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Finansinspektionen stress tests large banks

Stress tests are one of the tools employed by FI in its supervision of banks. FI carries out ongoing tests to assess the banks' ability to withstand various negative scenarios. Stress tests are also used in the annual assessment of the banks' total capital. FI most recently published the results of the stress tests in October 2010.

The following memorandum presents the methodology and results of the most recent stress test that was performed on the major banks (Nordea, SEB, Handelsbanken and Swedbank). Finansinspektionen uses a simplified, standardised method that is different than the methods the banks use when conducting their own stress tests. The scenario does not make any assumptions about a specific macro scenario. Instead, the intention is to illustrate the effects of a sharp decline in the economy and thereby demonstrate the conditions for the banks' profitability. Weaker results in the scenario are primarily caused by large credit losses within all segments of the banks' lending.

FI believes that the magnitude of the decline in the scenario is improbable but not impossible. At the end of the scenario all banks still have adequate buffers to the minimum regulatory requirements, both with and without transition regulations. The reason for this is that the banks are not only well-capitalised from the outset, they also have good underlying earnings.

Finansinspektionen's assessment from the previous risk report remains unchanged, i.e. that there is currently no need for any of the major banks to strengthen their capital adequacy. However, the financial turbulence shows that, during extreme periods, investors may require a much higher level of capital than the requirements stipulated by law. This means that the banks should have good capital preparedness, even for improbable scenarios. Good capital preparedness means that the banks should have concrete plans for improving their capital adequacy within a reasonable period of time. FI believes that the major Swedish banks currently possess this level of preparedness.

Changes to the method

Some changes have been made to the method since last year. In an effort to improve the method, the stress test now includes the coming changes to the regulations. These changes affect the capitalisation of all of the banks. Deductions for investments in insurance operations that are today drawn from total

capital will instead be drawn equally from common equity Tier 1 capital and Tier 1 capital. This effect is introduced into the stress test during 2013. Another regulatory change which will affect the calculation of common equity Tier 1 capital in Swedbank is the implementation of CRD 3 in Sweden with effect from December 2011. The change in the definition of capital affects the reported common equity Tier 1 capital ratio in Swedbank since its equity includes includes other types of equity than ordinary shares, specifically preference shares, which are not equal to ordinary shares in the event of a liquidation. The new regulations therefore entail that Swedbank will report lower common equity Tier 1 capital than it does today. However, the amount of loss-absorbing capital in Swedbank is not affected and thus neither is FI's view on Swedbank's capitalisation. In addition, it is assumed that the preference shares will be transformed into ordinary shares immediately following the company's 2013 Annual General Meeting. The own funds are not affected, either, since the preference shares can be included as Tier 1 capital contributions.

General methodology

FI's method differs from the stress tests conducted by e.g. the EBA and the banks themselves in one important aspect. FI, like the Riksbank, conducts its stress tests on public information and does not take into account bank-specific characteristics, such as earnings stability or credit quality in a certain segment. In short, both authorities assume a certain fall in earnings and a certain development in credit losses in various segments of different markets and simulate the effects of these changes on the banks' financial positions. The advantage of such a standardised method is that it is easier to draw comparisons between the banks. The disadvantage, of course, is that the method does not contain more detailed information about, for example, the quality of each bank's credit portfolio.

In its stress test, FI calculates the banks' resilience in a three-year scenario that assumes a sharp fall in the all areas of the economy. In the scenario, the banks suffer from lower earnings and higher credit losses, which has a negative impact on capitalisation. The scenario assumes at the same time that lending increases by 5 per cent during the first year (no new lending in the following years) and that the capital requirement for credit risk pursuant to internal models increases by 5 per cent during the first and second year due to negative migration effects (higher risk weights). It is assumed that the banks will distribute 40 per cent of their net profit if they report a net profit and nothing if they report a loss.

The stress test assesses the ability of the four major banks to handle a very negative economic scenario.[1] The test focuses on the banks' credit risks. Of the capital requirements for the major Swedish banks, typically 85-90 per cent originate from credit risks. The capital requirement for market risks and opera-

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[1] The assumptions are described in greater detail in the Appendix.

tional risks are assumed to remain unchanged during the period of the scenario.[2]

Information about the banks' credit portfolios is based on the banks' published quarterly reports for the second quarter of 2011. FI then divided the banks' credit portfolios into 41 different exposure classes and assigned different credit loss levels to each class. No differences were attributed to the credit losses of the banks within each exposure class. This means that differences in credit losses for the four banks in the scenario can be entirely traced back to differences in the composition of the loan portfolios.

