

Memorandum

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Capital requirements for the major Swedish banks – the Riksbank's view¹

Summary

In November 2011 the Swedish authorities decided that the risk-weighted capital requirement for the major Swedish banks² should be at least 12 per cent CET 1 capital in relation to the banks' risk-weighted assets³. With hindsight, there are a number of indications that suggest that this level was probably too low.

Experiences after 2011 indicate that the costs of introducing higher capital requirements were probably overestimated, while the benefits of such an introduction were underestimated. International studies published since 2011 also indicate that the capital level should be higher than 12 per cent. Moreover, the major banks' risk weights, which affect the risk-weighted capital requirement, have declined since 2011. This reduction has largely been driven by the fact that the banks now use internal models to an increasing degree to calculate their risk weights, whereas they previously used the so called standardised approach. As a result, the capital requirement decided on in 2011 now ties up a smaller amount of capital in relation to the banks' risk than was the case in 2011.

All in all, this indicates that the capital requirement should be raised. However, further analysis than was possible within the scope of this memorandum is needed with regard to how much the requirement should be raised.

Finansinspektionen has introduced further capital requirements for Swedish banks since 2011, for instance through a risk-weight floor for Swedish mortgages and the countercyclical capital buffer. But these requirements were introduced largely to deal with other risks than those considered in the agreement from 2011. They therefore should not be included in the discussion of whether the requirement introduced in 2011 is well-balanced.

There are advantages, but also disadvantages, with the methods the banks use in their internal models to calculate the risk weights on which the risk-weighted capital requirement is based. Financial supervisory authorities, as well as banks and other market participants, have in many cases questioned the reliability of the risk weights calculated by the banks using internal models. In particular, there is concern that the

¹ This memorandum was written as a basis for the meeting of the Financial Stability Council in June 2015.

² The four major banks are Handelsbanken, Nordea, SEB and Swedbank.

³ Risk-weighted assets refer to the value of the assets adjusted for risk.

■ banks underestimate the risks and therefore hold too little capital. To reduce this risk, the current risk-weighted capital requirement should be supplemented with other types of capital requirement, such as a new general risk-weight floor or a leverage ratio.

1. Introduction

In light of the lessons learned from the global financial crisis, capital requirements have been raised for banks all over the world. The Third Basel Accord (Basel III) was concluded in December 2010 and established that globally operating banks should hold Common Equity Tier 1 (CET 1) capital equal to at least 7 per cent of their risk-weighted exposures (BCBS, 2010a). In June 2013, this global minimum standard was also adopted in an EU directive, which covers all credit institutions within the EU (EU, 2013). This directive was incorporated into Swedish law the year after (Sveriges Riksdag, 2014).

For various reasons, however, the Swedish banking system is particularly sensitive to economic shocks. This led Finansinspektionen, the Ministry of Finance and the Riksbank to place further capital requirements on the four major Swedish banks in November 2011, over and above the provisions provided for in Basel III and the EU directive. According to this "November agreement", the major Swedish banks are to hold at least 12 per cent CET 1 capital in relation to their risk-weighted exposures.⁴

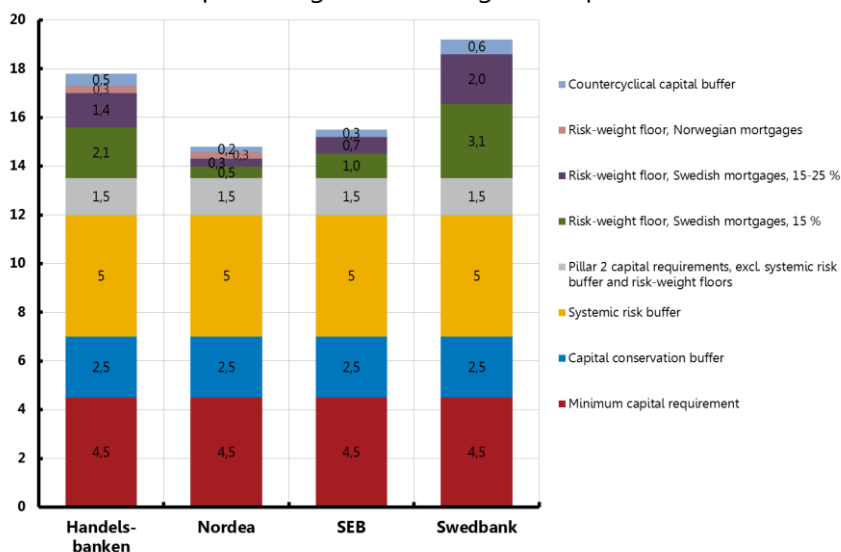
There were also certain specific risks in the Swedish banking system, which were not considered in the 2011 agreement. As a result, additional requirements have been introduced since then to manage these risks in particular. These additional requirements include a capital requirement in the form of a risk weight floor of 25 per cent that affects the banks' mortgage lending, along with a so-called countercyclical capital buffer.⁵ All in all, the total CET 1 capital requirement for the major Swedish banks amounts to between 15 and 19 per cent of their respective risk-weighted exposure amounts (see Figure 1).⁶ Since this memorandum focuses on an examination of whether the requirement established in November 2011 needs to be adjusted or not, the additional requirements mentioned above will not be included in the analysis.

⁴ The other banks have a CET 1 capital requirement of 7 per cent.

⁵ In addition to this, each bank has an institution-specific capital requirement within what is known as Pillar 2. This requirement is also over and above that which was adopted in the 2011 agreement. The idea of the requirement is to capture risks that are specific to the individual bank along with risks that are not captured by other requirements. The institution-specific requirement is therefore in addition to the systemic risk requirement of 2 per cent and the risk weight floor for mortgages, even though these are also within Pillar 2.

⁶ The actual CET 1 capital ratios of the major banks currently amount to between 15 and just over 21 per cent (Finansinspektionen, 2015).

