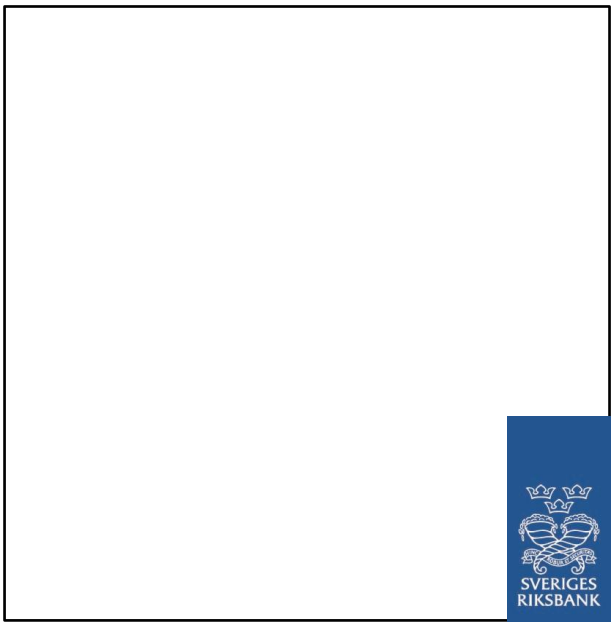

Riksbank Studies

CREATING A SWEDISH TOOLKIT FOR MACROPRUDENTIAL POLICY

November 2012

■ Foreword

The Riksbank's new publication series Riksbank Studies publishes analyses and investigations in the Riksbank's fields of study that lie outside the scope of the Riksbank's policy reports, such as the Monetary Policy Report and the Financial Stability Report, and which require more comprehensive descriptions than are appropriate for the Economic Commentaries series.

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The objective of the studies is to contribute knowledge and understanding of current issues or of issues that are expected to come to the fore in the near future.

The first of the series is a study by Christina Nordh Berntsson and Johan Molin from the Riksbank's Financial Stability Department on the theme "Creating a Swedish toolkit for macroprudential policy".

Stockholm, 6 November 2012

Mattias Persson

Head of the Financial Stability Department

■ Creating a Swedish toolkit for macroprudential policy

Christina Nordh Berntsson* och Johan Molin**

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Following the costly global financial crisis, it is apparent that the regulation and supervision of the financial sector has been too weak and too narrowly focused on the risks in individual institutions. Consequently, financial regulation and supervision must be strengthened. At the same time, a return to the far-reaching regulation that prevailed before the reforms of the 1980s would hardly be desirable. This strengthening must therefore be implemented in a well-reasoned manner. As it is primarily the risks to the system as a whole that are really serious for society, the development of regulatory tools should mainly be focused on these systemic risks. 'Macroprudential policy' is a rapidly-growing policy area that places systemic risks in focus. In this study, we use a simple conceptual framework as a basis for a discussion of how a Swedish toolkit for macroprudential policy might be developed.

A NEW POLICY AREA – WITH THE SYSTEM IN FOCUS

One of the most important lessons from the global financial crisis is that, traditionally, financial supervision has been far too narrowly focused on the health of individual financial institutions. Indeed, significant risks can build up and ultimately jeopardise the stability of the financial system as a whole at the same time as individual banks seem to be healthy and stable. When the focus on individual institutions becomes too narrow, there is a risk that such *systemic risks* will not be noticed. Or to put it another way: you risk not seeing the forest for the trees. This is exactly what happened in the years preceding the collapse of the US housing market, which triggered the turbulence on the world's financial markets leading to the collapse of Lehman Brothers in September 2008. As we are all acutely aware today, these events developed into a global financial crisis – the aftermath of which we are still experiencing and which, in many countries, has now developed into a serious sovereign debt crisis.[1] The

[1] Of course, the causes and effects are open to discussion. Many countries had had large fiscal deficits for a long time, which may have been one of many causes for the financial crisis. A number of underlying factors to the crisis are discussed by Ingves and Molin (2009).

final bill for the crisis, in the form of lower growth and increased unemployment in the world economy, is still unknown – but it will undoubtedly be huge.[2]

Traditional supervision, with its focus on individual institutions, is needed to ensure that financial companies comply with the rules and regulations set up for them and that the consumers of financial services are dealt with correctly and fairly. Of course, the supervision of individual institutions is also significant for the stability of the financial system, not least to the extent that financial institutions can be considered 'systemically important'. But keeping institutions under observation is not enough to capture the build-up of systemic risk. What is also needed is supervision and analysis to identify and assess factors such as credit cycles and contagion channels for financial problems that may lead to comprehensive systemic crises. This requires a different approach – and a different kind of competence – than has traditionally been found among financial supervisory authorities. Instead, this kind of expertise is primarily found among central banks.[3]

Consequently, around the world, comprehensive measures have been adopted to remedy the shortcomings of traditional regulation and supervision. Above all, it has been realised that it needs to be complemented by a new policy area: *macroprudential policy*. Unlike traditional financial supervision – microprudential supervision – macroprudential policy has an explicit systemic perspective.

On the European level, the emergence of this new policy area can be seen in the formation of the *European Systemic Risk Board* (ESRB), which is located in the premises of the *European Central Bank* (ECB) in Frankfurt. In the United Kingdom, alongside a series of other reforms, a *Financial Policy Committee* (FPC) has been set up as a part of the *Bank of England* and been given the task of identifying and intervening against systemic risks. For the same purposes, the United States has formed the *Financial System Oversight Council* (FSOC), which consists of a large number of supervisory authorities, including the US central bank, the *Federal Reserve*, which has been given a clearer mandate to take responsibility for the supervision of systemically-important institutions. In Sweden, the question of how an institutional framework for macroprudential policy should be designed is currently being investigated.[4] In a previous article, we have discussed in depth what we consider to be the key factors for the

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[2] Haldane (2010) has roughly estimated the total cost of the global financial crisis in terms of lost growth to between 1 and 5 times global GDP.

