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Further analysis of the stress tests in Financial Stability 2/2012

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Further analysis of the stress tests in *Financial Stability* 2/2012

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The results of macro stress tests of banks' solvency are published twice a year in Norges Bank's Financial Stability (FS) report. The purpose of the stress tests is to assess developments in credit and market risk under different macroeconomic assumptions and the consequences of these developments for the banking system as a whole. A baseline scenario and an adverse scenario reflecting key risk factors were presented in the November report (FS 2/12). This article describes how the adverse scenario in the report is constructed and the sensitivity of the results to changes in key assumptions.

Assumptions in the adverse scenario

The adverse scenario includes key risk factors affecting developments in the real economy that can have an impact on financial stability. One of the objectives of the stress tests has been to reflect the risk outlook described in the *Financial Stability* (FS) reports.[2] The adverse scenarios used in recent years have primarily been based on combinations of the following risk factors:

- A fall in GDP and economic activity for Norway's trading partners
- A fall in oil prices
- Rising turbulence in global money and bond markets[3], affecting banks' funding costs
- A fall in domestic house prices

The outcome of a stress test will depend on both the macroeconomic assumptions and the situation in banks. In order to assess developments in banks' vulnerability over time, however, it is important that the adverse scenario can be compared with adverse scenarios in previous stress tests. FS 2/12 included an adverse scenario which can be used with different years as starting-points. The scenario is based on the following principles and assumptions:

- Variables are increased or decreased to the same levels (for prices and indices) or growth rates (for GDP) each time the shock occurs (see Table 1).
- After the shock has occurred, conditions will gradually normalise. It is assumed that this will take place through an AR (1) process using historical data.
- The impact on interest rates, exchange rates and equity prices is the result of macro model calculations.[4] The key policy rate is changed in line with a Taylor rule for monetary policy, but is always above zero. The exchange rate is sensitive to a fall in oil prices. Equity prices fall markedly in the year the shock occurs.
- It is assumed that fiscal policy functions in line with normal countercyclical policy, and extraordinary fiscal policy measures are therefore not included.

[1] Thanks to Ingvild Svendsen for useful comments.
[2] See Table 3.
[3] We measure turbulence in money and bond markets using the VIX. The VIX is a volatility index based on derivative contracts as a measure of expected volatility in the US financial market over the 30-day period ahead.
[4] For a description of the model, see Hammersland and Træe (2012).

Table 1 Macro paths in the adverse scenario

	Selected extreme observation		Developments in adverse scenario		
	Q1	Q2	Year 1	Year 2	Year 3
Quarterly GDP growth, trading partners[1)]	-2.2 (2008 Q4)	-2.0 (2009 Q1)	-3.9	-0.4	2.2
VIX[2)]	59 (2008 Q1)	45 (2009 Q1)	44.0	27.0	22.4
Oil price[3)]	46 (2009 Q1)	48 (2005 Q1)	47.1	49.7	51.5
Four-quarterly change in house prices[4)]	-13 (1989 Q4)	-13 (1990 Q4)	-12.2	-7.4	-3.6

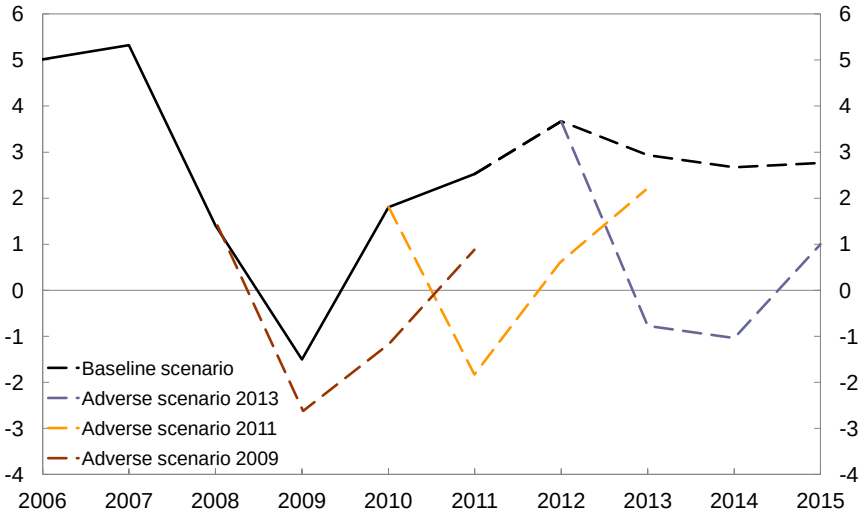
1) Export-weighted, 26 main trading partners.
2) VIX index, average.
3) USD per barrel, level.
4) Based on house prices as listed by real estate industry in Norway. Estimated four-quarterly change.

The effect of changes in macro variables will be a function of the situation in the economy at the starting-point of the adverse scenario. By focusing on falls to given levels, the adverse scenarios will follow fairly similar paths. The level the variables fall to will be the same each time. The change in level will, however, depend on the starting-point. Because both the level and the change can influence the risk outlook, the results of the stress tests may thus appear to be more severe when levels are high, for example following periods of persistently rising prices.

Summary of results of the stress test in *Financial Stability* 2/12

The adverse scenario described the impact on the Norwegian economy and the Norwegian banking sector of a substantial decline in the global economy and turbulence in global financial markets. In our assessment of financial stability, we are interested in developments in banks' vulnerability over time. To illustrate the change in vulnerability, we assess the respective consequences of the adverse scenario if it occurs at the beginning of 2009, 2011 and 2013.

