



NORGES BANK

2015

FINANCIAL STABILITY REPORT

VULNERABILITIES AND RISKS

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Norges Bank's *Financial Stability Report*

In the annual *Financial Stability Report*, Norges Bank assesses vulnerabilities and risks in the financial system, with a focus on the long-term, structural features of banks, financial markets and the Norwegian economy that are of importance for financial stability. Norges Bank's *Monetary Policy Report with financial stability assessment* includes an ongoing assessment of financial imbalances and the banking sector, Norges Bank's monetary policy assessments and the decision basis for the countercyclical capital buffer for banks.

The Executive Board discussed the 2015 *Financial Stability Report* at its meeting on 4 November.

FINANCIAL STABILITY AND NORGES BANK'S ROLE

Financial stability implies a financial system that is resilient to shocks and thus capable of channelling funds, executing payments and distributing risk efficiently.

Financial stability is one of Norges Bank's primary objectives in its work on promoting economic stability. Norges Bank's tasks and responsibilities in this area are set out in Section 1 of the Norges Bank Act, which states that the Bank shall "promote an efficient payment system domestically as well as vis-à-vis other countries". Section 3 states that "the Bank shall inform the Ministry of Finance when, in the opinion of the Bank, there is a need for measures to be taken by others than the Bank in the field of monetary, credit or foreign exchange policy". Under the Payment Systems Act, Norges Bank is the licensing authority for interbank clearing and settlement systems.

The central bank can provide extraordinary liquidity to individual institutions in the financial sector or to the banking system when liquidity demand cannot be satisfied from alternative sources and there is a threat to financial stability. As lender of last resort, Norges Bank monitors the financial system as a whole, with particular focus on the risk of systemic failure.

The Ministry of Finance shall set the level of the countercyclical capital buffer four times a year. Norges Bank has been assigned responsibility for preparing a decision basis and providing advice to the Ministry regarding the level of the buffer. The decision basis is published four times a year as part of the *Monetary Policy Report with financial stability assessment*.

EXECUTIVE BOARD'S ASSESSMENT

In the *Financial Stability Report*, Norges Bank assesses vulnerabilities and risks in the Norwegian financial system and points to measures that can contribute to financial stability. The Executive Board discussed the content of the *Report* on 4 November.

The Executive Board notes that Norwegian banks are currently posting solid earnings, while losses are low. Capital ratios have increased substantially in recent years and banking sector liquidity has improved, boosting banks' resilience. At the same time, some aspects of the Norwegian economy and financial system are a source of vulnerability for banks:

- Household debt burdens are high. Debt growth is lower than in the years preceding the financial crisis, but household debt is still growing more rapidly than household income. Younger households in particular are vulnerable because of high debt, a high interest burden and limited assets other than housing wealth. With high levels of debt, households faced with a drop in income, an increase in interest rates or a fall in house prices may tighten consumption considerably. This could amplify a downturn and lead to higher bank losses.
- Real estate prices have risen for a long period. Banks have substantial exposures to commercial real estate. In regions highly exposed to the petroleum sector, both the housing and commercial real estate markets are showing signs of weakness, particularly in the southwest of Norway. Spillover effects from the fall in oil prices may also gradually result in weaker developments in other regions.
- Norwegian banks make extensive use of short-term foreign currency funding. Maturities have fallen over the past year. Short-term funding that is not matched by high quality liquid assets may give rise to refinancing risk. New regulation of US money market funds may restrict Norwegian banks' access to short-term USD funding.

Central bank purchases of securities have pushed down long-term interest rates. Investors have responded by investing in other securities, which has pushed down risk premiums. At the same time, there

is considerable uncertainty about developments in the global economy and about how long central banks will continue to employ unconventional measures. Even relatively small events have triggered strong reactions in financial markets. In the event of a rapid rise in risk premiums in international financial markets, Norwegian banks may find it more demanding to obtain wholesale funding.

The fall in oil prices has weakened the growth outlook and has heightened uncertainty regarding further developments in the Norwegian economy. This has increased the probability that a rise in risk premiums on bank funding or a shift in sentiment in the real estate market could trigger a downturn and lead to bank losses in the next few years. A sharp contraction in elevated real estate prices and high household debt could then amplify the downturn. The stress test in this *Report* shows that banks could face large loan losses in the event of a pronounced downturn in the Norwegian economy, but also that capital buffers have increased the resilience of the banking system. Larger capital buffers and improved liquidity reduce the risk that a downturn or financial turbulence will develop into a financial crisis.

The Executive Board notes that central counterparties (CCP) have become more systemically important in international financial markets. The requirement for central counterparty clearing has been an important measure to address the challenges in derivatives markets that were revealed during the financial crisis. Norwegian banks trade interest rate derivatives through CCPs abroad. CCP clearing will normally enhance the management of counterparty risk. However, the concentration of risk in CCPs is a source of vulnerability.

Vulnerabilities in the Norwegian financial system and the Norwegian economy have prompted the introduction of stricter bank capital and liquidity requirements since the financial crisis. Risk-weighted capital requirements are intended to ensure that bank equity is commensurate with the risk of losses. Banks calculate risk weights on the basis of historical loan losses. Insufficient data and model uncertainty can result in risk weights that are too low. This demonstrates the need

for a backstop mechanism. Norwegian capital requirements currently include such a backstop mechanism in the transitional rule, which is based on the risk weights in the Basel I framework. The transitional rule is applied differently in different European countries.

A leverage ratio is an alternative backstop mechanism. There are plans to introduce a leverage ratio requirement in the EU in 2018. Finanstilsynet (Financial Supervisory Authority of Norway) sent a letter in June to the Ministry of Finance assessing such a requirement for Norwegian banks.

The Executive Board holds the view that a sufficiently high leverage ratio requirement could replace the transitional rule. A leverage ratio is independent of risk weights. A leverage ratio requirement could therefore be more appropriate as a backstop mechanism than the current transitional rule. Eliminating the transitional rule will simplify comparison of capital adequacy ratios across banks from different countries. In addition, the leverage ratio is a direct measure of banks' loss-absorbing capital.

The minimum leverage ratio requirement in the EU is expected to be 3%. Several European countries are introducing a higher requirement. The Executive Board holds the view that a leverage ratio requirement

for Norwegian banks should be sufficiently high to sustain banks' resilience to losses. Norwegian banks currently maintain an overall leverage ratio of a good 6%, close to their average level over the past 20 years.

The Executive Board holds the view that a leverage ratio requirement should comprise a minimum requirement and buffer requirements, corresponding to the risk-weighted capital requirements. Systemically important banks should be subject to stricter requirements than other banks with regard to loss-absorbing capacity. Higher buffer requirements should therefore be imposed on systemically important banks. One possible structure is to set a minimum requirement and a fixed ratio between the buffer requirement and the risk-weighted buffer requirements. Banks should be able to draw down capital buffers in the event of substantial loan losses.

The outcome of international regulatory processes may influence the final design of the leverage ratio requirement. The phasing-in of the requirements should be assessed in the light of other requirements imposed on banks. The level of any leverage ratio requirement should be publicised.

Øystein Olsen
11 November 2015

RECOMMENDATION

A sufficiently high leverage ratio requirement could replace the transitional rule (Basel I floor).

The leverage ratio requirement should include buffer requirements, corresponding to the requirements relating to risk-weighted capital.

Systemically important banks should be subject to higher requirements than other banks.

The total requirement must be high enough to ensure that banks at minimum maintain their current leverage ratio level of about 6%.

The level of the leverage ratio requirement should be publicised.

SUMMARY

In the 2015 Financial Stability Report, Norges Bank assesses vulnerabilities and risks in the Norwegian financial system and presents its recommendation on a leverage ratio for Norwegian banks.

1. RISK OUTLOOK

Global growth is continuing at a moderate pace, but uncertainty with regard to developments in China and other emerging economies has increased. Weaker prospects for the Norwegian economy have increased the probability that a shift in sentiment in the real estate market or an abrupt rise in bank funding costs could trigger a downturn and lead to financial turbulence. A sharp contraction in elevated real estate prices and high household debt could amplify the downturn. At the same time, banks are now better prepared for more demanding times.

2. BANK SOLVENCY

Norwegian banks have almost doubled their Common Equity Tier 1 (CET1) capital ratios in recent years. This has made them more resilient to future loan losses. The stress test shows that the largest Norwegian banks could experience high loan losses in the event of a pronounced downturn in the Norwegian economy without breaching the minimum capital adequacy requirement. The financial crisis revealed that banks' risk weights may underestimate real risk. This indicates that a non-risk weighted solvency measure should also be required, i.e. a leverage ratio.

3. BANK FUNDING

Norwegian banks have ample access to wholesale funding, but new regulations are having an impact on funding markets and banks' funding structures. New liquidity regulations will reduce banks' vulnerability to funding shortfalls. Covered bonds are an important funding source for banks' residential mortgage lending. A sharp decline in house prices may raise risk premiums and reduce banks' access to funding.

4. CENTRAL COUNTERPARTIES AND SYSTEMIC RISK

The financial crisis revealed a number of weaknesses in derivatives markets. The EU regulation EMIR implements the requirement that all standardised OTC derivatives contracts must be cleared through a central counterparty (CCP). Norwegian banks' interest rate derivative transactions are cleared through CCPs abroad. CCPs have effective risk management procedures. Losses that arise are shared by the CCP's members. At the same time, an increase in the use of CCPs also increases concentration risk.

1 RISK OUTLOOK

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Global growth is continuing at a moderate pace, but uncertainty with regard to developments in China and other emerging economies has increased. Weaker prospects for the Norwegian economy have increased the probability that a shift in sentiment in the real estate market or a rise in bank funding costs could trigger a downturn and lead to bank losses. A sharp contraction in elevated real estate prices and high household debt could amplify the downturn. At the same time, banks are now better prepared for more demanding times.

VULNERABILITIES AND RISKS IN NORWAY

With more capital and liquidity, banks are better equipped to cope with higher losses. On the other hand, there are vulnerabilities in the Norwegian financial system: high household debt, a persistently strong rise in real estate prices and banks' short-term foreign currency funding.¹

A MORE RESILIENT BANKING SECTOR

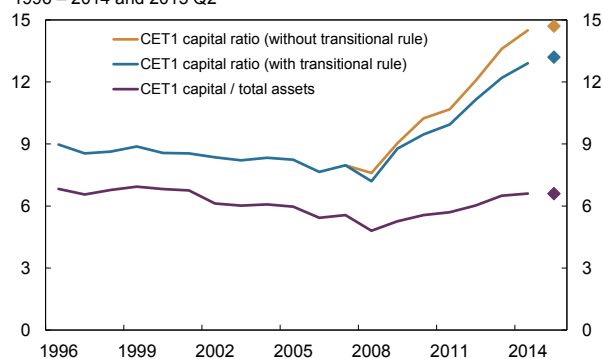
Banks have posted solid earnings in recent years and losses have been low. Profits have been used to provide a considerable boost to capital ratios. Banks' Common Equity Tier 1 (CET1) capital ratios have almost doubled in recent years (Chart 1.1). Banking sector liquidity has improved. The stress test in Section 2 shows that the increase in capital ratios has provided banks with solid capital buffers to draw on.

At the same time, some aspects of the Norwegian economy and financial system increase banks' vulnerability. The key vulnerabilities in the Norwegian financial system are summed up in the box on page 10 and described below.

HIGH HOUSEHOLD DEBT

Household debt burdens are high. Debt growth has slowed since the financial crisis, but household debt

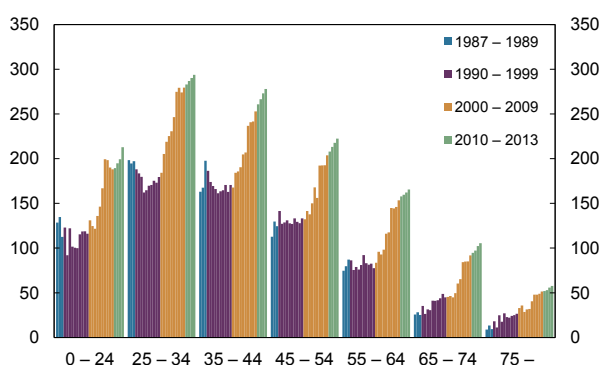
Chart 1.1 Common Equity Tier 1 (CET1) capital ratio and CET1 capital as a share of total assets. Norwegian banks overall.¹ Percent. 1996 – 2014 and 2015 Q2



1) Consolidated figures are used for banks that are banking groups. For the other banks, parent bank figures are used.

Source: Finanstilsynet (Financial Supervisory Authority of Norway)

Chart 1.2 Debt to after-tax income ratio by age of main income earner. Percent. 1987 – 2013



Sources: Statistics Norway and Norges Bank

1 The IMF has recently published an assessment of the financial system in Norway (see box on page 15).

has continued to grow more rapidly than household disposable income over the past year.

Debt burdens have risen across all age groups since the beginning of the 2000s (Chart 1.2). Household equity is high, but largely consists of housing wealth. Younger households in particular are vulnerable because of high debt, a high interest burden and limited assets other than housing wealth.

Increased uncertainty, higher unemployment and a possible fall in house prices could lead to both an abrupt fall in consumption and a higher default rate. Nevertheless, as indicated by the analyses in the 2014 *Financial Stability Report*, the probability of a sharp increase in the mortgage default rate is moderate. Households will probably respond to a fall in income and house prices by cutting consumption in order to service debt. A fall in household consumption may in turn affect corporate earnings and debt-servicing

KEY VULNERABILITIES IN THE NORWEGIAN FINANCIAL SYSTEM

KEY VULNERABILITIES IN NORWAY

High household debt

Persistently strong rise in real estate prices

Banks' short-term foreign currency funding

Change since the 2014 *Financial Stability Report*



There are three vulnerability levels, of which red is the highest:

Norges Bank's *Financial Stability Report* assesses financial system vulnerabilities and the risk of potential financial shocks that could have severe consequences for the real economy.

Vulnerabilities can build up gradually over time or be caused by persistent structural weaknesses in the financial system. Vulnerabilities can amplify a downturn and lead to financial turbulence when the economy is exposed to shocks.

Shocks that trigger financial turbulence or a downturn can be difficult for the authorities to predict and influence. Shocks to a small open economy like Norway will often originate in other countries. Even relatively minor shocks or a shift in expectations can trigger turbulence when vulnerability levels are high.

In the table there are three vulnerability levels: yellow, orange and red, with red representing the

highest level. The vulnerability assessment is founded on historically based insight into the causes of downturns and financial turbulence. The vulnerabilities identified as key vulnerabilities may change over time. The arrows indicate whether vulnerabilities are assessed as having increased, decreased or remained unchanged since the 2014 *Financial Stability Report*.

If vulnerabilities are categorised as orange or red, Norges Bank will consider issuing advice on measures to address them. These may be measures aimed at reducing the vulnerabilities directly or increasing banking sector resilience. The authorities have already implemented measures to address the three vulnerabilities summarised above, including measures to strengthen banks' capital base. It may take time before the effects of measures already implemented can be observed.

capacity. Banks may then experience losses on loans to enterprises. The losses may impair banks' ability to extend credit, thereby amplifying the downturn.

High debt levels have increased households' vulnerability to interest rate increases. With a three percentage point increase in interest rates, household interest burdens could come close to the levels prevailing at the end of the 1980s (Chart 1.3).

PERSISTENTLY STRONG RISE IN REAL ESTATE PRICES

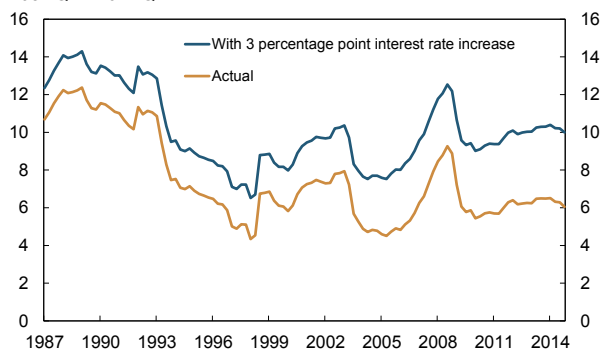
Real estate prices have risen rapidly for a long period (Chart 1.4). In central Oslo, estimated selling prices for high-standard office premises have continued to rise markedly over the past year. For the most attractive office premises in Oslo, owners' required rate of return has drifted down in tandem with the fall in financing costs. The rate of return required by investors in commercial real estate may increase in the event of a global rise in interest rates or higher risk premiums, which could in turn trigger a fall in commercial real estate prices.

There are also wide regional differences in the commercial real estate market. In the Stavanger area, the vacancy rate in square metres for commercial real estate has increased considerably, pushing down rental prices. Rental prices have also declined in certain areas that are exposed to the petroleum industry.

Banks have considerable exposure to the commercial real estate sector. A period of weak growth in the Norwegian economy could lead to commercial premises remaining vacant or lower rental prices, which would reduce the profitability and debt-servicing capacity of commercial real estate companies. Compared with other industries, the ratio of earnings to debt is low for commercial real estate companies, with the vulnerability this entails.²

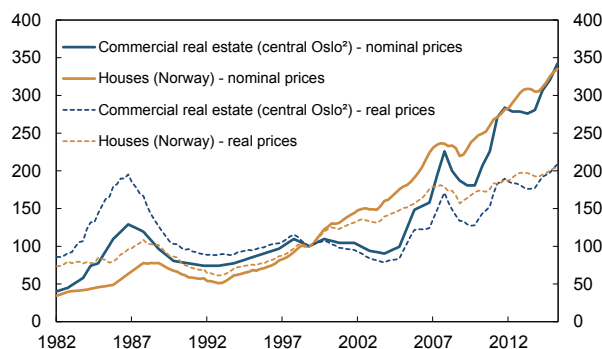
House prices rose sharply through autumn 2014 and the beginning of 2015. House prices have risen somewhat faster than household disposable income since 2014. Prices have risen more slowly in recent months. In Oslo, prices have increased by about 10% over the past year, while they have fallen in Stavanger. Higher unemployment and increased household uncertainty

Chart 1.3 Households' interest burden.¹ Actual and in the event of a three percentage point increase in lending and deposit rates. Percent. 1987 Q1 – 2014 Q4



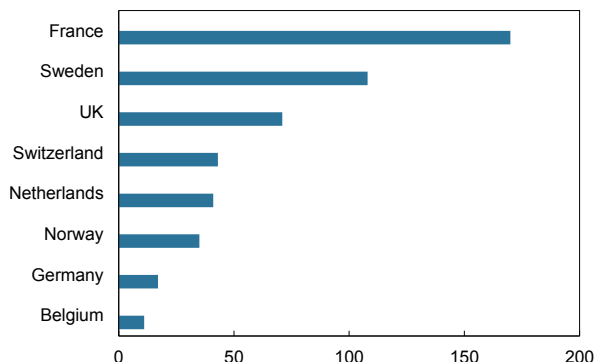
1) Interest expenses as a percentage of disposable income adjusted for estimated reinvested dividend income for 2003 – 2005 and redemption/reduction of equity capital for 2006 Q1 – 2012 Q3 plus interest expenses.
Sources: Statistics Norway and Norges Bank

Chart 1.4 House and commercial real estate prices.¹ Index. 1998 Q4 = 100. 1982 Q1 – 2015 Q2



1) House prices and GDP deflator are seasonally adjusted. Semi-annual commercial real estate prices are linearly interpolated.
2) Estimated selling prices for high-standard office premises in central Oslo.
Sources: Eiendom Norge, Eiendomsverdi, Finn.no, Dagens Næringsliv, OPAK, Statistics Norway and Norges Bank

Chart 1.5 US prime money market funds' total bank exposures¹ in Europe. In billions of USD. As at 31 August 2015



1) J.P. Morgan estimate.
Source: J.P. Morgan

2 See box on credit risk in commercial real estate and construction in Section 2.

about economic developments may lead to a fall in house prices in other regions too.

BANKS' SHORT-TERM FOREIGN CURRENCY FUNDING

Short-term funding from US money market funds came to about NOK 35bn at end-August (Chart 1.5), accounting for around 12% of banks' total wholesale funding. The percentage share varies considerably over time. Experience shows that short-term funding can dry up abruptly and prove difficult to replace.

DNB borrows short, as do the large Swedish banks, in the USD market. Much of that funding is matched by central bank deposits. The share that is not matched by such highly liquid assets could give rise to refinancing risk.