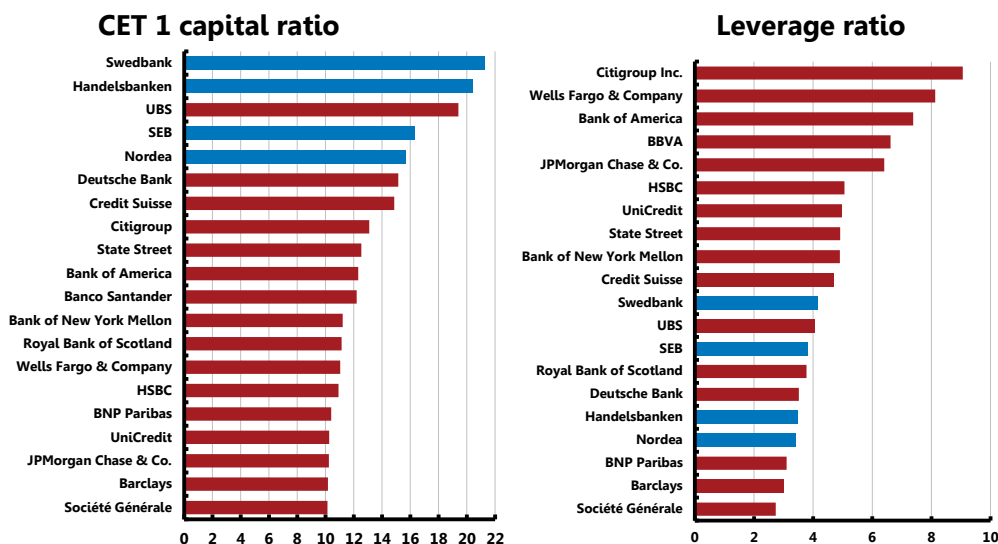
Figure 1. CET 1 capital requirements of the major Swedish banks
December 2014, percentage of risk-weighted exposure amount



Note: The size of the Pillar 2 requirement is not currently public but Finansinspektionen uses a standard rate of 1.5 per cent of risk-weighted exposure amount in its publications.
Source: Finansinspektionen (2014)

The major Swedish banks report high CET 1 capital ratios in an international perspective. Their position relative to other banks is however different if we look at the banks' leverage ratio, which is a non-risk-weighted capital adequacy measurement (see Figures 2 and 3).

Figures 2 and 3. Swedish banks' CET 1 capital ratios and leverage ratios in comparison with other systemically important banks⁷
December 2014, per cent



Note. Leverage ratio refers here to the banks' CET 1 capital in relation to their total assets, therefore making it slightly different from the Basel Committee's definition.
Source: SNL.

⁷ The comparison group includes globally systemically important banks for which relevant information is available via SNL

The aim of this memorandum is therefore to examine whether the capital requirement introduced in connection with the 2011 November agreement should be raised and – possibly – supplemented by other types of capital requirements. The analysis does not look into how large the countercyclical capital buffer should be.⁸

2. International and national work on capital requirements

2.1 The international regulation agenda

Sweden is not alone in reviewing capital requirements for banks. In the Basel Committee and in many countries around the world, extensive work is currently ongoing to increase the reliability of and trust in the levels of capital reported by banks. Much of this work is based on a concern that the internal models used by the major banks to calculate their risk weights underestimate the risk in the banks' exposures, and lead them to report capital ratios that are neither reliable nor sufficiently comparable between banks.⁹

The Basel Committee has therefore started a review of the regulations governing the banks' internal models. The aim is to increase credibility in the banks' risk weights by to some extent reducing the banks' flexibility in how internal models can be used to calculate risk weights. The Committee has said that other measures may also be necessary to ensure that the banks are sufficiently capitalised. This is why they have drafted proposals on new regulatory floors linked to a new standardised approach for calculating the risk-weighted capital requirement. Setting a floor for how low the banks' risk weights can go also limits how much the banks' capital requirements can decrease. Basel Committee members have also agreed on a definition of a non-risk-weighted capital requirement, the so-called leverage ratio requirement. Work is currently ongoing to establish at what level such a requirement should be set so that it best supplements the risk-based capital requirement (BCBS, 2014).

Parallel with the review, the Basel Committee and the Financial Stability Board (FSB) are discussing how they should introduce requirements on loss-absorbing capital and debt (Total Loss Absorbing Capacity, TLAC). TLAC should be possible to use when resolving a systemically important bank, and it therefore constitutes a supplement to existing capital requirements.

2.2 Raising capital requirements on the national level

In conjunction with the November 2011 agreement, Sweden became one of the first countries to introduce a capital requirement on its largest banks that is higher than the global minimum standard. Several countries have since followed suit, including the Netherlands, Switzerland, the United Kingdom and the United States. Analyses in these countries have also shown that systemically important banks need higher capital requirements. In some cases the risk-weighted requirements are being raised and in others, the non-risk-weighted requirements are being raised.

⁸ For the Riksbank's opinion on the issue of the size of the countercyclical capital buffer, see Sveriges Riksbank (2015)

⁹ See for example Haldane (2012), Tarullo (2014), The Economist (2012) and Barclays (2012), which is discussed in, among others, FT Alphaville 25 May 2012.

Table 1 shows that the requirements introduced in these countries are not uniformly higher or lower than in Sweden. It is also difficult to compare the level of capital requirements in different countries, partly because the bank systems are different, and partly because the data and assumptions used to devise the requirements are not always publicly available. We should also remember that higher capital requirements are just one of many ways to increase resilience in a banking system. The United Kingdom, for example, is planning to reduce systemic risks partly by separating the banks' borrowing and lending activities from their trading activities. Despite the difficulty involved in comparing the level of capital requirements in different countries, however, it is interesting to give an account of the reasoning employed when higher requirements have been introduced in countries that have a banking system that shares some or several properties with the Swedish system.

Table 1. Overview of requirements introduced in the Netherlands, the United Kingdom, the United States and Switzerland

Country	Requirement raised	Level of requirement after increase	Introduced
Netherlands	CET 1 capital	10 %	2016–2019
Switzerland	Leverage ratio	4 to 4.9 %	Before 2019
Switzerland	CET 1 capital	10 %	Before 2019
United Kingdom	Leverage ratio	Up to 4.05 %	2016–2019
United States	Leverage ratio	5 to 6 %	2016–2019

Source: De Nederlandsche Bank (2014), Finma (2014), Bank of England (2014) and Federal Reserve (2014)

2.3 The arguments in favour of raised requirements are also relevant to Sweden

The arguments in favour of the increases implemented in other countries are partly the same as those used to justify Sweden's need for requirements that are higher than the global minimum requirements. These arguments include the fact that the countries' banking systems are unusually large and interlinked. A number of other arguments have also been highlighted, as described below.

