

Further analysis of the stress test of banks' capital adequacy in Financial Stability 2/2010

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Stress tests of banks' financial strength were first introduced in the Financial Stability report (FS) in 2004. Since then Norges Bank has presented stress tests twice a year.

Norges Bank uses stress tests to quantify risk factors that may weaken the stability of the financial system. Stress tests provide an indication of links between different risk factors and Norwegian banks' vulnerability to negative economic developments. The results are dependent on a number of assumptions. In this article we describe how the adverse scenario in FS 2/10 is built up, and how sensitive results are to changes in key assumptions. In addition, we compare the adverse scenarios over time.

Results from the stress tests in FS 2/10 show that banks are robust to the negative economic shocks to which they are exposed. This time the adverse scenario is milder than in Norges Bank's previous stress tests. However, the sensitivity analyses presented here illustrate that banks are able to withstand even more severe economic shocks than those applied in the stress test.

The adverse scenario in FS 2/10

Since FS 1/09 a downturn in the international economy has been the most important risk factor in the adverse scenarios in Norges Bank's Financial Stability reports (see Table 1). In FS 2/10 production for Norway's trading partners is assumed to weaken broadly in line with that assumed for the euro area countries in the EU-wide stress test exercise conducted by the CEBS (Committee of European Banking Supervisors) in summer.¹ The CEBS applied the assumption that GDP growth would be about 3 percentage points weaker, with a time horizon of two years, than in the benchmark scenario. The adverse scenario in FS 2/10 applies a time period of 3½ years. The difference in growth for trading partners is about 5½ percentage points for the overall period, which implies somewhat stronger international growth than in FS 1/10.

Weaker global growth may trigger a drop in oil prices, an important channel into the Norwegian economy. In the adverse scenario, oil prices fall to about USD 50 per barrel. Oil prices in the adverse scenario are in the lower 5% percentile for futures options prices at the end of the second half of 2011.² Since oil prices have been relatively stable recently, this assumption results in a smaller fall compared with previous reports.

A drop in oil prices could, in isolation, lead to a depreciation of the krone. On the other hand, GDP growth among our trading partners is slower than in Norway,

and uncertainty abroad is considerable. Furthermore, foreign interest rates are low. As in FS 1/10, it is therefore assumed that the krone exchange rate remains broadly unchanged in relation to the benchmark scenario.

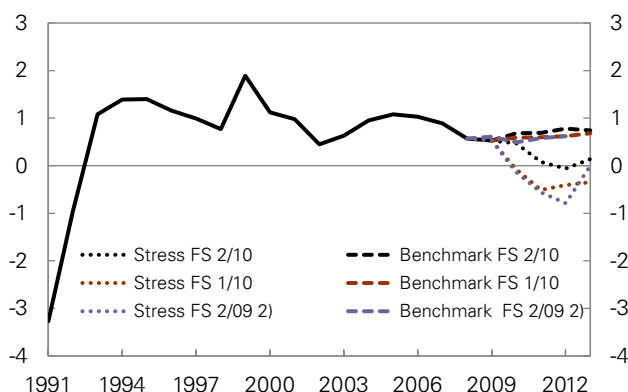
As a result of lower growth and weaker price impulses, the key policy rate in the adverse scenario is reduced. This contributes to a dampening of the decrease in economic growth. A lower key policy rate is somewhat counteracted by the rise in premiums in international money markets. External turbulence spills over to Norwegian money markets, and premiums increase by up to one percentage point. The increase occurs as a result of uncertainty concerning sovereign debt and the international financial sector. It is also assumed that lending margins remain approximately at the current level. Consequently, the fall in interest rates facing households and enterprises is dampened.

These shocks reduce growth in the Norwegian economy and unemployment rises. A downturn in international growth will lead to a reduction in manufacturing production in Norway, and particularly in traditional exports. It will also lead to an increase in household pessimism. The adverse scenario assumes that Norwegian households' expectations concerning their own financial position and the country's economy weaken. Low oil prices will reduce investment in the oil sector and related industries. Increased unemployment, weaker expectations and lower income compared with the benchmark scenario lead to a

¹ On 23 July 2010 the CEBS, in cooperation with the ECB, the EU Commission and national and European supervisory authorities, published a stress test conducted on a sample of 91 European banks. The sample did not include any Norwegian banks.

² See World Economic Outlook (IMF), October 2010, p. 49

Chart 1 Banks' post-tax profits in stress scenarios. Percentage of average total assets. 1991–2013¹⁾

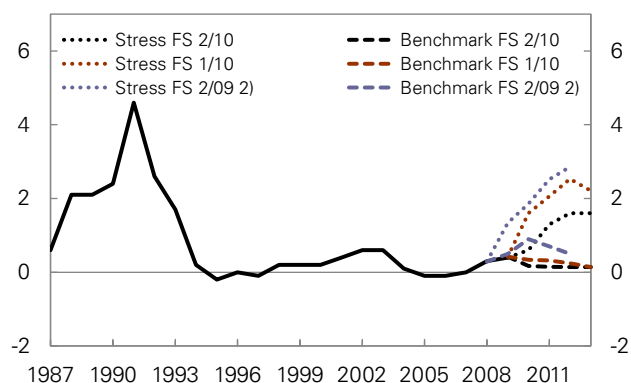


¹ Projections for 2009–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

² Including losses on exposures to shipping and the Baltic countries.

Sources: Statistics Norway and Norges Bank

Chart 2 Banks' loan losses in stress scenarios. Percentage of gross lending. 1987–2013¹⁾



¹ All banks. Projections for 2009–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

² Including losses on exposures to shipping and the Baltic countries.

Sources: Statistics Norway and Norges Bank

drop in house prices. Reduced investment and lower house prices also lead to lower debt growth for both households and enterprises. A fall in house prices, which reduces collateral values and thereby loan-financed consumption and investment, amplifies the downturn in the real economy.