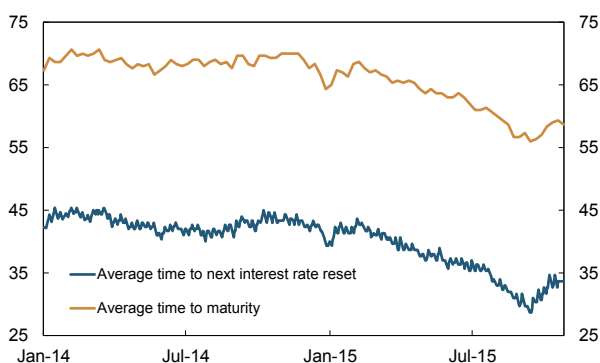
Over the past year, short-term funding maturities have declined, partly due to new regulations on money market funds and expectations of an increase in US interest rates (Chart 1.6; see also Section 3). This may increase banks' vulnerability to financial market turbulence.

Banks have ample access to wholesale funding today. However, low oil prices and uncertainty surrounding developments in the Norwegian economy have increased the likelihood that short-term USD funding will become more costly or less accessible.

MEASURES TO MITIGATE VULNERABILITIES

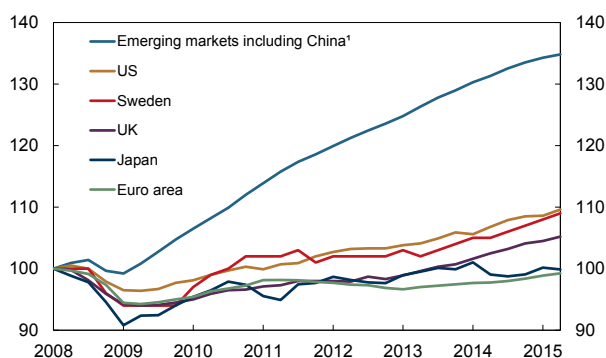
Vulnerabilities in the Norwegian financial system and the Norwegian economy have led to stricter capital and liquidity requirements for banks since the financial crisis. A more resilient banking sector reduces the risk that stress or turbulence in the markets will lead to financial crisis.

Chart 1.6 Average maturity of US money market funds¹ assets. Number of days. 3 January 2014 – 27 October 2015



1) Money market funds that invest in short-term paper issued by banks, referred to as prime funds. Sources: JP Morgan and Norges Bank

Chart 1.7 GDP. Seasonally adjusted volume index. 2008 Q1 = 100. 2008 Q1 – 2015 Q2



1) Emerging markets comprise China, Thailand, Poland, Turkey, Russia, Indonesia, India and Brazil. Weighted by Norwegian export weights. Sources: Thomson Reuters and Norges Bank

The Norwegian authorities have implemented new international regulations earlier than many other countries and implemented a number of measures to increase capital requirements for banks. The level of banks' risk-weighted assets has been maintained by continued application of the transitional rule based on the former Basel I framework. In addition, the authorities have increased the risk weights for residential mortgages.

Against the background of the persistent rise in real estate prices and household debt, the Ministry of Finance, on advice from Norges Bank, decided to increase the countercyclical buffer rate for banks to 1.5%, with effect from 30 June 2016. Furthermore, the Ministry issued an interim regulation in June defining requirements for new residential mortgage lending. The regulation sets out requirements for loan-to-value ratios, debt-servicing capacity and principal repayment, but provides banks with a quota for non-compliant mortgages. Some banks included in Norges Bank's lending survey have reported that the new requirements have contributed to somewhat tighter credit standards. Finanstilsynet's (Financial Supervisory Authority) mortgage lending survey for 2015 indicates that the number of bank loans with an LTV ratio above 85% has decreased somewhat compared with 2014.

The Liquidity Coverage Ratio (LCR) requirement, recently circulated for consultation by the Ministry of Finance, will strengthen banks' resilience to a period of financial turbulence. The requirement contributes to reducing short-term refinancing risk.

GLOBAL RISK OUTLOOK

Growth in the world economy is moderate, but uncertainty surrounding economic developments in China and emerging economies has increased. There are signs of lower liquidity in financial markets.

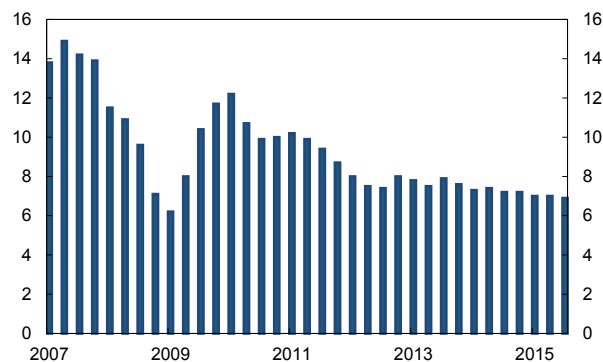
The world economy is growing at a moderate pace (Chart 1.7). The projections in the September 2015 *Monetary Policy Report* imply that growth will pick up slightly in 2016. The US and UK economies have continued to expand and an increase in policy rates is expected soon in both countries. A cautious recovery is continuing in the euro area. However, against the background of low inflation prospects, the European Central Bank is likely to keep policy rates near zero and continue to pursue unconventional monetary policy.

European banks are in a stronger position now than a year ago. Capital ratios are higher, but profitability is low.³ Large stocks of non-performing loans are still limiting lending capacity.

Emerging economies are growing at a slower pace than in 2014. There is a high level of uncertainty, particularly surrounding future developments in China (Chart 1.8). Weak export performance for the largest advanced economies may indicate that some manufacturing segments are feeling the impact of lower growth in emerging economies. Many emerging economies have a high debt to GDP ratio, and in a number of these countries this ratio has risen faster since the financial crisis (Chart 1.9).

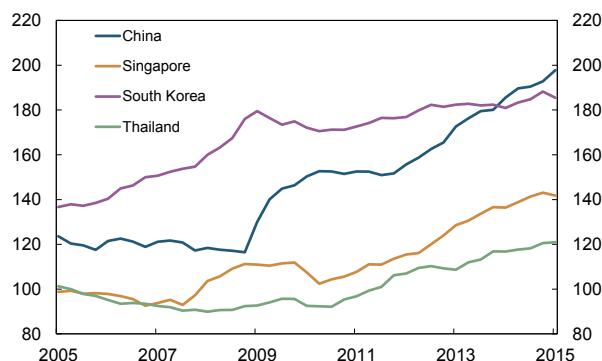
China's stock market recorded a considerable decline through summer. In August, the Chinese authorities announced a change in the exchange rate system that resulted in a depreciation of the domestic currency and market turbulence. There is considerable uncertainty with regard to a smooth implementation of further reforms and the effectiveness of government measures to prevent an abrupt fall in the growth rate. Private sector debt has shown a sub-

Chart 1.8 GDP China. Four-quarter growth. Percent. 2007 Q1 – 2015 Q3



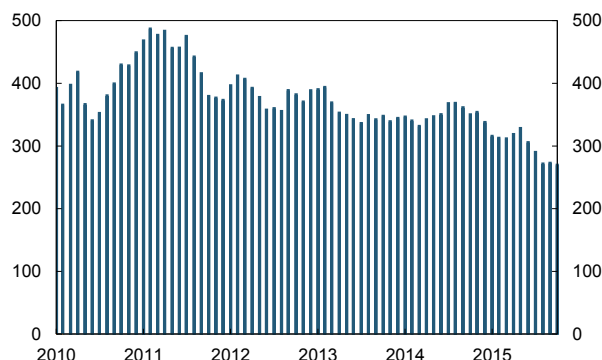
Source: Thomson Reuters

Chart 1.9 Credit to private sector as a share of GDP. Percent. 2005 Q1 – 2015 Q2



Sources: Thomson Reuters, Bank for International Settlements and Norges Bank

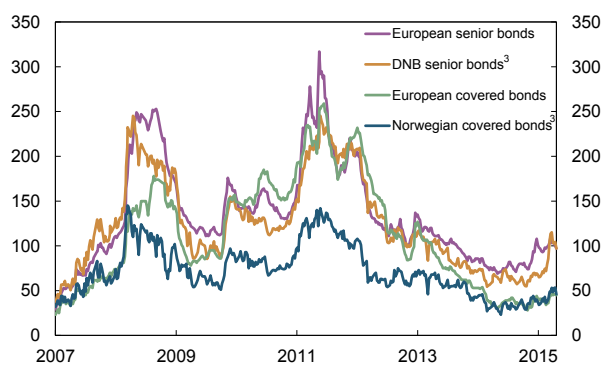
Chart 1.10 Industrial metal prices.¹ January 2010 – October 2015



1) Industrial metals index. Source: Thomson Reuters

³ See latest Risk Assessment Report and Basel III Monitoring Report from the European Banking Authority (EBA).

Chart 1.11 Risk premium¹ in European and Norwegian bank bonds².
Basis points. Week 29 2007 – week 45 2015



1) Difference against German government bonds.
2) Maturity of approximately five years.
3) Denominated in NOK swapped into EUR.
Sources: Thomson Reuters and DNB Markets

stantial increase in recent years and local government debt is very high. If local government funding conditions deteriorate, the result may be a fall in the pace of investment. The manufacturing sector is growing at a slower pace than earlier, contributing to a fall in industrial metal prices (Chart 1.10). If growth performance in China's services sector also worsens, the result may be a sharp setback with repercussions for the world economy and in particular for China's close trading partners and commodity-exporting countries. Moreover, oil prices may remain low for longer. An abrupt fall in economic growth in China could also trigger turbulence in financial markets.

SIGNS OF LOWER LIQUIDITY IN FINANCIAL MARKETS

In recent years, relatively small events have on several occasions triggered strong reactions in financial markets, which may be a sign that market liquidity is lower than before.

In the years preceding the onset of the financial crisis in 2008, bond and foreign exchange markets appeared to be highly liquid. The period featured strong economic growth and few market disturbances. Internationally, a large majority of transactions in securities markets involved banks, contributing to high turnover and low transaction costs. Ample access to cheap short-term funding and very low capital requirements enabled banks to build up large securities portfolios.

Stricter regulation since the financial crisis has reduced banks' vulnerability. At the same time, capital and liquidity requirements may have pushed up transaction costs and reduced market liquidity.

Despite signs of lower liquidity, risk premiums are not high (Chart 1.11). After a long period of unusually low policy rates and with expectations that rates will remain low for a long time, the search for yield has become more demanding. As a result, demand for risky assets has increased and pushed down risk premiums. This tendency has been amplified by large securities purchases by central banks internationally.

Risk premiums have edged up over the past year, albeit from low levels. Lower market liquidity could lead to a rapid increase in risk premiums. Higher premiums in international financial markets will also spill over to Norwegian banks' funding costs.

IMF ASSESSMENT OF THE NORWEGIAN FINANCIAL SYSTEM¹

In early September, the International Monetary Fund (IMF) presented a detailed assessment of the Norwegian financial system. Under its Financial Sector Assessment Program (FSAP), the IMF regularly conducts such assessments of member countries. The aim is to identify vulnerabilities and strengths and to recommend measures to enhance the resilience of the financial system nationally and internationally. The previous FSAP report on Norway was published in 2005.¹

The report's main conclusion is that the Norwegian financial system coped well with the global financial crisis in 2008–2009 and that buffers have been built up further in the post-crisis period. At the same time, the IMF is of the opinion that financial imbalances have built up, referring in particular to high household indebtedness, overvalued house prices and banks' increased reliance on wholesale funding.

The IMF's key recommendations are:

- Requirements for banks' new **residential mortgage** loans should be tightened further to constrain household debt growth. The tax incentives for home ownership should be reduced, and measures should be implemented to stimulate the supply of new housing units.
- Risks related to **banks' wholesale funding** should be reduced. One possibility is to set limits on the proportion of short-term funding from abroad and limits on the maturity mismatch between foreign currency funding and the currency swaps banks enter into to convert foreign currency debt into NOK.
- Finanstilsynet (Financial Supervisory Authority of Norway) should continue to restrict dividend payouts by weakly capitalised **insurance companies**. The stress test framework for the insurance sector should be enhanced, with particular emphasis on assessing liability-side risks.
- Decision-making processes in the area of **macro-prudential policy** could be standardised and made more transparent. Greater delegation of decision-making powers over macroprudential instruments to Norges Bank or Finanstilsynet should be considered; alternatively, a formal committee structure could be established. The authorities should also prepare an annual review of the purpose and impact of the use of macroprudential policy instruments.
- In their work on **financial market infrastructure**, Norges Bank and Finanstilsynet should strengthen regulatory cooperation to handle potential risks related to the outsourcing of critical financial market infrastructures (FMIs). Norges Bank should also draw on Finanstilsynet's IT expertise in its oversight of operational risk in Norges Bank's settlement system (NBO). The IMF is of the opinion that Norwegian FMIs are modern and stable, but points out that contingency arrangements, the risk management framework and governance arrangements for the Norwegian Interbank Clearing System (NICS) could be improved.
- Banks should consider introducing more conservative assumptions in their **stress testing** models. The IMF's stress tests show a far more pronounced decline in capital ratios than banks' own stress tests. More extensive stress testing of banking sector liquidity risk should be performed. Finanstilsynet and Norges Bank should cooperate more closely on bank stress tests.
- **Finanstilsynet's** formal independence should be strengthened. Finanstilsynet's resources should be augmented to improve the supervision of smaller banks and the work to detect money laundering and combat terrorist financing.

¹ See the IMF's FSAP Financial System Stability Assessment for Norway, 2015.

LOW RETURNS POSE CHALLENGES TO DEFINED BENEFIT PENSION PLANS

Occupational pension plans are designed to finance future old-age pensions for persons with wage income. Defined benefit (DB) pension plans feature a fixed level of future payouts. Premium payments (the savings component) combined with accumulated return must be sufficient to finance pension payouts. Low interest rates and low investment returns pose challenges to life insurance companies¹ and pension funds in terms of financing future payouts without an increase in premiums.

Return assumptions are decisive for determining the size of premiums. Pension policies are designed based on a technical rate that corresponds to the assumption about the future return. A cap on the technical rate is set by Finanstilsynet (Financial Supervisory Authority of Norway) and has been reduced in recent

years, from 2.5% to 2.0% from January 2015.² But a lowering of the maximum technical rate only reduces the guaranteed return on subsequent premiums. The average guaranteed return for life insurance companies was slightly lower than 3.2% at the end of 2014.³

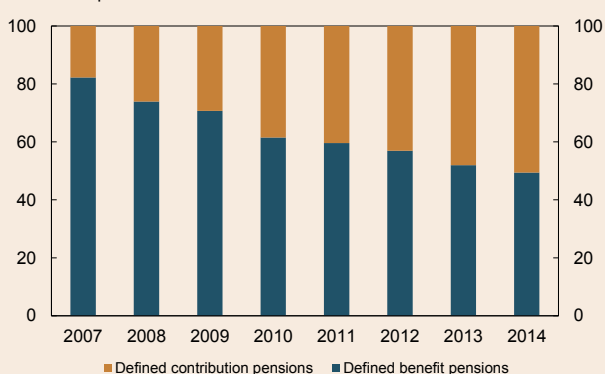
A lower technical rate requires an increase in premiums, rendering DB plans seemingly more expensive. As a result, many private sector agents have switched to defined contribution (DC) pension plans (Chart 1.12). DC plans do not provide for a fixed level of future payouts. Payouts will vary with the return accrued during the accumulation period.

Shifting to a DC plan in the private sector involves the closure or termination of a DB plan. In the case of closure, existing employees continue under the old DB plan while new employees are covered by a DC

1 The largest private sector life insurers are DNB Livsforsikring and Storebrand Livsforsikring. KLP is the largest life insurer in the public sector.

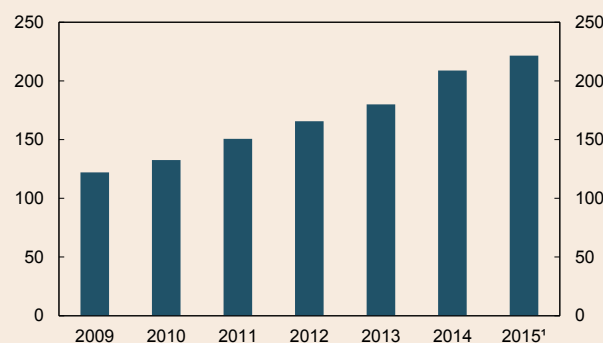
2 The maximum technical rate is set on the basis of long-term interest rates. It was 3% from 1994, 2.75% from 2006 and 2.5% from 2011.
3 Source: Risk Outlook 2015, Finanstilsynet.

Chart 1.12 Gross premium due in private defined benefit and defined contribution pension schemes. Percent. 2007 – 2014



Source: Finance Norway

Chart 1.13 Liabilities of paid-up policies. In billions of NOK. 2009 – 2015



1) As at 30 June 2015.
Source: Finance Norway

plan. Paid-up policies are issued when a DB plan in the private sector is terminated. Paid-up policies are contracts of insurance that provide for entitlement to a future pension without any further premiums payable by employer or employee. The termination of DB plans has resulted in a substantial increase in the volume of paid-up policies (Chart 1.13). Paid-up policies accounted for 20% of life insurance companies' liabilities at the end of 2014 (Chart 1.14).

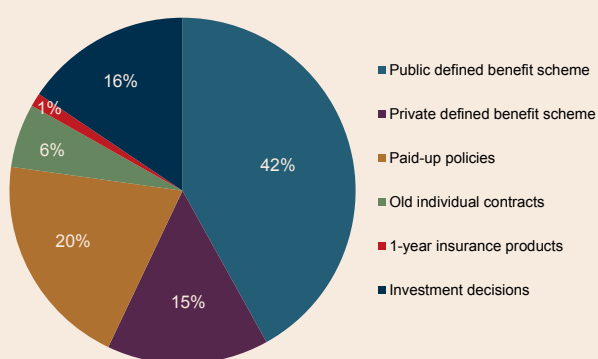
Paid-up policies pose a particular challenge for life insurance companies and pension funds in an environment of low interest rates and low investment returns because life insurance companies and pension funds are obliged to cover the difference between the technical rate and the actual return. For public and private sector pension plans, the difference is covered by employers through increased interest rate guarantee premiums.

The new regulatory regime for EU and EEA insurers, Solvency II, will be implemented on 1 January 2016. Solvency II better reflects the risk associated with DB plans than existing regulation. Under the new regulation, insurers' assets and liabilities are valued at market value. The value of insurance liabilities is computed by discounting future net payouts by the risk-free long-term interest rate. The fall in long-term interest rates has increased the value of insurance liabilities, reducing the value of equity capital. Transitional arrangements curb the negative effects of adaptation to market values.

Under Solvency II, equity capital must be sufficient to survive a severe adverse scenario that affects the value of insurers' equity capital (in practice a stress test). A fall in long-term interest rates is an example of such an adverse development. When the level of interest rates falls, the loss potential rises while the market value of equity capital decreases.

Life insurers report a stress test to Finanstilsynet applying assumptions that are close to the upcoming rules under Solvency II.⁴ The stress test shows that a number of life insurers face challenges, but it does not take into account the transitional rules in the new regulation. Solvency II does not apply to pension funds, but they too report stress test results to Finanstilsynet. Stress testing of pension funds at the end of the first half of 2015 showed an improvement since the beginning of the year. Pension funds with a large proportion of paid-up policies may nevertheless face challenges if interest rates and returns remain low.

Chart 1.14 Insurance liabilities by contract type. As at 31 December 2014

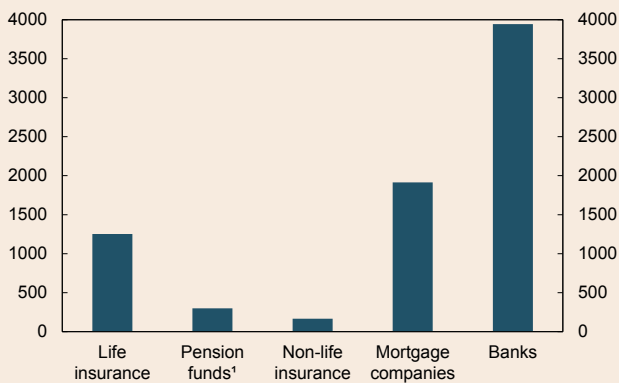


Source: Finanstilsynet

⁴ This stress test is referred to as "Stress test I" (see Finanstilsynet's website, Norwegian only).

The challenges facing life insurance companies and pension funds do not normally pose a direct threat to financial stability, but may have adverse indirect effects. Life insurance companies do not have a direct role in the payment system, and their overall assets are low compared with banks (Chart 1.15). On the other hand, life insurance companies have an indirect role given their investments in debt securities issued by banks. There is also a risk that uncertainty surrounding pension payouts could affect confidence in other financial institutions, including banks.

