M E M O R A N D U M

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Finansinspektionen
Box 7821
SE-103 97 Stockholm
[Brunnsgatan 3]
Tel +46 8 787 80 00
Fax +46 8 24 13 35
finansinspektionen@fi.se
www.fi.se

The future structure of banks' capital requirements

Conclusions

If non-risk-sensitive capital requirements – such as a leverage ratio requirement or standardised floor – are set at a level that makes them the binding capital restriction, Sweden may end up with a smaller, but riskier banking system. A larger proportion of credit supply is then likely to take place via the financial markets. This means more financing channels, which could contribute to greater efficiency. But it could also result in credit supply becoming less stable.

Currently, supervisory authorities have a limited ability to regulate and supervise financing outside of the banking sector. A high leverage ratio requirement could consequently result in less financial stability. Finansinspektionen (FI) therefore believes that current risk-based regulation is preferable. FI also believes it is important that Swedish authorities carefully analyse and evaluate the consequences of the choice between a bank-oriented and a market-oriented system, and that a healthy balance between different forms of funding be maintained.

There is also scope for improvements to the current risk-based regulation framework. For example, there are indications that risk weights in recent years have decreased more than is justified by the actual level of risk. FI therefore takes a positive view of those international initiatives that have been adopted to improve risk weight calculations and reduce model risks. These initiatives could lead to capital requirements rising considerably over the coming years.

There are also a number of different initiatives currently ongoing that aim to reduce the value of the implicit state guarantee for the banking sector. The aim of the forthcoming regulations via the EU's crisis management directive and the Financial Stability Board's requirements on total loss-absorbing capacity for globally systemically important banks, is for the banks' owners and creditors, rather than the state, to bear the costs when banks encounter serious financial difficulties. As these new regulations are in the process of being introduced, FI believes there is currently no reason to simultaneously raise capital requirements further to reduce the value of the implicit state guarantee. In the longer term, the motivation for, and the structure of current systemic risk

capital requirements may also need to be reviewed, as the purpose of these requirements may have then been met in part by other measures.

Introduction

On 11 November 2014, the Financial Stability Council agreed that:

"Further analysis of capital levels and funding in the banking system, with particular focus on international regulatory initiatives regarding loss-absorbing capital (TLAC), leverage ratio requirements and net stable funding ratio (NSFR) requirements, should be carried out."

FI has previously argued on a number of occasions that risk-based regulation of capital requirements has many advantages over non-risk-based regulation.[1] FI retains this view. The focus of this memorandum is therefore on capital levels, future measures to reduce model risks and future regulations in the form of BRRD[2] (*Bank Recovery and Resolution Directive*) and TLAC (*Total Loss-Absorbing Capacity*) .

Why is capital regulation of banks needed?

In a corporation, equity works as a shock absorber that can absorb losses without the entire business being jeopardised. A corporation that does not have any equity cannot continue to operate. The same applies to banks and credit market companies (both referred to as 'banks' hereafter).[3]

Compared with other corporations, banks have a high level of indebtedness. In other words, their share of equity is low in relation to other funding.[4] This is consistent with the capital structure theory put forward by Modigliani and Miller (1958 and 1963).[5] In its simplest form, this theory is based on very stylised assumptions in which interest costs are not tax-deductible and bankruptcies do not occur. Based on such assumptions, a corporation's value and funding costs are independent of the extent to which the corporation chooses to use equity or debt as a source of funding.

[1] See, for example, the minutes from the meeting of the Financial Stability Council on 11 November 2014 and Finansinspektionen (2014a).
[2] Directive 2014/59/EU of the European Parliament and of the Council
[3] A bank's shareholders, however, lose control of the firm as soon as the minimum capital requirement is breached.
[4] There may be different reasons why banks choose to largely fund themselves with debt. For a bank, deposits, for example, are not just a form of funding, they can also be regarded as a factor of production, see, for example, Cline (2015).
[5] Since the state imposes capital requirements on banks, unlike traditional corporations banks cannot determine the level of their debt entirely by themselves and it is only capital above the minimum capital requirement that can fully absorb losses from the perspective of the bank's shareholders. Modigliani and Miller's theory about funding is based on all equity being able to be used as a buffer against losses and therefore does not fully apply to banks.