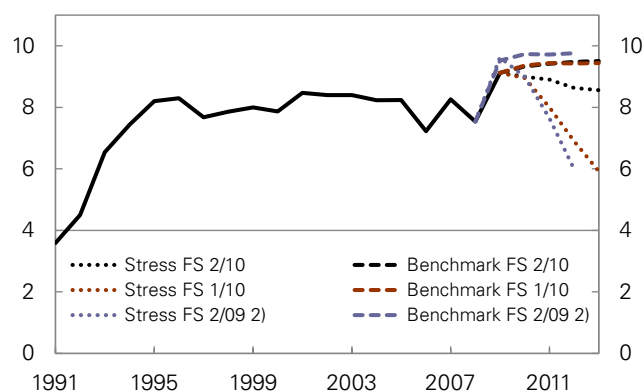
Banks' results in the stress test

As a result of negative developments in the real economy, banks' results turn negative in 2012, (see Chart 1). However, banks' results weaken to a somewhat lesser extent than in FS 2/09 and 1/10, primarily because the increase in loan losses is lower (see Chart 2). This partly reflects that the share of problem loans does not increase as much as in the adverse scenario in the previous report as economic developments are somewhat more favourable in this scenario. In addition, this reflects a change in the distribution between losses to households and enterprises in this stress test. While losses in households are higher, losses in enterprises are lower compared with the previous report. For the banks in the stress test³, which have a large share of lending to the corporate market, overall losses are reduced.

It is assumed that due to competitive conditions banks cannot raise their interest margin during the stress period. Banks' net interest income is thus reduced in the adverse scenario when their funding costs increase. The premium on their total market funding⁴ rises by 10 basis points under the adverse scenario. This is a lower increase than in the previous report where the premium rose by 30 basis points in relation to the benchmark scenario.

Banks' return on securities is assumed to be the same

Chart 3 Banks' Tier 1 capital ratio in stress scenarios. Per cent. 1991–2013¹⁾



¹ Projections for 2009–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

² Including losses on exposures to shipping and the Baltic countries. Including planned increases in Tier 1 capital.

Sources: Statistics Norway and Norges Bank

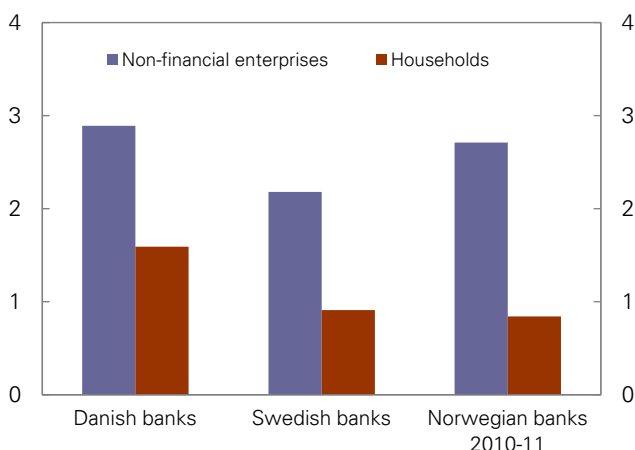
under the adverse and benchmark scenario. The sensitivity analyses presented below show banks' vulnerability to variations in the return on their security portfolios. As Norwegian banks have limited holdings of high-risk government bonds, the stress test does not include specific analyses of the effects of shocks to various countries' state finances on banks' security portfolios.

The Tier 1 capital ratio in the adverse scenario remains well above the minimum requirement of 4%. It also remains above 6%, i.e. the new minimum Tier 1 capital requirement set out by the Basel Committee (see Chart 3). The Tier 1 capital ratio falls through the period as

³ In FS 2/10 stress tests are applied to DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

⁴ Banks' market funding includes loans and deposits from credit institutions, notes, bonds and subordinated debt. The stress test assumes that the premium on banks' market funding over the money market rate increases.

Chart 4 Banks' corporate and retail losses in CEBS stress tests and in FS 2/10. Per cent of sector lending. Accumulated losses for 2010–11¹⁾



¹ Projections

Sources: CEBS and Norges Bank

banks' lending becomes more risky and thereby increases risk-weighted assets. Since the credit risk associated with lending to enterprises rises less than in the adverse scenarios in the previous reports, the risk weights do not increase as rapidly.

Losses for Norwegian banks in the stress tests for the years 2010-2011⁵ in FS 2/10 are comparable to Swedish and Danish banks' losses in the CEBS stress test (see Chart 4). In the CEBS stress test many of the banks used their own models, i.e. a bottom-up approach, while a top-down analysis for all Norwegian banks was used in FS 2/10. Moreover, the time horizon in our adverse scenario is longer than in the CEBS stress test. Since banks' losses rise in line with the duration of the downturn, the FS 2/10 adverse scenario is stricter than the CEBS adverse scenario.⁶ It is therefore difficult to compare the results of these two stress tests directly.

Sensitivity analyses of banks' results and capital adequacy

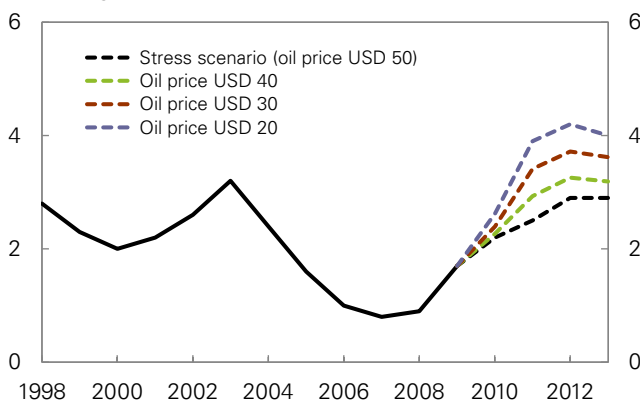
Scenario analyses estimate the effect on banks' accounts of the materialisation of one or more risk factors. The macro stress scenario's design and bank-specific assumptions have a bearing on banks' results and capital adequacy in the adverse scenario. To provide a more comprehensive picture of Norwegian banks' vulnerability, it is useful to look at the effect of different paths for some key variables.