Earning assumptions were based on the SME Direkt consensus forecasts for the third and fourth quarters of 2011 for each bank. For the period 2012 to 2014, a deduction of 10 % has been made to expected earnings before credit losses for the whole of 2011. The results of the tests are consistently reported as the banks' common equity Tier 1 and Tier 1 capital ratios, both with and without transitional rules.[3]

Results

In the scenario, the credit losses are high in all industries and regions. Compared to today, this applies in particular to lending for commercial real estate and mortgages. Even if the credit losses are generally high compared to current levels, they do not reach the levels measured during the crisis in the 1990s. This also applies to the Baltic countries which in the scenario continue to report relatively large credit losses, but the loss levels are considered to be lower than those actually achieved in 2009.

The high credit losses in the scenario linked to mortgages are based on an unfavourable development in disposable income and unemployment combined with large expenses for interest rate payments and amortisation. If economic growth is weak at the same time as unemployment and inflation increase, a situation that would force the Riksbank to raise the interest rate, house prices would be affected negatively. Some households which in recent years took on mortgages with high loan-to-value ratios could find themselves in a situation where the size of the loan exceeds the value of the property. If these households are affected by unemployment, they could become insolvent, resulting in credit losses.[4] However, even in the event of this kind of scenario, the banks' credit losses mostly come from lending to companies and real estate firms.

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[2] It is often reasonable to exclude market risks when stress tests are conducted over a longer period of time since market positions can be hedged or closed in the shorter term.

[3] The transitional rules mean that the banks cannot yet fully apply their risk weights from their internal models, which results in higher capital requirements. When assessing the capital buffers of the banks, FI has also confirmed that their capital adequacy ratios were sufficient.

[4] Banks have a claim on borrowers even after the security is realised. However, in a normal case, the banks make provisions for what is left of the claim after the security is realised. Outstanding amounts can be recovered at a later date.

Table 1: Credit loss levels

Credit losses	2011	2012	2013	2014	Totalt (2011-2014)
Nordea	0,19%	1,35%	1,35%	1,12%	4,33%
Handelsbanken	0,05%	1,09%	1,09%	0,91%	3,13%
Swedbank	-0,14%	1,28%	1,25%	0,98%	3,56%
SEB	-0,11%	1,36%	1,35%	1,13%	3,47%
Total (medel)	**0,00%**	**1,27%**	**1,26%**	**1,04%**	**3,62%**

The credit losses in the scenario are significantly higher than the major banks' actual losses in 2011 (which were also affected positively by recoveries of previous provisions) and total approximately SEK 275 billion in total for the four major banks between 2011 and 2014. This can be compared to earning during the same period of more than SEK 330 billion.[5]

Table 2: Profit with a change in equity

| SEK million, 2012-2014	Nordea	Handelsbanken	Swedbank	SEB
Profits before credit losses	114 720	47 299	40 551	40 646
Credit losses	116 922	54 842	49 586	50 580
Tax	997	0	0	0
Profits after tax	**-3 198**	**-7 544**	**-9 035**	**-9 934**
Dividends	1 246	0	0	0
Change in equity	**-4 444**	**-7 544**	**-9 035**	**-9 934**

In the scenario, all of the banks demonstrate adequate buffers to the minimum requirements stipulated by law with transitional rules (Diagram 1). The Tier 1 capital ratios fall to 8.3 % at their lowest. The reason for this is that the banks are well-capitalised from the outset and have good underlying earnings (Table 2). Without transitional rules, the Tier 1 capital ratios fall to 10.6 % at their lowest (Diagram 2).

