the distinctions. Any analysis of systemic risk and any macro-prudential policy should address each form of systemic risk as a problem in its own right, without presuming that 'systemic risk' is just about a credit crunch or just about contagion. Recognizing the different forms of systemic risk and designing macro-prudential oversight and policies to match them is a major challenge.

Shock Propagation in the Financial System

There are several distinct channels by which systemic interdependence of financial institutions can induce contagion. Any assessment of shock propagation in the system must take account of all of these channels and of possible interactions between them.

Contractual Dominos

The most direct channel of contagion involves *domino effects through contractual relations*. If one institution goes bankrupt, all institutions with claims on the defaulting institution are damaged. Their claims are frozen, at east initially, and they must expect to take losses as claims on the debtor may not be repaid in full.

Thus, on September 15, 2008, the insolvency of Lehman Brothers caused the money market mutual fund Reserve Primary to 'break the buck' because the roughly $800 million that they had lent to Lehman Brothers were impaired. The resulting run caused Reserve Primary to be closed a short while after. On September 16, 2008, the insurance company AIG was bailed out because authorities in the United States feared that an insolvency of AIG might seriously damage all institutions to which AIG had sold credit default swaps. In these examples, contagion involves the failure of an institution to fulfil its obligations under *existing contracts*.

Sometimes, we also see contagion effects from the *disappearance of an institution as a potential contracting partner*. If an institution is regularly active in a certain market and others rely on being able to trade with or through this institution, the institution's failure forces these institutions to change their plans, perhaps leaving them exposed to risks that they had expected to shed through appropriate contracts.

Thus, when Reserve Primary and other money market funds were run upon after the Lehman bankruptcy, they were no longer available as a source of funds for banks, e.g., the Belgian-French bank Dexia or the German bank Hypo Real Estate that had been using the money market to fund the excess coverage for their covered bonds. Another example is the disappearance of Lehman Brothers as a market maker in certain CDS and repo markets, which caused problems for financial institutions that had relied on these markets for their risk management.

Information Contagion

A second channel involves *information contagion*. Information showing that one institution is in trouble can be relevant for the assessment of other institutions that are believed or known to have similar risk exposures as the institution that is in trouble. Thus, Reserve Primary's breaking the buck caused investors to reassess the risk of all money market mutual funds and to withdraw from these institutions, in a run that was only stopped when the US Treasury's offered an analogue of deposit insurance for money market mutual funds. Similarly, the fact that authorities in the US had not bailed out Lehman Brothers caused investors all over the world to reassess bank bailout prospects. This led to a sharp downturn in investors' willingness to fund banks, including a breakdown of interbank markets as banks no longer trusted each other.

There is a question as to whether 'information contagion' is always based on information. Could it be that investors' reactions to the observation of certain shocks involve an element of *hysteria contagion*, making them worry about all banks when they see Lehman Brothers declaring bankruptcy? What about investors' questioning all of 'Asia' in 1997, when they saw Thailand in trouble?[5] In the recent and still ongoing sovereign debt crisis in Europe, decision makers were worried that defaults on Greek or Cypriot sovereign debt might induce investors to lose confidence in Spanish or Italian sovereign debt even though there are substantial differences between these countries in terms of fiscal problems and fiscal capacities.

Behind this question, there is the issue that, in certain constellations, there might be *multiple equilibria*, i.e., multiple behavior constellations that would be mutually consistent in the sense that each participant's behavior is a best response to the other agents' behaviors. For example, if a bank uses short-term borrowing to fund long-term lending, depositors wondering whether to withdraw their money might leave it with the bank if they expect others to do the same and might wish to withdraw if they expect others to run on the bank. In such a constellation, a new piece of information might be objectively irrelevant and yet trigger a run because investors believe that it will affect other investors' behaviors.[6]

The *empirical literature on bank runs and banking crises* suggests that contagion and runs are driven by relevant new information about the institutions in question.[7] However, this finding does not quite eliminate the possibility of hysteria contagion. Hysteria contagion can also take the form of inordinate system responses to small changes in information, due to the fact that, on the basis of the information they have, participants form expectations about the information other participants may have and about the other participants' reactions to their information.[8]

Fire Sale Contagion

Another channel of contagion in the financial system involves markets and prices. An institution that is in difficulties may choose to sell assets in order to get cash or in order to reduce its leverage. Such asset sales put pressure on market prices. If market prices go down, all other institutions that hold these assets in their trading books have to write down their positions. These write-downs reduce these institutions' equity. Because of equity requirements or because of pressure from investors who are worried about the institutions' solvency, they may feel obliged to react and also sell assets. As they do so, the spiral proceeds further.

This mechanism played an important role in the period from August 2007 to October 2008 and again in the European crisis in the second half of 2010. In the early stages of the crisis of 2007 – 2009, it was mainly driven by the banks' lack of equity, as banks that were forced to take structured-investment vehicles onto their balance sheets found that their equity was insufficient; the lack of equity was exacerbated by the losses on mortgage-backed securities, MBS CDOs etc. that they had to acknowledge. Subsequently, in the panic after the Lehman bankruptcy, the process was driven by the scramble for cash as the runs on money market funds had caused money markets to freeze. In the European crisis in 2011, liquidity concerns and solvency concerns came together as the weak equity positions of European banks caused money market investors to withdraw their funding from these banks and, in November 2011, the European Summit's mandate for banks to strengthen their capital positions caused banks to sell assets in order to deleverage.

Fire sale contagion is the more pronounced the weaker the banks' equity positions are. The reason is that, with weak equity positions, the relative impact of losses on asset holdings is larger. If equity accounts for only three percent of total assets, a 1% loss on assets wipes out one third of the equity,

requiring a sale of roughly one third of the assets merely to return the equity position to 3 percent of total assets. If equity accounts for twenty percent of assets, a 1% loss on assets wipes out no more than 5% of the equity, so to restore the twenty percent ratio one only needs to sell five percent of the assets.

Market Breakdowns

Finally, market breakdowns also play an important role in contagion. Such a breakdown may be due *to a breakdown of trading infrastructures*. If an institution serves as a market maker, the disappearance of this market maker can have a dramatic negative effect on all institutions that regularly rely on this particular market. As mentioned above in the context of damage from the disappearance of contracting opportunities, an example was provided by Lehman Brothers suddenly disappearing as a market maker in certain CDS and repo markets. Looking forward, the replacement of over-the-counter markets by markets with central counterparty clearing may reduce the system's vulnerability from market intransparency but at the same time enhance the system's vulnerability from risks to the central counterparty.

Disappearance of trading facilities can also be the result of a *market freeze*, as occurred in August 2007 when uncertainty about the proper valuation for mortgage-backed securities and related derivatives caused a breakdown of markets for these securities. For institutions that were funding such securities through short-term debt, in particular, for the structured-investment vehicles of regulated banks, this market freeze created significant liquidity problems that required them to take recourse to the liquidity guarantees of the sponsoring banks.[9]

Even if a market does not freeze altogether, its functioning may be impaired by extreme volatility or large spreads. Such impairments are

usually caused by information problems, in particular in situations when participants fear that their counterparty's willingness to sell an asset, or a price decline in the market, may reflect adverse information rather than 'real' trading needs. The more potential buyers are afraid that market developments are driven by information, the less they are willing to respond to price movements and the greater must be the price movements that are needed to clear the markets as some participants may want to sell.

In 1998, fears of such radical market reaction were one reason why the Federal Reserve preferred Long Term Capital Management not to go into bankruptcy, with a quick liquidation of assets in a situation where markets were very jittery. At the time, the fire sale externality from such a liquidation might have been very destructive because quite a number of other funds were believed to have similar positions.

Market breakdowns involve some of the same mechanisms that I have discussed before, such as the disappearance of a contracting partner on whom one had counted or information contagion. Even so, it is useful to think of them as a separate category because interactions and contagion effects here work in a somewhat different manner, anonymously, through market prices and other market signals that participants may not identify with any particular other institutions.

System Risk Exposure

As mentioned in the introduction, risks to the financial system as a whole can be due to macro shocks affecting many institutions at once, or they can be due to contagion effects by which difficulties at individual institutions impose significant damage on others. In both cases, the system as a whole is affected, but the mechanisms involved are different – and so are the methods required to diagnose systemic risk and to deal with it.

Parallel Exposures to Macro Shocks

System exposure to macro shocks may involve interest rate risk, exchange rate risk, real-estate prices, or simply the macro-economy. Most of the major financial crises of recent decades have been associated with such shocks. The banking crises of the early 1980s had to do with high interest rates. The crises of the late 1980s and early 1990s again had to do with high interest rates, in combination with downturns in real-estate prices and in the macro-economy. The Asian crises in the late 1990s had to do with international capital movements, developments in competitiveness and trade, and exchange rates. More recently, the crisis of 2007-2009 started with the subprime mortgage crisis in the United States, which in turn seems to have been triggered by the Federal Reserve's tightening of monetary policy in 2005-2007, though the causes lay deeper of course.

In some of these cases, financial crises were due to the size of the macro shocks involved and to the parallel exposures of many institutions. An example would be the de *facto* insolvency of S&Ls in the United States in the early 1980s; this insolvency was due to the extent of maturity transformation and to the size of the interest rate shock.[10] The Swedish crisis of 1992 provides another example, as do the recent banking crises in Ireland and Spain.[11] By contrast, as mentioned above, the global financial crisis of 2007-2009 involved significant magnification by interconnectedness and contagion.

If system exposure to the risk of such shocks is mainly seen as a result of different institutions taking the same kinds of positions, then the assessment of systemic risk is a matter of gauging the positions of all institutions. Prevention will focus on the individual institution's risk management and try to provide incentives to limit such exposures. Macro-prudential oversight will focus on whether different institutions take similar

risks or, more generally, on the correlations between the risks taken by these institutions.[12]

Macro Risks Hidden in Correlated Counterparty Credit Risks

However, the *institution-oriented approach to assessing and limiting system risk exposure is insufficient* when shock propagation through the system can magnify overall exposure. An example is provided by the Thai crisis of 1997. In the run-up to the crisis, much lending, from foreign banks to Thai banks and from Thai banks to Thai firms, had taken place in dollar terms in order to eliminate exchange rate risks for lenders. After the devaluation of the Baht, however, Thai firms could not pay their dollar debts to Thai banks, and, with their debtors in default, Thai banks could not pay their dollar debts to foreign banks. In looking at the international banks' books before the crisis, one would not have guessed their actual exposure to the risk of a Baht devaluation because much of this exposure was hidden in the credit risk of their loans, which in turn was driven by the exchange-rate dependence of their debtors' debtors' credit risk.[13]

The problem pervades all uses of derivatives for risk sharing and risk shifting. The emergence of credit default swaps (CDS) has given it even more prominence. In the crisis of 2007 – 2009, the banks that had hedged the credit risks of subprime-mortgage-backed securities and associated derivatives through CDS with AIG and monoline insurers found that the counterparty credit risks of these hedges were strongly correlated with the underlying. Such correlations are to be expected if the counterparty takes many positions whose risks are highly correlated. After all, the counterparty is most endangered when the underlying moves adversely and the buyer of the hedge calls on the counterparty to perform.

In a previous era, banks were used to having macro risks in their own books, but since the 1980s, they have more and more tried to get the risks

off their books. This development has in part been due to a recognition that macro risks, in particular interest rate and exchange rate risks, had become larger, and that, in an increasingly competitive environment, banks were not really able to bear these risks.[14] In a sense, this was a reaction to the crises of the early and the late 1980s. In part, the development was also due to the development of new techniques for modelling, managing and trading risks, in particular, through derivatives.

When banks try to get macro risks off their books, the question is where these risks go. If they go to a party that has a comparative advantage in bearing them, the banks' risk management and risk contracting may reduce the overall risk exposure of the system. This would be the case, for example, if banks used covered bonds or mortgage-backed securities to get the interest rate risk of real-estate finance off their books, and if these securities end up with pension funds or annuity insurance providers that have long investment horizons. If instead, they end up with other banks, or with the special-purpose vehicles of such banks, the risks have merely been moved to a place where nobody can see them even though they still threaten the system.[15] The same is true for hedge contracts whose counterparty credit risks are highly correlated with the underlying.[16]

Risk-Based Capital Regulation and System Exposures to Macro Shocks

The use of new techniques for modelling, managing and trading risk was much encouraged by the Basel approach to the determination of required capital on the basis of risk weights and in particular by the 1996 Amendment to the Basel Accord to Incorporate Market Risk, which allowed banks to use their own risk models to assess their risks as well as the equity needed to back them. This approach encourages financial institutions to invest in the management of risk weights, in modelling risks and in hedging them so that they can economize on equity and maximize the amount of business they do with the equity they have.

However, if hedges are imperfect and if financial institutions and their supervisors neglect the correlated counterparty credit risk, they will underestimate the exposures of the individual institutions and of the overall system to these risks. This underestimation is likely to be most serious for risks that are correlated across institutions because they are jointly driven by macro shocks. The paradigmatic example is AIG selling CDS for mortgage-backed securities and CDOs for $500 billion without anybody appreciating that the risks in those contracts were driven by macro variables such as interest rates and real-estate price developments.

If the hiding of risks makes market participants and supervisors underestimate the overall system risk exposure, the use of advanced techniques to manage and trade risks, which seems to reduce the exposure of the individual institution, may actually increase the exposure of the overall system to adverse macro shocks. We must therefore be concerned that, in the modern system of risk management and risk trading between financial systems, system exposure to macro risks is no longer discernable by looking at each bank's books individually and then considering the correlations. Instead, we must be afraid that system exposure to macro risks is hidden in correlated counterparty credit risks and that adverse macro shocks play out through contracting dominos and other forms of shock propagation in the financial system.[17] This is the essence of the 2008 experience with AIG.[18]

In the years since 2007, many institutions came into difficulties because of risks that did not appear in their books and their models because they had been hedged and then neglected. For example, UBS Investment Bank used to hedge some of the credit risks of MBS CDOs that the bank held and to set the corresponding credit risk equal to zero in their risk model.[19] The bank's discretion over its own risk model and its ability to use this risk model to determine risk weights for positions in the trading book played an important role here. More generally, the UK's Financial Services Authority

(FSA) has found that banks' losses in the crisis were mainly centered in the trading book, that risks of positions in the trading book were greatly underestimated, and equity backing these positions quite inadequate.[20]

Empirical research on the banks' experiences in the global financial crisis has shown that, in the financial crisis of 2007-2009, equity relative to risk weighted assets was a poor predictor of institutions' robustness to the shocks that were hitting them. By contrast, equity relative to total assets was fairly reliable as a predictor of bank robustness in the crisis.[21] From a macro-prudential and systemic perspective, we must therefore rethink our approach to the assessment and regulation of risk in the financial system.

The Assessment of System Risk Exposure

The Need for a Systemic Approach

At some point in the early 1990s, when I was working on the efficient allocation of interest rate risk in the economy,[22] a person from Swiss Bank Corporation (SBC) with whom I talked about my research told me that, as far as his bank was concerned, this was a non-issue. According to him, SBC was using asset and liability management through money market borrowing and lending so as to match maturities in the bank's balance sheet and eliminate interest rate risk.[23] I was puzzled because, shortly before this conversation, Swiss banks had been hard hit by the fallout from the 1989/1990 interest rate hike.

Could it be, I asked myself, that, as they are engaged in asset and liability management, these banks do not actually see the extent of maturity transformation they are actually providing? The following thought experiment seems relevant. Suppose that there are three banks A, B, C, all of which have $1 billion in real-estate loans, $1 billion in deposits, and $1 in equity. In addition, bank A has made short-term loans of $100 billion to

bank B, bank B has made short-term loans of $100 billion to bank C, and Bank C has made short-term loans of $100 billion to bank A. Each bank individually believes that it has $100 billion in short-term assets and $101 billion in short-term liabilities, which seems like almost perfect maturity matching, reducing interest rate risk 'almost' to zero. Yet, the banking system as a whole is transforming deposits into mortgages. Whatever interest rate risk is inherent in this maturity transformation by the system as a whole and is not apparent in the banks' books must be hidden away in the counterparty and settlement risks of the short-term debt.[24]

In another thought experiment, consider a system with 480 institutions and suppose that institution n funds itself by borrowing at a maturity of n-1 months and invests its funds by lending at a maturity of n months. Each institution probably believes that it is almost perfectly maturity-matched. The system as a whole, however, is transforming demand deposits into 40-year mortgages. Here again, much of the interest rate risk that is associated with this substantial maturity transformation by the system as a whole is not discernible from the individual institutions' balance sheets but is hidden in the counterparty risks in interbank borrowing and lending. These risks themselves are difficult to see because, for example, the credit risk in bank 200's lending to bank 201 depends on the credit risk in bank 201's lending to bank 202, etc., and clearly, any one bank is unable to assess its counterparty's counterparty's counterparty's ... credit risk. To properly assess the overall system's risk exposure, one must look beyond these individual institutions and appreciate that the system as a whole is transforming demand deposits into 40-year mortgages.[25]

The examples are contrived, artificially constructed to make a point. But consider the following chain of positions in subprime mortgage origination and securitization: Money would go from an investor to a money market fund. In return for asset-backed commercial paper, the money market fund would give the money to a structured-investment

vehicle of a regulated bank. The structured-investment vehicle would use the money to buy CDOs from a special-purpose vehicle of an investment bank. The investment bank (or its SPV) would buy mortgage-backed securities from special-purpose vehicles of other investment banks. These other investment banks (or their SPVs) would buy the mortgages from the originating mortgage banks. The mortgage banks would lend the money to their mortgage clients, and the clients would use it to buy their houses. The chain of transactions has fewer than 480 elements, but it was long enough to allow the participants – and the supervisors – to have delusions about the extent of maturity transformation, liquidity risks, credit risks, and incentives.

A typical example is Gorton's (2010) assertion that, though nominally concluded for thirty years, subprime mortgage lending involved hardly any maturity transformation. According to Gorton, subprime mortgages were designed so as to be replaced by new mortgages after two or three years and therefore could be regarded as being effectively 'short-term' loans.[26] This argument neglects the problem that the renegotiation after two years might be unsuccessful because the debtor is unable to comply with the new conditions that the creditor wants to impose. For example, the debtor might by unable to pay the higher interest rates that the creditor wants to impose or needs to impose because his own financing conditions have changed.[27] This is another instance of the problem that shifting certain risks to another party may merely transform this risk into a counterparty credit risk.[28]

The important point is that the mortgage loans served to finance long-term assets. The long-term nature of the asset gives rise to certain risks that affect the financing relation even if they do not appear in the contract itself. The house that is financed by the mortgage loan has an economic lifetime of a few decades; during this lifetime, the accommodation services that this house provides are, by and large, given and can hardly be adapted to changes in the economic environment. In particular, the accommodation

services cannot be adapted to changes in market rates of interest that affect refinancing conditions and/or the market value of the property.

Refinancing risks and valuation risks of long-lived assets cannot be avoided, but *must* be borne by someone. If the ultimate financier is a short-term investor, they must be borne by someone else, and the intermediation chain *must* involve some maturity transformation. This maturity transformation, however, may only be recognizable by looking at the entire chain of transactions, asking, what are the 'real' assets that are being funded, what are the risks associated with these assets, and who is ultimately bearing these risks.

If, along the chain, someone is trying to hedge risks with third parties such as AIG, who are these third parties and what do we know about their place in the financial system and their ability to fulfill their obligations? There is thus a need for transparency about all parts of the financial system. Traditional arguments of the sort that hedge funds need no regulation because their investors are sophisticated enough to fend for themselves are moot when it comes to the systemic implications of such shadow banking institutions for the system's risk exposure. The importance of this concern is underlined by the fact that, in August 2007, the sudden realization of the extent to which MBS and CDOs had been held in shadow-banking institutions contributed greatly to the panic and to the decline in prices. Market participants had always known that structured-investment vehicles and the like held a lot of such securities, but they were shocked to learn that these holdings amounted to a trillion dollars and that, therefore, almost from one day to the next, securities originally worth a trillion dollars were in search of funding or of equity backing.

'Measurement' of System Risk Exposure versus 'Story Telling'

In am skeptical about the notion of that system risk exposure can be *measured*. To see why, consider the system risk that is hidden in the correlations between the counterparty credit risk sin hedge contracts and the underlying risks of macro shocks against which the hedge contracts are supposed to provide insurance. Even under the best of circumstances, it is notoriously difficult to obtain reliable estimates of risks correlations.[29] Time series are highly non-stationary, credit events are rare, and estimates of correlations require more observations than simple estimates of means and variances.

In fact, one may wonder whether in this context the notion of estimation or 'measurement' makes any sense at all: The counterparty's reliability depends on the counterparty's behavior, in particular, the other contracts it concludes and the risks to which it is exposed under these other contracts. Some of these risks in turn depend on the counterparty's counterparties' reliability, and so on. Thus, counterparty credit risk is endogenous and is undergoing constant change.

Exposure to the risk of fire sale externalities is also hardly 'measurable'. The extent of the externality depends on the asset positions held by the other market participants and on the extent to which the other market participants' equity enables them to absorb losses. As mentioned above, prior to August 2007, neither the regulators nor the market participants knew the extent to which mortgage-backed securities and CDOs were held by structured-investment vehicles and similar shadow-banking institutions without any backing by equity. If this information is not available, the risk from other institutions' selling in a panic cannot be reliably assessed.

Even if the information were available, estimates of system risks from fire sales might not be reliable because these risks also depend on the market's

reactions to fire sales. These reactions may very much depend on the situation. A given sale may precipitate a drastic price decline if the other market participants are very nervous and very vulnerable. The same sale may involve no systemic risk at all if market participants are calm and, with but a small rebate, there are plenty of buyers for the assets that are put for sale.

The Federal Reserve's worries in 1998 about letting LTCM go into bankruptcy provide an example. Under normal circumstances, unwinding of the LTCM portfolio would be considered unproblematic (as indeed it proved to be once the panic had been overcome), but the particular situation in September 1998, shortly after the Russian default and with may institutions hold similar portfolios as LTCM, was not normal, so the Federal Reserve feared that as a result of winding down LTCM, there might be a market meltdown. Systemic fallout from fire sales of institutions in difficulties is highly contingent, as it depends on the ability and the willingness of other to acquire the assets in question.

On many occasions when I have highlighted these difficulties and expressed my skepticism about the scope for 'measuring' systemic risk, I received the answer that the requisite information might be contained in market prices. For example, an individual institution's exposure to such risks would be considered by the institution's counterparties and would therefore affect the institution's spread, i.e. the premium that it must pay in excess of the riskless rate when it borrows.[30] However, the information contained in prices cannot be better than the aggregate of the information collected by participants. As a matter of principle, I do not see how the other market participants, or the analysts on whom they rely, can overcome the difficulties that I have just sketched.

The idea that systemic risk is something to be 'measured' combines the methodological traditions of finance and of macroeconomics. Estimation of return processes and return distributions is an essential element of applied

finance, especially as a basis for portfolio choice. In macroeconomics, development of a dynamic stochastic general-equilibrium model, with estimation or calibration of model parameters, provides the standard basis for forecasting and for policy analysis. In the crisis of 2007-2009, however, the standard empirical models in finance and macroeconomics failed. Both the theoretical models and the parameter estimates and calibrations were inadequate for the situation.

It may therefore be useful to draw on methodological approaches that are used in other parts of economics. In competition analysis and competition policy, for example, about the first thing one learns is that no one theoretical model is adequate for all situations. Industrial economics has a large zoo of theoretical models, and the analyst's first task in dealing with a competition policy 'case' is to decide which model from the zoo, or which combination of such models might be relevant to understand the problem on hand. This step requires a certain element of improvisation as one has to combine models or even to develop new ones in order to take proper account of all the relevant aspects the information one has been presented. There also is some interplay, in an iterative procedure, between the trying out of theoretical models and the collection and assessment of data, which may or may not be in a form that is suitable for serious statistical analysis. Detailed regression analysis or calibration come at a very late stage, when one begins to have a sense that one understands 'the story' behind the material with which one has been presented.

I submit that a similar approach would be very helpful in trying to assess system risk exposure. In Section 2, I exhibited a zoo of possible propagation mechanisms. Although I tried to impose some structure, it is not clear that the structure I imposed will prove to be useful in practice. Nor is it clear that the zoo is complete. To the contrary, I suspect that, as we are discussing the issue, the financial sector and the overall economy may be breeding some new species of propagation effects that we do not yet

know. In Section 3, I also exhibited a zoo of possible macro shocks. Not all of these shocks are equally relevant for all economies at all times. Nor are all the propagation effects equally relevant for all economies at all times.

For a proper assessment of system risk exposure, including potentially an understanding of risks whose precise similes we have not yet seen, we need to proceed as in competition analysis: Gather observations on what seems to be going on. Try to understand the 'story' that underlies new developments. Think as to which animals in our zoo of propagation effects and macro shocks might be relevant. Possibly also what mutations of the species we have studied might best be adapted to what we observe. All this must be done from a system perspective and going back and forth between the available data and the potential stories behind the data. This procedure involves a certain element of ad-hockery and is anything but foolproof. However, given the way in which the economy is constantly coming up with new patterns of interaction between the different participants, it seems like the best we can do. If we do not follow this approach and instead settle on single macro model and a single mechanism for systemic risk propagation, which we then estimate and calibrate, we can be pretty sure that the next big crisis will again be a big surprise.

The next crisis will also come as an unpleasant surprise if we do not take a comprehensive view of system risk. A comprehensive view requires that we start with the real assets that are being funded, and that we consider the entire chain, or chains, of intermediation and risk sharing up to those investors who are the ultimate claimants and risk bearers. If some elements of the chain are left out, we may be overlooking some important causes of systemic risk.

Challenges for Macro-prudential Policy

Conventional Macro-prudential policies

Most policy discussion of macro-prudential concerns focuses on *the interaction of the financial with the real economy over the business cycle*. Such a focus seems implied by the very word 'macro'. It is also suggested by the Spanish experiment with countercyclical provisioning and by the hindsight assessment of the buildup of risks before 2007 that I mentioned in the introduction.

In this approach, the underlying policy concern is with the effects of financial conditions on new lending and, through new lending, on the real economy and possibly back from the real economy on the financial system. The main focus is to restrain the buildup of credit risks so as to avoid a sharp crisis when the bubble bursts. Countercyclical capital buffers, increases in loan-to-value ratios and in margins and haircuts are all intended to slow the buildup of risks by restraining lending sprees. And when the cycle turns, reversing these policies should provide some leeway to also smooth the downward movement.

Discussions about the use of these policy tools focus on the conditions under which to use them, what indicators to use for their imposition to prevent an excessive buildup of risks and what indicators for reversing them. My discussion in the preceding section suggests that one should not try to be over-precise in these matters. Given my skepticism about measurement, I expect that no one indicator will prove to be the best in all situations. Use of these policy tools will require an element of judgment, an assessment of 'the story' that is underlying current developments.

Relying on judgment requires discretion. Discretion raises problems of commitment. According to an old saying, no one likes the punch bowl to

be taken away while the party is going strong. Allowing an element of judgment into the application of macro-prudential tools on the upswing of the cycle may therefore imply too much leniency, if not on the side of supervisors, then possibly on the side of the government, which may have ways to affect supervisory action, directly, by fiat, if the supervisory authority is subordinated to the government, or indirectly, by political means, if the supervisory authority is legally independent. In this context, it is worth recalling that the same supervisor who invented countercyclical provisioning was unable to interfere with the buildup of a real-estate bubble, presumably because the alliance of local and regional banks, real-estate developers and politicians was too strong.

There is a tradeoff here between the need for discretion to deal with the fact that any indicator is likely to be imperfect and the need for commitment, which might be provided by having a fixed rule that ties macro-prudential policy to an indicator.

Asset Price Dynamics as a Macro-prudential Concern

A deeper problem arises from the fact that *financial developments can affect the macro-economy in patterns that have little to do with any conventional notions of the business cycle*. An example is given by the slow implosion of the financial system between August 2007 and August 2008 that I mentioned when I discussed the propagation of shocks through fire sales. This implosion involved the interplay of asset price declines, fair-value accounting, lack of equity, deleveraging and again asset price declines. In this example, crisis propagation in the financial sector developed on its own, without much of a link to the real economy (except for the US real-economy events that triggered the financial downturn in 2006/2007). Because the system dynamics went unchecked, they grew to macroeconomic dimensions taking the real economy down when the final implosion came after the Lehman bankruptcy. In my view, such processes

should be on the radar of macro-prudential supervision just like the slow buildup of risks during the upswing phase of a business cycle.

The example of the period August 2007 to September 2008 brings in additional concerns which are not sufficiently taken in if one focuses only on the interaction of the financial with the real economy over the business cycle. The systemic developments from August 2007 to September 2008 involved asset markets and asset prices. *Asset markets involve stock variables, asset prices have fast dynamics*, with a time frame on the order of months, if not days. By contrast, *the business cycle involves flows* of aggregate demand, aggregate production, new lending, investment, etc. The *dynamics of flow variables are slow*, with a time frame in the order of years.

The difference in time frames of processes involving asset markets and asset prices and processes involving macroeconomic flows is important because a policy that focuses on the interaction of the financial system with the real economy over the business cycle works at the level of the macro flows, i.e. slowly. Countercyclical provisioning is intended to prevent the buildup of capital from new profits from being fully leveraged and therefore to put a brake on the expansion of new lending.

Macro-prudential concerns at the level of stock variables, bank balance sheets, asset positions and asset prices cannot quickly be taken care of by measures involving flows. If asset price declines force a bank to take losses, the resulting *imbalance between assets and equity cannot be corrected by a cutback in new lending. If new equity cannot be raised right away, imbalances at the level of stock variables in the bank's balance sheet can only be corrected by deleveraging*, i.e. asset sales or callbacks of outstanding loans. Asset sales feed back into asset prices. Callbacks of outstanding loans may be ineffective or may create chaos for the loan clients involved.

Some help may come from a relaxation of countercyclical capital requirements, which are of course defined in terms of stock variables. This may be insufficient, however, either because increases in asset risks and asset risk weights neutralize the effect, or because, in a crisis, required equity depends at least as much on the attitude of lenders, e.g. money market funds that provide repo loans, as on the regulatory rules.

In thinking about corrective measures at the level of stock variables, it is important to appreciate that *the system as a whole can only change its holdings of these variables if there are third parties willing to buy or sell assets*. If all banks engage in deleveraging, and there are no third parties willing to buy, the system may not even have a new equilibrium at all, i.e. there is no limit to the downward dynamics.