[3] In Sweden, the systemic perspective started to find its way into the authorities' monitoring at the start of the 1990s. The Ministry of Finance was then reviewing the business regulations for banking operations, and Finansinspektionen was given the task of "working for a stable and efficient financial system", alongside its consumer-protection tasks. However, in practice, the work of changing the focus of supervision proceeded slowly. It was not until the mid-1990s, when the Riksbank started to develop an analytical framework for financial stability, that the systemic perspective seriously came into the picture. Since then, taking its starting point from the task of "promoting a safe and efficient payment system", the Riksbank has built up a considerable capacity for assessing threats to the stability of the financial system.

[4] See Terms of Reference 2011:6.

design of such a framework, so we do not intend to address it again here.[5]

Apart from a clear institutional framework, appropriate and effective *tools* are required. As the risks that can threaten the stability of the financial system may differ in nature, several types of tool may be needed in macroprudential policy. At present, intensive efforts are underway in international forums to develop such tools.[6] The concrete consequences of this work will be a number of changes to the regulatory framework that governs financial companies, including Swedish banks. Of course, this will also largely determine which macroprudential policy tools it may be appropriate to apply in Sweden. However, this does not eliminate our need to make an independent assessment of how this toolkit should be designed in more detail. One problem is, of course, the lack of empirical experience. Until more knowledge of the area becomes available, it will be difficult to evaluate how effective and useful the various tools are.[7]

Monetary policy, the goal of which is low and stable inflation, can indeed also be used to counteract certain types of risk build-up, such as the build-up of bubbles and exaggerated credit growth. However, the interest rate tool risks acting indiscriminately, with potential undesirable effects in sectors that are not overheated. Neither can the repo rate be used to counteract all dimensions of systemic risk.[8] Special tools for macroprudential policy are thus needed.

This study primarily aims to present a simple conceptual framework that can serve as a starting point for the design of a toolkit for macroprudential policy. Furthermore, from a more practical perspective, we also aim to highlight those tools that should be good candidates for inclusion in a Swedish toolkit. By explaining the intention behind some of the regulatory proposals now being worked out internationally, we hope that this study can also contribute towards more clearly putting these into a macroprudential context.

A TOOLKIT MUST BE ASSEMBLED – DIFFERENT TYPES OF SYSTEMIC RISK REQUIRE DIFFERENT TOOLS

The results of our study point to nine tools as suitable candidates for inclusion in an initial Swedish toolkit for macroprudential policy. Five of these are determined by the international regulatory agenda. The

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[5] Berntsson and Molin (2012). Important factors to consider when deciding on an organisational structure for macroprudential policy are decision-making power, independence, accountability, analytical capacity, effects on Sweden's international influence and resource efficiency.

[6] In several cases, traditional microprudential tools may be recalibrated for macroprudential purposes.

[7] Some empirical experience is available, however. The Committee on the Global Financial System (2010) provides an overall review of these.

[8] The relation between monetary policy and macroprudential policy is a central and important issue. However, it is not examined in depth in this study, which is focused on identifying tools that may need to be developed with the specific aim of counteracting risks to the stability of the financial system.

point of having a somewhat broader toolkit is that this increases our chances of finding an appropriate tool for the problems we wish to address. The more accurate the tool is, the more effective the tool will be from a socio-economic perspective.

Firstly, tools are needed to manage systemic risks related to credit markets and indebtedness. If there are tendencies towards excessive credit growth in general, countercyclical capital buffers can contribute towards a certain degree of dampening. If the problem, on the other hand, is limited to a specific sector, more focused and less blunt tools are probably preferable. Sector-specific risk weights are an example of such a tool. In addition, it is desirable for the banks to have a certain amount of resilience, regardless of the risk profile of their asset portfolio, which could be achieved with a mandatory leverage ratio. These three tools are all aimed at influencing the banks' credit supply. There may be reason to complement them with tools that are more focused on influencing borrowers' demand for credit. The mortgage cap, which we have already introduced in Sweden, is a good candidate for this.

Secondly, tools for the reduction of liquidity and funding risks must be available. The Swedish banks' high proportion of market funding, which is largely in foreign currency, makes them extremely vulnerable when market liquidity falters. It is therefore essential to introduce requirements for both the Liquidity Cover Ratio (LCR), which Finansinspektionen is already working to introduce, and the long-term Net Stable Funding Ratio (NSFR) into the Swedish toolkit. However, it is not certain that these two tools can effectively counteract all the relevant liquidity and funding risks. This may justify complementing the toolkit with a flexible tool, such as some form of targeted charges.

Thirdly, structural risks must be identified and counteracted. This will require persistent development work for a long time to come. Among other things, efforts to ensure better access to data are needed. It is also necessary to develop analytical models to better understand the mechanisms and channels for the spread of problems in the financial system. During the time that this work is in progress, we should try to minimise the problem of certain banks having become 'too big to fail'.

An extra capital requirement for systemically-important banks, a SIFI surcharge, could increase their resilience to shocks, thereby reducing the risk of a default with major repercussions for the rest of the system. The degree of concentration on the Swedish banking market has led the Swedish authorities to announce that a SIFI surcharge will be introduced in Sweden relatively soon.

