

# MEMORANDUM

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## **Finansinspektionen stress tests major 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 published the most recent results of its own stress tests in November 2009.

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). In the scenario it is assumed that the recovery in the economy halts, followed by a recession in Western Europe and a new decline in the Baltics. This results in much higher credit loss levels, for corporate loans, mortgages and from lending to commercial real estate.

FI judges this scenario to be improbable but not impossible. At the end of the scenario all banks still have adequate buffers for 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, but 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 crisis showed that investors in extreme periods can 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. Although the stress test still covers a period of three years, the start of the stress period has been moved forwards. The scenario starts at the end of 2010 and continues for the following three years. This stress test is based on public information and we have included the actual results of the major banks until the second quarter of 2010 and consensus forecasts<sup>1</sup> for the third and fourth quarters of 2010.

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<sup>1</sup> SME Direkt is a forecast service from Nyhetsbyrån Direkt

The number of exposure classes has increased to 41 in order to improve the method. The most significant new classes are exposures to commercial real estate in the Nordic countries and the breakdown of Baltic lending into household, corporates and real estate companies. Another change is that Nordic corporate lending now specifies the kind of company that is included in the low, medium and high risk categories.

The change in lending volumes affects the development of risk-weighted assets during the period. However, we assume no change in the composition of the loan portfolio.

### **General methodology**

The stress test assesses the ability of the four major banks to handle a very negative economic scenario.<sup>2</sup> 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 operational risks are assumed to remain unchanged during the period of the scenario.<sup>3</sup>

Information about the banks' credit portfolios is based on the banks' public quarterly reports for the second quarter of 2010. FI then divided the banks' credit portfolios into 41 different exposure classes and adopted different credit loss levels for each exposure 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.

Although the stress test does not include any new lending, the bank's credit obligations, referred to as 'off-balance' items, are taken into consideration. FI assumes that a significant share of the credit obligations will be used in the scenario.

Earning assumptions are based on the SME Direkt consensus forecasts for the third and fourth quarters of 2010 for each bank. For the period 2011 to 2013 a deduction of 10% has been made to the expected profit before credit losses for the whole of 2010. The results of the tests are consistently reported as the banks' Tier 1 capital relationship, both with and without transitional rules.<sup>4</sup>

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<sup>2</sup> The assumptions are described in greater detail in the Appendix.

<sup>3</sup> 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.

<sup>4</sup> The transitional rules mean that the banks cannot yet fully apply their risk weights from their internal models, resulting in higher capital requirements. When assessing the capital buffers of the banks, FI has also confirmed that their capital adequacy ratios were sufficient.

## Results

The scenario shows higher credit losses in all industries and regions. This is particularly true for lending to commercial real estate and mortgages, which account for a significant share of the credit losses. Even if the Baltic countries continue to generate relatively high credit losses, the loss levels are assumed to be lower than in 2009, as the banks have already made provisions for a large share of the weaker credits, and new lending since 2008 has been practically non-existent.

The assumption of higher credit losses related to mortgages is based on a disadvantageous development to interest rates and unemployment – in practice a stagflation scenario. 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 that 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.<sup>5</sup> However, even in the event of this kind of scenario, the banks' credit losses mostly come from lending to companies and real estate firms.

### Credit loss levels

	Credit loss level				
	2010	2011	2012	2013	2010-2013
Nordea	0.30%	1.56%	1.54%	1.33%	<b>4.82%</b>
SHB	0.11%	1.09%	1.08%	0.92%	<b>3.32%</b>
Swedbank	0.42%	1.43%	1.32%	1.04%	<b>4.23%</b>
SEB	0.30%	1.22%	1.18%	1.01%	<b>3.61%</b>
<b>Average</b>	<b>0.29%</b>	<b>1.33%</b>	<b>1.28%</b>	<b>1.08%</b>	<b>3.99%</b>

The credit losses are assumed to be considerably higher than 2010 levels, amounting to approximately SEK 290 billion in total for the four major banks from 2010 to 2013. This can be set against earnings in the same period of just under SEK 300 billion.<sup>6</sup>