This observation raises questions about the advisability of regulating different sectors, e.g., banks and insurance companies in parallel fashion and thereby inducing parallel behaviors. We should think about complementarities between the different parts of the financial system and make sure that regulation does not prevent different types of institutions from stepping in if banks have problems and want to sell assets. 'Level playing fields' should not be a concern in dealing with institutions that have different roles and different funding structures and that ultimately pose different regulatory concerns.[31]

The Need for Circuit Breakers

The slow implosion of the global financial system from August 2007 to September 2008 went unchecked. The final and radical implosion after the Lehman bankruptcy went unchecked until governments and central banks committed vast amounts of money to provide capital, guarantees, and liquidity support, and even then it took some time for the system to catch its breath. The implosion of the European financial system in 2011 went

unchecked until the European Central Bank provided banks with additional funding under its Long-Term Refinancing Operations (LTRO), amounting to a trillion euros.

Given these experiences, macro-prudential policy should think about possibilities to introduce circuit breakers into the system. If we cannot manage to introduce circuit breakers into the financial sector itself, we are left with governments and central banks as the ultimate backstops. This raises serious issues for fiscal policy, even to the point where fiscal feasibility is in doubt; it also raises serious issues for the credibility of monetary policy. These issues are reinforced by concerns about moral hazard as the financial industry learns that it can rely on the 'Draghi put'.

In this context, the following matters seem worth thinking about:[32]

- Substantially higher equity requirements than we currently have would dramatically reduce the procyclicality of capital regulation, as well as the vulnerability of individual institutions. As mentioned above, if the initial equity is 2% of total assets, a loss of 1% of assets cuts the equity in half and requires ten times as much deleveraging to restore the initial equity ratio than if the initial equity had been 20% of total assets. Substantially higher equity requirements would also ensure that, if the chain of intermediation is lengthened, each additional element in the chain adds more loss absorption capacity.
- Eliminating the ability to reduce equity requirements by risk weighting would substantially reduce incentives for artificial increases in interconnectedness. Risk weighting is usually justified on the grounds that banks which take greater risks should be required to have more equity funding. In practice this means that banks which claim to be taking smaller risks are allowed to get away with more borrowing. An asymmetric application of risk – weighting, imposing stricter requirements on banks that take more risk without reducing equity requirements for banks that claim to take less risk, would not only

make the system safer by avoiding the manipulation of risk weights to maximize borrowing; such a regime would also remove incentives to use hedge contracts so as to make risks seem to disappear while in fact they have just been hidden. Interconnectedness would be substantially reduced.

- Viable recovery and resolution procedures that permit the temporary maintenance of systemic functions of banks are essential. Given that the principle of multiple-entry resolution for institutions with legally independent subsidiaries in different jurisdictions is unlikely to be removed in the foreseeable future, such procedures may require that systemically important subsidiaries be managed in such a way that their activities can at least temporarily be continued outside the parent corporation as well as inside. This consideration suggests that such subsidiaries should satisfy certain stand-alone criteria not only with respect to funding and liquidity but also with respect to procedures and infrastructure, for example, IT systems. Such requirements may reduce the efficiency of the institutions but this cost is likely to be outweighed by the benefits of greater system stability.
- Finally, we need to question the role of contract law and bankruptcy law in the increase of money market funding of banks that we have observed over the past fifteen years. Whereas in the past money market funds would mainly invest in short-term government debt and non-financial commercial paper, since the early 2000s, they have shifted to funding banks. In one interpretation, this was a reaction to China's investing surpluses in short-term US government debt. In another interpretation, it was a reaction to legal changes in US rules concerning the treatment of asset-backed commercial paper and repos in bankruptcy. The privileged positions of these forms of short-term debt in bankruptcy are convenient for the short-term lenders. They are also convenient for the borrowers who find that short-term funding is easy to come by. If one takes a wider perspective, however, they are problematic because they provide borrowers and their short-

term lenders with the means to dilute the positions of earlier lenders, encumbering assets and jumping the priority queue of insolvency law. And their effect on the system has been to lengthen the chain of intermediation by having money market funds get into the business of funding banks special-purpose vehicles of banks.

What is the Relation between Macro-prudential and Micro-prudential Oversight?

Whether it was meant that way or not, Andrew Crockett's invention of the term 'macro-prudential' served a diplomatic purpose. By creating this new category, Crockett avoided giving the impression that he was blaming micro-prudential supervisors for having neglected macro-prudential concerns. By now, this separation has become firmly enshrined in the legal documents for macro-prudential supervision, including the assignment of macro-prudential tasks to separate authorities.

However, this separation has problems. First, macro-prudential policy is implemented by micro-prudential actions, legal norms and administrative acts directed at the individual institutions, and presumably subject to judicial review like all such acts. Second, and more importantly, there is a macro-prudential element in the application of micro-prudential rules. If at some point, the micro-prudential supervisor changes, for example, the rules for assessing loan impairments in banks' books, the simultaneous application of the new rules is likely to have macro-effects, making for a loosening or a tightening of bank credit depending on whether the micro-rules are loosened or tightened.

In this context, there is a danger that the macro-prudential aspects of micro-prudential policies are overlooked, perhaps even as a result of turf conflicts between the different authorities. After all, if macro-prudential and micro-prudential concerns are as distinct as the terminology suggests,

shouldn't the micro-prudential supervisors simply be left to do their jobs without any macro-person meddling with them?

The issue already arises at a prior level. What information will macro-prudential authorities have access to? Information about individual institutions? From the micro-prudential supervisor's perspective, this is privileged information that individual institutions have provided under the assurance that the information would not be divulged to third parties. From the perspective of the macro-prudential supervisor, information about individual institutions is the raw material from which an overview over the state of the system can be obtained. Indeed, to understand the 'story' behind current developments, it may be necessary to know what is happening at the levels of the individual institutions because in aggregation too much information is lost.

In my view, it is important that the macro-prudential dimension of micro-prudential activity and micro-prudential information be clearly recognized and that procedures be found to ensure that macro-prudential concerns are properly seen and addressed, without doing violence to the legal obligations of micro-prudential supervisors to the institutions for which they are responsible.

Objectives and Tradeoffs in Macro-prudential Policy

The objective of macro-prudential policy is not always clear. Whereas micro-prudential policy is – at least in principle – targeted towards the safety and soundness of banks, the objective of macro-prudential policy is less clear: Is macro-prudential policy concerned with financial stability or is it concerned with macro-economic stability?

In an economic upswing, the question may seem moot. In that constellation, macro-prudential policies such as countercyclical

provisioning would seem to be suitable for both, preventing an overheating of the financial sector and preventing an overheating of the economy. But what about the objectives of macro-prudential policy in bad times, when the economy is doing badly and the banks are still coping with the fallout from past mistakes? In this setting, a macro-prudential policy that tries to stabilize the macro-economy might move to loosen banking regulation so as to enable banks, perhaps even to encourage banks, to provide loans so that the real economy does not suffer from a credit crunch. In contrast, a macro-prudential policy that tries to avoid system-wide problems in the financial sector might want to clean up the banks' books, forcing them to acknowledge losses and recapitalize if necessary, rather than carry hidden losses along for an extended period of time. There can thus be a clear conflict between the two objectives of economic stability and financial stability.

The conflict is inherent in the ambiguity, mentioned in the introduction, about whether 'systemic risk' refers to the risks that the financial sector might impose on the real economy or whether it refers to the risk that shocks from the real economy impose on the financial sector. As far as I am aware, this conflict has not been much addressed, let alone resolved.

If macro-prudential regulation works well, the conflict may well be moot. If countercyclical provisioning is effective in providing for tighter regulation in good times, a loosening of this regulation would seem to provide a natural counterpart in bad times. If the countercyclical buffers are there, there should not be any problem. But what if they are not there? Right now, we have credit crunches in a number of countries that are at least partly due to banks' weak capital positions.[33] Allowing these banks or asking these banks to expand their lending to nonfinancial companies may well imply risks for financial stability in the future. The risks are particularly large, if the underlying problem is that the banks' own loan customers have problems from excessive debt overhang. If excessive debt is at the root of

macro-economic weakness, can more borrowing – and more bank lending to such borrowers – be appropriate for financial stability?

As yet, we do not have a good conceptual framework for assessing the cyclicality of the prevailing regulation. In January 2009, the Academic Advisory Committee to the German Economics Ministry warned that, whereas the crisis had for a long time just affected the financial sector, the downturn of the real economy in the fourth quarter of 2008 had increased the credit risk of the banks' loan clients.[34] A strict application of Basel II would therefore enhance the imbalances between assets and equity in the banks' balance sheets (stock variables again!), with incalculable additional procyclical effects. The Advisory Committee recommended some loosening in the application of Basel II in order to alleviate procyclicality.

This *procyclicality of regulation* needs to be kept in mind when considering the behavior of banks vis-à-vis their loan clients and their treatment of non-performing loans. To some extent banks may just want to avoid credit events that would force them to make provisions that cut into their equity at a time of stress. From a macro-prudential perspective, this may be seen as a way to reduce pressure on the real economy.

Such *forbearance cannot be a panacea* however. In the early eighties, US S&Ls benefited from forbearance and went on to gamble for resurrection, making the cleanup of the crisis ten years later that much more expensive. Similarly, the initial forbearance in the Japanese crisis of the nineties ended up being very costly.[35] In contrast, the cleanup of the Swedish crisis was undertaken right away. The sharpness of the authorities' intervention contributed to the sharpness of the recession but the thoroughness of the cleanup contributed to the fast recovery.

The empirical literature on the subject suggests that, as a rule, prompt interventions and cleanups are to be preferred. Attempts to delay such interventions and cleanups are likely to cause a long period of low growth or even stagnation, and the eventual budgetary and economic costs of the later cleanup when it comes are likely to be much greater.[36]

As yet, we do not have a good conceptual framework to assess the tradeoffs that are involved. It would be desirable to consider procedures that would reduce the harmful effects of a lack of forbearance as well as the harmful effects of forbearance. For example, what measures can be taken to avoid procyclical effects of tightening capital requirements in a time of stress? Alternatively, if there is to be some forbearance in a time of stress, what measures are needed to prevent banks from abusing the leeway they are given in order to gamble and expose the rest of the system to additional risks? And what can be done to avoid a situation where the authorities become hostages of their own past forbearance, unable to proceed with a cleanup of problems in the financial sector because their own past forbearance and their encouraging of bank lending more to already highly indebted borrowers contributed to the banks' problems?

Notes

1 Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board.

2 A. Crockett: Marrying the micro- and macro-prudential dimensions of financial stability, *BIS Review* 76 (2000), 1-7.

3 According to T. Curry and L. Shibut, The Costs of the Savings and Loan Crisis: Truth and Consequences, *FDIC Banking Review* 13 (2000), 26-35, the total costs of the S&L crisis amounted to $153 billion, of which $124 billion was covered by the government.

4 For detailed accounts, see M. Hellwig, Systemic Risk in the Financial Sector: An Analysis of the Subprime-Mortgage Financial Crisis, *De Economist*, 157 (2009), 129-207, and A. Admati and M. Hellwig, *The Bankers' New Clothes: What's Wrong With Banking and What to Do About It*, Princeton University Press, Princeton, N.J. 2013, Ch. 5. Remarkably, the International Monetary Fund's *Global Financial Stability* Report of April 2007 and the Bank for International Settlement's Annual Report published in June 2007 contain fairly accurate accounts of the subprime crisis in the United States, but overlook the potential for contagion and therefore very much underestimate the impact of the subprime crisis on the global financial system.

5 In M. Hellwig, International Contagion - the Result of Information or of Rhetoric? Contribution to a Panel Discussion on International Contagion: What is it and what can be done against it?, *Swiss Journal of Economics and Statistics* 134 (1998), 715-721, I related this form of contagion to certain forms of superficial thinking that result from decision makers' economizing on the time they devote to analysis or to collective discussion.

6 The classical analysis of this phenomenon is given by R.K. Merton, The Self-Fulfilling Prophecy, in: R.K. Merton, *Social Theory and Social Structure*, rev. and enl. Edition, Glencoe Free Press, New York 1957, 421-436; see also D.W. Diamond and P.H. Dybvig Bank Runs, Deposit Insurance, and Liquidity, *Journal of Political Economy* 91 (1983), 401-419.

7 For a survey, see C. Calomiris and G. Gorton, The Origins of Banking Panics: Models, Facts, and Bank Regulation, in G. Hubbard (ed.), *Financial Markets and Financial Crises*, Chicago UP 1991.

8 Whereas the early literature, including the critical assessment by Calomiris and Gorton (fn. 7), treats runs as a facet of equilibrium multiplicity, S. Morris and H.S. Shin, Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks, *American Economic Review* 88 (1998), 587-597, and the subsequent literature find that, with incomplete information about the underlying fundamentals, runs are a feature of equilibrium that arises if the fundamentals are sufficiently bad, even though the equilibrium is unique if agents have only private information about the fundamentals. Transition between the no-run and the run part of the state space needs not be smooth. C. Hellwig, Public Information, Private Information, and the Multiplicity of Equilibria in Coordination Games,' *Journal of Economic Theory* 107 (2002), 191-222, shows that, if agents condition also on public information about the fundamentals, there may be multiple equilibria, in which case the system may respond discontinuously to changes in information.

9 For an account of these problems, see G. Gorton, *Slapped by the Invisible Hand: The Panic of 2007*, Oxford University Press, Oxford, 2010, as well as M. Hellwig, Systemic Risk in the Financial Sector (fn. 4). As mentioned above the sponsoring banks that had to take the structured investment vehicles onto their books then had a capital problem. See also V.V. Acharya, P. Schnabl, and G. Suarez, Securitization without Risk Transfer, *Journal of Financial Economics* 107 (2013), 515-536, and A. Krishnamurthy, S. Nagel and D. Orlov (2011), Sizing up Repo, NBER Working Paper No. 17768, 2012.

10 See, for example, E.J. Kane, *The Gathering Crisis in Federal Deposit Insurance*, MIT Press, Cambridge, MA, 1985.

11 P. Englund, The Swedish Banking Crisis – Roots and Consequences, *Oxford Review of Economic Policy* 15 (1999), 80-97.

12 Such correlations played an important role in Crockett's plea for macro-prudential oversight (fn.2).

13 In this context, it is pertinent to mention the ESRB's work on lending in foreign currencies; see https://www.esrb.europa.eu/pub/pdf/recommendations/2013/ESRB_2013_2.en.pdf?c63788d50e9a1b957f4f7cfb39b4b99a

14 The growth of exchange rate risks was triggered by the end of the Bretton Woods regime of fixed exchange rates, which went along with a removal of capital controls and a need for international financial activities to recycle petro-dollars after the 1973 oil price increase. Nominal interest rates reached extraordinary levels in the mid-1970s, the early 1980s and again the late 1980s, largely as a result of the interplay of high inflation, inflationary expectations and monetary policy. See, for example, M. Hellwig, Systemic Aspects of Risk Management in Banking and Finance, *Swiss Journal of Economics and Statistics* 131 (1995), 723-737.

15 For an extensive discussion, see M. Hellwig, Liquidity Provision, Banking, and the Allocation of Interest Rate Risk, *European Economic Review* 38 (1994), 1363-1389, as well as M. Hellwig, Systemic Risk in the Financial Sector (fn. 4).

16 See Hellwig, Systemic Aspects of Risk Management (fn. 14).

17 A warning about this development is contained in M. Hellwig, Systemische Risiken im Finanzsektor, *Schriften des Vereins für Socialpolitik* NF 261 (*Zeitschrift für Wirtschafts- und Sozialwissenschaften* Beiheft 7), Verlag Duncker & Humblot, Berlin 1998 , 123-151.

18 Thus, in its 2007 Annual Report, AIG writes that 'approximately $ 379 billion ... of the $ 527 billion in notional exposure of AIGFP's super senior credit default swap portfolio as of December 31, 2007 represents derivatives written, for financial institutions, principally in Europe, for the purpose of providing them with regulatory capital relief rather than risk mitigation.'

19 See UBS, *Shareholder Report on UBS's Writedowns*, Zürich, April 18, 2008.

20 Financial Services Authority, The prudential regime for trading activities: A fundamental review, *Discussion Paper* 10/4, August 2010.

21 See R.A. Brealey, I. A. Cooper, and E. Kaplanis, International Propagation of the Credit Crisis, mimeo, London Business School, 2011, and A. Demirgüc-Kunt, E. Detragiache, and O. Merrouche, Bank Capital Lessons from the Financial Crisis, *Policy research Working Paper* No. 5473, The World Bank, Washington, D.C., 2010.

22 M. Hellwig, Liquidity Provision, ... (fn. 15).

23 A few years later, this person would have referred to interest rate swaps as a means of maturity mismatch management on a daily basis. See M. Staub, Interbankenkredite und systemisches Risiko, Schweizerische *Zeitschrift für Volkswirtschaft und Statistik* 134 (1998), 193-230.

24 The argument is taken almost verbatim from M. Hellwig, Banking and Finance at the End of the Twentieth Century, WWZ Discussion Paper 9426, University of Basel, Basel 1994.

25 For an extensive discussion and interpretation of this example, see M. Hellwig, Systemic Aspects of Risk Management (fn. 14).

26 Gorton, Slapped ... (fn. 9), p. 79.

27 As discussed in Hellwig, Liquidity Provision, ... (fn. 15), this had been the experience of UK building societies with variable-rate mortgages in the late 1980s. For a more systematic account of risk allocation in real-estate finance, see Hellwig, Systemic Risk ... (fn. 9).

28 Gorton downplays the problem of credit risk in subprime lending and overlooks the endogeneity of this risk. He negates the incentive effects of securitization prospects on quality control in origination (pp. 138-144), without however discussing the contrary evidence, for example, in the UBS Report (fn. 19) or in I. Ben-David, Financial Constraints and Inflated Home Prices, *American Economic Journal*: Applied Economics 3 (2011), 55-78 (which had been available as a working paper as early as 2007). For an early discussion of the incentive problem, see Hellwig, Banking and Finance … (fn. 24).

29 This point was already made by D. Duffie, Innovations in Credit Risk Transfer: Implications for Financial Stability, mimeo, Stanford University, Stanford, CA, albeit with respect to the correlations between the different securities in a CDO.

30 Charles Calomiris has on many occasions suggested that supervisors should use this risk premium as a signal about the state the institution is in; see, for example, C.W. Calomiris, Market-Based Banking Supervision, *The Financial Regulator* 4 (1999), 33-36.

31 With hindsight, it seems clear that the banking lobby's complaints in the early 2000s about insurers' not being subject to the same equity requirements for derivatives should have been taken as a signal of malfunctioning. So should have been the observation that bankers, rather than insurers and pension institutions, were the biggest investors in mortgage-backed securities and CDOs.

32 On the first two of these points, see M. Hellwig, Capital Regulation after the Crisis: Business as Usual?, Preprint No. 31/2010, Max Planck Institute for Research on Collective Goods, Bonn, 2012; on all four points, see A. Admati and M. Hellwig, The Bankers' New Clothes (fn. 4) , Ch. 11, 5, and 10.

33 V. V. Acharya and S. Steffen, The Greatest Carry Trade Ever? Understanding Eurozone Bank Risks, *NBER Working Paper* No. 19039, May 2013.

34 Wissenschaftlicher Beirat beim Bundesministerium für Wirtchaft und Technologie, Zur Bankenregulierung in der Finanzkrise, Brief an den Bundesminister für Wirtschaft und Technologie vom 23. Januar 2009, Berlin 2009.

35 T. Hoshi and A. Kashyap, Japan's financial crisis and economic stagnation, *Journal of Economic Perspectives* 18 (2004), 3-26, T. Hoshi, and A. Kashyap, Why did Japan stop growing?, *NBER working paper*, National Bureau of Economic Research, Cambridge, MA, 2010.

36 G. Caprio and D. Klingebiel, Bank insolvencies: Cross-country experiences, Policy Research Working Paper 1620, World Bank, Washington, D.C, 1996.; G. Caprio and D. Klingebiel, Bank insolvency: Bad luck, bad policy, or bad banking?, Paper written for the Annual World Bank Conference on Development Economics, April 25-26, 1996. See also Advisory Scientific Committee of the European Systemic Risk Board, *Report* No. 4, Frankfurt, 2012.

4. Macroprudential policy: what do we need to know?[1]

Claudia M Buch

Macroprudential policy is – by its very nature – a highly ambitious policy field. Its aim is to contain systemic risk, that is the risk that instabilities of an individual bank or of parts of the financial system feed back into instabilities of the system as a whole, thereby adversely affecting the real economy.

Macroprudential policy is thus closely related to microprudential regulation and to monetary policy. *Microprudential regulation* aims at ensuring the safety and soundness of individual financial institutions. The goals, instruments, and institutions for microprudential supervision are quite well-defined: microprudential supervisors monitor whether banks meet appropriate liquidity or solvency requirements. The regulator intervenes where rules are violated. Yet, instabilities and sources of risk that are not addressed at the micro-level can affect the stability of the system.

Monetary policy can also have an impact on financial stability because, for instance, incentives for risk-taking increase in a low-interest-rate environment. The goals of monetary policy in terms of inflation targets are well defined. A large set of established empirical and theoretical tools is available to assess and evaluate the effects of monetary policy.

Protecting the stability of the system, which is the goal of *macroprudential regulation*, is less well defined in terms of policy goals, intermediate targets, and concrete instruments. Against the backdrop that macroprudential policy is a highly ambitious policy field, the ambitions of this short paper are very modest. I particularly want to make two points. The first is that we need a range of empirical (and theoretical) models to analyse systemic risk and macroprudential policies. For practical policy making, the models need to be combined with qualitative surveillance tools. The second point is that any decision on macroprudential policies will be made under a considerable degree of uncertainty. A structured evaluation of policies thus becomes all the more important, and clear standards for such evaluations have to be established.

Which models should we use?

Understanding, observing, and ultimately containing systemic risk through macroprudential policy measures requires models. These models can be informal and of a rather heuristic nature, they can be theoretical or they can be empirical. Hellwig (2014)[2] rightly argues that theoretical modelling should not be confined to a narrow set of models. Instead, we need to try and tell the right 'story' about risks to financial stability. I fully agree with that. The point I would like to make here is that we also need a range of empirical models. Empirical models can supply us with information on the probability of a particular narrative providing an adequate description of reality, they can give us guidance as to which story to trust more, and they can help to assess the effectiveness of policy measures.

Drivers of systemic risk

Any good storyteller needs to set the stage for her narrative, which, in our case, is the definition of systemic risk. Systemic risk implies that the failure of a financial institution exerts a *negative externality* on the system as a whole. Such risks can arise through direct and indirect channels (Hellwig, 1998)[3]. *Domino effects* mean that the failure of an individual bank (or a group of institutions) may threaten system-wide stability. If, for example, creditors of a distressed bank are affected through direct contractual linkages, negative shocks may feed their way through the system. Because domino effects are linked to contractual relationships, they are, in principle, measurable and observable. The complexity of the financial system, the presence of regulated and unregulated entities and incentives for regulatory arbitrage, however, will always limit our ability to fully monitor and analyse even direct contractual linkages.

Observing threats to financial stability due to *informational contagion* is even more difficult. Informational contagion can arise if the distress of

one bank leads to a run on the assets of other banks even without any direct contractual linkages. Hence, similar business models and common exposures to (potentially correlated) macroeconomic shocks can be sources of systemic risk. Downward spirals of prices and markets, driven by fire sales, can be the consequence.

At first sight, it thus seems rather difficult to map these two channels of systemic risk into a metric of the systemic importance of an individual institution. Therefore, empirical tools have been developed that do not attempt to model the exact channels through which systemic risk could arise but rather to answer the following question: how important is the contribution of an *individual* bank to the risk for the financial *system* as a whole? And how big is a particular bank's capital shortfall if the entire system is in distress and undercapitalised?

These two questions can be answered using the Shapley-value concept (Drehmann and Tarashev, 2011)[4], the CoVaR model (Adrian and Brunnermeier, 2011)[5], the concept of the systemic expected shortfall (Acharya et al., 2012[6], Brownlees and Engle, 2011[7]), or the distress insurance premium (Huang et al. 2012[8]). These empirical methods are data intensive and tend to rely on market data which, for many European countries, are not available for all relevant banks. This limits the applicability of these concepts for many practical policy questions.

In terms of the general messages on the factors driving systemic risk though, the messages the models send are quite clear: systemic risk increases with the risk of a financial institution and with its inability to absorb these losses using own funds (in the form of equity or of debt that can be bailed in). The degree of leverage thus plays a central role. But systemic risk also increases with the size of a financial institution ('too big to fail'), with the degree of connectedness ('too connected to

fail'), and with the exposure to macroeconomic risks ('too many to fail'). These are concepts which, in turn, lend themselves to empirical analyses.

Too big to fail

Large banks are more systemically important because of their links to other financial institutions, their presence in foreign markets and thus the difficulties of restructuring their (global) operations. Large banks may also take on more risk due to implicit or explicit state – or 'too-big-to-fail' – guarantees.

But even if one abstracts from incentives to take risks and the (cross-border) structures of large banks, size effects in banking and on financial markets in general can arise through *granular effects*. Typically, bank sizes follow a 'power-law' distribution: banking systems are dominated by a few very large banks which coexist with many small financial institutions. This biased size distribution implies that shocks hitting large banks do not cancel out in the aggregate but may, in fact, affect the financial system. The law of large numbers does not apply. Gabaix (2011)[9] has developed this concept of granularity, and he shows that aggregate volatility can be expressed as the product of idiosyncratic volatility and the Herfindahl index as a measure of concentration. For the US manufacturing sector, Gabaix (2011) shows that shocks to the largest firms explain about 30% of the variance of GDP growth. In banking, size effects are important as well (Bremus and Buch, 2013[10]; Carvalho and Gabaix, 2013[11]).

Too connected to fail

While pure size effects might be relatively straight-forward to measure, assessing the importance of 'connectedness' as a source of systemic risk is more difficult. If risk is concentrated in a small number of systemically important financial institutions, the distress of these institutions can

impose significant *network externalities* on other parts of the financial system. If these costs are not internalised, large banks may engage in higher risk-taking and feature high leverage, thereby increasing the amplitude of the financial cycle.

Nonetheless, the effects of connectedness for financial stability are not clear-cut. From a theoretical point of view, close linkages improve diversification of idiosyncratic risks. But close linkages may also give rise to contagion effects, and systemic shocks can be transmitted more easily (Allen and Gale 2000)[12].

Empirically, there is, in fact, a non-linear link between financial connectedness and the risk of financial contagion. Analysing the importance of *linkages between banks* for systemic risk requires (empirical) methods that have been applied in network analysis (Acemoglu et al., 2012[13]; Allen and Babus, 2009[14]). Applying these models to more markets and to better datasets is certainly warranted. For policy purposes, one important objective of such literature would be to identify structural features of banks (or of other financial institutions) which make networks more resilient to adverse contagion effects.

Too many to fail

Finally, even if all financial institutions were small and were not linked directly, they may yet pose a risk to financial stability due to *common exposures* to the same type of shock. To analyse exposures to macroeconomic shocks, empirical tools linking micro or semi-aggregated to macroeconomic data can be useful. For banks, a number of studies help assessing the empirical importance of exposure to macroeconomic shocks, and it would be interesting to apply the results of these studies to other financial services industries such as insurance.

Take monetary policy shocks as an example. Monetary policy shocks affect banks' risk-taking and lending decisions through two main channels. The traditional credit channel implies that lower interest rates increase collateral values and thus induce an increase in lending (Bernanke and Gertler, 1989[15]). But monetary policy can also have an impact on banks' risk-taking because lower interest rates cause banks to adjust their lending portfolios towards high-risk customers (Borio and Zhu, 2008[16], Rajan, 2005[17]). The relative importance of these effects differs across banks: smaller banks might be more exposed to domestic macroeconomic risks than larger banks because the latter are able to diversify shocks internationally. Also, banks' business models affect their exposure to changes in interest rates. In addition, banks may face incentives to coordinate their exposure to macroeconomic risks, thus leading to expectations of a 'collective bail out' (Farhi and Tirole, 2012[18]).

Empirical studies using factor-augmented VAR models do indeed show that the reaction of (US) banks to macroeconomic shocks depends on bank-specific features such as size, liquidity, degree of internationalisation, interbank exposure, and capitalisation (Buch et al., 2014[19]). Hence, banks' business models effect exposure to macroeconomic risks, and a regulatory framework may have to take this heterogeneity into account (Rochet, 2008[20]).

Surveillance and institutional knowledge

In sum, the above examples show that measuring systemic risk requires a large set of empirical (and theoretical modelling) tools. These tools can contribute to our understanding of specific parts and incentives of the financial system. However, they cannot provide us with a panoramic picture of the stability of the financial system. We will not be able to model all linkages across banks and sectors, all incentives for risk-taking and for becoming too big to fail, nor all exposures to macroeconomic shocks in one model. Nor should we strive to do so.

Rather, proper *surveillance mechanisms* are needed which help to synthesise the different pieces of evidence and to sketch a picture of the state of the financial system. Such *surveillance mechanisms* should focus on market participants' incentives and on sources of externalities. If private and societal costs diverge, banks may strive for higher risk, more concentration of exposures, and less stable networks than they would choose if such negative externalities were fully internalised. Disclosure requirements, in turn, can generate positive externalities, as they enhance information sharing and processing and thus improve information efficiency.

The ultimate task for regulators is thus to appropriately identify externalities, both negative and positive, and ensure that they are adequately reflected in market participants' cost structures. For a comprehensive analysis of systemic risk, it is also essential to integrate information about *structural innovations* such as developments on markets for derivatives and securitisation. In short, proper surveillance requires a significant amount of *institutional knowledge*.

What are the implications for policymaking and regulations?

Regulatory reforms have to be made and policy decisions have to be taken under a great degree of uncertainty (Manski, 2013[21]). There is uncertainty about the actual state of the economy and the financial system, uncertainty about the relevant mechanisms contributing to system risk, and uncertainty about the effects of policy measures. In terms of macroprudential policy, a lack of clarity with regard to measurable policy targets adds to the complexity of the decision-making process. This uncertainty may lead to an *inaction bias* and the quest for 'more data' – unless macroprudential policy follows clear and transparent guidelines.