When the exchange rate is assumed to remain unchanged compared to the benchmark scenario, changes in oil prices have a considerable impact on macroeco-

⁵ The adverse scenario in FS 2/10 does not start until the second half of 2010.

⁶ Unlike the CEBS stress tests, our stress tests do not include banks' foreign branches and subsidiaries. Swedish and Danish banks' loans losses in the stress tests include losses in the Baltic countries, while such losses are not incorporated in our stress tests. There is thus reason to believe that domestic losses for Norwegian banks under the stress test in FS 2/10 are higher than the Swedish and Danish banks' losses in the CEBS stress test. minimum of 0.8 per cent of the value of their covered bonds.

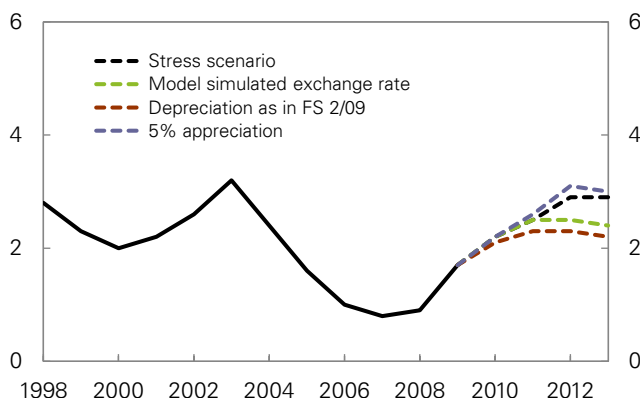
Chart 5 Problem loans in stress scenarios with alternative oil price assumptions. Percentage of gross lending. Annual figures. 1998–2013¹⁾



¹ Projections for 2010–2013.

Sources: Statistics Norway and Norges Bank

Chart 6 Problem loans in stress scenarios with alternative exchange rate assumptions. Percentage of gross lending. Annual figures. 1998–2013¹⁾



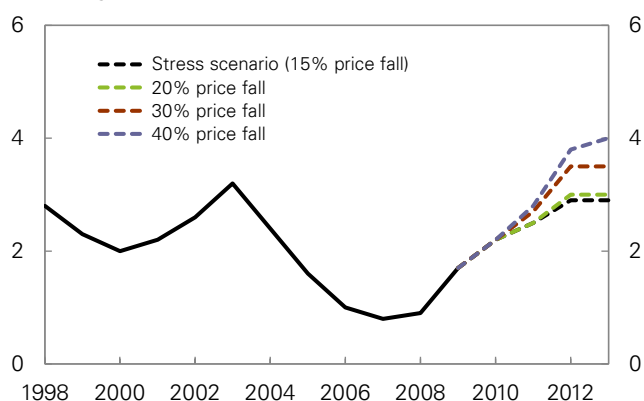
¹ Projections for 2010–2013.

Sources: Statistics Norway and Norges Bank

nomical developments. Even though oil prices are high today, they have varied widely over time. Towards the end of 2001 oil prices dropped to USD 20 per barrel. If we apply the assumption that oil prices move down to USD 20, but let the interest rate and real exchange rate follow the same path as in the initial adverse scenario, the share of problem loans rises by about one and a half percentage points (see Chart 5).

In the FS 2/10 stress test, the real exchange rate is held approximately unchanged in relation to the benchmark scenario. According to the estimated relationship in the macro model used in the stress test, the other assumptions in the adverse scenario could result in a weakening of the krone of about 10%. In this case the share of problem loans is around a half percentage point lower (see Chart 6). With

Chart 7 Problem loans in stress scenarios with alternative house price assumptions. Percentage of gross lending. Annual figures. 1998–2013¹⁾



¹ Projections for 2010–2013.

Sources: Statistics Norway and Norges Bank

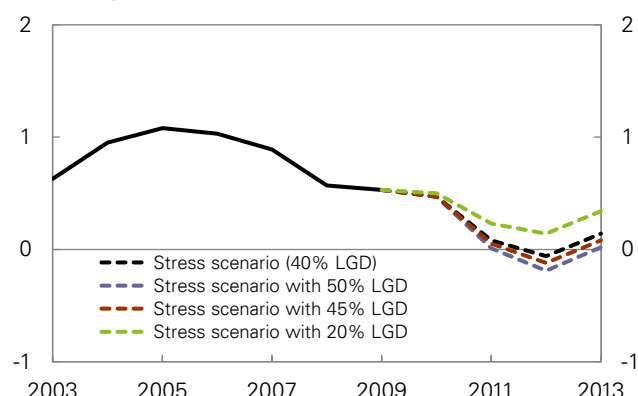
a weakening of the krone to levels observed in autumn 2008, the share of problem loans would have fallen further. A depreciation of this magnitude was assumed in FS 2/09. If, on the contrary, the krone appreciated by about 5%, the share of problem loans would rise by a quarter percentage point compared with our adverse scenario.

In the adverse scenario property prices decrease by approximately 15%. By comparison, Norwegian house prices fell by around 30% during the 1988-1993 banking crisis in Norway. The ECB reports that commercial property prices fell by close to 40% in some countries in 2008 (ECB 2010). With a drop in house prices of close to 40%, the share of problem loans would increase by an additional one percentage point (see Chart 7).