Chart 1 Mainland GDP. Annual volume growth. Percent. Annual figures. 2006 – 2015[1)]

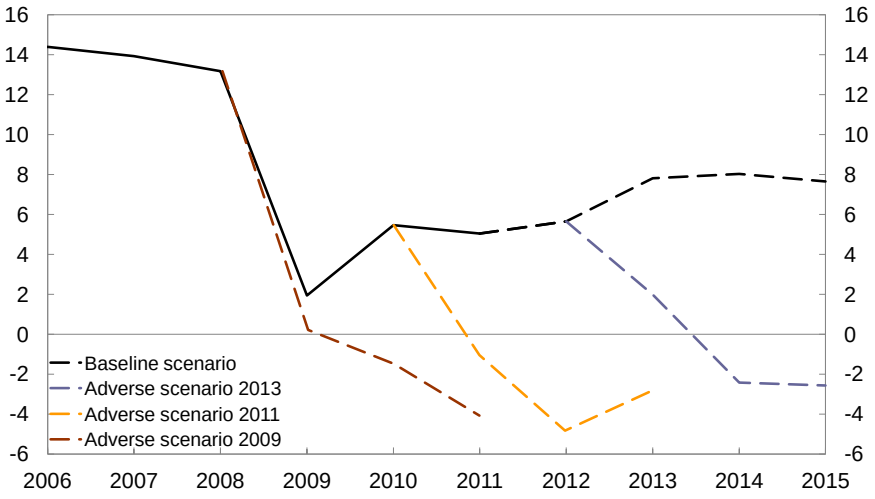


1) Projections for next three years
Sources: Statistics Norway and Norges Bank

The impact on mainland GDP is shown in Chart 1. When the shock occurs in 2009, the adverse scenario resembles developments during the financial crisis, but with somewhat deeper and more persistent effects. Even though most of the highest and lowest figures are taken from the financial crisis, the effects of our scenario on the real economy are somewhat more severe than the actual effects of the crisis. First, all the shocks occur at the same time, producing a greater total effect. Second, we include an estimated process for reversion to normal levels, and the result indicates that the shocks will persist for somewhat longer than observed during the crisis. In addition, the extraordinary measures that were implemented to counteract the effects of the crisis are not taken into account.

Compared with the baseline scenario, the largest fall in mainland GDP occurs when the shock takes place in 2013, while the overall downturn is most severe when the adverse scenario starts in 2009. This result is related to the relatively weaker economic starting-point in 2009.

Chart 2 Weighted growth in credit to enterprises (C3) and households (C2). Year-on-year growth.[1)] Percent. Annual figures. 2006 – 2015[2)]



1) Change in stock of loans as measured at year-end
2) Projections for next three years
Sources: Statistics Norway and Norges Bank

Credit growth will have considerable impact on developments in banks' capital ratios through a downturn. In the projections, the macro shock has a severe impact on credit growth (see Chart 2). It is not possible to distinguish between supply and demand effects on credit growth. In a situation of considerable international uncertainty and a sharp fall in domestic collateral values, it is likely that the fall in credit growth will largely be the result of tighter bank credit standards. A tightening of credit standards can in itself amplify the downturn. Overall, the fall in credit growth is somewhat more pronounced in the adverse scenarios for 2009 and 2011 than in the scenario for 2013.

In addition to the macro path, we also establish some more specific assumptions regarding how banks are affected in times of stress. The main assumptions are shown in Table 2.

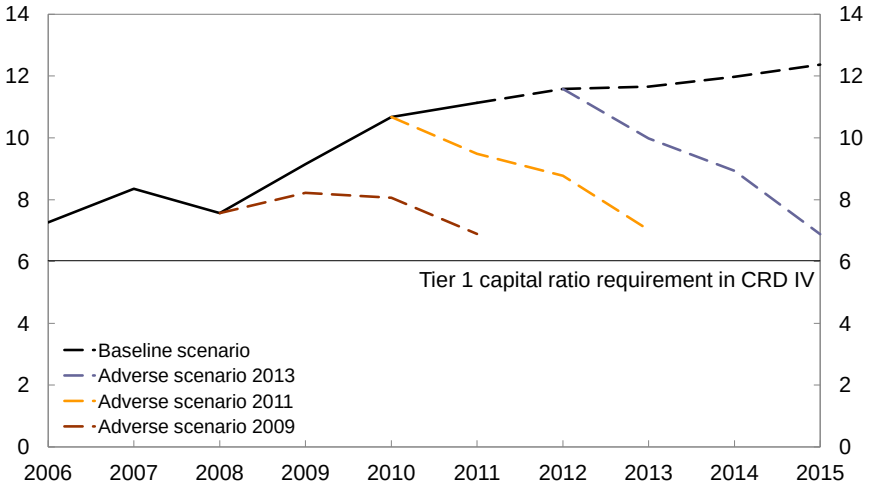
Table 2 Main assumptions in bank projections (all figures as percentages)

	Baseline scenario			Adverse scenario		
	2013	2014	2015	2013	2014	2015
Loss ratio	10	10	10	40	40	40
Increase in risk-weighted assets	0	0	0	5	5	5
Dividends paid	25	25	25	25	25	25
Extra losses shipping sector	0	0	0	2	3	4
Extra losses commercial property sector	0	0	0	1	2	2

In the stress test, Tier 1 capital ratios for the average of the six largest banks[5] fall by between 1 and 5 percentage points over three years in the projections starting in 2009, 2011 and 2013 respectively (see Chart 3).

[5] The six banks are DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge.

Chart 3 Banks'[1)] Tier 1 capital ratios. Baseline scenario and adverse scenario. Percent. Annual figures. 2006 – 2015[2)]



1) DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge
2) Projections for next three years
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

There are two reasons for the fall in Tier 1 capital ratios. First, negative results deplete banks' equity, primarily as a result of large loan losses in the adverse scenarios. Second, increased credit risk results in higher risk weights on some assets in lending portfolios, which increases the denominator in the regulatory capital ratio, i.e. risk-weighted assets. However, this is offset by negative credit growth, which reduces banks' risk-weighted assets.

In spite of a downturn that is strongest overall in 2009, Tier 1 capital ratios fall most in the last two projections. One reason for this is that banks in recent years have transferred a large share of their residential mortgages to covered bond mortgage companies. Since credit risk on corporate loans is higher than on household residential mortgages, banks' losses as a percentage of gross lending will be higher in our projection. A somewhat less pronounced fall in credit growth in the projection for 2013 also contributes to a more rapid decrease in capital ratios in this scenario than in the other two.

On average, Tier 1 capital ratios will remain above the new proposed regulatory minimum requirement in Basel III of 6 percent in all three years, but there are wide variations across banks.[6] The stress test shows that the increase in regulatory capital ratios in recent years has been necessary in order to increase banks' resilience to a deep global downturn.