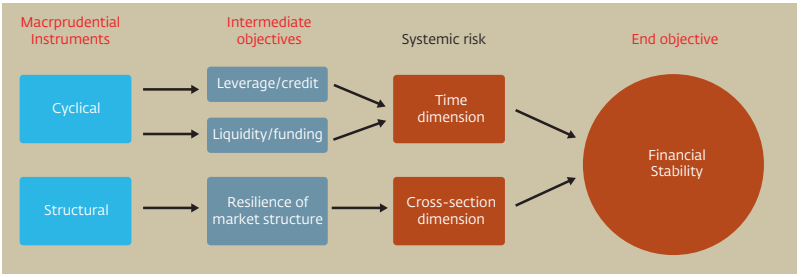
Policy thus needs to follow clear goals and principles. Furthermore, the concrete instruments that are employed to achieve these goals need to go through a systematic process of policy evaluation. Last but not least, we need to find the right way of communicating uncertainty.

Monetary policy is one of the fields where modern theoretical, empirical, and experimental tools have contributed to a better informed process of policymaking. Why are monetary policy measures well-suited for evaluation? There are basically two reasons. First, it is quite clear what the policy targets are: the Eurosystem targets an inflation rate of below – but close to – 2% over the medium term, for example. Increased transparency has also shaped monetary policymaking over the past decades. It has made monetary policy more effective, and it has enabled improved analysis of actual policy decisions. Meanwhile, there are no such clear indicators for macroeconomic policies, and it is more difficult to communicate the goals and effects of these policies. Second, in the field of monetary policy, there is ample data that is suitable to evaluate policy measures – at least when it comes to standard policy measures. Assessing the effects of more unconventional policy measures may also require more unconventional tools for policy analysis.[22]

Targets, indicators and instruments

Before moving from the general policy goal of enhancing financial stability to concrete macroprudential policy instruments, macroprudential policy needs to be made operational by specifying intermediate objectives (ESRB, 2013[23]; Figure 1). These *intermediate objectives* are either linked to the *financial cycle*, such as mitigating excessive credit growth and market illiquidity, or they are related to the *structural dimension* of systemic risk by increasing capital and thus resilience or limiting the concentration of exposures.

Figure 1: Intermediate Objectives of Macroprudential Policy



Source: Houben et al. 2012[24]

To monitor whether these intermediate objectives are met, central banks and macroprudential authorities use a very broad set of indicators including information on asset prices, liquidity, leverage and market structures. This requires condensing information and extracting leading indicators.

One criterion for the *selection* of a specific set of *indicators* can be their historical quality in providing early warnings for crises, while minimising the frequency of false signals, ie when crises do not materialise. Alessi and Detken (2011)[25], for instance, show that global measures of liquidity can be useful indicators of risk building up in the system. Borio and Drehmann (2009)[26] analyse the importance of including asset prices and indicators of bank distress in models forecasting crises.

Broad credit aggregates are useful indicators of the structure of the financial system and signal potential overheating. Traditionally, credit to GDP has been used as a measure for the state of development of the financial system. But higher credit in the system is, *ceteris paribus*, also an indicator of leverage and thus risk. Higher credit contributes to greater macroeconomic instability, and this link is often non-linear (Aikman et al., 2014;

Bremus and Buch, 2013).[27] Excessive credit growth has been a key driver of financial instabilities with adverse consequences for the real economy (Kindleberger, 1989[28]; Reinhart and Rogoff, 2009[29]). During financial crises, credit market imperfections and information asymmetries are aggravated, which implies a higher volatility of the real economy.

Given tha t the factors driving systemic risk have been identified, which concrete *policy instruments* should be used? With the financial crisis, the focus of regulatory reforms affecting the banking sector has shifted from micro to macroprudential regulation. New regulations span a wide array of measures, with increased capital requirements being centre stage. The need to increase capital requirements for banks and to eliminate the misaligned incentives that risk-weighted capital requirements can create has been widely understood. Higher bank capital not only increases the resilience of individual banks to adverse shocks but also makes the system as a whole more stable (Admati and Hellwig, 2013[30]).

The details in terms of how (quickly) to adjust capital requirements and which additional measures to use are more controversial. In addition to tightened capital requirements, new liquidity regulations for banks, such as the liquidity coverage ratio and the net stable funding ratio, will be introduced. The entire legal and institutional framework on how to deal with banks in distress and how to resolve financial institutions that do not have a proper business model is under reform. Putting in place a credible framework which allows for an orderly exit of financial institutions will constitute an important step towards greater resilience and financial stability.

Besides strengthening resilience, macroeconomic policy measures also aim at moderating the cycle and preventing credit markets from overheating. The most prominent instrument to achieve this objective is the *countercyclical capital buffer* (CCB). The main purpose of the CCB is to increase resilience in a downturn (by releasing the buffer). Nevertheless,

setting a positive CCB raises the cost of credit in an upswing, which may dampen credit and thus limit the build-up of financial imbalances.

BCBS (2010)[31] has developed a methodology for deriving an internationally consistent capital buffer, which relies on the concept of the so-called the benchmark buffer rate. The methodology is based on the credit-to-GDP gap, i.e. the deviation of the credit-to-GDP ratio from its long-term trend. The benchmark buffer rate (as a percentage of risk-weighted assets) is calculated as follows: it equals 0 if the credit-to-GDP gap is below a lower threshold. It is set at 2.5% if the credit-to-GDP gap is above a higher threshold. In between the two thresholds, the benchmark buffer rate is linearly interpolated, but it is increased in steps of (multiples of) 0.25 percentage point.

However, this benchmark buffer rate serves only as a reference point. Policymakers have to consider a broader set of indicators in order to judge whether there is excessive credit growth and evidence of the build-up of system-wide risk.

Policy evaluation and data infrastructure

Assessing the effects of macroprudential policies requires information about the actual policy measures taken, and it requires access to data that can be used to analyse the effectiveness of these policies. One route that can be taken is to collect *more data*. This has been the approach of the FSB Data Gaps initiative, and these developments are highly welcome in terms of providing a better basis for policy analysis in the future. However, significant benefits can also be reaped by making better use of *existing data*.

One example for the improved use of existing data relates to the analysis of policy transmission across countries. Large, internationally active banks

have many possibilities for arbitraging existing regulations, but we know relatively little about the spillover of micro and macroprudential regulations across countries. Many relevant questions cannot be answered using data that are aggregated or semi-aggregated across all banks in an economy. A careful analysis of the transmission of macroprudential policies through internationally active banks requires micro-data on the exposures of individual banks. If macroprudential instruments are implemented in one country, reciprocity aims to ensure that all bank lending in a specific jurisdiction follow the same rules. Whether reciprocity is effective remains an empirical issue.

There is, in the International Banking Statistics of the Bank for International Settlements (BIS), a cross-country dataset that would, in principle, allow policy transmission through international banking to be analysed. Since policy responses are highly heterogeneous across banks though, (semi-) aggregate data provide only partial answers to the questions of interest. However, the micro-data underlying the BIS Banking Statistics are confidential and cannot be merged across countries for analytical work.

For these reasons, the *International Banking Research Network* (IBRN) was conceptualised and then established in 2012 by central bank researchers and academics from Austria, Germany, the United Kingdom and the United States.[32] In the past two years, the IBRN has been expanded to include researchers from Australia, Brazil, Canada, Chile, France, Hong Kong, India, Ireland, Italy, South Korea, Mexico, the Netherlands, Poland, Slovenia, Spain, Sweden, Switzerland and Turkey. Representatives of the BIS and the IMF are engaged in IBRN discussions. The network brings together researchers with access to their country's bank-level data to analyse issues pertaining to global banks. The participants analyse bank-level datasets by country and share empirical results and insights (not the data). The resulting research yields comparable cross-country evidence on a particular topic

from different banking system perspectives and has the benefit of delving into the reasons for heterogeneity within and across countries.

In a first set of studies, researchers in this network have looked at the transmission of liquidity shocks across countries and the role of (unconventional) monetary policies (Buch and Goldberg, 2014)[33]. In terms of future activities, the network will look into the effects of macroprudential policy measures and the impact of new regimes for recovery and resolution. *Inter alia*, the network will discuss how to collect data on these policy issues and how to make them accessible to researchers.

One source of information on macroprudential policies is the ESRB and the warnings and recommendations it publishes. On its website, the ESRB provides an overview of the macroprudential measures taken by European authorities. Member States are requested to inform the ESRB on the steps they have taken to safeguard the stability of the financial system using standardised templates. These templates contain detailed information on the respective measure, which entities will be affected, why the measure was taken, how long it will remain in place and when it will be reviewed. As transparency is of utmost importance in a European system that contains 28 national player and where decision making is complex, the ESRB website serves an important function. It should be developed further, both in terms of content and presentation.

Summing up

Financial crises can entail high costs for the real economy and for taxpayers. Policymakers thus need to be prepared to act decisively even if the information set remains incomplete. Given the high degree of uncertainty and the lack of experience with macroprudential policies, a flexible *learning-by-doing* approach should be implemented, and policies should be evaluated both *ex ante* and *ex post*. *Ex ante*, ie before actual

implementation, this would include model calculations and impact studies. Inaction bias and adjustment costs can be reduced by allowing for a gradual phasing-in of macroprudential policies and by specifying observation periods. During these, both regulators and external researchers can learn from real data about the ongoing adjustment in the system. Even after these measures have been fully implemented, their effectiveness will need to be evaluated regularly. Whenever policy objectives have not been met, further measures need to be considered, or existing measures may have to be refined.

In Germany, the Financial Stability Committee (*Ausschuss für Finanzstabilität*, AFS) is tasked with analysing the build-up of systemic risk, issuing warning and recommendations and evaluating policy measures. The AFS consists of members of the Bundesbank, the Ministry of Finance and the banking supervisor (BaFin). The Bundesbank is the main agent of the AFS, and it performs the relevant analyses. It also has a veto over major decisions taken by the AFS. One of its tasks is to evaluate the effectiveness of macroprudential policy decisions – this is a statutory mandate [section 1 of the Financial Stability Act, or *Finanzstabilitätsgesetz*] as well as a strategic target for the AFS.

Generally, assessing the effects of (macro)prudential policy requires clarity about policy goals and the institutional infrastructure to evaluate these policies. A better evaluation of macroprudential policymaking can be facilitated through two channels: (i) by defining and communicating macroprudential policy goals and (ii) by improving the data infrastructure, in particular by making better use of data that is already available.

Notes

1 This paper has been prepared for the high-level seminar 'Making Macroprudential Policy Work in Practice', organised by the Dutch Central Bank on 10 June 2014. I would like to thank Axel Loeffler, Hubert Oettl and Sebastian Wider for most helpful discussions in preparing this paper. All errors and inaccuracies are my own.

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5. What should be the ambition level of macroprudential policy?

Karolina Ekholm

The paper by Martin Hellwig makes clear the many unresolved issues that surround macroprudential policy. What kind of systemic risk is it supposed to mitigate? Is the issue financial stability or macroeconomic stability, a distinction that may be especially important in a downturn of the economy? How do we assess systemic risk exposure? How can we establish the degree of commitment needed to ensure that policies are implemented in a timely fashion to prevent the build-up of excessive risks? What is the relation between macroprudential and microprudential supervision? How should we think about the trade-offs involved in forbearance by banks in a situation of stress?

These are many important questions that we do not really have good answers to yet. Notwithstanding these uncertainties, we have to start making policy in this area. The legal basis and institutional framework for pursuing macroprudential policy are now in place, or in the process of being put in place, in many countries. So policies will be made, irrespective of whether all the relevant effects are fully understood.

Under these circumstances, we need to find some principles for making sure that the policies undertaken do more good than harm. At a general level, this involves identifying policies that directly affect sources of systemic risks without having strong undesirable side effects. To go some way towards this, it can be instructive to try to identify what this policy area can achieve that other policy areas cannot.

The relationship between macroprudential policy and monetary policy

It is often stated that the primary objective of macroprudential policy is to increase the resilience of the financial system by addressing systemic risk. The ultimate goal is thus similar to a main objective of microprudential supervision, but the focus is on the system rather than the individual

institutions. A debated issue is whether it should also aim at smoothing the credit cycle. That swings in the credit cycle may become dampened as a side-effect of policies such as countercyclical capital buffers, LTV and DTI caps and sector-specific capital requirements is obvious. But the question is whether the aim of smoothing the credit cycle should guide the timing and calibration of such policies.[1]

My own view is that there is an important role for macroprudential policy in trying to dampen credit growth in an upturn of the financial cycle, but a less important role in trying to counteract a downturn. The reason why macroprudential policy may be important for dampening credit growth in an upturn is that monetary policy is unlikely to be suitable for this task.

Monetary policy can and should be used to counteract the macroeconomic consequences of a downturn of the financial cycle. In such a situation it may also benefit financial stability through the positive effect that low short-term interest rates are likely to have on the banks' earnings. As has been discussed in the context of the so-called Greenspan put, this tendency for monetary policy to be used so that financial institutions are protected from heavy losses in a downturn of the cycle can introduce moral hazard and lead to excessive risk taking.

One way to mitigate moral hazard would be to make monetary policy react more symmetrically to swings in the financial cycle, 'leaning against the wind' by setting policy rates higher than what would be justified by the outlook for inflation and capacity utilization in the upturn of the cycle.[2] However, using monetary policy in this way is likely to be costly. The financial cycle is typically much longer than the business cycle and therefore most of the time in a different phase.[3] Setting policy rates higher than what would be justified by the outlook for the business cycle leads to unnecessarily high unemployment and risks undermining the credibility of inflation-targeting central banks. It may even lead to risks of ending up

in a deflationary state of the economy – a situation that would not only constitute a very poor macroeconomic outcome but also one that entails serious threats to financial stability if debt levels are high.

In my view, there is thus an important role for macroprudential policy in filling a gap created by the difficulties involved in using monetary policy completely symmetrically in upturns and downturns of the financial cycle. According to this view, macroprudential policy would be the policy area mainly responsible for dampening credit growth and prevent banks from excessive leveraging in an upturn of the financial cycle, while monetary policy would be the policy area mainly responsible for stimulating credit in a downturn. Such a division of responsibilities would probably be associated with a relatively restrictive view on forbearance on the part of banks. Banks would be helped by low short-term interest rates in a downturn, but would be required to make proper provisions for non-performing loans.

The relationship between macroprudential policy and microprudential supervision

It is somewhat more difficult to see what gap macroprudential policy fills *vis-à-vis* microprudential supervision. As pointed out by Hellwig in the paper, macroprudential policy is implemented by microprudential tools. The fact that microprudential supervision in the past often failed to properly address the build-up of risks in the financial system is not in itself an argument for the creation of a new policy area. It might instead be an argument for significant reform of the way microprudential supervision is carried out.

The analysis needed in order to assess the scope for macroprudential policy is, however, clearly different from the analysis typically conducted by microprudential supervisors. They have, at least in the past, neither focused on the risk of macro shocks affecting many institutions at once nor on the

risk of contagion effects within the financial sector. With a clear mandate to consider and act on these risks, however, it would probably be possible to simply broaden the scope of the supervisory authorities to include macroprudential as well a microprudential oversight.

In this context, a more practical concern is that the type of analysis required to assess macroprudential risks is typically carried out at central banks. Partly for this reason, many see the central bank as the natural candidate for being responsible for macroprudential policy, even when financial supervision is carried out by a separate authority from the central bank. However, since the main tools used for macroprudential policy are likely to be tools that are already used for microprudential supervision, a central bank without supervisory authority can hardly be an effective macroprudential policy maker. Instead, a division of responsibility for carrying out the relevant analysis and for making decisions based on that analysis is needed.

Another argument that is sometimes put forward for making the central bank responsible for macroprudential policy is that it may be more independent from the government than the financial supervisor and therefore more likely to be able to 'take away the punch bowl while the party is going strong'. However, this argument ignores the fact that independence cannot be taken for granted. Many central banks have been given operational independence regarding how monetary policy is conducted. This operational independence goes hand in hand with a clearly defined mandate whose fulfilment is easily monitored. The lack of a clear framework for assessing systemic risk exposure and uncertainties regarding the effects of potential macroprudential policies make it difficult to treat macroprudential policy in the same way. Because the microprudential tools that are likely to be used for macroprudential policy potentially also have strong redistributive effects, it is important that the institutional set-up allows effective accountability and democratic control.

This, however, puts macroprudential policy squarely under the influence of the government, which may be prone to exercising too much leniency in the upswing of a cycle. Some element of fixed rules that tie macroprudential instruments to indicators would be desirable in order to avoid harmful inaction. Defining appropriate indicators that can be tied to appropriate instruments is an important task ahead.

Macroprudential policy in practice – the case of Sweden

Currently, European countries are facing very different types of problems relating to macroprudential policy. Within the euro area, many countries are facing the consequences of a downturn of the financial cycle, with significant falls in asset prices – in particular real-estate assets – and high levels of non-performing loans in the banking sector. In these countries, the challenge is to mitigate a credit crunch that renders a recovery of the real economy more difficult. For these countries, a main issue regarding macroprudential policy is how to balance a clean-up of bad loans in the banking sector and forbearance.

However, in other countries, such as Sweden, the financial crisis of 2007-2009 did not lead to lower real-estate prices and significant increases in non-performing loans (except for a temporary increase in non-performing loans in subsidiaries in the Baltic states). Whereas it is probably not accurate to say that a country such as Sweden is still in an upturn phase of the financial cycle, it does not seem to be in a downturn either. While credit growth in the household sector is not at the two-digit level it was before the financial crisis, it is still relatively high. Household indebtedness is today high both in a historical and international perspective.[4]

A fall in housing prices in connection with an economic slowdown with increased unemployment could lead to a severe downturn if the

households reacted by significantly increasing their saving to compensate for declining wealth. This risk relates to the macroeconomic outcome much more than financial stability. A sharp downturn of the economy could of course result in a financial crisis, but currently this does not seem to be a significant risk.

Arguably, monetary policy has been used in a 'leaning against the wind' way in the last few years because of the risk of a negative macroeconomic outcome. Monetary policy has been less accommodative than has been strictly motivated by the macroeconomic outlook. However, the outcome has been very low inflation and an unemployment that has remained stuck at a relatively high level.

Sweden is thus an example of when macroprudential policy is needed to deal with substantial credit growth in the household sector at the same time as the rest of the economy is weak. Macroprudential policy involves measures that are likely to be reasonably effective in restraining excessive indebtedness in the household sector at the same time as they, unlike monetary policy, have limited side effects.

A number of macroprudential policies have been introduced in Sweden in order to deal with the risks associated with a large financial sector which is highly dependent on market funding and specifically with the risks associated with household indebtedness. Risk-weighted capital requirements for banks were raised in 2012 and LCRs, both in total and separately for the euro and the US dollar, were introduced in 2013. An LTV cap and risk-weight floors on mortgage loans have been introduced and the activation of a countercyclical capital buffer has been communicated.

The Swedish supervisor, Finansinspektionen, introduced an LTV cap of 85 per cent in 2010, when house prices and household credit growth started to increase again after the financial crisis of 2007-2009. When it

was introduced, it was unclear whether Finansinspektionen had a mandate to pursue policies in order to reduce systemic risks. The measure was motivated by the risk that high LTV ratios would 'expose consumers to unacceptable risks and eventually damage the confidence in the credit market as a whole'.[5] Since then, Finansinspektionen has been given responsibility for macroprudential policy.

The LTV cap had a dampening effect on debt. The vast majority of households currently have mortgages below 85 per cent of the value of the home. Households with loan-to-value ratios exceeding 85 per cent amortize at a rapid rate.[6] Nevertheless, credit growth in the household sector has started to increase again recently after falling in connection with the introduction of the LTV cap.

In May 2013, Finansinspektionen set a risk-weight floor on mortgages within the framework of Pillar 2. It set a capital add-on equivalent to a risk-weight floor of 15 per cent for Swedish mortgages, thereby tripling the capital requirement for mortgages applicable to Swedish banks using an internal ratings-based model (IRB). Finansinspektionen has announced that the risk-weight floor for Swedish mortgages will be raised to 25 per cent in the autumn of 2014.

The purpose of the risk-weight floors is to ensure that Swedish financial institutions have own funds sufficient to cover the risks to which the firms are exposed due to their exposure to Swedish mortgages. The first increase of the risk-weight floor was motivated by the limitations of the IRB models, i.e. it was a permanent structural measure. The coming increase to 25 per cent is motivated by systemic risks related to household indebtedness.

Applying the risk-weight floor within the pillar 2 framework gives the supervisor flexibility to target institution-specific risks related to household debt. It is not bound by pre-defined limits. At the same time, pillar 2

requirements typically lack transparency. They are normally not disclosed because they may reveal confidential information. Finansinspektionen has nevertheless made public the extra capital needed for the four major Swedish banks to fulfill the increased risk-weight floor.

Finansinspektionen has also announced that it intends to set the countercyclical capital buffer at a positive level. The exact level is to be determined in the next few months. It was discussed at the most recent meeting of the newly-created Financial Stability Council, a council that was set up in connection with the allocation of responsibility for macroprudential policy to the Swedish supervisor. The Financial Stability Council consists of representatives from the supervisor, the central bank, the Ministry of Finance and the Debt Office. At its meeting on May 23, it was clear that these authorities had different views on the appropriate level of the countercyclical capital buffer. Finansinspektionen advocated 1 per cent, the Riksbank 2.5 per cent and the Debt Office that it should not be activated at this particular time.

What the appropriate level of the countercyclical capital buffer should be thus seems far from obvious. Based on the credit gap, defined as the difference between the actual credit-to-GDP ratio and a statistical trend computed using a Hodrick-Prescott filter, it would be set at a relatively low level, around the 1 per cent advocated by Finansinspektionen. Credit growth has been very strong during the past decade and the level of credit has increased from about 100 to 150 per cent of GDP. Because of this, the statistical trend in the credit-to-GDP ratio is growing and is now rapidly catching up with the actual credit-to-GDP ratio. The credit gap has thus been decreasing lately.

The question is whether this is evidence of a reduction in the risks associated with household indebtedness. In my view, it is rather evidence of a slower increase in these risks than before. In any case, increased

capital requirements for banks appear to be measures that have small negative side effects and therefore are preferable to many other potential measures to enhance the resilience of the financial system and perhaps dampen credit growth. Since the countercyclical capital buffer becomes a macroprudential tool throughout the EU with CRD IV, however, it is important to come up with a sensible and robust way of determining its appropriate level.

In Sweden, the debate about household indebtedness is very much centered on the notion of a housing price bubble that needs to be dealt with. My own view is that housing price developments in Sweden do not constitute a bubble in the sense that they cannot be explained by fundamental variables related to the supply of and demand for housing. As a principle, I think that macroprudential policy can be used to mitigate excessive indebtedness, but I would not advocate using it to directly influence asset prices such as house prices. These prices may be high because of underlying structural factors, such as impediments to the construction of residential property and urbanization processes. Still, since structural factors may change and this may trigger a fall in housing prices, with potentially strong negative macroeconomic effects if households are highly indebted, pursuing policies that can dampen excessive indebtedness seems worthwhile.

Notes

1 See the discussion on the economic considerations for selecting and calibrating macroprudential policy in the recently published ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector, European Systemic Risk Board, March 2014, pp. 17-18.

2 For a discussion of different views on the role of monetary policy in addressing issues related to financial stability, see Frank Smets, 'Financial Stability and Monetary Policy: How Closely Interlinked?' Sveriges Riksbank Economic Review 2013:3, pp. 121-160.

3 See Mathias Drehmann, Claudio Borio and Kostas Tsatsaronis, 'Characterising the financial cycle: don't lose sight of the medium term!' BIS Working Paper 380, June 2012.

4 See Financial Stability Report 2014:1, Sveriges Riksbank, June 2014.

5 Press release by the Swedish FSA 2010-05-05, www.fi.se.

6 According to the Swedish FSA, see The Swedish Mortgage Market 2014, 2004-04-10, www.fi.se.

6. Implementing macroprudential policies: the Korean experience

Hyun Song Shin

Korea was one of the countries hardest hit during the 1997 Asian financial crisis, and was again at the sharp end of the crisis in 2008. Korea's experience holds lessons for the Netherlands in three respects.

- Korea is a current account surplus country, just like the Netherlands, and ran surpluses in the run-up to the 2008 crisis.
- Korea's vulnerability lay in the procyclicality of the banking sector, in common with the Netherlands.
- Korea's macroprudential policy measures held consequences for cross-border capital flows through the banking sector, and therefore had to navigate multilateral policy imperatives that respected Korea's OECD commitments on free capital flows as well as to pass the IMF's scrutiny on capital controls. The Netherlands faces perhaps even more challenging multilateral commitments due to the internal markets directive of the European Union.

The crisis in Korea in 2008 was acute. From 2005 to 2007, locally-owned Korean banks and the branches of foreign banks in Korea saw rapid asset growth financed with short-term foreign currency liabilities. With the onset of the 2008 crisis, the banking sector saw very substantial capital outflows, associated with the deleveraging of the banking sector. In the three months following the Lehman bankruptcy, the outflow from the banking sector was 49 billion dollars. Over the same three months, Korea's foreign exchange reserves fell from 240 billion dollars to 200 billion dollars.

The banking sector in Korea (including the foreign bank branches) also held dollar assets, but the counterparties were local borrowers, such as exporting companies which held long-term dollar assets arising from their export receivables. Although the overall currency mismatch on the consolidated balance sheet consisting of the corporate and banking sectors would then cancel out, a maturity mismatch between long-term dollar claims and short-term dollar liabilities took its place. In effect, the currency mismatch was

replaced by a maturity mismatch which left the Korean financial system vulnerable to the global financial crisis in 2008 that followed in the wake of the bankruptcy of Lehman Brothers.

These lessons led to a policy initiative on the part of Korean policy makers to mitigate some of the known vulnerabilities.[1] Beginning in June 2010, the authorities in Korea introduced a sequence of macroprudential measures aimed at building resilience against its well-known vulnerability to capital flow reversals in the banking sector and the associated disruptions to domestic financial conditions. The IMF Background Paper on macroprudential policies provides useful information on the timing and rationale of the macroprudential policies in Korea.[2]

The first policy measure announced by the Korean authorities (in June 2010) was a leverage cap on the notional value of foreign exchange derivatives contracts (encompassing currency swaps and forwards) that banks could maintain (see IMF, 2012, p. 50). For foreign bank branches, the leverage cap was set at 2.5 times
their capital, while for domestic Korean banks, the cap was set at 50% of their capital. Foreign banks could in principle increase their positions by allocating greater capital to their branches in Korea, but the leverage cap lowers the return to capital for banks engaged in this segment of their business, thereby serving as a disincentive on expansion of derivatives positions.

The second component was the levy on the non-core liabilities of the banks (the 'macroprudential levy'), applied to the foreign exchange-denominated liabilities of the banking sector. The Korean non-core liabilities levy was relatively unfamiliar compared to the standard bank capital-related tools or standard capital control tools such as the unremunerated reserve requirements (URR). For this reason, the roll-out took more time. Although the policy was discussed from February of 2010[3] and press coverage trailed the introduction of the non-core levy from early in 2010[4], the measure was

announced formally in December 2010, after the conclusion of the G20 Seoul summit in November. The legislation was passed in April of 2011, and the levy began its operation in August 2011 (see IMF, 2012).

The levy consists of an annualized 20 basis point charge on the wholesale foreign exchange denominated liabilities of the banks of maturity up to 12 months. Lower rates are applied in a graduated manner to maturities of over one year. The levy was designed so that the proceeds of the levy are paid into a special segregated account of the foreign exchange reserves, rather than going into the general revenue of the government. In this respect, the Korean levy was designed from the outset as a financial stability tool, rather than as a fiscal measure. The outwardly similar bank levies introduced by France and the UK in 2010 had the proceeds being paid into general government revenue, and were designed as fiscal measures to supplement government revenue.

Korea's levy was on FX-denominated liabilities and therefore did not discriminate according to residence of the investor. This allowed the levy to be classified as a prudential tool, rather than a capital control tool. Nevertheless, the IMF and OECD have continued to raise questions on whether the Korean levy should be classified as a capital control tool, as it affects non-residents more than residents.

Crucially, by targeting non-core liabilities only, the levy was designed to address the procyclicality of the banking sector while leaving unaffected (as far as possible) the intermediation of core funding from savers to borrowers. In addition, the targeted nature of the levy gave it the attribute of an automatic stabilizer, thereby obviating the need for discretionary tightening, and allowing the policy to work in the background away from the glare of publicity and the possibly charged media coverage of the decisions.

Quasi-fiscal tools like the bank levy are relative newcomers compared to traditional macroprudential measures such as loan-to-value (LTV) or debt service-to-income (DTI) caps that are aimed at slowing credit growth directly. Instead, the bank levy works like a Pigouvian tax that raises the cost of dollar funding available to local banks (both locally incorporated banks and the branches of foreign banks).

Korea had LTV and DTI regulations in place before the 2008 crisis, but existing regulations did not address the currency mismatch and run potential of the banking sector.

The Korean levy can also be compared to traditional capital flow measures, such as the unremunerated reserve requirement (URR) whereby the central bank requires importers of capital to deposit a fraction of their balances at the central bank. This is equivalent to a tax on foreign inflows, which rate depends on the opportunity cost of funding. The popularity of measures such as the URR may be due in part to the fact that central banks have been in charge of both prudential policy and monetary management. The central bank normally has had discretion to use URR policies without going through the legislative procedures associated with other types of capital controls such as levies and taxes. One limitation of the URR is that its effectiveness is severely curtailed in an environment with low interest rates. Although the URR is an implicit tax on a balance sheet item, the implied tax rate will vary with the opportunity cost of funds and hence with the interest rate. The variability of the effective tax rate thus implies the need for regular adjustment of the reserve rate, for example, by raising reserve requirements when interest rates are low.

Being a quasi-fiscal measure, the introduction of the Korean levy entailed a lengthy legislative process and entailed considerable delay. When the external environment is changing rapidly, long delays make the introduction of a levy impractical. Nevertheless, as in Korea's case, alternative measures (such as the leverage cap on FX exposures) that rely on existing legislation or other

temporary measures can be used in the interim until the longer-term policy measures come into force.

Bruno and Shin (2014)[5] give a preliminary empirical assessment of the impact of the measures introduced by the Korean authorities. Their assessment is based on a panel study where Korea is one of 48 countries in a sample that encompasses both advanced and emerging economies. The approach is to treat the countries other than Korea as a comparison group and ask, first, how Korea's susceptibility to the global factors in capital flows compares to the other countries during the entire sample period. Then, having obtained a benchmark for comparison from this cross-country panel study, they ask whether the empirical relationship between Korea and the comparison group changed in any noticeable way following the sequenced introduction of macroprudential measures in Korea from June 2010. The method exploits the panel structure by reviewing the evidence both across time and in the cross-section, as well as examining the full complement of interaction dummies to test for structural changes.