Several national authorities¹⁰ point out that there still seems to be a perception that actors who are considered "too big to fail" have implicit government guarantees. As long as this perception persists, there is also an incentive for e.g. shareholders and creditors to take unduly large risks, since it will be the government who foots some of the bill if these risks materialise.

The perception that certain actors are "too big to fail" also distorts competition in a way that is unfair to smaller banks. The major banks benefit from receiving an implicit guarantee which smaller banks do not receive. It is therefore negative for competition on the banking market and can encourage unhealthy consolidation and concentration in the financial sector.

¹⁰ See e.g. De Nederlandsche Bank (2014), OCC, Federal Reserve and FDIC (2014) and Finansinspektionen (2015a).

■ The countries' analyses also highlight the particular importance of high capital adequacy for systemically important banks, as it gives the bank more time to act in a crisis situation and find solutions to protect its systemically important functions. Greater systemic importance also tends to be associated with a more complex organisational structure and more business areas, which in turn leads to more complicated and time-consuming crisis management.

It should be noted that the United States, the United Kingdom and Switzerland are all planning to increase their non-risk-weighted capital requirement on the grounds that it is an important component to guarantee stability in the financial system.

3 Several reports indicate that the capital ratio should be raised

When Finansinspektionen, the Ministry of Finance and the Riksbank decided to set CET 1 capital for the major banks at a minimum of 12 per cent of the banks' risk-weighted exposures, they based their decision on reports such as "Appropriate capital ratio in major Swedish banks" (Sveriges Riksbank, 2011), as well as academic studies and reports from other policy organisations. In this section, we review these sources to see if new information has come to light that in some way changes the conclusions reached in the autumn of 2011. We also present some of the research in the area since the Riksbank's report was published.

3.1 The Riksbank's report on appropriate capital ratios in major Swedish banks

In 2011, the Riksbank published a report in which it assessed appropriate capital ratios from a Swedish socioeconomic perspective (Sveriges Riksbank, 2011). The report was in turn, to a certain extent, based on other international studies, mainly BCBS (2010). The report also considered Swedish conditions and made calculations based on the Swedish banking system.¹¹ Here we present the conclusions in the report and how they hold true today.

To arrive at the most appropriate (optimum) capital ratio from a Swedish socioeconomic perspective, the long-term benefit and cost of higher capital ratios were estimated. The benefit of increased capital ratios is that they make costly banking crises less likely. The cost arises from the assumption that the banks will increase their interest rates and reduce their lending when capital ratios are raised. The benefit of increased capital ratios therefore leads to a higher GDP, while the cost results in a lower GDP. The appropriate capital ratio is consequently the level that provides the highest GDP in the long term. The report concludes that for the major Swedish banks, this should be somewhere between 10 and 17 per cent of their risk-weighted exposure amounts. This corresponded to a leverage ratio of 3.5–6 percent at the time of the study.¹²

The reason why the report presented the capital ratio as an interval was because several different methods were used to calculate both the socioeconomic benefit and the cost of higher capital ratios. The 10-17 percent interval represents the range of outcomes from the various possible combinations of methods.

¹¹ The report also calls attention to a few Swedish conditions that point towards a capital requirement for Swedish banks that is higher than the international minimum level in the Basel framework. These conditions are mainly that Sweden has a large banking system in relation to GDP, that the system is closely interlinked, that the banks are very dependent on wholesale funding and that the banks have a large proportion of foreign funding. These are the same factors that were highlighted in the November agreement.

¹² This is made clear in Table 7 in Appendix A in Sveriges Riksbank (2011).

■ However, the report probably underestimates the socioeconomically appropriate capital ratio for Swedish banks. Below we examine what leads us to believe that the benefit of higher capital ratios was underestimated in the report:

- When the cost of a banking crisis was calculated in the report, only limited consideration was given to the global financial crisis in 2007-2009. This was due to the fact that it was not possible at that time to fully appreciate the consequences of the crisis.¹³ Since the report was written in 2011, the costs of the crisis have risen more than expected. This suggests that the benefit of higher capital ratios is also greater than was assumed at the time.
- Since the financial crisis, the Swedish banking sector has grown further in relation to GDP. A large banking sector means that future banking crises may be even more costly than previous ones and the benefit of higher capital ratios will therefore be greater.
- The calculations in the report did not take into account the attempts by governments and central banks to mitigate the consequences of banking crises by implementing different types of costly rescue measures and the fact that the effects of the crises would probably have been much worse without them. Government rescue measures can also have a negative impact on public finances. The recent sovereign debt problems within the EU are an example of this. If these costs had been included, the total cost of a banking crisis would have increased. The report hence underestimated the benefit of higher capital ratios in this respect as well.
- The report uses a very strict definition of banking crises in order to analyse how higher capital ratios reduce their likelihood. A banking crisis was assumed to arise only when banks become insolvent, although in reality they often arise before this is the case. Thus, the likelihood of a banking crisis occurring at different capital ratios is probably higher than is concluded in the report.
- The calculations do not include the fact that the consequences of a banking crisis would probably be less serious at higher capital ratios since the banks would then be better able to cope with losses. The absence of this aspect in the report is due to the limited amount of research on how capital ratios influence the effect of a banking crisis.

Below we examine what leads us to believe that the costs of higher capital ratios were overestimated in the report:

- The report makes the assumption that shareholders continue to demand the same rate of return on bank capital when the capital ratio increases. However, the required rate of return should reasonably decline if the banks hold more capital, since this reduces the risk of them failing. If the shareholders required rate of return, and hence the banks, decreased, the cost to society of higher capital ratios would be lower, since the banks would not raise their lending rates to the same extent.
- The report did not take into account the fact that the banks' borrowing costs should decrease when their capital ratios increase. This should therefore

¹³ To calculate the benefit of higher capital ratios, an average cost of previous crises was used. The report thereby concludes that if greater consideration were given to the actual effects of this crisis, the estimated benefit of higher capital ratios would probably also have been greater.

■ indicate that the cost of higher capital ratios has been overestimated in this respect as well.

- Neither did the report consider that the banks are probably not able to pass the full increased capital cost on to borrowers due to competition. This is above all true if smaller banks, who are not subject to higher capital requirements, compete on the same market as the bigger banks. It is this competition that can to a certain extent explain why lending rates have risen less than feared as a result of the higher capital ratios in Basel III, see for example Caruana (2014). This suggests that the socioeconomic cost of higher capital ratios has been overestimated in this respect as well.