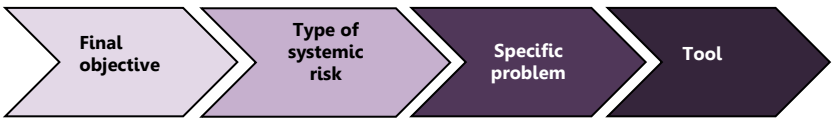
We also consider that somebody should be assigned to identify systemic risks arising inside as well as outside the regulated sector at an early stage. The authority or authorities given such a broad investigatory assignment should also have a clear mandate to propose legislative measures to counteract the build-up of these systemic risks – regardless of where they arise or the form they take.

We will now describe how we reached these conclusions.

AN OVERALL CONCEPTUAL FRAMEWORK

Assembling a suitable toolkit for macroprudential policy requires a model linking the final objective with the tools needed to get there. In other words, we need to use a bit of 'reverse induction'. Inspired by the analytical work carried out by the Bank of England[9], de Nederlandsche Bank[10] and others, we have produced a four-step plan (Figure 1) to provide a simple framework for our thinking.

Figure 1: Overall conceptual framework



Our starting point is thus to begin at the 'end' and define the final objective of macroprudential policy. In the next step, we identify what kind of risks may form the main threat to the objective. In step three, we try to increase concreteness and identify the specific problems that may be causing the different types of risk. In the fourth and final step, we highlight some tools that, one way or another, could counteract the specific problems we have identified and which could thus be possible candidates for inclusion in a Swedish toolkit for macroprudential policy.

FINAL OBJECTIVE: FINANCIAL STABILITY

The final objective for macroprudential policy is stability in the financial system (which will ultimately benefit the development of the real economy). According to the Riksbank's definition, financial stability means that the financial system can maintain its basic functions and that it has resilience to disruptions that threaten these functions.[11] The basic functions referred to are mediating payments, converting savings into funding, and managing risk. Internationally, this definition is relatively well-established, even if the exact wording can, of course, vary.

When we speak about measures to promote financial stability, we usually divide these into *preventive* and *crisis management* measures. Macroprudential policy only deals with preventive work, that is increasing the resilience of the financial system and reducing systemic risks that could create financial crises leading to major costs for society.

So what kind of risks could threaten our objective, the stability of the financial system?

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[9] Bank of England (2011).
[10] Houben et al. (2012).
[11] See Sveriges Riksbank (2010).

TWO TYPES OF SYSTEMIC RISK

Systemic risks are, as the name suggests, risks affecting the system as a whole. More precisely, we are referring to the risk of the financial system being affected by such serious disruptions as to disable or very negatively affect one of its basic functions. Systemic risks are usually divided into cyclical and structural risks. The cyclical dimension, or time dimension, refers to how risks to the system as a whole can build up over time, either through the mutual interplay of financial agents or through feedback between the financial system and the real economy. The structural dimension, also known as the cross-sectional dimension, relates to how the concentration of risk and the interconnectedness between different parts of the financial system at any given time affect the risk of crisis hitting the system as whole.[12]

Cyclical systemic risks

Strong upturns and downturns in both the price of various assets and the supply of credit are usual on the financial markets.[13] It is during the upturn phase of these financial cycles that systemic risk usually builds up. Upturn phases are often characterised by strong optimism, leading to the underestimation – and thus the underpricing – of risk.[14] This is when bubbles tend to blow up on various asset markets, such as the property market or the stock market. In these periods, credit growth is also often very strong, at the same time as indebtedness tends to increase.[15]

If such a bubble should finally burst, the reaction on the financial markets can be powerful. There can then almost be a race to reduce risks, for example by selling assets or reducing lending. For individual agents, this reaction is entirely rational. But the total effect of all these agents' actions can be dramatic – sometimes causing such severe price falls and credit crunches as to lead to a comprehensive financial crisis with serious repercussions for the real economy, such as rising unemployment and falling, occasionally even negative, growth. It is above all when an asset bubble is combined with strong credit growth that really serious problems can arise for the financial system.[16] Almost every financial crisis has been preceded by a credit boom.[17]

There are various theories about the underlying causes of financial cycles.[18]

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[12] Borio (2003) and HM Treasury (2012).
[13] See, for example, Claessen et al. (2011) for a comprehensive empirical study of financial cycles.
[14] This phenomenon has been documented by Shiller (2000), among others.
[15] Aikman et al (2011).
[16] It is considered that one reason that the IT bubble of the 2000s did not lead to a comprehensive systemic crisis was that it was not mostly funded by loans.
[17] See, for example, Reinhart and Rogoff (2009).
[18] Berntsson and Molin (2012) describe some of these.

These theories are often based on the presence of various 'frictions' in the market. These market frictions can be due, for example, to the uneven allocation of information among various agents[19] or to the failure of the various agents to coordinate their actions in a way that is beneficial to the economy.[20]

These financial cycles do not necessarily coincide with the cycles of the real economy. Even if they often mutually reinforce each another, they can arise with slightly different frequencies and wavelengths.[21]

Structural systemic risks

But there are also *structural* factors behind the build-up of systemic risk that can be just as significant as the cyclical factors. As financial companies are closely interconnected with each other, due to factors such as counterparty exposures, problems arising in one institution risk spreading to other institutions with great speed and force, thus giving rise to a system-wide financial crisis. The more extensive and complex these interconnections are, and the harder it is to separate and assess the institutions' exposures towards each other, the greater the risk is that any financial contagion will be comprehensive. The global financial crisis is a case in point. Financial engineering led to major exposures outside the monitored sectors (in the 'shadow banking system'), at the same time as, in practice, significant links existed back into the traditional banking sector. This complexity, and the resulting lack of transparency, contributed to the depth and global scope of the crisis.