Bruno and Shin (2014) do indeed find evidence that bank capital flows into Korea became less sensitive to global factors after the introduction of its macroprudential measures. Interestingly, this change in Korea's sensitivity to global conditions is in contrast to the other countries in the region (Australia, Indonesia, Malaysia, Philippines, Thailand and Vietnam). For the comparison group, their incremental sensitivity to global liquidity conditions was higher after June 2010.

Notes

1 At the time, I was Senior Adviser on the International Economy to President Lee Myung-bak, on leave from Princeton University, and led the design of the macroprudential policies introduced in Korea.

2 International Monetary Fund (2012) 'The Interaction of Monetary and Macroprudential Policies: Background Paper' IMF Background paper, http://www.imf.org/external/np/pp/eng/2013/012713.pdf

3 Shin, Hyun Song (2010) 'Non-Core Liabilities Tax as a Tool of Prudential Regulation' policy memo, http://www.princeton.edu/~hsshin/www/NonCoreLiabilitiesTax.pdf

4 See Wall Street Journal, April 22, 2010: http://blogs.wsj.com/economics/2010/04/22/is-obamas-bank-tax-plan-right-for-emerging-markets/

5 'Assessing Macroprudential Policies: Case of South Korea', Scandinavian Journal of Economics, 116(1), 128-157, symposium issue on capital flows, 2014.

7. How to deploy the macroprudential toolkit?

Anne Le Lorier

The financial crisis of 2007-2009 made it clear that the soundness of financial institutions considered on an individual basis could no longer be the main focus of prudential policies. It raised the need for a more holistic approach, centred on the financial system as a whole, and for a new kind of instruments explicitly aimed at preventing and mitigating 'systemic risk, i.e. the risk of widespread disruptions to the provision of financial services that have serious consequences for the real economy.'[1] It may be noted that, prior to the crisis, some instruments used in a number of countries and not yet labelled as 'macroprudential' have served that purpose.

At present, a number of instruments have been identified, sometimes experimented as promising and therefore included in the toolkit at the disposal of macroprudential authorities. Yet, beyond the design of the macroprudential toolkit, which is quite a well-advanced process, new issues arise regarding its operationalisation.[2] To do so, one has to answer a range of questions: What instruments to choose? How to implement them? At what moment? This paper tries to provide some responses.

What? Choosing the right instrument(s) to address the vulnerabilities

A number of tools at the disposal of the macroprudential authority

Following the ESRB recommendation on intermediate objectives and instruments of macro-prudential policy,[3] the ultimate objective of macroprudential policy is 'to contribute to the safeguard of the stability of the financial system as a whole, including by strengthening the resilience of the financial system and decreasing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial sector to economic growth'. In order to deploy this policy, one has first to determine what is included in the macroprudential toolkit.

A number of macroprudential instruments have already been identified as promising instruments to be part of a macroprudential toolkit. In Europe, the capital requirements directive (CRD IV) and regulation (CRR) package, which is gradually implemented from 1 January 2014 onwards, sets up a toolkit for European countries composed of a range of macroprudential instruments, which comprises:

- the countercyclical capital buffer – CCB – (Art. 130 CRD), which corresponds to the time-varying capital requirement proposed by the Basel Committee on Banking Supervision;
- the buffers for global and other systemically important institutions – G-SII and O-SII – (Art. 131 CRD);
- the systemic risk buffer – SRB – (Art. 133 CRD), which is meant to address long-term, non-cyclical systemic or macroprudential risk;
- the flexibility package of Art. 458 CRR, which allows national authorities to impose stricter requirements regarding own funds, large exposures, public disclosure, liquidity, risk weights for the property sector, or intra financial sector exposures, provided that certain conditions are met;
- sectoral capital requirements for real estate exposures, namely higher risk weights and higher loss given default floor (Art. 124 and 164 CRR).

Other tools, such as limits on the loan-to-value (LTV) or the loan-to-income (LTI) ratios, are not harmonised under CRR/CRDIV, but are commonly included in national macroprudential toolkits.

In France, we favour a toolkit containing a critical number of instruments, combining capital rules and other regulations such as asset-side instruments, since capital alone is unlikely to build a sufficient macroprudential framework.[4] These instruments fall within the competence of either the High Council for Financial Stability (HCSF), which was appointed in July 2013 as the national macroprudential authority, or the *Autorité de*

Contrôle Prudentiel et de Résolution (ACPR), which is the French banking and insurance supervisor.

Bringing clarity by creating a taxonomy of instruments

For the sake of consistency, the tools that are used within the macroprudential policy framework should be specifically designed to address systemic risk. This is of course the case for purely macroprudential instruments, such as the countercyclical capital buffer, which requires the accumulation of precautionary reserves during cyclical upswings that could then be used to address difficulties in the event of an economic downturn. But this could also be achieved with instruments originally used in other policies, as long as they are redefined and adapted for financial stability purposes. More classical capital requirements are a case in point. Capital surcharges for systemically important financial institutions are not microprudential but macroprudential instruments since their target is to limit the risks to the financial system as a whole by enhancing the ability of critical institutions – not all institutions – to absorb shocks. One may also recall that banks' reserves with the central bank, a common monetary policy tool, may, in some instances, be used for macroprudential purposes, e.g. their use by several Emerging Market Economies to regulate capital flows. Equally, rules aimed at protecting retail borrowers/investors may in practice serve a macroprudential purpose.

In practice, selecting the right tool within the toolkit may require beforehand breaking down the ultimate goal of macroprudential policy, which is not easy to define, into more quantifiable objectives, often called 'intermediate objectives', and linking specific macroprudential instruments to each of them. Such a classification, which contributes to improving accountability and transparency, may, for instance, follow ESRB (2013), which distinguishes between several goals: (i) mitigate and prevent excessive credit growth; (ii) mitigate and prevent excessive

maturity mismatch and market illiquidity; (iii) limit direct and indirect exposure concentration; (iv) limit the systemic impact of misaligned incentives. Moreover, according to the Tinbergen rule, macroprudential authorities should devote at least one instrument to each objective. In this way, the selection of the appropriate tool is facilitated when the macroprudential authority identifies a specific risk that falls within one of these categories. Within this framework, the selection of a particular tool may either be left to the discretion of the macroprudential authority or be the result of rules based on a range of indicators and thresholds. In practice though, a balance between rules and discretion, i.e. a 'constrained/guided discretion', seems to allow for the most appropriate response to systemic risks, since it gives room to the authority's judgment while limiting the risk of inaction (inaction bias).

Lastly, as systemic risk is often multi-faceted, addressing the vulnerabilities may require implementing several tools at the same time. To allow the authority to determine the best mix of tools, interactions and complementarities between instruments and between policies have to be well documented. For instance, caps on LTVs could be more effective if combined with an LTI limit. Indeed, since income is more stable than house prices, LTI limits may become more binding in times of rising house prices than LTV limits which are related to mortgages. Thus LTI limits may act as a complementary tool to LTV caps, thereby better contributing to smoothing the cycle.

How? Ensuring an efficient implementation

Transmission mechanisms and experience

Ensuring the efficiency of macroprudential instruments is a key implementation issue. To do so, understanding the transmission mechanisms and channels of the instruments may facilitate the choice of macroprudential

authorities, depending on what their target is. For instance, from a theoretical point of view, the impact of all real estate instruments – sectoral capital requirements, LTV and LTI caps – on financial stability is two-fold: they increase the resilience of the financial system and they contribute to moderating the credit cycle. But depending on their transmission channels, their impact may not be comparable. Sectoral capital requirements have a direct impact on banks' resilience, whereas their impact on the credit cycle seems more hypothetical since it depends on the response of banks to the mechanical fall in their aggregate capital ratio. Banks may choose to decrease their credit supply or to opt for an increase in the cost of credit for borrowers. But they can also draw down their voluntary capital buffer, which can act as a counterbalance. Leverage limits on SBS entities such as REITs (e.g. in Singapore) are susceptible to the same variety of reactions. As regards LTV/LTI caps, their impact on resilience and credit may be more straightforward, since they directly reduce the funding available to borrowers thereby restricting the quantity of credit and increasing the ability to withstand shocks.

Country experience with macroprudential instruments is still scarce as macroprudential policy remains quite a new area of intervention. Yet, preliminary lessons can be drawn from the experience of emerging market economies, where macroprudential instruments have been widely in use in the past decades. To reduce the risks associated with external capital flows, Korea, for instance, has resorted to a successful macro-prudential strategy in 2010. On the domestic front, with respect to real estate measures, Asian countries, especially Hong Kong and Korea, are cases in point. According to He, caps on LTV ratios, which were first introduced in Hong Kong in 1991, have been effective in limiting household leverage but their impact on house prices proved temporary.[5] India is another example of the extensive use of countercyclical macroprudential instruments. In the 2000s, for instance, the Reserve Bank of India required banks to build-up an 'investment fluctuation reserve' in good times to

be drawn down in bad times to counter the impact of rises in interest rates on their marked to market profits. In Europe, the entry into force of the CRR/CRD IV package prompted several countries (including Belgium, the Netherlands, Sweden, Croatia, and Slovenia) to notify European institutions their intention to implement macroprudential measures at their country level. We will certainly learn from those experiences. However, national specificities have a bearing on macro-prudential instruments efficiency and should be taken into account.

Anticipating potential malfunctioning and arbitrage

Economy or finance are not a perfectly well-oiled machine: instruments may sometimes not reach their stated target or experience unintended limits because of leakages and arbitrage that interfere in the good functioning of the macroprudential toolkit. Anticipating those difficulties may make the action of macroprudential authorities more effective. For instance, regarding real estate instruments, one has to be aware that the dampening impact on the supply of credit may be mitigated by an increase in the credit supply by non-banks and from abroad.

Thus, ensuring an efficient implementation also means monitoring and addressing cross-borders effects and arbitrage. This can take the form of 'reciprocity' in the imposition of macroprudential requirements, as stated in the Basel III agreement on the countercyclical buffer. This principle is intended to make sure that the same constraints are imposed on all relevant credit exposures to borrowers in a given country, be credit provided by home or foreign entities. Under this principle, the rate of the countercyclical capital buffer set in a jurisdiction applies to all credit exposures in this jurisdiction. The rate of a banking group is then calculated as the weighted average of the rates that apply in the jurisdictions where the bank's relevant credit exposures are located. To minimize negative cross-border spillovers, it could be useful to extend the reciprocity principle

to other capital requirements. In the absence of reciprocity, countries could resort to unilateral imposition of capital controls in order to increase effectiveness of macroprudential actions, and the riskiness of cross-border banking flows increases.[6] It is thus desirable that reciprocity applies across a large set of macroprudential tools.

When? Assessing systemic risk and determining the appropriate timing

Finding informative indicators

Among the three high-level criteria that the Committee on the Global Financial System considers key in determining instrument selection and application is the ability to determine the appropriate timing for the activation or deactivation of the instrument; the two others being: the effectiveness of the instrument in achieving the stated policy objective, and the efficiency of the instrument in terms of a cost-benefit assessment. In this regard, successfully implementing macroprudential policy is crucially dependent on the ability to identify and measure systemic risk, as a necessary condition for correctly timing the activation and the release of macroprudential instruments as well as for avoiding the over- or undershooting of macroprudential objectives. To do so, relying on quantitative indicators may prove helpful in identifying weaknesses in both the time and cross-sectional dimensions of systemic risk.

Yet, choosing the most appropriate indicators may prove challenging. It is important to have in mind that market indicators can send false signals, which is one reason why microprudential data are key for systemic risk assessments. With respect to the monitoring of risk in the time dimension, the identification of sources of pro-cyclicality in the financial system may not be straightforward as risk tends to be undervalued during good times[7]: asset prices or measures of banks' risk-taking tend to have

limited predictive power as risk may not be correctly priced by the markets. Some macroeconomic indicators and balance sheet variables, such as the ratio of non-core bank liabilities to deposits or the debt service ratio seem to be better suited to assess the state of the financial cycle because they do not rely on agents' beliefs.[8, 9] Regarding the cross-sectional dimension of systemic risk, macroeconomic aggregates, credit risk variables, financial soundness ratios, but also measures of concentration risks can serve as useful indicators. A drawback, though, can be the lack of real time data as they are in general not updated frequently or sometimes even unavailable (e.g. foreign exchange exposure of non-financial corporations or households). As a complement, it is possible to monitor model-based indicators which provide a real-time assessment of sources and intensity of systemic risk, based either on publicly available (market information or balance sheet statements) or regulatory data (CDS counterparties or interbank payment data). Network analysis can be another tool to monitor systemic risk, which sheds light on systemic risk arising from contagion, i.e. from spillovers due to direct or indirect links between financial institutions.

Leaving room for judgement

Having said that, in order to make macroprudential policy fully operational, one has to choose leading indicators and associated thresholds at which an intermediate objective of macro-prudential policy would be in danger, to serve as a basis for guided discretion on the activation of macroprudential instruments. Thresholds for indicators can be derived from statistical evaluation, literature, historical distributions, or cross-sectional averages. At the current juncture, the countercyclical capital buffer is probably the tool for which guidance is most clearly defined. The credit-to-GDP gap, recommended by the BCBS[10] and CRD IV, would guide the build-up of the buffer up to 2.5%. However, additional measures of property prices, of private sector debt sustainability or of bank balance sheets may usefully complement the credit-to-GDP gap. For the release phase, measures of

stress in bank funding markets and financial market variables seem to to be able to perform well.

However, when determining the appropriate timing for the activation or deactivation of a macroprudential instrument, macroprudential authorities should not entirely rely on indicators. A certain amount of discretionary judgement on top of a rule-based response remains of the essence. A number of examples can be cited. For the activation of macroprudential instruments on the one hand, if a country has already implemented several ones, responding to a signal from a selected indicator by further policy tightening would not be as urgent and appropriate as if no instrument would have been resorted to. In the release phase on the other hand, qualitative assessment of systemic risk, including market and supervisory intelligence, may enable to keep an overview of the issue. Finally, indicators will certainly be used in different ways for different instruments. The good balance between rules and discretion could vary. Indicators may be easier to be used to act against time-varying risks, especially credit growth, whereas their use against structural vulnerabilities may be less obvious.[11]

Conclusion

How to deploy the macroprudential policy is definitely a stimulating question behind which several fundamental issues are hiding: choosing the right instrument(s), ensuring an efficient implementation and determining the appropriate timing. Since macroprudential policy is still in its early days, knowledge in this field will continue to grow along with experience through a process of learning by doing. Further work in this area is required: will Goodhart's law apply? Indicators may evolve and lose their informational content as macroprudential policy is implemented; at the same time, how to deal with the Lucas critique? We have limited knowledge on the way the economy would have behaved counterfactually in case macroprudential measures had been taken in the past. In the future,

operationalising macroprudential policy will certainly remain an important challenge, as its impact on borrowers, savers and investors is often more direct than that of other policies such as in the monetary field. In this regard, macroprudential authorities will have to learn how to cope with the acute tension between independence and political constraints. It might be desirable that they err on the side of being pro-active rather than cautious given the resistance they will meet from the impacted players.

Notes

1 Committee on the Global Financial System (2012), Operationalising the selection and application of macroprudential instruments.
2 See also Banque de France (2014), Macroprudential policies: implementation and interactions, Banque de France Financial Stability Review, April.
3 European Systemic Risk Board (2013), Recommendation on intermediate objectives and instruments of macro-prudential policy, ESRB/2013/1, April.
4 Bennani, T., Després, M., Dujardin, M., Duprey, T., Kelber, A. (2014), Macroprudential framework: key questions applied to the French case, Banque de France Occasional Paper 9, February.
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10 Basel Committee on Banking Supervision (2010), Guidance for national authorities operating the countercyclical capital buffer, BCBS Paper 187.
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8. Thoughts on how to use the instruments of macroprudential policy

Lex Hoogduin[1]

Introduction

One of the main lessons from the financial crisis of 2007/2008 was the need for the development of macroprudential policy. That would be a policy focusing on the financial system as a whole, with its own objective(s), instruments, accountability requirements and analytical framework.

This note provides some reflections on the development of the instruments for macroprudential policy. It is, however, impossible to discuss macroprudential instruments in isolation. Therefore, I will discuss the instruments against the background of the initial conditions in which they will be introduced, the objective(s) of macroprudential policy, the theory of crises/instability underlying that policy and the relation with other policies.

Initial conditions

New Policy

It must be acknowledged that macroprudential policy is new. Introduction of a new policy and using new policy instruments or existing policy instruments for other policy objectives than used to be the case, may always have unintended consequences, for the recovery and growth in particular. This calls for a gradual introduction of instruments and for learning by doing and from experience. That means not using a great number of instruments at the same time and initially.

It also calls for initial modesty in objectives of macroprudential policies. Usually two possible objectives are distinguished. The first is to maintain or increase the resilience of the financial system. The other is stabilising the financial cycle. The first objective is more modest, because no data or diagnosis on the state of the cycle is required. Therefore, it would be wise to focus on maintaining and where needed increasing the resilience of the financial system

as the objective of macroprudential policy. Instruments should thus be targeted on that objective.

The macroprudential authority needs to be flexible and indeed be able to learn from experience. Therefore, it should be able to introduce new instruments rapidly without having to go through a lengthy process, also involving politics.

To enable flexibility a basis in law could be created for the macroprudential authority to develop and use specific instruments from four categories of instruments at short notice:[2]

1. Related to balance sheets of financial institutions: liquidity, leverage, etc.
2. Related to financial transactions: haircuts, margin requirements, etc.
3. Related to commercial and/or residential real estate: loan to value ratios, debt to income ratios, etc.
4. Structural policies: size of financial institutions, restrictions with respect to certain (types) of activities like proprietary trading, etc.

The perimeter of macroprudential policy should be wider than banks. If not, over time the shadow banking system will become larger and its resilience cannot be ensured. This may undermine the resilience of the financial system at large.

Low buffers

Another main lesson from the financial crisis is that capital requirements had fallen to too low levels and that there was a need to introduce a regime for liquidity requirements. Basel III sets higher capital requirements and in addition to that systemically important financial institutions (SIFIs) have to hold even more capital. Basel III also introduces the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) with respect to liquidity.

Implementing these policies will increase the resilience of the world wide financial system. The Basel III countercyclical buffer does not only contribute to increasing the resilience of the financial system, but also to stabilising the financial cycle.

For the coming years, in the context of a gradual introduction of macroprudential policies no additional macroprudential instruments than foreseen in Basle III and the policies related to SIFIs need to be applied to banks. I have sympathy for the argument that after full implementation of these measures capital buffers in particular are still too low. That would argue for the presumption that Basel IV would further increase capital requirements.

What is urgent is the development of policies for the resilience of the shadow banking system. Capital requirements fully consistent with those for banks should be introduced.

Real estate is very often at the heart of financial crises. Maintaining or increasing resilience of the real estate sector should therefore be a key element in macroprudential policies going forward. That would require introducing loan to value ratios well below 100% where they do not yet exist in residential real estate markets and implementing similar measures in commercial real estate markets. This should be done in steps. It may also require structural changes elsewhere, e.g. in pension systems, to avoid that these policies would dampen aggregate demand more than necessary.

Introducing macroprudential instruments related to insurance and pension funds activities has no priority. I would also be cautious to introduce additional structural policies at this stage. The same applies to macroprudential instruments related to financial transactions.

With respect to financial market infrastructure, it seems wise to now first implement the new regulation and not introduce new instruments on top of those for the next four or five years, but rather fine tune the existing regulation.[3]

Underlying theory of financial cycles and -fragility

Underlying forces

Part of any macroprudential policy framework must be a theory of financial crises and fiancial fragility. Fragility is defined here as the negative of resilience, i.e. the potential for the financial system to become unstable or fall into crisis.

It goes far beyond the scope of this note to comprehensively discuss theories of financial cycles and -fragility. I just list what in my view can be identified as the key driving forces of financial cycles and -fragility:

1. The inevitable existence of fundamental uncertainty.[4] An element of the human condition is that we cannot know now the development of our own knowledge over time. Rationality alone cannot guide decisions and actions as a consequence.
2. Human nature has slowly evolved over time adapting to the (changing) environment and to dealing with uncertainty in an evolutionary process. This has led to overconfidence, herd behaviour, emotions, etc. to play a role in decision making and in driving (in)action.[5]
3. Financial systems and economies are complex systems,[6] i.e. they consist of a great number of interacting subjects and institutions responding also to their environment. All necessary data about the state of the financial system cannot be centrally collected. Data, information and knowledge are highly dispersed throughout the financial system and are created, deleted and reshaped continuously.[7]

Consequences

In the context of the topic of this note this has the following consequences. Risk assessments both by economic agents and supervisors/central banks are fallible methods to deal with the uncertain future. There is no solid ground in logic for quantitative risk management. Probability theory and risk management are useful heuristics. No more, no less. Risk assessments are always subjective. The same holds for prices of financial assests. Market to market measurement does not provide an objective method for measuring financial soundness. Such a method does not exist.

The pattern of financial cycles and -fragility, is that prices of financial assets increase and perceived risks and required compensation thereof decrease in the upswing. And then there is a sudden turning point and that triggers a sharp revision of valuations, sometimes with a crisis as a result. Cyclicality is an inherent characteristic of the economic/financial process.

Systemic risk

This implies that the concept of systemic risk is troublesome. A quantifiable measure of the probability of crisis cannot be grounded in logic. Market indicators of risk are pro-cyclical and are lagging indicators. The upswing exists because many subjects are optimistic and/or are prepared to receive a low compensation for taking risk. Therefore, I would not have this concept play any role in deciding on how to employ macroprudential instruments.

Dampening of the financial cycle

Ambitious objectives for macroprudential policy are problematic. The data needed for making a diagnosis of the state of the financial system can never be collected. The assessment of how likely it is that

a development will become unsustainable, is very difficult to make and cannot be simply be derived from data.

The nature of financial cycles also makes clear that macroprudential measures in the upswing will always be unpopular, also because they can probably be only effective if taken at a moment when there are no clear signs of an unsustainable development building up. This requires the macroprudential authority to be independent. But this can only work in a democracy with a clear and limited mandate.

This reinforces the earlier conclusion that the focus of macroprudential policy and -instruments should be on increasing/maintaining the resilience of the financial system. If nonetheless instruments will be chosen for dampening the cycle, there is much in favour of making them as much as possible rules based.

Leverage

Risk weighted capital measures have a shaky foundation. The risks cannot be measured reliably. Ultimately capital should not be seen as insurance against risk, but as a buffer against the unforeseeable, against fundamental uncertainty. But uncertainty cannot be measured.

This would argue for making unweighted capital measures the basis for macroprudential policy and -instruments. Leverage should take centre stage.

Liquidity

Liquidity is endogenous. More thought should be given to what that means for the definition of a liquidity measure in a macroprudential instrument. A narrow or broad range of assets? And how to determine which assets qualify? It also touches upon the importance of diversity for

creating resilience. More diversity in the financial system is likely to lead to preserving more liquidity in stressed times than when there is little diversity.

The downswing

Financial cycles are a fact of life. This means that there will always be upswings, turning points and downswings. Macroprudential instruments should not be designed with primarily the upswing in mind. Promoting the resilience of the financial system does not only require to determine how high minimal buffers should be. There should also be a policy with respect to the use of buffers. Buffers that cannot be used, are useless in absorbing losses and providing resilience.

Developing a policy with respect to using capital and liquidity buffers should have high priority. Such a policy should be made consistent with the policies with respect to recovery and resolution and with the lender of last resort role of the central bank.

Relation with other policies and their instruments

A crucial area that I can only mention here is that the deployment of macroprudential policy instruments should be well coordinated with the use of other policy instruments. Economic policy instruments have almost always an impact on more than one policy objective.

Therefore, in defining the objective of economic policies it should always be mentioned that they should support other policy objectives to the extent that it does not hinder achievement of their own primary objectives.
In this context one could question if announcing that interest rates will remain low for a long period of time or that monetary policy tightening would be gradual, is sufficiently supportive of maintaining a resilient financial system.

128 It should be avoided that macroprudential policy instruments will be used to compensate for suboptimal other policies, like fiscal and monetary policies. This would, for example, be the case if capital controls or lower loan to value ratios would be introduced as macroprudential measures in an environment where monetary policy would be too expansionary.

Notes

1 Universities of Amsterdam and Groningen, the Duisenberg School of Finance and independent director at LCH.Clearnet and chairman of its risk committees.

2 Such an approach existed in the past in the Netherlands for the introduction of new instruments for monetary policy.

3 That does not rule out that for example the scope for mandatory clearing is extended if need be.

4 See Hoogduin (1991), Some Aspects of Uncertainty and the Theory of a Monetary Economy, Groningen, Keynes, J.M. (1921), A Treatise on Probability, The Collected Writings of John Maynard Keynes, Vol. VIII, London, Keynes, J.M. (1937), The General Theory of Employment, reprinted in The Collected Writings of John Maynard Keynes, Vol. XIV, London, pp. 109-124 and Knight, F.H. (1921), Risk, Uncertainty and Profit, Boston.

5 See Keynes, J.M. (1936), The General Theory of Employment, Interest and Money, The Collected Writings of John Maynard Keynes, Vol. VII, London, Chapter XII for a vivid description, preparing the ground for what is nowadays called behavioural economics.

6 See Hayek, F.A. (1967), The Theory of Complex Phenomena, reprinted in Studies, in Philosophy, Politics and Economics, London, pp. 22-42 and Mitchell (2009), Complexity. A Guided Tour, Oxford.

7 See Hayek, F.A. (1945), The Use of Knowledge in Society, reprinted in Individualism and Economic Order, London, 1949, pp. 77-91.

9. How does macro-prudential policy interact with other policy areas?

Christine Cumming

Thank you very much for the opportunity to explore this important topic of the interaction of macroprudential policy with other policies. In my comments, I'll be expressing my own views and not those of the Federal Reserve Bank of New York or the Federal Reserve System.

Context

I'd like to build on the discussion in previous sessions. It's useful to define a macroprudential perspective or framework as the starting point for considering and addressing vulnerabilities, threats and issues related to financial stability. The macroprudential perspective supplements existing frameworks for monetary and microprudential policies. The macroprudential toolkit potentially covers the full range of policy tools available to the financial authorities, including those available for monetary and micro-prudential policies. Institutional arrangements differ across countries, and the choice of instruments employed in the basic setup of monetary or microprudential policies may differ across countries as well, although perhaps less than they once did. The instruments a country sees as macro-prudential may similarly differ across countries. The instruments may be among those already used for monetary and microprudential policies or supplementary instruments from the broader potential toolkit.

Describing the macroprudential perspective and toolkit this way makes clear the coordination opportunities and challenges across macroprudential, microprudential and monetary policies and -potentially aspects of fiscal policy as well, although I will leave those aside. Coordination is needed because the emergence of a systemic threat in a financial system often reflects not just a single development but often a confluence of several developments that requires a multifaceted and coordinated response using several elements of the toolkit. Coordination is also needed because the objectives of monetary policy, microprudential policy and macroprudential policy, usually well aligned at a conceptual

level, can be in conflict in some given contexts. Finally, because the toolkit is a shared one, coordination is needed to address the potential exists for a policy response in one domain to impinge on the institutional frameworks used for the other domains.

The experience of the recent financial crisis reminds us that coordination challenges across the three policy domains begin in the run-up to a financial crisis. As various accounts of the US housing and housing finance bubble of the last decade have suggested, policy settings such as the relaxation of restraints on leverage, the absence of sound microprudential oversight of specific classes of financial entities in the shadow banking system, and the stance of monetary policy combined with a series of financial innovations (such as subprime and alt-A mortgages, CDOs and CDO-squareds) and flawed incentives within financial entities to fuel the bubble. Those developments in turn combined with what I'll call the bubble psychology of excessive optimism about future prices and conditions and the systematic underestimation of risks, resulting in a willingness to leverage and to erode underwriting and even ethical standards. Taken together, these forces created a potent mix of drivers toward financial crisis.

Such a complex mix of forces requires the application of a macroprudential perspective for early identification of emerging problems and the choice of an overall strategy, most likely a set of strategies, for early intervention and rapid action. Those strategies may include the adjustment of existing microprudential or monetary policies. The overall strategy should be both sustainable and capable of being adjusted as conditions play out. The overall strategy could in concept incorporate some escalation, should the initial intervention fall short, or even be a layered strategy, providing a form of 'defense in depth'.

Ultimately, experience with exercising a macroprudential perspective should lead us to develop policy design that helps reduce systemic

vulnerabilities and increase resiliency to shocks, and thereby contributes to greater financial stability. This last is a rich area for further research.

That, in short, is the policy coordination problem: shaping a response to emerging systemic threats from the broad policy toolkit, addressing potential conflicts in policy objectives and policy implementation, and working toward policy design across the three policy domains to enhance financial stability. My remarks will concentrate on the first two coordination challenges.

Opportunities and Challenges in Policy Coordination

A key development since the 2008-9 financial crisis is the introduction of an explicit consideration of financial stability. That explicit consideration may take the form of a designated financial stability authority, the creation of a financial stability council, or the inclusion of financial stability in existing policy processes. The introduction of a macroprudential perspective changes the understanding of the policy context as well as the policy process.

The introduction of a more formal, structured macroprudential perspective poses several challenges, which the official community is working through. The first challenge is to develop a framework for monitoring the financial landscape for threats to financial stability and vulnerabilities that may propagate and amplify those threats. We have made considerable progress on identifying key financial stability indicators and elaborating and analyzing stress scenarios. Where we may have more work is truly integrating these new analyses into a coherent picture of the state of the overall financial system which can serve as the springboard for policy discusion by financial authorities.

I would characterize the next challenges as work in progress, in large part because they require repeated practice of skills that take time to become natural. A second challenge is to conduct discussion of financial stability and macroprudential issues across the policy domains based on an integrated view of the overall financial system such that those discussions lead to more cohesive consideration of concerns and possible policy responses. The challenge arises because policymakers in each domain – monetary policy, different aspects of microprudential policy, financial stability – have a mandate to fulfill and need to maintain a level of independence. Incorporating a macroprudential perspective requires a careful balancing by each authority – never losing sight of the specific mandate and accountability that the authority must fulfill while sustaining a 'big picture' perspective that is incorporated into the authority's thinking and policy choices. To achieve that balance requires open and candid dialogue and a sense of shared purpose among policymakers with different objectives and perspectives. Beyond that, identifying emerging systemic risks and how to address them requires an openness to the possibility that widely held assumptions may be incorrect or that current policies may not be set appropriately or may be insufficient to address an issue.