In conclusion, we can establish that the assumptions made in the report probably led to the benefits of higher capital ratios being underestimated and the costs being overestimated. Since the report was published, there have been no structural changes made to the Swedish banking system that could have justified a lower interval, for example the banking system having reduced in size or becoming less complex and interlinked. This indicates therefore that the capital ratio of 12 per cent adopted in the November 2011 agreement was on the low side.

3.2 International reports indicate that capital ratios should be raised

In recent years, several reports have been published in which it is argued that higher capital requirements are positive from a socioeconomic perspective. There are many types of capital requirements, but the reports that can be directly compared to the ratio in the November agreement are those that look at requirements for CET 1 capital. One of these is Miles et al. (2012), which has analysed the societal benefit and cost of higher capital requirements in the United Kingdom and reached the conclusion that the overall social benefit is maximised at a CET 1 capital ratio of 16–20 per cent.

Norway's central bank, Norges Bank, has published a report (Kragh-Sørensen, 2012) in which an attempt is made to find the optimum capital ratio for Norwegian banks by applying the same methodology as in Sveriges Riksbank (2011), but based on Norwegian data. The author draws the conclusion that the optimum CET 1 capital ratio is between 13 and 23 per cent. Just as in the Riksbank's earlier report, however, it is pointed out that the analysis contains a number of areas of considerable uncertainty and that certain cautious assumptions have therefore been made. It is also ascertained that the estimate of optimum capital ratios would have been higher if different assumptions had been made in the report.

Admati et al. (2013) ascertain that the capital adequacy regulations in Basel II resulted in far too low capital ratios for the banks. The authors analyse different arguments as to why a high level of equity at the banks would be expensive for society and have a negative impact on the credit market. They find that these arguments are either mistaken, weak, or irrelevant since they confuse societal costs with private costs. They then reach the conclusion that it is not unreasonable to have a non-risk-weighted capital requirement, i.e. leverage ratio requirements, for banks of 20 to 30 per cent.

The European Commission (2014) has published a detailed report on the financial regulation agenda, in which they take a consolidated approach to capital requirements together with other reforms and regulations, such as the Banks Recovery and Resolution Directive (BRRD). The report does not look for a suitable level of capital, but rather looks at the current situation and the regulation that has been introduced or is planned to be introduced. The Commission writes that the regulations often result in considerable costs, but that these usually affect financial

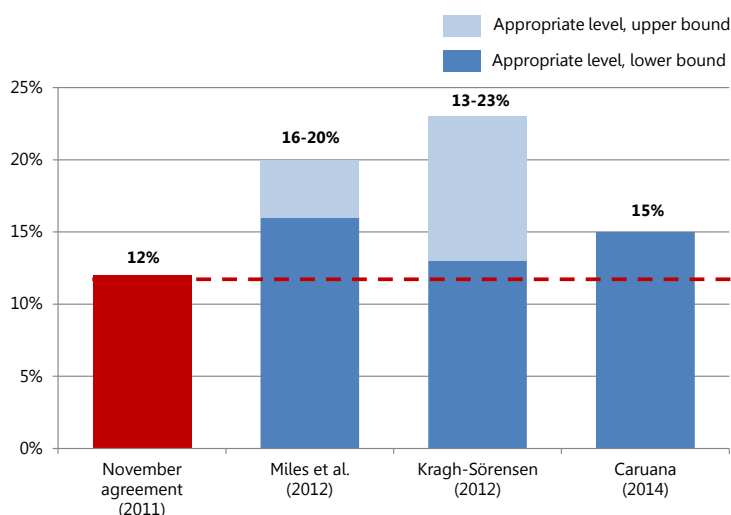
- intermediaries and their shareholders and employees. Furthermore, these costs are offset by the fact that the regulations result in benefits for the broader society, by for instance strengthening resilience in the financial system and reducing the likelihood of a crisis.

The Commission also writes that the costs of capital requirements should not be analysed in isolation and that the abovementioned benefits for society must also be taken into consideration. The Commission also thinks, however, that studies looking into the costs of stricter regulations cannot be used as a relevant yardstick, since they are normally based on conditions that prevailed prior to the financial crisis when the system was fragile, excessively indebted and approaching a crisis.

There are also several reports indicating that the costs of higher capital requirements have in reality been less than expected. Caruana (2014) ascertains that the major negative effects that some feared would affect the real economy and the financial system (e.g. as a result of higher lending rates) have not materialised. The banks' return on equity has fallen, as one might expect when indebtedness goes down and the risk-free interest rate is low. Caruana ascertains that CET 1 capital ratios up to 15 per cent in relation to risk-weighted exposure amount are beneficial for the economy. Cecchetti (2014) also ascertains that the costs that some feared would occur when capital requirements were raised have so far been low. Cecchetti hence shares Caruana's view that a further increase in the requirements should be considered.

In conclusion, we can ascertain that several studies point to the appropriate capital ratio in a banking sector being higher than the 12 per cent level adopted in 2011.

Figure 4. List of appropriate CET 1 capital ratios in studies



Note: Note that 12 per cent is used as a comparative index for the Swedish capital requirements. Other Swedish capital requirements were mainly introduced to cope with specific risks in the Swedish system (see Chapter 1), and are hence not fully relevant to the comparison.

■ 4 Significance of internal models for capital ratios

4.1 Reduced risk weights as a result of a transition to internal methods justify an increase in the capital requirement

A bank's CET 1 capital ratio is expressed as a percentage and can, in simplified terms, be said to depend on how much capital the bank has in relation to its assets - i.e. the bank's leverage ratio¹⁴ – and how high the average asset risk weights are (see Equation 1).