But since interest expenses are tax-deductible, loan financing is less expensive and a corporation is therefore able to increase its value by opting to use the lowest possible proportion of equity. Bankruptcy costs also exist. If a corporation opts for high indebtedness, the cost of loan financing may rise, which creates an upper limit for how large a share of loan financing is optimal for the corporation.

The banking system has contained both implicit and explicit guarantees, as banks have been considered to be too important to the economy for the state to allow them to fail. These guarantees have resulted in the disabling of an important market mechanism, implying that the cost of loan financing does not rise to the full extent if a bank opts for a high debt ratio. The tax-deductibility of interest costs together with these guarantees means that it is usually profitable for banks to fund their business with a very large proportion of borrowing.[6] According to Modigliani and Miller's theory, if there were no capital regulation, a bank would fund itself almost entirely with debt.

This high debt ratio among banks means they are sensitive to disturbances and losses. In such situations there is a risk that banks might not be able to fulfil their role in the financial system, which could have significant adverse consequences for the economy. In a worst case scenario, banks may become bankrupt, resulting in even worse consequences. It is therefore of great public interest for banks to have sufficient capital to meet their commitments and to continue to operate, even if they were to suffer losses. The state therefore requires firms that conduct banking operations to have a level of capital that is sufficient to cover losses that could arise in the event of severe financial stress.

The purpose of regulating banks' capital levels, therefore, is to ensure that a bank is sufficiently able to withstand losses. But it is not just individual banks but the entire financial system that needs to be protected. Because problems in one bank can spread to others, banks also have to maintain capital to reduce such systemic risks.

Should capital requirements be risk-sensitive?

There are two main approaches for regulating the capital levels in the banking system: risk-based and non-risk-based. The current Basel 3 Accord is mainly risk-based and means that the higher the risk an asset has, the more capital a bank must hold against that asset.[7]

[6] See Juks (2010) for further information about why banks prefer debt financing.

[7] The EU has implemented the Basel 3 Accord via binding rules in the supervisory regulation (regulation of the European Parliament and the Council 575/2013) and in the capital adequacy directive (directive of the European Parliament and the Council, 2013/36/EU). Insofar as the provisions of the capital adequacy directive have not been covered by applicable law, these provisions have been implemented by means of laws, directives and regulatory provisions or via adjustments to existing regulation. Hereinafter, the term 'the Basel 3 Accord' is used to refer to all of these regulations.

A leverage ratio requirement is an example of a non-risk-based capital requirement, as it means that a bank must retain the same amount of capital for two assets of equivalent size, irrespective of the assets' risks. FI believes there are risks in introducing a leverage ratio requirement at a level at which it comprises the binding capital restriction, i.e. it determines how much capital banks must retain. Risks arise as a result of the incentives that such a requirement creates for banks, which in the long term could have significant effects on the entire financial sector.

High-risk lending usually results in higher returns as compensation for the higher risk. Under a binding leverage ratio requirement, a bank has to hold the same amount of capital regardless of risk. This incentivises a bank to shift its business towards higher-risk lending and to thereby generate a higher return on equity. This increases the risk of large credit losses and makes the bank and the entire banking system more risky. Business that involves low risk and low returns, such as mortgage loans and lending to highly creditworthy corporations, may be securitised, sold in some other way or discontinued. Securitisation and other forms of selling result in this business being removed from banks' balance sheets or in some other way ending up outside the regulated banking sector, in what is called the shadow banking sector.[8] This results in a reduction in the size of the bank and the entire banking system, measured in terms of assets.

The introduction of non-risk-sensitive capital requirements that are binding under normal circumstances could therefore result in Sweden's banking system becoming smaller, but riskier and the supply of credit to the real economy taking place to a greater extent via financial markets. Although more lending via financial markets means more funding channels, which could increase efficiency, it could also pose risks. One of these risks is that the credit supply could become less stable than it currently is. Experience from the US suggests that a more market-based system can become particularly sensitive during times of crisis.[9]

A further risk stemming from a more market-based system is that large parts of the shadow banking sector are unregulated and that the regulation that exists is not primarily aimed at maintaining financial stability. Neither are there any concrete proposals for regulation that address systemic risks in this sector. FI's assessment is that it will take time before such regulation is in place, if it is possible to regulate this is an appropriate manner at all. Moreover, the shadow banking sector consists largely of foreign entities, which cannot be regulated nationally. The supervisory authority will therefore have less scope to verify

[8] See Hansson et al (2014) for a discussion of shadow banks from a Swedish perspective.
[9] Reinhart and Rogoff (2008) argue that the US development towards a more market-based system may have increased the financial system's resilience against some shocks, but that the system also may have become more vulnerable to other types of shocks.

that businesses are being operated properly and that there is sufficient ability to absorb losses in the financial system as a whole. There will also be fewer opportunities to use macroprudential policy tools to stabilise the credit cycle.