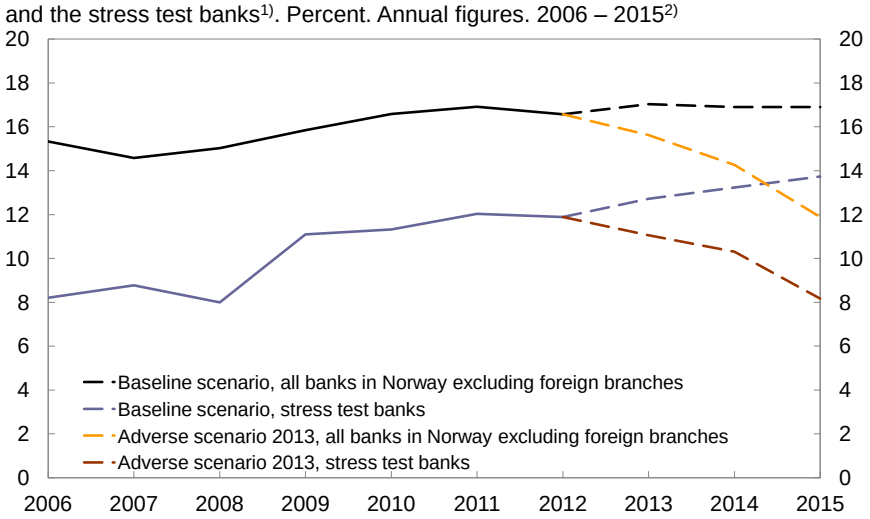
Stress testing banks' balance sheets for different banking groups

The composition of banks' balance sheets at the beginning of the projection period has a decisive impact on the results of the stress test. Three balance sheet variables in particular are important: share of total lending, share of lending to the corporate sector and share of assets recognised at fair value. The article providing further analysis of the stress test in FS 1/12 (Norwegian only) studies the differences across balance sheets for banks grouped by size. The study showed that lending to the corporate market is higher and financial instruments used on a larger scale in the largest banks.

[6] The current Tier 1 capital requirement is set at 4 percent. The proposed Tier 1 minimum capital requirement of 6 percent excludes the capital conservation buffer. The proposed Common Equity Tier 1 minimum capital requirement is set at 4.5 percent. The proposed capital conservation buffer requirement is set at 2.5 percent.

The stress tests focus on the six largest Norwegian banks in terms of total assets[7]. The stress test banks have a larger share of lending to the corporate sector than other Norwegian banks. Total corporate lending by stress test banks was 53 percent of gross lending in the third quarter of 2012. By comparison, the share for other Norwegian banks was only 34 percent. Stress test banks also have the highest share of lending to the shipping industry in the banking sector.

Chart 4 Median Tier 1 capital ratio. All banks in Norway excluding foreign branches and the stress test banks[1]. Percent. Annual figures. 2006 – 2015[2]

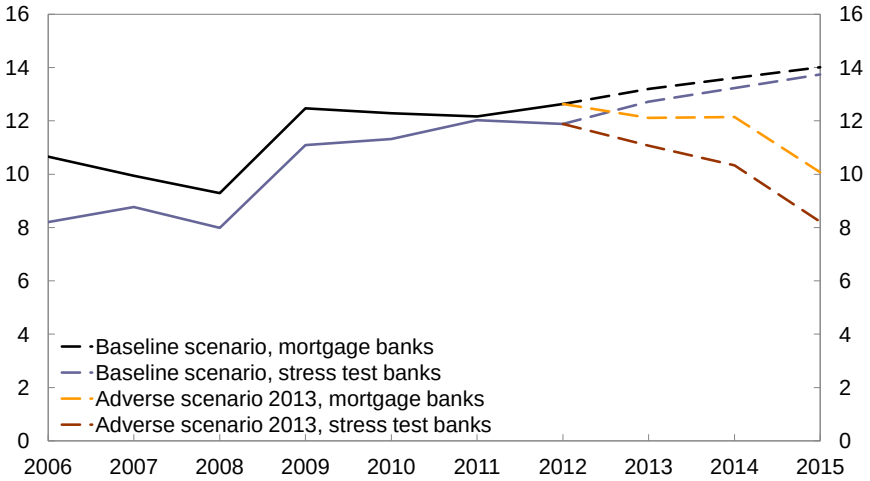


1) DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge
2) Projections for 2012-2015
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Chart 4 shows the median Tier 1 capital ratio for an aggregate of all Norwegian banks compared with the banks in the stress test. Regulatory capital ratios for the banking sector as a whole are higher than for the stress test banks. Small banks typically hold more capital than large banks. In the baseline scenario, regulatory capital ratios for the banking sector as a whole remain stable in the projection period. The median rises somewhat for the stress test banks.[8] In the adverse scenario, Tier 1 capital ratios fall in both the stress test banks and the banking sector as a whole. An assessment of individual banks would have shown considerable variation across banks. Some banks can strengthen Tier 1 capital ratios even in a strained economic climate.

[7] All banks excluding foreign branches in Norway.
[8] We have not taken account of any IRB or advanced IRB models that may have been introduced in the projection period.

Chart 5 Median Tier 1 capital ratio for mortgage banks and the stress test banks[1]. Percent. Annual figures. 2006 - 2015[1]



1) DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge
2) Projections for 2012-2015
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