Diagram 1. Tier 1 capital ratios of the banks with transitional rules
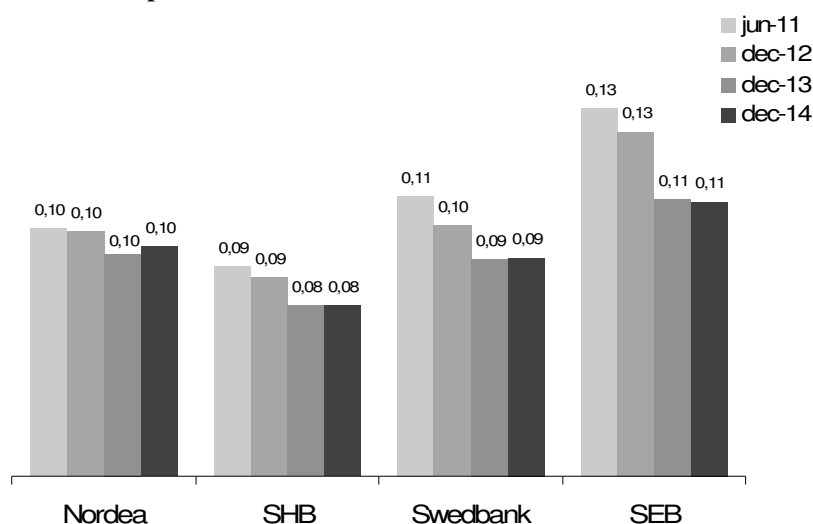
With the transitional rules, risk-weighted assets are not affected by migrations. Without the transitional rules, the negative effect of risk migration leads to the capital ratio falling for all banks.

[5] See Table 1 for a detailed profit and loss statement

Diagram 2. Tier 1 capital ratios of the banks without transitional rules
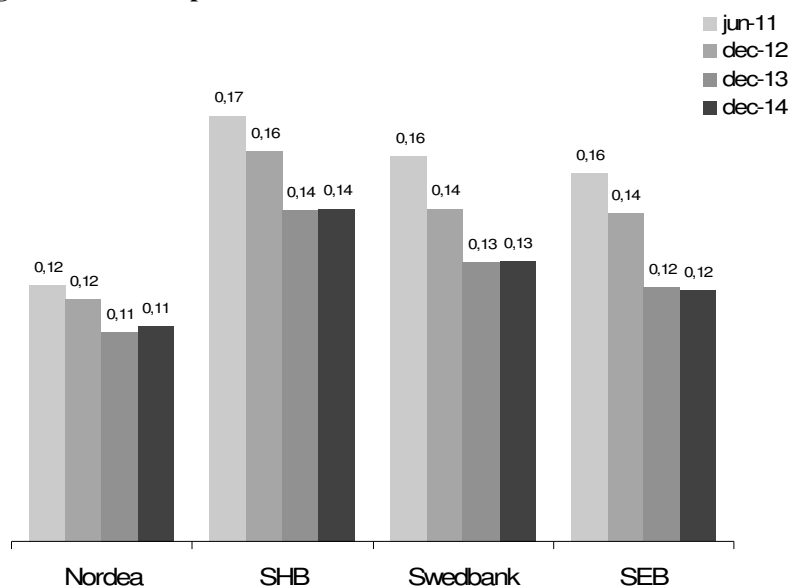
Common equity Tier 1 capital ratios "Basel 3"
In this calculation, FI has used the current definition of risk-weighted assets, which means that capital adequacy is slightly overestimated compared to the proposals set out in Basel 3 [6]. Deductions for investments in insurance operations as of 2013 will be drawn equally from common equity Tier 1 capital and Tier 1 capital. Swedbank's common equity Tier 1 capital during 2012 is around 1.8 percentage points lower because we are defining common equity Tier 1 capital in accordance with the change to the CRD 3 regulations.

Diagram 3. Common equity Tier 1 capital rations estimated under Basel III
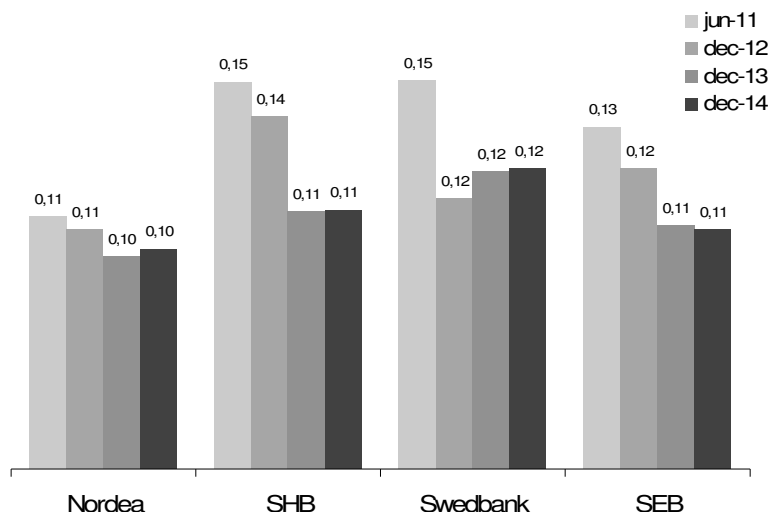
At the end of the scenario, the major banks have common equity Tier 1 capital ratios between 10.1 and 12.3 per cent, which means they have a relatively good margin to Basel 3's proposed requirement of 7 per cent.