Although Swedish authorities have adopted a cautiously positive attitude towards a slightly more market-based system, they have also noted that each proposal should be preceded by a thorough impact assessment ensuring that financial stability as well as consumer protection is not put at risk.[10] The consequences of a more market-based system have so far not been sufficiently analysed. More analysis is therefore required to find out how a more market-dependent system could be expected to affect credit supply and financial stability in different economic circumstances and what supervisory tools would be needed.

So, paradoxically, a binding leverage ratio requirement could lead to a deterioration in financial stability. FI therefore believes that the current risk-based regulation is preferable to a leverage ratio requirement that is set at a level such that it becomes the binding capital restriction for the most important Swedish banks. If capital requirements are to be raised for Swedish banks, this should instead take place within the risk-based regulation.

The structure of current capital requirements

The Basel 3 Accord capital requirements are based on risk-weighted assets. Risk-weighted assets are a weighted total of all of a bank's assets, with the weighting determined by the risk in each individual asset. The actual risk weighting can be calculated either by using a standardised value or is calculated based on a bank's own estimates of the expected loss on individual assets. Calculation of risk-weighted assets is regulated in detail by capital adequacy regulations. These detailed regulatory calculations are often referred to as Pillar 1.

The overall capital requirements are made up of different components, which are summarised below:

i. **Minimum capital requirement** – amounts to 8 per cent of risk-weighted assets (of which 4.5 percentage points must be covered by common equity Tier 1 capital) and must be met for a bank to retain its licence to conduct banking operations. The requirement is set at level to cover those losses that could arise over the course of a year in a severe financial stress scenario.

ii. **Bank-specific requirement** – each year, FI carries out an individual assessment of the risk of all large banks, which can also include a bank's impact on systemic risks. This assessment usually

[10] See the Swedish Ministry of Finance, Finansinspektionen and Sweden's Riksbank (2015).

results in banks being allocated a higher capital requirement than the Pillar 1 capital requirement. This additional capital base requirement is called Pillar 2 and is also principally covered by common equity Tier 1 capital. The purpose of the Pillar 2 requirements is the same as the purpose of the Pillar 1 minimum requirement.

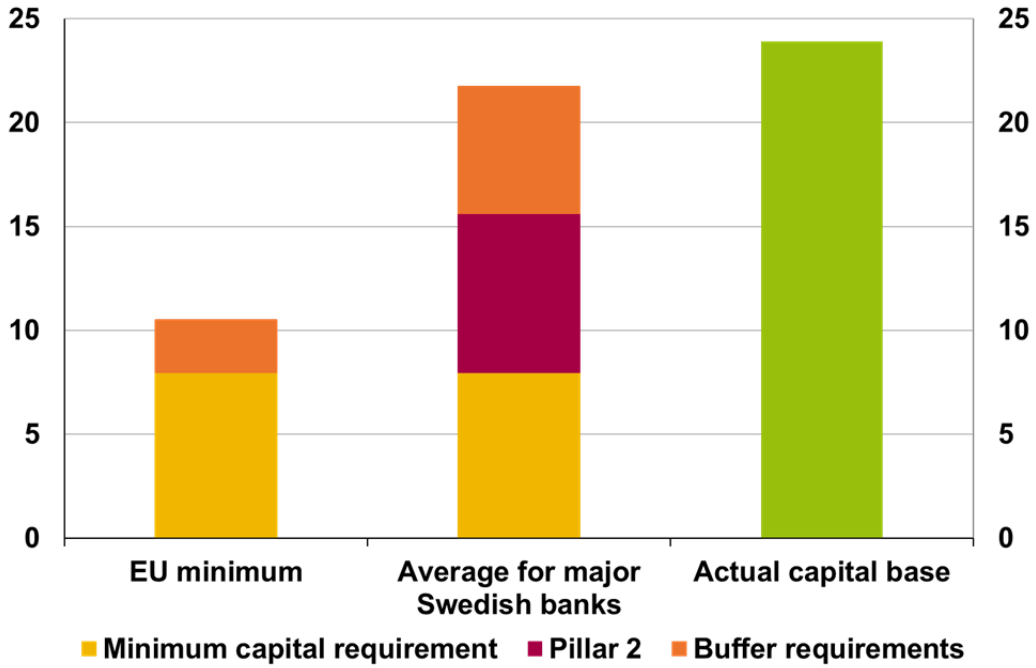
iii. **Buffer requirements** – there are a number of different buffers that act as shock absorbers and protect a bank against losses being so large that the minimum capital requirement is not met. A bank may breach the buffer requirements without losing its license, but only for a limited period and under strict terms. These buffers must be covered exclusively with common equity Tier 1 capital and consist of:

- **The capital conservation buffer** – currently amounts to 2.5 per cent of risk-weighted assets and applies to all banks. Its purpose is to constitute a buffer down to the minimum requirement.
- **The countercyclical capital buffer** – varies between 0 and 2.5 per cent (but may, in exceptional circumstances, be set even higher) of the bank's risk-weighted Swedish assets.[11] As of June 2016 this buffer will amount to 1.5 per cent. The purpose of this buffer is to strengthen the ability of banks to withstand the development of cyclical systemic risks. The additional capital that banks must build up when lending growth is high could be used during worse times if FI decides to reduce or remove this buffer requirement.
- **Systemic risk buffers** – consist of the systemic risk buffer, the capital buffer for global systemically important institutions and the capital buffer for other systemically important institutions. FI has determined that the four major Swedish banks should have systemic risk buffers totalling 3 per cent of risk-weighted assets. The systemic risk buffers aim to reduce risks in the financial system as a whole rather than bank-specific risks.

Together, these different capital requirements mean that the four major Swedish banks must on average maintain the equivalent of 22 per cent of their risk-weighted assets in the capital base. The majority of these, almost 17 percentage points, must consist of common equity Tier 1 capital. A large proportion of the requirements consist of buffer requirements and banks maintain approximately 2 percentage points of capital in addition to this as a buffer (see Chart 1).

[11] Swedish banks also have to maintain a countercyclical buffer for their foreign assets if the competent authority in the respective country has set the buffer higher than zero. The same is true for foreign banks in relation to their Swedish assets.

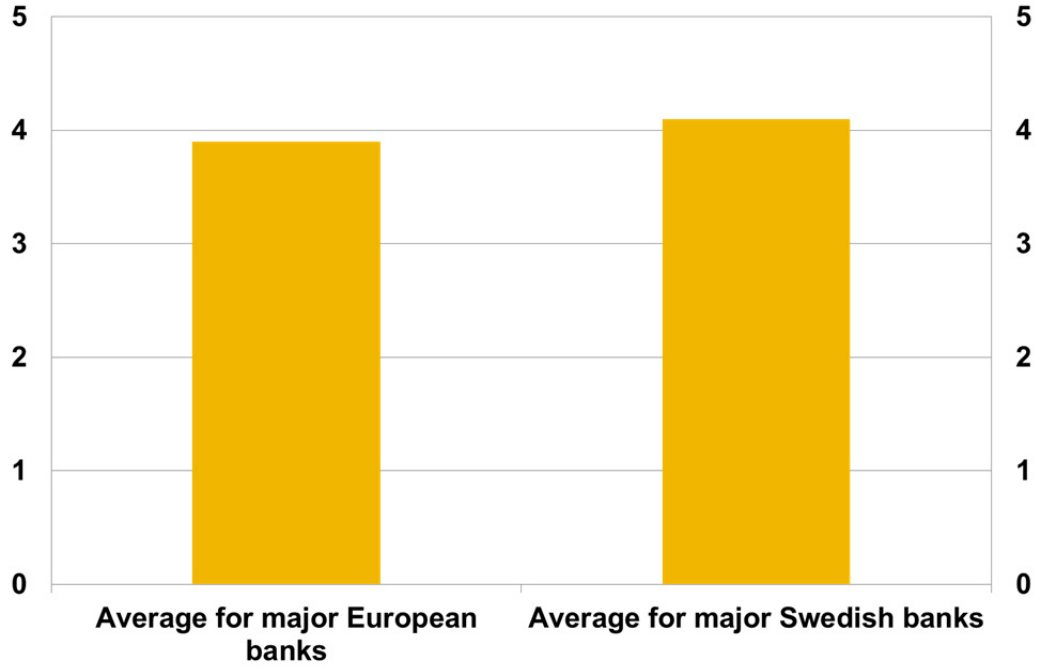
Chart 1. Current total capital requirements
Percent of risk-weighted assets



Note. The chart shows the average for the four major Swedish banks.
Source: Finansinspektionen (2015b).