Chart 1.15 Total assets for Norwegian financial institutions by category. In billions of NOK. As at 30 June 2015



1) Includes private and municipal pension funds. Figures for pension funds are estimated. Sources: Finanstilsynet and Norges Bank

2 BANK SOLVENCY

HIGH PROFITS, BUT INCREASED UNCERTAINTY	19	• Norwegian banks well above expected EU minimum requirement	25
• Increasing oil-related credit risk for banks	20	• A sufficiently high leverage ratio requirement could replace the transitional rule	26
BANK SOLVENCY IN THE EVENT OF A PRONOUNCED DOWNTURN	21	BOX: LEVERAGE RATIO BASED ON LOSSES IN THREE PREVIOUS CRISES	27
• Economic downturn	21	BOX: CREDIT RISK IN COMMERCIAL REAL ESTATE AND CONSTRUCTION	28
• Weaker bank solvency	22	• Measures of risk in the corporate sector	28
FOCUS: LEVERAGE RATIO REQUIREMENT FOR NORWEGIAN BANKS	24	• Vulnerable enterprises and debt at risk	29
• Risk-weighted and unweighted capital requirements complement each other	24	• Losses on loans to commercial real estate and construction	31
• Other countries are introducing leverage ratio requirements	25		

Norwegian banks have almost doubled their Common Equity Tier 1 (CET1) capital ratios in recent years. This has made them more resilient to future loan losses. The stress test shows that the largest Norwegian banks could experience high loan losses in the event of a pronounced downturn in the Norwegian economy without breaching the minimum capital adequacy requirement. The financial crisis revealed that banks' risk weights may underestimate real risk. This indicates that a non-risk weighted solvency measure should also be required, i.e. a leverage ratio.

HIGH PROFITS, BUT INCREASED UNCERTAINTY

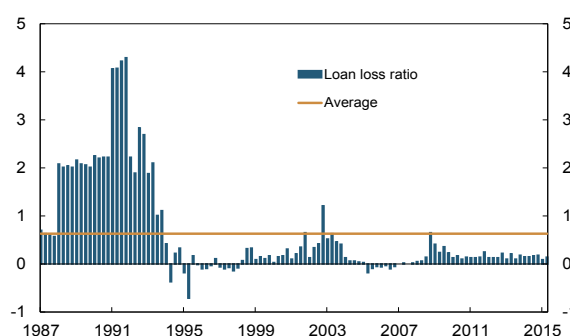
Banks continue to post high earnings and strengthen equity capital. Weaker developments in the Norwegian economy may contribute to higher losses and reduced earnings ahead.

Norwegian banks¹ have posted solid profits in the years since the financial crisis, and losses have been very low (Chart 2.1), reflecting solid growth in the Norwegian economy. Low oil prices and weaker growth in the Norwegian economy will affect banks. They expect higher losses in 2016.

Banks have largely used their solid profits to strengthen equity capital. CET1 capital ratios for Norwegian banks have almost doubled in the period since the financial crisis (Chart 2.2). Both increased CET1 capital and reductions in risk-weighted assets have contributed.²

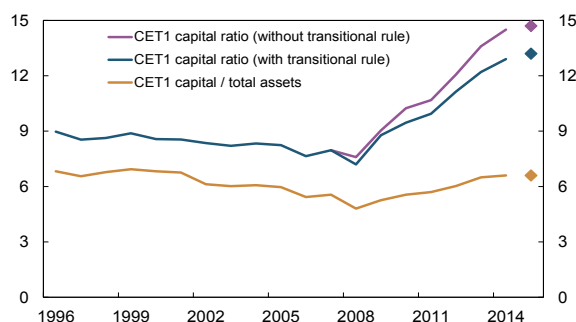
Several banks will have to increase their CET1 capital ratios further. From 1 July 2016, the CET1 capital ratio requirement will increase to 11.5%, and 13.5% for

Chart 2.1 Loan losses¹ as a share of gross loans. Annualised. All banks and mortgage companies. Percent. 1987 Q1 – 2015 Q2



1) Annual figures to end-1991, converted to quarterly figures. Source: Norges Bank

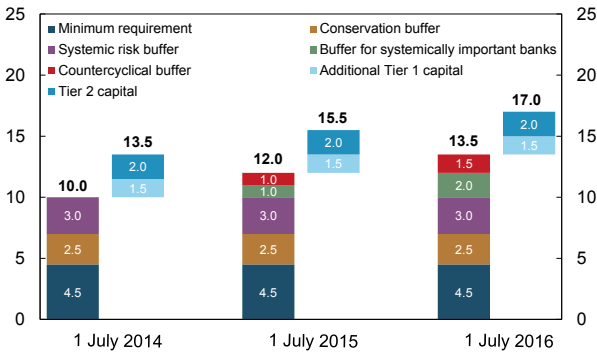
Chart 2.2 Common Equity Tier 1 (CET1) capital ratio and CET1 capital as a share of total assets, Norwegian banks overall.¹ Percent. 1996 – 2014 and 2015 Q2



1) Consolidated figures are used for banks that are banking groups. For the other banks, parent bank figures are used. Source: Finanstilsynet

1 In this section, the term "banks" refers collectively to banks and mortgage companies.
2 See Winje, H. and L.-T. Turtveit (2014): "Norwegian banks' adjustment to higher capital requirements", Staff Memo 14/2014, Norges Bank.

Chart 2.3 Phase-in of Pillar 1 capital requirements in Norway.¹
Percent of risk-weighted assets. 1 July 2014 – 1 July 2016



1) The minimum requirement and buffer requirements in the left-hand columns make up the CET1 requirement for each year. Additional Tier 1 capital and Tier 2 capital in the right-hand columns are added to arrive at the total Tier 1 requirement and total capital requirement, respectively.
Source: Ministry of Finance

systemically important banks (Chart 2.3). Banks will also need to anticipate additional capital requirements (under Pillar 2) from Finanstilsynet.³ A Pillar 2 requirement of 1.5% has been imposed on DNB. This means that DNB must meet a CET1 requirement of 15% by end-2016.

In addition to CET1 capital requirements, banks must fulfil requirements with regard to Tier 1 capital (CET1 capital plus hybrid capital) and total capital (Tier 1 capital plus Tier 2 capital). In 2014, the Ministry of Finance issued regulatory changes setting out stricter requirements with regard to the quality of hybrid capital and Tier 2 capital. Banks are expected to issue somewhat more of these capital instruments in order to meet capital requirement quotas.

INCREASING OIL-RELATED CREDIT RISK FOR BANKS

Banks' exposure to oil producers is low. Some banks, however, have substantial exposure to oil-related industries. Banks' loans to oil-related industries are largely classified as low- and medium-risk. The share of high-risk loans is larger in the corporate bond market. Payment and refinancing problems in oil-related industries are therefore likely to initially surface in the corporate bond market. Since summer, risk premiums on high-yield bonds issued by enterprises in oil-related industries have risen substantially and the market has in practice become inaccessible for a number of enterprises. Enterprises that are unable to refinance their bond debt may also experience difficulty servicing bank debt.

Chart 2.4 Position of oil-related enterprises in the value chain

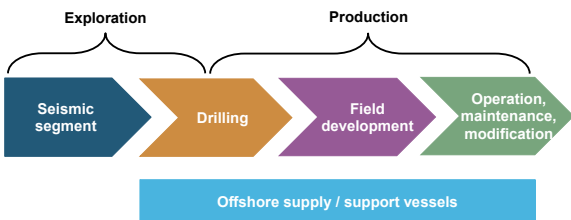
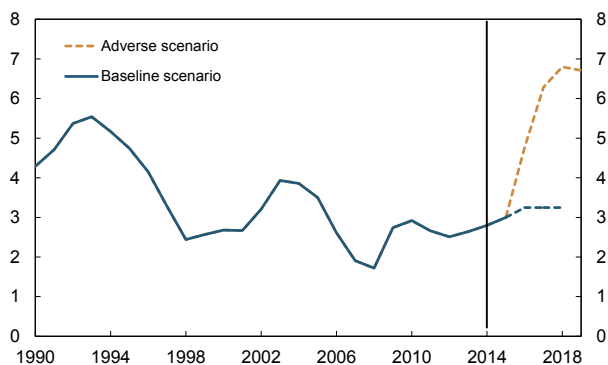


Chart 2.5 Registered unemployment in baseline and adverse scenario.
Percentage of labour force. Annual average. 1990 – 2019¹



1) Projections for 2015 – 2019.
Sources: Norwegian Labour and Welfare Administration (NAV), Statistics Norway and Norges Bank

As enterprises in oil-related industries are involved in different stages of the value chain for oil exploration and production (Chart 2.4), banks' risk exposure to these enterprises varies. For example, the seismic segment is one of the first to be hit by an oil industry decline, although it represents a relatively small share of banks' oil-related exposure. Low oil prices over a long period also increase risk for enterprises further out in the value chain. Banks' exposure to drilling and supply enterprises is higher. The increase in laid-up vessels indicates that there may also be a risk of banking sector losses in these segments.

As Norwegian banks are solid and post high earnings, they will probably be resilient to high losses on loans to enterprises engaged in oil-related activities. Lower activity in the petroleum industry also has negative

3 See Finanstilsynet's Circular No. 9/2015.

effects on the wider economy. Spillover effects may become more visible should oil prices remain persistently low. This may entail higher losses than anticipated by banks today.

BANK SOLVENCY IN THE EVENT OF A PRONOUNCED DOWNTURN

The stress test shows that the largest Norwegian banks will experience high loan losses in the event of a pronounced downturn in the Norwegian economy. In the stress test, CET1 capital ratios fall, although not below the minimum requirement.

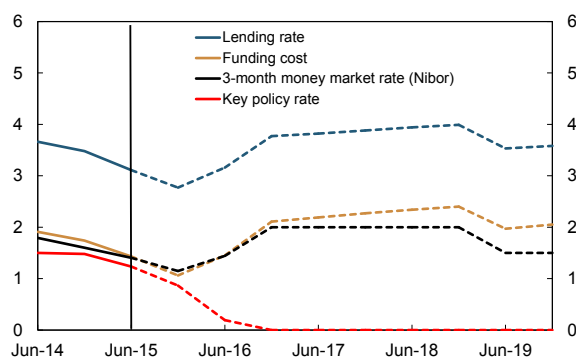
ECONOMIC DOWNTURN

The stress scenario in this Report is based on the risk outlook described in Section 1.4 The scenario outlines developments of low, albeit not negligible probability. Growth among Norway's trading partners is assumed to fall markedly at the beginning of 2016, primarily driven by weaker growth in China and the euro area. Owing to a fall in energy demand, oil prices fall to USD 30 per barrel. Oil prices remain low for a long period, and only rise towards USD 50 per barrel in 2019. A substantial repricing of all risk premiums occurs in financial markets, with the effects amplified by low market liquidity.

The international developments in the stress scenario lead to a pronounced downturn in the Norwegian economy. Activity falls markedly and unemployment rises towards 7% (Chart 2.5). The key policy rate is set to zero, but banks raise their lending rates owing to increased money and credit market risk premiums⁵ (Chart 2.6). Combined with heightened uncertainty, this contributes to a sharp fall in house prices totalling 35% (Chart 2.7). Developments in the key macroeconomic variables in the stress scenario are summarised in Table 2.1.

The persistent increase in house prices and household debt since the beginning of the 2000s amplifies the impact on the Norwegian economy.⁶ Since household wealth is largely in the form of housing, the fall in

Chart 2.6 The macro bank's lending rate and funding cost¹, money market rate and key policy rate in the adverse scenario. Percent. Semi-annual average. 2014 H1 – 2019 H2²

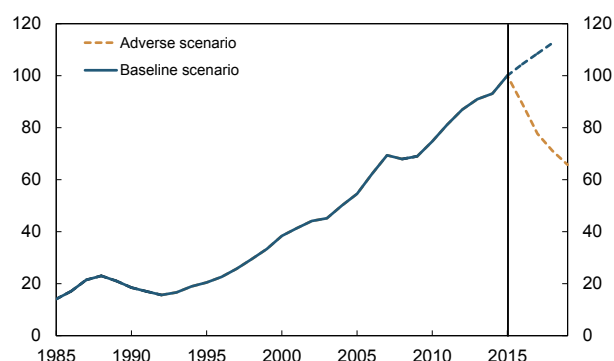


1) Interest rate cost on wholesale funding and deposit rate.

2) Projections for 2015 H2 – 2019 H2.

Sources: SNL Financial and Norges Bank

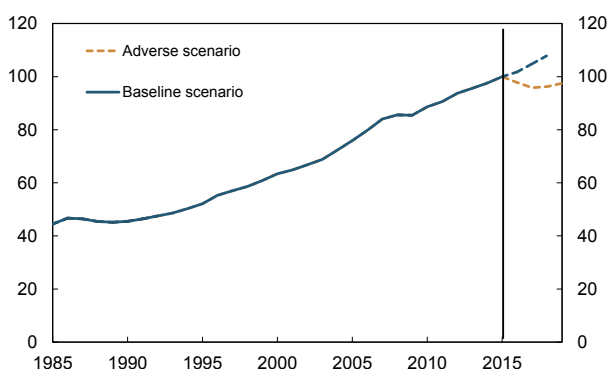
Chart 2.7 House prices in baseline and adverse scenario. Nominal prices. Index. 2015 = 100. Annual average. 1985 – 2019¹



1) Projections for 2015 – 2019.

Sources: Eiendom Norge, Finn.no, Eiendomsverdi and Norges Bank

Chart 2.8 Private consumption in baseline and adverse scenario. Index. 2015 = 100. Annual average. 1985 – 2019¹



1) Projections for 2015 – 2019.

Sources: Statistics Norway and Norges Bank

4 The baseline scenario is based on projections in the September 2015 Monetary Policy Report.

5 No extraordinary liquidity measures are implemented. Fiscal policy adheres to the baseline scenario in the September 2015 Monetary Policy Report.

6 Empirical studies suggest that strong credit growth contributes to deeper and longer recessions, see Jordà, Ò., M. Schularick and A. M. Taylor (2013): "When credit bites back", *Journal of Money, Credit and Banking* 45: 3.28. These effects are amplified when credit growth fuels a house price bubble, see Jordà, Ò., M. Schularick and A. M. Taylor (2015): "Leveraged bubbles", NBER Working Paper 21486.

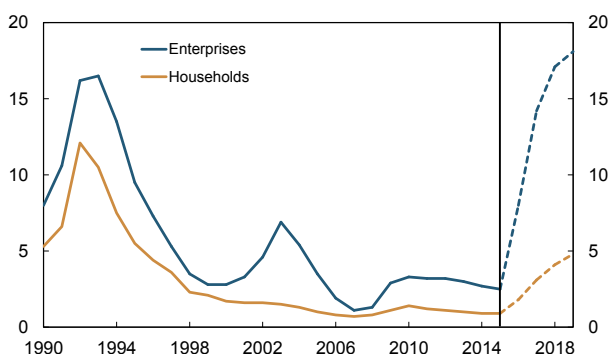
TABLE 2.1 MACROECONOMIC AGGREGATES. PERCENTAGE CHANGE FROM PREVIOUS YEAR¹

	Adverse scenario				
	2015 ²	2016	2017	2018	2019
GDP, mainland Norway	1.3	-2.5	-2.3	0.1	1.5
CPI-ATE	2.7	3.2	3.2	1.9	1.2
Registered unemployment (rate, level)	3.0	4.8	6.3	6.8	6.7
Exchange rate (level, I-44)	102.8	111	111	111	111
Oil price, USD per barrel (level)	54	30	32	39	47
3-month Nibor (level)	1.3	1.7	2.0	2.0	1.5
Weighted risk premium for covered bonds/senior bank bonds ³	0.7	0.8	0.9	1.0	1.1
House prices	7.4	-10.4	-12.9	-8.5	-7.5
Credit (C2), households ⁴	6.9	3.4	0.9	-2.1	-1.7
Credit (C2), non-financial enterprises ⁴	2.8	-1.4	-4.5	-4.4	-1.2
Share of problem loans, ⁵ households	0.9	1.8	3.1	4.1	4.8
Share of problem loans, ⁵ non-financial enterprises	2.5	8.0	14.2	17.1	18.1

- 1 Unless otherwise stated. Levels are measured as annual averages.
- 2 Baseline scenario for mainland GDP, unemployment, CPI-ATE, exchange rate, 3-month Nibor, house prices, credit to households (C2) and oil price is from *Monetary Policy Report 3/2015*.
- 3 Percentage points at year-end. The higher premiums only have an effect on new bonds.
- 4 Change in stock measured at year-end.
- 5 Delinquent loans and other loans with a particularly high probability of default. All banks excluding branches of foreign banks in Norway. Problem loans to households include problem loans from mortgage companies. Percentage share of lending to the sector.

Sources: Statistics Norway, the Technical Reporting Committee on Income Settlements, Thomson Reuters, Eiendom Norge, Finn.no, Eiendomsverdi AS, Finanstilsynet and Norges Bank

Chart 2.9 Banks' problem loans¹ in the adverse scenario. Percentage of lending to sector. Annual average. 1990 – 2019²



- 1) Banks' problem loans to enterprises. Problem loans to households for banks and mortgage companies.
 - 2) Average for the second half of 1990. Projections for 2015 – 2019.
- Sources: Statistics Norway and Norges Bank

house prices in the stress scenario results in a substantial fall in household equity. This affects household consumption. High and rising debt burdens have increased household vulnerability to interest rate increases. Declining collateral values and higher lending rates limit households' ability to take on new debt, amplifying the negative effects on private consumption. Together with higher unemployment and a fall in household income, this results in a considerable reduction in consumption (Chart 2.8).

Higher unemployment, increased lending rates and weaker income growth also lead to higher household default rates. Banks' share of problem loans⁷ to households increases to almost 5% in the stress test (Chart 2.9).

Lower demand from households, petroleum-related industries and trading partners contributes to lower profitability and lower business sector investment. A number of firms experience debt-servicing problems and the share of problem loans to enterprises rises to 18% at the end of the stress period.

WEAKER BANK SOLVENCY

The stress test⁸ is conducted for a macro bank comprising seven large Norwegian banking groups: DNB Bank, Nordea Bank Norge, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør and SpareBank 1 Nord-Norge. The macro bank's CET1 capital requirement increases, in principle, to 13.5% from 1 July 2016, in accordance with the requirement for systemically important banks (Chart 2.3). In the adverse scenario, it is assumed that the countercyclical capital buffer is switched off, resulting in a Pillar 1 CET1 capital requirement of 12%.

Banks' lending, especially to non-financial enterprises, falls throughout the stress period and contributes to reducing total assets. Banks are assumed to pay out 30% of profits in dividends for the financial year 2015, but there are no dividend payments during the stress period.

⁷ Problem loans are delinquent loans and other loans with a particularly high probability of default.

⁸ For a more detailed discussion of assumptions and mechanisms in the bank model used in the stress test, see Syversten, B. D. et al (2015): "Bankmodellen og stresstesten i rapport om Finansiell stabilitet 2015" [The banking model and stress test in the 2015 *Financial Stability Report*], Staff Memo 5/2015, Norges Bank (English translation forthcoming).

Each individual bank adjusts its lending rates to achieve the same margin against their borrowing costs as before the stress period. Borrowing costs remain high throughout the stress period despite cuts in the key policy rate. This results in an increase in the macro bank's lending rate (Chart 2.6).

Loan losses in the stress period are calculated assuming loss given problem loan rates of 25% for new problem loans to households and 40% for new problem loans to enterprises. Moreover, it is assumed that banks will have to recognise impairment losses of 30% of their equity holdings and 5% of their bond holdings at the beginning of the stress period. For the rest of the stress period, net income from securities or other financial instruments is assumed to revert to the pre-stress period level.

HIGH LOAN LOSSES

High loan losses lead to weak results and the macro bank incurs a loss throughout the stress period (Table 2.2). The CET1 capital ratio declines to 8% at the end of the stress period (Chart 2.10). The fall in total assets cushions the fall in the leverage ratio. In the CET1 capital ratio, this effect is countered by higher risk weights as a result of higher shares of problem loans. This illustrates the less cyclical character of the leverage ratio as a measure of solvency.

The macro bank breaches the total CET1 capital requirement of 12% at the end of 2016, but is well above the minimum CET1 capital requirement of 4.5%. When a bank breaches the total capital buffer requirement, a capital plan to restore the buffer must be prepared within five working days. One possibility is to raise new equity. Another is to try to increase profitability. Measures by banks to improve capital adequacy, such as considerable increases in lending rates and tighter lending, can amplify macroeconomic effects (see the stress test in the 2014 *Financial Stability Report*).