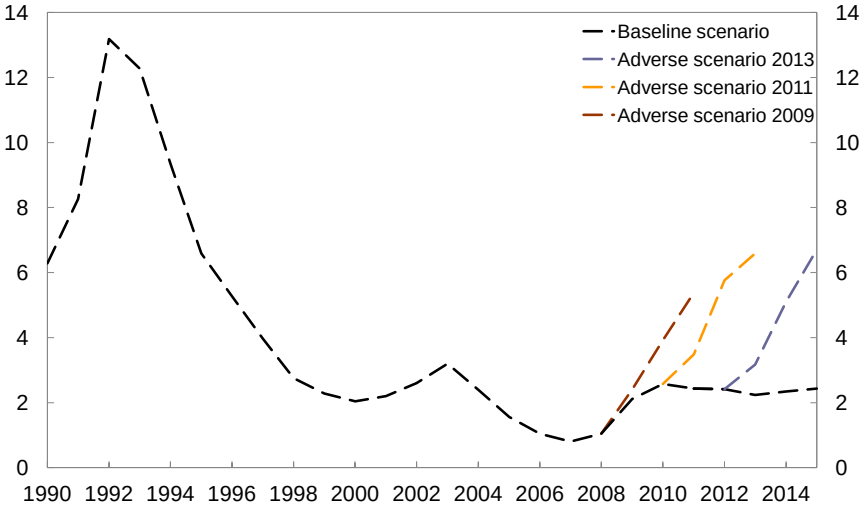
Chart 5 compares the six stress test banks with the Norwegian banks ranked from 7 to 11 according to share of lending to the retail market.[9] For the stress test banks, lending to the retail market accounts for 30 percent of gross lending, while the share is 60 percent in the other group. In the adverse scenario, Tier 1 capital ratios for the five smaller banks are approximately 2 percentage points higher than the stress test banks' Tier 1 ratios towards the end of the projection period. This is the result of a higher starting-point, but also a smaller fall in Tier 1 ratios.

How are problem loans affected by changes in the macro paths?

The most important effect on the banks' results derives from the impact of macroeconomic developments in the share of problem loans[10] (see Chart 6). The projections of the banks' results are based on the assumption that banks' losses are a function of the share of problem loans.

[9] The six stress test banks are also the six Norwegian banks with highest lending to the retail market in NOK. The next five banks are, in order, Santander, Sparebanken Hedmark, Sparebanken Møre, Bank 1 Oslo Akershus and Sparebanken Sør.
[10] Sum of non-performing and other particularly doubtful loans.

Chart 6 Banks'[1] problem loans as a percentage of gross lending. Percent. Annual figures. 1990 – 2015[2]

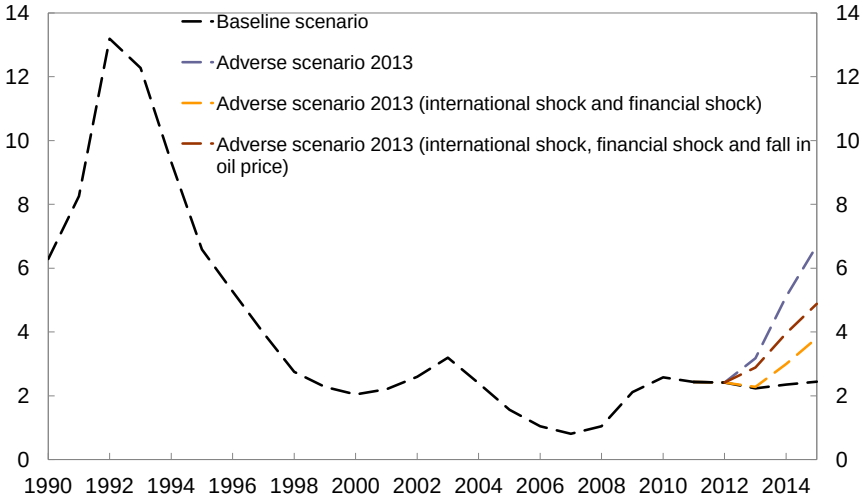


1) All banks in Norway
2) Projections for the next three years
Sources: Statistics Norway and Norges Bank

In the adverse scenario, four different shocks are combined (see Table 1). Each of the four shocks would in itself be sufficient to result in a substantial disturbance in the Norwegian economy. Chart 7 shows the impact on the total share of problem loans to households, non-financial enterprises and municipalities when the effects of these shocks are allowed to accumulate. In "Adverse scenario 2013", all four shocks are included. The yellow line shows the impact on the share of problem loans when an increase in global uncertainty affects trading partners' growth amid rising money market premiums. The sharp fall in global activity has severe consequences for Norway. Reduced demand, however, leads to lower expected inflation and the key policy rate is rapidly lowered. The effect of a lower key rate is dampened as banks pass on higher funding costs to borrowers. Because the central bank responds to the crisis by reducing the key rate, it takes time for the full impact of the shock to become evident in the Norwegian economy. In this case, the share of problem loans increases in 2015 to slightly below 4 percent, as against close to 7 percent in the adverse scenario in FS 2/12.

The red line shows the combination of a global downturn and a substantial fall in oil prices. The oil price shock is assumed to occur relatively instantly, contributing to more rapid effects on the Norwegian economy. If we include an oil price shock, but do not include a separate fall in Norwegian house prices, the share of problem loans in 2015 is estimated at about 5 percent.

Chart 7 Banks'[1] problem loans as a percentage of gross lending.
Adverse scenario 2013 including shocks. Annual figures. 1990-2015[2]

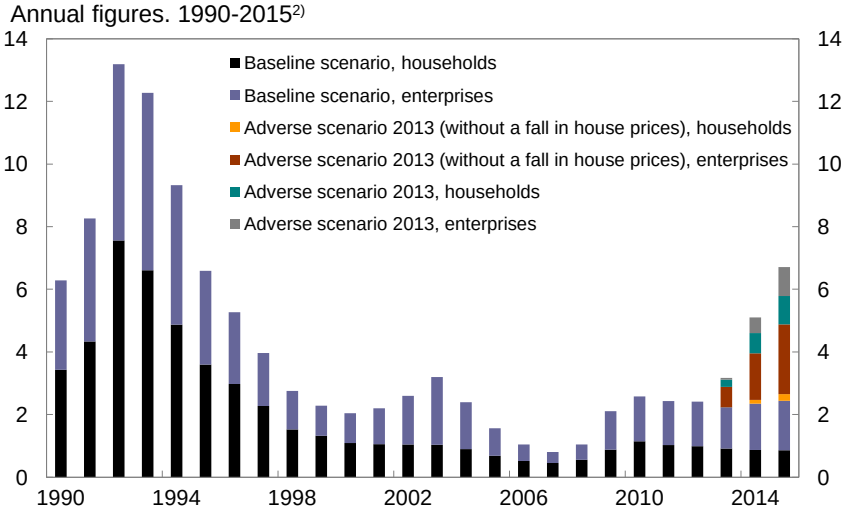


1) All banks in Norway
2) Projections for 2012-2015
Sources: Statistics Norway and Norges Bank

A fall in house prices as a source of potential risk to financial stability has been highlighted in several FS reports. In the adverse scenario in FS 2/12, nominal house prices fall by about 20 percent from today's levels. This constitutes a sharp fall in house prices based on extreme observations from the banking crisis. In Chart 8, the increase in problem loans has been split into two channels: loans to households and loans to enterprises. The chart also includes the extra contribution from the fall in house prices, showing that the extra contribution to the increase in problem loans in the event of a fall in house prices is approximately evenly distributed across the two channels:

- A sharp fall in house prices combined with increased uncertainty leads to a greater reduction in household consumption than a downturn would imply. This leads to an increase in problem loans in the corporate sector through reduced demand.
- A fall in house prices reduces households' housing wealth. Combined with increased unemployment and reduced income growth, some households may opt to default on their mortgage. The share of problem loans in the household sector is considerably lower than in the corporate sector.