### The banks' total credit losses and earnings

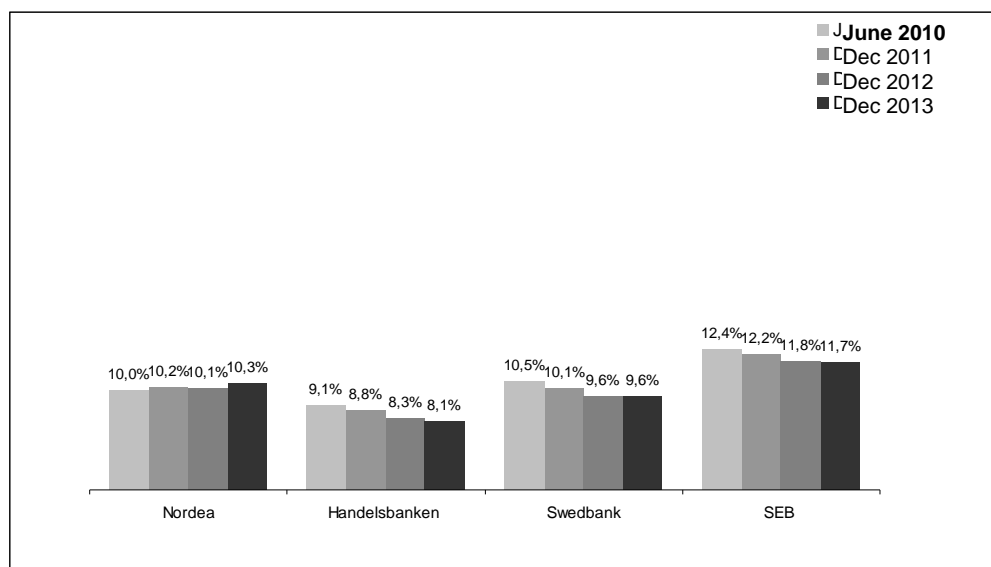
	Credit losses (SEK billion)					Earnings
	2010	2011	2012	2013	2010-2013	2010-2013
Nordea	8.3	42.4	40,6	33.9	<b>125.2</b>	<b>143.1</b>
SHB	2.1	20.8	20,1	16.9	<b>60.0</b>	<b>59.4</b>
Swedbank	5.4	18.0	16,3	12.5	<b>52.2</b>	<b>47.0</b>
SEB	4.5	17.1	16,3	13.5	<b>51.4</b>	<b>47.3</b>
<b>Total</b>	<b>20.3</b>	<b>98.3</b>	<b>93,3</b>	<b>76.8</b>	<b>288.7</b>	<b>296.8</b>

<sup>5</sup> 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.

<sup>6</sup> See Table 1 for a detailed income statement

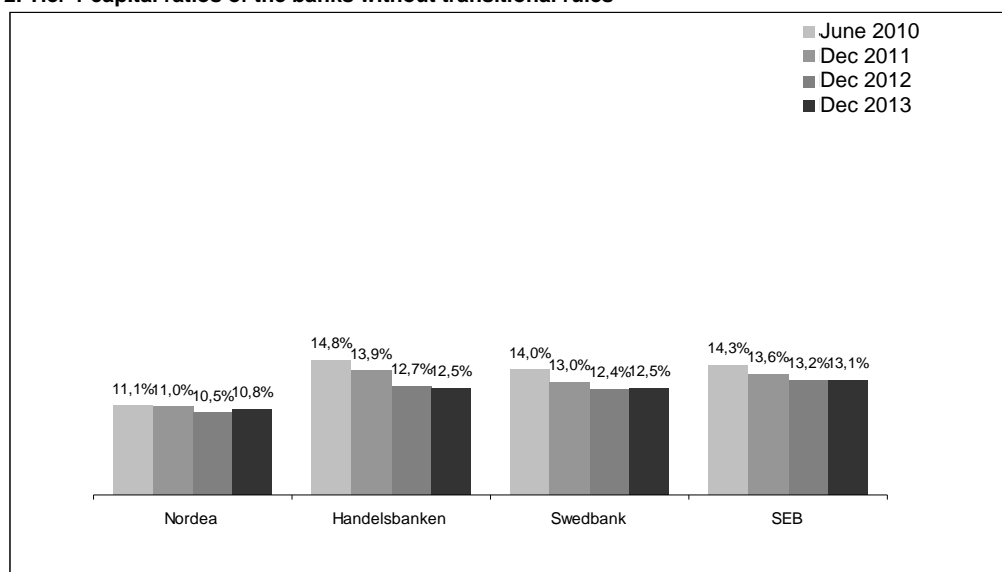
However, all of the banks have adequate buffers to meet the minimum requirements stipulated by law with transitional rules (diagram 1). The Tier 1 capital ratios fall to 8.1% at their lowest. The reason for this is that the banks are well capitalised from the outset and have good underlying earnings (table 1). Without transitional rules the Tier 1 capital ratios fall to 10.5% at their lowest (diagram 2).