The result indicates that the macro bank holds sufficient capital to survive the stress scenario. However, there are elements of uncertainty. One factor that may influence the results is the extent to which banks maintain interest margins throughout the stress period. In the IMF stress test of the Norwegian banking sector in the recently concluded Financial Sector Assessment Program (FSAP) for Norway, it

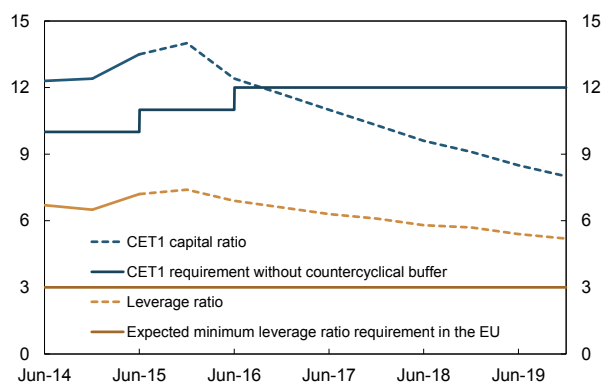
TABLE 2.2 KEY FIGURES FOR THE MACRO BANK (IN BILLIONS OF NOK¹)²

	Adverse scenario				
	2015	2016	2017	2018	2019
Net interest income	55	57	54	53	49
Loan losses	6	65	68	64	60
<i>Loan losses as a share of gross loans</i>	0.2%	2.5%	2.6%	2.6%	2.4%
Profit after tax	32	-29	-16	-15	-15
Net lending to customers	2 580	2 558	2 499	2 410	2 365
Total assets	3 715	3 544	3 462	3 340	3 272
<i>Annual growth in total assets</i>	2.1%	-4.6%	-2.3%	-3.5%	-2.0%
Risk-weighted assets (with the transitional rule)	1 817	1 830	1 869	1 890	1 893
<i>Annual growth in risk-weighted assets</i>	1.6%	0.7%	2.1%	1.1%	0.2%
Common Equity Tier 1 (CET1) capital	254	214	192	171	151
CET1 capital ratio (with the transitional rule)	14.0%	11.7%	10.3%	9.1%	8.0%
Tier 1 capital / Total assets ³	7.4%	6.6%	6.1%	5.7%	5.2%

- 1 Unless otherwise stated.
- 2 Balance sheet figures and CET1 figures at year-end. Profit and loss figures for the whole year.
- 3 This ratio is an estimate of the leverage ratio.

Sources: SNL Financial and Norges Bank

Chart 2.10 CET1 capital ratio and leverage ratio¹ in the adverse scenario. Macro bank. Percent. 2014 H1 – 2019 H2²



- 1) Leverage ratio is calculated as: Tier 1 capital / Total assets.
 - 2) Projections for 2015 H2 – 2019 H2.
- Sources: SNL Financial and Norges Bank

was assumed that banks were not able to strengthen profitability by raising lending rates to match the increase in borrowing costs. This led to slimmer interest margins and lower bank profits. Another uncertainty is the size of losses on loans to households. The empirical basis is weak (see analyses in box "Losses on loans to households" in the 2014 *Financial Stability Report*). A large portion of Norwegian banks' lending to the enterprise sector is to commercial real estate and construction. If losses on these loans are higher than assumed in the stress test, capital adequacy could be significantly impaired, (see box "Credit risk in commercial real estate and construction" on page 28).

How quickly banks and the economy recover from a pronounced downturn may be influenced by banks' recognition of impairment losses on non-performing loans. In the stress test, we assume relatively high loss given problem loan rates. In uncertain times with prospects for higher losses, banks may be incentivised to postpone impairment recognition in order to preserve Tier 1 capital and maintain favourable funding conditions.⁹ This may result in a deadlock where banks experience difficulty attracting fresh equity, extending new credit and creating a new basis for profitability.

FOCUS: LEVERAGE RATIO REQUIREMENT FOR NORWEGIAN BANKS

A leverage ratio requirement is to be introduced in the EU. Norwegian banks' leverage ratios are high compared with banks in other countries and meet the expected EU requirement by an ample margin. A sufficiently high leverage ratio requirement for Norwegian banks could replace the transitional rule.

The EU is scheduled to implement a leverage ratio requirement in 2018, as a supplement to risk-weighted capital requirements. Finanstilsynet submitted a proposal to the Ministry of Finance in June 2015 regarding how such a requirement could be introduced in Norway pending its incorporation into the EEA Agreement.¹⁰

The leverage ratio is defined as a capital measure divided by an exposure measure:

$$\text{leverage ratio} = \frac{\text{capital measure}}{\text{exposure measure}}$$

In the EU regulations, the capital measure will probably consist of Tier 1 capital. The exposure measure consists of banks' total assets as well as off-balance sheet items included according to specific rules.

The exposure measure does not take account of the risk related to the various assets. The assets that make up the denominator of the capital adequacy ratio, on the other hand, are risk-weighted. Risk-weighting is the most important difference between the leverage ratio and the capital adequacy ratio:

$$\text{capital adequacy ratio} = \frac{\text{capital measure}}{\text{risk-weighted assets}}$$

For Norwegian banks overall, the leverage ratio is about half of the CET1 capital ratio. This is roughly equivalent to an average risk weight of 50%.

RISK-WEIGHTED AND UNWEIGHTED CAPITAL REQUIREMENTS COMPLEMENT EACH OTHER

A capital requirement based on risk-weighted assets requires banks to hold more capital against higher-risk assets than lower-risk assets. This is in line with sound risk management.

Risk weights are calculated based on historical loan losses. There is considerable uncertainty associated with such calculations, both with regard to the models and to the quality of the data. In addition, new risks may arise that are not covered by historical data. The financial crisis revealed that banks' risk weights may underestimate real risk. A number of studies have shown that the leverage ratio was a better indicator of how a bank fared through the crisis than risk-weighted capital adequacy measures.¹¹

⁹ See e.g. Aiyar, S. et al. (2015): "A Strategy for Resolving Europe's Problem Loans", *Staff Discussion Note 15/19*, IMF and Jassaud, N. and K. Kang (2015): "A Strategy for Developing a Market for Nonperforming Loans in Italy", Working Paper 15/24, IMF.

¹⁰ See Finanstilsynets brev til Finansdepartementet 26 juni 2015 [submission by Finanstilsynet to the Ministry of Finance of 26 June 2015] (Norwegian only).

¹¹ See for example Aikman, D. et al. (2014): "Taking uncertainty seriously: simplicity versus complexity in financial regulation", *Financial Stability Paper No. 28*, Bank of England, Demircuc-Kunt, A., E. Detragiache and O. Merrouche (2010): "Bank Capital: Lessons from the Financial Crisis", Working Paper 10/286, IMF, Haldane, A. and V. Madouros (2012): "The dog and the frisbee", Haldane, A. (2013): "Constraining discretion in bank regulation" and Mayes, D. G. and H. Stremmel (2014): "The effectiveness of capital adequacy measures in predicting bank distress", *SUERF Study No 2014/1*.

Risk weights calculated by banks themselves will be procyclical. In good times, low losses result in lower risk weights and lower capital needs. Banks' capital needs can also be reduced by increasing the proportion of assets with low risk weights. If many banks make this adjustment, systemic risk may increase.

The capital adequacy ratio should normally be the binding requirement. A leverage ratio requirement could function as a backstop mechanism to prevent banks' capital levels from becoming too low if risk weights do not fully capture risk. The leverage ratio is a more direct measure of banks' loss-absorbing capital.

New regulation will make it simpler to allow some of a bank's debt to be written down or converted to equity while the bank continues to provide services (a so-called bail-in). Losses in the event of a severe crisis can then be covered to a larger degree by private creditors. Banks should nevertheless hold a certain amount of equity as a buffer. A leverage ratio requirement will ensure that shareholders have a minimum of "skin in the game". This may dampen incentives to take excessive risk.

OTHER COUNTRIES ARE INTRODUCING LEVERAGE RATIO REQUIREMENTS

The EU leverage ratio framework has not yet been finalised. However, based on the Basel Committee's proposals, it seems likely that the minimum requirement will be 3% as from 2018.

In the US and Canada, the supervisory authorities have applied a measure similar to the leverage ratio for many years, setting differentiated requirements ranging from 2% to 5%. The US has decided to introduce a leverage ratio requirement of up to 6% from 2018. Some European countries are implementing leverage ratio requirements ahead of the EU schedule. The UK authorities are planning to introduce a leverage ratio requirement for systemically important banks in 2016. The requirement will be set as a percentage of the risk-weighted requirements, with both a minimum requirement and a buffer requirement (Chart 2.11). The percentage has been set at 35%. With this framework, changes in the risk-weighted requirement will have a direct impact on the leverage ratio requirement. Given a maximum Tier 1 capital requirement in the UK of 14%, the leverage ratio requirement may be up to 5%.

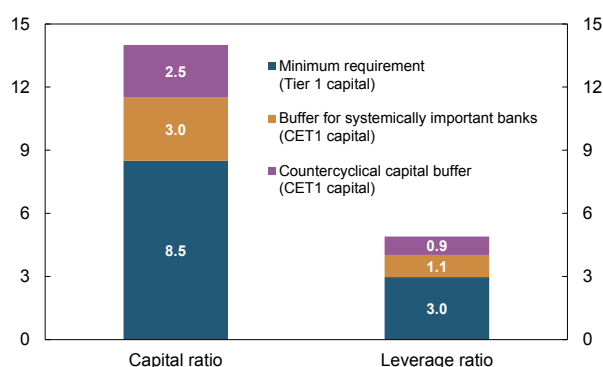
Switzerland recently increased the leverage ratio requirement for systemically important banks to 5%. The requirement is to be met by 2019. The Netherlands is aiming for a level of 4% for its systemically important banks. Sweden and Denmark have considered, but not yet implemented, a leverage ratio requirement.

NORWEGIAN BANKS WELL ABOVE EXPECTED EU MINIMUM REQUIREMENT

All Norwegian banks are currently well above the expected EU minimum requirement. At the end of the first half of 2015, the leverage ratio of Norwegian banks as a whole was 6.5%. Compared with large Nordic banks, Norwegian banks generally have higher leverage ratios and lower CET1 capital ratios (Chart 2.12), primarily due to Norwegian banks' higher risk weights.

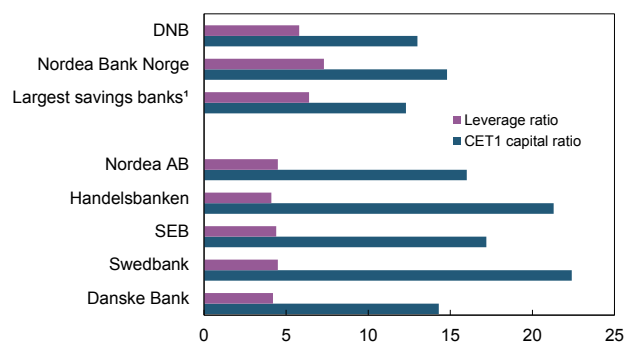
The difference between the capital adequacy ratios and leverage ratios of Norwegian banks has widened since

Chart 2.11 Leverage ratio requirement in the UK from 2016. Percent



Source: Bank of England

Chart 2.12 Leverage ratios and CET1 capital ratios for large Norwegian and Scandinavian banking groups. Percent. As at 30 June 2015



1) Weighted average of the five largest Norwegian regional savings banks. Sources: Banks' quarterly reports, Finanstilsynet and Norges Bank

the financial crisis (Chart 2.2). Growth in total assets has clearly outstripped the rise in risk-weighted assets.

The gap between these solvency measures would have been even wider without the transitional rule. The rule sets a lower limit on the sum of risk-weighted assets applied by banks using internal models for calculating risk weights (IRB models) compared with the sum required under Basel I. The transitional rule has been applied for several years longer than originally planned and is practised more strictly in Norway than in other European countries. The Basel Committee issued a proposal for consultation where the current transitional rule is replaced by permanent floors based on new standard methods of risk-weighting.¹² It may take several years before a recommendation from the Basel Committee is ready to be introduced into national rules.

A SUFFICIENTLY HIGH LEVERAGE RATIO REQUIREMENT COULD REPLACE THE TRANSITIONAL RULE

A leverage ratio requirement could replace the transitional rule as a backstop mechanism. As the leverage ratio is independent of risk weights, a leverage ratio requirement provides a more robust buffer against new, unknown risks. With a leverage ratio requirement instead of the transitional rule, banks could report a CET1 capital ratio that could be more easily compared with that of banks in other countries.

A leverage ratio requirement should be sufficiently high to sustain banks' resilience to losses. Over the past 20 years, the leverage ratio of Norwegian banks as a whole has been around 6%, measured as the ratio of CET1 capital to total assets (Chart 2.2). The calculations in the box on page 27 show that a leverage ratio on a level with the EU's expected 3% minimum requirement is far too low to cope with the levels of losses that occurred in selected previous financial crises.

The leverage ratio requirement should include buffers that can be drawn down in a crisis.¹³ Over half of the CET1 capital requirement for Norwegian banks is

buffer requirements. These requirements lose their function as buffers if banks that fall slightly below the buffer requirement breach a high minimum leverage ratio requirement at the same time. A possible structure is to set a minimum requirement and specify a fixed ratio between the leverage ratio buffer requirement and the risk-weighted buffer requirements. This would restrict banks' scope to adjust to increased risk-weighted capital requirements by reducing risk weights and shifting lending.

Systemically important banks face higher risk-weighted buffer requirements than other banks. This is because the macroeconomic consequences of problems in systemically important banks are more severe than for other banks. For the same reason, the leverage ratio requirement should be differentiated based on systemic importance.

A leverage ratio requirement should be publicised. Investors must have access to information about a bank's position with respect to the requirements facing the bank, including both minimum and buffer requirements, in order to be able to price risk as accurately as possible.

Norges Bank's recommendation (see page 7):

- *A sufficiently high leverage ratio requirement could replace the transitional rule (Basel I floor).*
- *The leverage ratio requirement should include buffer requirements, corresponding to the requirements relating to risk-weighted capital.*
- *Systemically important banks should be subject to higher requirements than other banks.*
- *The total requirement must be high enough to ensure that banks at minimum maintain their current leverage ratio level of about 6%.*
- *The level of the leverage ratio requirement should be publicised.*

¹² Norges Bank and Finanstilsynet have submitted a joint consultation response that in general supports the proposal (see letter of 25 March 2015).

¹³ The Basel Committee suggests buffers, particularly for systemically important banks, as a possible extension of the leverage ratio requirement, see BCBS (2013): "The regulatory framework: balancing risk sensitivity, simplicity and comparability", BIS *Discussion paper*. The ESRB supports the use of leverage ratio buffer requirements, see ESRB (2015): The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector, Addendum: Macroprudential Leverage Ratios.

LEVERAGE RATIO BASED ON LOSSES IN THREE PREVIOUS CRISES

Historical loan losses during crises can provide valuable information regarding the appropriate level of the leverage ratio for banks.¹ The calculations below are based on a standardised average bank that incurs average losses on lending on a level with those occurring during the Norwegian banking crisis at the beginning of the 1990s and in Ireland and Greece during the financial crisis. The losses are measured over a six-year period.

The calculations are based on two alternative assumptions regarding developments in profitability.² During the banking crisis and the financial crisis, Norwegian banks maintained profitability before deduction of higher loan losses at approximately the pre-crisis level. A “normal profitability” scenario is constructed based on these developments. Banks can also experience a substantial decline in profitability in a crisis even before loan losses are deducted, as a result of factors such as higher funding costs or a reduction in the fair value of financial instruments. For several large Irish banks, profitability before loan losses was reduced by more than half during the financial crisis. A “50% lower profitability” scenario is also examined based on these developments.

To assess whether the expected EU minimum leverage ratio requirement of 3% is sufficient, the leverage ratio of the average bank is assumed to be 0.5 percentage point above the requirement, i.e. 3.5%. With

this capital level, a normal level for banks’ return on equity of around 15% is assumed.³

Both with normal profitability and with profitability reduced by half, the scenario bank with an initial 3.5% leverage ratio will end up with a “negative” leverage ratio at the end of the crisis period (Chart 2.13). A negative leverage ratio implies that losses will be incurred on some of the debt. With a 50% reduction in profitability before loan losses, the average bank ends up with a leverage ratio of up to negative 4%. This outcome indicates that an EU requirement of 3% will be far too low to cope with losses at the levels occurring in these three serious crises.

At 6.5%, the leverage ratio of Norwegian banks as a whole is currently well above the proposed EU minimum requirement. On the basis of this level, normal profitability is adjusted down from a 15% return on equity to 12%.

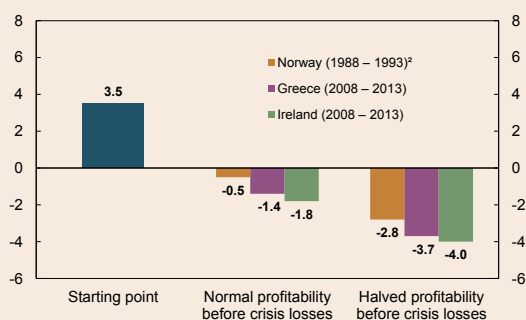
With normal profitability before increased losses, the leverage ratio falls to a level in the interval 3.7% to 5% at the end of the crisis period (Chart 2.14). It is likely that some banks would have experienced serious problems in this scenario. With a 50% reduction in profitability before increased losses, the leverage ratio will fall to a level in the interval 0.4% to 1.6% at the end of the period. In this case, the average bank will be in breach of the “hard” minimum CET1 capital requirement, given Norwegian banks’ current risk weights.

1 In preparing its proposal for a leverage ratio requirement, the Bank of England also looked at historical losses on lending relative to banks’ capital levels (see Bank of England (2014): “The Financial Policy Committee’s review of the leverage ratio”).

2 Here, profitability refers to profit after tax.

3 Return on equity after company tax. According to Aronsen, P.A. et al. (2014): “Norwegian banks’ adjustment to stricter capital and liquidity regulation”, *Staff Memo 18/2014*, Norges Bank, a 12% return on equity is a reasonable assumption for large Norwegian banks. In Vale, B. (2011): “Effects of higher equity ratio on a bank’s total funding costs and lending”, *Staff Memo 10/2011*, Norges Bank, the effects of a change in the equity ratio are estimated. On the basis of the same assumptions as in Vale (2011), a reduction in the equity ratio from 6.5% to 3.5% could raise the required return on equity from 12% to 15%.

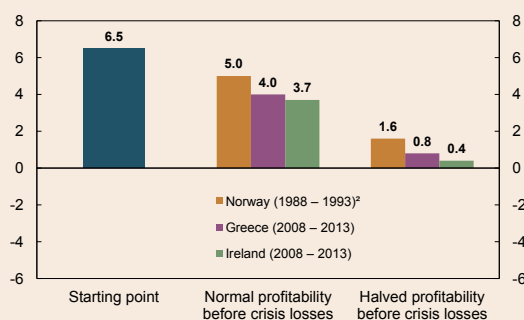
Chart 2.13 Leverage ratio based on loss levels from previous crises.¹ Percent



1) Total losses during the crisis are deducted from the starting level of the leverage ratio and provide an estimate of the post-crisis leverage ratio.

2) Adjusted to present-day total assets.
Sources: SNL Financial and Norges Bank

Chart 2.14 Leverage ratio based on loss levels from previous crises.¹ Percent



1) Total losses during the crisis are deducted from the starting level of the leverage ratio and provide an estimate of the post-crisis leverage ratio.

2) Adjusted to present-day total assets.
Sources: SNL Financial, Finanstilsynet and Norges Bank

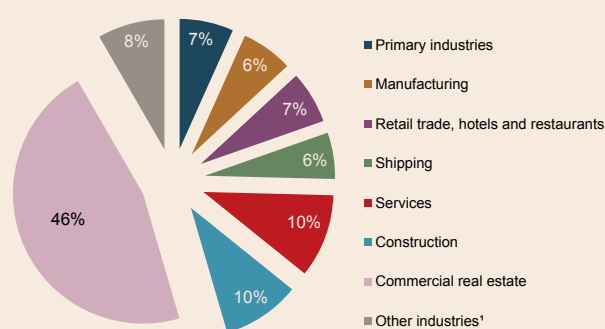
CREDIT RISK IN COMMERCIAL REAL ESTATE AND CONSTRUCTION

Previous financial crises show that, as a rule, banks' losses are higher on corporate loans than on loans to the retail market. During crises, banks' losses on lending to commercial real estate and construction enterprises have been especially high. Key ratios indicate that vulnerability in these sectors increased prior to the crisis, after which it has lessened somewhat. At the same time, banks' exposure to real estate-related sectors has continued to increase. Any loan losses may therefore severely impact bank solvency in the event of a downturn.