The loss ratio, or losses as a percentage of problem loans, may vary between banks and partly depends on the value of banks' collateral and equity ratios in the household and enterprise sector. It also depends on the quality of banks' loan-monitoring and the timing of loan writedowns. We assumed a 40% loss ratio in the FS 1/10 and FS 2/10 stress scenarios. In 1991, when banks suffered large losses, 55% of problem loans were recorded as loan losses. For the period of 1990-1992, banks' losses represented close to 40% of problem loans. However, banks reversed a share of these losses. This led to very low losses during the following years. In Ireland the national company NAMA (National Asset Management Agency, a bad bank) has taken over a large share of Irish banks' problem loans. NAMA expects that it might lose over 50% these loans (NAMA 2010). The Basel Committee requires that banks using the internal-model based approach⁷ to calculate capital requirements set loss given default (LGD) at 45%.

Chart 8 shows banks' results in the FS 2/10 adverse

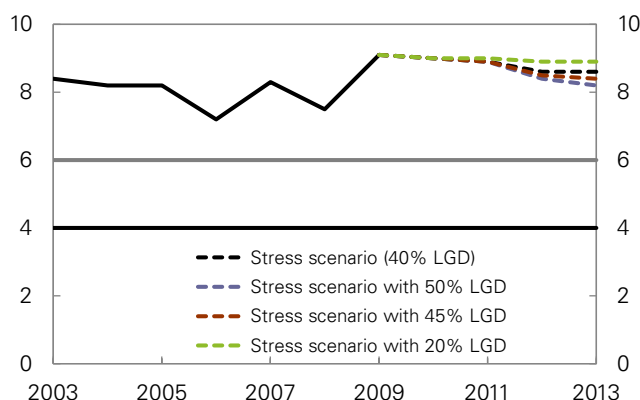
Chart 8 Bank profits in stress scenarios under different LGD assumptions. Per cent of average total assets. Annual figures. 2003–2013¹⁾



¹ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

Chart 9 Banks' Tier 1 ratios in stress scenarios with different LGD assumptions. Per cent. Annual figures. 2003–2013¹⁾



¹ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

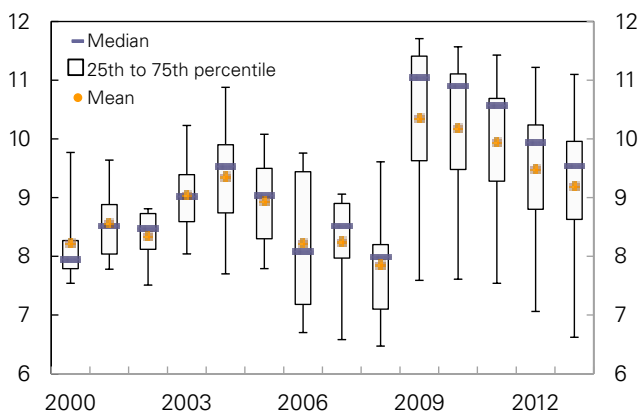
scenario given four different loss ratios. A higher loss ratio through the period has a clearly negative effect on bank performance. This also influences their capital adequacy (see Chart 9). All banks remain above the minimum Tier 1 capital requirement even with a loss ratio of about 50% (see Chart 10).

Banks' return on securities is another item on the banks' balance sheet that can heavily influence the results in a stress situation. In the fourth quarter of 2008 numerous banks posted negative results after the value of their trading book fell.⁸ The impact on an individual bank depends on the size and composition of its trading book. During the turbulence in both 2002 and 2008 banks' were impacted very differently. FS 2/10 assumes that banks'

⁷ Banks that use standardised internal models shall set LGD at 45% for "other unsecured exposures" (see § 12-1 of the Regulation relating to capital requirements).

⁸ The fall in value had a limited effect because many of the banks reclassified the securities in their trading book to "hold to maturity". The securities were thus no longer valued at market value and the banks could recognise the portfolio at the value prevailing prior to the fall in securities prices in autumn 2008.

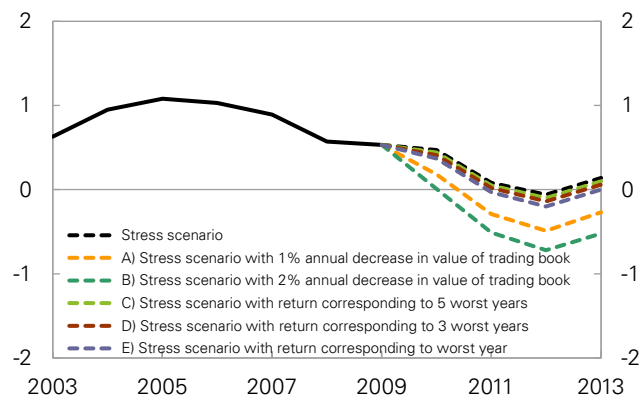
Chart 10 Banks' Tier 1 ratio in a stress scenario with 50% LGD. Per cent. Annual figures. 2003–2013¹⁾



¹⁾ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

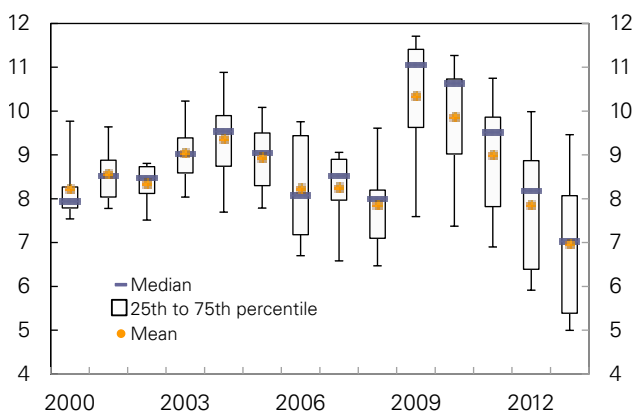
Chart 11 Bank profits in stress scenarios. Per cent. Annual figures. 2003–2013¹⁾