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[6] The calculated common equity Tier 1 capital ratios are based on a rough estimate that does not completely take into account the definition of risk-weighted assets that will also be changed in Basel 3. The effects of IAS 19 are not included in the estimation.

Appendix

The assumptions made by FI with respect to the banks' earnings, credit portfolios, lending growth, credit losses and other factors that affect the results of the stress test are described in more detail below.

Capital adequacy regulations

According to the provisions set out in Basel 2 regulations, banks should have own funds corresponding to eight per cent of the calculated risk-weighted assets for credit risks, market risks and operational risks (Pillar 1 risks). At least half of this capital, i.e. four per cent of the risk-weighted assets, should be Tier 1 capital. In addition, the banks should hold capital for other risks in their organisation (Pillar 2 risks). Examples of these types of risks include business risks, insurance risks and concentration risks. The banks must also keep a buffer in addition to the capital requirement for the aforementioned risks.

Exposure classes in 2011

Exposure class
Sweden household mortgage
Sweden household other
Sweden corporates low
Sweden corporates medium
Sweden corporates high
Sweden commercial real estate
Denmark household mortgage
Denmark household other
Denmark corporates low
Denmark corporates medium
Denmark corporates high
Denmark commercial real estate
Finland household mortgage
Finland household other
Finland corporates low
Finland corporates medium
Finland corporates high
Finland commercial real estate
Norway household mortgage
Norway household other
Norway corporates low
Norway corporates medium
Norway corporates high
Norway commercial real estate
Estonia - household
- corporates
- real estate companies
Latvia - household
- corporates
- real estate companies
Lithuania - household
- corporates
- real estate companies
Russia/Poland
Germany household
Germany corporates
Ukraine
United Kingdom
Credit institutions
Other
Off balance

The credit exposure of the major banks is divided into 41 different classes. A credit loss level is assigned to each class for 2012, 2013 and 2014. For exposures to corporates, it is assumed that the credit losses for each type of company will depend on the industry. The industries have been divided into low, medium and high risk in order to take this into account.

Assumptions about earnings
The banks' earnings during the second half of 2011 are assumed to follow the SME Direct consensus forecast. These predictions are the average of around 15 forecasts by analysts about how the banks' profits before credit losses will develop.

In the scenario, earnings are expected to be lower than the market's expectations. This is mainly due to a lower activity level, falling assets prices and higher funding costs, which will result in a fall in net income. The lower earnings have been created using a standard simulation in which the income level before credit losses for the period 2012 to 2014 is set as the expected level for the full year 2011, with a deduction of 10 per cent.

Credit loss assumptions for mortgages
In the scenario, credit losses from mortgages have been assumed to increase due to a significant drop in house prices from higher unemployment and a parallel rise in interest rates. The majority of these credit losses occur in the scenario during the period 2012-2013.

Mortgages are the largest individual exposure class, amounting (in the second quarter of 2011) to SEK 2,500 billion, or more than 33 per cent of the major banks' total lending. Assumptions about the high loss levels for mortgages will therefore have a significant impact on the outcome of the stress test.

Assumptions about lending growth
In addition to the size of new lending, the banks' total lending is determined at all times by the defaulted stock in the previous period. The higher the number of defaults, the lower the credit volume will be in the next period. The defaulted stock was estimated by dividing the credit loss assumption for each exposure class by 0.5. This means that the bank is assumed to recoup 50 per cent of an exposure amount that defaults at any time.

Example:

Total lending mortgages Sweden Q3 2011 = Total lending mortgages Sweden Q2 2011 + new lending mortgages Sweden Q3 2011 – (credit losses mortgages Sweden Q2 2011 / 0.5)

Although the scenario assumes low levels of new lending, the average risk weight goes up, leading to an increase in risk-weighted assets and consequently an increase in the banks' capital requirements. However, the effect on risk-weighted assets of high loan losses is greater than the effect of an increase in risk weights.