Corporate loans make up nearly 30% of banks' lending portfolios. Over half of these loans are to commercial real estate and construction enterprises¹ (Chart 2.15). Bank debt is an important source of financing for these sectors. As a share of total financing, bank debt² is over twice as high among real estate-related enterprises as among other non-financial enterprises as a whole (Chart 2.16). The credit risk associated with real estate-related enterprises is linked to developments in residential and commercial real estate prices. After rising sharply for many years, real estate prices are currently at a high level. The impact of a fall could be substantial and with weaker economic prospects the risk of a price decline has increased.

- 1 In what follows, "real estate-related sectors" is used as an umbrella term for the construction and commercial real estate industries.
- 2 Bank debt is classified here as "amounts owed to credit institutions" in enterprises' financial statements. Thereafter, only enterprises with bank debt are considered.

Chart 2.15 Breakdown of banks' loans to the corporate market. All banks and mortgage companies. Percent. As at 30 June 2015



1) Other industries comprises Oil service, Other transportation, Electricity and water supply and Extraction of natural resources.
Source: Norges Bank

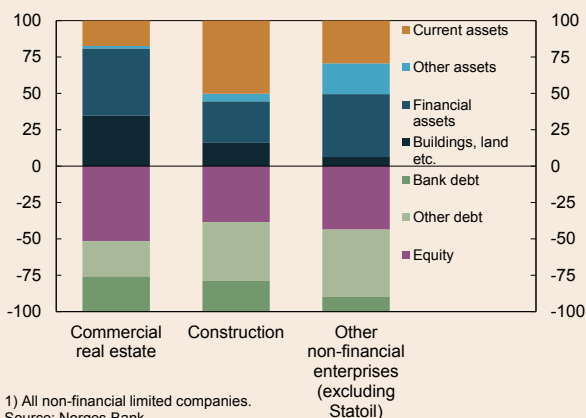
MEASURES OF RISK IN THE CORPORATE SECTOR

Solvency and debt-servicing capacity are key measures of credit risk in the corporate sector.

A firm's profitability and liquidity are important for its capacity to service debt. Over time, cash earnings³ must be high enough to cover principal repayment and other obligations. Excessively weak earnings force firms to draw on their liquid assets. The earnings-to-debt ratio, i.e. cash earnings as a percentage of interest-bearing debt, is used here as an indicator of corporate debt-servicing capacity.⁴ Corporate earnings-to-debt ratios rose at the beginning of the 2000s, but had already begun to fall before the financial crisis (Chart 2.17). Since then, the indicator has stabilised at a lower level. Earnings-to-debt ratios vary across sectors. Earnings-to-debt ratios in commercial real estate overall are lower than in many other sectors. This reflects commercial real estate firms' large balance sheets, which tie up a considerable amount of capital relative to income generated. Since real estate is considered solid collateral, it is also often easier to obtain debt financing. Thus, many real estate companies have considerable interest-bearing debt.

- 3 Cash earnings are defined here as ordinary profit before tax and operating depreciation, amortisation and impairment losses.
- 4 Similar measures of debt-servicing capacity have been used in earlier analyses of credit risk. See for example Eklund, T., K. Larsen and E. Bernhardt (2001): "Model for analysing credit risk in the enterprise sector", *Economic Bulletin* (3/2001), Norges Bank and "Financial vulnerability of non-financial companies", *Risk Outlook 2013: The Financial Market in Norway*, Finanstilsynet.

Chart 2.16 Corporate¹ balance sheets. Percent. As at 31 December 2014



1) All non-financial limited companies.
Source: Norges Bank

The equity/assets ratio is an important indicator of an enterprise's resilience to shocks. A high equity ratio functions as a buffer in periods of weak earnings. If it is financially strong, the enterprise usually also has collateral available to ease access to credit in difficult times. Enterprises' equity ratios fell somewhat during the financial crisis, but have risen steadily since then (Chart 2.18). Historically, equity ratios in the construction industry have been lower than in other sectors. In recent years, equity ratios have risen considerably. A large share of current assets in the construction industry is associated with real estate development projects, and in commercial real estate, non-current assets are largely tied to the value of commercial buildings. A substantial fall in real estate prices may therefore have a considerable impact on equity in both the construction industry and commercial real estate.

VULNERABLE ENTERPRISES AND DEBT AT RISK

On average, real estate-related enterprises have lower equity ratios and lower earnings-to-debt ratios than other non-financial enterprises. Even so, there is considerable variation within the sectors. Determining the characteristics of vulnerable enterprises thus becomes relevant. A combination of criteria for vulnerable firms has been selected on the basis of the earnings-to-debt ratios and equity ratios of enterprises that went bankrupt in the period 1999–2012⁵:

- 1) Negative earnings-to-debt ratio
- 2) Low equity ratio
 - Commercial real estate: Equity ratio below 13%
 - Construction: Equity ratio below 11%
- 3) Credit rating below AAA⁶

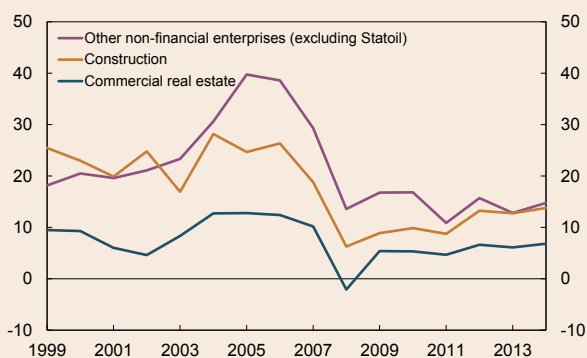
The selection of indicator values is based on a trade-off between identifying as many as possible of the companies that subsequently go bankrupt and filtering out companies that do not. The selected combination of criteria identifies approximately 60% of the companies that went bankrupt one to two years later. The first criterion captures enterprises with negative earnings-to-debt ratios. The second criterion captures enterprises with a low or negative equity ratio. The third criterion filters out enterprises with the highest credit rating, AAA. An enterprise's credit rating contains more information than is captured in criteria 1 and 2. Historically, enterprises with the highest credit rating have seldom gone bankrupt a few years later.

Bank debt held by enterprises meeting all three criteria is regarded as at risk. In 2014, 11% of the bank debt held by commercial real estate enterprises was at risk (Chart 2.19). The corresponding share for construction was 16% (Chart 2.20). The share of debt at risk rose steadily in the period before the financial crisis in both

5 The period covers good years for the Norwegian economy, and for that reason there are few bankruptcies in the period for which the thresholds have been calculated. Owing to a small sample, the calculations are uncertain.

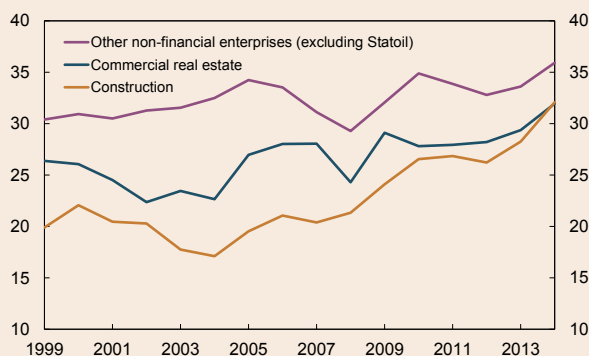
6 Bisnode ratings. The scale is AAA, AA, A, B and C. In commercial real estate and construction, 5% and 11%, respectively, of the enterprises had a AAA rating in 2014.

Chart 2.17 Earnings-to-debt ratio of enterprises¹. Cash earnings² as a percentage of interest-bearing debt³. 1999 – 2014



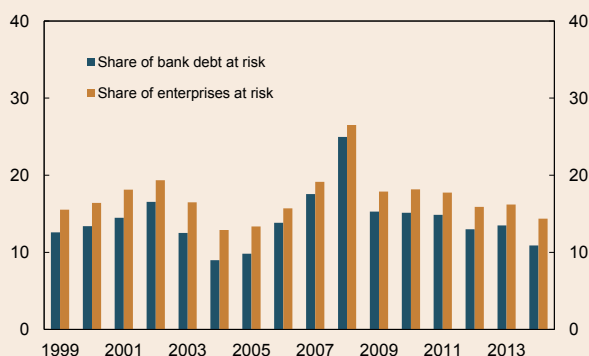
1) Only enterprises reporting bank debt in their financial statements.
 2) Defined as ordinary profit before tax and operating depreciation and amortisation.
 3) Defined as the sum of the items other long-term debt, short-term convertible loans, short-term notes and short-term debt to credit institutions.
 Source: Norges Bank

Chart 2.18 Equity ratio of enterprises¹. Equity as a percentage of total assets. 1999 – 2014



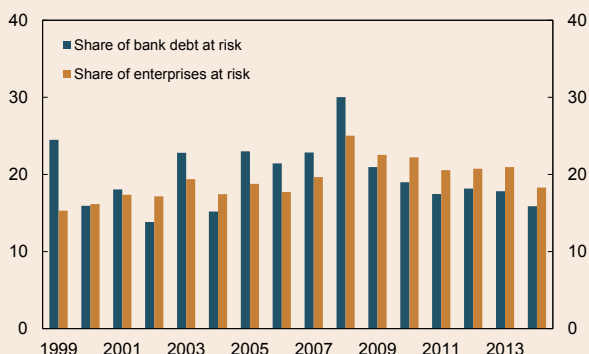
1) Only enterprises reporting bank debt in their financial statements.
 Source: Norges Bank

Chart 2.19 Share of bank debt and share of enterprises meeting criteria for debt at risk¹. Commercial real estate. Percent. 1999 – 2014



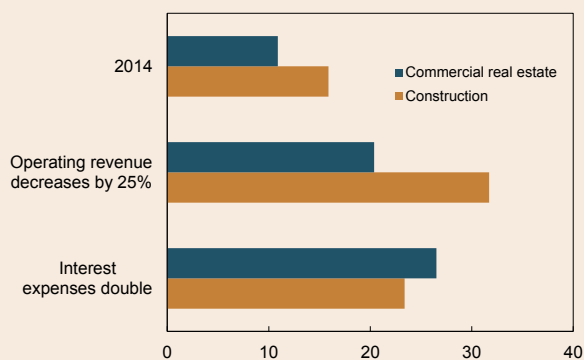
1) Negative earnings-to-debt ratio, equity ratio below 13% and rating below AAA. Source: Norges Bank

Chart 2.20 Share of bank debt and share of enterprises meeting criteria for debt at risk¹. Construction. Percent. 1999 – 2014



1) Negative earnings-to-debt ratio, equity ratio below 11% and rating below AAA. Source: Norges Bank

Chart 2.21 Share of bank debt at risk after a fall in operating revenue and an increase in interest expenses, respectively. Percent. As at 31 December 2014



Source: Norges Bank

sectors. In recent years, this share has remained fairly stable, at a level slightly below the historical average.

SENSITIVITY ANALYSES: FALL IN OPERATING REVENUE AND HIGHER INTEREST EXPENSES

If enterprises' revenue base should shrink or if interest rates should rise, a number of enterprises can be expected to experience difficulty meeting their debt obligations.⁷ Enterprises' sensitivity to economic shocks is expressed by how much the share of debt at risk rises when a fall in revenue or an increase in interest expenses is introduced into the financial statements for 2014.⁸

In one scenario, operating revenue falls by 25% in all enterprises. For commercial real estate, all operating expenses are assumed to be fixed, so that the full effect passes through to profits. As construction industry costs are variable to a greater extent, 50% of operating expenses are assumed to vary with operating revenue. This means the fall in operating revenue will to some degree be dampened by lower operating expenses. A reduction in profits results in lower cash earnings and thus leads to a lower earnings-to-debt ratio. Lower profits are assumed to have an impact on retained earnings, which results in a fall in the equity ratio.

In another scenario, interest expenses are doubled for all enterprises. Higher interest expenses reduce cash earnings, affecting earnings-to-debt and equity ratios in a manner similar to that in the revenue reduction scenario.

The two scenarios affect the sectors differently. The construction industry is hit slightly harder by a decline in operating revenue (Chart 2.21), possibly because earnings overall in this industry are a smaller percentage of turnover. Thus, owing to a decline in operating revenue, a relatively larger share of construction enterprises will operate at a loss, resulting in negative earnings-to-debt ratios. In addition, the size of balance sheets and equity is substantially smaller than in the

7 Fixed-rate loans will reduce enterprises' vulnerability to interest rate increases.

8 The sensitivity analysis is a simple mechanical analysis, which only examines the direct effect of adjusting certain items in enterprises' financial statements. In reality, the effect of the scenarios will be more complex.

commercial real estate sector. Thus, a reduction in earnings has a more pronounced impact on equity ratios in the construction industry. After the fall in operating revenue, 32% of the bank debt held by this industry is at risk. In the analysis, commercial real estate is more severely affected by higher interest expenses, probably because interest expenses overall account for a substantially larger share of the costs in this sector than in construction. In this case, a doubling of interest expenses will result in a greater reduction in profits. In this scenario, debt at risk in commercial real estate doubles.

In the calculation of bank debt at risk, the criteria for vulnerable enterprises are linked to enterprise bankruptcies. The bank debt of bankrupt enterprises does not exactly correspond to banks' loan losses. When collateral is pledged for a loan, such as e.g. a mortgage on a building, the bank will not normally lose the entire sum of the loan when an enterprise goes bankrupt. In addition, banks also recognise substantial impairment losses on loans to enterprises that have not gone bankrupt. Nevertheless, the bank debt of bankrupt enterprises has historically shown a correlation with banks' loan losses (Chart 2.22). A higher share of debt at risk in real-estate related sectors will likely increase the probability of banks' losses on loans to such enterprises.

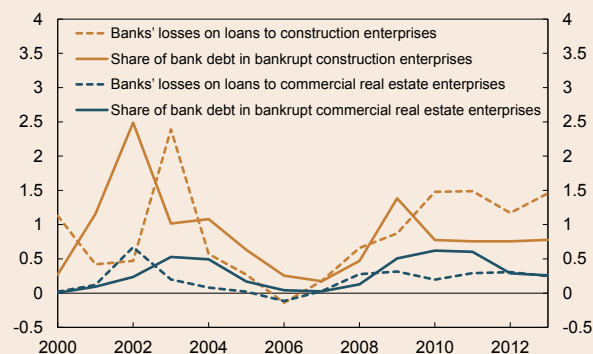
LOSSES ON LOANS TO COMMERCIAL REAL ESTATE AND CONSTRUCTION

Owing to banks' considerable exposures to real estate-related sectors, developments in these sectors will be crucial for bank solvency in the event of a downturn. Chart 2.23 shows three alternative scenarios for developments in the macro bank's Common Equity Tier 1 (CET1) capital ratio under various assumptions concerning losses on loans to commercial real estate and construction. The middle scenario, with annual average loan losses of 5% of total loans to these sectors, resembles the adverse scenario in the stress test on page 23.⁹ This corresponds to a loss level to real estate-related sectors slightly below the level during the Norwegian banking crisis in the early 1990s. In this sce-

nario, the macro bank's CET1 capital ratio falls to 8%. In the most adverse scenario, banks are assumed to lose an annual 7% of their commercial real estate and construction loans. This is slightly more than Norwegian commercial banks' losses on lending to these sectors during the banking crisis.¹⁰ It reduces the macro bank's CET1 capital ratio by more than half, to around 6%.

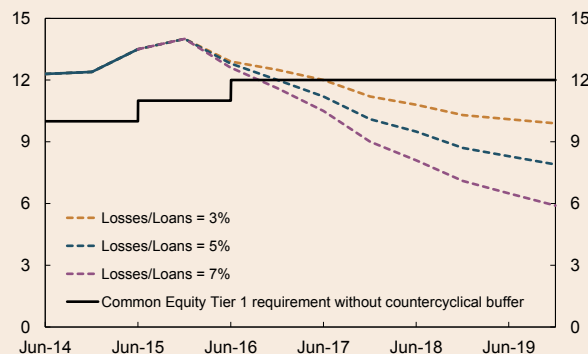
¹⁰ See Kragh-Sørensen, K. and H. Solheim (2014): "What do banks lose money on during crises?", Staff Memo 3/2014, Norges Bank.

Chart 2.22 Bank debt in bankrupt enterprises as a share of total bank debt in the industry, and banks' losses on loans to the industry as a share of total loans to the industry. Percent. 2000 – 2014



Source: Norges Bank

Chart 2.23 CET1 ratio under various loss scenarios¹ in the commercial real estate and construction industries. Macro bank. Percent. 2014 H1 – 2019 H2²



¹ The scenarios illustrate the effect of different average annual losses in the commercial real estate and construction industries, while stressing the remaining loan portfolio at a constant level.

² Projections for 2015 H2 – 2019 H2.

Sources: SNL Financial and Norges Bank

⁹ In all scenarios, households and the remainder of enterprises are stress tested with annual loan losses of 0.7% and 4.2%, respectively, of total lending.

3 BANK FUNDING

DEVELOPMENTS IN BANKS' FUNDING SOURCES 32

- Higher risk premiums on long-term wholesale funding, but from low levels 32
- Increased refinancing risk associated with short-term foreign currency funding 34

NEW LIQUIDITY RULES FOR NORWEGIAN BANKS 34

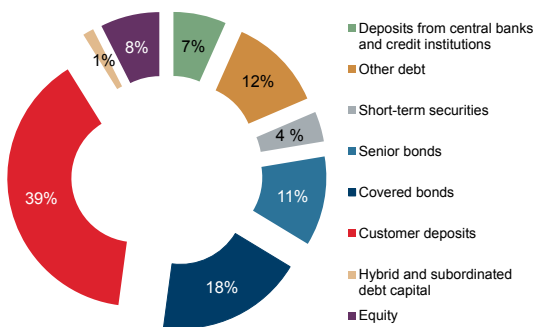
FOCUS: IMPACT OF A FALL IN HOUSE PRICES ON BANK FUNDING 36

- Covered bonds are a resilient funding source 36
- Covered bonds are designed to withstand considerable declines in house prices 37

BOX: LIQUIDITY REGULATION 39

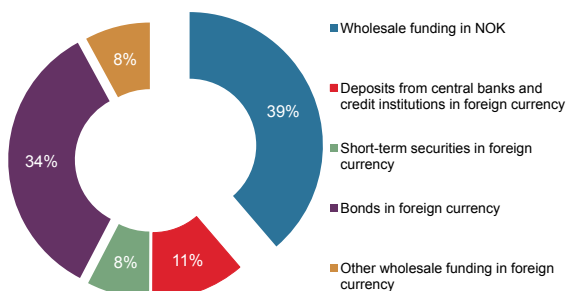
Norwegian banks have ample access to wholesale funding, but new regulations are having an impact on funding markets and banks' funding structures. New liquidity regulations will reduce banks' vulnerability to funding shortfalls. Covered bonds are an important funding source for banks' residential mortgage lending. A sharp decline in house prices may raise risk premiums and reduce banks' access to funding.

Chart 3.1 Funding structure of Norwegian banks and covered bond mortgage companies.¹ Percent. As at 30 June 2015



¹ Sum of all banks and covered bond mortgage companies excluding branches and subsidiaries of foreign banks in Norway. Source: Norges Bank

Chart 3.2 Wholesale funding of Norwegian banks and covered bond mortgage companies.¹ By currency. Percent. As at 30 June 2015



¹ Sum of all banks and covered bond mortgage companies excluding branches and subsidiaries of foreign banks in Norway, less intragroup items. Source: Norges Bank

DEVELOPMENTS IN BANKS' FUNDING SOURCES

Banks have ample access to wholesale funding. Risk premiums are low, but have risen over the past year. Changes in the regulation of US money market funds may curtail Norwegian banks' access to short-term securities funding. Maturities of short-term USD funding have fallen, potentially increasing Norwegian banks' refinancing risk.

Norwegian banks¹ fund more than a third of their assets with customer deposits, while the remainder of their funding primarily consists of wholesale funding (Chart 3.1). The share of wholesale funding has remained stable in recent years. Around 60% of total wholesale funding is in foreign currency (Chart 3.2), much of which is used to fund assets in foreign currency, such as loans and liquidity buffers (Chart 3.3). The rest is swapped for NOK through currency swaps.