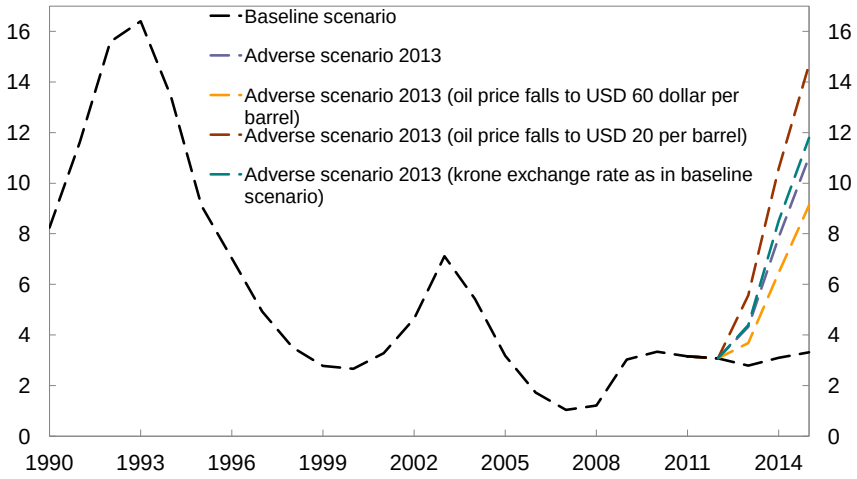
Chart 8 Banks'[1)] problem loans as a percentage of gross lending. Adverse scenario 2013 with and without a fall in house prices. Annual figures. 1990-2015[2)]



1) All banks in Norway
2) Projections for 2012-2015
Sources: Statistics Norway and Norges Bank

Oil prices have a substantial impact on activity and investment levels in the petroleum sector, but also repercussions in the wider economy, affecting the profitability of suppliers to the petroleum sector, for example. The extent to which a fall in oil prices will affect enterprises' debt-servicing capacity will partly depend on the magnitude and duration of the fall. The adverse scenario is based on extreme oil prices in the period 2005 to 2011. This may, however, give a misleading picture of the risk associated with changes in oil prices. In the early 2000s, prices were as low as around USD 20 per barrel for long periods. On the other hand, average oil prices over a calendar year have not fallen below USD 60 per barrel since 2005.

Chart 9 Banks'[1)] problem loans to enterprises as a percentage of gross lending to the sector. Adverse scenario 2013 under different assumptions concerning the oil price and krone exchange rate. Annual figures. 1990-2015[2)]



1) All banks in Norway
2) Projections for 2012-2015
Sources: Statistics Norway and Norges Bank

Chart 9 shows the effect on the share of problem loans in the corporate sector under different assumptions regarding oil prices and the krone exchange rate. If oil prices fall to close to USD 20 per barrel, the share of problem loans in the corporate sector increases to around 15 percent in 2015. This is close to the highest levels of the 1991-93 banking crisis. If oil prices only fall to USD 60 per barrel,

the share of problem loans in the corporate sector is reduced by about 2 percentage points in 2015 compared with the original adverse scenario.

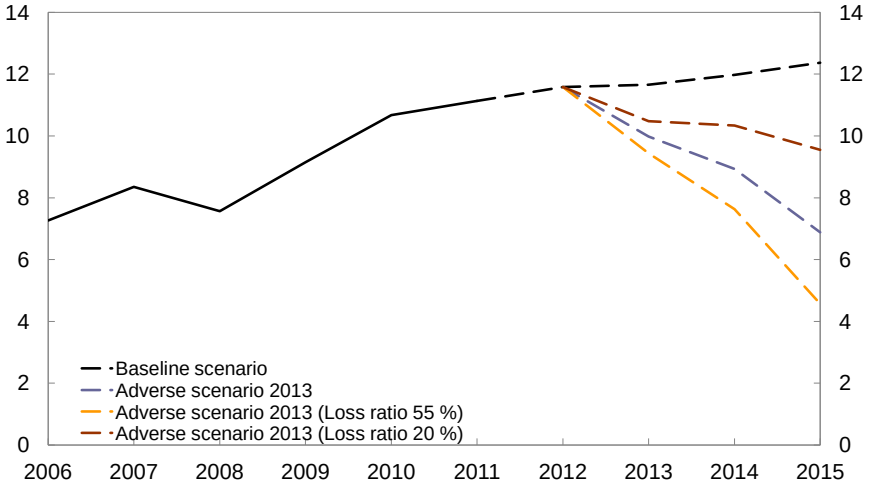
In the adverse scenario, the marked fall in oil prices leads to a depreciation of the krone exchange rate, reducing credit risk associated with the export industry and thereby counteracting the effect of a fall in oil prices on the share of problem loans to the corporate sector. If the adverse scenario is the same as above, but without the depreciation of the krone, the share of problem loans in the period increases more than in the adverse scenario. The difference has proved to be relatively modest.

Sensitivity analyses of banks' profits and capital ratios

Banks' profits in an adverse scenario depend on the share of problem loans that are recognised as losses (loss ratio). The size of the loss ratio is determined by banks' collateral and by corporate and household equity ratios. Important additional factors are how banks follow up their borrowers and when they choose to recognise impairment losses on problem loans. The loss ratio remains at 10 percent in the baseline scenario, while it increases to 40 percent in the adverse scenario. This is in line with loss ratios during the 1988–1993 banking crisis.