Migrations in the banks' rating systems
In addition to the change in lending growth, the banks' capital requirements are also affected by potential migrations within their internal rating systems. Migrations mean that exposures are moved between different risk classes, which affects the banks' capital requirements. The banks use internal rating models to

assign PD[7] and LGD[8] estimates for their counterparties. The choice of rating methodology thereby affects the banks' capital requirements.

Change to the banks' capital requirements due to migrations

Migrations	2012	2013	2014
All banks	5,0%	5,0%	0,0%

FI does not apply different migration assumptions to each bank, which means that some banks are affected more than others by the assumed standard migration effect. In the scenario with transitional rules, the capital requirement of the banks calculated in accordance with the transitional rules, i.e. 80% of the capital requirement under Basel 1, will be higher than the capital requirement under Basel 2 throughout the scenario period. As migrations only affect the capital requirement under Basel 2, the migration assumptions will not be relevant in this scenario.

Here is a list of the factors that affect the constituent parts of capital adequacy, i.e. own funds and the capital requirement.

Affects own funds

New share issues	Depending on the quality of the capital that is collected, affects common equity Tier 1 capital, Tier 1 capital and own funds.
Profit after tax	Impacts retained earnings.
Dividends	Affects how much of the profit goes to retained earnings.
Credit losses	Affects what the profit will be.

Affects the capital requirement

Lending volume	Increased lending results in an increase in the capital requirement, all else being equal.
Migrations in the rating systems	A downturn in the economic climate or other changes specific to counterparties can increase the risk of a counterparty going into liquidation, which also increases the capital requirement. The effect of this depends on the through-the-cycle/point-in-time levels in the bank's rating systems.
Roll-out of portfolios	In general the capital requirement falls for portfolios whose capital requirement is calculated using internal ratings models rather than the standardised approach. Most banks still roll out portfolios.
Credit losses (default)	Exposures that have defaulted must be covered by reserves and not by capital. This means that the capital requirement falls when several exposures default, all else being equal. However, the negative effect of credit losses

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[7] *Probability of default*
[8] *Loss given default*

	on own funds is greater than the positive effect on the capital requirement.
Risk weight in new lending	If new lending has a lower risk weight than the risk weight in the existing portfolio and this new lending only replaces the lending that has matured, the capital requirement will fall.

A fall in lending growth in the banks has a positive effect on capital adequacy. The increase in lending in the past few years has to a large extent occurred within exposures with a relatively low risk weight, for example mortgages. The banks also use internal ratings models to calculate the capital requirement in an increasing number of portfolios, which generally leads to a lower capital requirement.

Other assumptions
It is assumed that the banks will distribute 40 per cent of their net profit (given a profit) to their shareholders for all three years.

Tax is calculated as each individual bank's average (normalised) tax rate over the previous three years. No loss carryforwards were taken into consideration during the exercise.

Both profits and losses are assumed to have a direct effect on the bank's Tier 1 capital. Tier 2 capital is assumed not to have the ability to absorb losses.

It is assumed that no portfolios were rolled out during the scenario. IAS 19 reporting of pension deficits are assumed not to have had an impact on the banks' capital in the scenario.

Table 3:

Profit and loss statement*
SEK million

	Nordea				SHB				Swedbank				SEB			
	2011*	**2012**	**2013**	**2014**	**2011***	**2012**	**2013**	**2014**	**2011***	**2012**	**2013**	**2014**	**2011***	**2012**	**2013**	**2014**
Profit before credit losses	42 489	38 240	38 240	38 240	17 518	15 766	15 766	15 766	15 735	13 517	13 517	13 517	15 054	13 549	13 549	13 549
Credit losses	5 274	41 177	41 617	34 128	859	19 216	19 536	16 090	-1 809	17 940	17 847	13 799	-1 518	17 793	17 917	14 871
Tax	9 354	0	-	997	4 229	-	-	-	3 962	-	-	-	3 554	-	-	-
Profits after tax	27 861	-2 936	-3 377	3 115	12 430	-3 450	-3 770	-324	13 582	-4 423	-4 330	-282	13 018	-4 244	-4 368	-1 322
Dividends	11 145	0	-	1 246	4 972	-	-	-	5 433	-	-	-	5 207	-	-	-
Change in equity	**16 395**	**-2 936**	**-3 377**	**1 869**	**7 431**	**-3 450**	**-3 770**	**-324**	**8 305**	**-4 423**	**-4 330**	**-282**	**6 757**	**-4 244**	**-4 368**	**-1 322**

* 2011 refers to a consensus estimate for Q3-4