HIGHER RISK PREMIUMS ON LONG-TERM WHOLESALE FUNDING, BUT FROM LOW LEVELS

Long-term wholesale funding in the form of senior bank bonds and covered bonds accounts for around 30% of Norwegian bank funding (Chart 3.1). Banks

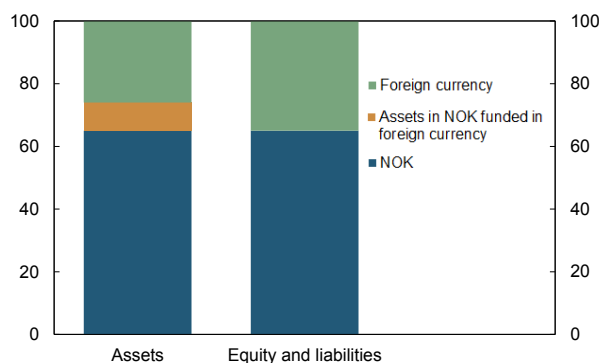
¹ Norwegian banks and covered bond mortgage companies, hereinafter referred to as "banks".

continue to have ample access to wholesale funding, but risk premiums have risen over the past year (Chart 3.4). Low oil prices and weaker growth prospects for the Norwegian economy have so far not resulted in a greater increase in risk premiums for DNB than for other Nordic banks (Chart 3.5). DNB's senior bank bonds are priced at the same level as those of large Swedish banks. Risk premiums have risen somewhat more for Norwegian banks with large exposures to regions with substantial petroleum-related activity.

Hybrid and subordinated debt represents 1% of Norwegian bank funding. In recent years, banks have issued more hybrid and Tier 2 capital, prompted by stricter rules for the instruments that may be included in regulatory capital and a somewhat higher quota for hybrid capital in the capital requirement.² This capital is raised in the market primarily as additional Tier 1 instruments and subordinated bonds. These instruments must absorb losses before other bonds. If the bank operates at a loss and its Common Equity Tier 1 (CET1) capital ratio breaches the combined buffer requirement, interest payments on hybrid capital instruments may be reduced or cancelled. These instruments are written down or converted to CET1 capital when the bank is on the verge of breaching the minimum requirement.³ Higher risk in a bank should therefore quickly be reflected in market pricing of that bank's hybrid capital outstanding.

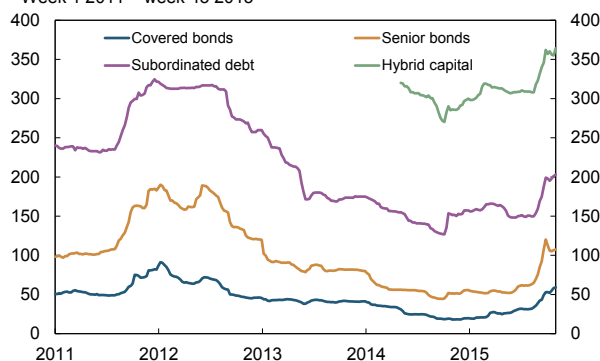
Risk premiums on hybrid capital and subordinated bonds in the Norwegian market fell considerably from 2012 (Chart 3.4). Since summer 2015, risk premiums have increased somewhat, for both Norwegian and foreign banks. At issuance, Norwegian banks paid more for hybrid capital in the international market than e.g. Swedish banks. This is because investors regard it as more probable that restrictions on paying interest on hybrid capital will be imposed on Norwegian banks. The reason appears primarily to be regulatory differences and not an assessment that Norwegian banks are fundamentally more risky than Swedish banks. Norwegian banks' Pillar 1 capital requirements⁴ are higher than those of Swedish banks. In Sweden, some of the buffer requirements

Chart 3.3 Norwegian assets funded in foreign currency. Norwegian banks and covered bond mortgage companies.¹ Percent. As at 30 June 2015



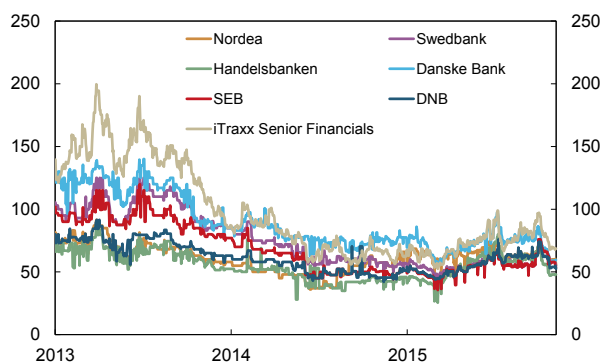
1) Sum of all banks and covered bond mortgage companies excluding branches and subsidiaries of foreign banks in Norway.
Source: Norges Bank

Chart 3.4 Risk premiums on wholesale funding. Large banks.¹ Premiums above three-month Nibor. 5-year maturity. Basis points. Week 1 2011 – week 45 2015



1) DNB Bank Group and Nordea Bank Group Norway.
Source: Nordic Bond Pricing

Chart 3.5 CDS prices for 5-year senior bonds in EUR. Spreads in basis points. 1 January 2013 – 5 November 2015



Source: Bloomberg

² Compared with previous Norwegian rules.

³ Normally at a CET1 capital ratio of 5.125%, but the level can be set higher in the individual instrument's contractual terms.

⁴ Pillar 1 requirements cover credit risk, operational risk and various forms of market risk. The minimum requirement in Pillar 1 is the same for all banks.

and risk-weight add-ons are under Pillar 2⁵ and have not been formally set. The gap between banks' capital adequacy ratios and the formal capital requirement is therefore wider than in Norway.

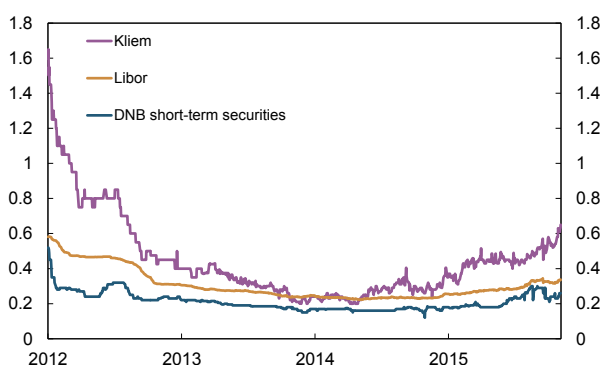
INCREASED REFINANCING RISK ASSOCIATED WITH SHORT-TERM FOREIGN CURRENCY FUNDING

Short-term wholesale foreign currency funding accounts for about 14%⁶ of bank funding, a large proportion of which is in USD. Like Swedish banks, DNB obtains short-term funding in the USD market. DNB currently has ample access to this type of funding on favourable terms (Chart 3.6). US money market funds are the largest purchaser of DNB's short-term securities in USD, and these funds also have substantial overnight USD deposits in DNB. The investor base is therefore poorly diversified.

This short-term funding is largely matched by central bank deposits and other liquid securities. The portion of borrowings that fund central bank deposits do not give rise to refinancing risk, since central bank deposits are highly liquid and risk-free. However, a loss of short-term funding in excess of the amount of central bank deposits may quickly result in a need to borrow against or sell portions of the securities portfolio, especially if other funding also becomes unavailable. The situation is further exacerbated if the securities

5 Pillar 2 requirements are intended to cover risks not covered under Pillar 1. These requirements vary across banks.
6 All funding excluding customer deposits, bond debt, hybrid capital, subordinated debt and equity.

Chart 3.6 USD interest rates. 3-month maturity. Percent. 2 January 2012 – 5 November 2015



Source: Bloomberg

portfolio falls in value or the need to post collateral increases. New liquidity regulations are intended to ensure that Norwegian banks can meet their obligations for a period of 30 days, even under severely stressed funding conditions and without access to new funding (see page 39).

CHANGES IN THE US MONEY MARKET

Recently, maturities in the US short-term securities market have declined. Reduced maturities, in isolation, increase banks' refinancing risk. Expectations of an interest rate increase by the Federal Reserve have contributed to the reduction in maturities. Money market funds have required higher interest rates to invest in securities with longer maturities, while banks that issue short-term securities have been reluctant to pay higher rates than before.

A new regulation for US money market funds has also likely contributed to shorter maturities in the short-term securities market. The regulation enters into force from October 2016. Money market funds that invest in short-term securities issued by banks, called prime funds, will be especially affected by the regulation. These funds will be subject to stricter liquidity requirements, and more of these funds will have to sell and redeem shares at market price, compared with a fixed price previously. Maturities of short-term securities have therefore decreased and will likely shorten further in the period leading to implementation of the regulation. In addition, a number of providers have indicated that they will reduce the size of prime funds. This may reduce Norwegian banks' access to short-term securities funding in the US market. Owing to less capital under management, prime funds may also become more selective and withdraw from a bank or a region more quickly than before.

NEW LIQUIDITY RULES FOR NORWEGIAN BANKS

A new liquidity regulation will soon be introduced in Norway. This will increase banks' resilience to disruptions in funding markets.

The liquidity coverage ratio (LCR) requirement was finalised by the EU in 2014,⁷ and implementation began in October 2015. The requirement is intended to improve individual banks' resilience to funding

7 On 10 October 2014, the European Commission presented a delegated regulation with regard to the LCR.

market turbulence. The Ministry of Finance circulated a draft Norwegian liquidity regulation for comment in June. The requirements are generally in line with the new EU regulation.

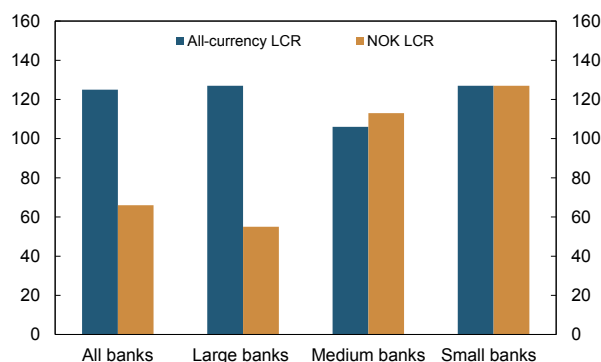
In the draft Norwegian liquidity regulation, large banks must meet a 100% LCR requirement from 1 January 2016. Most large Norwegian banks are already above the requirement (Chart 3.7). The largest banks have low LCRs in NOK and high LCRs in USD and EUR. Smaller banks' assets and liabilities are primarily in NOK and their LCRs in NOK are over 100%. Under Finanstilsynet's (Financial Supervisory Authority of Norway) proposal, there will not be a minimum LCR requirement in NOK, but the ratio will be followed up on an individual basis. Norges Bank has recommended a common minimum LCR requirement in NOK of 60% to ensure a reasonable degree of self-insurance against liquidity stress in NOK, while taking into account the limited volume of liquid NOK assets.⁸

LCRs have risen since 2014, especially for smaller banks. One reason is that the regulation adopted by the EU permits banks to hold a substantially higher percentage of covered bonds in their liquidity buffers, with lower haircuts than previously. The new limit is up to 70% covered bonds in the liquidity buffer. Currently, covered bonds account for approximately 30% of banks' liquidity buffers (Chart 3.8). Since the Norwegian government debt market is small, the phase-in of the LCR requirement may increase the share of covered bonds in liquidity buffers.

Norwegian banks already own around 35% of the Norwegian covered bond market. A high concentration of covered bonds in liquidity buffers results in a higher correlation between banks' possibilities for selling liquidity buffer assets and banks' funding possibilities. If many banks sell covered bonds from their liquidity buffers at the same time, new issuance will become more costly and difficult, possibly leading to further liquidity problems and sell-offs from liquidity buffers.

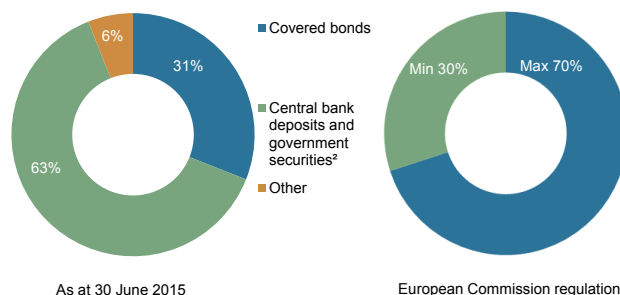
The proposed net stable funding ratio (NSFR) requires banks to fund illiquid assets with stable funding. Norges Bank has supported Finanstilsynet's proposal that the NSFR should be introduced as a minimum requirement of 100% for the largest institutions as

Chart 3.7 LCR. Weighted average by bank category. Percent. As at 30 June 2015



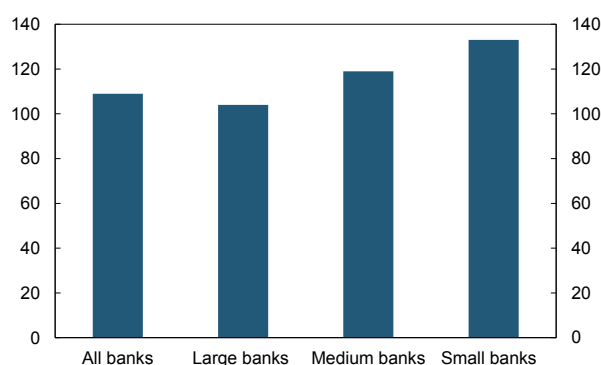
Source: Finanstilsynet

Chart 3.8 Norwegian banks' high quality liquid assets under LCR.¹ Percent. As at 30 June 2015



1) After haircuts.
2) Level 1 assets excluding covered bonds.
Sources: Finanstilsynet and Norges Bank

Chart 3.9 Total NSFR. Weighted average by bank category. Percent. As at 30 June 2015



Source: Finanstilsynet

⁸ See the 2014 *Financial Stability Report* and Consultation response – New Liquidity Requirements for Financial Institutions.

soon as the final definition of the NSFR has been adopted by the EU.

Measured by the NSFR under the Basel Committee’s proposal, Norwegian banks’ funding structure has become more stable over the past year. Only four banks are below 100%. Smaller banks’ NSFRs are higher, on average, than those of larger banks (Chart 3.9), partly reflecting the higher proportion of deposit funding among smaller banks than among large banks. Several categories of customer deposits and some wholesale funding count as stable funding (see box on page 39).

BANKS SHOULD BE TRANSPARENT ABOUT THEIR LIQUIDITY SITUATION

Greater transparency about banks’ liquidity and funding structure may improve liquidity and make funding more resilient. In the 2014 *Financial Stability Report*, Norges Bank recommended that banks publish an LCR each quarter. In 2015 Q2, of the largest Norwegian banks, only DNB Bank, SpareBank 1 SR-Bank, Sparebanken Vest and SpareBank 1 Nord-Norge published an LCR for all currencies combined. DNB Bank also published an LCR for USD and EUR. None of the banks published an LCR for NOK. In the new liquidity regulation, Finanstilsynet proposes that banks should publish their total LCR, and LCRs in NOK and in other significant currencies each quarter.

Publishes LCR each quarter

	Combined	NOK	Other significant currencies
DNB Bank	●	●	●
Nordea Bank Norge	●	●	●
SpareBank 1 SR-Bank	●	●	●
Sparebanken Vest	●	●	●
SpareBank 1 SMN	●	●	●
Sparebanken Sør	●	●	●
SpareBank 1 Nord-Norge	●	●	●

Publishes ● Does not publish ●

Banks already report their NSFRs to Finanstilsynet based on a method of calculation published on Finanstilsynet’s website. The institutions should also publish their NSFRs.

The EU’s implementing technical standards on additional liquidity monitoring metrics (AMM) were sched-

uled to be introduced in 2015. Introduction of the requirement has so far been postponed to 2016, and the standards are yet to be finalised. Once the standards are finalised, banks should publish metrics related to investor concentration and inflows and outflows by maturity (see the 2014 *Financial Stability Report*). This will better enable depositors and investors to assess banks’ liquidity risk.

FOCUS: IMPACT OF A FALL IN HOUSE PRICES ON BANK FUNDING

A broad decline in house prices will affect banks’ funding conditions. Mortgage companies will be able to withstand a sharp fall in house prices, but refinancing costs for covered bonds may rise. A fall in house prices will likely have a greater impact on the cost of refinancing unsecured funding.

Covered bond funding of residential mortgages has tied banking groups’ funding conditions more closely to house price developments. Covered bonds are securities issued by mortgage companies and primarily secured on residential mortgages with a low loan-to-value ratio (LTV).¹⁰

Since 2007, Norwegian banking groups have funded much of their residential mortgage lending by issuing covered bonds. Large reserves of available residential mortgages on banks’ balance sheets, high house price inflation and increased investor demand for presumably low-risk investments have contributed to the considerable increase in the volume of covered bond funding in recent years. Norwegian mortgage companies’ covered bond funding outstanding totals approximately NOK 900bn (Chart 3.10), or around 35% of Norwegian banking groups’ wholesale funding.

COVERED BONDS ARE A RESILIENT FUNDING SOURCE

Covered bonds are a resilient funding source owing to their high collateralisation ratios. By law, the value of the eligible cover pool must exceed the value of covered bonds issued (balance sheet requirement). Only the share of the residential mortgage with an LTV below 75% is included when calculating the balance sheet requirement.

⁹ The term “banking group” is used here to refer to banks and covered bond mortgage companies. The term “banks” is used for banks that own covered bond mortgage companies. Residential mortgage lenders are covered bond mortgage companies where the cover pool mainly comprises residential mortgages.

¹⁰ See the Financial Institutions Act (Norwegian only).

Internationally, covered bonds have performed well in crises. In periods of market turbulence, covered bonds are normally more resilient in terms of market liquidity than uncollateralised bank bonds. Compared with other corporate bonds, covered bonds trade at low risk premiums in both the Norwegian and international markets. The largest Norwegian mortgage companies obtain the highest credit rating on their issues.

The proportion of residential mortgages transferred to mortgage companies varies across banks. Transferring a large share of low LTV residential mortgages may increase risk for banks' unsecured creditors because the assets least likely to default are encumbered. In that case, banks may have to pay more for unsecured wholesale funding. On the other hand, the possibility of issuing covered bonds expands access to funding. It reduces banking groups' overall liquidity risk and hence the risk for unsecured creditors. In other words, covered bonds provide banking groups with additional and more stable funding sources. Through jointly owned mortgage companies, smaller banks have also gained access to global capital markets.

So far, increased encumbrance of banking groups' assets does not appear to have resulted in more costly unsecured wholesale funding. Risk premiums have been pushed down in recent years (Chart 3.11; see also Section 1), narrowing the difference between unsecured and covered bond funding. Recently, risk premiums have risen somewhat, widening the price difference between unsecured and secured funding.

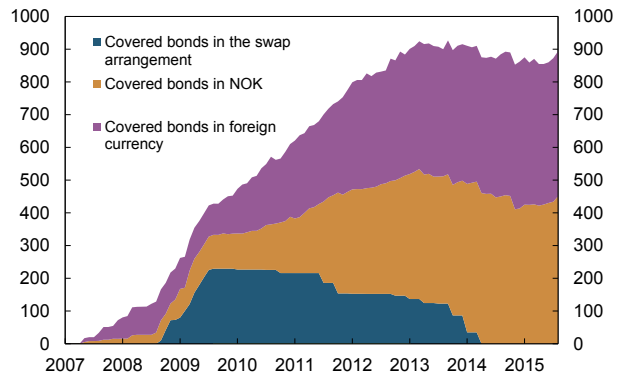
COVERED BONDS ARE DESIGNED TO WITHSTAND CONSIDERABLE DECLINES IN HOUSE PRICES

A fall in house prices will reduce the volume of residential mortgages that can be funded with covered bonds. Residential mortgages already transferred to the covered bond mortgage company will also fall in value.

Chart 3.12 shows how a fall in house prices can reduce the eligible cover pool in a sample of Norwegian residential mortgage lenders.^{11,12} Since a majority of

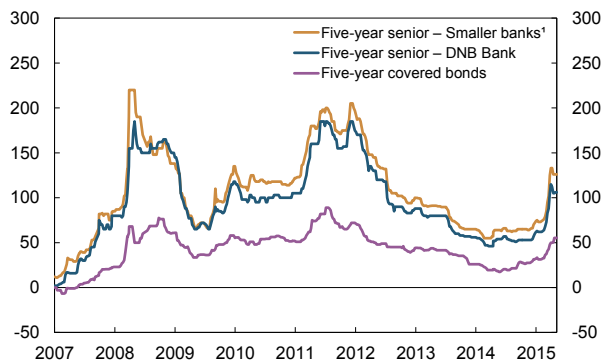
11 The sample includes all covered bond residential mortgage companies with total assets of over NOK 10bn at end-2014. Residential mortgages account for 97% of the eligible cover pool in the sample.
 12 Non-performing loans may not be included in the eligible cover pool. The green line in Chart 3.14 shows the reduction in the eligible cover pool if the default rate is 3% for loans with an LTV of up to 60% and 5% for other loans. By comparison, the default rate was just over 6% for household loans during the banking crisis in the early 1990s.