The four major Swedish banks' average leverage ratio was in line with the average of major European banks in the second quarter of 2014 (see Chart 2). Since then, the leverage ratio of major Swedish banks has increased slightly and the average was 4.3 per cent in the first quarter of 2015. Neither the Basel Committee on Banking Supervision nor the EU have yet decided the level at which the leverage ratio requirement will be set, but the level that has so far been indicated is 3 per cent. Swedish banks are therefore also relatively well capitalised in risk-weighted terms.

Chart 2. Leverage ratios of major Swedish and European banks
Percent



Note. These figures relate to the second quarter of 2014 and have been calculated based on Basel 3 being fully phased in. In the EU average, the definition of major banks is all banks with Tier 1 capital of more than EUR 3 billion and that are active internationally. A total of 38 banks in the EU fit this definition.

Sources: European Banking Authority (EBA) and FI.

Measures to reduce model risks

The Swedish banks' average risk weights have gradually decreased since the introduction of Basel 2 in 2007. This is mainly due to greater use of internal models, which usually result in lower risk weights than standardised approaches. The fact that risk weights have continued to decrease since banks started using internal models is largely as a result of them shifting their businesses towards lower-risk lending.

FI believes that the increased use of internal models largely provides a more accurate view of risk. However, the use of internal models can lead to model risk, i.e. a risk of the models being misleading, particularly since banks have an incentive to overexploit regulatory opportunities so that the risk weights decrease more than is justified by the actual level of risk.

FI believes there are a number of weaknesses in current regulation that could lead to risk weights and, consequently, the capital requirement, being underestimated. To address these weaknesses, the Basel Committee has proposed that a floor be introduced for the risk-weighted exposure amount based on the standardised approach. FI believes, however, that there are better ways of addressing these weaknesses than introducing such crude non-risk-sensitive measures.

One alternative to the standardised floor is to improve the internal models. Such measures are currently planned for discussion by the Basel Committee. Such improved risk weight calculations in internal models result in more accurate capital requirements and improved risk sensitivity in the regulation. FI believes that risk sensitivity is important and therefore has a positive view on improved risk weights to reduce model risk.

It is not yet possible to precisely measure the effects of these improvements; the proposals have not yet been specified. FI believes, however, that these improvements could lead to a considerable increase in capital requirements over the coming years.

Are current capital levels sufficient?

The capital requirements for Swedish banks is already currently significantly higher than EU minimum levels. The Swedish banks are also well capitalised compared with banks elsewhere in Europe, both from a risk-weighted and a non-risk-weighted perspective. This does not, however, necessarily mean that current Swedish levels are high enough, and may instead reflect excessively low levels globally. The question of whether capital levels are sufficient can be approached in various ways.

What do cost-benefit analyses say about capital levels?