A third challenge is to develop a bias toward action, even when considerable uncertainty exists about the probability that an adverse financial stability outcome will occur. Over the course of the last few decades, I believe the hurdle for action by financial policymakers rose substantially, to a large extent because the pricing provided by financial markets was seen to be highly effective in allocating flows of funds and distributing risks. I am a firm believer in the power of markets to allocate resources efficiently and effectively. But a global look at the history of the performance of the financial system since the major deregulations of the 1970s and 1980s reveals that episodes of financial instability have been frequent and they are often severe enough to have large macroeconomic impacts. While many past episodes have not been as destructive on a global scale as the recent

financial crisis, many past episodes depressed incomes and reduced wealth at the level of national economies. Our collective financial supervisory experience suggests that early intervention is often f
ar more effective than later intervention. Markets do not always seek a stable equilibrium, action will be needed, and waiting is often costly.

A fourth challenge is the design of a response. In many if not most countries, the toolkit is large and identifying the appropriate macroprudential instruments may be difficult. In some cases, a single instrument may be highly effective. It may be sufficient to put in place prudential standards for foreign exchange or liquidity maturity mismatches or to harden standards around credit underwriting, such as loan-to-value ratios. Even in those cases and in situations where the confluence of drivers is complex, it seems worthwhile to build on our increased understanding of the factors contributing to financial instability to see if there are complementary policy actions that can be taken. Particularly if the system threat is judged to be large, a fuller range of policy interventions may be called for. If we think back to the factors in the run-up to the recent financial crisis, it seems clear that several forms of policy intervention and adjustments would have been necessary to brake, if not stem, the excess. Considering a wider range of policy instruments may also be helpful in braking or winding down an emerging systemic threat with as little macroeconomic damage as feasible by distributing some of the severity of a potential single intervention across a larger number of touchpoints in the financial system.

You'll note that I've described these challenges without respect to the institutional arrangements – whether macroprudential, microprudential and monetary policies are largely the responsibility of a single institution or whether those mandates are spread across many financial authorities. Even when these responsibilities are combined in a single institution, the need to fulfill specific mandates and differing perspectives and the tendency in modern life toward technical siloes may inhibit rich dialogue

within the institution. Financial stability programs may involve tradeoffs among efficacy in meeting objectives, if not tradeoffs in the objectives themselves. The coordination and direction can be set by the chief executive officer and the board, and they have the incentives within the organization to bring about alignment.

In the United States, where accountabilities for microprudential supervision and regulation are spread across a large number of agencies, coordination faces greater difficulty. Mandates can be drawn fairly narrowly for some regulatory agencies. Some mandates, like investor protection or market conduct, may be difficult to connect formally to financial stability concerns, placing some constraints on the scope of action.

The Dodd-Frank Act created a new mechanism for macroprudential coordination, the Financial Stability Oversight Council, the FSOC. Chaired by the Secretary of the Treasury, the ten members include the Federal Reserve, the other banking agencies, the Securities and Exchange Commission, the Commodity Futures Trading Commission and representatives from insurance supervision, which is not federally regulated. The FSOC has some statutory responsibilities. In particular, it designates systemically important nonbank financial institutions for additional regulation and supervision and it can designate systemically important financial activities. It publishes an annual financial stability report. It can formally recommend that policies be considered or reconsidered at regulatory agencies if the FSOC has identified financial stability concerns.

The FSOC provides the opportunity for the US financial authorities to meet all four of the challenges I described above: review financial stability indicators, conduct candid dialogue, consider action and follow through as necessary, and, when the time comes, design a response that draws on the full and rich policy toolkit that our regulatory diversity provides in the United States.

What are the incentives for the FSOC to function effectively? The FSOC annual report creates transparency around the FSOCs concerns and activities around financial stability, and I can't emphasize enough the disciplining value of this reporting. In addition, the FSOCs power formally to ask for reconsideration of a policy or to designate an activity as systemic gives it clout even if those powers are rarely or never exercised.
The FSOC has engaged on risk issue, most publicly, concerning the need to reduce the run risk in money market mutual funds, a significant issues that arose during the financial crisis. When the SEC was unable to put forward a proposal a few years ago, the FSOC placed pressure on the SEC to revisit its draft proposals. We do not yet have new rules in place, but the FSOC has continued to highlight the regulatory gap in its just-published annual report.

Conflicts Among Policy Objectives

As noted above, designing a response to multi-faceted or complex threats to financial stability at this point appears to be a discipline at a relatively early stage of development. The objectives of monetary policy and microprudential policy conceptually seem complementary. The first provides a sound policy foundation under the economy to encourage long-run growth and low inflation; the second provides a foundation to the financial system through the safety and soundness of most significnat financial institutions. Both seem necessary, although neither alone may be sufficient for good macroeconomic performance.

Most of the time, I believe, the objectives of monetary policy and microprudential policy are aligned and compatible. But the specifics of calibration or the employment of specific policy tools can bring these policies into conflict. The post-crisis environment provides many examples. Efforts to tighten up lax mortgage underwriting and servicing standards may slow the growth of housing at a time when the economy is weak and requires

monetary acommodation. Measures to discourage excessive capital flows into an economy when those flows are contributing to overheating one or more specific sectors (e.g., real estate) may tighten financial conditions across the financial system sufficiently to complicate monetary policy. Recently, the development of new regulations to strengthen liquidity management practices at supervised financial institutions have raised concerns about changing conditions and institutional arrangements in short-term financing markets that may make conducting monetary operations more difficult.

I suggest that in virtually all of these circumstances, increasing the dialogue among financial authorities is beneficial. The dialogue may reveal that the conflict is not so much in the *objectives* of policy as it is in the *methods used* to achieve the objectives. Here is where a rich toolkit can be helpful to tailor the two policies to the situation. It's also quite possible that tailoring through the choice policy tools is not enough to set aside the conflict, but the dialogue can assist both authorities in assessing benefits and costs, making adjustments to policy as needed, and further monitoring the impact of the conflict. The challenge, as noted earlier, is to balance maintaining accountability for mandates and independent scope of action with an integrated macroprudential perspective and the shared goal of financial stability.

There will be times when there is real conflict between the near-term objectives of monetary policy and decisions that fall in the microprudential sector (or the fiscal sector). Arguably, US efforts over the four decades leading to the 2008-9 crisis to create the most favorable environment possible for home ownership increasingly created conflict with the goals and objectives of all three policy domains. It should be our hope that in the future, a strong macroprudential framework will generate the insightful analysis that can catalyze an open, candid dialogue between or among the financial authorities about the strategic conflict among goals and bring attention to the conflict to legislators and to the public.

10. On the special role of macroprudential policy in the euro area

Fabio Panetta

Introduction

I would like to thank Klaas Knot and De Nederlandsche Bank (DNB) for inviting me to this seminar. It is a pleasure to be here, and to carry on our discussions of the challenges associated with the implementation of macroprudential policy (MAP).

Policy-makers around the world have been engaged in recent years in a wide-ranging debate on the potential role of the new, as yet broadly untested, MAP regime and its connection with two other regimes that share similar features but have a much longer history, namely microprudential policy (MIP) and monetary policy (MP). The fact that MAP is or will soon be operational in many advanced economies does not diminish the importance of continuing this debate, especially in the euro area, which is in many ways a natural laboratory to study the challenges posed by MAP.

First, euro-area economies rely heavily on bank credit to finance the real economy. Second, their banking markets have become increasingly concentrated in recent years, and might become more so in the future as a consequence of market pressures and banking union. Third, the euro area is subject to a single MP regime, but its stance cannot take into account the heterogeneity among member states and its transmission mechanism has been weakened by financial fragmentation. Finally, major changes are taking place on the institutional side for both MIP and MAP, with an increased centralisation of functions within the ECB, but also a notable retention of responsibilities at the national level.

I will argue that this state of affairs has two main implications. The first one is that MAP is likely to be particularly important and powerful in the euro area. The second one is that its interaction with MIP and MP raises issues – opportunities as well as difficulties – that are specific

to the euro area and in many ways more delicate than those faced by policy-makers elsewhere. In particular, an open dialogue between micro and macroprudential regulators is absolutely essential in this respect, especially today: our handling of the interplay between MAP and MIP is setting a precedent and shaping public expectations on how the two policies will work in the future, so any opacity on what we are doing, or why we are doing it, could be extremely damaging.

In the following paragraphs I will first recall three key factors that make the euro area's case special: high reliance on banks (Section 2); heterogeneity and fragmentation (Section 3); and concentration of the banking system (Section 4). I will then comment on 'what to do next' (Section 5) and discuss some of the practical challenges surrounding the implementation of MAP (Section 6). The thread running through the arguments, to which I will come back in my concluding remarks, is that MAP can certainly play a prominent role in the euro area, both structurally and in today's situation, and that special care must be taken in operationalising it to exploit the synergies with MIP and MP.

High reliance on banks

One key common denominator of the euro-area economies is that they rely heavily on bank finance. Financial markets and non-bank intermediaries are less developed than in the US or the UK, and typically do not fully compensate for shifts in the supply of bank credit.

The MAP toolbox is generally thought to operate mainly through the banking sector; this is certainly the case for most of the instruments that we are beginning to explore following the introduction of the Basel III and CRR/CRDIV package.[1] Hence, the regime could be both more powerful and more important here than in market-based economies. If a variation in MAP capital buffers had a broadly similar impact on the supply of bank

credit in the US and in the Euro Area, I would expect its impact on total credit to be stronger in the EA, where non-bank credit is both smaller and relatively less elastic. The linkage between capital buffers and aggregate credit gaps is also likely to be stronger in bank-centric economies. Other things being equal, this will tend to make the risks and potential gains from using countercyclical capital (or liquidity) buffers greater in the EA than elsewhere.

The structure of the financial system is endogenous (it reacts to changing regulation), so MAP policies focusing on banks may ultimately affect markets or the shadow banking sector.[2] In the medium term, however, the structure of financial markets in the EA can arguably be taken as given, so that high reliance on banks implies a more powerful transmission of MAP.

Heterogeneity and fragmentation

The second distinctive factor of the euro area has to do with the heterogeneity among member states. The business cycles of national economies are not synchronous; real and financial markets are not completely integrated, despite significant progress since 1999. The fragmentation of European financial markets has a structural dimension: many European banks operate mostly in retail markets, which are by nature local markets. Furthermore, cross-border bank penetration has always been relatively low in Europe.[3] This has placed severe strains on the MP transmission mechanism. With macroeconomic outlooks that (in general) differ widely among member countries, and a monetary transmission mechanism that (as of today) works in a strongly asymmetric fashion – and is least effective precisely where it is most needed, namely in the periphery – the value of introducing policy tools with a national focus is considerable. In this environment, country-specific MAP regimes can be used not only to enhance financial stability but also to prevent financial and possibly real imbalances

stemming from the 'one size doesn't fit any' problem that may at times be associated with MP. This point is intuitive, but it can also be formalised, showing that MAP rules can reduce macroeconomic volatility and improve aggregate welfare.[4]

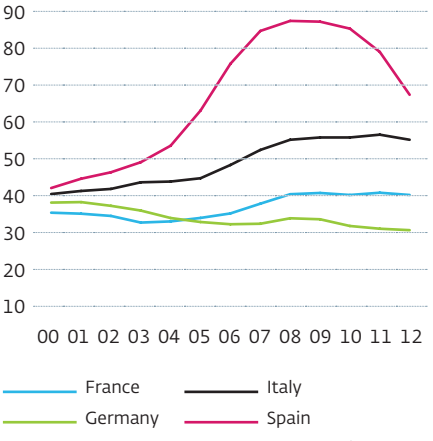
We have plenty of evidence, both before and after the crisis, of discrepancies in real and financial cycles among euro-area countries. As an example, let us consider bank lending to firms and households during the last decade (Figure 1). Germany, France, Italy and Spain all started off in 2000 with ratios of corporate loans to GDP in a relatively narrow range between 35 and 45 per cent (panel A). Over the following ten years, however, the ratio declined in Germany, remained constant in France, increased in Italy, and literally ballooned in Spain. This diversity also appeared in household credit (panel B) and house prices (panel C).

Evidence suggests that a set of country- and/or sector-specific MAP measures could have been used in the run-up to the crisis to limit the emergence of imbalances. In fact, the crisis emphasised that policy-makers should be concerned with the whole distribution of future economic outcomes.[5] Some argue that MP could take an active stance in cases where inflation is on target but financial imbalances generate large upside or downside risks around its expected path.[6] In any case it is clear that, in dealing with situations of the kind just illustrated, targeted MAP tools are a powerful complement – possibly an alternative – to a 'lean against the wind' MP stance.

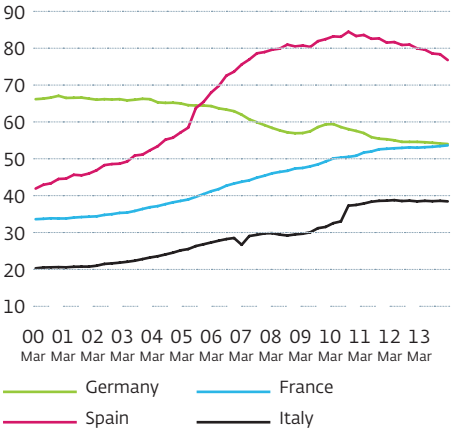
To the extent that credit booms, or excessive concentration of exposures within specific sectors in specific countries, stem from externalities among banks, MAP clearly has the potential to usefully complement a pure MIP regime.[7] Many commentators have indeed pointed to strategic complementarities – a specific form of externality by which the pay-offs associated with a bank's decision are positively affected by the number of

Figure 1: Heterogeneity across Europe

(A) Bank loans to firms in selected euro-area countries (per cent of GDP)

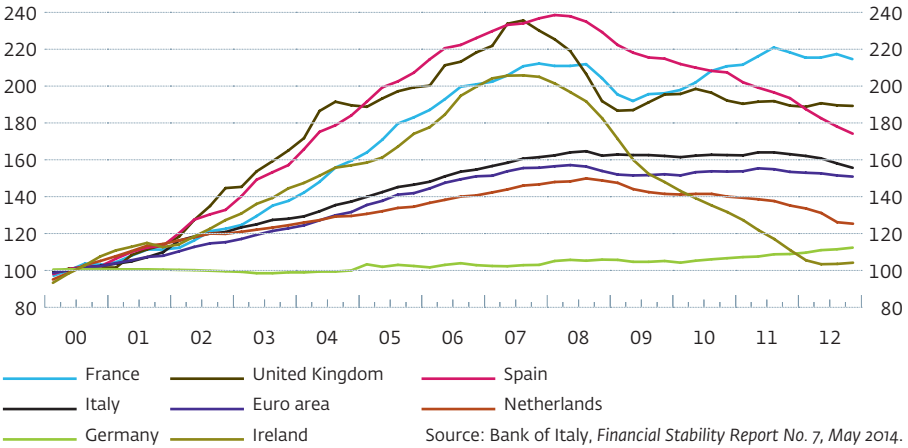


(B) Domestic bank lending to the household sector (per cent of GDP)



Source: ECB and Eurostat

(C) House prices in selected European countries



Source: Bank of Italy, *Financial Stability Report No. 7, May 2014.*

banks that behave in the same way – as one of the key drivers behind the financial exuberance of the early 2000s. Given its focus on the solvency of individual institutions, MIP did not historically, and probably could not in general, respond to these types of behaviour. Instead, MAP could have discouraged, for instance, excessive mortgage lending through higher LTVs on real-estate loans, or a disproportionate reliance on wholesale funding through an NSFR-type instrument.[8] Crucially, these would have operated across the board, regardless of whether banks appeared individually resilient or not.

Concentration

The banking systems of the euro area have relatively high, and rising, levels of concentration.[9] In the medium term further impetus in this direction could stem from market pressures and from Banking Union. So far the debate on macroprudential policy has ignored the question of how the structure of the banking system itself might affect an MAP regime. Yet there are at least three reasons why structure – in particular high concentration – should matter.

First, the literature on the bank lending channel[10] and the bank capital channel[11] suggests that large banks with highly liquid and diversified assets are less sensitive to MP impulses (they adjust their credit supply more gradually to changes in the MP stance). A high level of concentration, with credit markets dominated by a few large players, would thus make it harder for MP to affect banking credit cycles: if the credit multiplier associated with monetary policy is low, any attempt to control credit aggregates through MP interventions would require large swings in interest rates, which in turn could cause significant distortions in relative prices outside the financial sector. While the effectiveness of MAP tools is still largely untested, a euro-area-wide MAP framework might well fill an important gap in this respect. Indeed, big, liquid, diversified banks may

respond more to MAP impulses, as we know that right up until the onset of the crisis the capital ratios of large banks were very close to the regulatory minima. If this regularity were to be confirmed in the future despite regulatory changes, then we could conclude that large banks, with their thin capital buffers, are likely to be more sensitive to a countercyclical capital buffer (CCB) tightening.

A second, related point is that the interaction between MP and MAP ought to be weaker and thus less problematic when the market is more concentrated. One important finding of the literature on the interaction between MP and MAP is that there can be significant overlaps between them.[12] However, insofar as concentration weakens the financial stability spillover of MP by making banks' lending decisions less dependent on the monetary policy stance, it also widens the scope for independent macroprudential decision-making.[13] This would be good news for the euro area, where the policy framework should place national MAP authorities in a good position to internalise conflicts between MAP and MP.

Finally, the concentration of the industry is also an important determinant of the extent of any overlaps, hence potential tensions, between MAP and MIP. To see why concentration matters in this context, think of two polar cases. In a one-bank economy, the overlap between MIP and MAP is perfect, and coordination is crucial. If there is no coordination, in a recession the MIP authority raises its requirement, the MAP authority reduces its own, and they end up neutralising one another. In an economy with many (N) small banks, on the other hand, the overlap must be less significant. As long as the banks' levels of capitalisation differ, the MAP authority can lower the requirement on all banks while the MIP authority can pursue its objective of preventing idiosyncratic bank failures by raising capital requirements for the k banks it identifies as fragile. In net terms, capital requirements will be effectively reduced only for N-k banks. This means that MAP is again diluted by MIP, but the dilution is targeted

to the banks that need higher ratios in relation to their risk. Furthermore, the combined intervention stimulates a reallocation of credit from fragile to sound banks, which is of course a desirable outcome.[14]

MIP and MAP are clearly complementary from the operational standpoint. The synergy works in two ways: MAP analysis should inform and help focus the activity of micro supervisors; at the same time, micro supervisors will have a key role to play in implementing most macro policy interventions, because these are largely based on the use of micro tools to pursue macro objectives.[15] However, the two policies have different aims, and the example above suggests that the tension between them may be more severe in concentrated banking systems.

Compared with other systems, EA economies are in many ways closer to the polar one-bank case. This means that it is crucial to work out an explicit ranking of the policy objectives. As a consequence, clearly defining the processes that regulate the interaction between MIP and MAP authorities will be particularly important for the EA. To my mind it is clear that the overarching MAP objective of reducing systemic risk logically precedes the MIP objective of preventing idiosyncratic bank failures, for three complementary reasons. First, no individual bank can be deemed sound where significant systemic risks loom large: as we learned in 2008-9, even liquid and well-capitalised banks can be quickly cornered if funding markets seize up or asset prices plummet owing to fire sales. Second, idiosyncratic bank failures are a matter of concern almost exclusively for systemic spillovers: a bank's failure may or may not constitute a serious problem, depending on whether its counterparties can withstand its demise. Third, experience shows that big, well-diversified banks are largely sheltered from idiosyncratic shocks and can only become insolvent because of a systemic shock. On these premises, my view is that MIP should work to fine-tune regulatory requirements for individual institutions subject to the provision of adequate aggregate financial stability by MAP.

The governance structure we set up in the euro area might strike external observers as overcomplicated. Yet its design is conceptually appealing, because it puts us in a good position to insure coordination between MIP and MAP at both European and national level. What is crucial is that the ECB retains both MIP responsibilities (through the Single Supervisory Mechanism) and, in coordination with the European Systemic Risk Board, direct MAP powers to adjust the policy stance of individual national authorities (through CRR/CRD IV). The Governing Council should thus be able to internalise any tensions between MIP and MAP and establish a well-defined hierarchy between them.

Caveats: getting MAP to work

There are, of course, risks and uncertainties attached to the implementation of MAP in the euro area. A first challenge – and one that is clearly not confined to the euro area only – is that financial cycles, like most economic phenomena, are notoriously difficult to identify ex ante. Assessing in real time the causes behind any divergence among countries or markets, and establishing to what extent they reflect fundamentals, is not easy. One should guard against the temptation to look at a handful of indicators in isolation. MAP should ideally be grounded in the analysis of a broad set of risk indicators and rely on a joined up, holistic view of how these are related to economic fundamentals, domestically and abroad. Structural economic models can certainly help, but they are plainly not rich enough to capture all the dimensions of the problem. Hence, MAP policy-making is largely judgmental, and will remain so for some time to come.

To operationalise MAP it is also crucial to identify how far banks (that is, leveraged financial intermediaries) are involved in any hypothetical build-up of risks. The amount of systemic risk generated by a bubble depends on a number of factors, including who is financing it and whether the funding comes in the form of equity or debt. Typically, it is the direct

participation of banks in a bubbly market that can turn a local problem into a systemic event.[16] Real-estate markets are an interesting example of this problem, so allow me to return briefly to the credit and house price data I used earlier. Preliminary statistical evidence suggests that in several EU countries bank lending predicts house prices (Table 1). This is consistent with credit being an important determinant of the demand for housing. An inverse causation, with higher prices driving more real-estate financing by banks, is potentially more problematic because it may signal that asset prices are distorting banks' choices: prices might be growing for exogenous and possibly non-fundamental reasons (a 'bubble' or a wave of optimism), and banks might be piling in to reap capital gains on the housing stock. In this case the probability of a sharp correction in prices is higher. Such a correction is also more likely to translate into a banking crisis unless macroprudential measures are appropriately tightened beforehand. Interestingly, the only country for which house prices predict credit among those listed in Table 1 is Spain.[17]

Table 1. Test of Granger causality between lending for house purchase and housing prices in selected EU countries*

(2003Q2-2013Q3, annual growth rates)

Country	F-Statistic	Prob.	Significance level	Causality**	2007 LTV ratio	Banking crisis	Real-estate crisis
Belgium	5.071	0.006	***	C→P	80		
France	4.928	0.006	***	C→P	91	x	
Italy	4.638	0.016	**	C→P	65		
Netherlands	2.866	0.099	*	C→P	101	x	x
Spain	4.030	0.027	**	P→C	73	x	x
UK	4.583	0.009	***	C→P		x	x
Germany			Not significant		70		

* The null hypothesis is no Granger causality. Lending for house purchase is measured as domestic credit to households for house purchase as a share of GDP.

** C→P = credit causes house prices; P→C= house prices cause credit.

Even when the diagnosis is reasonably clear (as was apparently the case for the Spanish mortgage market in the early 2000s), political economy may get in the way of MAP: in practice, it is difficult to 'take the punch bowl away'. Furthermore, there is a risk that national authorities may design and manage national MAP regimes in a way which, although rational from a domestic perspective, could have undesired consequences. For example, national authorities may relax constraints on lending in order to stimulate the expansion of the domestic banking sector, with potential adverse spillovers for financial stability in other markets.

The controls at the ESRB and SSM level mitigate the risk of these negative spillovers, but other risks are more subtle and harder to address. When faced with an increase in a specific sectoral risk, relating for instance to real-estate loans, a national MAP authority could force banks to hold more capital by a) raising the overall capital requirement, b) creating an ad hoc buffer on real-estate exposures (although presently this is not allowed under the CRD-IV/CRR), or c) increasing the risk weights. These seemingly identical measures actually differ in important ways. One of them is the degree to which regulators wish to be transparent about what their concerns are: the nature of the vulnerability may not be fully disclosed in case a). Another is the impact on market perceptions: compared with their foreign peers, domestic banks would look relatively better capitalised in cases a) and b), while they would be perceived as relatively under capitalised in c).

The euro-area configuration, with the ECB-SSM in a position to top up national measures, goes in the direction of assuaging political economy concerns of this kind. The punch bowl may be taken away by someone other than the host, namely a supranational authority. Furthermore, the fact that all individual initiatives must pass the collective examination of the ESRB and/or the Governing Council limits the scope for strategic choices by individual countries. MAP is certainly going to be 'an adventure

more than a job', and it will entail a lot of adaptation and learning by doing. Here practice must necessarily come before theory. But since MAP can play a crucial role in resolving current economic difficulties, and the euro area has a sound institutional framework in place to handle it, our practice should begin in earnest, and sooner rather than later.

What could MAP do today, and how?

These reflections suggest that MAP could make a considerable difference in the euro area. It is likely to be a powerful instrument; it reintroduces a degree of flexibility that could compensate for the lack of national monetary policy frameworks; and it can relieve monetary policy of some of its burden. The question is how to relate this structural discourse to our current impasse. As we know, the euro area is not in good shape: inflation is too low, growth is weak, MP is stretched and affected by financial segmentation, banks' balance sheets are still strained and credit is scarce. Credit growth is weak across the area, although the underlying causes might differ across countries, and the need to stimulate credit supply accordingly ranks high on policy-makers' agenda.[18] Thus, the dilemma faced by MAP today is how to improve the financing conditions without further undermining banks' resilience.

How should this dilemma be resolved? The set of recent policy initiatives taken and discussed within the ESRB suggests that decision-makers have reached a consensus. In the Netherlands the central bank has announced the introduction of a systemic risk buffer for banks starting in January 2016, and similar initiatives have been taken in Belgium, Croatia and Estonia.[19] The core of the consensus thus appears to be (a) that the key MAP instruments in these circumstances are bank capital ratios and (b) that a conservative policy stance is called for. In short, all we need is 'more bank capital'. This consensus has emerged without an explicit debate on the underlying policy trade-offs, and it has implicitly reduced the broad

question of 'what MAP should do' to a narrow debate on 'whether capital requirements should go up or down'. This state of affairs is dangerous and potentially harmful, regardless of one's conclusions on the pros and cons of raising capital requirements. This for three reasons.

First, we are not paying enough attention to the relation between MAP and MIP. I argued earlier (i) that the interplay between the two is delicate, (ii) that coordination is important, particularly in the euro area, and (iii) that MAP should take priority over MIP when their objectives appear to clash. From this point of view, our conduct seems an example of how not to run MAP. Interactions and coordination have indeed been largely absent from the policy discussion. For example, given the great heterogeneity in banks' conditions, one could ask whether resilience could be improved by a set of selective MIP interventions on weak institutions, rather than a non-discriminatory increase in MAP capital requirements. This option, however, is not being discussed. We are glossing over the issue of coordination between MAP and MIP. The absence of discussion is bad per se, and it also carries a subtler but equally negative implication: the observed alignment between MAP and MIP authorities (both of which push for banks to hold more capital) could be interpreted as a sign that we are simply placing MIP objectives above MAP. As I remarked above, I consider this approach to be deeply problematic.

The second pitfall is that we seem to have accepted that bank capital ratios are practically the only weapon in the MAP toolbox. A behavioural economist would view this focus on capital as an example of ambiguity aversion. That is, we might be acting mainly through capital ratios for the same reason stock market investors over-buy domestic stocks – simply because we know them better.[20] Like a home bias in investment, such a 'capital bias' can obviously be suboptimal: we could gain by greater 'diversification' of our intervention 'portfolio'. Furthermore, if we determine that tighter capital requirements are necessary but believe they

have a negative spillover effect on credit supply, we should combine the tightening with initiatives to mitigate pro-cyclicality. A useful analogy can be drawn with MP, where interventions aimed at controlling the exchange rate can be sterilized in order not to affect the domestic money supply. In our case, we should be looking for ways to sterilize the impact of stiffer requirements on aggregate credit and economic activity. Admittedly, this is not easy, but it is possible. For example, it could be done by incentivising banks to build up their capital ratios through cost rather than credit cuts (I will shortly provide an example of this, based on our recent experience at the Bank of Italy). It could also be done by facilitating firms' recourse to non-bank intermediaries (such as insurance companies) or by stimulating bond and stock issuance, in particular by SMEs.[21]

The third problem is that the consensus does not seem to rest on a clear, shared understanding of the cause of the credit crunch. It should, because there is no ready-made, cookbook-style answer to the question of what MAP should do in a recession with weak credit (or in any other situation for that matter), as the policy measures to mitigate the crunch will differ with the causes. We should be wary of recipes that simply suggest more capital because 'risk is high', or less capital because 'credit is weak', without further analysis of the fundamental factors that drive the data. For example, if the credit crunch is caused by high credit risk, then higher capital requirements would certainly be the right choice. But if instead it depends on high funding costs for banks regardless of their individual situation (say, the poor condition of the domestic sovereign), raising capital charges might work (well-capitalised banks also obtain funds at lower rates) but it would clearly be second-best (central banks have a range of alternative tools that affect banks' funding more directly). Finally, consider a crunch caused by a problem of coordination among banks. When an economy with a concentrated banking system is at a turning point, large lenders certainly have a notion that the speed of the recovery depends on their lending strategies, and they might well realise that lending more, or on

softer terms, is the optimal strategy because it would stimulate growth and generate higher returns. Even in that case, however, it could well be that nobody is willing to bear the risk of expanding their balance sheet unless everybody else does likewise. The reason is that without coordination the recovery will not start and the lender who took the solitary initiative will pay all the costs of running a large balance sheet in a still recessionary environment: a credit crunch could emerge as a suboptimal Nash equilibrium. In this case, MAP policy could facilitate coordination among lenders to bring the crunch to an end and make the banking sector sounder.[22] These stories are all possible and credible. Any policy prescription should be based on a discussion of which of them we believe to be most plausible. It seems to me that so far this discussion – like those on MAP-MIP interactions and MAP tools mentioned above – has been largely bypassed.

The current conjuncture obviously puts pressure on policy makers to act decisively and narrows the room for wide-ranging discussion of governance and general principles. The MAP mechanism is now operating in conditions that are very different, and probably more complex, than those that will prevail in the future: in the pre-crisis period banks did not build up sufficient macroprudential capital buffers, greatly complicating the policy dilemma. After all, increasing prudential capital requirements might well be the right policy choice given the uncertain prospects of our economies. My main contention is that, even if that is so, we cannot afford to restrict ourselves to this strategy, or stick to it in a way that the public may see as a-critical.

The decisions we take today set an important precedent for how MAP will work and how it will be expected to work in the future. Accordingly, I submit that being transparent on the logic behind MAP initiatives and making sure that that logic is consistent with our agreed principles, is at least as important as getting the details of any specific intervention

right. The costs of setting a bad precedent or weakening the credibility of MAP, and particularly of its countercyclical nature, are hardly quantifiable, but I suspect that they would be very high indeed. The only way to contain them is to make sure that our decisions – whatever they are – derive from first principles, rest on sound economic analysis, and represent the outcome of a transparent, open dialogue among the authorities.