Chart 3.10 Outstanding covered bonds issued by Norwegian covered bond mortgage companies. In billions of NOK. 1 April 2007 – 1 November 2015



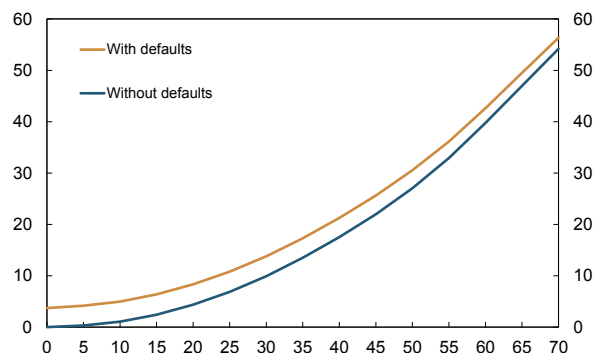
Sources: Stamdata, Bloomberg and Norges Bank

Chart 3.11 Bond risk premiums. Spread against three-month Nibor. Basis points. Week 27 2007 – week 45 2015



1) Banks with total assets between NOK 5bn and NOK 15bn with an A rating from DNB Markets.
 Sources: DNB Markets and Norges Bank

Chart 3.12 Decline in eligible cover pool (y-axis) owing to fall in house prices (x-axis). Percent. As at 30 June 2015



Sources: Norwegian covered bond residential mortgage lenders and Norges Bank

the residential mortgages have low LTVs (Chart 3.13), the change in house prices will not result in a proportional change in the eligible cover pool. Chart 3.12 shows that a 10% fall in house prices will reduce the eligible cover pool by around 1%, while a 40% fall in house prices will reduce the eligible cover pool by around 20%.

The value of the cover pool is normally considerably higher than that of issued covered bonds. This is required to obtain a good credit rating. Average overcollateralisation for our selection of mortgage companies is around 30%. Overcollateralisation provides investors with additional security and makes it easier

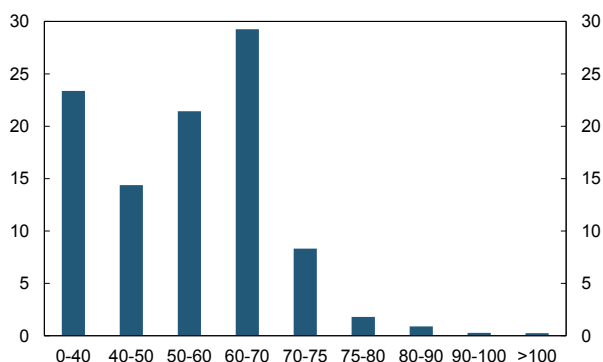
for mortgage companies to comply with balance sheet requirements if house prices should fall. Chart 3.14 shows that house prices could fall by approximately 45% before mortgage companies are at risk of breaching the balance sheet requirement. Combined with higher default rates, a somewhat less pronounced fall in house prices would put mortgage companies in breach of the balance sheet requirement.

If house prices should fall sharply, reduced overcollateralisation can lead to a downgrade of the mortgage company. To maintain overcollateralisation, mortgage companies will probably try to strengthen the cover pool. They can do this by increasing the size of the eligible cover pool or reducing covered bond debt outstanding. Strengthening the cover pool will have to be funded, and funding may be difficult and expensive if house prices are falling and the economy weakens.

A solution for mortgage companies may be direct support from owner banks.¹³ Banks' direct obligations to mortgage companies vary. Even if all banks do not have direct obligations to maintain overcollateralisation of mortgage companies, it is nevertheless reasonable to assume that to the extent they are able, they will support mortgage companies to prevent a downgrade prompted by a fall in house prices.

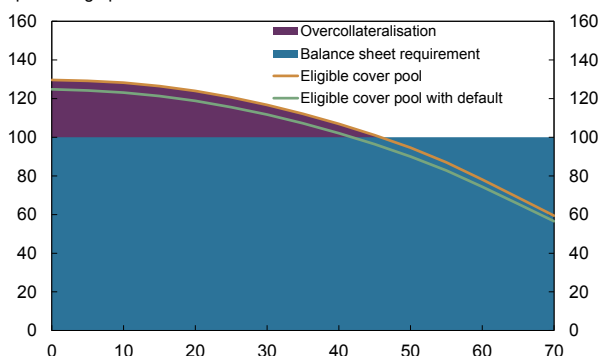
If banks support the mortgage company, the average risk in owner banks' balance sheets may rise. A fall in house prices will probably also increase the risk associated with banks' other assets. More of the increased risk in banking groups' balance sheets may thus be transferred to owner banks' unsecured creditors. Funding terms for types of loans other than low LTV residential mortgages may therefore deteriorate to a greater extent compared with a situation without covered bond funding.

Chart 3.13 Mortgage loans in Norwegian covered bond mortgage companies' cover pool. By loan-to-value ratio. Percent. As at 30 June 2015



Sources: Norwegian covered bond residential mortgage lenders and Norges Bank

Chart 3.14 Eligible cover pool and overcollateralisation (y-axis) and decline in house prices (x-axis). Percent of covered bonds outstanding and percentage points. As at 30 June 2015



Sources: Norwegian covered bond residential mortgage lenders and Norges Bank

¹³ New banking regulations and changes in rating agencies' credit rating methodology give preferential treatment to covered bonds to a greater degree than previously relative to unsecured bank bonds. This may reduce owner banks' need to support mortgage companies in order to maintain their credit rating.

LIQUIDITY REGULATION

Under the **Liquidity Coverage Ratio (LCR)**, banks must hold an adequate stock of unencumbered high-quality liquid assets (HQLA) to meet their liquidity needs for a 30-day period of financial market stress. The LCR has two components:

- a) The value of the stock of HQLA after haircuts for assumed price declines in the stress period.
- b) Total net cash outflows in the stress period, defined as expected outflows minus expected inflows, based on assumptions of an inability to roll over wholesale funding and a run-off of a proportion of deposits.

$$\text{LCR} = \frac{\text{Stock of HQLA (a)}}{\text{Total net cash outflows (b)}} \geq 100\%$$

In the European Commission regulation¹, banks must meet the LCR for all currencies combined. It is not an explicit requirement for banks to fully comply with the LCR requirement by currency.

In the EU, the phase-in began on 1 October 2015 and the requirement will apply in full from 1 January 2018. The Ministry of Finance has circulated a draft Norwegian liquidity regulation for comment. The requirements are generally in line with the new EU regulation.

The **Net Stable Funding Ratio (NSFR)** requires banks' illiquid assets to be financed by long-term funding. The NSFR has two components:

- a) The value of funding expected to be stable, including regulatory capital, long-term bond funding and household deposits, multiplied by a defined available stable funding (ASF) factor.
- b) The value of assets and off-balance sheet exposures assumed to require stable funding, including encumbered assets and loans to customers, multiplied by a defined required stable funding (RSF) factor.

$$\text{NSFR} = \frac{\text{Available amount of stable funding (a)}}{\text{Required amount of stable funding (b)}} \geq 100\%$$

The NSFR will be introduced under Basel III on 1 January 2018. The NSFR is yet to be clearly defined in EU regulations, and it is uncertain when and in what form this requirement will enter into force. The European Commission will submit draft legislation for the NSFR by end-2016 in order to introduce the NSFR as a requirement by 2018.

¹ See European Commission regulation of 10 October 2014.

4 CENTRAL COUNTERPARTIES AND SYSTEMIC RISK

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- Exposures among CCPs 43
- Multiple CCP memberships can result in margin requirements that are set too low 43

The financial crisis revealed a number of weaknesses in derivatives markets. The EU regulation EMIR¹ implements the requirement that all standardised OTC derivatives contracts must be cleared through a central counterparty (CCP). Norwegian banks' interest rate derivative transactions are cleared through CCPs abroad. CCPs have effective risk management procedures. Losses that arise are shared by the CCP's members. At the same time, an increase in the use of CCPs also increases concentration risk.

INCREASED USE OF CENTRAL COUNTERPARTIES

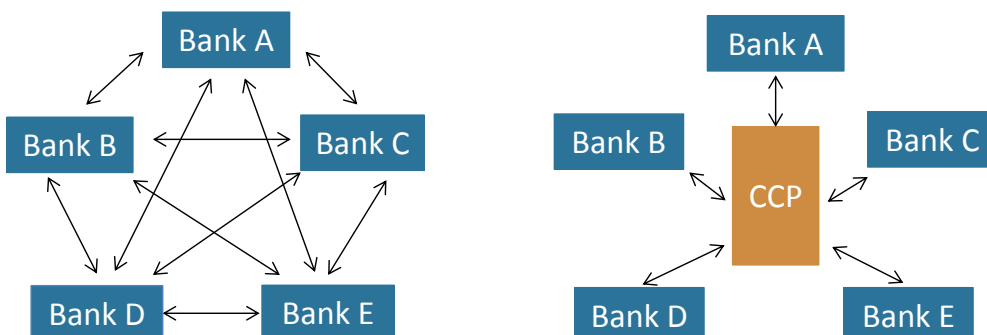
A CCP interposes itself between the buyer and seller in a trade, becoming the counterparty for each (Chart 4.1). The original contract is replaced by two new contracts: one between the buyer and the CCP and one between the seller and the CCP. The CCP guarantees that it will honour the terms of a trade in financial instruments to which it is a counterparty (clearing). Consequently, the parties no longer have exposure to each other but instead are exposed to the CCP.

The financial crisis demonstrated that insufficient collateral had been posted as margin in bilateral over-

the-counter (OTC) derivatives transactions. In addition, it was difficult for the authorities to monitor exposures in the market. In the light of experience gained during the financial crisis, G20 leaders agreed to strengthen the regulation of derivatives markets. One important measure was to require that OTC derivatives should to a greater extent be cleared through CCPs. This has been followed up in the US through the Dodd-Frank Act and in Europe through the EMIR regulation. If EMIR is implemented in Norway, central clearing of standardised interest rate derivatives will be mandatory for Norwegian banks. Interest rate derivatives are by far the most widely traded derivative (Chart 4.2).

¹ Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

Chart 4.1 Central counterparties (CCPs)



For countries that have introduced EMIR, clearing of standardised interest rate derivatives will be mandatory in spring 2016. This applies to derivatives denominated in EUR, USD, GBP, and JPY.² On 10 November 2015, The European Securities and Markets Authority (ESMA)³ issued a proposal for mandatory central clearing of some interest rate derivatives denominated in NOK.⁴ ESMA has sent the proposal for endorsement to the European Commission, which has three months to do so.

Norwegian banks' interest rate derivatives transactions are currently cleared bilaterally as well as centrally through the UK CCP SwapClear, which is part of the clearing house group LCH.Clearnet Limited. Norwegian banks use interest rate derivatives in connection with their foreign exchange funding. DNB Bank ASA and Nordea Bank Norge ASA are direct members of SwapClear, as are several other Nordic banks. Banks are subject to higher capital requirements if they settle trades in financial instruments bilaterally rather than through a CCP.⁵ Another reason why Norwegian banks use CCPs to clear OTC derivatives is that this is required by their trading partners.

Central clearing has also increased because a number of trading venues have introduced it as a requirement. CCP clearing for trades in equities has been obligatory on Oslo Børs since 2010. Derivatives trades on Oslo Børs have been cleared through a CCP since 2006. Norwegian equities and equity derivatives are traded on a number of trading venues (Chart 4.3). A number of CCPs clear these instruments and thus clear payments denominated in NOK. Problems in one of these CCPs could lead to settlement fails and Norwegian market participants could incur losses.

CENTRAL COUNTERPARTIES STRENGTHEN FINANCIAL STABILITY

The use of CCPs contributes to market resilience in times of turbulence and to predictability in loss management.

As a CCP's positions are normally balanced, CCPs are not exposed to potential losses as a result of fluctuations in prices for equities or derivatives. However,

CCPs have contingent market risk: if one of the counterparties defaults on a trade, the CCP's position will no longer be balanced. In this situation, the CCP is under an obligation to honour the trade vis-à-vis the non-defaulting counterparty. The CCP has to replace the defaulter's part of the transaction. A CCP does this by closing out the position, i.e. it enters into a new contract with another buyer or seller, which takes on the position of the defaulting member. To mitigate risk, the CCP will seek to close the position relatively quickly after the default.

Chart 4.2 The global market for OTC derivatives. Notional amounts outstanding. In trillions of USD. 30 June 1998 – 31 December 2014

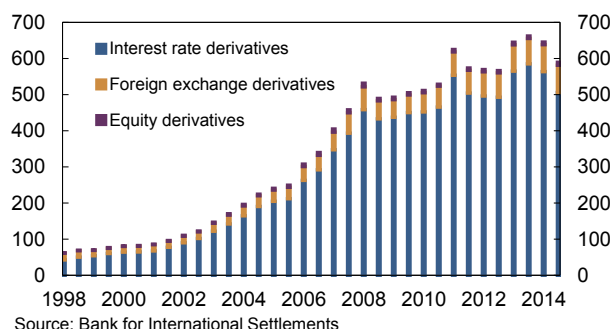
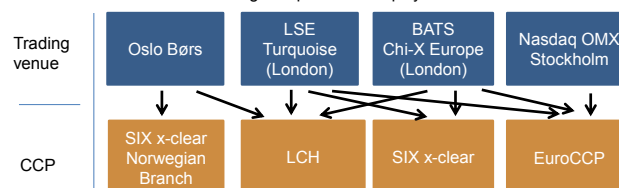
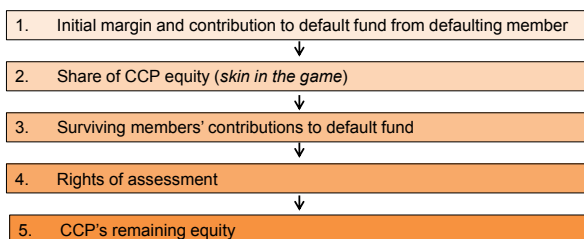


Chart 4.3 Trades in and clearing of equities and equity derivatives in NOK



2 See European Commission press release of 6 August 2015.
 3 ESMA is the European supervisory body for financial markets.
 4 The ESMA proposal applies to the mandatory central clearing of fixed-to-float interest rate swaps (IRS) and forward rate agreements denominated in NOK, PLN and SEK. See ESMA press release of 10 November 2015.
 5 When EMIR has been fully implemented, capital requirements for exposures to qualifying (EMIR-authorized) CCPs will be lower than for exposures to non-qualifying CCPs.

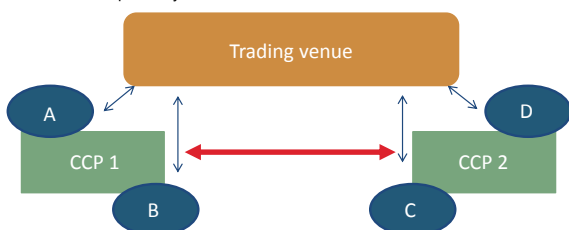
Chart 4.4 Example of a CCP's default waterfall



To address counterparty risk, CCPs require margin to be posted by each party in a transaction and contributions to a default fund. In the event of default, the defaulting member's margin and contributions to the default fund are used to cover any losses. Losses that exceed the margin posted by the defaulting member and its contribution to the default fund must be absorbed by the CCP's equity. Any remaining losses must be covered by the default fund contributions of other members (Chart 4.4).

Most direct members of CCPs are large banks. If losses are so high that the CCP has to exhaust its default fund to close out the defaulting member's position, Norwegian banks may face further capital calls to top up the default fund (rights of assessment). The size of these contributions follows from the agreements the CCP has with its members. Both oversight and supervisory authorities and banks themselves must ensure that they are well-informed regarding banks' exposures to CCPs and the additional capital calls that banks may face in a crisis.

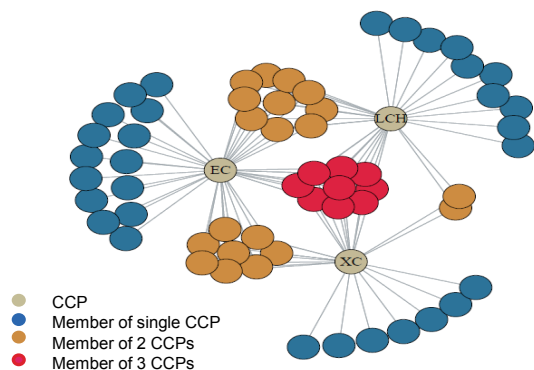
Chart 4.5 Interoperability



NEW CHALLENGES

A consequence of the central clearing mandate is that market exposures become concentrated in CCPs, increasing their systemic importance.

Chart 4.6 Members of multiple CCPs



Sources: EuroCCP, SIX x-clear and LCH.Clearnet Limited

Beyond being required to collect margin and default fund contributions, CCPs are required to have explicit, pre-defined procedures to manage a member's default. As a result, the probability that problems will spread is lower compared with bilateral trades. At the same time, a consequence of the requirement for central clearing is a greater concentration of market exposures, particularly in the case of OTC interest rate derivatives. Of all centrally cleared OTC interest rate derivatives, more than 95% are cleared through LCH.Clearnet.⁶

The increase in the use of CCPs poses new challenges. Three factors that could lead to CCP losses and weaken financial stability are presented below.

⁶ See LCH.Clearnet's webpages.

PROCYCLICAL MARGIN CALLS MAY AMPLIFY MARKET TURBULENCE

CCP margin requirements will depend on market volatility. Moreover, margin calls must usually be met within one hour. Through feedback effects in the market, margins may have a procyclical impact: an increase in margin requirements could force a clearing member to sell financial instruments to meet the increase, which may exacerbate price volatility and in turn lead to a further increase in margins. In a crisis, price volatility may be further amplified if the CCP closes out positions because members do not meet margin requirements. Given that these increased margin requirements will occur in periods of market turbulence and affect a number of the clearing members at the same time, the consequences may be severe.

Procyclical margin requirements also pose a challenge in connection with bilateral trades. However, the consequences may be more severe for centrally cleared trades because of the explicit rules specifying when and how margins should be posted.

The European Systemic Risk Board (ESRB) recommends that macroprudential authorities should ensure that CCPs take sufficient account of the potential procyclicality of margin requirements. ESMA has issued guidelines with the aim of preventing margins from being set too low in normal times.

EXPOSURES AMONG CCPs

CCPs have entered into agreements allowing clearing members in different CCPs to trade with each other (interoperability) (Chart 4.5). Such agreements have been made for equities and equity derivatives, but not for OTC derivatives. When market participants in different CCPs have the opportunity to trade with each other, the increase in the number of counterparties improves the liquidity of the market. At the same time, exposures among CCPs generate a risk of problems spreading to other CCPs. A CCP's exposures to other CCPs will normally be larger than its exposures to its members. Exposures among CCPs are a result of all the trades between their members across the CCPs. If for example banks A and C enter into a trade, the original trade between A and C will be replaced by the following trades: one between A and CCP 1, one between C and CCP 2 and a trade between the two CCPs.

ESMA has issued guidelines on managing exposures among CCPs.⁷ ESMA does not, for example, allow CCPs to contribute to each other's default funds, thereby reducing the risk of losses spreading among the CCPs if one of their members defaults. In a serious crisis, however, even a CCP can fail. The authorities in the relevant countries conduct oversight and supervision to mitigate the risk associated with exposures among CCPs.

MULTIPLE CCP MEMBERSHIPS CAN RESULT IN MARGIN REQUIREMENTS THAT ARE SET TOO LOW

Large banks are often members of several CCPs. Chart 4.6 shows a breakdown of members of the three CCPs LCH.Clearnet, SIX x-clear and EuroCCP. Some of the largest Nordic banks, such as DNB, Nordea and Danske Bank, are members of both EuroCCP and SIX x-clear.

If a bank defaults on the same type of positions across multiple CCPs, the CCPs may have to close out the positions at the same time. Because the CCPs do not know the bank's total position, price volatility may be greater than had been assumed by the CCPs when they calculated margins and default fund contributions. At worst, this could result in substantial losses for the CCPs. National authorities or the CCPs themselves should exchange information about members' positions.

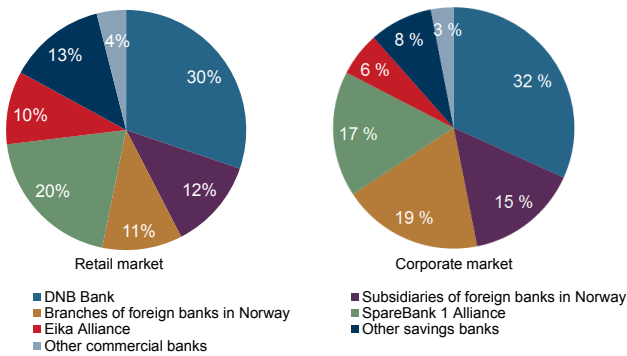
Despite a substantial concentration of risk in CCPs and an increase in their systemic importance, CCPs strengthen the resilience of financial markets. To ensure that CCPs take sufficient account of the risks, national authorities must engage in close monitoring and extensive cooperation across borders. The Norwegian authorities take part in oversight groups, known as "colleges", for a number of CCPs active in the Norwegian securities market.