### 1. Tier 1 capital ratios of the banks with transitional rules



With the transitional rules, risk-weighted assets are not affected by migrations. This means that Nordea's Tier 1 capital ratio with transitional rules actually increases in the scenario, as the bank makes a positive net income in this scenario<sup>7</sup>, while lending volumes fall. Without the transitional rules, the negative effect of risk migration leads to a fall in Tier 1 capital ratios for all banks.

### 2. Tier 1 capital ratios of the banks without transitional rules



<sup>7</sup> See Table 1 for a detailed income statement

## 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 shall 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, shall be Tier 1 capital. In addition, the banks shall 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 2010*

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 these major banks is divided into 41 different classes. A credit loss level is assumed for each class for 2011 up to 2013. One change since the previous stress test is the breakdown of the Baltic exposures into household, corporates and real estate companies. A new class, commercial real estate, has also been added for each Nordic country.

For Nordic 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 have been assumed to follow the SME Direkt consensus forecasts. These predictions are the average of around 15 forecasts by analysts about how the banks' profit before credit losses will develop in the third and fourth quarters of 2010.

In the scenario earnings are expected to be lower than the consensus forecasts. This is mainly due to lower lending growth, coupled with a lower activity level and lower assets prices, which will result in income falling. The lower earnings have been achieved by setting the income level before credit losses for the period 2011 to 2013 at the expected level for the full year 2010, 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. In FI's negative scenario the majority of these credit losses are assumed to occur in 2011-2012, with the largest share in 2011.

Mortgages are the largest individual exposure class, amounting (in the second quarter of 2010) to SEK 2,463 billion, or more than 36 per cent of the banks' total lending. Assumptions about the changes in 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 2010 = Total lending mortgages Sweden Q2 2010 + new lending mortgages Sweden Q3 2010 – (credit losses mortgages Sweden Q2 2010 / 0.5)*

Although the scenario does not assume any 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 from 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<sup>8</sup> and LGD<sup>9</sup> estimates for their counterparties. The choice of rating methodology thereby affects the banks' capital requirements.

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

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***Affects own funds***

New share issues	Depending on the quality of the capital that is collected, affects the core 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 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 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.

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A fall in lending growth in the banks has a positive effect on capital adequacy. The increase in lending has generally been for 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.

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<sup>8</sup> *Probability of default*

<sup>9</sup> *Loss given default*

#### Change to the banks' capital requirements due to migrations

Migrations	2011	2012	2013
Handelsbanken/Nordea	5.0%	5.0%	0.0%
SEB/Swedbank	5.0%	0.0%	0.0%

Based on the migrations that have taken place over the past few quarters, FI is making some adjustments to its migration assumptions. In the scenario slightly higher migrations are assumed for Handelsbanken and Nordea, as their internal rating systems vary more during the cycle. In the scenario with transitional rules, the capital requirement of the banks calculated in accordance with the 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.

#### *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 tax rate over the previous three years.

Both negative and positive results are assumed to have a direct effect on the bank's Tier 1 capital. Tier 2 capital is assumed not to have any loss absorbing ability.



Table 1:

**Income statement**

SEK million

	Nordea				SHB				Swedbank				SEB			
	2010*	2011	2012	2013	2010*	2011	2012	2013	2010*	2011	2012	2013	2010*	2011	2012	2013
Profit before credit losses	38 665	34 799	34 799	34 799	16 064	14 458	14 458	14 458	12 713	11 442	11 442	11 442	12 790	11 511	11 511	11 511
Credit losses	8 257	42 366	40 598	33 935	2 136	20 791	20 148	16 882	5 383	18 017	16 270	12 541	4 476	17 103	16 256	13 527
Taxes	7 325	-	-	188	3 522	-	-	-	2 070	-	-	-	2 329	-	-	-
Profit after tax	23 083	-7 568	-5 800	675	10 406	-6 334	-5 690	-2 425	5 260	-6 575	-4 829	-1 099	5 985	-5 592	-4 745	-2 017
Dividend	9 233	-	-	270	4 162	-	-	-	2 104	-	-	-	2 394	-	-	-
<b>Change in equity</b>	<b>13 850</b>	<b>-7 568</b>	<b>-5 800</b>	<b>405</b>	<b>6 244</b>	<b>-6 334</b>	<b>-5 690</b>	<b>-2 425</b>	<b>3 156</b>	<b>-6 575</b>	<b>-4 829</b>	<b>-1 099</b>	<b>3 591</b>	<b>-5 592</b>	<b>-4 745</b>	<b>-2 017</b>

\* Full year 2010, Q3-4 are estimates and Q1-2 actual results.