Another significant structural factor is connected with the degree of concentration in the financial system. If, for example, a large part of the financial system is exposed to the same kind of risks, or is dependent on the same sources of funding, the sensitivity of the system as a whole increases. A clear example of high concentration is when a few major institutions completely dominate the financial system. If a very large portion of the financial system's basic functions are conducted by a very few institutions – which are also closely interconnected – these will, of course, become highly significant to the stability of the financial system. Consequently, such institutions are often called 'systemically important'.

The link between cyclical and structural risks

In practice, it is often difficult to differentiate between cyclical and structural risks. Structural problems, such as difficulties in writing contracts aligning incentives for management and shareholders, can give rise to cyclical problems.[22] It can likewise be imagined that the degree of competition between the financial institutions may influence

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[19] See, for example, Bernanke et al. (1996), Kiyotaki and Moore (1997) and Geanakoplos (2010).
[20] See, for example Gorton and He (2008), Archya (2009), and Rochet and Vives (2004).
[21] See, for example, Aikman et al. (2011) and Claessens et al. (2011).
[22] See, for example, Rajan (2005) and Woolley (2010).

risk propensity.[23] Cyclical factors can also influence structural factors. For example, during an upturn phase, with strong expansion and high risk-taking, both greater concentrations of risk and more, and more complex, interconnections in the financial system can arise.[24]

Despite this, we find it useful to categorise systemic risks into cyclical and structural risks. As regards the cyclical risks, the tools are aimed at counteracting those tendencies that lead to systemic risks successively building up during upturn phases. For structural risks, the tools are aimed at neutralising structures with, for example, high concentrations and a major contagion risks that mean that problems arising in one part of the financial system can rapidly and forcefully paralyse the system as a whole.

SPECIFIC PROBLEMS – AND TOOLS TO COUNTERACT THEM

The third step of the four-step conceptual framework is to identify, in more concrete terms, which problems it is particularly important to be able to counteract from a Swedish perspective, and the fourth step is to identify possible tools to achieve this. The measures that may be appropriate are primarily concerned with increasing resilience among banks, households or companies and reducing the risks by influencing their choice of risk strategy. The latter is a matter of changing agents' incentives by changing the 'relative price' of the various choices.

The idea here is only to describe the various tools' basic mechanisms, not to provide detailed instructions on *when* and *how* they should be applied. That forms a separate and comprehensive subject which lies outside the scope of this study.[25]

We have identified three main problem areas for macroprudential policy.

A.	Problems related to credit markets and indebtedness
B.	Liquidity- and funding-related problems
C.	Problems related to the structure of the financial system

We will now examine more closely the specific problems that can arise in these areas and discuss possible tools to counteract them.

[23] Goodhart (2012).
[24] Shin (2010).
[25] The European Central Bank (2010) provides an overall description of the fairly comprehensive analytical mechanism that may be necessary for the work of identifying and assessing systemic risks. See also IMF (2011b).

A. PROBLEMS RELATED TO CREDIT MARKETS AND INDEBTEDNESS

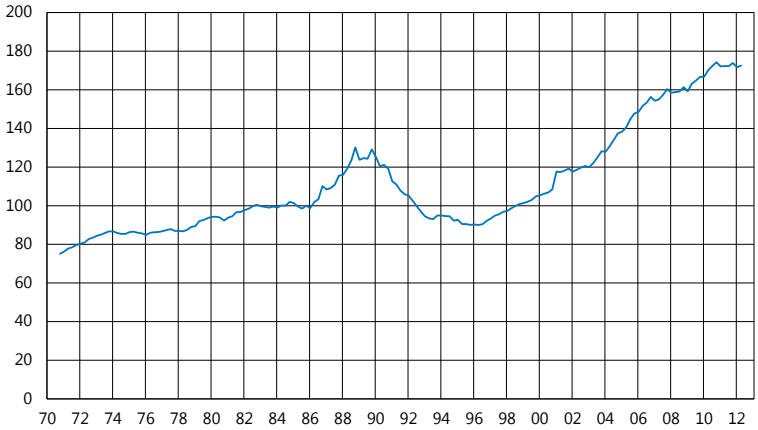
We have previously pointed out the fact that financial crises are usually preceded by strong credit growth and increased indebtedness in the economy. Not infrequently, this has taken place parallel to an overheating in a sector of the economy, often the property sector. As a rule, credit growth and price increases seem to reinforce each other, and it is not always easy to determine which is the chicken and which the egg.[26]

Credit growth and indebtedness were also an important aspect of the most recent crisis. In the United States, a policy was conducted prior to the crisis that consciously aimed to increase owner-occupied housing. This contributed to rapid credit growth, above all among less creditworthy borrowers, and to a housing price bubble. The mortgages were also repackaged and sold onwards in a way that made it difficult to assess where the risks lay. When the housing price bubble burst, major problems arose in the US financial sector, which then rapidly spread across the world.