⁷ Guidelines and Recommendations for establishing consistent, efficient and effective assessments of interoperability arrangements.

ANNEX 1

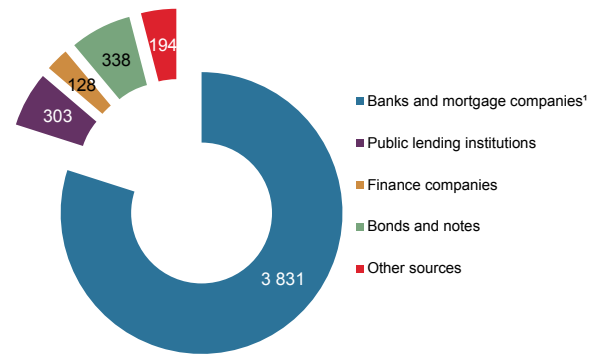
THE NORWEGIAN BANKING SECTOR

Chart 1 Lending market shares in the Norwegian banking sector.^{1,2} Percent. As at 30 June 2015



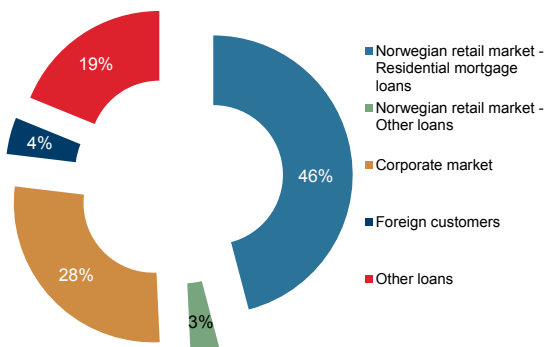
1) All banks and mortgage companies in Norway.
2) See Table 2.
Source: Norges Bank

Chart 2 Gross domestic lending to the private sector by credit source. In billions of NOK. As at 30 June 2015



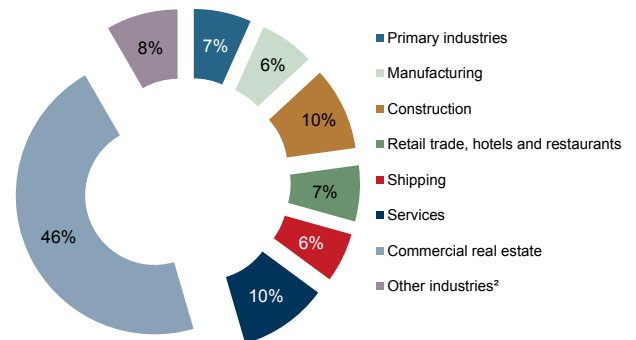
1) All banks and mortgage companies including Eksportfinans.
Source: Statistics Norway

Chart 3 Lending¹ by all banks and mortgage companies. Percent. As at 30 June 2015



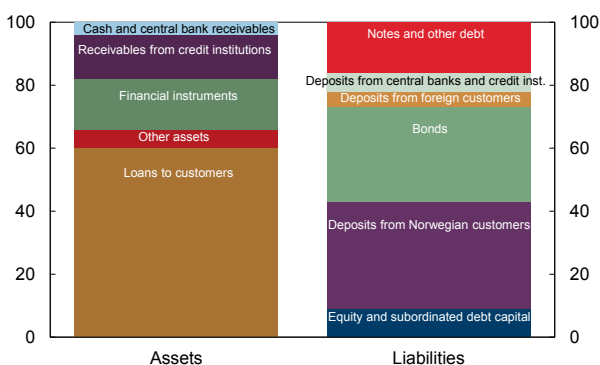
1) Total lending of NOK 4 570bn.
Source: Norges Bank

Chart 4 Lending by all banks and mortgage companies to the corporate market.¹ Percent. As at 30 June 2015



1) Corporate loans total NOK 1 264bn.
2) Other industries comprises Oil service, Other transportation, Electricity and water supply and Extraction of natural resources. Here, "Oil service" is narrowly defined.
Source: Norges Bank

Chart 5 Balance sheet¹ of Norwegian-owned banks and covered bond mortgage companies.² Percent. As at 30 June 2015



1) Intercompany items between banks and mortgage companies are not eliminated.
2) All banks and mortgage companies with the exception of subsidiaries and branches of foreign banks in Norway.
Source: Norges Bank

TABLE 1 STRUCTURE OF THE NORWEGIAN FINANCIAL INDUSTRY
AT 30 JUNE 2015

	Number	Lending (NOK bn)	Total assets (NOK bn)
Banks (excluding branches of foreign banks)	123	2 098	3 943
Branches of foreign banks	12	474	769
Mortgage companies (including branches of foreign companies)	29	1 482	1 915
Finance companies (including branches of foreign companies)	46	144	160
State lending institutions	3	307	315
Life insurance companies (excluding branches of foreign companies)	13	52	1 253
Non-life insurance companies (excluding branches of foreign companies)	60	3	167
Memorandum: (NOK bn)			
Market value of equities and equity certificates, Oslo Børs	2 107		
Outstanding domestic bonds and short-term paper debt	1 871		
Issued by public sector and state-owned companies ¹	669		
Issued by banks	320		
Issued by other financial institutions	467		
Issued by other private enterprises ¹	166		
Issued by non-residents	249		
GDP Norway (2014)	3 150		
GDP mainland Norway (2014)	2 527		

¹ Compared with the table last year, NOK 122bn has been reclassified from other private enterprises to public sector and state-owned companies.

Sources: Oslo Børs, VPS, Statistics Norway and Norges Bank

TABLE 2 MARKET SHARES OF BANKS AND MORTGAGE COMPANIES¹ IN NORWAY AT 30 JUNE 2015. PERCENT

	Gross lending to		Deposits from	
	Retail market ⁹	Corporate market ¹⁰	Retail market ⁹	Corporate market ¹⁰
DNB Bank ²	30.2	31.8	31.1	37.6
Subsidiaries of foreign banks in Norway ³	12.2	15.1	9.1	13.3
Branches of foreign banks in Norway ⁴	10.8	18.8	9.4	15.1
SpareBank 1 Alliance ⁵	19.9	16.8	18.7	14.8
Eika Alliance ⁶	9.9	5.9	12.1	7.9
Other savings banks ⁷	13.1	8.5	13.8	9.3
Other commercial banks ⁸	4.0	3.1	5.8	2.1
Total	100.0	100.0	100.0	100.0
Total market (NOK bn)	2 251	1 264	1 043	592

1 The market shares are calculated by summing the balance sheet items for the institutions in the different groups.

2 DNB Bank, DNB Boligkreditt and DNB Næringskreditt.

3 Nordea Bank Norge, Santander Consumer Bank and Nordea Eiendomskreditt.

4 Danske Bank, Handelsbanken, Handelsbanken Eiendomskreditt, Skandiabanken, eight other branches and one mortgage lender.

5 SpareBank 1 SR-Bank, SpareBank 1 SMN, SpareBank 1 Nord-Norge, Sparebanken Hedmark, the 11 other savings banks in the SpareBank 1 Alliance, SpareBank 1 Boligkreditt, BN Bank and Bank 1 Oslo Akershus, one commercial mortgage lender, one mortgage lender and one other residential mortgage lender.

6 Eika Boligkreditt, Eika Kredittbank, 71 savings banks and three commercial banks which are owners of Eika Gruppen AS and two other residential mortgage lenders.

7 Sparebanken Vest, Sparebanken Vest Boligkreditt, Sparebanken Møre, Sparebanken Sør and Sparebanken Sogn og Fjordane, 13 other savings banks, seven residential mortgage lenders, one mortgage lender and one hybrid covered bond mortgage company.

8 Eksporthfinans, Storebrand Bank, Gjensidige Bank, Landkreditt Bank, seven other commercial banks and four other residential mortgage lenders, Kommunalbanken and one municipal mortgage lender.

9 The retail market comprises wage earners, pensioners, benefit recipients and students.

10 The corporate market primarily comprises non-financial private enterprises and the self-employed.

Source: Norges Bank

TABLE 3 RATING BY MOODY'S¹, TOTAL ASSETS, CAPITAL ADEQUACY² AND RETURN ON EQUITY FOR NORDIC FINANCIAL GROUPS, SUBSIDIARIES IN NORWAY AND NORWEGIAN BANKS AT 30 JUNE 2015. CONSOLIDATED FIGURES

	Credit rating		Total assets (NOK bn)	Common equity tier 1 (CET1) capital ratio (%)			Return on equity		
	Short-term	Long-term		(with transitional floor)	(without transitional floor)	Proportion of interim result in CET1 capital ² (%)	2013	2014	2015 Q1-Q2
Nordea Bank	P-1	Aa3	6 002	10.8	16.0	100	11.0	11.6	13.7
Danske Bank	P-1	A2	4 068	N.A.	14.3	50	5.0	2.6	12.5
SEB	P-1	Aa3	2 826	10.5	17.2	100	13.1	15.3	12.8
Handelsbanken	P-1	Aa2	2 801	8.9	21.4	25	13.9	13.4	13.5
DNB	P-1	Aa2	2 642	13.0	14.0	50	13.1	13.8	14.1
Swedbank	P-1	Aa3	2 193	10.3	22.4	25	12.5	15.2	14.1
Nordea Bank Norge	P-1	Aa3	640	15.6	26.2	100	12.3	11.6	11.0
SpareBank 1 SR-Bank	P-1	A1	182	12.6	12.6	100	14.0	14.2	11.8
Sparebanken Vest	P-1	A1	151	12.5	13.4	100	11.7	13.7	12.2
SpareBank 1 SMN	P-1	A1	131	13.0	13.0	100	13.3	15.1	13.5
Sparebanken Sør	P-1	A1	99	12.8	12.8	100	12.3	10.1	10.0
Santander Consumer Bank	P(P-2)	A3	99	11.4	11.4	100	14.6	12.2	12.1
SpareBank 1 Nord-Norge	P-1	A1	85	13.8	13.8	100	13.0	12.2	11.7

1 Rating at 29 September 2015. Moody's scale of rating: Short-term: P-1, P-2,... Long-term: Aaa, Aa1, Aa2, Aa3, A1, A2,...

2 The proportion of interim results included in the calculation of CET1 capital ratios varies across institutions. The higher the proportion of (positive) interim result included, the higher the CET1 capital ratio. Owing to different national rules, such as consolidation rules for life insurance companies, CET1 capital figures for Norwegian financial groups are not directly comparable with those of other Nordic financial groups.

Sources: Moody's and banks' websites

TABLE 4 BANKS'¹ LOSSES ON LOANS² TO VARIOUS INDUSTRIES AND SECTORS AS A PERCENTAGE OF LENDING TO THE RESPECTIVE INDUSTRIES AND SECTORS

Industries										Lending in NOK bn
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2014
Agriculture, forestry and fishing	-0.55	-0.06	0.19	0.22	0.13	0.15	0.10	0.14	0.18	86.55
of which: Fish farming, hatcheries	-0.17	-0.11	0.56	0.84	0.23	0.14	-0.03	0.12	0.09	13.04
Extraction of crude oil and natural gas	-0.05	0.00	0.00	0.13	0.02	0.06	0.39	-0.08	0.19	8.79
Manufacturing, mining and quarrying	-0.28	0.10	0.45	0.86	0.71	0.66	0.71	0.18	1.04	68.75
of which: Manufacturing				0.89	0.88	0.42	0.53	0.24	1.18	49.46
of which: Ship and boat building				0.84	-0.08	2.67	2.04	-0.03	-0.02	12.46
Electricity and water supply, construction	-0.18	0.12	0.42	0.62	0.65	0.59	0.60	0.57	0.60	126.01
of which: Construction	-0.14	0.18	0.66	0.87	1.48	1.49	1.17	1.46	1.95	34.26
Retail trade and auto repair, hotels and restaurants	0.09	0.21	0.52	1.38	0.35	0.76	0.34	0.58	0.80	68.41
of which: Retail trade and auto repair	0.10	0.21	0.49	1.58	0.33	0.78	0.30	0.63	0.86	55.54
of which: Hotels and restaurants	0.03	0.29	0.42	0.43	0.46	0.67	0.48	0.35	0.54	12.87
Shipping and pipeline transport	0.06	-0.05	0.09	1.43	1.37	1.66	2.10	2.08	1.40	51.57
Other transport and communications	0.05	0.06	0.06	1.43	1.43	1.16	0.62	2.07	0.12	61.90
Business services and real estate activities	-0.06	0.02	0.34	0.37	0.21	0.29	0.32	0.25	0.34	440.36
of which: Real estate activities	-0.12	0.03	0.28	0.32	0.20	0.29	0.31	0.25	0.29	376.04
of which: Professional, financial business services				0.60	0.23	0.29	0.42	0.25	0.65	64.32
Other service industries	0.14	0.10	0.22	0.38	0.56	0.14	0.36	0.15	0.81	29.49
Total for all industries	-0.08	0.03	0.28	0.61	0.44	0.51	0.51	0.52	0.50	941.83
Retail market	-0.01	0.04	0.07	0.12	0.15	0.14	0.11	0.12	0.07	944.60
Others³	0.02	0.01	0.09	0.05	0.02	0.01	0.03	0.04	0.00	890.69
Total	-0.03	0.03	0.17	0.29	0.23	0.26	0.25	0.24	0.20	2777.12

1 All banks except branches of foreign banks in Norway.

2 Recognised losses, excluding changes in collective impairment losses/unspecified loss provisions.

3 Financial institutions, central government and social security administration, municipal sector and foreign sector.

Source: Norges Bank

TABLE 5 LOAN DEFAULT RATES. ALL BANKS AND COVERED BOND MORTGAGE COMPANIES¹. AT YEAR-END

Year	Loan defaults. Percentage of lending to sector			Loan defaults. Percentage of lending to private sector			
	Households	Enterprises	Others	Households	Enterprises	Others	Total
1990	4.87	7.63	3.07	3.08	2.56	0.10	5.74
1991	6.33	10.25	3.13	4.07	3.36	0.09	7.52
1992	8.20	11.50	1.94	5.19	3.92	0.05	9.17
1993	6.54	10.62	0.40	4.26	3.47	0.01	7.73
1994	4.79	6.89	0.68	3.18	2.16	0.02	5.36
1995	3.69	4.61	0.29	2.40	1.47	0.01	3.88
1996	2.82	3.29	0.40	1.85	1.05	0.01	2.91
1997	2.12	2.12	0.22	1.36	0.71	0.01	2.07
1998	1.49	1.33	0.06	0.94	0.45	0.00	1.40
1999	1.34	1.47	0.07	0.86	0.50	0.00	1.36
2000	1.25	1.42	0.08	0.79	0.50	0.00	1.29
2001	1.27	1.72	0.04	0.81	0.60	0.00	1.41
2002	1.27	3.46	0.08	0.84	1.14	0.00	1.98
2003	1.08	3.25	0.14	0.74	0.98	0.00	1.72
2004	0.82	1.79	0.10	0.59	0.49	0.00	1.07
2005	0.72	0.95	0.05	0.52	0.26	0.00	0.78
2006	0.57	0.70	0.07	0.39	0.21	0.00	0.60
2007	0.54	0.50	0.01	0.36	0.16	0.00	0.52
2008	0.77	0.85	0.01	0.49	0.30	0.00	0.79
2009	1.11	1.59	0.13	0.74	0.51	0.00	1.25
2010	1.21	1.84	0.12	0.81	0.57	0.00	1.39
2011	1.02	1.89	0.24	0.68	0.59	0.00	1.27
2012	0.98	1.81	0.72	0.66	0.56	0.02	1.23
2013	0.93	1.77	0.35	0.63	0.53	0.01	1.17
2014	0.81	1.51	0.10	0.55	0.45	0.00	1.00
2015 ²	0.71	1.35	0.12	0.48	0.40	0.00	0.89

1 Covered bond mortgage companies included from 2005.

2 As at 30 June 2015.

Source: Norges Bank

ANNEX 2

REGULATORY REFORM

Field	Institutions and regulations	Progress
Tools for banking crisis resolution	Financial Stability Board (FSB) – Crisis resolution	The FSB presented proposals on total loss absorbing capacity (TLAC) for global systemically important banks (GSIBs) on 10 November 2014. Following a consultation, a draft standard was adopted by the FSB and published on 9 November 2015.
	EU – Bank Recovery and Resolution Directive (BRRD)	The BRRD became EU law on 1 January 2015. Bail-in as a crisis resolution tool will enter into force on 1 January 2016. The Banking Law Commission will report on transposing the directive into Norwegian law.
	EU – Deposit insurance	The EU has approved a deposit guarantee of EUR 100 000 per depositor. The Norwegian deposit guarantee is currently NOK 2m. The Banking Law Commission will report on new deposit insurance legislation in Norway.
Requirements relating to banks' capital adequacy, risk management and liquidity	New standardised approach and capital floor for IRB banks	The Basel Committee has proposed revisions to the standardised approach to credit risk and a capital floor for IRB banks related to the revised standardised approaches. On 27 March 2015, Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank submitted a joint consultative statement on these proposals. The Basel Committee has not yet finalised the proposals.
	The EU CRD IV/CRR framework in Norway	Large portions of CRD IV/CRR have been transposed into Norwegian law, effective from 1 July 2013. The rules entail stricter requirements for the quality of regulatory capital and the introduction of capital buffers. The framework has been supplemented with regulations.
	Leverage ratio	On the basis of the advice of the European Banking Authority (EBA), the European Commission shall prepare a report to the Council and the Parliament by the end of 2016 to be accompanied by a legislative proposal to introduce a binding leverage ratio or different leverage ratios for different business models, applicable from 1 January 2018 onwards. The report shall also consider adjustments to the calibration of the ratio. In the first half of 2017, the Basel Committee will propose a minimum leverage ratio in Pillar 1.
	Risk weights for residential mortgages	The minimum Loss Given Default (LGD) model parameter in IRB banks' residential mortgage models was increased to 20% in 2014. Finanstilsynet also issued new requirements for the calibration of IRB banks' residential mortgage models effective from 2015. The recalibration entails an increase in the minimum Probability of Default (PD) for individual loans to 0.2% and an increase in the long-term average PD.
	Systemically important banks	The Ministry of Finance has issued the Regulation on the designation of systemically important financial institutions and designated DNB ASA, Nordea Bank Norge ASA and Kommunalbanken AS as systemically important. Designations will be reviewed annually. Institutions with total assets of at least 10% of mainland GDP, or a share of the lending market of at least 5%, will, as a main rule, be designated as systemically important.
	Countercyclical capital buffer	The Ministry of Finance sets the countercyclical capital buffer on the basis of advice from Norges Bank. On 12 December 2013, the Ministry of Finance set the buffer at 1% effective from 30 June 2015. On 18 June 2015, the Ministry of Finance decided to increase the buffer to 1.5% effective from 30 June 2016.
	Quantitative liquidity standards	On 10 October 2014, the European Commission published a delegated regulation on the LCR requirement. The LCR will be progressively implemented from 1 October 2015 and will apply in full from 1 January 2018. Draft liquidity regulations for Norwegian financial institutions have been circulated for comment by the Ministry of Finance. The Basel Committee published a proposal for the NSFR in October 2014. The European Commission will submit draft legislation for the NSFR by the end of 2016 in order to introduce the NSFR as a requirement by 2018.
	Loans secured on dwellings	The Ministry of Finance has laid down a regulation on requirements for new loans secured on dwellings, which applies in the period between 1 July 2015 and 31 December 2016. The regulation is based on guidelines previously issued by Finanstilsynet. Repayment loans shall not exceed 85% of the dwelling's value, the borrower must have the capacity to service debt in the event of a 5 percentage point increase in interest rates, and annual principal repayments of at least 2.5% are required for loans granted with a loan-to-value ratio above 70%. Up to 10% of the value of loans granted can be loans that do not comply with one or more of these requirements.
Supervisory structure	New EU supervisory structure	New supervisory structure for the EU financial sector as from 2011. On 14 October 2014, EU and EFTA/EEA states reached agreement on a solution for the incorporation of the EU Regulation establishing the European Supervisory Authorities into the EEA Agreement. The solution must be approved by the Storting.
	EU Banking Union	The Single Supervisory Mechanism (SSM), which transfers much of the supervisory responsibility in the euro area to the ECB, entered into force from November 2014. A Single Resolution Mechanism (SRM) and a Single Resolution Fund were approved in April and May 2014, respectively. Crisis resolution under the SRM is subject to the principles and rules set out in the BRRD.

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Financial Stability Report 2015