In 1991, when banks took substantial losses, 55 percent of problem loans were recognised as loan losses. If the loss ratio reaches this level, banks' profits decline markedly and Tier 1 capital ratios fall to below 6 percent. With a loss ratio of 20 percent, Tier 1 capital ratios only fall to slightly below 10 percent (see Chart 10).

Chart 10 Banks'[1)] Tier 1 capital ratios. Baseline scenario and adverse scenario 2013. Percent. Annual figures. 2006 – 2015[2)]

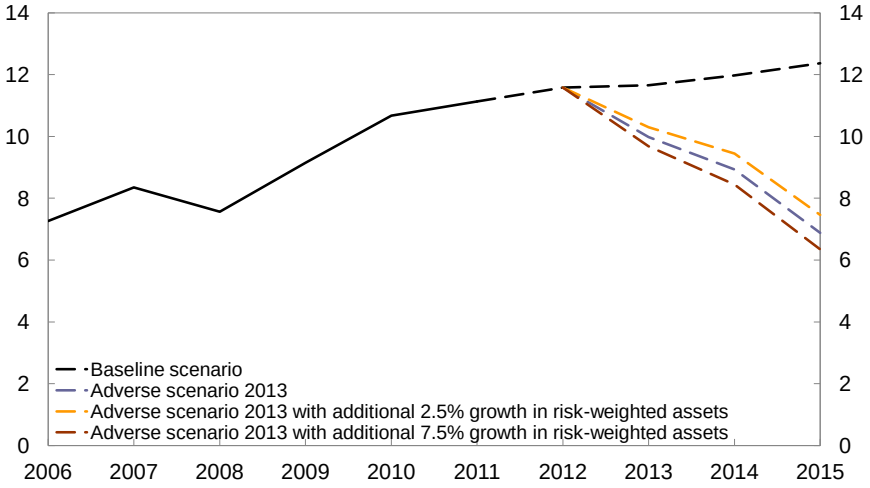


1) DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge
2) Projections for 2012-2015
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

The denominator of the regulatory capital ratio is a bank's total risk-weighted assets. In the adverse scenario, a number of assets will migrate to higher risk classes. Migration means that when the risk associated with a specific borrower's loan increases, the risk weights for this loan will rise. This leads to an increase in total risk-weighted assets and a decline in the regulatory capital ratio.

In order to reflect the increase in credit risk in the adverse scenarios, the rise in risk-weighted assets is assumed to exceed credit growth. In the adverse scenarios, annual credit growth exceeds the rise in assets by an annual 5 percent. The effect on Tier 1 capital ratios of changing this assumption to 2.5 percentage points and 7.5 percentage points is shown in Chart 11. Banks'[11] own reports have shown that migration in corporate lending portfolios led to an increase in volume-weighted risk weights of just under 10 percent in 2010, albeit with some variation across banks.[12] The chart shows that at the end of the period an increase of 7.5 percentage points in risk-weighted assets would result in a deviation in Tier 1 capital ratios compared with the baseline scenario of about 0.5 percentage point. Tier 1 capital ratios for the stress test banks would nonetheless remain above the Basel III minimum requirement of 6 percent.

Chart 11 Banks'[1)] Tier 1 capital ratios. Baseline scenario and adverse scenario 2013. Percent. Annual figures. 2006 – 2015[2)]

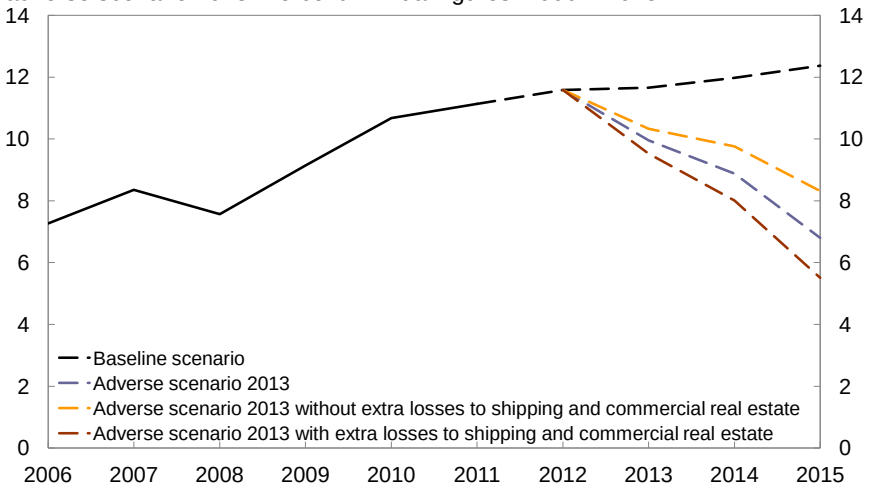


1) DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge
2) Projections for 2012-2015
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

The adverse scenario is based on the assumption that the loss ratio for the shipping and commercial property sectors is higher than for other sectors. Norwegian banks' losses in shipping have historically been low. However, some shipping freight rates are still low compared with pre-crisis rates. The shipping sector is cyclical, and developments in the global economy and international trade have a strong impact on activity. Substantial overcapacity has also built up in recent years, particularly in the dry bulk, tanker and container segments. In the adverse scenario, global economic activity is low and it is natural to assume that freight rates remain at a low level in the projection period, continuing to generate problems for the shipping sector.

[11] Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, SpareBank 1 Nord-Norge and Bank 1 Oslo (now Bank 1 Oslo Akershus).
[12] See Havro, Johansen, Ruud and Træe (2011) and Finanstilsynet (2011).