¹⁾ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

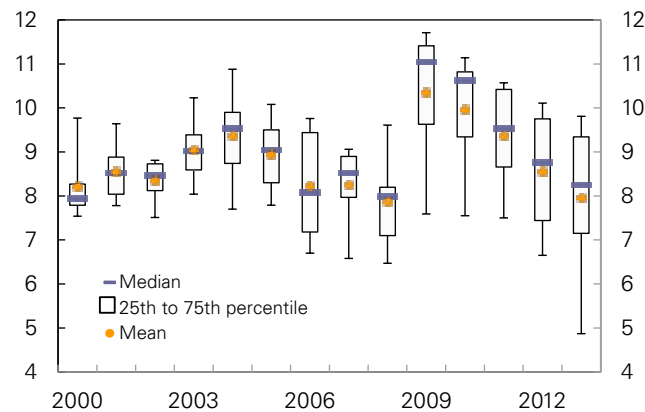
Chart 12 Banks' Tier 1 ratio in a stress scenario with 2% annual decline in the trading book. Per cent. Annual figures. 2003–2013¹⁾



¹⁾ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

Chart 13 Banks' Tier 1 ratio in a stress scenario with income from financial assets equalling worst observed year. Per cent. Annual figures. 2003–2013¹⁾



¹⁾ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

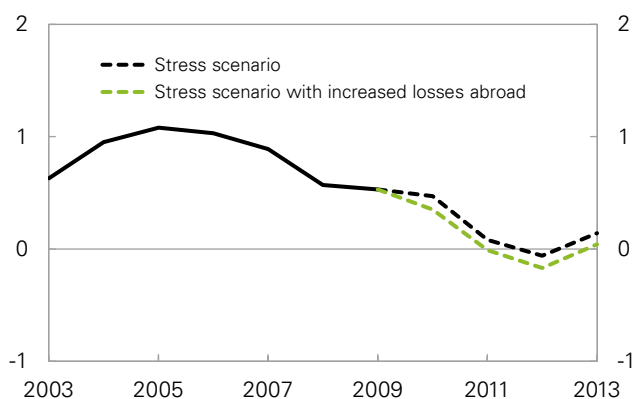
return on securities equals an average of the past seven years' return (excluding extreme observations) both in the benchmark scenario and in the adverse scenario. Chart 11 shows the implications of changing this assumption. The impact of changes in trading books on banks' results is assessed using two alternatives. The first alternative assumes a percentage decrease in the value of the trading book (alternatives A and B). This fall is the same for all banks. Banks with large trading books are then hardest hit. Such an analysis does not take into account differences in the composition of banks' trading books and in their risk management strategies. In the second alternative, the banks' historical return on securities is therefore used to assess the degree of risk under a stress scenario (alternatives C, D and E). We assume that the

percentage loss on the trading book varies across banks. In both of the most extreme scenarios – 2% annual fall in the value of the trading book (B) and a return on the securities portfolio corresponding to the bank's worst year (E) – the banks' capital declines considerably. Yet in both cases, all the banks remain above the minimum Tier 1 capital requirement (see Chart 12 and 13).

The adverse scenario assumes that the Norwegian economy is exposed to shocks, primarily stemming from external developments. Even if some of the Norwegian banks⁹ also have loan exposures to foreign customers, the banks' losses in FS 2/10 are projected based on developments in problem loans for domestic customers. It is likely that a downturn abroad will lead to higher losses among foreign borrowers than among Norwegian bor-

⁹⁾ In the stress test, we look at Norwegian banks at the parent bank level, and do not include their foreign branches and subsidiaries.

Chart 14 Bank profits in stress scenario. Per cent. Annual figures. 2003–2013¹⁾



¹ Projections for 2010–2013 for DnB NOR Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN and SpareBank 1 Nord-Norge.

Sources: Statistics Norway and Norges Bank

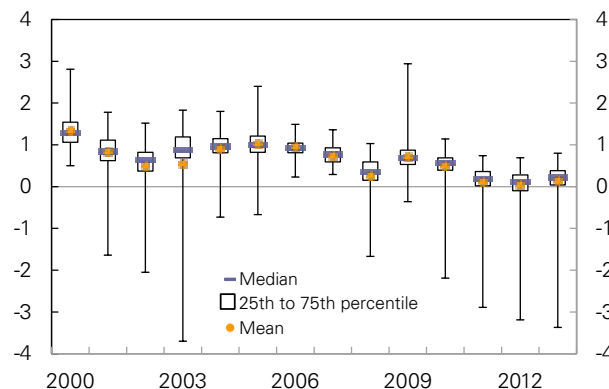
rowers, which suggests that losses in Norwegian banks are underestimated when all borrowers are treated equally. In the CEBS stress test, corporate loan losses averaged 4.4%. Large US banks reported a loss rate of 4.1% in 2009 (OECD 2010). Chart 14 assumes a loss rate of 4.5% for loans to foreign enterprises and households. This will increase total losses and on average banks' results will be 0.4 percentage point lower through the projection period. However, none of the banks will be in breach of the Tier 1 capital requirement.

In Norges Bank's Financial Stability reports, six of the largest Norwegian banks are subject to stress tests. At the end of the third quarter of 2010, they accounted for 62% of the Norwegian banking market and combined they are important for financial stability. The international financial crisis has shown, however, that also smaller banks can have an impact on financial stability. In order to determine whether there are wide differences between the result for the largest banks and the Norwegian banking sector as a whole, the stress tests can be applied to the entire banking sector. A number of the banks will post negative results during the period and some of the banks will approach the Tier 1 capital requirement of 4% (see Charts 15 and 16). The banks that post the poorest results and the lowest Tier 1 capital ratio at the beginning of the period and that have the highest losses during the projection period perform the worst in the stress test.