Equation 1.

$$CET\ 1\ capital\ ratio = \frac{CET\ 1\ capital}{Assets * Average\ risk\ weights}$$

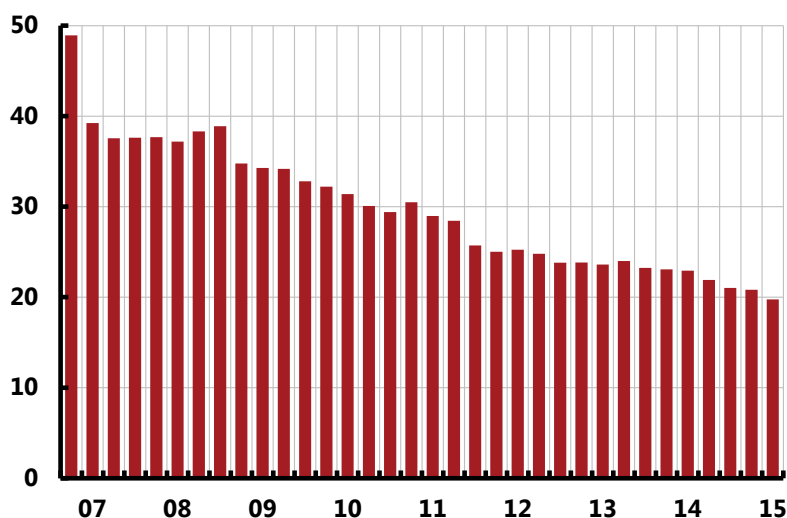
Similarly, a bank's risk-weighted capital requirement is a function of a percentage in relation to the risk weights. The fact that these ratios are dependent on the risk weights of the assets is important in the context since the risk weights have fallen since 2011, when the agreement to set the bank's CET 1 capital requirement at 12 per cent was concluded (see Figure 5). This therefore means that the banks need to hold a smaller amount of capital in relation to their assets than before the decrease in risk weights. This would have been reasonable if the whole risk weight decrease had been due to the banks having reduced their *actual risk*. But the decrease has instead been driven to a large extent by the banks having changed the way they calculated their risk weights. Since 2007, when Basel II was implemented in Sweden, and subject to Finansinspektionens approval, the banks have been allowed to calculate their risk weights using internal methods instead of the standardised approach¹⁵. Internal methods are currently used to calculate just over 75 per cent of the major banks' risk-weighted exposure amounts. And this increased use of internal methods has led to lower risk weights.

¹⁴ Note that the Basel Committee's definition differs slightly from this definition.

¹⁵ According to the regulations, once a bank has decided to use internal methods for some of its exposures, it must gradually switch over to using them for other exposures as well. Finansinspektionen can however give dispensation for exposures for which the calculation of risk weights by internal methods is inappropriate.

Figure 5. Average risk weights of the major banks

Per cent



Note: Average risk weights of the banks refer here to REA density, i.e. the banks' risk-weighted exposure amount (REA) divided by their total assets. Note that the risk weight floor for mortgages does not affect the risk weights directly but is added as an extra capital requirement.

Source: Bank reports

The banks' use of internal methods is in accordance with the regulations. Nonetheless, it must be ascertained that this transition has led to the risk weights decreasing more than the banks' risk has done. This means that the capital requirement of 12 per cent currently ties up a smaller amount of capital in relation to the banks' risk than it did when the requirement was introduced in 2011. This indicates that the capital requirement should be raised. This adjustment would have to be proportional to the effect on risk weights caused by the transition to internal methods.

Using currently available data, it is not possible to say how much of the risk weight decrease that has occurred after 2011 (when the November agreement was concluded) and has been driven by the banks continuing to switch over to internal models.¹⁶ Finansinspektionen has however estimated the size of the corresponding effect for the period December 2006 to December 2013. In the study, Finansinspektionen noted that the average risk weights of the major banks went down from 47 per cent to 23 per cent during this period (see Figure 6). 20 percentage points of the decrease were due to the banks changing their method of determining risk weights while only 5 percentage points were due to them having reduced the actual risk in their operations by shifting their lending to less risky exposures (sum of lending segment and geographical distribution in Figure 6).¹⁷

So even though we are unable to say how great an impact the transition to internal methods has had on the risk weights after 2011, it is likely that the effect is not negligible. This would suggest that the capital requirement needs to be raised so that

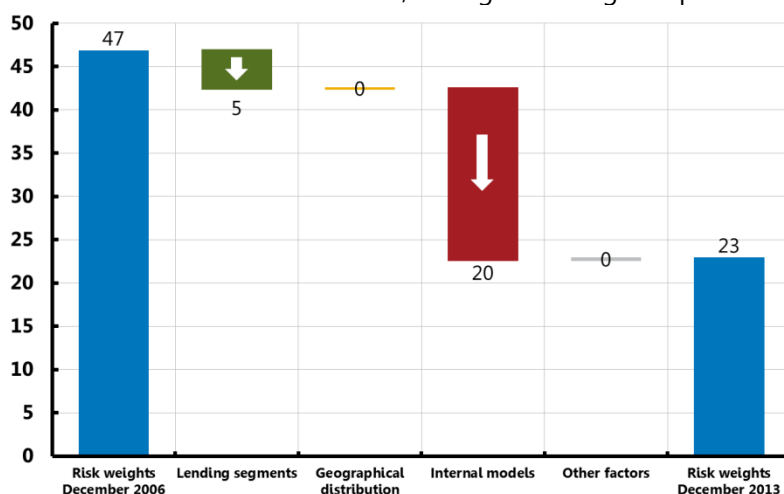
¹⁶ When the calculation is done using internal methods, the banks develop their own parameters based on historical loss statistics, which are then used in one of the formulae predetermined by the Basel Committee. This formula then gives the risk weights and the capital requirement. A bank can either use a basic or an advanced internal method. The difference between these is that the banks calculate more of the parameters themselves in the advanced method.

¹⁷ For more information on contributions to the reduction of risk weights, see Finansinspektionen (2014b).

it corresponds to the same amount of capital in relation to the banks' actual risk as it did in 2011.

It should be mentioned that Finansinspektionen adjusted the capital requirement upwards when it introduced the so-called risk weight floor for Swedish mortgages. This was done in May 2013 since the risk weights were considered to have dropped too low for Swedish mortgages. No similar adjustment has, however, been made for the banks' other exposures.

Figure 6. Risk weight change in the major Swedish banks
December 2006 – December 2013, average risk weight in per cent



Note: Other factors refer to a number of factors whose individual effect on the risk weights could not be estimated by Finansinspektionen. These include model optimisation and cyclical fluctuations. Note that the risk weight floor for mortgages is not included here, since it does not affect the risk weights directly but is instead added as an extra capital requirement.