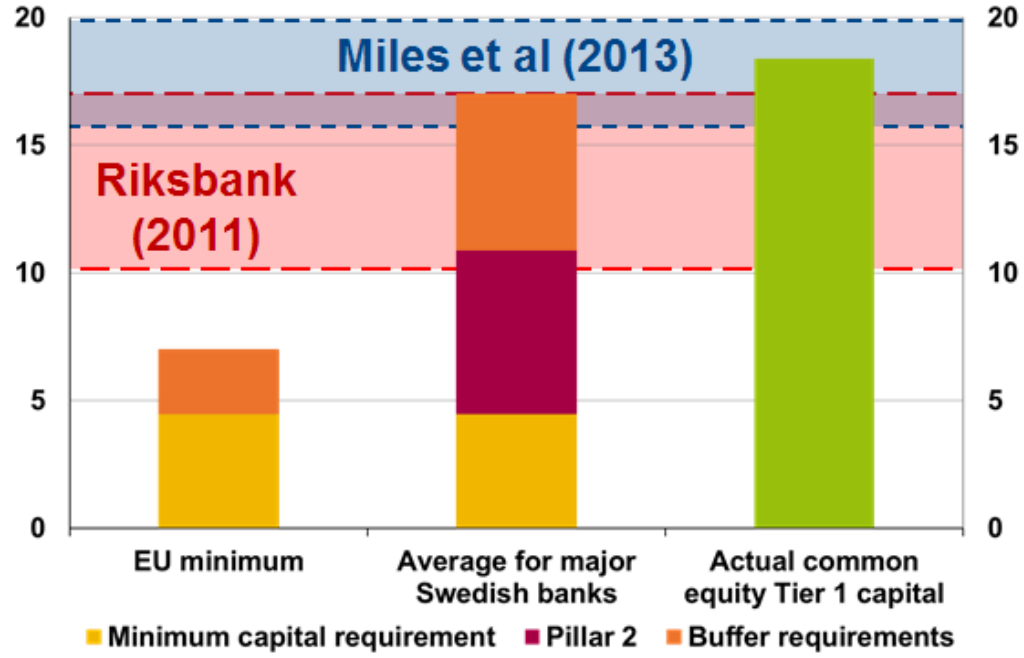
There are a number of studies that try to find the appropriate capital levels for the economy by calculating the cost and benefit from higher capital levels and comparing them. Costs arise since higher capital requirements tend to make banks' funding more expensive. To compensate for this, interest rates for customers are also set higher, which reduces the level of GDP. The benefit consists of higher capitalisation being deemed to make the banking system more resilient, which reduces the risk of financial crises that reduce the level of GDP. According to this approach, the appropriate level of capital is that which produces the highest level of GDP over the long term.

One of the highest-profile studies regarding appropriate levels of capital according to this approach is Miles et al. (2013), who find that the risk-weighted level of capital in the UK banking system should be in the range of 16–20 per cent. The Riksbank (2011) conducted a similar study and found that an appropriate level of risk-weighted capital for the Swedish banking system is in the range of 10–17 per cent.

The four major Swedish banks currently have common equity Tier 1 capital that is slightly higher than the range considered optimal by the Riksbank (2011) based on specific conditions in Sweden (see Chart 3). If we also add the other capital requirements (in the form of Tier 1 and Tier 2 capital) it is

difficult to claim that the Riksbank (2011) or Miles et al (2013) are suggesting higher levels of capital than banks are currently required to hold.

Chart 3. Common equity Tier 1 capital and appropriate capital levels
Percent of risk-weighted assets



Source: Finansinspektionen (2015b).

Both the Riksbank (2011) and Miles et al (2013) argue, however, that these quantifications constitute a lower limit for an appropriate level of capital. They have three different arguments why they consider that this range could be considered a lower limit.

First, they may have *overestimated the costs* of higher capital levels, which is something that Cecchetti (2014) and others argue. It is true that capital levels in the banking system have increased substantially since the Basel 3 Accord was introduced and the macroeconomic effects of this so far appear to have been very minor. But the fact that the macroeconomic impacts have been small may be due to many countries still recovering from the financial crisis and their monetary policy being far from normal. It is therefore not certain that these studies overestimate the long-term costs of higher capital levels.

Second, the studies may have *underestimated the benefits* from higher capital levels, chiefly because higher capital levels may reduce the size of the financial crisis that the capital is intended to protect against. But as previously mentioned, increased capital requirements for banks, at least if they are introduced as non-risk-sensitive capital requirements, could result in Sweden having a smaller but riskier banking system in which a larger share of funding takes place via financial markets. This could in turn increase the risk of financial crises, which reduce the level of GDP. So although the studies argue

that they may have underestimated the benefits from higher capital levels, this is not necessarily the case, since the regulation itself may affect the banks behaviour in a way that the studies ignore.

Third, they say that their estimates do not fully reflect the social benefits from higher capital requirements as there are a number of *market failures* that are not accounted for in the analysis. One such market failure is studied by Hanson et al (2011), who demonstrate that in the absence of regulation, capital levels in the banking sector could be too low as a result of a 'fire sale' externality. This means that if one bank is affected by losses and consequently has to sell assets to restore its capital ratio, the market price of these assets may fall. If these assets are also owned by another bank, the lower market price could also result in this second bank having to sell assets to restore its capital ratio. This is an example of a market failure in the form of an externality, as the first bank does not take account of the consequences for the other bank in determining its own capital level.