And neither has Sweden been spared problems of this kind. In the 'home-made' crisis that impacted Sweden at the beginning of the 1990s, the bubble in the commercial property sector played a central role. Today, indebtedness among Swedish households is relatively high, both from a historical perspective and in comparison with the rest of Europe, and there has been a trend increase since the turn of the century (see Figure 1). Whether this presently poses a problem for financial stability is also being discussed widely, not least within the Executive Board of the Riksbank. In any case, it seems clear that, should overheating take place in one sector, as it did on the market for commercial properties in Sweden at the end of the 1980s, the ability to counteract rapid credit growth and excessive indebtedness would also be valuable for Sweden.

[26] Determining cause and effect can, of course, influence the choice of tool. If the upturn in asset prices depends on supply limits, for example insufficient new construction, the choice of tool may be different from if the price increases are due to a high supply of credit.

Figure 1: Household debt ratio (indebtedness in relation to disposable income); per cent



Source: The Riksbank and Statistics Sweden.

POSSIBLE TOOLS FOR PROBLEMS RELATED TO CREDIT MARKETS AND INDEBTEDNESS

Countercyclical capital buffers

As yet, there are relatively few tools specially designed for macroprudential policy. However, one such is what are known as *countercyclical capital buffers*, which were introduced with Basel III, the international agreement on a regulatory framework for banks.[27] Briefly, countercyclical capital buffers work by subjecting banks to a relatively high capital requirement during periods in which systemic risks are building up, particularly as a result of high credit growth – a requirement that can then be alleviated when the financial system comes under pressure. The idea is to increase the banks' resilience by encouraging them, in good times, to create a buffer to be used in a downturn. The ultimate purpose is to ensure that the banking sector as a whole has the capital needed to maintain the supply of credit in the economy through less favourable periods. By raising the cost of capital in expansionary phases and lowering it in downturn phases, the capital buffers can also contribute towards dampening financial cycles.

The Basel Accord means that countercyclical capital buffers will be introduced on a national level between 2016 and 2019. At present, negotiations are underway on how the Basel Accord will be implemented in EU legislation. In Switzerland, the possibility of

[27] Basel Committee on Banking Supervision (2011b).

activating countercyclical capital buffers has already been introduced.[28]

However, countercyclical capital buffers are a relatively blunt tool with an indiscriminate effect on the entire banking sector. Such broadly-acting tools have the disadvantage that they risk having undesired effects in sectors that do not have problems. If the problems are clearly concentrated on an individual sector or closely-interconnected sectors, more focused tools are to be preferred. One tool with a more restricted area of effect is sector-specific risk weights.

Sector-specific risk weights

Put simply, the basic model for capital adequacy entails relating the capital requirement to the assets' inherent risk level. More specifically, different asset classes have been allocated different risk weights, either through a standard method or through an internal model approved for this purpose by a supervisory authority. The aim of this risk differentiation is to reduce risk-taking for individual institutions. The risk weights have thus been set from a microprudential perspective.

But, with more dynamic application, it should also be possible to use the risk weights for the purposes of macroprudential policy. Adapting the risk weights to where systemic risk is building up would make it possible to counteract undesired developments in a specific market segment. For example, if the market for commercial properties is becoming overheated, it could be possible to counteract the risk of overheating by (temporarily) increasing the risk weights for credit to this sector, which would make this kind of lending more expensive, thus reducing demand.

As yet, no ready and prepared proposal for sector-specific risk weights exists within the framework of the Basel Accord. On the other hand, the current wording of the proposed EU Capital Requirements Directive leaves an opening for varying the risk weights of credit for investments in residential and commercial property, as well as for intrafinancial sector exposures.

Leverage ratio

As already mentioned, the current system of risk weights is aimed at differentiating the requirements for institutions' capital adequacy on the basis of the risks in the different asset classes. This thereby allows the institutions' risk-taking to be directed, to a certain extent. However, the system is not without problems. As certain asset classes can have very low risk weights – or even zero weight – a bank can, in principle, incur almost unlimited debt. If the risk weights perfectly reflected the assets' actual risk in all situations, this would be a minor problem. Unfortunately, this cannot really be expected. The risk weights are based either on general standards or on historical data

[28] Swiss National Bank (2012).

combined with assumptions of stable relationships. These standards do not always agree with reality and the risk associated with a particular asset class can, in reality, shift very quickly, particularly in times of financial turbulence. It is also in turbulent periods that an excessive level of indebtedness becomes dangerous. It is thus important to set an absolute limit to how much debt a bank may incur.

One way of achieving this is to set a minimum limit for the bank's *leverage ratio*. Put simply, the bank's leverage ratio reflects its equity in relation to its total *non-risk-weighted* assets, including off-balance sheet items. A floor for the leverage ratio means that the bank will have a certain minimum resilience, regardless of the risk profile of its asset portfolio.

Basel III means that requirements for the leverage ratio will be introduced in 2019. No corresponding timetable has yet been included in the proposed EU legislation. On the other hand, the EU regulations mean that the banks are to start reporting their leverage ratios to the authorities. The explicit intention is, following a period of assessment, to take a stance on whether leverage ratio requirements should be introduced into EU law.

Tools influencing demand for credit

The tools mentioned above, that is to say countercyclical capital buffers, sector-specific risk weights and leverage ratios, together form the mix of tools that the recently-formed British macro-prudential body, the *Financial Policy Committee*, has requested being granted as a first step.[29] Another common characteristic of these tools is that they primarily affect the *supply* of credit.

As a complement to this, tools that are more focused on the *demand side*, that is to say on the bank's loan customers, can also be imagined.

One example of this type of tool is what is known as the mortgage cap (sometimes called the maximum loan-to-value ratio or LTV cap), which limits the proportion of a residential property's market value that a borrower may raise a loan on. Another way of influencing demand for credit may be to set a cap on the size of a loan relative to the borrower's disposable income. A third possibility is to introduce the requirement that loans be amortised at a certain rate.