From theory to practice

Speculating on the interactions between MP, MAP and MIP in abstract is one thing. Bridging the gap between theory and practice, and setting up mechanisms that run reasonably smoothly, is another. Like many other central banks in the euro area (and beyond), the Bank of Italy has a micro (MIP) supervisory function that coexists with its macro (MP) function.[23] This coexistence requires two elements. The first one is a protocol that regulates the bottom-up flow of information and allows the Board to form a consistent view of the state of affairs and of the related risks. The second one is a mechanism that defines the top-down transmission of decisions, assigning clear responsibilities to all the sub-structures involved in implementing any policy interventions agreed by the Board.

Seen through a financial stability-MAP lens, the information flow within the Bank of Italy can be divided into three phases. First, risks are examined separately by the areas with the relevant expertise. Micro risks relating to banks' balance sheets are examined by the supervisory directorates; risks relating to money markets are monitored by the markets and payment systems directorate; macro conditions of any other kind are looked at by the economics and statistics directorate. This information is shared and debated within the Financial Stability Coordination Committee. Meetings are ordinarily held twice a year, but can be called at any time by the committee members – the heads of the key directorates – or by its chair – a deputy governor. The third and last phase involves a discussion

with the Board on the key conclusions, which includes a critical assessment of the evidence, a ranking of the risks and, if necessary, a list of suggestions for potential policy actions.

A supervisory initiative launched by the Bank of Italy in 2012 provides an example of the workings of this mechanism. In that case, a prolonged fall in non-performing loan coverage ratios (a micro signal) was deemed to be a potential threat for market confidence, particularly in a recessionary scenario (a macro issue). The Bank therefore launched a targeted but broad on-site review of positions with low coverage ratios to ensure that accounting practices were correct.[24] In order to avoid pro-cyclical effects, in parallel with this wave of inspections the Bank of Italy asked banks to increase internally-generated resources by cutting costs, selling non-strategic assets, adopting sustainable dividend policies, and revising the criteria for the remuneration of directors and executives. These actions, the results of which have been published, have improved banks' practices and standards; they have helped to reverse the declining trend in coverage ratios, increase transparency and assuage investors' concerns.
Thus, they relied on micro tools but were macro in spirit.

These processes will have to be adapted in the light of the radical institutional changes being introduced both at the national level (establishing a new MAP authority) and at the international level (MIP and MAP coordination and burden-sharing between national authorities and ESRB, EBA, SSM). Often, the devil is in the detail, and admittedly many details need to be sorted out for this architecture to work well. Therefore, it would be sensible to divide our time between speculation on the conceptual challenges posed by the interaction between MP, MAP and MIP and a less exciting but equally crucial effort to create a sound and effective governance structure.

Conclusions

Bold policy initiatives are rarely preceded by long periods of careful reflection. On the contrary, they are often taken in response to dramatic and unforeseen changes in the economic environment and (or hence) often at times when little is known about what the future holds in store. The situation we find ourselves in today is no exception to this rule. The financial turmoil created a strong rationale to introduce MAP, but our knowledge of the potential of this new tool is less than perfect. It will take a while to acquire that knowledge, to understand how MAP interacts with MP and MIP, and to explore ways to get the best out of all three. Operating the system in the meantime will surely be challenging.

The spirit of my remarks today is that, besides being inevitable, this challenge is very much worth meeting. MAP can deliver great benefits to the euro area in terms of macroeconomic and financial stability. Furthermore, the area has an institutional framework that favours coordination and places us in a good position to observe and exploit the complementarities between this and other, more traditional policy frameworks. We knew from the start that learning by doing would be central to MAP. Given these two preconditions, we should start doing, and learning, as soon as possible.

Notes

1 Countercyclical capital buffers and risk weights are obvious examples of bank-focused MAP instruments. On the market side, one could think instead of restrictions on specific transactions (e.g. short selling).

2 Panetta, F., 2013b, Macroprudential Tools: Where Do We Stand?, speech delivered at the Banque Centrale du Luxembourg, May.

3 From 2007 on, foreign banks accounted for 9% on average of the total number of active banks in France, Germany, Italy, Spain and held only 6.5% of total bank assets. By contrast, in the United Kingdom foreign banks accounted for 57% of the total headcount and held 14% of total bank assets. For the US, the figures are 28% and 23% (Claessens, S., and Van Horen, N., 2013, Foreign Banks: Trends and Impact, *Journal of Money Credit and Banking*, 46(1), 295-326). Banks' foreign credit claims in euro-area countries declined significantly as a consequence of the financial crisis (see Bologna, P., and Caccavaio, M., 2014, Euro Area (Cross-border?) Banking: Before and After the Global Financial Crisis, manuscript).

4 Angelini, Neri and Panetta (2014) examine the gains from coordinating MP and MAP in a closed economy (Angelini, P., Neri, S., and Panetta, F., 2014, The Interaction between Countercyclical Capital Requirements and Monetary Policy, *Journal of Money, Credit and Banking*, forthcoming). Brzoza-Brzezina et al. (2013) extend the analysis to the case of two countries facing asymmetric shocks but subject to the same MP, and find that country-specific LTVs and capital buffers have significant stabilising effects (Brzoza-Brzezina, M., Kolasa, M., and Makarski, K., 2013, Macroprudential Policy Instruments and Economic Imbalances in the Euro Area, ECB Working Paper, 1589, September).

5 Visco, I., 2009, The Financial Crisis and Economists' Forecasts, commencement speech to the students of the Faculty of Economics, La Sapienza University, Rome, March.

6 As Stein (2014) notes, this activist approach is justified even if the monetary authority does not have an explicit financial stability objective. The point of tackling the underlying financial imbalance is to reduce the variance of inflation and unemployment around their target values (Stein, J.C., 2014, Incorporating Financial Stability Considerations into a Monetary Policy Framework, remarks delivered at the International Research Forum on Monetary Policy, Washington DC, March 21).

7 Brunnermeier, M.K., Crockett, A., Goodhart, C.A., Persaud, A., and Shin, H.S., 2009, The Fundamental Principles of Financial Regulation, *Geneva Report on the World Economy*, 11, July.

8 See Catte, Pagano and Visco (2010) on the role of MAP in the US, i.e. whether adopting it would have prevented the bubble; see also Neri (2012). Catte, P., Cova, P., Pagano, P. and Visco, I., 2010, The Role of Macroeconomic Policies in the Global Crisis, Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 69, July; Neri, S., 2012, Financial Intermediation and the Real Economy: Implications for Monetary and Macroprudential Policies, in Gerlach, S., Gnan, E. and Ulbrich, J. (eds), *The ESRB at 1*, SUERF Studies: 2012 (4).

9 Between 2005 and 2011, the market share of the three largest banks in the European Union increased from roughly 46% to over 60%; in the US, it went from 20% to 30%, while in Japan it remained stable at about 40% (Bijlsma, J.M. and Zwart, G.T.J., 2013, The Changing Landscape of Financial Markets in Europe, the United States and Japan, Bruegel Working Paper, 2013 (02) March).

10 Kashyap, A.K. and Stein, J.C., 2000, What Do a Million Observations on Banks Say about the Transmission of Monetary Policy?, *The American Economic Review*, 90(3), 407-428.

11 Van den Heuvel, S.J., 2001, The Bank Capital Channel of Monetary Policy, manuscript; Gambacorta, L. and Mistrulli, P.E., 2004, Does Bank Capital Affect Lending Behavior?, *Journal of Financial Intermediation*, 13(4), 436-457.

12 Angelini, P., Nicoletti-Altimari, S. and Visco, I., 2013, Macroprudential, Microprudential and Monetary Policies: Conflicts, Complementarities and Trade-offs, in Dombret, A., Lucius, O. (eds.), *Stability of the Financial System – Illusion or Feasible Concept?*, Elgar Edwards Publishing; Angelini, P., Neri, S. and Panetta, F., 2014, The Interaction between Countercyclical Capital Requirements and Monetary Policy, *Journal of Money, Credit and Banking*, forthcoming; Collard, F., Dellas, H., Diba, B. and Loisel, O., 2012, Optimal Monetary and Prudential Policies, Banque de France, Document de Travail, 413, December.

13 Of course, there are other channels through which MP can affect financial stability, such as via risk taking.

14 Heterogeneity among banks is crucial to this argument: if the *N* small banks all hold identical portfolios and capital buffers, then tension between MAP and MIP arises here exactly as in the one-bank world. This is another argument for preventing the sort of herd behaviour mentioned in Section 3, incentivising instead the diversification of business models and investment strategies between banks.

15 Bank of England, 2011, Instruments of Macroprudential Policy, Discussion Paper, December.

16 Aoke, K. and Nikolov, K., 2012, Bubbles, Banks and Financial Stability, ECB Working Paper, 1495, November; Reinhart, C. and Rogoff, K., 2008, *This Time Is Different*: *Eight Centuries of Financial Folly*, Princeton University Press.

17 An alternative explanation for this predictive relation is that rising house prices relax households' borrowing constraints, allowing them to take on more debt. The two hypotheses cannot be disentangled by looking at plain correlations. Miles and Pillonca (2008) suggest that expectations of capital gains played a significant role in driving housing credit in Spain, Sweden, Belgium and the UK before the crisis (Miles, D. and Pillonca, V., 2008, Financial Innovation and European Housing and Mortgage Markets, *Oxford Review of Economic Policy*, 24 (1), 2008, 145-175).

18 Draghi (2014) clarifies that the ultimate objective of the comprehensive assessment is to address capital constraints on credit supply (Draghi, M., 2014, Monetary Policy in a Period of Prolonged Inflation, speech delivered at the ECB Forum on Central Banking, Sintra, May).

19 Slovenia is moving in the opposite direction, and at the end of June will introduce a minimum loan-to-deposit ratio, in order to slow banks' deleveraging.

20 Following the ambiguity aversion analogy, the bias may stem because we are able to characterise, in probabilistic terms, the implications of a shift in bank capital requirements, which have a long history of regulation, while we lack this ability for other, new or relatively untested MAP policy instruments (see e.g. Barberis, N. and Thaler, R., 2003, A survey of behavioural finance, in Constantinides, Harris and Stulz eds., *Handbook of the Economics of Finance,* Elsevier).

21 The Italian insurance supervisor (IVASS, which is under the control of the Bank of Italy) has now broadened the possibility for insurance companies to buy corporate bonds. The Italian government is introducing tax benefits for IPOs and new equity issuance, as well as non-pecuniary incentives to stimulate issuance of bonds and equities by non-financial companies.

22 A similar story is formalised by Bebchuk, L.A., and Goldstein, I., 2011, Self-Fulfilling Market Freezes, *The Review of Financial Studies*, 24(11), 3519-3555. Note that in this case MAP can have a role to play *ex post*, after the burst of a credit bubble, for exactly the same reason why it has one *ex ante*, in the build-up phase: it corrects externalities (a strategic complementarity) that could otherwise bring about suboptimal equilibria.

23 The law that introduced capital requirements and assigned the Bank of Italy supervisory powers dates back to 1926 (see https://www.bancaditalia.it/bancaditalia/storia/1936/il_dopoguerra).

24 It was judged necessary to preserve a satisfactory level of provisioning in order to maintain investor confidence and low funding costs, particularly given the market tensions stemming from Italy's fiscal imbalances. (Panetta, F., 2013, Banks, Finance, Growth, remarks delivered at the Associazione per lo Sviluppo degli Studi di Banca e Borsa, March).

11. Central banks, monetary policy and the new macroprudential tools

Avinash Persaud

After years of being considered at best aspirational, and at worst repressive, macro-prudential tools are now fashionable. I am not ashamed of playing a modest role in that along with other co-conspirators.[1] In the first half of this short note I would like to focus on the challenges to the current operation of macro-prudential policy with respect to monetary policy, in the second half I will argue that an understanding of systemic risk management would argue for another approach that impinges less on the monetary policy role of central banks.

Financial markets have a long and tested habit of collectively under-estimating risks in a boom and overestimating them in the subsequent crash. It's why we have booms and busts. Interest rate policy is particularly ineffective at these times. When the common expectation is that house prices will rise by 20% per annum, the level of interest rates required to choke off a housing boom would decimate the rest of the economy. When the animal spirits are low, even zero interest rates are as ineffective as pushing on a string.[2] What is required is regulatory policy that acts against collective, self-reinforcing, errors in estimating risk.

This appears complimentary to monetary policy. And if regulatory policy targeted asset price booms and took that burden away from monetary policy, interest rate policy could be better focused on inflation. We would have two specific policy tools targeting two specific policy objectives, a la Tinbergen.[3] As I argued in last year's guest article in the Economist, this is all the more important in the euro area where there is a need to balance the one interest rate to rule all, with national macro-prudential policies to moderate national, often housing-related, asset price cycles.

Today, in the developed world, a common formulation is the establishment of new systemic risk committees of the wise and connected, to judge whether capital adequacy requirements should be raised or not. There are a number of challenges with this approach. First, the inconvenient truth

is that authorities had the discretion to tighten lending limits before and mostly chose not to use it.[4] However much those chasing evil-doers in the rubble of a past boom would like to think, booms are not all fakery hoisted upon the innocent by a few crooks. There is always a compelling, genuinely life-changing story that grips us all, such as the advent of railroads, electrification and the internet.[5] The collective inability of humanity to escape present preoccupations is not overcome by anointing a few to do so. The lesson of the crisis is that we need more rules to rein in credit growth, not more discretion. Claudio Borio and others have shown that there are strong, detectable, common, elements in macro-financial cycles that we can shape macro-prudential policy tools around.[6] A bold rule, based on bank profitability, or growth in assets or non-core liabilities, credit growth in general or to the property sector in particular could determine when capital or lending requirements are tightened or relaxed, with committees only empowered to over-rule the rule, transparently, in proscribed circumstances.[7]

Second, the problem with counter-cyclical capital requirements is that raising them in a boom, could lead banks to concentrate their lending in the booming sectors which are best able to absorb the higher borrowing costs. Central bankers are alert to this unintended consequence. Capital requirements could be raised only in the booming sectors, or banks could be required to only lower loan to value ratios to borrowers there. This appears inelegant and ad hoc (banks would be incentivised to game the definitions of the curbed sector). If elegance was the test there would be very little banking regulation. Arguably, macro-prudential is more about sectors and excessive concentrations rather than aggregate levels. Capital requirements could rise with increased concentrations of risk on a bank's balance sheet.[8] This is more elegant, but less practical. Statistical correlations of risk are, like almost everything else, pro-cyclical. The same world seems to be a diversified and liquid place in a boom and a concentrated, illiquid one in a crash. It is why we need macro-prudential and not just micro-prudential policy.

A third problem is how to reduce capital requirements when the bust arrives, at the same time as everyone is realising that the world is a riskier place than they thought. Just like raising capital requirements when the world looks to be a safer place than before, the politics of this is far harder than the economics.

What *is* Macro-Prudential?

A yet bigger problem with the current thinking on macro-prudential policy is that it is fixated with capital, still linked to the pro-cyclical measurement of individual risks[9] and not about risk-managing the system. The Global Financial Crisis settled the debate on the need for a macro-prudential dimension to policy, but it may have done so ahead of there being common ground on what that means.

Macro-prudential regulation is in danger of slipping back to an enhanced micro-prudential exercise, with macro-prudential merely meaning that we have a wider set of macro risks to consider and put up capital against. As the economy slows, the amount of macro risk rises, requiring more capital. The new capital adequacy regime may act more pro-cyclically than contra-cyclically.

Risk can be hedged, spread, pooled and shifted, but not easily removed. The critical task of the macro-prudential central banker is as a risk manager to the financial system. This is not familiar territory for many monetary policy experts. To them it seems complex and parochial. However, an understanding of systemic risk management is essential to the macro-prudential regulator and would point macro-prudential regulation in a different direction than today, and one with less potential conflict with monetary policy.

There is not one, but a few different types of risk. They are different, not because the dictionary gives them different names, but because each would be hedged differently. The liquidity risk of an asset, is the risk that if you were forced to sell the asset tomorrow, you would have to accept a deep discount in the price to bring out an unwilling buyer, compared to the price you would achieve if you had a longer time to do so. The way you hedge liquidity risk is not by owning a diverse range of equally illiquid assets, but by having time to sell, perhaps through long-term funding (or other long-term liabilities). The credit risk of an investment is the risk that it defaults on its payments and principal. Credit risk is not hedged by having more time in which the default can take place. More time increases credit risks. It is hedged by spreading credit risks across a diverse set of credits.[10]

A pension fund or life insurance firm has a capacity to absorb liquidity risks, but no particular ability to spread credit risks. A bank funded with overnight deposits with a raft of different borrowers has a capacity to absorb individual credit risks, but little capacity to absorb liquidity risks. The right place for risk is where there is a capacity to absorb it. If risks in the financial system are in the wrong place, there is no reasonable amount of capital that will save it. One critical advantage of placing risk where, if it erupts, it can be absorbed, is that we are then less dependent on measuring it correctly, individually or collectively. The pro-cyclical, collective, mis-measurement of risk is the critical source of systemic risk.

Not all risk transfers are good. The risk transfers that took place prior to the boom were the exact opposite of what would be desired from a systemic risk perspective and were a contributing factor to the crisis. But this was because micro-prudential oriented regulation made no allowance or plan for where risks should be. Consequently, risk was attracted to where it was cheapest to hold, not where it could be best absorbed naturally. Banks were left carrying liquidity risk in off-balance sheet vehicles that had little risk absorptive capacity and were busy shifting credit risk to hedge

or pension funds which had even less natural capacity to hold these risks than banks, but had lower capital requirements for doing so. If banks hold all the liquidity risk, and pension funds and life insurers hold all the credit risks, panics will be frequent, deep and inconsolable with reasonable levels of bank capital.

Let me end this brief note by arguing that getting the right risk transfers could be done simply, by requiring all financial institutions irrespective of what sector we think they are in, to place capital or a levy against mismatches of liquidity, credit and market risks. This would incentivise those with wells of liquidity to draw liquidity risks from others and in return sell them credit risks that they cannot easily match and vice versa. We would have stability strengthening transfers of risks across the financial sector. That is risk-managing the system. That is macro-prudential.

Within the banking sector, regulators have taken one step towards this goal by the introduction of the net stable funding ratio with the goal of a bank's long-term assets being matched by an equal or greater amount of stable funding. This is one of the new regulations that bankers are most up in arms against and one of the most important from a systemic risk point of view. Regulators and policy makers must hold the line.

One of the key messages of this note is that banks can only effectively shed systemically important liquidity risks if there is someone more appropriate to hold them. Yet, today, right under the noses of the new systemic risk committees, the new regulation of insurance and long-term savings institutions looks set to deliver the opposite. Wrongly formulated and the proposed 'Solvency II' regulation of insurance companies with regards to valuation and capital, could discourage the natural holders of the financial systems liquidity risk from holding it. Forcing long-term institutions to behave like short-term ones will be the biggest contributor to systemic risk – since the first iteration of Basle II.

Notes

1 See, Persaud, A., (2002), Banks Put Themselves At Risk in Basle, Financial Times, October 2002; Brunnermeier, M., Crockett, A., Goodhart, C.A.E., Persaud, A.D., Shin, H., (2009), The Fundamental Principles of Financial Regulation, Geneva Reports 11, ICMB/CEPR; Baker, A. (2013), The new political economy of the macroprudential ideational shift, New Political Economy 18.1, 112-139.

2 A phrase attributed to John Maynard Keynes.

3 Tinbergen, On the Theory of Economic Policy. North-Holland Pub. Co.1952.

4 Persaud, A., (2009a), Macro-Prudential Regulation. World Bank Policy Brief No. 6. July. Persaud, A., (2009b), Boom-time politicians will not rein in the bankers, The Financial Times, November 26. Banco de Espana and the Reserve Bank of India could claim otherwise.

5 See Carlota Perez, Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages, 2002, Edward Elgar.

6 See Borio, C.R. McCauley and P. McGuire (2011): Global credit and domestic credit booms BIS Quarterly Review, September, 43-57; and Drehmann, M.C. Borio and K. Tsatsaronis (2011): Anchoring countercyclical capital buffers: the role of credit aggregates, International Journal of Central Banking, 7(4), 189-2.

7 An approach focused on bank profitability is favoured by the Swiss National Bank amongst others.

8 Or co-variance of risk, see Adrian, T. and M. Brunnermeier (2011), 'CoVaR', Princeton, unpublished mimeo.

9 However much that assessment is scaled up or down by counter cyclical mechanisms.

10 For a more detailed exposition of this, see Warwick Commission (2009), 'The Warwick Commission on Financial Reform: In praise of unlevel playing fields', University of Warwick; A. Persaud, Macro-Prudential Regulation, World Bank, Policy Note, No. 6. (July, 2009); and A. Persaud, Reinventing Financial Regulation, Springer, 2014 (forthcoming).

12. The institutional setting of macro-prudential policy

Jan Brockmeijer

Introduction

Effective macroprudential policy requires the ability to assess systemic risk, assemble and deploy the necessary toolkit, and monitor and close regulatory and information gaps. A strong *Institutional Framework* is indispensible if these conditions are to be met on a lasting basis. Such a framework should in particular:

- Foster the *ability to act*, by assuring access to information and an appropriate range and reach of instruments.
- Strengthen the *willingness to act*, by countering biases for inaction.
- Establish *strong accountability*, based on clear objectives, mandate, and communication.
- Ensure *effective coordination* across policies to address systemic risk, while preserving the autonomy of these policies to pursue their primary targets.

This note[1] explores the relative strengths and weaknesses in achieving these goals of three models of institutional arrangements that are becoming increasingly prevalent (Annex 1):

- *Full integration*, where the macroprudential mandate is assigned to the central bank.
- *Separation*, where it is assigned to a committee outside the central bank.
- *Partial Integration*, where it is assigned to a dedicated committee within the central bank.

Fostering the ability to act

Effective conduct of macroprudential policy requires the *ability to detect* potential buildup of systemic risks through comprehensive monitoring and assessment, and *powers to respond* to these risks through an appropriate range of instruments. The monitoring and assessment needs to consider

both the time and structural dimensions of systemic risk, making full use of supervisory and statistical data, as well as market intelligence. The powers to respond to detected risks should include a well-defined set of instruments under direct control of the macroprudential authority, capacity to identify and calibrate the tools, as well as the ability to recommend actions by other authorities. The institutional framework should be conducive to information sharing in order to enhance the ability to detect systemic risks and to ensuring access to the necessary instruments.

Assigning the macroprudential mandate to a central bank that already performs financial regulatory and supervisory functions, i.e. *full integration* within the central bank, is conducive to bringing together all relevant information, and to making full use of existing expertise in analyzing potential systemic risks. Having these functions 'under one roof' also ensures that the integrated institution has a wide range of policy instruments at its disposal. Its management can put in place arrangements and incentives to ensure access to relevant data and collaboration between functions that would be difficult if more than one institution were involved. As regards risk identification, a drawback of this full integration model is that it lacks institutional mechanisms to challenge the dominant view within the one institution, and may thus result in some risks being ignored.

If responsibility for macroprudential policy is placed with a committee outside the central bank, such *separation* implies that the identification and mitigation of systemic risk becomes a multiagency task. Under these circumstances there is less risk that any one institution becomes dominant and remains unchallenged in its identification of risks, dependent on the precise arrangements governing the committee. But when multiple agencies are involved in risk assessment, this may result in no one institution having all the information needed to analyze all interlinked aspects of systemic risk. Rivalry and turf issues, as well as legal obstacles

can impede the necessary sharing of information between institutions. A multiagency setup can also result in a suboptimal access to policy instruments. While the central bank has institutional incentives to ensure financial stability, it may not have direct control over prudential tools, and thus be limited in its ability to act. Arrangements aimed at strengthening coordination between the members of the committee, with a prominent role for the central bank, can help overcome some of these weaknesses associated with the separation of functions.

The intermediate approach of *partial integration*, where the macroprudential mandate is assigned to a dedicated committee within the central bank, can in principle reap the benefits of both preceding models. It ensures a strong role for the central bank in systemic risk mitigation, as well as access to relevant prudential data and tools, while involving the relevant supervisory and regulatory agencies in the decision making process. This can help reconcile differences in perspectives, and create collective ownership of decisions taken. The representation of other agencies on the macroprudential committee will also help safeguard against dominance of the views of one institution.

Strengthening the willingness to act

Macroprudential policy is subject to a strong bias in favor of inaction or insufficiently timely and forceful action as risks build up. Difficulties in quantifying the benefits of such actions (as opposed to their cost), lobbying by the financial industry, and political pressures all add to this tendency. To strengthen the willingness to act, a well-defined objective, a clearly formulated mandate, and accountability are essential. The macroprudential mandate should be assigned to *someone*. Where a clear assignment is lacking, collective action problems lead to an inadequate response, as in the end *no one* is responsible for action and accountable for the consequences of the lack of action. A rule-based approach can help overcome a bias

to inaction, although it will in practice need to be complemented with some degree of discretion. One way of doing so may be through 'guided discretion', based on a systematic monitoring of key indicators, but allowing room for judgment that takes into account all available information.

Under the *full integration* model, mandate and responsibility for macroprudential policy are clearly assigned to the central bank. On the whole, it has strong incentives to act, since failure to do so will affect its price stability goals or increase the likelihood of needing to act as a lender of last resort. Central bank independence can also reduce the risk of delayed action due to political pressures or lobbying. But this model provides for few safeguards against overly aggressive use of macroprudential policy and concentrates a lot of powers in the hands of the central bank, especially when it also conducts monetary policy. Independent powers need therefore to be subject to a precise mandate and strong accountability mechanisms, including some type of safeguard mechanisms (such as basing decisions to act or not to act on clearly defined rules or guided discretion with appropriate indicators to justify the decision).

Placing collective responsibility for mitigation of systemic risk with an independent policymaking committee, as is the case under the *separation* model, mitigates the concentration of power. But differences of view between its members may cause delay in action being taken. Even though each institution represented on the committee may have a mandate to use resources and tools in its purview to ensure mitigation of systemic risk, no one agency is fully responsible for the (crisis) outcome if the overall effort to mitigate systemic risk falls short. This reduces the incentives on the part of all agencies to invest in systemic risk reduction through macroprudential policies. To the extent that the treasury plays a stronger role on the committee, this can help garner political support for actions taken, but it also poses the risk that short-term political considerations

prevail over incentives to mitigate systemic risk. A further implication of an independent committee is that it creates greater separation between policy decision and control over tools, requiring greater reliance on mechanisms to compensate for this separation. These might include strengthening the role of the central bank in the committee, and giving the latter the power to make 'act or explain' recommendations.

The risk of undermining the willingness to act appears less in the case of *partial integration*, where the central bank retains a strong role in systemic risk mitigation, albeit through a dedicated committee under its roof. The committee structure ensures that different views of members, including the treasury, are taken into account. But as this committee is part of the organization of the central bank, the latter's incentives to actively respond to potential systemic risks are likely to come through strongly.

Establishing strong accountability

A clear mandate and powers to mitigate systemic risk should go hand in hand with strong *accountability and transparency*. Accountability is needed to guide the exercise of macroprudential powers, while strong communication helps to create public awareness of risks and understanding of the need to take mitigating action. Internal checks and balances aimed at ensuring that well considered decisions are taken should be complemented by scrutiny on the part of third parties, such as parliament or the public. Since accountability for macroprudential policy cannot easily be tied to outcomes that can be observed in the short term, it needs instead to focus more on processes. Ways to achieve this are to publish an overall policy strategy, records of deliberations that led to particular policy decisions, and a periodic assessment of the effectiveness (and costs or side effects) of actions taken.

Under the *full integration model* it is clear that the central bank is accountable for the proper conduct of macroprudential policy. But it is also accountable for its conduct of monetary policy. Such a dual mandate for price and financial stability may be subject to tensions between the two objectives, which can affect the central bank's credibility or independence in the conduct of monetary policy. It also poses communication challenges that can undermine the transparency of either policy. Having both policies 'under one roof' implies that trade-offs between policy options will be part of an internal process within one institution, which tends to be less suitable for formal checks and balances aimed at ensuring that all views are carefully considered.

In the case of *separation*, the macroprudential mandate is assigned to a committee outside the central bank, and the latter will avoid the challenges associated with having a dual mandate. A balanced composition of this independent committee, with appropriate voting arrangements, can help ensure that internal checks and balances are in place. But such a structure with collective responsibility for mitigation of systemic risk can also dilute external accountability. With a number of key players involved in macroprudential policy (central bank, regulatory agencies, and treasury), there is a greater risk that the public will not understand who is ultimately responsible for preventing crises. A clearly assigned and communicated mandate and powers allocated to the independent committee, together with periodic reporting requirements, would help alleviate these risks.

A dedicated committee within the central bank, as is the case in the *partial integration* model, allows decisions regarding macroprudential policy to be clearly distinguished from other policy objectives of the central bank. It can thus to a large extent avoid the complications arising from a dual mandate. Also, under this model a broad composition of the committee need not lead to confusion as to who in the end is responsible, as the committee is housed by the central bank, and will ultimately be associated

with it. A consequence of this association is that the central bank will not be shielded entirely from potential damage to its reputation in case the committee fails to address systemic risk appropriately.

Ensuring effective coordination

Financial stability is affected also by a range of policies other than macroprudential policy. There are particularly strong complementarities between macroprudential, monetary and microprudential policies, but fiscal and structural policies can also have important implications for financial stability. The institutional arrangements should be conducive to effective coordination between these policy fields in the pursuit of financial stability, without undermining the credibility of each in achieving its primary objective.

The *full integration* model has important strengths in fostering coordination, as the conduct of macroprudential, monetary, and microprudential policy all takes place within one organization. This can increase effectiveness of decision making when there is a need to internalize trade-offs. It can also reduce mismatches between the reach of mandates and the reach of powers, because the decision maker has control over most of the relevant tools. Full integration also means that risk warnings and messages are likely to be coherent, as the central bank management can ensure that all officials speak with 'one voice', and that policy decisions can be implemented by the same organization and do not compromise the operational autonomy of separate agencies. But the integration of different policies in the central bank comes with the risk that its credibility as monetary policymaker can be affected by reputational damage resulting from prudential policy failures. Difficult trade-offs between its objectives can also place a heavy burden on the central bank.

An independent committee outside the central bank, as is the case under the *separation* model, will limit reputational risk. Such a model can also more easily include other policy fields in the formulation of macroprudential policy. A stronger role of the treasury in macroprudential decision making can help garner political support for the actions of the committee. But it brings with it a risk that short-term political considerations may prevail over the central bank's incentives to mitigate systemic risk, and it can undermine the established operational autonomy of the prudential authority, and the central bank's operational autonomy in monetary policy.