Stress testing of households

Interest rate increases and/or a fall in the value of a dwelling can influence the financial situation of households that are homeowners. This analysis takes a close look at the partial effects of changes in house prices and interest expenses. Households that are included as homeowners

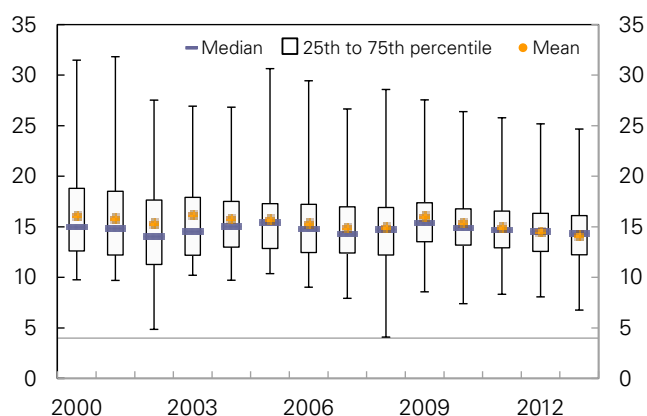
Chart 15 Bank profits in stress scenario. Annual figures. 2000–2013¹⁾



¹ Projections for 2010–2013. All banks in Norway excluding foreign branches. Outliers are not shown in the chart.

Sources: Statistics Norway and Norges Bank

Chart 16 Banks Tier 1 ratio in stress scenario. Per cent. Annual figures. 2000–2013¹⁾



¹ Projections for 2010–2013. All banks in Norway excluding foreign branches. Outliers are not shown in the chart.

Sources: Statistics Norway and Norges Bank

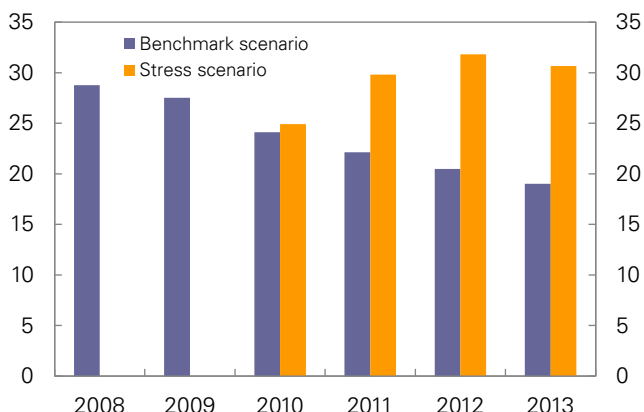
are those that have a positive assess value of owner-occupied dwellings or units in housing companies. The sample is confined to households with dwellings for which Statistics Norway has estimated a market value. There are 1.36 million households in this sample.

The analysis is based on household income, debt and the estimated value of dwellings in 2008. Debt and income are held constant. The values of the dwelling and interest expenses are projected based on the benchmark and adverse scenarios.

Household vulnerability is assessed using the:

- 1) Loan to value ratio: households' total loans as a share of estimated projected market value of the dwelling.
- 2) Interest burden: households' projected interest expenses as a percentage of after-tax income

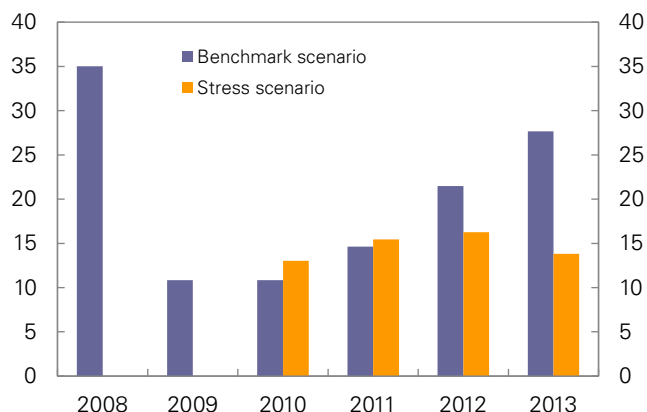
Chart 17 Share of homeowners with loan-to-value ratio of more than 100%¹⁾



¹ Projections for 2010–2013.

Sources: Statistics Norway and Norges Bank

Chart 18 Share of homeowners with interest expenses above 20% of post-tax income¹⁾



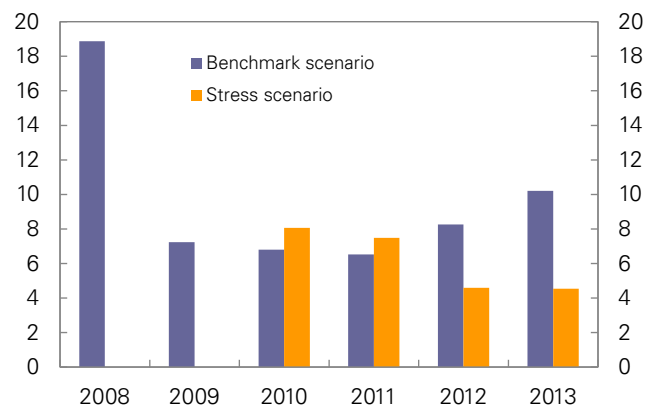
¹ Projections for 2010–2013.

Sources: Statistics Norway and Norges Bank

Households with a loan to value ratio of over 100% and an interest burden of over 20% are classified as vulnerable.

House prices increase in the benchmark scenario, resulting in a fall in the share of homeowners with a loan to value ratio of over 100% (see Chart 17.1). In the adverse scenario house prices fall, which has the opposite effect. The interest rate in the benchmark and the adverse scenario influences the percentage of homeowners with an interest burden over 20%. Because the interest rate is lower in the adverse scenario than in the benchmark scenario, the share of vulnerable homeowners measured by this indicator will be higher in the benchmark scenario than in the adverse scenario (see Chart 18). In both projections, the level remains lower than in 2008. Chart 19 combines the two indicators. Neither the benchmark nor the adverse scenario results in a dramatic change in the share of vulnerable homeowners compared with the situation in 2008.

Chart 19 Share of homeowners with loan-to-value ratio above 100% and interest expenses exceeding 20% of post-tax income¹⁾



¹ Projections for 2010–2013.