Source: Finansinspektionen (2014b)

BOX: The actual resilience of the major banks has increased less than what the rise in their CET 1 capital ratio suggests

We ascertained above that the transition to internal methods has resulted in a greater fall in the banks' risk weights than the decrease in their actual risk implies. We have also ascertained that this could mean that the capital requirement adopted in 2011 should be adjusted upwards so that it corresponds to the same resilience as when the November agreement was concluded.

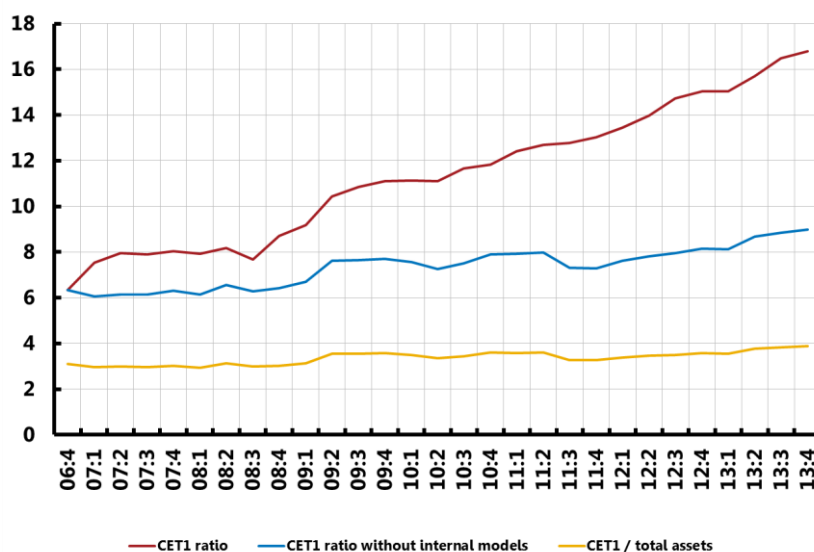
Another way of illustrating the effect of the banks' transition to internal methods is to look at how high the banks' reported capital ratios would have been if they hadn't changed their calculation method. In other words, instead of looking at what *the capital requirement* in the November agreement corresponds to with current risk weights, we look here at what the banks' reported *capital ratios* would have been if they had not developed new internal methods during this period.

This can be interesting since it is often assumed that an increase in the bank's capital ratios reflects a corresponding rise in their resilience to losses. But since a large part of the decrease in the major banks' risk weights depends on the fact that they changed their calculation method, it cannot be said that the entire increase in capital ratios reflects greater resilience. If we, on the other hand, adjust for the proportion of the increase in capital ratios that depends on the transition to internal models, we obtain a different picture of the increase in resilience.

During the period 2006 – 2013, the average reported CET 1 capital ratio of the major banks rose from 6.3 to 16.9 per cent (see the red graph in Figure R1). But if we adjust the capital ratios for the proportion of the risk weight decrease that depends on the banks' transition to internal methods, the CET 1 capital ratio for the major banks amounts to only about 9 per cent at the end of 2013 (see the blue graph in Figure R1).¹⁸ This estimation suggests that the actual resilience of the major Swedish banks has probably increased much less since Basel II was introduced, than what seems to be the case when we only look at the banks' reported capital ratios.¹⁹

Figure R1. The major banks' CET 1 capital ratios, with and without risk-weight effects from internal models, and CET 1 capital/total assets

Per cent



Note. The red line shows the major banks' CET 1 capital ratio with the banks' reported risk weights, while the blue line shows how high the ratio would have been if the part of the risk-weight reduction driven by the transition to internal models over the period covered by the diagram had been excluded. The figure assumes that the effect is evenly spread over the entire period in such a way that the internal models reduce the risk weights equally each quarter. Note that the risk weight floor for mortgages does not affect the risk weight exposure amount but is added as an extra capital requirement. The red line is hence unaffected by the risk weight floor.

Source: Bank reports, Finansinspektionen and the Riksbank

4.2 The disadvantages of internal models justify the introduction of non-risk-weighted capital requirements as a complement

The possibility for the banks to calculate their risk weights using internal methods was introduced in order to provide a stronger link between risk weights and asset

¹⁸ The Finansinspektionen study only concerned the banks' credit risk. But since credit risk is responsible for around 80 per cent of the banks' capital requirement and since the banks also use internal methods to a great extent for market risk and operative risk, the result can be assumed to be a reasonable estimate of all the banks' operations.

¹⁹ This does not imply that the risk weights according to Basel I were necessarily more accurate than current risk weights, only that actual resilience in the banking system has not increased to the same extent as is sometimes claimed. It should also be noted that the capital ratio of 9 per cent calculated here cannot be directly compared to the requirement of 12 per cent adopted in the November agreement. It is therefore not the case that we can conclude from this calculation that the banks are not living up to the November agreement in terms of resilience. The reason is that the capital requirement in the November agreement was based on the risk weights that prevailed in 2011, and which therefore had been affected by the increase in internal models that took place prior to 2011, while the calculated figure of 9 per cent also excludes this effect.

■ risk. In this way, capital requirements could be made more risk-sensitive. The banks' models are often good at differentiating risk between exposures, which means that they effectively capture *the difference* in risk between different types of exposure. This is desirable since it ensures that riskier exposures require more capital than less risky exposures. This maintains effective allocation of capital and furthermore increases the banks' incentive to improve their risk management and control.

Recently, however, concern has grown that internal models sometimes underestimate *the level* of risk in the exposures and that the capital requirement will therefore be too low. Regulators, banks as well as other market participants have expressed doubt about how well the risk weights calculated by the banks with the help of their models reflect the risks in an accurate manner and whether they provide comparable capital ratios among different banks.²⁰ Among other things, the Basel Committee published three reports in 2013, in which the banks' risk weights calculated using internal models were analysed.²¹ One conclusion from the work was that there are major differences in the banks' risk weights even for identical portfolios.

Below we list some of the shortcomings highlighted as regards internal models.