Chart 12 Banks'[1)] Tier 1 capital ratios. Baseline scenario and adverse scenario 2013. Percent. Annual figures. 2006 – 2015[2)]



1) DNB Bank, Nordea Bank Norge, Sparebank 1 SR-Bank, Sparebanken Vest, Sparebank 1 SMN and SpareBank 1 Nord-Norge
2) Projections for 2012-2015
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Norwegian banks have substantial exposure to shipping and commercial property. Weakened debt-servicing capacity in these sectors may lead to substantial losses for banks. DNB and Nordea are among the world's leading shipping banks, but other Norwegian banks also have large exposures to these sectors. Loans to the shipping industry represent about 8 percent of the stress test banks' total lending and loans to commercial property about 20 percent. Commercial property loans make up the largest share of Norwegian banks' lending to the corporate sector. In the adverse scenario, the loss ratio for loans to shipping increases by an extra 10 percent in total over three years and by 5 percent for loans to the commercial property sector. Chart 12 shows regulatory capital ratios in the adverse scenario and how sensitive these ratios are to extra losses in these two sectors. If banks' extra losses on loans to the shipping and commercial property sectors are doubled, Tier 1 capital ratios fall below 6 percent. If we exclude the extraordinary losses in these sectors, Tier 1 ratios remain above 8 percent.[13]

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Norges Bank (2012): *Financial Stability* 2/12

[13] Loss of interest income due to loan write-downs has not been taken into account. Banks' profits would have been somewhat lower if this had been taken into account.

Norges Bank (2012): Utdyping av stresstestene i Finansiell stabilitet 1/12 (Further analysis of the stress tests in Financial Stability 1/12). Norwegian only. *Penger og Kreditt* 1/2012. Norges Bank

Table 3 Adverse scenarios in the three most recent Financial Stability reports

	FS 2/11	FS 1/12	FS 2/12
Risk factors	Lower economic activity in Norway's trading partners	Lower economic activity in Norway's trading partners	Lower economic activity in Norway's trading partners
	Fall in oil price owing to low demand	Fall in oil price owing to low demand	Fall in oil price
	Increased turbulence in global money and credit markets	Increased turbulence in global money and credit markets	Increased turbulence in global money and credit markets Fall in domestic house prices
Adverse scenario	Substantial fall in GDP for Norway's trading partners. with Europe hardest hit. Oil price below USD 50. Renewed turbulence in money markets. Krone exchange rate remains strong despite low oil price. Sharp fall in asset prices. Some extra losses in shipping and property sectors.	Adverse scenario 1 based on a financial shock, centred on European banks. Banks encounter refinancing problems and are forced to reduce lending. Substantial fall in GDP for Norway's trading partners and low oil price.	To assess banks' vulnerability over time, the same adverse scenario is applied at the beginning of 2009, 2011 and 2013. The variables will fall to the same levels (for prices and indices) or growth rates (for GDP) each time the shocks occur.
Shock variables	GDP trading partners	GDP trading partners	GDP trading partners
	Household expectations	Household expectations	Household expectations
	GDP	GDP	Oil price
	Oil price	Oil price	Higher domestic and global money market premiums
	Exchange rate as in baseline scenario in MPR 3/2011	Exchange rate as in baseline scenario in MPR 1/2012 in alternative 1	
	Higher domestic and global money market premiums	Higher domestic and global money market premiums in alternative 1	

Table 4 Stress test of banks'[1)] losses and profits. Financial Stability 2/2012

	Baseline scenario[2)]				Adverse scenario 2013			
Macro scenario. Percentage change on previous year, unless otherwise specified	2012	2013	2014	2015	2012	2013	2014	2015
Mainland GDP	3 3/4	3	2 3/4	2 3/4	3 3/4	-3/4	-1	1
CPI	3/4	2	2	2 1/4	3/4	1	1	1
Annual wage growth	4	4 1/4	4 1/2	4 1/2	4	4 1/4	3 1/4	1 1/2
Registered unemployment (percentage of labour force)	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3 1/2	4 1/2
Exchange rate (level. Import-weighted exchange rate index, 44 trading partners)	87	85 3/4	85 1/4	85 1/2	87 1/4	89 3/4	90 1/4	89 1/2
Oil price, USD per barrel (level)	112	105	99	96	112	47	50	52
Average bank lending rates (level)	4 3/4	4 3/4	5	5 1/2	4 3/4	4	3 1/2	2 3/4
House prices	7 3/4	7 3/4	6 1/4	4 1/4	7 3/4	-12 1/4	-7 1/2	-3 1/2
Credit to households[3)]	7 1/4	7 3/4	8 1/2	8 1/4	7 1/4	4 1/2	1 1/2	- 1/2
Credit to non-financial enterprises[3)]	3 1/4	7 3/4	7 1/2	6 3/4	3 1/4	-1 3/4	-8 1/2	-6
Banks' losses and profits								
Problem loans households[4)] (percentage of lending to sector)	1.8	1,7	1.7	1.6	1.8	2.2	2.9	3.5
Problem loans non-financial enterprises[4)] (percentage of lending to sector)	3.1	2,8	3.1	3.3	3.1	4.3	7.9	11
Problem loans total[4)] (percentage of total lending)	2.4	2,2	2.3	2.4	2.4	3.2	5.1	6.7
Loan losses (percentage of total lending)	0.2	0.2	0.3	0.3	0.2	2	3.2	4.2
Pre-tax profits (percentage of average total assets)	0.7	0.7	0.8	0.8	0.7	-0.3	-0.7	-1.3
Net interest income (percentage of average total assets)	1.2	1.4	1.5	1.6	1.2	1.3	1.2	1.1
Tier 1 capital ratios	11.6	11.7	12	12.4	11.6	10	8.9	6.8

[1)]The six largest Norwegian banks.

[2)] Baseline scenario for mainland GDP, CPI, annual wage growth, exchange rate and oil price from Monetary Policy Report 3/2012.

[3)] Change in stock of loans as measured at year-end. Owing to a change in the Norwegian standard for institutional sector classification as from 1 January 2012, credit growth statistics apply only to the period to end-February 2012.

[4)] Non-performing loans and other particularly doubtful loans. All banks in Norway excluding foreign branches.