Sources: Statistics Norway and Norges Bank

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Table 1 Stress scenarios in the three previous FS reports

	FS 2/09	FS 1/10	FS 2/10
Risk factors	Banks' short-term market funding	More expensive funding	Turbulence in international financial markets, more expensive funding
	Continued low activity abroad	Continued weak growth abroad. High government debt	Lower growth abroad, high government debt
	High household debt and over-optimism in the housing market	High household debt	High household debt
	Losses on loan exposures to commercial property, shipping and the Baltic countries		
Adverse scenario	Oil prices fall to USD 40 pb, manufacturing production falls and household expectations decline. Krone depreciates and inflation rises. Banks' losses on international exposures increase and banks increase lending margins.	Weak growth abroad results in low oil prices, about USD 40 pb. Real exchange rate still remains close to benchmark scenario as Norwegian krone perceived as a safe haven. Exports fall and unemployment rises. Household expectations weaken.	Weak growth abroad results in low oil prices, about USD 50 pb. Real exchange rate still remains close to benchmark scenario. Exports fall and unemployment rises. Household expectations weaken.
Shock variables	Household expectations	GDP among trading partners	GDP among trading partners
	Oil price	Household expectations	Household expectations
	GDP (fall in exports)	GDP	GDP
	Exchange rate (depreciates)	Oil price	Oil price
	Premiums money markets	Real exchange rate on a par with benchmark scenario	Real exchange rate on a par with benchmark scenario
		Interest margins and premiums in money markets	Premiums in international and Norwegian money markets

Table 2 Stress test Financial Stability 2/2010

Macroeconomic scenario. Percentage change from previous year unless otherwise stated (Benchmark scenario ¹⁾ in brackets)	2010	2011	2012	2013
Mainland GDP	1¼ (1¾)	-¼ (3)	1¾ (3)	2¼ (2¾)
CPI	2¼ (2¼)	¾ (1¼)	1¼ (2)	1½ (2¼)
Annual wage growth	3¼ (3½)	3½ (3¾)	3¼ (4¼)	3 (4½)
Registered unemployment (percentage of the labour force)	3 (3)	3 (2¾)	3½ (2½)	3½ (2½)
Exchange rate (Level. Import-weighted 44 countries)	90¾ (90¼)	91½ (90¾)	91¼ (90½)	91¾ (91½)
Oil price, USD per barrel (level)	64 (79)	50 (85)	50 (88)	52 (88)
Three-month money market rate, NIBOR (level)	3 (2½)	2½ (2¾)	2 (3½)	2 (4½)
Bank lending rates (level)	4¾ (4½)	4½ (4½)	3¾ (5)	3¾ (6)
House prices	6 (7¾)	-10 (4¾)	-4 (4)	2½ (3¾)
Credit to households ²⁾	6¼ (6¾)	3¾ (7)	2½ (6¾)	2¼ (6½)
Credit to non-financial corporations ²⁾	2¼ (2½)	-1½ (4½)	0 (6)	½ (6)
Bank³⁾ losses and profits				
Problem loans households ⁴⁾ (percentage share of lending to the sector)	1.3 (1.3)	1.5 (1.2)	1.4 (0.9)	1.3 (0.8)
Problem loans non-financial enterprises ⁴⁾ (percentage share of lending to the sector)	4.0 (3.4)	4.6 (3)	6.1 (3)	6.6 (3)
Problem loans total ⁴⁾ (percentage share of gross lending)	2.2 (2)	2.5 (1.8)	2.9 (1.6)	2.9 (1.5)
Loan losses (percentage of gross lending)	0.6 (0.2)	1.3 (0.2)	1.6 (0.1)	1.6 (0.1)
Pre-tax results (percentage of average total assets)	0.6 (0.9)	0.1 (0.9)	-0.1 (1.0)	0.2 (0.9)
Net interest income (percentage of average total assets)	1.2 (1.2)	1.0 (1.2)	1.0 (1.3)	1.3 (1.2)
Tier 1 capital (percentage of risk-weighted assets)	9.0 (9.3)	8.9 (9.4)	8.6 (9.5)	8.6 (9.5)

¹⁾ Benchmark scenarios for CPI, annual wage growth, registered unemployment, oil price, exchange rate and mainland GDP are from *Monetary Policy Report 3/2010*

²⁾ Change in stock measured at end-year

³⁾ Norway's five largest banks and Nordea Bank Norge

⁴⁾ Non-performing loans and other loans that banks regard as particularly doubtful. All banks excluding branches of foreign banks in Norway

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 and Norges Bank

Table 3 Stress test Financial Stability 1/2010

Macroeconomic scenario. Percentage change from previous year unless otherwise stated (Benchmark scenario ¹⁾ in brackets)	2010	2011	2012	2013
Mainland GDP	0 (2¼)	¼ (2¾)	½ (2½)	1¾ (2¼)
CPI	2½ (2½)	1¼ (1¾)	1½ (2½)	1½ (2½)
Annual wage growth	3¾ (3¾)	3½ (4¼)	2¾ (4¾)	2¾ (4¾)
Registered unemployment (percentage of the labour force)	3 (3)	3¾ (3)	4 (2¾)	4¼ (2¾)
Real exchange rate (Level. Import-weighted 44 countries)	91 (91)	92 (92)	93 (92)	93 (93)
Oil price, USD per barrel (level)	40 (80)	41 (84)	45 (86)	52 (86)
Three-month money market rate, NIBOR (level)	2¼ (2¼)	1¾ (3)	1¾ (4¼)	2 (4¾)
Bank lending rates (level)	4 (4)	3¾ (4¾)	3¾ (6)	4 (6½)
House prices	-4¼ (7½)	-13 (4)	-6½ (3)	-2 (3½)
Credit to households ²⁾	4½ (7¾)	1½ (6¼)	3 (6¾)	2¾ (5¾)
Credit to non-financial corporations ²⁾	-1¼ (0)	-¾ (3¾)	¼ (5½)	1¾ (6)
Bank³⁾ losses and profits				
Problem loans households ⁴⁾ (percentage share of lending to the sector)	0.7 (0.6)	0.8 (0.5)	1.0 (0.5)	1.0 (0.5)
Problem loans non-financial enterprises ⁴⁾ (percentage share of lending to the sector)	6.0 (4.0)	7.9 (4.0)	9.5 (4.0)	7.7 (3.2)
Problem loans total ⁴⁾ (percentage share of gross lending)	2.4 (1.7)	2.9 (1.6)	3.5 (1.6)	3.0 (1.4)
Loan losses (percentage of gross lending)	1.6 (0.3)	2.1 (0.3)	2.5 (0.2)	2.2 (0.1)
Loan losses, including extra losses to shipping and the Baltic countries (percentage of gross lending)	2.0	2.4	2.9	2.5
Post-tax results (percentage of average total assets)	-0.1 (0.6)	-0.5 (0.6)	-0.4 (0.6)	-0.4 (0.7)
Net interest income (percentage of average total assets)	1.0 (1.2)	1.0 (1.2)	0.9 (1.1)	1.0 (1.2)
Tier 1 capital (percentage of risk-weighted assets)	8.9 (9.4)	8.0 (9.4)	6.9 (9.4)	5.9 (9.4)
Capital adequacy (percentage of risk-weighted assets)	11.8 (12.2)	10.8 (12.3)	9.6 (12.3)	8.5 (12.4)