Under the partial integration model, assigning the macroprudential policy mandate to a dedicated committee within the central bank – that has no role in monetary policy – can help limit reputational risks, especially when its composition differs from the monetary policy committee, and the accountability arrangements supporting different policy functions are clearly visible to outsiders. Such a dedicated committee can allow for treasury participation, but since decision making is in the hands of the committee, rather than the Board of the central bank, there is less risk of this undermining the independence of the monetary policy function or of the central bank as an organization. This can have benefits when cooperation by the treasury is needed to ensure mitigation of systemic risk, e.g., when effective mitigation of risks requires legislative change or use of tax instruments. In principle a dedicated committee can come at the cost of reduced coordination with monetary policy, potentially leading to a suboptimal policy mix, but in practice, the importance of this concern may be less when there is an appropriate degree of overlap in the composition of the two committees.

Conclusion

This paper looks at the relative strengths and weaknesses of three prevalent institutional approaches to macroprudential policy through the perspective of how conducive they are to fostering the ability and willingness to act, establishing clear accountability, and furthering coordination with other policies (Annex 2). None of the approaches is without weaknesses. If implemented, all would benefit from measures aimed at mitigating their respective shortcomings, including from mechanisms that ensure coordination with other policies that have implications for financial stability.

In the case of *full integration* of macroprudential powers in the central bank, mechanisms are needed to discipline the use of these powers. The mandate of the single decision maker should ensure that it fully considers policy costs and trade-offs of its actions. It should be accompanied by strong transparency and accountability arrangements in order to distinguish between its price and financial stability objectives. The inclusion of independent experts in the process of policy formulation can help avoid 'group think' within the institution. Coordination mechanisms with policy areas outside the domain of the central bank, such as fiscal policy, are particularly important to complement this model.

In the case of *separation*, where macroprudential policy is assigned to an independent committee outside the central bank, it is important to overcome the risk of delayed decision taking. For this, majority voting would be more conducive than a requirement of unanimity. Ensuring a strong voice for the central bank in the voting arrangements, or assigning it the role to propose policy actions to the committee would further reduce the risk of delay. Even if timely decisions are taken, the separation model implies that the committee will not have direct control over many instruments. Vesting it with binding powers over a specific and well-defined

set of instruments can help overcome this shortcoming. Allowing the committee the power to issue non-binding recommendations, that may be strengthened through a 'comply or explain' mechanism, can also help. To ensure that the committee has all relevant data at its disposal, it will be important to remove specific legal impediments to information sharing by its members, and it may be useful to introduce a formal duty for them to make available all information needed to assess systemic risk. The composition of the committee should be conducive to the coordination with other policy areas relevant to financial stability.

As might be expected of an intermediate approach, the *partial integration* model, where a dedicated committee is housed within the central bank, avoids the more pronounced outcomes of the other two. To gain full advantage of this model, it is important to ensure that the formal distinction between macroprudential policy and other objectives of the central bank is not undermined in practice by both being part of the same institution. Clearly defined mandates, separate accountability mechanisms, and transparent communication are needed to counter too close an association. As with the other models, it will be important to ensure proper coordination with policies that reside outside the organization of the central bank, but have a bearing on financial stability.

Notes

1 The note draws heavily on IMF Staff Discussion Note: Institutional Models for Macroprudential Policy (November 2011) and IMF Board Paper: Key Aspects of Macroprudential Policy (June 2013).

Annex 1. Stylized Models for Institutional Setting of Macroprudential Policy

Model/Features of the model	Full integration model	Partial Integration model	Separation model
1. Ownership of macroprudential policy mandate	Central Bank	Committee 'related' to central bank	Independent committee
2. Degree of institutional integration of central bank and supervisory agencies	Full in principle	Partial	Partial
3. Role of MOF (government)	No (or passive)	Passive	Active
4. Separation of policy decisions and control over instruments	No (or in some areas)	In some areas	Yes
5. Existence of coordination mechanism across policies	No	Yes, other policy bodies represented in committees	Yes, other policy bodies represented in committees
Examples of specific model countries/regions	*New Zealand* *Czech Republic* *Ireland* *Serbia*	*United Kingdom* *Romania* *Thailand* *Malaysia*	*United States* *France* *Korea* *Germany* *Mexico* *Chile*

Annex 2. Relative Strengths (+) and Weaknesses (-)

	Principles	Full Integration	Separation	Partial Integration
Ability to act	Access to relevant information	+	o	+
	Using existing resources and expertise	+	o	+
	Challenging dominant views of one institution	-	+	+
Willingness to act	Incentive and willingness to act	+	-	+
	Concentration of power	-	+	o
Strong accountability	Strong mandate and accountability	+	-	+
Effective coordination	Interaction with monetary and microprudential policy	+	o	+
	Role of fiscal policy and structural policies	-	+	o
	Preserving the autonomy of separate policy functions	o	o	+

13. Allocating Macro-Prudential Powers

Dirk Schoenmaker

In the wider policy framework for the economic and financial system, monetary policy, macro- and micro-prudential policies are intimately linked. Given the synergies and conflicts between policy objectives, the macro-prudential authority should be allocated to the body where the overall balance of synergies and conflicts between policy objectives and required expertise is the largest. This chapter[1] reviews the pros and cons of the four institutional models for the allocation of macro-prudential powers: 1) the government, 2) the central bank, 3) the financial authority and 4) a committee with representatives from these three bodies.

Macro-prudential policy requires complete independence from short-term political pressures to deal with the inherent conflict between the short-term and the long-term. An independent agency, such as the central bank or the financial authority, may therefore be appropriate for macro-prudential policy. Adequate arrangements for democratic accountability are then important.

There is a link between macro- and micro-prudential policies, as their instruments overlap to a large extent. But the key issue is the expertise and corporate culture of the body that takes the macro-prudential decision. Macro-prudential policy (just as monetary policy) requires a macro-economic approach that focuses on the entire financial system, while micro-prudential supervision is more micro-oriented, as it looks at individual institutions. These perspectives can differ significantly. As the stability of the whole financial system is more important than that of its individual components, macro-prudential concerns should generally prevail over micro-prudential concerns, when they conflict. Nevertheless, the micro-prudential concerns should be addressed as well.

Macro-prudential and monetary policies also have synergies and conflicts. Nevertheless, they share the same methodological approach, which is commonly found at central banks. To ensure appropriate trade-offs, a central bank may assign the two policies to separate departments.

Committee decision-making tends to be more balanced than that of a single body. But this benefit need not extend to committees comprising bodies with differing objectives. Reputational concerns may induce members to manipulate information and vote strategically. Furthermore, large committees are prone to inaction bias. Finally, when chaired by a government representative, committees can be sensitive to short-term political pressures.

Some special considerations apply to the euro area in the presence of the banking union. First, macro-prudential policy is even more important in a monetary union, with a one-size-fits-all monetary policy. Pro-active macro-prudential policies are then needed to address financial imbalances at the country level. Second, while the national supervisory authorities (whether central bank with supervisory powers or stand-alone financial authority) are part of the ECB's Supervisory Board, the national designated macro-prudential authorities are represented in the ECB's Financial Stability Committee. To avoid a patchwork, it would be appropriate to have a closely-knit group of national central banks with macro-prudential powers represented in this Financial Stability Committee. Finally, the ESRB is responsible for the overall macro-prudential framework in the EU. The ESRB has thus a key role in ensuring a consistent approach across the EU and examining cross-border effects of the use of macro-prudential instruments at the country level.

Introduction

In its recommendation of 22 December 2011 on the macro-prudential mandate of national authorities (ESRB/2011/3), the European Systemic Risk Board called on Member States to designate in their national legislation an authority to conduct macro-prudential policy – either a single institution or a board composed of all the institutions whose actions affect financial stability. The ESRB also recommended that this institution or board be

given the powers to conduct macro-prudential policy either on its own initiative or following recommendations and warnings by the ESRB. This requirement to set up a 'designated authority' for macro-prudential supervision was restated in EU Capital Requirements Regulation (CRR, Regulation No 575/2013).

All Member States have abided by the recommendation and designated a national authority to conduct macro-prudential policy. However, not all have made the same choice in designating a single institution or a board, and among those which have chosen a single institution some have opted for the central bank while others have chosen another institution. In addition, the ECB will play a role in macro-prudential policy for the Banking Union according to the EU Single Supervisory Mechanism Regulation (SSM, Regulation No 1024/2013). This paper explores the implications of different choices in the allocation of macro-prudential powers from both a positive and a normative viewpoint. Specifically, it addresses the following questions:

- What are the likely effects of alternative allocations of macro-prudential power? In light of these likely effects, to which authority should it be attributed?
- How does this choice affect the interaction between macro-prudential policy and monetary policy?
- How do the answers to these questions differ (i) in countries with monetary sovereignty, (ii) in a monetary union such as the euro area, and (iii) in the European Union, which comprises both?

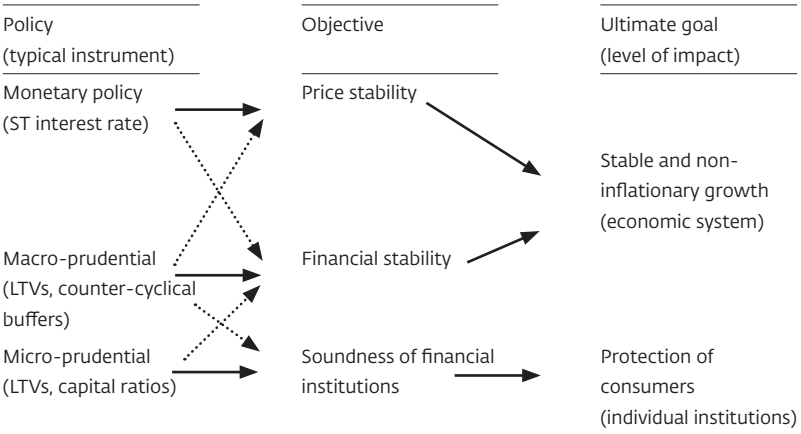
To address these questions, we start by defining the overall policy framework for the financial system. We then analyse interactions between the various policy objectives. Finally, we discuss the main considerations for the appropriate allocation of macro-prudential power, and how these considerations change depending on the different institutional settings listed above (standalone countries, monetary union, European Union).

Policy framework

The ultimate objective of macro-prudential policy is to safeguard the stability of the financial system as a whole. This includes decreasing the build-up of financial imbalances (financial cycle) and strengthening the resilience of the financial system, thereby ensuring a sustainable contribution of the financial sector to economic growth. Monetary policy aims to ensure stable and non-inflationary economic growth. Micro-prudential supervision purports to promote the soundness of financial institutions, thereby protecting the depositors or policyholders of these institutions. Hence, while the first two policies are set at the level of the whole economy, the last one operates at the level of individual institutions.

Figure 1 provides an overview of the policy framework for the financial sector and the wider economic system: it outlines the typical assignment of policy instruments to policy objectives, in the tradition of Tinbergen (1952)[2], who argued that at least one independent policy instrument is required for each policy objective. For example, Mundell (1962)[3] applied this general principle to the objectives of internal and external stability, recommending that monetary policy be assigned to the pursuit of external stability (via the determination of the exchange rate) and fiscal policy to that of internal stability (defined as full employment). What makes the problem non-trivial is that both policy tools and objectives are interrelated.

Figure 1. Policy framework for financial and economic system



Source: Based on Schoenmaker (2013)[4].

Figure 1 illustrates the overall policy framework for the financial and economic system.[5] To keep it simple, each policy has a primary impact on its direct objective and a secondary impact on other objectives primarily affected by another policy. The solid lines in Figure 1 illustrate the primary impact and the dotted lines secondary impacts. A prime example is a change in the interest rate, which impacts primarily price stability and aggregate output, but may also have a secondary impact on the objectives of financial stability (by triggering swings in asset prices) and soundness of financial firms (by affecting the creditworthiness of borrowers and the value of the securities held by banks and insurance companies).

These policies are often, but not invariably, assigned to different agencies. In several European countries, the central bank is in charge of both monetary policy and micro-prudential supervision (often labelled as

financial supervision). These broad central banks increasingly adopt an organisational structure with a separate body in charge of supervision. A case in point is the Single Supervisory Mechanism in the euro area: the ECB has created a Supervisory Board for day-to-day supervision of euro-area banks.

The most policy-relevant question addressed in this note is how macro-prudential authority should be allocated in this framework, i.e. to which authority the corresponding powers should be given.

Policy interactions

The interactions between policy areas raise several issues in the choice of policy instruments as well as in determining interactions between the agencies. It is important to take into account the impact of using one area's instrument not only on that area's own objective, but also on the objectives of the other areas. Being aware of such cross-effects may lead to a choice and use of instrument that is less damaging to other areas, and thus to better overall results.

But it may not always be possible to avoid conflict of objectives. Although the agencies have their own mandate (and are thus independent), there may be a need for policy coordination, with at least information exchange and sometimes consultation (while respecting each agency's mandate). In particular for financial stability, countries have been setting up a committee with representatives from all three branches (government, central bank, supervision) to ensure adequate coordination.

Committee decision-making tends be more balanced than decision-making by individuals. But this is typically true of committees acting as a body of a single institution (e.g. the executive board of a company or the monetary policy committee of a central bank) or a single system of related

institutions (e.g. the European System of Central Banks or the Federal Reserve System). The benefits of committee decision-making need not directly extend to committees representing more or less independent institutions with differing objectives that are supposed to work together. Visser and Swank (2007)[6], for example, show that reputational concerns induce members to manipulate information and vote strategically if their preferences differ considerably. Moreover, large committees are prone to 'group think', which plays an important role in the formation of financial bubbles: see, for example, the account in the seminal book by Reinhart and Rogoff (2009)[7] and the theoretical analysis by Benabou (2013)[8].

Hence, giving the macro-prudential policy mandate to a single body is likely to foster a more efficient and timely decision-making than entrusting it to an 'ad-hoc' board composed of all the institutions whose actions may affect financial stability. However, assigning macro-prudential powers to a single body does not preclude having a financial stability committee fostering adequate coordination.

In a world with synergies and conflicts of interests between policy objectives, the macro-prudential authority could be allocated to the body featuring the greatest overall synergy between the objective of systemic stability and the expertise required to pursue it.

Monetary and Macro-prudential policy

There is synergy between the price and financial stability mandate. In principle, the goals of monetary and macro-prudential policy should never conflict: without financial stability it is difficult to maintain the economy on a stable and non-inflationary growth path, and without price and output growth stability it might be difficult to maintain financial stability.

However, in practice there can also be conflicts in the short term. For example, during a period of high unemployment (and potentially downward pressures on prices) the central bank might want to stimulate demand with low interest rates. One channel through which lower interest rates stimulate aggregate demand is via their impact on assets prices, for example, house prices. Higher house prices could induce families to increase consumption by extracting the equity in their homes or to engage in building activity. But from a macro-prudential point of view this might not be desirable because, as soon as interest rates rise again, they could lead to a drop in house prices and thus endanger financial stability by pushing many borrowers into financial distress (as their mortgages go 'under water'). However, if the macro-prudential authority intervenes by decreasing loan-to-value ratios, the impact of monetary policy on aggregate demand will be much reduced, since households will then not be able to extract the equity in their homes.

A similar conflict might arise in the setting of countercyclical capital buffers. Increasing them should reduce the availability of credit and thus dampen demand, which in some instances might conflict with the short-term objective of monetary policy. Macro-prudential instruments can be targeted more directly to addressing financial imbalances than monetary policy instruments, as they can tighten or loosen financial conditions in specific markets or segments. Monetary policy-makers will need to consider the effects of macro-prudential instruments on the aggregate transmission mechanism. For instance, if macro-prudential policy addresses tensions in the mortgage lending and housing market via a decrease in the LTV ratio, the central bank may avoid raising interest rates. Ultimately, it is necessary to find a policy mix that addresses the undesirable side effects of macro-prudential policy without compromising monetary policy objectives (ESRB, 2014).[9]

Another conflict may arise in the application of the policies, as monetary policy is set at the euro area level and macro-prudential policy at the country level. In that way, the general effects of a loosening of monetary policy may be largely undone (sterilized) in a country when macro-prudential tools are tightened in that country. Again, it is crucial that an appropriate policy mix is found.

Micro- and Macro-prudential policy

At the instrument level, there are strong synergies between macro- and micro-prudential policies. Several macro-prudential instruments are very closely related to micro-prudential tools (ESRB, 2014). Table 1 illustrates that the countercyclical capital buffer (macro) is, for example, part of the larger capital adequacy framework (micro), though with a different underlying objective. Moreover, such macro-prudential instruments, which are written down in detailed legislation, also share the same legal

Table 1. The macro- and micro-prudential perspectives contrasted

	Macro-prudential	Micro-prudential
Policy objective	Limit financial system wide distress	Limit distress of individual firms
Ultimate goal	Avoid output (GDP) costs linked to financial instability	Consumer (depositor/ investor/policyholder) protection
Characterisation of risk	Dependent on collective behavior; endogenous	Independent of individual agents' behavior; exogenous
Correlations and common exposures across firms	Important	Irrelevant
Calibration of prudential controls	In terms of system-wide risk; top-down	In terms of firm risks; bottom-up

Source: Borio (2003).

base, e.g. the EU Capital Requirements Regulation (CRR, Regulation No 575/2013) and the EU Capital Requirements Directive (CRD IV, Directive No 2013/36). A similar observation applies to loan-to-value ratios (LTVs) that are usually set with a consumer protection goal in mind, but can also prove a key instrument to preserve macro-financial stability.

As the underlying objectives are different, it is important to allocate macro- and micro-prudential tasks to separate authorities. The macro-prudential authority decides at the macro level (e.g., the size of the countercyclical capital buffer), while the implementation may subsequently be done by the micro-prudential supervisor if that is more efficient (e.g., implementing the overall capital adequacy framework). Finally, some macro-prudential tools may apply to non-regulated entities, outside the remit of the micro-prudential supervisor. Loan-to-value ratios should, for example, apply to all financial institutions that provide mortgages to households. The scope may thus go beyond the regulated entities of banks, insurers and pension funds.

Until recently, the prevalent approach to financial stability has implicitly assumed that the system as a whole can be made safe by making individual financial institutions safe. But this represents a fallacy of composition. The fallacy of composition (Brunnermeier *et al*., 2009)[10] concerns the idea, fundamentally at the basis of original Basel banking supervision, that to safeguard the system it suffices to safeguard the components. But in trying to make themselves safer, financial institutions can behave in a way that collectively undermines the stability of the system. Selling an asset when the price of risk increases may be a prudent response from the perspective of an individual bank; but if many banks act in this way, the asset price will collapse, forcing financial institutions to take yet further steps to rectify the situation. The responses of the banks themselves to such pressures lead to generalised declines in asset prices, and enhanced correlations and volatility in asset markets (Shleifer and Vishny, 2011[11]). The micro policies can thus be destructive at the macro level.

Macro- and micro-prudential policies have distinct objectives and therefore distinct perspectives (Borio, 2003[12]). Table 1 summarises the differing perspectives, which are intentionally stylized. They are intended to highlight two orientations that inevitably *coexist* in current prudential frameworks.

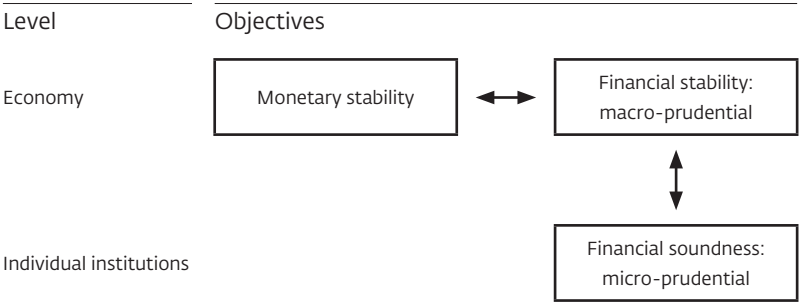
Table 1 provides a general overview, practices can be more nuanced. While supervisors tend to deal with financial institutions one by one in their supervision (implicitly assuming no correlation), correlations can also be important for micro-prudential, as they could affect the way to address micro-problems. When there is no correlation, the supervisor can, for example, prompt other financial institutions to take over a failed institution, but when there is strong correlation all financial institutions experience difficulties and alternative resolutions have to be found.

It may not always be possible to avoid conflict of objectives. The objectives in the first two rows of Figure 1, price and financial stability, are equally important and affect the economy at large. The last objective, sound financial institutions, concerns individual financial institutions and aims to protect individual consumers. The first two objectives aimed at the 'system' are more important than the latter objective aimed at 'individuals', for the simple reason that when the system goes down its individual components will go down as well. Moreover, the stability of the financial system is more important than the soundness of its individual components. In a market-driven economy, firms – including financial firms – should be allowed to fail in order to contain moral hazard, unless there is a systemic threat.

When the objectives are in conflict, it may be appropriate to define a hierarchy of objectives (Schoenmaker and Kremers, 2014[13]). In such situations, the macro concerns should override the micro concerns. Figure 2 depicts the proposed hierarchy of objectives. The override should be reversible to prevent forbearance. When a large unexpected stock market drop occurs, for example, capital adequacy rules may be temporarily lifted

to avoid fire sales. But there must be a clear exit. Otherwise problems may scale up and become worse. Moreover, the supervisor could take alternative micro measures which are less damaging at the macro level.

Figure 2. Hierarchy of objectives



Source: Schoenmaker and Kremers (2014)

Allocation of macro-prudential powers

The allocation of macro-prudential policy to any of the existing agencies (government, central bank, or financial authority)[14] involves several trade-offs, as pointed out earlier. This section highlights the main considerations.

Government

Macro-prudential policy has an impact on financial stability in the medium to long term, just like monetary policy on price stability. There is almost always a conflict between the long term and short term, with politics being driven by the short term and the election cycle. Due to this time inconsistency, monetary policy has been hived off from the government to an independent central bank (Kydland and Prescott, 1977[15]; Barro and Gordon, 1983[16]). The same time inconsistency arguments are valid for

macro-prudential policy. There is thus a danger of inherent 'inaction bias', as the costs of tightening are immediately visible and felt, while the benefits are less visible and indirect. Governments (or agencies close to the government) may block unpleasant decisions that are required for macro-prudential reasons from being taken. By contrast, independent central banks are designed to be able to take long-term decisions.

At the same time, macro-prudential policy can have a large impact on the economy as well as individual households. Lowering LTV ratios for mortgages makes it more difficult to acquire a new house (first-time buyers are affected) and may have a negative impact on house prices (home-owners are affected). In a democratic society, governments typically take this redistribution decision with parliamentary control. But to avoid inaction bias, it may be necessary that responsibility for macro-prudential policy be assigned to an independent agency, such as the central bank, or an independent committee. In this case, appropriate arrangements for democratic accountability are important (De Haan and Eiffinger, 2000[17]).

Central bank

Monetary policy and macro-prudential policy both have an impact on the financial system and the wider economy. They thus require a macro-economic approach to assess the current situation and the potential need for action (though the financial crisis has taught us that finance expertise is also important to assess the transmission mechanism for monetary policy and the stability of the financial system).[18] As the ultimate objective is different (price versus financial stability), the desired action may differ. Separate departments of the central bank are therefore involved. Nevertheless, there is a strong need for coordination. Monetary policy should take into account financial conditions. It may, for example, be useful to lean against the wind to prevent asset price bubbles. After the monetary policy decisions have been taken, the financial stability wing can assess

whether further tightening via macro-prudential instruments is necessary. Furthermore, the nature of decision making in macro-prudential and monetary policy is different: interest rates are frequently adjusted, but a macro-prudential authority will only sporadically use its powers on LTVs or countercyclical capital buffers.

As illustrated above, there can be conflicts of interest. For example, a need to loosen on the monetary side, while a need to tighten on the financial side. In that case, each side can apply its own instruments with appropriate coordination to avoid sending conflicting signals to the market.

Financial authority

While there is a strong synergy at the instrumental level, the perspective of macro- and micro-prudential supervision is very different. The fallacy of composition further suggests that the policies can have a differing impact at the level of the financial system versus the individual financial institutions. As the system is more important than its components, it is suggested that macro-prudential concerns should generally prevail over micro-prudential concerns.

Next, the methodological approach is also different. Macro-prudential policy uses the tools of macroeconomics and finance, while financial supervision is relatively more based on accountancy (checking balance sheets) and legally driven. While a small macro-prudential unit could be incorporated within a large financial authority, its effectiveness is not guaranteed as the corporate culture of the agency depends much on the presence and identity of its dominant group(s). Central banks tend to adopt a more macro-oriented perspective, while separate financial authorities adopt a more micro-oriented approach (Goodhart *et al*. 2002[19]).

Finally, financial authorities may be under indirect or direct control of the government (finance ministry) for policymaking. That may introduce political pressures for or against a particular policy stance, and hamper the effectiveness and timely activation of macro-prudential tools. As discussed above, macro-prudential authorities should be independent from government.

Concluding considerations

Monetary policy, micro- and macro-prudential policies are all intimately linked. The link is particularly apparent between the latter two, as their instruments overlap to a large extent. The key issue is, however, not the institutional assignment, but the corporate culture and expertise of the body that takes the decision. Macro-prudential policy requires a combination of complete independence from short-term political pressures and a macroeconomic, or system-wide point view in decision making, which is usually not the case for micro-prudential bodies.

Macro-prudential policy also requires a different approach than monetary policy. The latter is usually based on models that link macroeconomic variables smoothly to prices (inflation targeting). The former is concerned with non-linear, abrupt discontinuities in financial markets that can endanger financial stability. It should be noted that monetary policy also needs to consider financial frictions that may hamper the smooth functioning of the transmission mechanism. Here again the key consideration is not so much the institution where the body is housed, but its corporate culture in terms of what variables and mechanisms are at the centre of attention. Central banks have typically separate departments for monetary and macro-prudential policy. Following earlier work on democratic accountability of monetary policy, further work on the appropriate arrangements for democratic accountability of macro-prudential policy may be warranted.

Next, some important special considerations apply to the euro area in the presence of the banking union. First, macro-prudential policy is even more important in a monetary union, with a one-size-fits-all monetary policy. Pro-active macro-prudential policies are then needed to address financial imbalances at the country level, which may differ significantly. Monetary policy and macro-prudential policy are complementary in a heterogeneous banking union. For instance, an incipient housing bubble in a single country or in a subset of member countries may be addressed by lowering the respective LTV ratios, without requiring a tightening of the monetary policy stance in the entire monetary union. Second, while the national supervisory authorities (whether central bank with supervisory powers or stand-alone financial authority) are part of the ECB's Supervisory Board, the national designated authorities are represented in the ECB's Financial Stability Committee. To avoid a patchwork, it may be appropriate to have a closely-knit group of national central banks with macro-prudential powers represented in this Financial Stability Committee.

Finally, the ESRB is responsible for the overall macro-prudential framework in the EU. It has the power to issue warnings and recommendations to be followed up by the relevant macro-prudential authorities. The ESRB has a special role to monitor the consistent application of macro-prudential tools across the EU and to examine cross-border effects of the national application of these tools. The coexistence of three layers of decision-making levels regarding macro-prudential risk – the ESRB, the FSC of the ECB, and the national authorities – of course makes the European system of macro-prudential policy very complex. To overcome the potential inefficiencies (such as inaction bias) that may stem from such complexity, it will be essential to establish adequate cooperation between these bodies. In particular, it is very important for the ECB and the ESRB to agree on procedures to ensure information sharing and operational effectiveness.

Notes

1 This article is based on a forthcoming report No 5 of the ESRB Advisory Scientific Committee (2014), 'Allocating Macro-Prudential Powers', Frankfurt. The views reflected in this article are those of the author and do not necessarily reflect the official stance of the ESRB or its member organisations.

2 Tinbergen, J. (1952). On the Theory of Economic Policy. North-Holland Publishing Company, Amsterdam.

3 Mundell, Robert A. 'The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability.' IMF Staff Papers 9.1 (1962), 70-79.

4 Schoenmaker, D. (2013), An Integrated Financial Framework for the Banking Union: Don't Forget Macro-Prudential Supervision, European Economy – Economic Papers No 495, DG ECFIN, Brussels.

5 This chapter does not examine fiscal policy, which may impact on financial stability. Next, it only deals with the micro-prudential aspect of supervision, and does not discuss conduct of business policies.

6 Visser, B. and O. Swank (2007), On Committees of Experts, *Quarterly Journal of Economics* 122, 337-372.

7 Reinhart, C.M. and K.S. Rogoff (2009), *This Time Is Different: Eight Centuries of Financial Folly*, Princeton University Press, Princeton.

8 Benabou, R. (2013), Groupthink: Collective Delusions in Organizations and Markets, *Review of Economic Studies* 80, 429-462.

9 European Systemic Risk Board (2014), Flagship Report on Macro-prudential Policy in the Banking Sector, Frankfurt.

10 Brunnermeier, M., Crockett, A., Goodhart, C., Persaud, A. and Shin, H. (2009). *The Fundamental Principles of Financial Regulation*, Geneva Report on the World Economy 11, ICBM, Geneva, and CEPR, London.

11 Shleifer, A. and R. Vishny (2011), Fire Sales in Finance and Macroeconomics, *Journal of Economic Perspectives* 25, 29-48.

12 Borio, C. (2003), Towards a Macro-prudential Framework for Financial Supervision and Regulation?, *CESifo Economic Studies* 49, 181-215.

13 Schoenmaker, D. and J. Kremers (2014), Financial stability and proper business conduct: Can supervisory structure help to achieve these objectives?, in Huang, R. and Schoenmaker, D. (eds), *Institutional Structure of Financial Regulation: Theories and International Experiences*, Routledge, London, 29-39.

14 In Section 3, we explain why a separate committee may not work. See ASC (2014) for an overview of the designated authority for macro-prudential policy in the EU Member States and the Banking Union.

15 Kydland, F. and Prescott, E. (1977), Rules rather than Discretion: The Inconsistency of Optimal Plans, *Journal of Political Economy* 85, 473-491.

16 Barro, R. and Gordon, D. (1983), Rules, Discretion, and Reputation in a Model of Monetary Policy, *Journal of Monetary Economics* 12, 101-121.

17 De Haan, J. and S. Eijffinger (2000), 'The Democratic Accountability of the European Central Bank: A Comment on Two Fairy-tales', *Journal of Common Market Studies* 38, 393-407.