One might think that, since the problem consists of banks maintaining too little capital in the absence of regulation, the solution would be to introduce higher capital requirements. But a bank is never allowed to breach the minimum capital requirement and it is only permitted to breach the buffer requirements in stressed scenarios. So the effect of higher capital requirements would depend, among other things, on what capital a bank chooses to maintain over and above the minimum and buffer requirements. If the 'over-and-above' capital the bank holds reduces when capital requirements are raised , this could result in the bank needing to sell off assets in order to restore its capital ratios. So higher capital requirements could compound the effects of fire sale externalities. Neither is it certain, therefore, that the *market failures* that are not taken into account by the analysis strongly suggest that this range could be regarded as a lower limit.

FI therefore believes that the empirical studies that exist of appropriate capital levels do not provide clear guidance about whether the requirements should be higher, lower or at around current levels. FI believes it would be preferable for empirical studies to explicitly take account of externalities in the banking system (both positive and negative) and try to quantify what capital levels are required to reduce the negative consequences of such externalities, as well as to distinguish between minimum and buffer requirements. These types of studies could provide valuable information about appropriate future capital levels and how they should be structured in detail.

Do stress tests give cause to question the levels of the capital requirements?

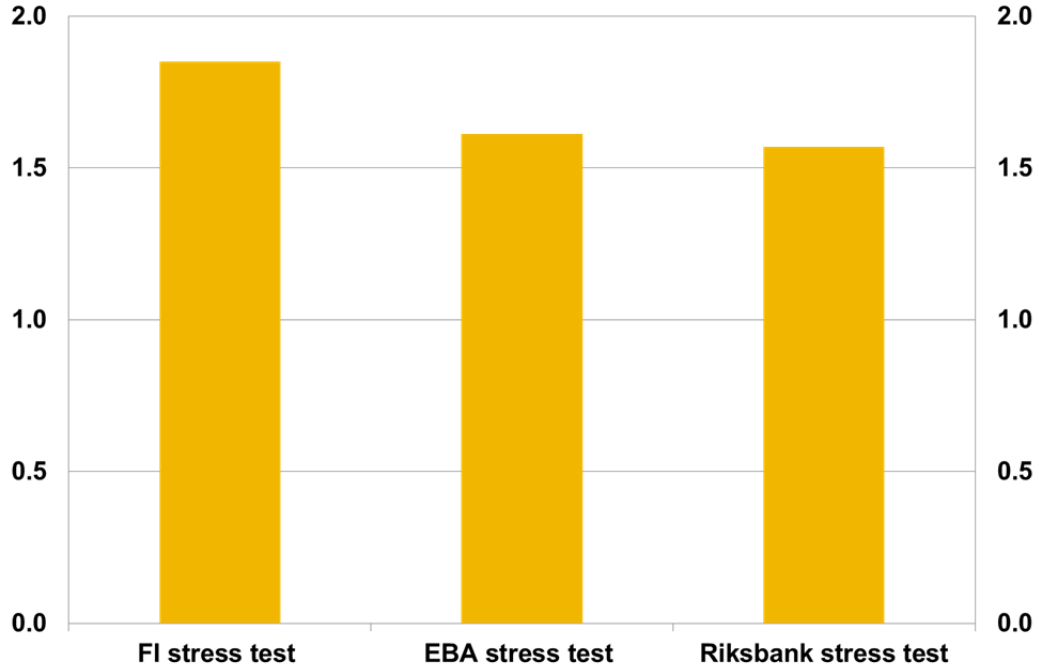
Stress tests are a way of analysing how banks' balance sheets would develop in the event of a particular scenario occurring. Each scenario analyses the effect on banks' capital ratios as a result of impacts such as lower earnings, increased

credit losses and higher risk weights. These scenarios are intended to be severe but plausible.

The major Swedish banks are stress-tested by FI, the Riksbank, and EBA. Although the stress tests are structured in different ways, the average impacts on banks' capital ratios are approximately the same: major banks' common equity Tier 1 capital ratios deteriorate by between 1.5 and 2 percentage points in the three stress tests (see Chart 4).

Stress tests are a tool that can be used to make a reasonableness assessment of the capital requirements imposed on banks. FI notes that the results of the stress tests in themselves do not give cause to question the capital requirements currently placed on banks.

Chart 4. Maximum capital effects in three different stress tests
Percent of risk-weighted assets



Sources: EBA, FI, and the Riksbank.

Are capital needs affected by possibilities of a bail-in?