- The banks often lack sufficiently good data on historical losses. In most cases, the banks don't have data covering an entire credit cycle, which means that they probably cannot capture all losses. This is above all true about events that take place very rarely, which are precisely the events which banks are supposed to hold capital to protect themselves against.
- A further problem is that historical data, even with a long history, does not necessarily provide a good prediction of the future. Structural changes are difficult to capture with databased models.
- Internal models are often very complex, and the regulatory framework leaves plenty of scope for interpretations. Both the Basel Committee and the banks' own sector organisations have pointed out that this gives rise to large difference between the banks' methods.²²
- Another problem is the lack of transparency. Major internationally active banks often use a large number of different models. Each one measures the risk of a certain part of the bank's operations, and furthermore is often influenced by country-specific regulatory variations. For the biggest banks, such as the so-called G-SIBs, it may be a question of scores of models. This makes it difficult for external participants, such as investors, but also authorities, to evaluate the quality of the banks' models.²³ Since the major Swedish banks use market funding to a great extent and are therefore dependent on investors' trust, this point is especially important for them.
- The banks' incentive is to relatively unequivocally attempt to reduce their risk weights, since lower risk weights give a lower capital requirement. Lower capital makes it easier to compete on the market and to increase their returns. Pressure from investors to demand more capital or higher returns if they consider that the banks' risk weights have dropped unjustifiably low could work as a counterbalance. The supervisory authority's approval is also required for the bank to be able to use a new model. But various market

²⁰ See for example Haldane (2012), Tarullo (2014), The Economist (2012), Barclays (2012) and Bruno, Nocera and Resti (2014).

²¹ See BCBS (2013a, 2013b, 2013c).

²² See BCBS (2013a, 2013b, 2013c) and IIF (2014).

²³ This problem is discussed in e.g. Le Leslé and Avramova (2012).

failures mean that these factors probably cannot offset the banks' incentive to reduce the risk weights.²⁴ Such market failures include: poor transparency regarding the models which makes it difficult to analyse and compare the banks' risk weights; uneven or insufficient competition; and the presence of implicit government guarantees.

As mentioned in Part 2.1, work is ongoing within the Basel Committee to improve credibility regarding banks' capitalisation, see BCBS (2014a). Some of the measures proposed are intended to directly strengthen the regulatory framework for internal models, by for example reducing the flexibility of the banks when they use these models. Other measures aim to increase external control of models by improving the degree of transparency regarding the calculation of risk weights, and in the long run increase the credibility of the banks' capital ratios. Major emphasis is also put on measures that are to complement the current capital requirements, most of which are calculated using internal methods. It is here a question of general risk weight floors linked to the new standardised approach and the non-risk-weighted measure - the leverage ratio requirement.

The Riksbank considers this to be very important work. The measures to reduce the greatest defects in internal models are absolutely essential. At the same time, this way of calculating the banks' capital ratios and capital requirements needs to be supplemented. Here, the risk weight floor being developed by the Committee fulfils an important role, although capital measures that are entirely independent of risk weights are also desirable as a complement since the banks' capitalisation should be measured in several different ways. Most studies also show that the banks' leverage ratio has been better than other capital measures when it comes to predicting losses and financial problems in the banks (see for example Blundell-Wignall and Roulet (2013) and Haldane (2012)).²⁵

5 Concluding discussion

The agreement between Swedish authorities in 2011 meant that the capital requirements of the major Swedish banks exceeded the international minimum requirement contained in the Basel agreement. Since then the banks have increased their capital ratios significantly. This is largely due to the reduction in the banks' risk-weighted exposure amounts. This reduction has in turn been driven by the fact that the banks have switched over to internal models rather than by the banks reducing the actual risk in their operations. This means that the increase that could be observed in the risk-weighted capital ratios of the major banks has not been matched by a similarly large increase in actual resilience.

The risk-weighted capital requirement has a number of advantages in that it links together the banks' capital requirements with risk management. At the same time, we can ascertain that an increasing amount of criticism is being directed towards the risk-weighted capital requirement in general, and the internal models in particular. The Basel III accord has meant that the quality of the banks' capital has been strengthened compared to previous regulatory frameworks. But without a way of measuring risk that is both credible and comparable over time, risk-weighted capital requirements risk leading to far too low capital requirements. This leads us to two conclusions:

²⁴ In Finansinspektionen (2015), it is ascertained that the major Swedish banks still enjoy the advantages of an implicit government guarantee at an estimated value of SEK 6-14 billion.

²⁵ For a deeper discussion of the benefits of a leverage ratio requirement, see Wagman (2013) and Sveriges Riksbank (2014).

1. A tightening of the risk-weight-based capital requirement for the major Swedish banks should be considered. Experience and studies since 2011 suggest that the capital requirement of 12 per cent adopted at that time was probably too low. Moreover, the requirement ties up a smaller amount of capital in relation to the banks' risk today than was the case when it was introduced, since the risk weights have fallen as a result of the banks having extended their use of internal models. All in all, this indicates that the capital requirement should be raised. Further analysis is needed, however, in order to determine more precisely by how much the capital requirement should be raised.
2. The risk-weighted capital requirement should be supplemented with capital requirements that are not dependent on internal models. It is true that some of the problems associated with models could be counteracted by improving the regulatory framework but the complexity and lack of transparency in the internal models mean that most of the problems of assessing whether the banks have sufficient capital to cover their risks would nevertheless remain. The current risk-weighted capital requirement therefore needs to be supplemented, for example with a new risk weight floor or a leverage ratio requirement.

A common argument against raising capital ratios is that it can lead to the risks in the banks being moved to the so-called shadow banking sector instead.²⁶ Extensive international work is ongoing, mostly in FSB, to reduce possible systemic risks from the shadow banking sector and to improve its oversight. The Swedish shadow banking sector is currently relatively small compared to the Swedish banks and in an international comparison (Hansson, Oscarius and Söderberg, 2014). Moreover, virtually all Swedish shadow banks are regulated and under supervision. On the other hand, the development of the shadow banking system in Sweden should be closely monitored, regardless of whether capital ratios for the banks are raised or not, since this sector could have a negative impact on the financial system. If it gives rise to systemic risks, these risks should be restricted in the same way as for the banks.²⁷ The fact that higher capital ratios for the banks can lead to some of the risks being moved to the shadow banking sector should not therefore be a reason to refrain from investigating a tightening of the banks' capital requirements.

Another aspect that is often used as an argument against raising capital requirements is that the prevailing macroeconomic situation with low inflation could worsen if capital requirements were raised and the banks as a result were to tighten their lending by increasing interest rates. The exact timing for raising capital requirements should naturally be examined very carefully, but the fundamental question of higher capital requirements is not dependent on this argument.