The common factor for all of these tools is that, in various ways, they make it more difficult or more expensive for a bank's loan customers to incur excessive debt. The idea is that borrowers will thereby become more resilient to changes in the economic environment that can impair their ability to repay loans, such as unemployment or drastic interest-rate increases. Demand-focused tools of this type are usually justified by a desire to protect consumers. However, in as much as they strengthen borrowers' resilience, they also indirectly strengthen the banks' resilience. For this reason, they are also interesting from the perspective of systemic protection. In Sweden, it is primarily the

[29] Bank of England (2012).

development of prices on the residential property market and households' increasing indebtedness that may make it appropriate to use this kind of tool.

In October 2010, Finansinspektionen introduced a Loan-to-value (LTV) cap to protect consumers. Preliminary assessments of the LTV cap suggest that it has had a positive effect on the behaviour of the housing market, even if it is difficult to distinguish the significance of the various factors.[30] LTV caps have also been implemented as macroprudential policy tools in parts of Asia.[31]

At present, these tools are not covered by any international agreement.

B. LIQUIDITY- AND FUNDING-RELATED PROBLEMS

One characteristic of the recent financial crisis was the serious liquidity problems that were created in the global financial system. It was not until these problems arose that the major Swedish banks became seriously embroiled in the crisis. Due to their large proportions of market funding, to a significant degree in foreign currency, they experienced serious financing problems.

The basic problem behind liquidity and funding risks is a matter of how the banks match the maturities of their assets and liabilities. Banking operations are fundamentally vulnerable to liquidity problems, as the banks always have an asset side (primarily lending) that is less liquid and has a longer maturity than the liability side (for example, deposits and short-term funding on the global capital markets). To limit these liquidity risks, the banks thus need to reduce these maturity mismatches.

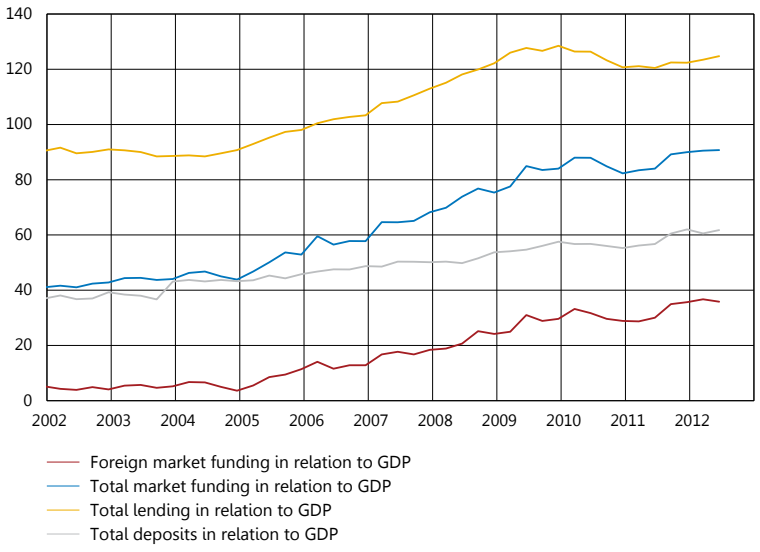
Today, the risk that *depositors* will rush to the bank and withdraw their money should they become uneasy about the security of the money is usually dealt with through national deposit guarantee schemes. At the same time, the proportion of deposits in the funding of the Swedish banks has successively fallen in favour of increased *market funding*, not least for short maturities. But market funding is extremely volatile, which makes the banks very sensitive to drops in this source of funding. The structural shift towards increased market funding has made it more important to find a way of effectively reducing the liquidity risks this entails. But liquidity risks are also influenced by cyclical factors. This is because, in upturn phases, the banks have a tendency to take greater risks when customer demand for loans is increasing, leading to the increase of maturity mismatches and thereby also liquidity risks. [32]

From a Swedish perspective, it is particularly important to be able to counteract liquidity and financing risks effectively. This is because the Swedish banks are considerably more vulnerable to this type of risk than the banks in other EU countries, above all because they are so dependent on market funding, not least in foreign currency. This

[30] Finansinspektionen (2011).
[31] See, for example, Wong et al. (2011).
[32] Shin (2010).

dependence has also increased in recent years (see Figure 2). It is particularly important to get the banks to build up reserves so that they can also manage their funding needs in periods when it is difficult to borrow on the market.

Figure 2: Major Swedish banks' market funding, total and in foreign currency, as well as deposits and lending; amount in relation to GDP



Source: The Riksbank and Statistics Sweden

Note: Refers to the major banks' parent companies and Swedish subsidiaries. The portion of foreign market funding estimated to be converted into Swedish kronor via the currency swap market is not included.

POSSIBLE TOOLS FOR LIQUIDITY- AND FUNDING-RELATED PROBLEMS

Liquidity coverage ratio (LCR)

One way of getting the banks to reduce their liquidity risks is to require them to attain a certain *liquidity coverage ratio* (LCR). A liquidity coverage ratio of at least 100 per cent means that the bank has enough highly-liquid funds to cope with at least a 30-day period of strained market liquidity and heavy cash outflows. In principle, a dynamic application of LCR requirements can be considered, in which these are allowed to vary according to the cyclical development of liquidity risks.

Within the framework of Basel III, there is an agreement that LCR requirements are to be introduced by 2015 at latest.[33] However, the Swedish authorities have signalled the introduction of an LCR

[33] Basel Committee on Banking Supervision (2010).

requirement of 100 per cent in 2013. Finansinspektionen is now working on the production of regulations to this effect, both for the total net outflows and for separate net flows in US dollars and euros.

In its Financial Stability Report[34], the Riksbank recommends the major Swedish banks to ensure they already have a liquidity coverage ratio of at least 100 per cent.

Net Stable Funding Ratio (NSFR)

In one way, the transformation of maturities on the banks' balance sheets forms a central function in the economy – it makes it possible to convert short-term savings into long-term lending and thus into funding for projects that benefit society in various ways. But, as mentioned earlier, the imbalances that arise simultaneously form the basis of the banks' inherent instability.

A requirement for a minimum *Net Stable Funding Ratio* (NSFR) means that long-term assets must be funded with at least a minimum of long-term stable liabilities and equity. The aim of such a requirement is to restrain the banks' dependence on the short-term capital markets for their funding and to encourage better assessments of the liquidity risks.

According to the Basel Accord, NSFR requirements are to be introduced by no later than 2018.[35] In its Financial Stability Report, the Riksbank has recommended the Swedish banks to start adjusting to these requirements already and reduce their structural liquidity risks.[36]

Targeted charges

It seems unlikely that certain structural imbalances can be managed by requirements for LCR and NSFR alone. It may thus be necessary to formulate targeted charges or fees of some kind to avoid certain kinds of undesirable behaviour. For example, the implied liquidity guarantees entailed by the central banks' loan facilities may be expected to increase risk taking among the banks. In Sweden, such problems could be mitigated by the introduction of a targeted charge to steer the banks' liquidity management in Swedish kronor. Such a charge would induce the banks to take more responsibility for liquidity in kronor. A larger portion of the economic costs for the liquidity facility would thereby also be carried by the banks themselves. This type of so-called 'Pigovian tax'[37] can be formulated in slightly different ways. At present, the Riksbank is investigating the possibilities of utilising a minimum reserve requirement for such a purpose.

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[34] Sveriges Riksbank (2011).
[35] Basel Committee on Banking Supervision (2010).
[36] Sveriges Riksbank (2011).
[37] See Pigou (1920) and Baumol (1972).

C. PROBLEMS RELATED TO THE STRUCTURE OF THE FINANCIAL SYSTEM

The most recent financial crisis spread considerably wider and faster than previous crises. This clearly demonstrated how integrated the financial system has become. However, the understanding of how the various parts of the system are linked to and dependent upon each other was imperfect. For example, the US authorities were not aware of the extent of Lehmann Brothers' links to other financial institutions when the company entered bankruptcy.

Structural risks are difficult to narrow down but can be said to relate to the construction of the financial system. They can be associated with the interconnections between different institutions, markets and products. They can also be grounded in the high concentration of funding sources or exposures among the banks, for example. In this last respect, Sweden is particularly vulnerable, with its highly concentrated banking sector. The four major banks together account for about three-quarters of lending to the Swedish public. And, as we pointed out earlier, these banks also have a high concentration of market funding in foreign currency.

Both internationally and in Sweden, the crisis has been a wake-up call demonstrating the need for new analytical methods and models that can help us better understand how the structure of the financial markets affects the stability of the system. The ideal situation would be to measure the various institutions' individual contributions to total systemic risk and calibrate tools accordingly.[38] However, academic research in this area is still at a relatively early stage. There is a great need for increased empirical underpinnings, including new data. At the same time, there is an increased need to be able to counteract risks of this type. Given the lessons of the crisis and all the new financial regulations being introduced, it is likely that significant structural changes will take place over the years to come. Not least, it will be important to monitor the extent to which certain activities – and risks – elude regulation. Some areas in which structural changes are underway and which will have to be monitored closely in the future include, for example, the increasing integration of the banking and insurance sectors, the development of the derivatives market, and changes in the use of central counterparties in the clearing and settlement of securities transactions.

POSSIBLE TOOLS FOR PROBLEMS RELATED TO THE STRUCTURE OF THE FINANCIAL SYSTEM

SIFI surcharges

The existence of systemically-important institutions (SIFIs) is, as has been mentioned, a typical example of a structural risk. A SIFI is defined as an institution that, due to its size, complexity and financial links, cannot fail without risking serious repercussions on the financial

[38] See, for example, Adrian and Brunnermeier (2008, revised 2011).

system and economy in general. To avoid consequences of this kind, states have been forced, on many occasions in history, to implement comprehensive rescue measures when a SIFI has encountered problems. This happened during the global financial crisis and during the Swedish banking crisis at the beginning of the 1990s. The suggestion that major banks are thereby covered by an implicit government guarantee creates distorted incentives that rather strengthen tendencies towards excessive risk-taking.[39] This problem is sometimes referred to as being 'too big to fail'.

To cure the 'too-big-to-fail' problem, international regulators have chosen two strategies. The first is to try to create a better regulatory framework for the management of problem banks, which will hopefully reduce the need for government rescue actions. Regulation of this kind is usually categorised as crisis management and not as macroprudential policy.[40]

The second is to impose an extra capital requirement, a *SIFI surcharge*, on systemically-important institutions. The aim of this is to increase the SIFI's ability to absorb losses and thus reduce the risk of a default. The SIFI surcharge can also give the banks a stronger incentive to reduce their own levels of systemic importance by reducing the complexity of their operations and perhaps the scope of certain activities.[41]

There exists an international agreement (Basel) to introduce capital surcharges for what have been designated '*global* systemically-important financial institutions' or 'G-SIFIs' by 2019. The list of G-SIFIs currently includes 29 institutions, one of which is Sweden's Nordea. Discussions are also underway on the introduction of SIFI surcharges for *domestic* systemically-important institutions ('D-SIFIs').

In Sweden, the Ministry of Finance, Finansinspektionen and the Riksbank have signalled that a SIFI surcharge for Swedish banks[42] will be introduced in two stages, starting in 2013.[43]

An assignment to initiate new legislation

So far, our approach has been to find tools for the specific problems we have been able to identify. However, history tells us that systemic risks constantly arise in new forms and in new places. For example, following the crisis, central counterparties (CCPs) have become more systemically-important, which has led to demands for strengthened regulation and supervision of these.

But risks also have a tendency to rapidly find their way outside the regulated sector's domains and thus evade the supervision of authorities. Such circumvention of the rules, known as regulatory arbitrage, was a significant factor behind both the global financial

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[39] This increased risk propensity can apply to both the bank's owners and its lenders.
[40] See the Financial Stability Board (2011) and the European Commission (2012).
[41] Basel Committee on Banking Supervision (2011b).
[42] The banks affected are primarily Handelsbanken, Nordea, SEB and Swedbank.
[43] Government Bill 2012/13:1, page 61.

crisis and the Swedish bank crisis of the 1990s. The authorities must be vigilant for this phenomenon.

In our opinion, this also means that some authority should be assigned with the early identification of systemic risks. This authority should monitor a broad field, not just the institutions currently formally under supervision. The authority or authorities undertaking such an assignment should also have the power – or even the obligation – to propose legislation to counteract the build-up of systemic risk – regardless of the form it takes. To the extent that a 'toolkit for macroprudential policy' can be defined as a collection of powers to adopt measures to counteract systemic risk, this mandate should be among the most important tools in the kit.

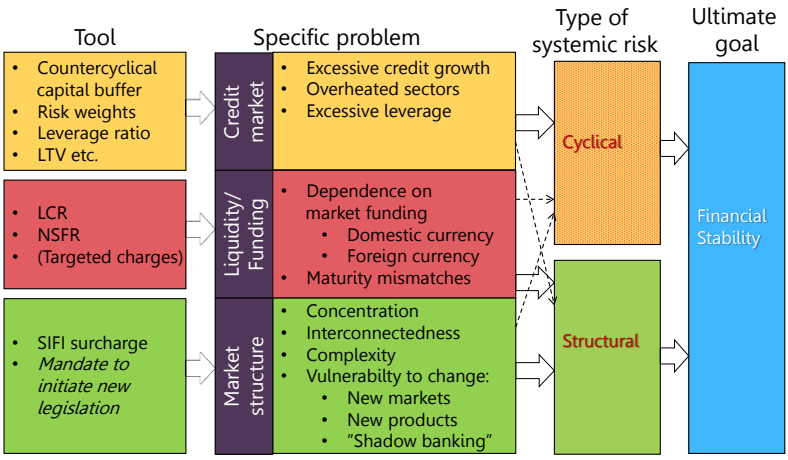
THE TOOLKIT NEEDS TO BE FURTHER DEVELOPED

Crises in the financial system can be extremely costly for society. This makes it important to counteract the build-up of risks that could lead to financial crises before it is too late. When private incentives are not enough to steer resources and risk-taking in the best direction for society as a whole, the government must step in and regulate. The global financial crisis is both a classic example of a market failure and an example of weak and partially misguided financial regulation and supervision.

At the same time, the financial sector is extremely valuable for the economy. Returning to the strict regulation that prevailed before the reforms of the 1980s can thus hardly be seen as a desirable alternative. On the other hand, systemic risks must be better managed. It is clear that participants in the financial sector cannot manage this alone. What is needed is better reasoned regulation that clearly takes aim at systemic risks too, as these are the really serious risks for the economy. This means that there is a need for tools that are specially focused on systemic risks.

In this study, we have used a simple conceptual framework to discuss how a Swedish toolkit for macroprudential policy could be assembled. Our starting point has been the need for tools to manage the risks and vulnerabilities that are most serious for Sweden. At the same time, the range of tools available is largely determined by the international regulatory agenda. Fortunately, however, the tools to be introduced under this are largely appropriate for the risks and vulnerabilities that we also deem to be relevant in Sweden, even if Swedish circumstances may justify the addition of a few extra tools to the toolkit. All in all, we propose nine tools as candidates for an initial Swedish toolkit, as summarised in Figure 2.

Figure 2: Conceptual framework applied to Sweden



As macroprudential policy is still under development, it is, of course, difficult to determine the optimal mix of tools that should be included in such a toolkit. It is difficult both to know how effective various tools will be and to understand the links between them. It is therefore unavoidable that the development of a toolkit will have elements of trial and error. Our proposals should be considered in this light.

However, one lesson from the financial crises we have experienced over the years is clear: we cannot afford to ignore systemic risks in the financial sector. We have to try, in some way, to prevent the build-up of such risks, even if we do not have a perfect understanding of how the tools for this work. In Sweden, as in other countries, we will, quite simply, have to proceed by trial and error and learn from our own and others' experiences.

The important thing is to establish a process to evaluate and later develop and modify the toolkit. To ensure that this work is conducted in a structured and long-term manner, both the actual toolkit and the process of modifying it should be confirmed by law. Such a process is also important in order to allow the toolkit to be adjusted to any changes in the character of systemic risk.

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