¹⁾ Benchmark scenarios for CPI, annual wage growth, registered unemployment, oil price, exchange rate and mainland GDP are from *Monetary Policy Report 1/2010*

²⁾ Change in stock measured at end-year

³⁾ Norway's five largest banks and Nordea Bank Norge

⁴⁾ Non-performing loans and other loans that banks regard as particularly doubtful. All banks excluding branches of foreign banks in Norway

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 and Norges Bank

Table 4 Stress test Financial Stability 2/2009

Macroeconomic scenario. Percentage change from previous year unless otherwise stated (Benchmark scenario ¹⁾ in brackets)	2009		2010		2011		2012	
Mainland GDP	-1¼	(-1¼)	0	(2¾)	¾	(3¼)	1½	(2¾)
CPI	2¼	(2¼)	1¾	(1¾)	3¼	(2¼)	3¾	(2½)
Annual wage growth	4	(4)	4	(4¼)	3	(4½)	3½	(4¾)
Registered unemployment ²⁾ (percentage of the labour force)	2¾	(2¾)	3¼	(3)	4	(2¾)	4½	(2¾)
Real exchange rate (Level. Import-weighted 44 countries)	97	(96)	105	(92)	106	(93)	103	(93)
Oil price, USD per barrel (level)	54	(62)	40	(82)	42	(87)	50	(87)
Three-month money market rate, NIBOR (level)	2½	(2½)	2¼	(2½)	3	(3¾)	4	(4½)
Bank lending rates (level)	4½	(4½)	4¼	(4¼)	5	(5½)	6	(6¼)
House prices	2½	(2¾)	¼	(8¾)	-9	(4½)	-9	(3½)
Credit to households ³⁾	6½	(6¾)	5	(7¼)	4	(7½)	3¾	(7)
Credit to non-financial corporations ³⁾	½	(1)	-¼	(4½)	-2	(5)	½	(5¼)
Debt-servicing capacity, non-financial corporations								
Share of debt among enterprises with a default probability above 5 per cent	11.5	(11.1)	16.0	(14.9)	18.7	(15.7)	19.6	(15.9)
Bank losses and profits								
Problem loans households ⁴⁾ (percentage share of lending to the sector)	1.0	(1.0)	0.8	(0.7)	0.9	(0.6)	1.2	(0.6)
Problem loans non-financial enterprises ⁴⁾ (percentage share of lending to the sector)	3.8	(3.6)	6.9	(4.0)	10.4	(4.0)	11.1	(4.0)
Problem loans total ⁴⁾ (percentage share of gross lending)	2.0	(1.9)	2.8	(1.8)	3.9	(1.8)	4.3	(1.8)
Loan losses excl. higher losses to shipping and the Baltic countries (percentage of gross lending)	0.7	(0.5)	1.7	(0.9)	2.4	(0.7)	2.8	(0.5)
Loan losses (percentage of gross lending)	0.6	(0.5)	1.3	(0.9)	1.8	(0.7)	2.1	(0.5)
Pre-tax results (percentage of average total assets)	0.5	(0.6)	-0.1	(0.5)	-0.6	(0.6)	-0.8	(0.6)
Net interest income (percentage of average total assets)	1.2	(1.2)	1.1	(1.2)	1.0	(1.2)	0.9	(1.2)
Tier 1 capital excluding capital injections (percentage of risk-weighted assets)	9.6	(9.5)	9.0	(9.7)	7.6	(9.6)	6.0	(9.5)
Tier 1 capital (percentage of risk-weighted assets)	8.3	(8.2)	7.8	(8.4)	6.4	(8.4)	4.8	(8.4)
Capital adequacy (percentage of risk-weighted assets)	12.5	(12.4)	11.9	(12.7)	10.5	(12.8)	8.7	(12.8)
Capital adequacy excluding capital injections (percentage of risk-weighted assets)	11.2	(11.1)	10.6	(11.5)	9.3	(11.6)	7.6	(11.7)

¹⁾ Benchmark scenarios for CPI, annual wage growth, registered unemployment, oil price, exchange rate and mainland GDP are from *Monetary Policy Report 3/2009*

²⁾ Benchmark scenario in Financial Stability 1/09 is not fully comparable with benchmark scenario in Financial Stability 2/09, as this series previously was calculated by using the same percentage change as in LFS unemployment

³⁾ Change in stock measured at end-year

⁴⁾ Non-performing loans and other loans that banks regard as particularly doubtful. All banks excluding branches of foreign banks in Norway

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 and Norges Bank