²⁶ This is also discussed in Sveriges Riksbank (2011).

²⁷ Internationally, for example in the EU, there is much discussion about various macroprudential policy tools being implemented for shadow banks as well, tools that could be used to limit any systemic risks from them.

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■ Appendix - capital requirement increases in other countries

A. 1 Raising of the CET 1 capital requirement in the Netherlands

The Dutch central bank (De Nederlandsche Bank, DNB) stated in 2014 that it intends to introduce an additional systemic risk buffer for the country's largest banks. This buffer will comprise CET 1 capital and be added on top of the 7 per cent compulsory risk-weighted capital requirements at EU level²⁸. The requirement applies to the three largest banks: ING, ABN Amro and Rabobank. These banks must therefore hold a buffer of 3 per cent of the risk-weighted exposure amount in addition to the compulsory capital requirements at EU level, and will thereby have a total CET 1 capital requirement of at least 10 per cent.

In the analyses that have paved the way for the decision on the additional requirement, DNB emphasises that the financial crisis of 2007 and 2008 has shown that problems in major banks have serious consequences for the financial system, as well as for the real economy. They also think that it is particularly important to have high capital requirements since the Dutch banking system is both large and concentrated. The Dutch financial sector has major similarities with the Swedish financial sector, in terms of both the size of the banking sector in relation to GDP and the fact that a few large banks dominate the sector.

A.2 Raising of both risk-weighted and non-risk-weighted capital requirements in Switzerland

At the beginning of 2014, the Swiss financial supervisory authority (Finma) finalised a package of measures for systemically important banks which includes raised capital requirements. For the two largest banks, Credit Suisse and UBS, both the risk-weighted and the non-risk-weighted capital requirements were raised as a result of the new regulations.

According to the new requirements, the total capital requirement will be 19.2 per cent for UBS and 16.7 per cent for Credit Suisse, 10 per cent of which is to consist of CET 1 capital. The leverage ratio requirement is also being raised to 4.9 per cent from UBS and 4.0 per cent for Credit Suisse. UBS has tougher requirements because of its higher share of the Swiss market. The aim of the raised requirements is to reduce the likelihood of default, have more flexible crisis management and strengthen the banks' incentive to reduce size and risk-taking. The latter is considered to be particularly important for systemically important institutions.

In an analysis, Finma writes that capitalisation is particularly important for systemically important banks, since it gives the bank's management and counterparties, as well as regulatory authorities, more time to act in a crisis situation, among other things to find solutions to protect the bank's systemically important functions. Finma also ascertains that higher systemic risk often goes hand in hand with a more complex organisational structure and more business areas, which in turn lead to more complex and time-consuming crisis management.

²⁸ The minimum capital requirement of 4.5 per cent and the capital conservation buffer of 2.5 per cent.

A.3 Raised leverage ratio requirement and other measures in the United Kingdom

The UK has proposed a tightened leverage ratio requirement for systemically important banks, called the Supplementary Leverage Ratio Buffer. In addition to the base ratio of 3 per cent, an extra requirement has been added that varies between banks and that is set at 35 per cent of the banks' risk-weighted systemic risk buffer. This calibration has not been finalised, but the result can be a total leverage ratio requirement of as much as 4.05 per cent. Sir John Vickers, who headed the committee within the Bank of England that examined the issue, said in connection with the publication of the raised requirement that it is obvious that systemically important banks should have higher leverage ratio requirements in line with their higher risk-weighted capital requirements. As a supplement to the raised requirements, the UK also plans to reduce the risk associated with large banks by partly separating the borrowing and lending activities of these banks from their trading activities - known as "ring-fencing".

A.4 Raise in the non-risk-weighted capital requirement in the United States

Also the US central bank, the Federal Reserve (Fed) said during 2014 that it intends to raise the capital requirements for the country's largest banks. It is however the non-risk-weighted capital requirement that is being raised, i.e. the leverage ratio requirement. This is being done by introducing a Supplementary Leverage Ratio (SLR)²⁹ which is the US implementation of the leverage ratio requirement in Basel III. The eight banks in the United States that are considered systemically important and their subsidiaries are covered by SLR, and will hence have a leverage ratio requirement of 5 to 6 per cent. All US banks already have a general leverage ratio requirement of 4 per cent, called the US Leverage Ratio. The US Leverage Ratio differs from the Basel III measure in its design, however, and is therefore not discussed further in this memorandum.

Regarding the SLR, the Fed stresses that a strong capital base is extremely important for the largest and most interlinked banks in the country, since capital shortages at these banks risk having manifest consequences for the economy and also add to stress in the financial system, both nationally and internationally. The Fed also points to the fact that higher capital requirements for these institutions work as a buffer to private capital that can be used before the state guarantee and resolution system is set in motion, and reduce the likelihood of problems at these institutions leading to shocks in the economy.

The Fed also points out that the United States, and many other countries, took measures after the crisis to prevent risk contagion and restore stability in the financial system. According to the Fed, the perception still persists that certain banks are "too big to fail", which means that they are expected to be given support by the government should they get into financial difficulty, known as an "implicit government guarantee". As long as the perception remains, there is also an incentive for exaggerated risk-taking since any costs associated with excessive risk-taking would be paid to a certain extent by the government. Raising capital requirements would, however, reduce the likelihood of the government having to give support to the bank, thereby reducing the implicit guarantee. The Fed also points out that "too big to fail" also distorts competition, since these institutions can capitalise at a lower

²⁹ SLR differed initially from Basel III on a number of points, but was adjusted in September 2014 to bring it more in line with the Basel III measure. These adjustments mostly affected the components included in the denominator, such as derivative exposures.

- cost than smaller banks as a result of the implicit government guarantee. This distortion is unfair to smaller banks, damages competition and can encourage unhealthy consolidation and concentration in the financial sector.

The Fed also writes that the risk-weighted and non-risk-weighted capital requirements compensate each other's potential weaknesses and that these requirements are most effective when they co-exist. The Fed says that the non-risk-weighted requirement has a central role in alleviating the pro-cyclical properties of risk-weighted capital requirements. The Fed believes that the leverage ratio requirement helps to compensate for the possibility that risk-weighted measures underestimate the risk inherent in large volumes of assets – assets that look completely stable in normal times but that can become much riskier in periods of stress.