18 Macro-finance is emerging as a new discipline in the academic literature, which aims to incorporate the financial sector in macroeconomic models (see, for example, Brunnermeier and Sannikov, 2014).

19 Goodhart, C., Schoenmaker, D. and Dasgupta, P. (2002), The Skill Profile of Central Bankers and Supervisors, *European Finance Review* 6, 397-427.

14. The macroprudential voyage of discovery: no map, no specific destination in mind... *no problem*?

Richard Barwell

It is only through resolving the conceptual debate about the purpose of macroprudential policy that we can provide satisfactory answers to questions of institutional design, accountability and discouraging inaction. Unless or until someone articulates the preferences of the policymaker – the goals she is trying to achieve, and the loss society experiences when outcomes deviate from targets (a.k.a. the loss function) – macroprudential policy will lack a credible anchor. To put it bluntly, if you don't know what you are trying to achieve, or how to rank different outcomes from a social welfare perspective, how do you plan to take decision on an objective basis? And if policymakers do not fill in the blanks and define their objectives soon then their actions will define the objective of the regime for them – and it is unlikely those actions will be consistent through time (i.e., reflect a particular set of preferences and view of how the world works) let alone optimal. To be clear, nothing in what follows should be understood as a defence of the status quo ante. On the contrary, if policymakers are unable to implement an activist (counter-cyclical) regime, tightening capital and liquidity buffers only when the circumstances demand it – i.e., in response to a perceived build-up of systemic risk – then a passive (acyclical) regime in which minimum capital ratios are far higher than currently envisaged may be the prudent course of action.

Introduction[1]

The practical questions we have been tasked with answering in this session are: *Who should be given responsibility for the conduct of macroprudential policy? How to provide the appropriate incentives to encourage that policymaker to act?* And *how to make that policymaker accountable for those decisions?*

Unfortunately, in the view of the author, it is not possible to give a satisfactory or sustainable answer to these questions unless we have a settled answer to some fundamental conceptual questions on the precise goal of macroprudential policy – what policymakers can do, should do and equally importantly cannot or should not do *given our current state of knowledge*.

For perfectly understandable reasons policymakers have quickly moved on from sketching out the macroprudential agenda to taking decisions on instruments and institutional design and now the stance of policy. This is at best a 'sticking plaster' solution and if the policy community does not double back and complete the conceptual foundations there are risks of serious policy errors ahead. Paradoxically, it is only by dealing with the abstract conceptual issues that we can make practical progress. In this note I will set out why I think these issues need to be resolved and how the answer may shape the response to practical questions under discussion here.

Before moving on one thing needs to be made crystal clear. The argument that there is a risk of making errors if work on the conceptual foundations of macroprudential policy is not completed should in no way be misunderstood as a blocking tactic, designed to delay or de-rail action to increase the resilience of the financial system. On the contrary, one possible conclusion of the debate I am proposing is that it may be very difficult to implement the counter-cyclical macroprudential agenda in the short run and therefore it might be wise to operate a *significantly tougher* through the cycle microprudential regime until we learn a lot more about measuring systemic risk in real time.

An aside on the monetary policy revolution

It is widely believed by policymakers that the transformation in macroeconomic outcomes in the 1980s and 1990s can be explained in part by two complementary reforms in the monetary policy arena – to the intellectual framework which underpinned policy and to the institutional framework which governed decision-making.

On the intellectual front, a consensus emerged about the costs of inflation, the importance of anchoring expectations and the nature of the trade-off between output and inflation at different time horizons which essentially defined what could and could not be done with monetary policy in the pursuit of social welfare.

On the institutional front, central banks were granted operational independence for the conduct of policy within a transparent and clearly codified framework. In particular, the concept of *price stability* was made concrete, in terms of a particular index, an implicit or explicit target for inflation, and guidance over the time horizon over which that target was to be achieved which essentially defined what should and should not be done with monetary policy in the pursuit of social welfare.

Modern central bankers have a precise goal and a good grasp of how to use the tools at their disposal to achieve that goal, so much so that in the academic literature we treat the conduct of monetary policy as a scientific endeavour, as just another constrained optimization problem. For example, consider the following comment by the then Fed Vice Chair Janet Yellen (2012)[2]:

An alternative approach... is to compute an 'optimal control' path for the federal funds rate using an economic model – FRB/US, in this case. Such a path is chosen to minimize the value of a specific 'loss function' conditional on a baseline forecast

of economic conditions. The loss function attempts to quantify the social costs resulting from deviations of inflation from the Committee's longer-run goal and from deviations of unemployment from its longer-run normal rate.

The key claim of this paper is that it would not be possible to conduct a similar thought experiment – solving the corresponding constrained optimization problem – in the macroprudential domain because policymakers lack a reliable model of the economy and a well specified loss function. That lack of clarity means that policymakers can have little confidence that macroprudential interventions are in the ball-park of optimal and that should be of concern to the policymaking community.

The conceptual framework

The debate about the goals of macroprudential policy in policy circles is largely confined to the high level question of whether macroprudential policy should focus simply on increasing the resilience of the financial system, or should also embrace a credit smoothing objective. It is important that a decision is taken on this front but this is only the tip of the iceberg on the conceptual front – we need to define the preferences of the social planner and a reliable model of how the system works. To fix ideas, consider the following four step work agenda.

Step 1) Define terms: The phrases '*strengthening resilience*' and '*credit smoothing*' need to be translated into specific operational concepts: *Are we concerned about the resilience of the system, a subset of institutions, specific markets or specific institutions? When we say resilience are we talking about the risk of failure/closure of those institutions/markets or a near-failure/closure? Which core financial services are we concerned about stabilising? Are we worried about debt stocks, credit flows or even asset prices (risk premia)?*

Step 2) Define targets: It is not sufficient to say the goal of macro-prudential policy is to lean against systemic risk. Once the broad goals have been agreed, targets need to be specified: *What is the optimal level of resilience of the financial sector or a specified set of institutions? What is the optimal provision of core financial services? What is the optimal price of risk/ constellation of cross-asset risk premia? What is the optimal stock of debt in the real economy?*

Step 3) Define the loss function: If policymakers are to make informed choices about how to manage any conflict between the pursuit of different objectives then clarity is required on the loss involved when outcomes deviate from the respective targets, whether that loss is symmetric and the relative weights (importance) attached to progress on each front. For example, is the social loss involved in an over exuberant supply of credit on the same scale as a deviation from the target in the opposite direction (i.e., in a credit crunch). That loss function may well include arguments which are not macroprudential policy targets but which reflect social welfare – for example, the level of demand, or perhaps even some measure of inequality to capture the welfare consequences of incomplete provision of financial services across segments of the population (for example, even in retrospect was there anything about the increased provision of core financial services to low income US households in the years leading up to the crisis that should be viewed as a positive outcome for the social planner?).

Step 4) Define the constraints (the model): The final step is to define the constraints on the optimization (policy) process: what can be done with the instruments at the disposal of the policymaker given the structure of the economy? In short, what is required is a reliable model of the macro financial system that explains the outcomes which concern policymakers.

An illustration of why all this matters

The fragility of the financial system and the insufficient supply of core financial services to the real economy have been amongst the most pressing concerns in policy circles in recent years. Almost everyone agrees that it would be better if the financial system was more resilient and providing core services on more attractive terms. However, in the short run, progress on one front *may* set back progress on the other, and that suggests that hard choices will have to be made – in just the same way that cost shocks can present a challenge for central banks because they shift the two arguments of the monetary policy loss function (output and inflation) in opposite directions. Even in the long run, there *may* be a trade-off between the pursuit of resilience and real economy objectives: for example, banks which are required to fund a relatively small share of their portfolio through debt may face a structurally higher cost of capital, which could impact on trend growth (via the cost of funding to the SME sector) or inequality (via the incidence of credit constraints on low income households).

The use of the word *may* is important. Under strong assumptions, enforced changes in the capital structure will have no impact on the terms on which banks extend credit and therefore the potential rate of economic growth. Those of that opinion often point to the historical record and argue there is little evidence that the secular shift in the capital structure of banks yielded any great growth dividend – see for example Miles (2011)[3]:

'In the UK and the US banks once made much greater use of equity funding than they do today. But during that period, economic performance was not obviously far worse and spreads between reference rates of interest and the rates charged on bank loans were not obviously higher. This is prima facie evidence that much higher levels of bank capital do not cripple development, or seriously hinder the financing of investment.'

Whether one is persuaded by such observations would depend in part on whether one believed that the maximum *feasible* rate of sustainable growth – due to the possible innovation of new ideas, efficiency gains, and so on – was broadly constant across the decades.[4] In any case, those who do happen to believe this theoretical benchmark is a reasonable approximation to reality should not expect enforced changes in the capital structure to have a material influence on bank behaviour: you can't have your Modigliani Miller cake and eat it.

It seems possible, if not probable, that different policymakers with different remits would have a different perspective on how to strike the right balance between increasing resilience and credit provision. Even within the macroprudential sphere, without a clear understanding of the loss function and what can be achieved with macroprudential instruments it is difficult to know how these tensions can be satisfactorily resolved. One would hope that any discussion between policymakers of such an important question would have firm foundations, but without a formal exposition of their preferences and constraints – what each policymaker values, and what can be achieved – it is not clear how such a discussion can take place.

For those of a more practical persuasion, consider how policymakers will actually take decisions in the real world. Many if not most commentators believe that the output of stress tests will play a key role in informing the internal debate within policy institutions on the appropriate macro-prudential stance. This is all very well, but pity the poor person who has to design these tests in a world where the macroprudential remit is unclear.

If the tests are to provide a valuable input into the policy process then the tests need to provide answers (outcomes) on all the variables that policymakers care about. For example, stress tests which focus on whether the capital buffers of regulated institutions are exhausted in specific scenarios are worryingly incomplete, unless the policymaker is confident

she has no policy interest in the resilience of the wider financial system (e.g. the health of non-bank financial institutions or key wholesale markets) or the stable provision of core financial services. Likewise, without a clear understanding of the target level of resilience it is not clear how those designing the tests can choose an appropriate level of severity of the stress; otherwise the implicit resilience target is defined by the essentially arbitrary selection of the shocks to macro variables in the stress test.

Even in the perfect world where policymakers have access to a battery of test which were defined with the appropriate severity (level of stress) in mind and which describe the state of key financial institutions and markets as well as the provision of core financial services in each scenario the policymaker still has to decide what to do with the output of those tests. In particular, if the banks are expected to 'survive' the test but are also expected to significantly tighten the supply of credit to the real economy in order to do so, then how should policymakers respond?

Asking for the impossible and the baby steps solution

The standard push-back to this demand for policymakers to articulate the macroprudential remit is that it is asking for the impossible – we simply do not know enough to define the optimal level of financial sector resilience or provision of credit from first principles. Many go further and argue that there is a risk of spurious precision which would encourage a tendency to 'fine tune' a system we do not understand. For example, John Cochrane (2013)[5] recently cautioned against central bankers 'micro-managing' the entire financial system:

'Fine-tuning a poorly understood system goes quickly awry. The science of 'bubble' management is, so far, imaginary.'

This push-back is both compelling and disturbing in equal measure: compelling because implementing this 'define the loss function/write down the model' manifesto is indeed an intimidating task; disturbing because the push-back does not dispute that there *is* a loss function or a true unknown model of the economy, or that failure to base policy upon them could lead to policy errors. We are simply told to carry on regardless: no loss function, no model, no problem. In practice, the push back is a weak defence of the status quo, which could be described as 'coarse tuning' an opaque (absent) remit in the hope that doing so will leave the system in the ball-park of the optimal outcome of the process described above, and it should be clear that this 'best endeavors' approach has its drawbacks too. So what should be done, *if we take it as read that the costs of financial crises are so large that inaction/return to the antebellum regulatory architecture is totally unacceptable.*

One possible solution is to set policy a more modest goal in the short-run, implement the manifesto as far as possible, and then gradually adopt a more ambitious goal as we ascend the learning curve. The last step is critically important – even if it is acceptable to begin the macroprudential voyage of discovery without a formal remit it surely cannot be acceptable to continue indefinitely that way. If the task of writing down a coherent macroprudential remit is incredibly challenging and likely to involve the investment of a huge amount of resource for a sustained period of time then there is no time like the present to start that work.

Macroprudential policymakers could adopt a narrow remit, focused on the resilience of the banking sector, with a crude target of keeping the incidence of crises on the scale of the 2008 event as around (say) once a century. That suggestion is not a million miles away from the conclusions of a hugely experienced former UK central banker (Tucker (2014)[6]):

'Cyclical' variation of headline or sector-exposure capital (and other) requirements is a completely new dimension of the regulatory settlement. It is too often caricatured as almost absurdly ambitious: manage the credit cycle; employ robust, scientific criteria for identifying bubbles; find the optimal combination of macro-prudential and monetary instrument settings. While those should be long-term goals, there is a more modest way of approaching policy in the meantime – by framing the primary goal as sustaining the resilience of the financial system in the face of material changes in financial and economic conditions.

However, even implementing this 'baby steps' iterative approach to designing the framework is not straightforward. It is all very well having a narrow resilience objective but the policymaker still needs to have the confidence that she can implement it.

Policymakers need to come to a preliminary view on two key questions: whether they will be able to adequately identify systemic risk in real-time, and whether interventions to raise resilience will have a material detrimental impact on the real economy (the slope of the resilience output trade-off). If the answer to both questions is 'no', then the policymaker might reasonably conclude that the safest course of action is to raise steady state capital buffers substantially to make the system more resilient, and then leave well alone. If the answer to both questions is 'yes', then the policy-maker might reasonably run with much lower levels of regulatory capital but respond aggressively to evidence of rising risks. If the answer to the first question is 'no' but the second is 'yes' then the policymaker faces a dilemma.

Who calls the shots? Expertise and Instruments

One entry point into the discussion about responsibility for the conduct of macroprudential policy is the question of institutional competence. That is, the choice over which institution is given responsibility for the conduct

of macroprudential policy should be driven by absolute advantage in the analysis of policy relevant questions and control over relevant instruments.

From this perspective, in an ideal world authority for macroprudential policy would be given to the institution which already holds the information, experience and expertise for analysis of the relevant areas of the macro-financial system and accommodates the appropriate macroprudential levers given its existing current policy brief. Once again, a clear sequencing exists: it is clear that allocation of responsibility surely follows the resolution of the debate over the nature of the remit.

In terms of the remit of macroprudential policy, if it is broad and incorporates a credit smoothing objective then responsibility will naturally fall on the central bank given its expertise in macroeconomic analysis, and *to a lesser extent* in monitoring retail credit markets. However, at the other extreme, given a narrow macroprudential remit, which focuses on safeguarding the resilience of the banking sector, it is more plausible that the microprudential regulator could be given responsibility: the new powers may require the regulator to expand its 'macro' analysis of financial markets to capture the build-up of systemic risk which may be lost in the 'micro' analysis of regulated institutions, but the focus is still on the granular detail of the banks balance sheets. Indeed, under the new regime, the microprudential regulator will have to get her hands dirty conducting systemic stress tests anyway, which are typically thought of as the cornerstone of macroprudential analysis.

Speaking of institutional competence for macroprudential analysis, one of the most dangerous myths in the macroprudential debate is that policy can be safely conducted from 30,000 feet: the idea that wise policymakers can decide the policy stance with the aide of a few high-level summary statistics, like leverage ratios and so on and by implication *without much analytical support from the staff of those policy institutions*. Macroprudential

policy cannot be done at altitude; it requires a pain-staking analysis of the fine detail of the balance sheets of financial institutions, or the motives which drive key participants in core markets, or the capacity of sections of the household or corporate population to service debts. In passing, a clearly defined remit, perhaps coupled with a plan for how that remit may be made more ambitious in the future, is critical if precious resources are not to be wasted on peripheral issues whichever institution is given operational responsibility. This point applies to the research agenda within that institution as well as the day to day conjunctural analysis. The staff of the policy institutions entrusted with this macroprudential agenda needs to know which non-bank financial institutions or set of institutions concern the policymaker and why; which specific retail credit markets concern the policymaker and why, and so on.

In terms of the allocation of responsibility according to the ownership of the macroprudential instrument set, the microprudential regulator is assumed to be in the driving seat because the debate has focused almost exclusively on the use of microprudential levers to achieve macroprudential ends. However, in the view of this author at least the set of potential macroprudential instruments are far richer than that.

Though not described in these terms, one can make the case that there have been a series of interventions in the crisis beyond the scope of these microprudential levers which have had a definite macroprudential flavour to them. Central banks may have intervened to 'fix the transmission mechanism', whether through market maker of last resort purchases of corporate bonds, sterilised purchases of sovereign bonds in febrile markets, or the provision of cheap term funding to banks with strings attached. The objective was to support systemically important financial markets or institutions, or to support the flow of credit to the real economy. Rather than label these interventions monetary policy because the central bank was in the driving seat, should we not view the central bank's balance

sheet as a potential instrument of macroprudential policy? Policy should be defined by the objectives not the institutions who pull the lever. One could make similar points about any lender of last resort operation: the decision should reflect a careful (macroprudential) cost benefit consideration of the short run cost from inaction (provision of credit supply and financial sector resilience) against the long run moral hazard cost of action (financial sector resilience).

We can extend this argument even further: one dimension of the macroprudential agenda is about correcting externalities: discouraging agents from taking privately rational decisions that are socially destructive in a boom or bust, or to force institutions to recognise the costs they impose on others in the event of failure. The classic policy prescription is to levy Pigouvian taxes and subsidies. Indeed, we might have much more confidence in the transmission mechanism of taxes on banks than the quasi-taxes of higher capital and liquidity requirements. Now we are talking about serious fiscal instruments and that raises awkward questions of accountability and the political independence of policy.

Single, twin and triple peaks, the risks of subordination and the virtues of committees

The other entry point into the discussion about the institutional arrangements is to think about where macroprudential policy sits relative to the current institutional arrangements for the conduct of monetary policy and microprudential regulation. At one extreme is the single peaked model, where one institution is given responsibility for the entire brief; beyond that lie the multi-peak models with multiple institutions.

The relative merits of these different institutional arrangements are well understood. On the one hand you may favour the 'joining up the dots' logic of carrying out all the analysis in one place, the efficient exchange of private

information and analysis, you wish to avoid needless duplication of analysis, and you may want to foster greater policy coordination across regimes. On the other hand, you may prefer to allow institutions to concentrate on their area of specific expertise, you may worry about institutional over-stretch, you may want to ensure that policymakers focus on one narrow brief, and you may want to preserve a defence against *Groupthink*.

Once again the question of clarity of objectives comes to the fore. A significant risk in the model where one institution has responsibility for multiple policy regimes is **subordination**. If a vague macroprudential policy brief is given to an institution which has responsibility (with an explicit remit) in another field then there is a genuine concern that the macroprudential agenda will play second fiddle to the existing brief. For example, how much appetite would a microprudential regulator have to use measures which actively encourage banks to lend more against a nebulous credit smoothing objective when the regulator is concerned about the health of the banks relative to the microprudential standards? Equally, how much appetite would a monetary policy committee have to use measures which actively encourage the banks to repair balance sheets (which might constrain credit supply) against a nebulous system resilience objective when the policymaker is concerned that the macroeconomic outlook is anaemic?

The other dimension of this debate is about the precise arrangement for decision making whichever institution is given responsibility of the conduct of policy. One possible attraction of the policy by committee approach is that it may mitigate some of the risks involved in implementing a remit which is opaque, or absent altogether. Committee members – especially those external members who are not formal employees of the institution which houses the committee – may reach different conclusions on the remit in the absence of any formal instruction. And that may prevent the conduct of policy being driven by the views of any one individual, which

may happen to lie at one end of the spectrum, or being subordinated to a pre-existing policy responsibility of that institution.

Macroprudential rules: worse than useless?

There may be a rich theoretical literature on the virtues of rules in the conduct of monetary policy, but policymakers willing to devolve power to a rule in practice are few and far between. If despite all that theory and evidence the rules are still judged to be far too crude to capture the richness of the monetary policy debate, then what price for macroprudential rules?

The onus is on those advocating macroprudential rules to explain how practical policymakers can implement a rules-based approach without clarity on what they are trying to achieve (the objective) and given such a primitive understanding of how the macro-financial system works, including how instruments will influence that system. After all, one distinguished macroeconomist turned central banker described our state of knowledge when it comes to dealing with macroprudential instruments as akin to being back in the Stone Age relative to the state of play on monetary policy. Without a clear objective and understanding of how the system functions it is not clear what arguments one should include in such rule, let alone how to quantify the appropriate response of the macroprudential instrument to those arguments.

To take a much discussed example, a lot of faith seems to have been invested in a gap variable derived from the 'credit stock to GDP' ratio as an indicator of systemic risk, and therefore as a potential argument of a macroprudential rule. It is not clear why. We don't have a reliable model and shouldn't trust a filter to decompose trend and cycle in this indicator, particularly at the end-point using real-time data. It is not clear what the conceptual basis of this measure is: it is neither an income nor a

capital gearing measure. Nor is it clear what the read across to resilience is: there is no information here about the capital buffers of the banks, whether those loans are secured against collateral or not (and if so, the value of that collateral relative to fundamentals) and so on. To be clear, I am not arguing that macroprudential policymakers should be blind to developments in credit flows and debt stocks: I am saying that they should not bind themselves to a flawed indicator.

One final comment is in order on the merits of transplanting the theoretical defence of rules in the monetary economics literature into the macroprudential arena. In the monetary sphere 'sophisticated agents' in financial markets have a vested interest in understanding the reaction function, but they have no clear private incentive to subvert the pursuit of price stability. Nobody is trying to game the central bank. It is not clear policymakers could confidently make such a claim in the macroprudential sphere. The concept of regulatory arbitrage is familiar to most; the concept of risk homeostasis is less familiar but it is certainly relevant. When the social planner intervenes to make the world a safer place, people who were comfortable with their initial exposure to risk may respond by taking more risk (for example, motorists may drive faster when the government improves the quality of the roads, or forces drivers to wear seat belts). It is not obvious that blind adherence to simplistic rules which have no credible theoretical foundation and take no account of the endogenous response of the system to a change in the policy regime is a recipe for success.

In short, whilst there is a superficial attraction of a rules based approach, as a defence against inaction and a fillip to transparency, it surely does not compensate for the fact that the rules are not fit for purpose. On the contrary, one can make the case that macroprudential rules are worse than useless. The rule can become a crutch: in the absence of a clear conviction on the optimal policy response there may be a natural psychological bias to follow the rule – because it defines the default option – even though

policymakers appreciate the rule as distinctly sub-optimal. The more policymakers are seen to follow a rule the more of a burden that rule becomes, because the rule becomes ingrained in the public consciousness: when policymakers try to deviate from that rule there may be considerable pressure because the outside world may equate deviations from the rule as evidence of a policy error.

A partial defence against inaction

The bias towards inaction is not hard to fathom, even before we allow for rent protecting behaviour by an organised lobby group. If macroprudential rules are to be resisted at all costs, then what is the alternative: how can society construct a viable defence against inaction bias?

The first line of defence against inaction is a transparent, clear and credible framework. To return to the monetary policy analogy it is the framework that creates internal pressure on the central bank to act: without the anchor of below but close to 2% that pressure would be less intense. Policymakers need clear marching orders – what they are, and are not, responsible for. Without that remit, the policy debate may degenerate into a discussion about the current level of key microprudential reporting variables, like leverage and capital ratios, relative to what was observed pre-crisis. It is therefore all too easy to imagine inertia setting in as policymakers become increasingly comfortable with the new steady state for those ratios.

The second line of defence against inaction is conviction that a certain policy decision is warranted. What we require is a credible body of evidence which gives policymakers the confidence that the benefit of pre-emptive action outweighs the costs. Think for a second about the analysis one would have had to present to convince the world's policymakers in the Fall of 2006 that the Great Moderation could (let alone would) give way

to a Great Depression scenario within 24 months. If conviction is the key constraint then a significant and sustained investment of resources in macroprudential research to help policymakers progress out of the Stone Age is the answer.

Transparency over decisions and opacity over objectives don't mix

In a speech in 2001 Executive Board member Otmar Issing (2001)[7] argued that one of the key reasons to be confident about the future of the euro and the conduct of monetary policy in the currency zone was the sound institutional design of policy in the Eurozone:

'The Treaty establishes a clear hierarchy of objectives for the single monetary policy, giving overriding priority to the maintenance of price stability in the euro area. This reflects the fact that the best contribution that the ECB can make to long run sustained economic growth, employment creation and raising standards of living, is maintaining price stability. The clear priority given to the price stability objective also highlights the fact that the ECB itself does not have either the means or the responsibility for ensuring a high level of employment and real growth, beyond the positive impact of price stability just mentioned. Such a clear allocation of task and objective to different policy-makers ensures efficiency, transparency and accountability.'

Issing pin-points the necessary conditions for accountability and transparency: the communication of a clear and credible set of objectives to politicians, markets and the general public. These are not sufficient conditions for accountability: the outside world needs to have a sound understanding of the conduct of monetary policy and access to sufficient data to be able to scrutinise the decisions that are taken.

These observations suggest that we should not expect much in the way of genuine transparency and accountability in the macroprudential arena in the immediate future. The necessary condition has not been satisfied: there is no clarity over what precisely macroprudential policy is for. Moreover, even with a clear framework it will be difficult for the outside world to assess whether decisions are consistent or compatible with that objective. Whatever the precise calibration, the broad goal of policy will be to keep the probability of nasty outcomes (a financial collapse or credit crunch) to a tolerably low level. However, that probability will be virtually impossible for an impartial observer to monitor in real time, and therefore it will be virtually impossible for the impartial observer to ascertain whether policy is on track.

The lack of transparency over objectives bites in different ways in different arenas. In financial markets the concern is that market participants will be unable to forecast the future path of policy and that could have implications. If we assume that there are significant costs involved in implementing material mandated changes in the business model or capital structure of a bank then it is likely that banks will try to avoid placing themselves in a position where the time-varying floor for capital or liquidity buffers is likely to bind at any point in the near future. If there is a stigma attached to banks that are the subject of regulatory interventions then that would further strengthen this argument. The more uncertain the future path of policy is, the further regulated institutions might try to place themselves above the current regulatory floor. If there is a trade off between resilience and the provision of certain core services and indirectly efficiency and equity then the lack of transparency could have real consequences. To give a practical example: if banks believe that the regulatory treatment of loans to certain groups – such as mortgage lending with high loan to income and value ratios – could vary significantly across the financial cycle to the point where those loans are not 'commercially viable' in certain states of the world, then banks may conclude that it is not

worth writing that business in the first place at anything other than very high spreads. Once again, that may not be a concern from a pure resilience perspective, but if certain groups in the population experience structurally higher credit constraints that ought to be of concern to someone in the policy domain.

In the real economy the transparency problem has more to do with the mismatch between the likely focus of policymakers and the everyday experience of households and companies. One could make the argument that for the general public and their elected representatives it is changes in the terms on which credit is supplied to them and the value of residential property are the most visible indicators of the current phase of the financial cycle. Given the ample evidence of the potential threat posed by bubbles in the housing market, the general public may reasonably conclude that the purpose of macroprudential policy is to stabilise the terms on which credit is supplied to them and the level of property prices. Failure to respond to a significant increase in the relative price of residential property may lead the general public and their representatives to conclude that a policy error was taking place.[8]

The observation that it will be challenging to provide genuine transparency and accountability should not be understood as a counsel of despair. On the contrary, if there is a consensus that transparency and accountability are important then this observation should inject a greater sense of urgency into the work agenda on clarifying the objectives.

Conclusion: Define your regime or your actions will define that regime for you, and it may not be pretty

This paper has argued that the near complete absence of a conceptual framework underpinning the new macroprudential policy regime is a serious cause for concern. Taking decisions without a clear statement

about the loss function, which defines the preferences of the policymaker, or a sound grasp of how the system behaves in the real world, which defines the constraint on the optimisation problem, does not sound a recipe for success.

Without a remit, it is hard to see how the policy regime can be transparent or how policymakers can be held accountable for the decisions they take. Macroprudential policy will be a black box for the outside world. It may be little better for those who are taking the decisions. Where is the framework that will allow the policymaker to rank (choose between) alternative outcomes for the system – say between the status quo and a scenario in which some resilience is sacrificed in return for a more generous supply of credit? Simply put, if you do not know what you are trying to achieve or how to rank different outcomes, how can you take policy decisions on an objective basis? And if policymakers do not define their objective, then their actions, their choices will define those objectives for them, and it is unlikely that those decisions will be consistent through time (i.e., reflect a stable set of preferences and model of the system) let alone optimal.

Finally, it is interesting to note that central bankers are comfortable putting the reputations of their institutions on the line by accepting operational responsibility for the conduct of a policy regime where the remit is yet to be written and so little is known about the system which those policymakers have been asked to coarse of fine tune. It seems hard to believe that the policymakers concerned would be sanguine about such a state of affairs in the monetary policy arena – being asked to implement a vague price stability remit with only a macroeconomics textbook from the 1950s to guide them – and the experience of recent years suggests that policy errors in the macroprudential domain can have far more serious consequences for social welfare than those in the monetary domain.

Notes

1 The views expressed in this article are the author's own and do not reflect the views of his current or former employer.
2 Yellen, J. (2012), Perspectives on monetary policy, *Speech*, 6 June.
3 Miles, D. (2011), *What is the optimal leverage for a bank*, *Vox*, 27 April.
4 If, for example, entrepreneurs and new companies were far more likely to be rationed in their access to credit in the dim and distant past (so spreads may not have been higher because they were observed over a much smaller and less risky population of companies) then one cannot be sure that bank capital is irrelevant. It is at least possible that the shift in the capital structure of the banks, the growth in bank balance sheets and the stock of debt in the non-financial sector did go hand in hand with a relaxation in credit constraints which has enabled recent generations to squeeze more growth from a less impressive potential flow of new ideas. There is after all a reason why development economists used to believe that financial deepening is an important ingredient in fostering economic growth.
5 Cochrane, J. (2013), The Danger of an All-Powerful Federal Reserve, *Wall Street Journal*, 26 August.
6 Tucker, P. (2014), Regulatory reform, stability and central banking, Hutchins Center on Fiscal and Monetary Policy Paper.
7 Issing, O. (2001), The euro – a stable currency for Europe, *Speech*, 21 February.
8 Of course, any plausible macroprudential remit would require the policymaker to be vigilant on outcomes in retail credit markets and the property market, but the extent of the intervention in these markets will depend a good deal on whether the regime incorporates an explicit credit stabilisation objective, over and above the narrow goal of system resilience (whatever that means).

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