Banks differ from other types of businesses in that they have a large proportion of debt financing, which is also often short-term. This means that knock-on effects in the event of default can quickly lead to significant disruptions and costs for large sections of the economy. This situation has led to many states considering it economically beneficial to prevent or mitigate the impact of banking defaults through bailouts.

Considering major banks to be too important to the economy for the state to allow them to fail, constitutes an implicit guarantee that has a value for banks

in the form of a lower cost of funding. For the four major Swedish banks, the value of this implicit guarantee has, at least at times, been significant.[12]

The existence of an implicit guarantee has a number of negative effects. First, it involves a transfer of wealth from taxpayers to banks' shareholders and creditors, as the market expects that the state will bail out a bank in trouble while at the same time not charging a fee for this implicit insurance. Second, access to cheap funding may result in the banking sector expanding and becoming too large. This is because the implicit guarantee leads to lower funding costs for banks and is therefore a form of subsidy. [13] Third, the implicit guarantee can lead to banks' risk appetite increasing. This is because the incentive for banks' creditors to monitor banks and fully price in credit risk in their exposures to banks decreases when they expect to be protected from banks defaulting.

Frequent and extensive state rescue measures for banks in the 2008–2009 financial crisis led to serious consequences for central government finances in numerous countries. As a result, considerable international political support was established early on for a new, separate insolvency regulation for banks to prevent states from having to intervene to save banks in the future.

The alternative involves a write-down of debt and tools to enable this to occur. This means that losses that could lead to banks failing should be fundable by a bank's creditors by making it possible for debt to be converted into loss-bearing capital[14]. Making this possible and, above all, perceived as a credible option, requires both legal changes and regulatory processes.

In order to deal with crisis-hit banks, a new regulation has been introduced in the EU by means of the BRRD. The bail-in tool and the requirement for a balance sheet structure that facilitates this, MREL (*Minimum Requirement for Own Funds and Eligible Liabilities*), is to be introduced on 1 January 2016, according to the directive. The global equivalent of MREL is TLAC, which will start to apply from 2019 at the earliest.

What is required for effective resolution is a functioning and credible legal system under which it is clear in advance what conditions will be applied for different types of debt instruments. Moreover, a sufficiently large proportion of the debt needs to consist of instruments that can be loss-bearing. For this to happen, the ongoing global work on TLAC/MREL needs to result in practical and applicable regulation that makes bail-ins credible and likely.

[12] See Finansinspektionen (2015a).
[13] See, for example, Kocherlakota (2010), who argues that one solution could be to use so called pigovian taxes.
[14] As well as capital instruments with certain debt-like properties, known as Tier 1 capital contributions and Tier 2 capital.

It is true that the value of the implicit guarantee could be reduced by requiring banks to hold more capital. But as long as there remains a probability that the bank will end up in crisis where lenders will be protected, such a regulation does not solve the problem that the banks' debt financing is too cheap; it is merely a way to mitigate its *consequences*. A bail-in tool, on the other hand, targets the *cause* of the problem and is therefore a more direct way to reduce the value of the implicit guarantee.

For the banks, the bail-in tool could result in an increase in funding costs, particularly for those debt instruments that could be subject to a bail-in. But other debts could become slightly less expensive by explicitly being exempted from bail-ins. Another effect is that the size of banks and their risk appetite could decrease if the implicit state guarantee were to disappear.

Although there is some uncertainty over how the BRRD will work in practice (since these new regulations are currently being introduced), FI believes that there is currently no reason to simultaneously raise capital requirements further in order to reduce the value of the implicit state guarantee. Implementation of the new framework will take place over the next few years and an assessment of the effects on the implicit state guarantees is therefore some way off.

In November 2011, the FI, the Ministry of Finance and the Riksbank presented an agreement on higher capital requirements for the major Swedish banks (the so-called November agreement). Implementation of the agreement meant that the major Swedish banks were to hold systemic risk buffers of a total of 3 percent plus 2 percent core Tier 1 capital under Pillar 2. This was justified, among other things, by a lack of an effective crisis management tool.[15] Swedish capital requirements for systemic risk have thus, at least in part, been motivated by reasons that now fall within the scope of the resolution framework and that could consequently be fulfilled by other instruments that could be loss-bearing. If the bail-in tool is made useful and credible, there could therefore be cause to review the motivation for, and the structure of, the capital requirements for systemic risks.

[15] See p. 40 of Finansinspektionen (2014b).

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