Sources: Statistics Norway, Technical Reporting Committee on Income Settlements, Thomson Reuters, Association of Real Estate Agency Firms, ECON Pöyry, Finn.no, Association of Real Estate Agents, Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Table 5 Stress test of banks'[1)] losses and profits. Financial Stability 1/2012

	Baseline scenario[2)]				Adverse scenario 1				Adverse scenario 2		
Macro scenario. Percentage change on previous year, unless otherwise specified	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014
Mainland GDP	3,25	3	3	3	3	-2	-1/4	2 1/4	2 1/2	1 1/4	1
CPI	1	1 3/4	2	2 1/4	1 1/4	1 1/4	3/4	1	1 1/4	1 1/2	1 1/2
Annual wage growth	3 3/4	4	4	4 1/4	4	3 1/2	1 1/2	0	4	3 1/2	2 3/4
Registered unemployment (percentage of labour force)	2 1/2	2 1/2	2 3/4	2 3/4	2 1/2	2 3/4	4 1/4	4 3/4	2 1/2	2 3/4	3
Exchange rate (level. Import-weighted exchange rate index, 44 trading partners)	87 1/4	87 1/4	87 1/4	87 1/2	87 1/4	87 1/4	87 1/4	87 1/2	88 3/4	90 1/4	91
Oil, USD per barrel (level)	121	115	103	103	117	65	65	65	102	87	78
Average bank lending rates (level)	4 3/4	4 1/2	4 3/4	5 1/2	5	5 1/4	3 1/2	2 1/2	5 1/4	5	4 3/4
House prices	8	7 1/4	4 3/4	3 3/4	6 1/2	-7 1/2	-11 3/4	-6	1	-2 3/4	-2 3/4
Credit to households[3)]	8	8 3/4	8 1/2	8	8	4 1/4	2	1/2	6 3/4	5 1/2	3 3/4
Credit to non-financial enterprises[3)]	7	8 1/4	7 3/4	7 1/2	6 1/4	-6 1/2	-11	-7 1/2	5 1/2	1 1/4	-2 1/4
Banks' losses and profits											
Problem loans households[4)] (percentage of lending to sector)	0.9	0.8	0.7	0.7	0.9	1.0	1.2	1.5	1.0	1.0	1.1
Problem loans non-financial enterprises[4)] (percentage of lending to sector)	2.5	2.7	3.0	3.1	2.5	4.3	8.6	10.0	2.7	3.6	5.0
Problem loans total[4)] (percentage of total lending)	1.4	1.3	1.4	1.5	1.4	2.0	3.2	3.6	1.5	1.8	2.3
Loan losses (percentage of total lending)	0.2	0.2	0.2	0.3	0.4	1.4	2.6	3.2	0.7	1.5	2.6
Pre-tax profits (percentage of average total assets)	0.7	0.8	0.8	0.8	0,.6	0.1	-0.3	-0.7	0.5	0.2	-0.2
Net interest income (percentage of average total assets)	1.4	1.4	1.5	1.6	1.4	1.6	1.5	1.2	1.5	1.6	1.5
Tier 1 capital ratio (percentage of risk-weighted assets)	11.4	11.4	11.5	11.7	10.7	10.4	10.0	9.1	10.6	10.1	9.3

[1)]The six largest Norwegian banks.

[2)] Baseline scenario for mainland GDP, CPI, annual wage growth, exchange rate, oil price and money market rate from Monetary Policy Report 1/2012.

[3)] Change in stock of loans as measured at year-end.

[4)] Non-performing loans and other particularly doubtful loans. All banks in Norway excluding foreign branches.

Sources: Statistics Norway, Technical Reporting Committee on Income Settlements, Thomson Reuters, Association of Real Estate Agency Firms, ECON Pöyry, Finn.no, Association of Real Estate Agents, Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Table 6 Stress test of banks'[1] losses and profits. Financial Stability 2/2011

	Baseline scenario[2]				Adverse scenario			
Macro scenario. Percentage change on previous year, unless otherwise specified	2011	2012	2013	2014	2011	2012	2013	2014
Mainland GDP	2 ¾	3 ¾	3 ¼	3	2 ¾	-2 ¼	½	2 ¾
CPI	1 ½	1 ½	2	2 ¼	1 ½	1 ¼	½	1
Annual wage growth	4 ¼	4 ¼	4 ½	4 ¾	4 ¼	4	2 ½	1 ½
Registered unemployment (percentage of labour force)	2 ¾	2 ½	2 ½	2 ½	2 ¾	2 ½	4	4 ½
Exchange rate (level. Import-weighted exchange rate index, 44 trading partners)	88	88 ½	89 ¼	89 ¾	88	88 ½	89 ¼	89 ¾
Oil price, USD per barrel (level)	110	97	94	94	110	46	47 ½	51 ¾
Three-month money market rate, NIBOR (level)	3	3	3 ½	4	3	3	2	2
Average bank lending rates (level)	4 ¾	5	5 ¼	5 ¾	4 ¾	5 ¼	4 ¼	4
House prices	9	8 ½	7 ½	4 ¾	9	-5 ¼	-11 ¾	-9
Credit to households [3]	7 ½	9	9	8 ½	7 ½	5	3	½
Credit to non-financial enterprises [3]	2	6 ¼	7 ¼	7 ½	2	-5 ¾	-10 ¼	-6 ¾
Banks' losses and profits								
Problem loans households [4] (percentage of lending to sector)	1	¾	¾	¾	1	1	1 ¼	1 ¾
Problem loans non-financial enterprises[4] (percentage of lending to sector)	3	3	3	2 ¾	3	4 ¾	10	11
Problem loans total[4] (percentage of total lending)	1 ½	1 ½	1 ½	1 ½	1 ½	2 ¼	3 ½	4
Loan losses (percentage of total lending)	¼	¼	¼	¼	¼	2 ¼	3 ½	3 ¾
Pre-tax profits (percentage of average total assets)	1	1	1 ¼	1 ¼	1	- ¼	-¾	-1
Net interest income (percentage of total assets)	1 ¼	1 ½	1 ¾	1 ¾	1 ¼	1 ¾	1 ½	1 ½
Tier 1 capital ratio	10	10 ¼	10 ½	10 ½	10	9	8	6 ¾

[1] The six largest Norwegian banks.

[2] Baseline scenario for mainland GDP, CPI, annual wage growth, exchange rate, oil price and money market rate from Monetary Policy Report 3/2011.

[3] Change in stock of loans as measured at year-end.

[4] Non-performing loans and other particularly doubtful loans. All banks in Norway excluding foreign branches.

Sources: Statistics Norway, Technical Reporting Committee on Income Settlements, Thomson Reuters, Association of Real Estate Agency Firms, ECON Pöyry, Finn.no, Association of Real Estate Agents, Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank