



NORGES BANK

**2018**

**FINANCIAL  
STABILITY  
REPORT**

VULNERABILITIES AND RISKS

# Norges Bank

Oslo 2018

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The text is set in 9 pt Azo Sans

ISSN 1502-2749 (print)  
ISSN 1503-1503-8858 (online)

## Norges Bank's reports on financial stability

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. In the *Financial Infrastructure Report*, Norges Bank assesses vulnerabilities and risks in the financial infrastructure. The report *Norway's Financial System* provides a comprehensive overview of Norway's financial system, its tasks and the performance of these tasks.

The Executive Board discussed the 2018 *Financial Stability Report* at its meeting on 19 September and 24 October.

### 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. Norges Bank's supervision and oversight of the financial infrastructure is discussed annually in the *Financial Infrastructure Report*.

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*.

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# Executive Board's assessment

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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 19 September and 24 October.

Vulnerabilities in the financial system have increased somewhat since the previous *Report*, which was published in November 2017, primarily owing to rising commercial property prices. At the same time, banks have become more resilient, and measures implemented by the authorities have limited borrowing by vulnerable households. On balance, the financial stability outlook is therefore broadly unchanged.

The upturn among Norway's trading partners is continuing and interest rates are on the rise, particularly in the US. Persistently low interest rates, high risk-taking and debt accumulation have increased vulnerabilities in many countries. A gradual interest rate normalisation can restrain the build-up of financial imbalances.

The risk of external shocks is primarily associated with the ongoing trade conflicts and the Brexit negotiations. Higher US interest rates have also contributed to sharp currency depreciations in some emerging economies with substantial foreign currency debt. Contagion to advanced economies has so far been moderate.

The key vulnerabilities in the Norwegian financial system are:

- Household debt ratios are high and rising. High debt entails a risk of a tightening of consumption in response to a substantial fall in house prices or a pronounced rise in interest rates, which may amplify a downturn and result in higher losses, especially on banks' corporate exposures.
- House prices have risen over many years. In 2017, house prices fell, and have since shown a more moderate tendency. Nevertheless, house prices are at historically high levels relative to household income. The most valuable asset of most households is a dwelling and a fall in house prices will reduce household equity.
- Commercial property prices have risen since the 2017 *Report* from already high levels. This increases the risk of a fall in prices if interest rates or risk premiums rise markedly. Nearly half of banks' exposures to Norwegian corporates are to commercial real estate (CRE). Experience shows that such exposures can be a source of substantial bank losses if property prices fall sharply. Moreover, a fall in property prices may have spillovers to real estate development, to which banks also have considerable exposures.

Requirements for banks' credit standards limit borrowing by the most vulnerable households. The regulation on new residential mortgage loans has also probably had a dampening effect on house price inflation. The Ministry of Finance has circulated for comment a draft regulation on prudent consumer lending practices. In its consultation response of 29 October 2018, Norges Bank supports the draft regulation, which may act as a constraint on total debt accumulation by vulnerable households. Two private entities have been licensed to operate debt registers for unsecured debt, with the first expected to be in operation in spring 2019. Such registers should also include information on collateralised loans to enable banks to easily obtain the full picture of a loan applicant's debt situation.

Stricter capital and liquidity requirements following the financial crisis have increased banks' resilience. Banks' profitability has been solid and equity capital has increased, which has boosted banks' loss-absorbing capacity. All Norwegian banks meet the capital requirements. Since the 2017 *Report*, banks'

liquidity reserves in foreign currency have increased more than their short-term funding, and banks meet the Liquidity Coverage Ratio (LCR) requirement with an ample margin, reducing banks' vulnerabilities to funding shortfalls.

In the stress test in this *Report*, banks need to draw down their countercyclical capital buffer and a portion of the other buffers in order to maintain lending in the event of a pronounced downturn in the Norwegian economy. In such a situation, a reduction in buffer requirements may reduce the procyclical effects of tighter bank lending. The stress test suggests that a larger portion of the total buffer requirement should be time-varying.

Losses on commercial property loans have been low in normal times, but high during crises, both in Norway and other countries. Since crises are rare events, there is a danger that banks underestimate these risks. Finanstilsynet (Financial Supervisory Authority of Norway) requires that banks' models are based on experience from the banking crisis and that banks take into account uncertainty in the data. The analyses in this *Report* suggest that banks that use internal models to calculate capital requirements should give substantial weight to crisis-related loss data when calculating risk weights on commercial property loans.

The statistical basis for commercial property prices is limited. In view of this sector's importance for the economy and financial stability, the statistical basis should be strengthened.

Some parts of the EU capital framework have still not been implemented in Norway. The remaining requirements to be transposed into Norwegian law include the exercise of national options and discretions. Financial stability concerns in each country should be the guiding principle. Foreign banks have a large share of the Norwegian lending market. If the Norwegian authorities are to maintain national governance over time, it is important that other countries recognise Norwegian regulations in areas where the European regulatory framework allows national options and discretions. Norway should therefore treat other countries' national options and discretions reciprocally.

New deposit guarantee rules and bank recovery and resolution rules enter into force in Norway on 1 January 2019. Under the new rules, investors in bank bonds and short-term paper will have to be prepared to contribute towards the bank's recapitalisation if the bank experiences a sharp decline in capital adequacy and requires fresh equity. Finanstilsynet will draw up recovery plans for banks deemed too important to be closed. Subjecting large regional banks deemed too important to be closed to the same capital requirements as systemically important banks should also be considered, in line with Finanstilsynet's proposal.

Norway is at the forefront in the use of digital financial services, particularly in payment services. Norges Bank assesses the financial infrastructure in Norway as secure and efficient. Nevertheless, ICT dependence makes the financial system vulnerable to unintended operational incidents and cyber crime. Prolonged disruptions in the payment system may entail high economic costs and weaken confidence in the financial system. This may also be the case if other agents gain access to confidential information or if information is manipulated. Banks' and other financial market infrastructure owners' control of ICT security is important to ensure satisfactory defence mechanisms. This applies both in-house and to critical service providers. Regulation and supervision of the payment system and critical providers should facilitate monitoring and mitigation of overall systemic risk. This means the electronic payment systems must be sufficiently secure and independent back-up solutions must be available. Studies should be conducted to determine how critical ICT service providers to the payment system can best be supervised, including whether supervision should be coordinated between relevant authorities.

# 1 Financial stability outlook

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**Vulnerabilities in the financial system in Norway have increased somewhat since the previous *Financial Stability Report*, which was published in November 2017, primarily owing to rising commercial property prices. At the same time, banks have become more resilient, and measures implemented by the authorities have limited borrowing by vulnerable households. On balance, the financial stability outlook is therefore broadly unchanged.**

## 1.1 RISK OF EXTERNAL SHOCKS

*The risk of external shocks is primarily associated with the ongoing trade conflicts and the Brexit negotiations. Higher US interest rates have also contributed to sharp currency depreciations in some emerging economies with substantial foreign currency debt. Persistently low interest rates, high risk-taking and debt accumulation have increased vulnerabilities in many countries. Owing to high debt levels, abrupt increases in interest rates and risk premiums are among the main risks to global financial stability.*

Global financial turbulence normally spreads quickly to small open economies like Norway. Earlier episodes have shown that global market turbulence can result in higher funding costs for Norwegian banks and corporates. In such a situation, banks may tighten credit standards and raise lending rates to maintain profit-

ability, leading to lower economic activity in Norway, reduced debt-servicing capacity and a higher risk of bank losses. Norwegian banks have been little affected by global turbulence since the 2017 Report.

### Continued high risk-taking in advanced economies

Following the financial crisis, low interest rates and high risk-taking have led to higher leverage and higher securities and property prices. Risk premiums in the global and Norwegian credit markets are low. This can change quickly. Price changes owing to an interest rate increase or a risk reassessment may trigger turbulence and substantial movements in capital flows and exchange rates. Episodes of equity price declines in 2018 (Chart 1.1) and highly volatile Italian sovereign bond yields owing to political turmoil in Italy (Chart 1.2) show that many markets are sensitive to shifts in expectations.

Historically, financial imbalances have often built up in periods of solid economic growth and low real interest rates. Interest rates are on the rise. This can have a dampening effect on debt accumulation, risk taking and asset price inflation.

There is uncertainty regarding global economic growth (see *Monetary Policy Report 3/18*). The upturn among Norway's trading partners is continuing, but increased protectionism may weigh on global growth. Both the ongoing US-China trade conflicts and the negotiations on the UK's withdrawal from the EU are important uncertainty factors. Even though more than two years have passed since the referendum in the UK, much remains unclarified, including the future regulation of trade in financial services between the EU and the UK. Global activity indicators are at high levels, but they have edged down recently (Chart 1.3).

### Emerging economies with substantial foreign currency debt are vulnerable to a stronger US dollar and higher interest rates

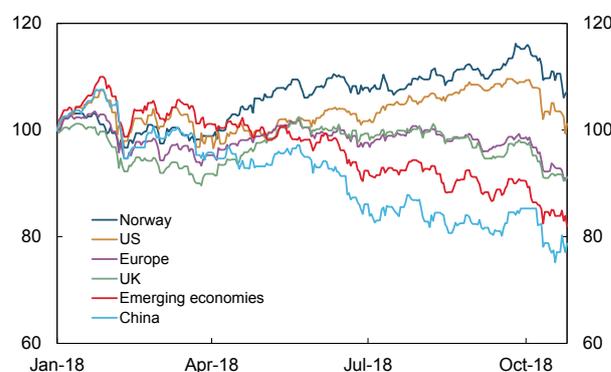
Higher US interest rates have led to sharp currency depreciations in a number of emerging economies with substantial foreign currency debt, particularly Turkey and Argentina. The depreciation also reflects country-specific factors. Emerging economy stock markets have fallen (Chart 1.1), also on account of the ongoing trade conflicts. The Chinese stock market in particular is down sharply since the turn of the year.

Corporates, households and sovereigns in emerging economies have levered up in recent years (Chart 1.4). Much of this debt is in foreign currency, and a depreciation of the local currency will lead to higher debt servicing costs and make refinancing existing debt more difficult. The International Monetary Fund (IMF) has long pointed out the risk related to increased borrowing by emerging economy sovereigns and corporates.

### EU banks more resilient

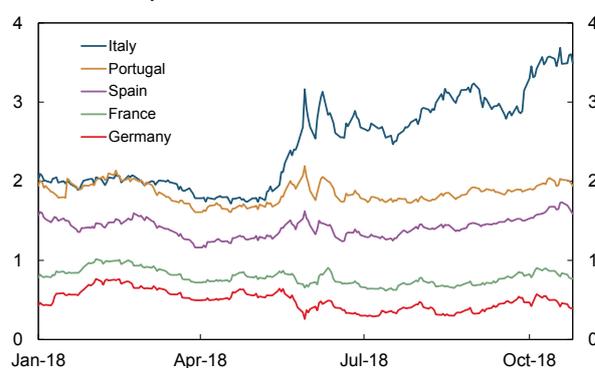
European banks overall have improved their solvency in recent years. Common Equity Tier 1 (CET1) capital ratios have risen on average by over 2 percentage points since 2014 (Chart 1.5), but capital ratios have recently levelled off. Much of the improvement reflects a lower share of risky assets and more widespread use of internal ratings-based (IRB) models resulting in lower risk weights. Leverage ratios are little changed.

Chart 1.1 Stock indexes in selected countries.<sup>1</sup> Index. 1 January 2018 = 100. 1 January 2018 – 25 October 2018



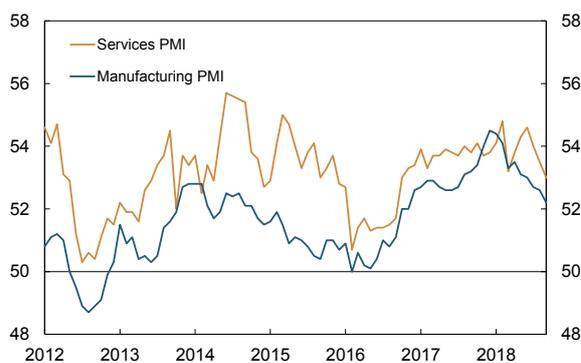
1) Standard and Poor's 500 Index (US), Stoxx Europe 600 Index (Europe), Financial Times Stock Exchange 100 Index (UK), Oslo Børs Benchmark Index (Norway), MSCI Emerging Markets Index (emerging economies) and Shanghai Composite Index (China).  
Source: Bloomberg

Chart 1.2 Yields on ten-year government bonds in selected countries. Percent. 1 January 2018 – 25 October 2018



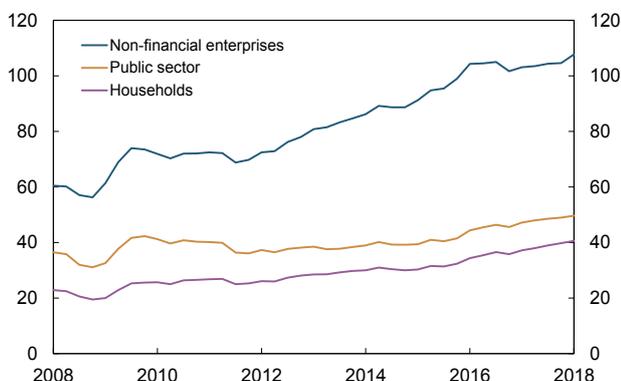
Source: Bloomberg

Chart 1.3 Global PMI.<sup>1</sup> Seasonally adjusted. January 2012 – September 2018



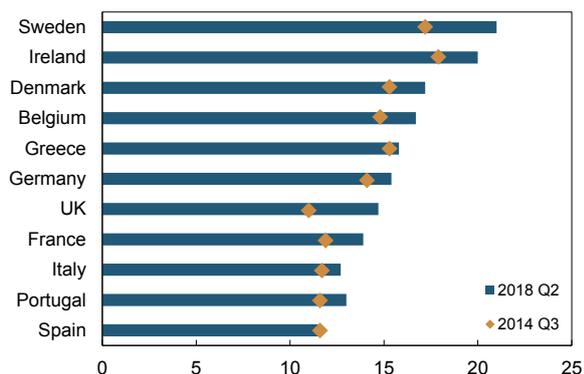
1) Purchasing Managers Index. Survey among purchasing managers. PMI values above 50 indicate that the sector has grown, while values below 50 indicate that the sector has shrunk. Weights are based on contribution to global production of goods and services.  
Source: Thomson Reuters

Chart 1.4 Debt as a share of GDP in emerging economies. By sector. 2008 Q1 – 2018 Q1



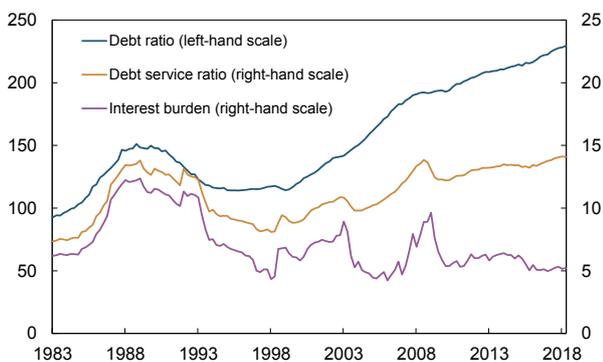
Source: Bank for International Settlements (BIS)

Chart 1.5 Common Equity Tier 1 (CET1) ratios<sup>1</sup> for banks in selected European countries. Percent. 2014 Q3 and 2018 Q2



<sup>1</sup> Owing to differences in national frameworks, CET1 ratios are not necessarily comparable across jurisdictions.  
Source: The European Banking Authority (EBA)

Chart 1.6 Household debt ratio<sup>1</sup>, debt service ratio<sup>2</sup> and interest burden<sup>3</sup>. Percent. 1983 Q1 – 2018 Q2



<sup>1</sup> The debt ratio is loan debt as a percentage of disposable income (income after taxes and interest payments). Disposable income is adjusted for a break in the series.  
<sup>2</sup> Debt service ratio is interest expenses and estimated principal payments on an 18-year mortgage as a percentage of after-tax income.  
<sup>3</sup> Interest burden is interest expenses as a percentage of after-tax income.  
Sources: Statistics Norway and Norges Bank

The level of non-performing loans (NPLs) in EU banks continues to fall. This frees up capital and improves banks' capacity to extend new loans, but there are considerable differences across countries and banks. There is an ongoing EU-wide effort to reduce banking sector vulnerabilities associated with NPLs.

Government debt in Italy is high, and the rating agency, Moody's, has downgraded the country's rating. Uncertainty surrounding the policies of the new coalition government has had a considerable impact on Italian yields (Chart 1.2). The banking sector is also negatively impacted. An index for Italian bank stocks has fallen by over 30% since mid-May. European bank stocks have also performed negatively so far in 2018.

## 1.2 VULNERBILITIES IN THE FINANCIAL SYSTEM IN NORWAY

The key vulnerabilities in the financial system in Norway are high household debt, high house prices and high commercial property prices. Vulnerabilities have edged up since the 2017 Report, primarily in the commercial property market. Requirements for banks' credit standards and gradually higher interest rates will have a dampening effect on debt growth and, further out, on household vulnerability to shocks.

Growth in the Norwegian economy is solid and employment is rising. The global upturn, higher oil prices and low interest rates have lifted growth. Norges Bank expects that growth will remain solid over the coming year, slowing gradually in 2020 and 2021.<sup>1</sup>

Norwegian banks' profitability has strengthened over the past year, and all banks meet the capital requirements. The improved returns on equity for the largest Norwegian banks reflect reduced credit losses and higher net interest income. Higher oil prices have led to lower-than-expected losses in oil-related industries, but oil-related companies may still face a new round of restructuring.

### High household debt

Vulnerabilities related to high household debt remain high (see box on page 9). High debt entails a risk of a tightening of consumption in response to a substantial fall in house prices or a pronounced rise in interest rates. A large share of household demand depends on access

<sup>1</sup> See Monetary Policy Report with financial stability assessment 3/18.

to new borrowing.<sup>2</sup> Lower house prices may reduce both the propensity and the ability to borrow against a home. A sharp tightening of consumption may reduce corporate earnings and debt servicing capacity, resulting in turn in higher losses on banks' corporate exposures.

Household debt has been rising faster than household income for a long time, fuelled in part by low interest rates. This has led to a steady increase in household debt ratios (Chart 1.6). Debt-to-income ratios are especially high for younger households, but in 2016, this ratio increased most for households aged over 35 (Chart 1.7). Continued low interest rates contribute to keeping household interest burdens low, but household debt service ratios are high and rising (Chart 1.6). Debt service ratios have indicated high systemic risk ever since the financial crisis (see box on page 10).

<sup>2</sup> See *Financial Stability Report 2016*, p. 13.

Since spring 2017, debt growth has moderated somewhat. Growth in the Norwegian economy is solid, and Norges Bank raised the key policy rate to 0.75% in September. The outlook and the balance of risks suggest on balance a gradual interest rate rise ahead (See *Monetary Policy Report 3/18*). This will help restrain debt growth.

The regulation on new residential mortgage loans has probably had a dampening effect on debt growth and house price inflation since the beginning of 2017 (see box on page 18). Finanstilsynet's residential mortgage survey for 2017 showed a marked decline in new loans to households with high debt-to-income (DTI) ratios. Over time, this may mitigate household vulnerabilities.

Growth in consumer credit to Norwegian households has been very high in recent years (Chart 1.8). Since the peak year 2016, consumer credit growth has fallen

## KEY VULNERABILITIES IN THE NORWEGIAN FINANCIAL SYSTEM

KEY VULNERABILITIES IN NORWAY	Change since the 2017 <i>Financial Stability Report</i>
High household debt	→
High house prices	→
High commercial property prices	↗

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

The table above shows Norges Bank's assessment of the key vulnerabilities in the Norwegian financial system. Vulnerabilities can be time-varying or the result of permanent structural conditions in the financial system. Vulnerabilities can cause or amplify financial turbulence and an economic downturn when the economy is exposed to large shocks. The interaction between shocks and vulnerabilities can result in financial crises that restrain economic growth.

Shocks that trigger financial crises can be difficult for the authorities to predict and influence. Shocks to a small open economy like Norway will often originate in other countries.

In the table there are three vulnerability levels: yellow, orange and red, with red representing the highest level. The vulnerability assessment is based on historical experience of what causes downturns and financial turbulence and assessments of new features of the financial system. The vulnerabilities identified as key vulnerabilities may change over time. The arrows indicate whether vulnerabilities are assessed to have increased, decreased or remained unchanged since the 2017 *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 financial system resilience. The authorities have already implemented a number of measures to address the vulnerabilities summarised in the table above (Section 1.3).

## DEVELOPMENTS IN THE HEATMAP

Norges Bank's heatmap monitors a broad range of indicators that can signal the build-up of systemic risk in the Norwegian financial system. The heatmap shows vulnerabilities associated with household debt, high commercial property prices and the increasing importance to the financial system of non-bank institutions.

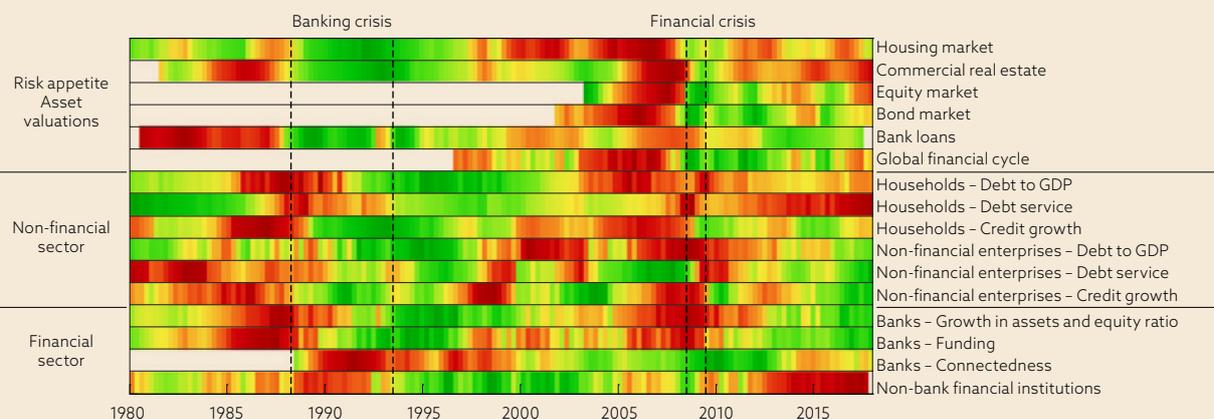
Norges Bank's heatmap is a tool for assessing systemic risk in the Norwegian financial system (see heatmap below).<sup>1</sup> Its primary objective is to measure cyclical or time-varying movements in vulnerabilities, and to a lesser extent vulnerabilities associated with structural aspects of the financial system or the wider economy. The heatmap monitors a broad set of indicators in three main areas: risk appetite and asset valuations, non-financial (household and corporate) sector vulnerabilities and financial sector vulnerabilities.

Developments in the indicators are mapped onto a common colour coding scheme, where a green (red) colour reflects low (high) levels of vulnerability. The heatmap signals vulnerabilities in several segments of the financial system:

- High household debt service ratios signal persistently high household sector vulnerabilities.
- The sharp rise in house prices and high housing investment levels in recent years have signalled vulnerabilities in the housing market, but owing to lower house price inflation and levels of housing investment, the heatmap now signals lower systemic risk. Even though house price inflation has been low since the 2017 Report and housing investment has slowed, high levels continue to imply vulnerabilities.
- The rise in commercial property prices from high levels signals elevated vulnerabilities in the commercial property market.
- Increased risk appetite and high equity and bond prices signal risks.
- Lending and other assets of non-bank financial institutions have increased relative to GDP. The heatmap therefore signals high risk. Life insurance companies have experienced strong growth in household and corporate lending. Although growth is high, lending by insurance companies still accounts for only 2% of total lending in Norway. Mutual funds have also seen substantial growth in total assets.

<sup>1</sup> See Arbatli, E.C. and R.M. Johansen (2017) "A Heatmap for Monitoring Systemic Risk in Norway", Staff Memo 10/2017, Norges Bank, for a detailed description of the heatmap and the individual indicators.

Heatmap: composite indicators. Q1 1980 – Q2 2018



Sources: BIS, Bloomberg, CBRE, Dagens Næringsliv, DNB Markets, Eiendomsverdi, Finn.no, Norwegian Association of Real Estate Agents (NEF), OECD, OPAK, Real Estate Norway, Statistics Norway, Thomson Reuters and Norges Bank

somewhat, but it remains nearly twice as high as total household debt growth. Even though consumer credit only accounts for 3% of total household debt, the high interest rates on such debt contribute to high interest burdens for households with substantial consumer debt. The authorities have introduced a number of measures to regulate consumer credit, and a draft regulation on prudent consumer lending practices has been circulated for comment (see Section 1.3 and box on page 20). These measures may help restrain overall debt accumulation by vulnerable households.

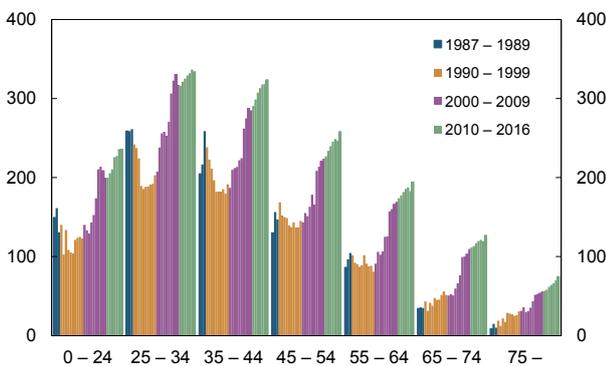
### High house prices

Vulnerabilities associated with high house prices are broadly unchanged since the 2017 Report (see box on page 9). House prices have risen over many years.

Measured as a share of disposable income, house prices are close to the levels prior to the banking crisis in the early 1990s and before the financial crisis (Chart 1.9). As a share of disposable income per capita, the level is higher than before the two crises. House price inflation has fuelled household debt accumulation.

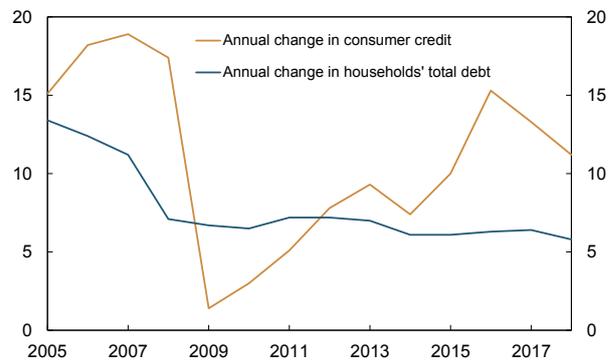
In 2017, house prices fell, and house price inflation has since been more moderate (Chart 1.10). In the first half of 2018, Oslo house prices rose the most, but also fell the most in 2017. Since summer, house price inflation has been low, both in Oslo and in the rest of Norway. Even though house prices have risen little over the past year, the high level continues to represent a vulnerability. Nationally, house prices are now at broadly the same level as the peak in 2017.

Chart 1.7 Debt as a share of disposable income<sup>1</sup>. By age of main income earner. Percent. 1987 – 2016



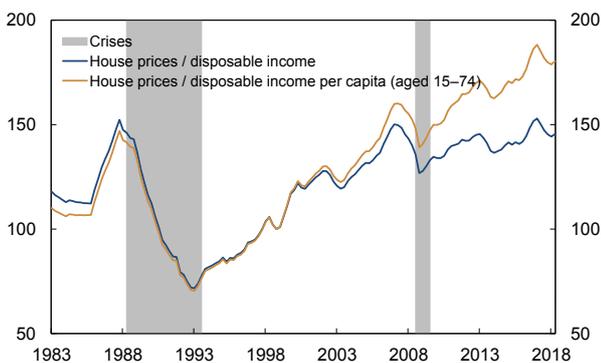
1) Disposable income is income after taxes and interest payments. Sources: Statistics Norway and Norges Bank

Chart 1.8 Consumer credit<sup>1</sup> and total debt<sup>2</sup> for Norwegian households. Annual change. Percent. 2005 – 2018<sup>3</sup>



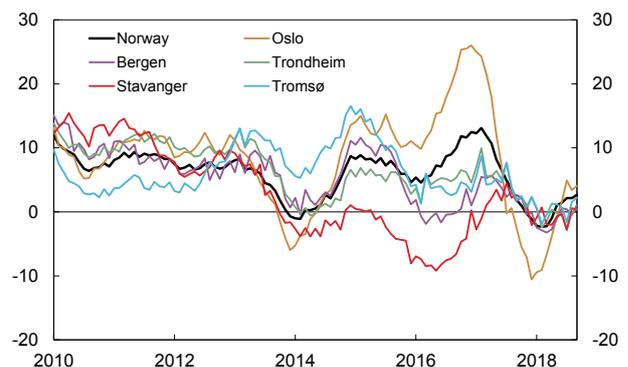
1) Based on the FSAs sample of banks and finance companies that cover most of the consumer credit market. 2) Domestic credit to households (C2). 3) At 30 June 2018. Sources: Finanstilsynet (Financial Supervisory Authority of Norway), Statistics Norway and Norges Bank

Chart 1.9 House prices relative to disposable income<sup>1</sup>. Index. 1998 Q4 = 100. 1983 Q1 – 2018 Q2



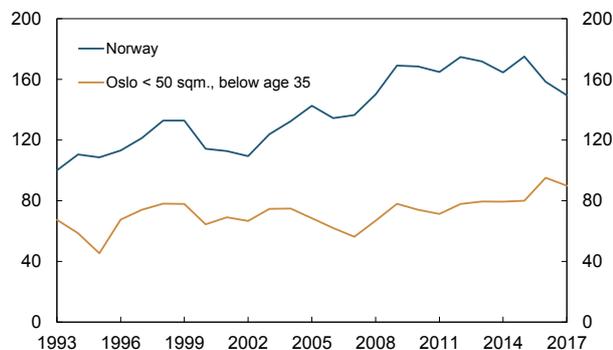
1) Disposable income is income after taxes and interest payments. Adjusted for a break in the series. Sources: Eiendomsverdi, Finn.no, Norwegian Association of Real Estate Agents (NEF), Real Estate Norway, Statistics Norway and Norges Bank

Chart 1.10 House prices. Twelve-month change. Percent. January 2010 – September 2018



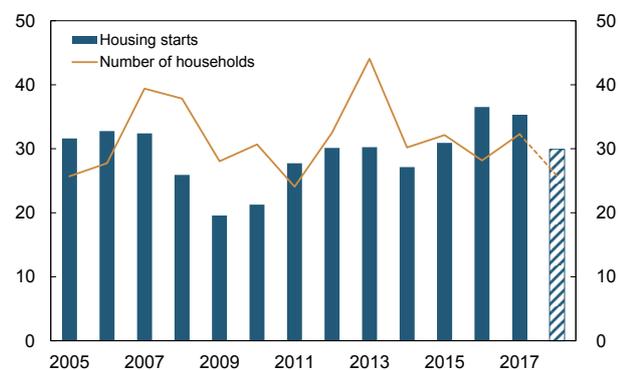
Sources: Eiendomsverdi, Finn.no and Real Estate Norway

Chart 1.11 Indicators of housing affordability.<sup>1</sup> Norway as a whole and young households in the market segment smaller dwellings in Oslo. Index. 1993 = 100.<sup>2</sup> 1993 – 2017



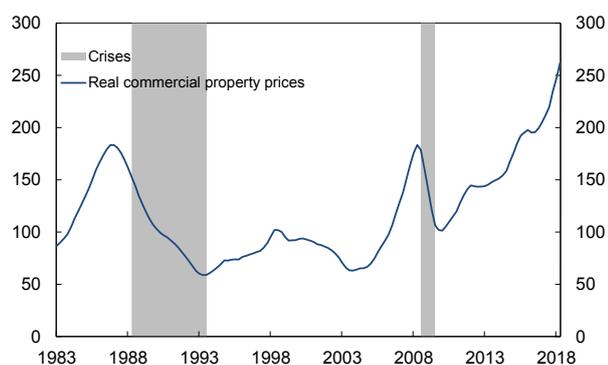
1) Indicator shows the relationship between households' median income and the income necessary for servicing a benchmark loan and standard consumption expenditure. The benchmark loan is assumed to be 85% of the purchase price of the median dwelling. Income for 2017 is projected using growth in aggregate income.  
2) The indicator for Oslo is normed such that the relative relationship to estimated affordability for the country as a whole is unchanged.  
Sources: Ambita, National Institute for Consumer Research (SIFO), Statistics Norway and Norges Bank

Chart 1.12 Housing starts and households in Norway. Number of dwellings and change in number of households. In thousands. 2005 – 2018<sup>1</sup>



1) Projections for 2018.  
Sources: Statistics Norway and Norges Bank

Chart 1.13 Real commercial property prices.<sup>1</sup> Index. 1998 = 100. 1983 Q1 – 2018 Q2



1) Estimated real selling prices per square metre for prime office space in Oslo. Deflated by the GDP deflator for mainland Norway. Average selling price for the previous four quarters.  
Sources: CBRE, Dagens Næringsliv, OPAK, Statistics Norway and Norges Bank

Higher house prices relative to income may indicate a weakening of housing affordability. One indicator of housing affordability<sup>3</sup>, measured as the ratio of median household income to expenses associated with borrowing for a home purchase and ordinary consumption, suggests that housing affordability increased from the early 1990s to around 2012 (Chart 1.11). In recent years, affordability has declined somewhat. The period of falling interest rates has generally contributed to higher housing affordability. Over time, the price of ordinary consumption goods has risen less than incomes, which has boosted housing affordability. Young households in Oslo have seen a less pronounced rise in affordability owing to higher house price inflation in Oslo, but even for them, affordability has edged up over the past 25 years. However, young homebuyers in Oslo must spend a larger share of income on mortgage servicing than the national average. Lower housing affordability increases the risk of a fall in housing demand and house prices.

Low interest rates and a lower level of residential construction than implied by population growth have fuelled house price inflation for many years. In recent years, however, residential construction has increased and population growth has slowed (Chart 1.12). Along with prospects for a gradual increase in the interest rate level, this suggests moderate house price inflation ahead.

### High commercial property prices

Vulnerabilities associated with high commercial property prices have risen (see box on page 9). Earnings from commercial property have historically been cyclically sensitive, and commercial real estate is the sector where banks have historically incurred the largest losses during a crisis. Norwegian banks have sizeable exposures to commercial real estate. Estimated selling prices for prime office space in Oslo have risen further from already high levels, continuing to rise in the first half of 2018 (Chart 1.13). The statistical basis for commercial property prices is limited. In view of this sector's importance for the economy and financial stability, the statistical basis should be strengthened.

The rise in prices for prime office space in Oslo over the past year reflects a marked increase in office rents. Higher rents strengthen the debt servicing capacity of commercial real estate companies. This differs from developments in previous years, where

3 The methodology is described in *Financial Stability Report 2013*.

the rise in selling prices was primarily driven by lower yields (Chart 1.14). Market participants cite a low level of new construction, conversions of office space to other uses and increased demand as reasons for higher rents. There are regional differences in the office market. In recent years, rents have been fairly stable in Trondheim and Bergen (Chart 1.15). In Stavanger, rents have fallen, particularly in areas heavily exposed to the oil industry.

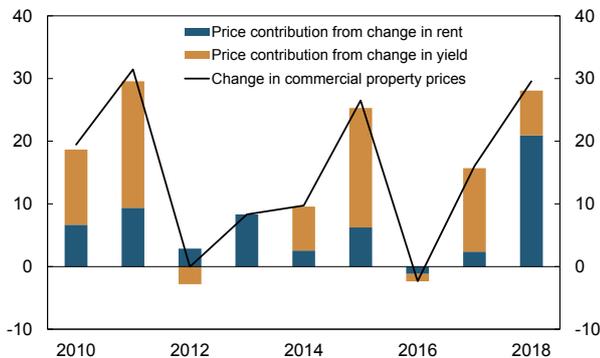
Even though long interest rates have risen in recent years, the yields on prime office space in Oslo have fallen. The spread between yields on office space in Oslo and long rates is now somewhat below the average since the turn of the millennium (Chart 1.16). Compared with selected large European cities, yields in Oslo are the lowest relative to interest rates (Chart 1.17). This may

indicate a relatively low risk premium in Oslo and market expectations of a pronounced rise in rents ahead.

The high commercial property price inflation in Oslo may contribute to higher leverage among real estate companies and bank vulnerability. At the same time, banks have in recent years increased the equity capital required for loans secured on office buildings in central Oslo.<sup>4</sup> Historically, a strong price rise for commercial property has often preceded a sharp price fall. Since yields are low, an interest rate increase or higher risk premium may lead to a sharp fall in commercial property prices. A downturn in the Norwegian economy could result in higher office vacancy rates. This will impair the debt servicing capacity of commercial real estate companies. If commercial property prices fall

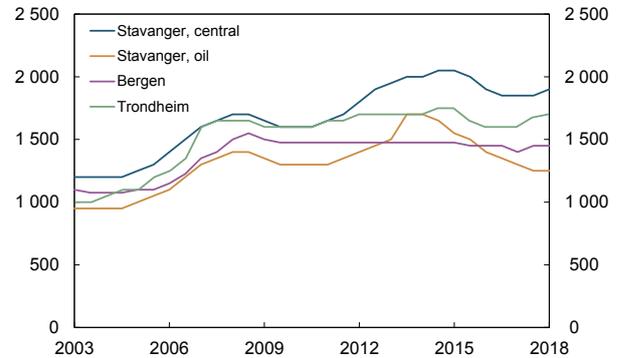
4 Union Gruppen bank survey 2018 Q3 (in Norwegian only).

Chart 1.14 Nominal commercial property prices<sup>1</sup> decomposed by estimated contribution from rents and yields.<sup>2</sup> Percent. 30 June 2010 – 30 June 2018<sup>3</sup>



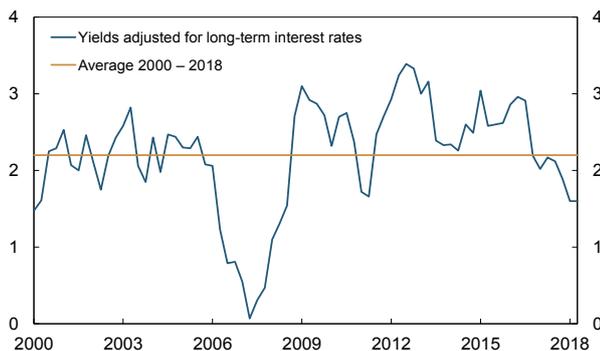
1) For prime office space in Oslo.  
 2) Contributions do not sum to the change in commercial property prices. This is due to the contribution from the change in rent/yield in the current year.  
 3) Annual data as of 30 June.  
 Sources: CBRE and Norges Bank

Chart 1.15 Office rents in selected cities.<sup>1</sup> NOK per square metre per year. 2003 H1 – 2018 H1



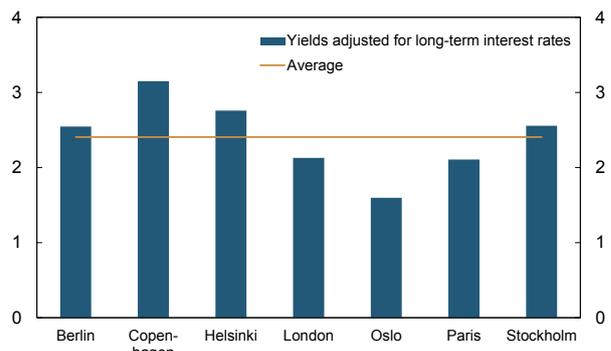
1) Developments in rents for high-standard office space in "Stavanger, central" and "Stavanger, oil" and good standard in Bergen and Trondheim. In autumn 2013 there was a change in the sample. For "Stavanger, oil" and Bergen, the data are not comparable between before and after autumn 2013.  
 Source: Dagens Næringsliv

Chart 1.16 Yields for prime office space in Oslo adjusted for long-term interest rates.<sup>1</sup> Percent. 2000 Q1 – 2018 Q1



1) The 10-year government bond yield is used as the long-term interest rate.  
 Sources: CBRE, Thomson Reuters and Norges Bank

Chart 1.17 Yields on prime office space in large European cities adjusted for long-term interest rates.<sup>1</sup> Percent. 2018 Q2



1) The 10-year government bond yield is used as the long-term interest rate for each country.  
 Sources: CBRE, OECD and Norges Bank

at the same time, bank losses may rise considerably. Since crises are rare events, there is a danger that banks underestimate these risks. Banks that calculate capital requirements using IRB models, so-called IRB banks, should give substantial weight to crisis-related loss data when calculating risk weights on commercial property loans.

### Other important vulnerabilities

#### Cyber risk

Cyber risk in the financial system increases with greater ICT dependence. Norway is at the forefront in the use of digital financial services, particularly in payment services. This makes the financial system vulnerable to unintended operational incidents and cyber-attacks.

Cyber risk has so far not resulted in large-scale financial system disruptions, and data for estimating costs of malicious attacks and operational incidents are limited. This makes it difficult to assess both the level of and changes in cyber risk. Nevertheless, examples from outside the financial sector show that cyber risk may result in considerable losses. Cyber risk may have systemic consequences and result in substantial economic costs if the financial system lacks the capacity to absorb shocks, rectify faults and ensure continuity of important economic functions. This may ultimately weaken confidence in the financial system (see Special Feature on page 25).

A number of international stakeholders have pointed out that cyber risk mitigation should be prioritised and that international cooperation is an important part of this work. Coordination and information-sharing are crucial for reducing the risk of operational incidents and cyber-attacks. In Norway and internationally, authorities and the financial industry are working together to ensure the security and efficiency of the financial infrastructure. This work is discussed further in *Financial Infrastructure Report 2018*.

#### Short-term foreign currency

Banks fund some of their assets with short-term wholesale funding in foreign currency, primarily USD. Like other large Nordic banks, DNB borrows short-term in the US money market.

This funding comprises short-term paper and deposits from money market funds and large companies. Deposits can be withdrawn quickly and are not considered

stable. Short-term money market funding is considered unstable owing to short maturities. In addition, rather than investors demanding higher risk premiums or shorter maturities, in a crisis, the supply may dry up altogether.

A large share of short-term funding makes banks vulnerable, if the supply of new funding dries up. This short-term funding is largely matched by central bank deposits and other liquid paper. Adjusted for central bank deposits, which are highly liquid and safe, banks' short-term foreign currency funding has been reduced in recent years (see Section 2.3).

### 1.3 MEASURES TO MITIGATE VULNERABILITIES

*The Norwegian authorities have introduced a range of measures to mitigate financial system vulnerabilities. Increased capital and liquidity have boosted banks' loss-absorbing capacity and their resilience to financial stress. Requirements relating to banks' lending practices are helping to restrain the build-up of vulnerabilities in the household sector.*

Following the global financial crisis in 2008, there has been broad international cooperation to increase financial system resilience. Many of the reforms recommended have already been implemented in Norway (see box on page 23).

#### Bank resilience

##### Bank capital

Banks have substantially increased capital ratios to meet the requirements introduced in recent years (see Table 1.1 for a list of requirements implemented in Norway). Banks have built up considerable capital buffers, comprising a capital conservation buffer, a systemic risk buffer, a countercyclical capital buffer and a buffer for systemically important banks.<sup>5</sup> The current countercyclical capital buffer rate of 2% reflects the build-up of financial imbalances, owing to a persistent rise in household debt ratios and strong property price inflation over a long period. Increased capital has strengthened banks' loss-absorbing capacity. The stress test in this *Report* suggests that banks would have to draw down their countercyclical capital buffer and some of the other buffers in order to maintain lending in the event of a pronounced downturn in the Norwegian economy (see Section 3).

<sup>5</sup> See Appendix 2 in *Norway's financial system 2018* for a description of banks' capital requirements.

An increasing number of countries have introduced macroprudential measures to mitigate cyclical systemic risk and increase banks' loss-absorbing capacity. Norway is a small open economy, and its banking sector is closely integrated with other countries, particularly Nordic countries. Branches of Nordic banks account for around a quarter of the bank lending market in Norway. If the Norwegian authorities are to maintain national governance of the financial market in Norway, it is important that other countries recognise Norwegian regulations in areas where the European regulatory framework allows national options and discretions. Swedish and Danish supervisory authorities have recognised stricter requirements for IRB models for residential mortgages in Norway, and the Norwegian authorities have done the same for Finland. Financial stability in the country concerned should be the guiding principle when national options and discretions in the rules are applied, and Norway should therefore treat other countries' national options and discretions reciprocally.

Some parts of EU capital framework have still not been implemented in Norway. Transposition of the remaining requirements into Norwegian law will harmonise Norwegian and European rules and also enable Norwegian banks to report somewhat higher capital ratios without this reflecting improved solvency. The capital requirement for loans to small

and medium-sized enterprises will be reduced (SME discount factor). In addition, rules will be relaxed for IRB banks, which will no longer have to use the Basel I floor for risk-weighted assets when calculating their capital ratios. The Basel Committee has proposed a new floor to be phased in from 2022. This may counteract a weakening in bank solvency, but the new floor will be less binding than the current Basel I floor.

While capital ratios depend on the risk-weighting of banks' exposures, the leverage ratio does not take into account differences in banks' risks. The leverage ratio requirement is intended to function as a backstop to risk-weighted capital requirements. All Norwegian banks meet the leverage ratio requirement, which may counteract a reduction in solvency owing to a fall in banks' risk weights.

#### Liquidity and funding

Under the Liquidity Coverage Ratio (LCR), banks must hold an adequate stock of high-quality liquid assets to meet their liquidity needs for a 30-day period of financial market stress (see box on page 32). Norwegian banks have increased their LCRs since the financial crisis and meet the requirements for each significant currency and for all currencies in total. This will improve banks' resilience to financial market turbulence and may prevent liquidity problems from spreading between banks.

**Table 1.1 Measures to mitigate vulnerabilities in Norway**

Category	Instrument	First introduced	Current level
Capital requirements	Pillar 2 requirements	2007	Varies across banks
	Conservation buffer	2013	2.5%
	Systemic risk buffer	2013	3%
	Sectoral capital requirement	2014	Risk weight on residential mortgages doubled
	Buffer for systemically important financial institutions	2015	2%
	Countercyclical capital buffer	2015	2%
Liquidity requirements	Leverage ratio requirement	2017	3% minimum requirement + 2% buffer
	Liquidity Coverage Ratio (LCR)	2015	100%
Lending practice requirements for mortgages <sup>1</sup>	LCR requirements in individual currencies	2017	100%. For LCR requirement in NOK, see box on page 32
	Tolerate higher interest rate (stress test)	2010 <sup>3</sup>	5 percentage points
	Loan-to-value, LTV	2010 <sup>3</sup>	85% <sup>2</sup>
	Principal repayment requirements	2010 <sup>3</sup>	2.5% annually with LTV above 60%
	Debt-to-income, DTI	2017	5 times gross income

<sup>1</sup> Up to 10% of the value of new loans can deviate from one or more of the requirements. For loans secured on dwellings in Oslo, the limit is 8% or up to NOK 10m.

<sup>2</sup> The requirement is 60% for loans secured on secondary homes in Oslo.

<sup>3</sup> The requirements were introduced as guidelines in 2010 and were subsequently laid down by regulation in 2015.

Sources: Finanstilsynet and Ministry of Finance

## MEASURES RELATED TO THE CONSUMER CREDIT MARKET

New measures have been introduced to address rapid growth in consumer credit. Most of the measures are designed to protect consumers, while some are also intended to increase the resilience of financial institutions.

The new measures include:

- A regulation on credit card invoicing entered into force in April 2017.
- A regulation on credit marketing entered into force in July 2017.
- Finanstilsynet (Financial Supervisory Authority of Norway) issued guidelines on prudent consumer lending practices in June 2017. Owing to a low level of compliance with the guidelines, a draft regulation is being circulated for comment (see box on page 20).
- The act on credit information entered into force in November 2017, and Gjeldsregisteret AS and Norsk Gjeldsinformasjon AS were licensed to operate debt registers in June 2018. Financial institutions will thus have access to information on borrowers' unsecured debt.
- The new act on bank recovery and resolution that enters into force on 1 January 2019 provides for increased risk differentiation in the calculation of the fee paid by banks to the deposit guarantee fund. Banks whose activities are to a great extent based on the provision of consumer credit will thus be required to pay higher fees (for further details, see Section 3.3 of the 2017 *Financial Stability Report*).
- Finanstilsynet has determined Pillar 2 requirements for several consumer credit banks that are higher than for many traditional banks. Additional capital requirements have also been laid down for newly established banks with consumer credit as their main activity.

### Requirements for banks' lending practices

The Norwegian authorities have laid down a regulation on requirements for residential mortgage loans. A draft regulation on prudent consumer lending practices has been circulated for comment.

#### Residential mortgage loans

In order to dampen the build-up of household sector vulnerabilities, the authorities have laid down in regulation requirements for new residential mortgage loans. At the beginning of 2017, the regulation was tightened to include a debt-to-income (DTI) requirement and stricter requirements for Oslo. The current regulation will remain in force until year-end 2019.

The regulation sets requirements for borrowers' debt servicing capacity and maximum DTI and loan-to-value (LTV) ratios. It also sets a principal repayment requirement when LTV ratios exceed 60%. Banks are given some flexibility to provide loans that breach the requirements, a so-called "speed limit". Norges Bank has performed an analysis which shows that the regulation has probably dampened borrowing by the most vulnerable households (see box on page 18). The requirements are helping to restrain the build-up of household sector vulnerabilities.

#### Consumer credit

The Ministry of Finance has circulated for comment a draft regulation on prudent consumer lending practices. In its consultation response of 29 October 2018, Norges Bank supports the draft regulation, which may act as a constraint on total debt accumulation by vulnerable households. The proposal echoes the regulation on residential mortgage loans and contains requirements for banks' credit assessments, the customer's DTI and debt servicing ratio and for principal repayment and maturity limits. Unlike the residential mortgage regulation, Finanstilsynet does not recommend a "speed limit". Estimates suggest that a substantial share of current consumer debt would have been constrained by the requirements in the draft regulation (see box on page 20). The requirements can reduce debt accumulation by vulnerable households and reduce the further build-up of household sector vulnerabilities. Other measures have also been introduced to regulate the consumer credit market (see box above).

#### Debt registers

The new act on credit information, passed in April 2017, allows private entities to operate debt registers for unsecured debt. A debt register will provide a total and up-to-date overview of both the scale and distribution of unsecured debt. Two private entities have

been licensed to operate debt registers, with the first expected to be in operation in spring 2019. A debt register may improve the quality of credit assessments of individual borrowers and contribute to a better overview of the total vulnerabilities and risks associated with unsecured debt in Norway. Such registers should also include information on collateralised debts to enable banks to easily obtain the full picture of a loan applicant's debt situation.

### Bank recovery and resolution

In order to facilitate the recovery and resolution of banks without recourse to taxpayer funds, the EU has introduced the Bank Recovery and Resolution Directive (BRRD). The directive is based on experience from the financial crisis and will enter into force in Norway from 2019.<sup>6</sup> The recovery and resolution rules are intended to provide a solid framework for managing troubled banks, making it easier for the authorities to prevent contagion to the wider financial system.

An important element of this framework is the minimum requirement for own funds and eligible liabilities (MREL). The MREL rules have been circulated for comment in 2018 (see box on page 38). Under the new rules, investors in bank bonds and short-term paper will have to accept conversion of portions of their debt claims to shares or equity certificates if the bank experiences a sharp decline in capital adequacy and requires fresh equity. Over time this may have an effect on banks' risk profiles and reduce banking sector vulnerabilities. Finanstilsynet will draw up recovery plans for banks deemed too important to be closed.

In view of the implementation of the recovery and resolution framework, changes in capital adequacy rules should also be considered. The rules cover procedures and criteria for determining the institutions to be subject to higher CET1 ratio and leverage ratio, because they are systemically important and play a key role in the financial system and the Norwegian economy. Harmonisation of the rules is important to ensure that the same definition of systemic importance applies to both recovery and resolution and capital requirements. Subjecting large regional banks deemed too important to be closed to the same capital requirements as systemically important banks should also be considered.

Finanstilsynet has proposed changes to the rules for identifying systemically important banks that give weight to market share for corporate loans. Under the proposal, banks with at least 10% of the corporate credit market in one or more regions shall be regarded as systemically important. The proposed changes will entail the classification of the largest regional banks as systemically important.

### Resilience of the financial infrastructure and markets

The financial infrastructure ensures that payments and trades in financial instruments are recorded and settled. In response to the 2008 financial crisis, derivatives market regulation was strengthened. An important measure is requiring more clearing of bilaterally traded derivatives through central counterparties (CCPs). This is being followed up by EMIR, which was implemented in Norway in July 2017.<sup>7</sup> In addition, many trading venues have their own central clearing requirements.

CCPs are intended to help markets to function in periods of turbulence and ensure predictable coverage of any losses. A CCP interposes itself in a trade between a buyer and a seller, becoming a counterparty to both. CCPs are structured to ensure that in the event of problems, large losses are shared among clearing members, with a lower risk of contagion than for bilateral settlement. In September, a clearing member of the Swedish CCP Nasdaq Clearing defaulted on an energy derivatives trade on the Norwegian trading venue Nasdaq Oslo. Members' margin payments were insufficient to cover the losses. Portions of the CCP's equity and the other members' default fund contributions were therefore lost. According to Nasdaq, the other members have replenished the default fund, so that it is now the same size as before the incident. The episode illustrates the importance of sound CCP risk management.

The Markets in Financial Instruments Regulation and Directive (MiFIR and MiFID) were implemented in Norway in January 2018. Their purpose is to ensure the efficient functioning of the market in financial instruments and enhance the investor protection framework.

<sup>6</sup> See Act on the Norwegian Banks' Guarantee Fund and Act to amend the Financial Institutions Act (deposit guarantee and bank recovery and resolution) (in Norwegian only).

<sup>7</sup> See *Norway's financial system 2018*, p 84 and Section 4 of *Financial Stability Report 2015*.

## MORTGAGE REGULATION DAMPENED DEBT GROWTH AND HOUSE PRICE INFLATION

The residential mortgage loan regulation has a direct effect on household borrowing. At the start of 2017, the regulatory requirements were tightened, which had a dampening effect on debt accumulation in areas where a large share of homebuyers had high debt-to-income ratios. House price inflation in these areas was also restrained.

To dampen the build-up of household vulnerabilities and promote sound and stable developments in the Norwegian economy, the authorities have laid down requirements for new residential mortgage loans (Table 1.2). The regulation, first introduced in 2015, was based on previous guidelines. At the start of 2017, the regulation was tightened, in part with a debt-to-income (DTI) ratio requirement and stricter requirements in Oslo. The current regulation remains in force until end-2019.

In recent years, a number of countries have introduced mortgage regulations. International analyses find that such regulations can dampen house price inflation and credit growth. The effects of reversing such measures during downturns seem to be weaker.<sup>1</sup>

### The regulation functions as intended

Requirements for banks' credit standards have a direct effect on household borrowing and have had a dampening effect on debt accumulation among particularly vulnerable households. The share of loans that breach the regulatory requirements was lower in Finanstilsynet's (Financial Supervisory Authority of Norway) autumn 2017 residential mortgage lending survey<sup>2</sup> than in the survey in 2016. The decline was particularly pronounced among younger households, the group that accounts for the most breaches of the requirements. The share of loans granted to borrowers with a DTI ratio higher than five declined considerably. In Norges Bank's autumn

1 See Lindquist, K. G. and M. D. Riiser (2018) "Regulering av boliglån – effekter på kreditt og boligpriser. En oppsummering basert på et utvalg internasjonale analyser og erfaringer" *Economic Commentaries* 3/2018 (in Norwegian only). Norges Bank.

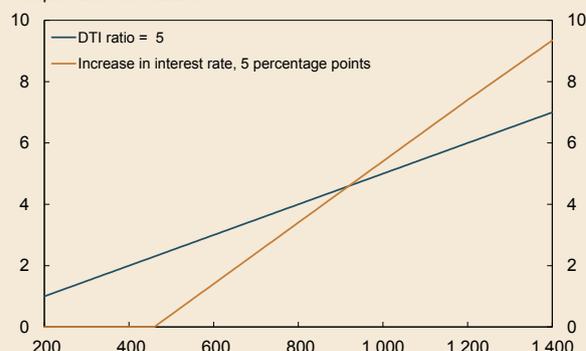
2 See Finanstilsynet (2017) "Boliglånsundersøkelsen" [Residential mortgage lending survey] (in Norwegian only).

**Table 1.2 Regulatory requirements for banks' residential mortgage lending<sup>1</sup>**

Type of requirement	Requirement specification	First laid down in regulation
Debt-to-income (DTI) ratio	Borrowers' total debt must not exceed five times gross annual income	2017
Interest rate stress test	Debt-servicing capacity must tolerate an interest rate increase of 5 percentage points	2015
Loan-to-value (LTV) ratio	Loans secured on dwellings must not exceed 85% of the dwelling's value, additional collateral may be included	2015
	For secondary home purchases in Oslo, the limit is 60%	2017
Principal repayment requirements	2.5% annually when LTV ratios exceed 60%	2015

1 Up to 10% of the value of new loans can deviate from one or more of the requirements. For loans secured on dwellings in Oslo, the limit is 8% or up to NOK 10m.

**Chart 1.18 Maximum loan in millions of NOK (vertical scale) by after-tax income in thousands of NOK (horizontal scale) for different requirements. Couples with two children<sup>1</sup>**



1) The chart is based on a couple with two children and their standard consumption expenditure as calculated by SIFO. Interest rate in the base situation is assumed to be 2.5%. Sources: National Institute for Consumer Research (SIFO), Statistics Norway and Norges Bank

2017 lending survey<sup>3</sup>, banks reported that the DTI ratio requirement had the strongest impact, followed by the requirement for secondary home mortgages in Oslo and the Oslo-specific speed limit.

The DTI limit and the requirement for households to be able to service debt in the event of a 5 percentage point rise in interest rates (interest rate stress test) impact different parts of the income distribution. The interest rate stress test restrains borrowing most for lower income households, while the DTI limit has the greatest impact on higher income households (Chart 1.18).

### House price inflation and debt growth dampened

Norges Bank has analysed the effects in 2017 of introducing the DTI limit in Norway. The analysis compares developments in house prices, the number of homebuyers and debt in areas with high and low shares of homebuyers with high DTI ratios, respectively.<sup>4</sup> Areas in which many homebuyers have high DTI ratios saw somewhat higher house price inflation in 2016 and a significantly larger fall in house prices in 2017 than in other areas (Chart 1.19).

The analysis finds a negative correlation between DTI and house price inflation in 2017 (Chart 1.20). If districts of Oslo are omitted from the sample, the correlation is somewhat weaker, but remains clearly negative.<sup>5</sup>

Housing market turnover remained elevated in 2017. In areas with a large share of highly leveraged homebuyers, the number of homebuyers declined a little compared with the average for the period 2010–2016. In areas with few highly leveraged homebuyers, the number of homebuyers in 2017 was approximately equal to the average over the previous years.

Debt also grew the least in 2017 compared with previous years in areas where many homebuyers were already highly leveraged. This negative correlation between debt growth and the share of highly leveraged households is particularly strong among households in the age group 20–39.

3 See Norges Bank's Survey of Bank Lending for 2017 Q3.

4 An area's DTI ratio is calculated as the share of homebuyers with DTI ratios greater than 5 in 2014 less the area's speed limit. See Borchgrevink, H. and K. N. Torstensen (2018): "Analysis of effects of the residential mortgage loan regulation". *Economic Commentaries* 1/2018. Norges Bank.

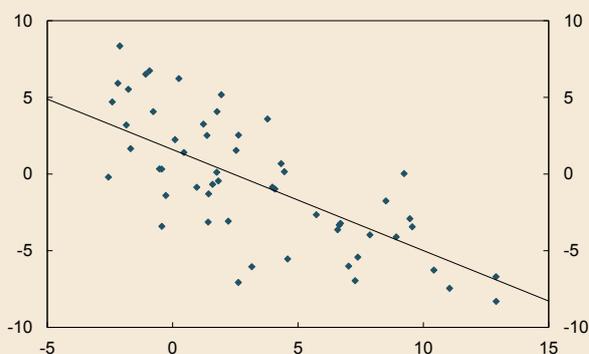
5 To assess the longer-term effects of the regulation, data for later years must be used.

Chart 1.19 House prices in areas with high and low shares of highly leveraged homebuyers. Twelve-month change. Percent. January 2016 – December 2017



Sources: Ambita, Eiendomsverdi, Finn.no, Real Estate Norway, Statistics Norway and Norges Bank

Chart 1.20 Relationship between the share of highly leveraged homebuyers<sup>1</sup> (horizontal scale) and the twelve-month rise in house prices (vertical scale). Percent. December 2016 – December 2017



1) The area's speed limit under the residential mortgage regulation has been deducted from the share of highly leveraged households. Sources: Ambita, Eiendomsverdi, Finn.no, Real Estate Norway, Statistics Norway and Norges Bank

## NEW CONSUMER CREDIT REGULATION

*A draft regulation on prudent consumer lending practices was circulated for comment in autumn 2018. Calculations indicate that a substantial share of today's consumer debt would be constrained by the requirements in the proposed regulation. The requirements may mitigate a further build-up of household sector vulnerabilities. In its consultation response of 29 October 2018, Norges Bank supports the proposed regulation.*

Consumer credit has shown strong growth for several years (Chart 1.8). Finanstilsynet published guidelines on prudent consumer lending practices in June 2017. As banks<sup>1</sup> have not fully complied with the guidelines<sup>2</sup>, a draft consumer credit regulation has now been circulated for comment.<sup>3</sup> The draft regulation is essentially the existing guidelines in the form of a regulation, including:

- **Credit assessment requirements.** As part of their credit assessment process, banks are required to collect information about the borrower's income, assets and debt and check this information against relevant databases and registers.
- **Debt-to-income (DTI) ratio requirement.** A loan will not be approved if the borrower's resulting total debt exceeds five times their annual income.
- **Debt-servicing capacity requirement.** A loan will not be approved for borrowers who will be unable to service their debt if interest rates increase by five percentage points after deduction of ordinary consumption expenditure.
- **Repayment requirements.** The loan agreement is required to contain principal payment requirements and maturity limits. Loans with a maturity of more than five years will not be approved. In general, loan repayment will be linear, with monthly instalments.

Under the regulation on mortgage lending, 10% of new loans may breach the requirements. In the interests of consumer protection, a corresponding quota has not been included in the proposed consumer credit regulation. Finanstilsynet's proposal nonetheless provides for the possibility of breaching the requirements in some cases. Banks may deviate from the requirements with regard to DTI ratio, debt-servicing capacity and repayment for credit cards with low credit limits.<sup>4</sup> Banks may also deviate from the DTI and debt-servicing capacity requirements if a debt is refinanced, provided the refinancing does not increase the existing volume or maturity of the borrower's loan/loans. The refinanced loan must also be subject to principal payment requirements that are no less strict than those that apply to the existing loans.

### Households with consumer debt and effects of the new regulation

The latest available tax assessment data from 2016 are used to analyse how the proposed regulation may affect access to consumer credit. Tax assessment data only contain information on total household debt, not consumer debt specifically. It is assumed that households paying an estimated interest rate of 8%<sup>5</sup> or more hold a high level of consumer debt.<sup>6</sup>

The analysis probably captures a considerable share of households with consumer loans. An estimated average interest rate of more than 8% is paid by 7.5% of households. These households hold close to 2% of total household debt. By comparison, macro credit data shows that consumer debt accounts for 3% of total household debt.

1 Consumer credit is available from both banks and finance companies. In this text, the term banks is used to refer to both types of financial institution.

2 Finanstilsynet (2018) "Retningslinjer for forsvarlig utlånspraksis av forbrukslån - oppsummering av undersøkelse om finansforetakenes gjennomføring". 12 June 2018. [Summary of survey on financial institutions' compliance with guidelines on consumer credit] (in Norwegian only).

3 See Ministry of Finance (2018) "Høring - forskrift om forsvarlig utlånspraksis for forbrukslån" [Consultation - regulation on prudent consumer lending practices] (in Norwegian only).

4 Applies to credit cards with a credit limit below NOK 25 000, provided the loan applicant does not have any other credit cards.

5 An interest rate of 8% is more than three times as high as the interest rate on an average variable-rate mortgage in 2016 and probably also higher than the interest rate on most car loans.

6 See Hagen, M., L. T. Turtveit and B. H. Vatne (2017) "Strong growth in consumer credit". *Economic Commentaries* 1/2017. Norges Bank.

To explore the effects of the proposed regulation, we calculate the share of consumer debt in the sample that would have been constrained by the proposed requirements.<sup>7</sup> As very few households paying an interest rate of 8% or more hold debt of more than five times their income, we focus on requirements relating to debt-servicing capacity and repayment. Debt-servicing capacity is calculated based on household post-tax income given an interest rate increase of five percentage points and ordinary consumption expenditure as defined by Consumption Research Norway (SIFO). Principal payments and maturities are based on linear repayment of the debt over five years.

In 2016, close to a quarter of households with consumer debt would have been constrained by at least one of the proposed requirements (Chart 1.21). This is equivalent to 42 000 households, holding a total of 58% of consumer debt in the sample. The repayment requirements would clearly have the most pronounced impact. According to Finanstilsynet, this is also the part of the guidelines for which banks' compliance was lowest.

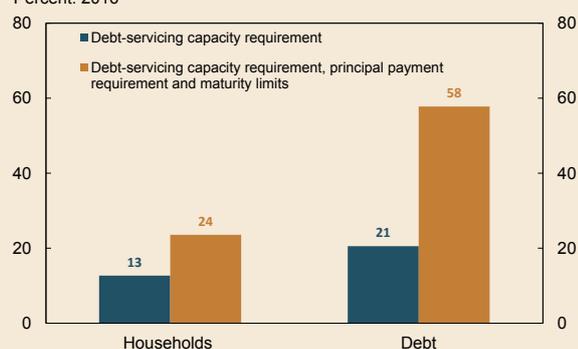
Calculations indicate that the new regulation will act as a constraint on borrowing in particular for younger households, low-income households and non-homeowning households. The entire population of households is divided into five groups of equal size according to household income and main wage earner's age. Over 70% of households that would have been constrained by the regulation are in the two lowest income groups, ie with an annual after-tax income of below NOK 395 000 (Chart 1.22). These households hold less than 30% of total consumer debt (Chart 1.23).

At the same time, the calculations indicate that half of the debt that would have been constrained by the regulation is held by households with an annual after-tax income of more than NOK 575 000. This is partly because higher loans are approved for households with higher incomes.

Even though only a quarter of the households that are constrained by the requirements are homeowners, these households account for two-thirds of total consumer debt. Homeowners may take out expensive consumer loans because they already have a high debt ratio through their mortgage. And the seemingly more cumbersome process of increasing the mortgage may also make consumer loans appear more attractive.

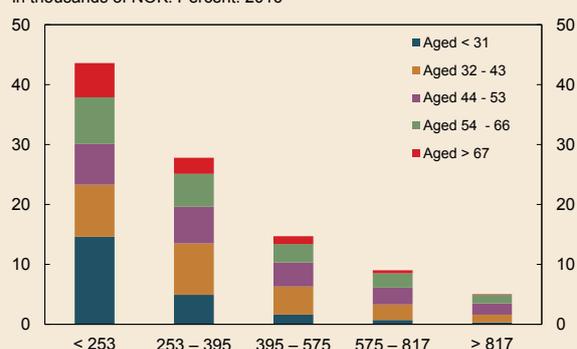
<sup>7</sup> In more precise terms, we calculate the share of the existing consumer debt that would have been in breach of the requirements if the loans had been approved as presented in the underlying data. In reality, a loan changes as it is repaid, owing to factors such as accrued interest, principal payments and refinancing. In addition, the regulation will only apply to new loans.

Chart 1.21 Share of households and household debt that would be limited by new consumer credit regulation. Households with consumer debt.<sup>1</sup> Percent. 2016



<sup>1</sup> Households with an estimated interest rate above 8%.  
Sources: National Institute for Consumer Research (SIFO), Statistics Norway and Norges Bank

Chart 1.22 Breakdown of households that would be limited by new consumer credit regulation. By age group and grouped by after-tax income in thousands of NOK. Percent. 2016



Sources: National Institute for Consumer Research (SIFO), Statistics Norway and Norges Bank

## Consumer credit banks and effects of new regulation

The household analysis shows that a substantial share of households with consumer debt in 2016 would have been constrained by the proposed requirements. The share is even higher for the volume of consumer debt. This suggests that the proposed regulation will entail an effective tightening of consumer credit standards.

Consumer credit growth has remained very high since 2016, driven to a great extent by Norwegian banks specialising in consumer credit. Any tightening of credit standards as a result of the proposed regulation will in isolation pull down on lending growth for consumer credit banks, which will in turn affect their earnings. The regulation will not apply to the consumer credit banks' operations abroad, where the bank will be subject to the host country's rules on consumer protection. Several of the Norwegian banks specialising in consumer credit have started or expanded operations in other countries over the past few years, and this may support lending growth and earnings despite declining lending growth in Norway.

In recent years, default rates on consumer credit in Finanstilsynet's sample of consumer credit providers have risen, despite an increase in banks' sales of non-performing consumer loans to debt-collection agencies (Chart 1.24).<sup>8</sup> At the end of 2018 Q2, the default rate was at its highest since the financial crisis. At the same time, the very high level of consumer credit growth in recent years may imply that households are taking out new consumer loans to service old consumer debt, thereby postponing their payment problems. The proposed regulation will restrict vulnerable households' possibility of refinancing to increase their loan or its maturity and may lead to higher default rates and losses on consumer loans in a transitional phase.

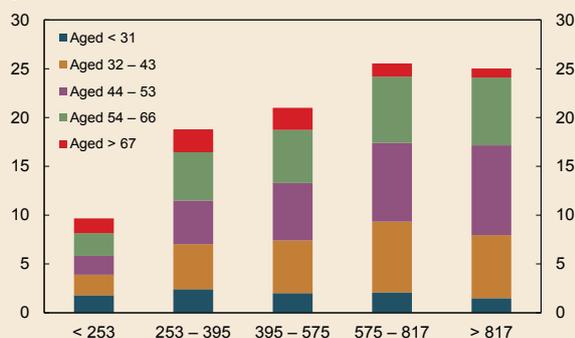
Norwegian consumer credit banks<sup>9</sup> can cope with substantial loan losses without having to post a negative result. Other things being equal, loan losses for these banks as a whole in the first half of 2018 could have been three times as high without leading to a negative result. In addition, these consumer credit banks have higher leverage ratios than traditional banks. At the end of the first half of 2018, the leverage ratio<sup>10</sup> for Norwegian consumer credit banks as a whole was 13.6% compared with 7.7% for the Norwegian banking sector. Despite showing strong growth, these banks still only account for just over 1% of total retail lending in Norway.

<sup>8</sup> Finanstilsynet's sample of consumer credit providers (banks and finance companies) make up the bulk of the consumer credit market. When non-performing loans are sold, they are taken off the seller's balance sheet. The default rate would therefore be higher without these sales. The debt collection agencies that purchase the non-performing loans are not included in Finanstilsynet's sample.

<sup>9</sup> We refer here to a sample of Norwegian banks with consumer credit provision as their main activity: Bank Norwegian, yA Bank, Komplet Bank, Monobank and Instabank.

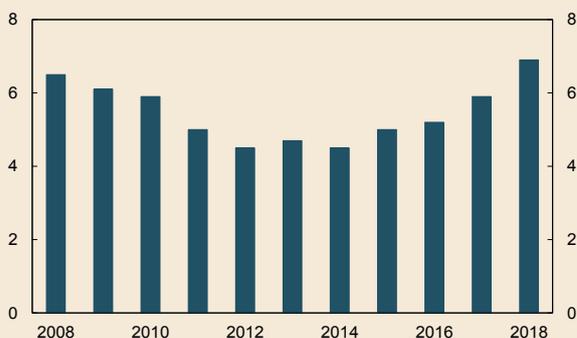
<sup>10</sup> The LR proxy used here is defined as the ratio of Tier 1 capital to total assets.

Chart 1.23 Breakdown of consumer debt in households that would be limited by new consumer credit regulation. By age group in 2018 and grouped by after-tax income in thousands of NOK. Percent. 2016



Sources: National Institute for Consumer Research (SIFO), Statistics Norway and Norges Bank

Chart 1.24 Default rate on consumer credit.<sup>1</sup> Percent. 2008 - 2018<sup>2</sup>



<sup>1</sup> Gross consumer credit defaults (90 days) as a percentage of gross consumer credit. Based on consumer credit to Norwegian and foreign customers provided by entities in Finanstilsynet's sample of consumer credit providers. Just under 30% of credit has been provided to foreign customers.

<sup>2</sup> At 30 June 2018.

Source: Finanstilsynet (Financial Supervisory Authority of Norway)

## TEN YEARS AFTER THE FINANCIAL CRISIS

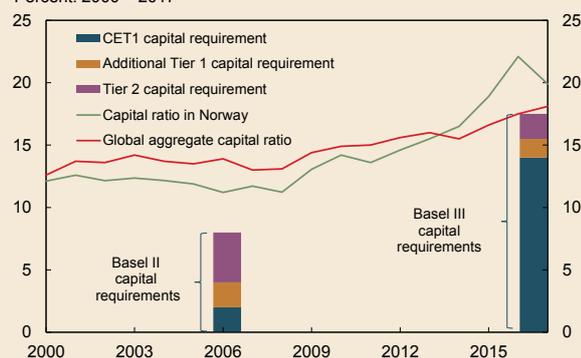
Following the global financial crisis in 2008, there has been a considerable international collaborative effort to strengthen the resilience of the financial system. Many of the recommended reforms have already been implemented in Norway.

The global financial crisis began in the US. Households had obtained mortgage loans on the basis of inadequate credit risk assessment procedures. The loans were funded by mortgage-backed securities called collateralised debt obligations (CDOs), which were sold on to other financial market participants. When house prices began to fall, considerable uncertainty arose as to both the value and ownership of these CDOs. The loss of confidence spread to other markets, and a number of banks experienced funding problems. While Norwegian banks had little or no exposure to US residential mortgages, they were affected because they funded much of their activities in global money and bond markets. Considerable uncertainty and massive shocks contributed to a marked decline in GDP in many countries.

A number of measures were implemented to alleviate the crisis. At the same time as countries collaborated to address the acute crisis, work began to improve the resilience of the financial system. The reform effort has addressed most aspects of the financial system. International recommendations for changes in the regulatory framework for capital, liquidity and crisis management have drawn considerable attention.

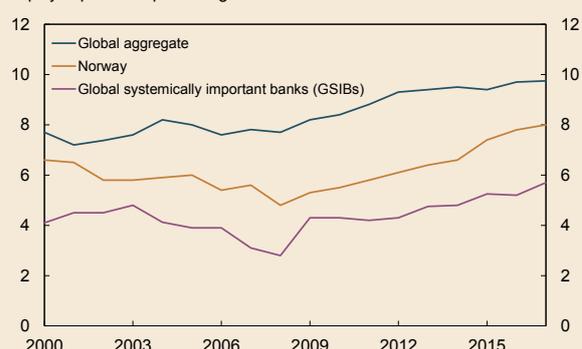
In 2010, the Basel Committee issued its proposal for new rules for minimum requirements for bank capital and liquidity (Basel III). The recommendation required banks to raise their capital ratios, with a larger share of capital comprising Common Equity Tier 1 (CET1) capital (Chart 1.25). Long transitional periods were included, since the authorities feared that stricter capital requirements would lead to tighter bank lending and delay the economic recovery.

Chart 1.25 Old and new minimum capital requirements<sup>1</sup> and actual developments in capital adequacy in Norway and global aggregate<sup>2</sup>. Percent. 2000 – 2017



1) Chart includes a 2% countercyclical capital buffer, as is the case in Norway.  
 2) Global aggregate capital ratio is based on data for banks from a total of 80 countries: 35 advanced economies and 45 emerging economies (see IMF *Global Financial Stability Report*, October 2018).  
 Sources: International Monetary Fund (IMF), Ministry of Finance, Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Chart 1.26 Leverage ratio in Norway<sup>1</sup> and global aggregate<sup>2</sup>. Equity capital as a percentage of total assets. 2000 – 2017



1) Common Equity Tier 1 (CET1) capital is used for Norway.  
 2) Global aggregate leverage ratio is based on data for banks from a total of 80 countries: 35 advanced economies and 45 emerging economies (see IMF *Global Financial Stability Report*, October 2018).  
 Sources: International Monetary Fund (IMF) and Finanstilsynet (Financial Supervisory Authority of Norway)

The Norwegian economy did not need long transitional periods, and Norway introduced the new requirements earlier than most other countries. The increase in capital ratios in Norway has been more pronounced than it has been globally, but even for the world as a whole, there has been a substantial increase in capital ratios (Chart 1.25).

Banks' capital ratios may be calculated using internal ratings-based (IRB) models. Since these models are based on historical data and do not necessarily capture all forms of risk, a leverage ratio requirement, which does not take into account the riskiness of various assets, has also been added as a backstop. The minimum recommended by the Basel Committee is 3%. For banks in Norway classified as systemically important, the leverage ratio requirement is 6% (minimum requirement of 3% and a buffer requirement of 3%). Leverage ratios have also risen since the financial crisis, but considerably less than risk-weighted capital ratios (Chart 1.26).

In the aftermath of the crisis, the Basel Committee proposed two new liquidity requirements, the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). Both are aimed at limiting the maturity mismatch between a bank's liabilities and its assets. Under the LCR, banks must hold an adequate stock of high-quality liquid assets to meet their liquidity needs for a 30-day period of financial market stress. Liquidity measured by the LCR has generally improved since reporting began, and is far above the minimum requirement. The NSFR requires banks' illiquid assets to be financed by long-term funding. Implementation has been delayed, but Norwegian banks report their NSFR and on average comply with the Basel Committee's recommendations as they now stand.

The financial crisis resulted in proposals for new principles for bank recovery and resolution. These principles are intended to guarantee the continuity of banking services without recourse to taxpayers' funds. In 2012, the Financial Stability Board proposed that creditors other than equity holders would have to be prepared to absorb losses or have claims converted to equity (be "bailed in") as part of a rescue. Most of the home jurisdictions of globally systemically important banks have introduced these recovery and resolution principles. In the EU, these principles are part of the Bank Recovery and Resolution Directive (BRRD). In this area, Norway lags behind the EU, and the new recovery and resolution principles will not be implemented in Norway until 1 January 2019.

According to the IMF, regulatory reform has contributed to a more resilient financial system,<sup>1</sup> which has become more liquid and better capitalised. In addition, both micro- and macroprudential supervision have been strengthened. Parts of the reform agenda have yet to be implemented (Appendix 2). The IMF warns that calls to roll back reforms should be resisted. At the same time, it is important to assess how the reforms have affected economic developments and, if necessary, adjust regulations that have had unintended consequences. Among remaining challenges, the IMF points to cross-border crisis resolution and the need for macroprudential authorities to have an adequate toolkit to contain systemic risk. The risks will change in the period ahead. Regulatory regimes will therefore need to evolve to address them.

<sup>1</sup> See International Monetary Fund (2018) «A Decade after the Global Financial Crisis: Are We Safer?». *Global Financial Stability Report*. IMF, October 2018.

# Cyber risk in the financial system

*Prolonged and large-scale disruptions to the availability of financial services may entail high social costs and ultimately weaken confidence in the financial system. The Norwegian financial system is digitalised and interconnected, which can amplify the effects of shocks and disruptions. Norwegian banks and other important system participants are devoting considerable attention to cyber risk. Coordination between the authorities and the financial industry, information sharing and clear reporting requirements may contribute to a reduction in the financial systems' vulnerability with respect to cyber risk.*

Cyber risk in the financial system increases with greater ICT dependence. ICT dependence makes the financial system vulnerable to unintended operational incidents and cyber-attacks. A number of international stakeholders have pointed out that cyber risk mitigation should be prioritised and that international cooperation is an important part of this work.<sup>1</sup>

A shock can cause serious disruptions in large parts of the financial system, but will not necessarily set off a systemic crisis. Cyber risk could have systemic consequences if the financial system lacks sufficient capacity to absorb shocks, rectify faults and ensure continuity of the most important economic functions in society. Cyber risk can be mitigated in a number of ways, including through an effective partnership between the authorities and system participants, sound security practices among banks and the owners of financial market infrastructures (FMIs), and recovery plans.

So far, cyber risk has not caused a financial system crisis. There is limited data on costs related to malicious attacks and operational incidents, in both the financial and non-financial sectors. More detailed data on attacks that could provide information on frequency and newly evolving forms of attack are also limited. Limited data make it difficult to assess and

predict banks' losses and exposures to cyber risk, as well as its impacts on financial stability.

## **Contagion channels and consequences for the financial system**

The Norwegian financial system is interconnected, both through banks' and financial institutions' exposure to one another and through extensive use of common systems and shared service providers. Financial connectedness and operational dependency can function as contagion channels when serious incidents occur. This may increase cyber risk and amplify the effects of shocks and disruptions. The consequences may become more serious if public and market confidence in banks and the financial system erodes.

The consequences of an incident depend on a number of factors. An incident affecting the payment system as a whole will have more serious consequences than an incident at an individual bank. In addition, the severity of the incident will depend on whether only the availability of banks or FMIs are impacted, whether other agents gain access to confidential information or whether information is manipulated.

## **Disruptions at an individual bank**

A prolonged and serious disruption at a bank may have consequences for the bank and its customers. For example, a breach of a bank's online banking systems may inflict direct economic losses on both the bank and its customers. Sensitive information could fall into the wrong hands or be manipulated. This can erode confidence in both the bank and in bank systems in general. The bank could risk losing customers and thus deposit funding, and the bank's wholesale funding could become more expensive or, at worst, dry up.

Only a few studies and analyses on economic loss resulting from cyber-attacks have been published. Some of these studies show that banks' losses have

<sup>1</sup> See FSB (2017) "Financial Stability Implications from FinTech" and IMF Kopp, E., L. Kaffenberger and C. Wilson (2017) "Cyber Risk, Market failures, and Financial Stability", *IMF Working Paper 17/185*.

been limited relative to their earnings and equity.<sup>2</sup> Nevertheless, non-financial sector examples illustrate that cyber risk can inflict considerable losses with serious consequences. For example, in 2017 A.P. Møller-Mærsk experienced a malware attack, which also impacted other companies internationally. As a result, the company was estimated to have lost around NOK 2bn, among other reasons because of higher costs and reduced shipping activity. The company's share price fell sharply.

At the outset, disruptions at individual banks will primarily entail costs for the affected bank and its customers, in the form of either direct losses or indirect costs such as higher funding costs or lower earnings. However, prolonged or serious incidents in one bank can also lead to problems in other banks. Substantial economic losses can affect the bank's ability to fulfil commitments to other participants and at worst affect interbank settlement. Moreover, severe incidents at one bank can erode the public's confidence in other financial institutions and in bank systems in general.

Stress testing resilience to, and contingency plans for, cyber-attacks and operational disruptions are important measures for reducing the cyber risk of individual banks.

#### **Payment system disruptions**

A well-functioning payment system is essential for financial stability. The payment system's critical function in the financial system makes society particularly vulnerable to a serious disruption.

An incident affecting the payment system can quickly have serious consequences. The public may be prevented from making payments, with banks and other market participants unable to execute planned transactions in money, foreign exchange and securities markets. Incidents could also result in unauthorised

access to or manipulation of sensitive information. This can undermine confidence in the financial system as a whole and lead to turbulence in the funding markets for Norwegian banks and businesses. If the payment system as a whole is unavailable for a prolonged period, large parts of the Norwegian economy could come to a halt.

#### **Disruptions among critical ICT service providers**

A large number of banking and payment service providers depend on a few key ICT service providers that provide and maintain critical systems and hardware. This poses a concentration risk to the Norwegian financial system. Even though financial institutions are themselves responsible for outsourced tasks, it is difficult for individual banks and other FMI owners to manage this concentration risk and bring it under control.

Extensive outsourcing could impair the effective management and control of outsourced operations by FMI owners, which in turn may weaken the security of the banks and the payment system. The use of external service providers may also make it more challenging to monitor unauthorised access to systems and sensitive information. A disruption among critical ICT service providers may put important components of the banking and payment system out of action.<sup>3</sup>

#### **Measures to mitigate cyber risk to financial stability**

In 2017, there were several operational incidents in Norway that made certain retail payment services unavailable to up to 30% of bank customers for periods of up to a full day. While the incidents were serious, Finanstilsynet concluded that they did not pose any threat to financial stability.<sup>4</sup> This shows that while cyber risk does not necessarily pose a risk to financial stability, the consequences of incidents related to cyber risk can still be serious. Cyber risk can be mitigated through well-functioning backup solu-

<sup>2</sup> See for example Bouveret, A. (2018) "Cyber Risk for the Financial Sector: A Framework for Quantitative Assessment", *IMF Working Paper 18/143* and Anderson, R., C. Barton, R. Böhme, R. Clayton, M.J.G van Eeten, M. Levi, T. Moore and S. Savage (2012) "Measuring the Cost of Cyber Crime" and Symantec (2013) *Norton Report 2013*.

<sup>3</sup> See *Financial Infrastructure Report 2018* for a further discussion of the risks related to critical ICT service providers.

<sup>4</sup> Finanstilsynet (2018) *Risk and vulnerability analysis 2017*.

tions, sound security practices among banks and FMI owners, and effective cooperation between authorities and private participants.

#### **Well-functioning backup solutions and sound security practices**

Efficient backup solutions for banks' critical operations are crucial for the swift recovery of banks' systems following an operational disruption.

Finanstilsynet recommends that financial sector entities strengthen their work in both the area of ICT security and in establishing resilient solutions. Finanstilsynet sees the need for banks to perform risk analyses for both their own infrastructures and outsourced ICT infrastructures.<sup>5</sup>

As the oversight and supervisory authority for inter-bank systems, Norges Bank has proposed that it should be studied how critical ICT service providers to the payment system can best be supervised, including whether such supervision should be coordinated among relevant authorities.<sup>6</sup>

#### **Information sharing and reporting requirements**

The threat landscape is quickly evolving, attack surfaces are multiplying and malicious attacks are becoming increasingly sophisticated. Coordination, information sharing and cooperation between private system participants and authorities, also across countries, are crucial for an effective defence system.

Detailed reporting requirements can provide the authorities with a more accurate and broader information base in their efforts to gain an overview of the levels of, and changes in, cyber risk. As part of the implementation of the revised Payment Services Directive 2 (PSD2), banks and third parties will be subject to standardised and more detailed incident reporting requirements, and to reporting requirements for losses and costs stemming from major

incidents.<sup>7</sup> More detailed loss and attack data will improve preventive work and analyses, for example in work on stress test scenarios.

A number of authorities are also conducting surveys to ascertain the status of cyber security work and operational dependence among system participants.<sup>8</sup> In spring 2018, Norges Bank and Finanstilsynet surveyed the use of outsourcing in the banking and payment system.<sup>9</sup>

5 Finanstilsynet (2018): *Risk and vulnerability analysis 2017*.

6 See *Financial Infrastructure Report 2018*.

7 See EBA Guidelines on Major Incident Reporting under the PSD2.

8 See for example Danmarks Nationalbank's web pages for cyber security in the financial sector and Bank of England's web pages on financial sector continuity.

9 See *Financial Infrastructure Report 2018* for more information on this survey.

# 2 Bank profitability, solvency and funding

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The profitability of Norwegian banks has been solid over the past year, strengthening their resilience to losses, while credit losses remain low. All Norwegian banks fulfil the capital requirements, and the large banks' Common Equity Tier 1 (CET1) capital ratios exceed their long-term capital targets. Banks have ample access to funding and meet the liquidity requirements. Liquidity risk related to short-term foreign currency funding has been reduced. New recovery and resolution rules and new debt structure requirements is expected to affect the composition of bank funding, which may increase funding costs somewhat during a transitional period.

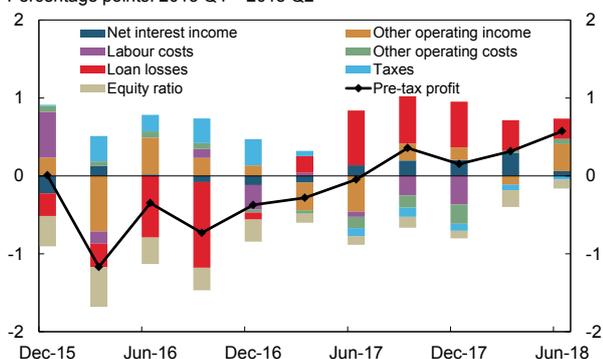
## 2.1 PROFITABILITY

The profitability of the large Norwegian banks has improved over the past year, owing to higher net interest income and reduced credit losses. Bank profitability is expected to remain solid in the coming years.

### Improved profitability

The large Norwegian banks have improved their profitability over the past year, primarily owing to reduced credit losses (Chart 2.1). Credit losses rose in 2016, but have been low since the beginning of 2017. Restructuring in oil-related industries has contributed to the decline in losses, and spillovers to other sectors have been less pronounced than many had expected. The introduction of new credit loss recognition rules (IFRS 9) increased impairment losses for the 30 largest banks by 7% at year-end 2017.<sup>1</sup> The purpose of the new rules is more forward-looking recognition of credit impairment.<sup>2</sup>

Chart 2.1 Estimated contributions to changes in banks<sup>1</sup> return on equity after tax. Four-quarter moving weighted average of annualised return. Percentage points. 2015 Q4 – 2018 Q2



1) Weighted average of DNB Bank, Nordea Bank Norge (to 2016 Q4), Sparebank 1 SR-Bank, Sparebanken Vest, Sparbanken Vest, SpareBank 1 SMN, Sparebanken Sør (from 2014 Q1), SpareBank 1 Østlandet (from 2016 Q3) and SpareBank 1 Nord-Norge. Consolidated figures.  
Sources: Banks' quarterly reports and Norges Bank

1 See Finanstilsynet (2018) Risk Outlook.

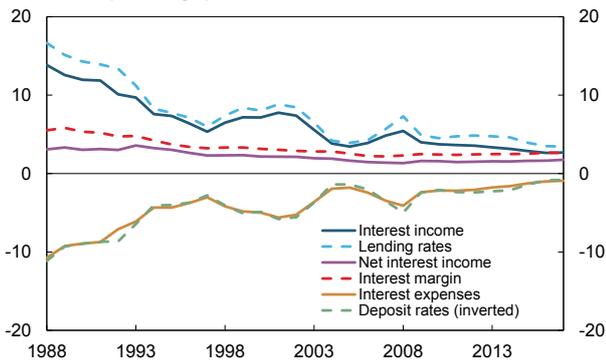
2 See Financial Stability Report 2017 for a detailed discussion of IFRS 9.

Higher net interest income has also helped to improve the profitability of large Norwegian banks over the past year. Net interest income is banks' most important revenue source and over the past 30 years has accounted for between 70% and 80% of banks' total income. Banks' net interest income depends largely on interest margins (Chart 2.2). Measured as a percentage of total assets, banks' net interest income was reduced by more than half between 1993 and 2017. In recent years, net interest income has edged back up. The interest margin shows broadly the same developments over time.

Compared with other European banks, return on equity is high among Scandinavian banks (Chart 2.3).

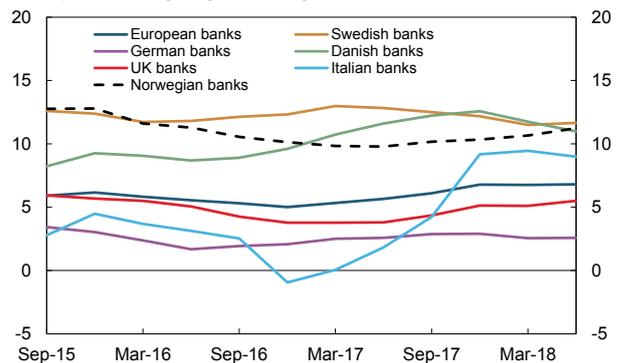
Nevertheless, most large Nordic banking groups' return on equity is lower now than before the financial crisis. Traditional banking, as measured by net interest income, is important for all of the Nordic banking groups (Chart 2.4), but net interest income accounts for a larger share of revenues for large Norwegian banks. Income from securities trading and extraordinary transactions, such as sales of business units, has contributed to the most pronounced changes in profitability compared with 2017. Risk indicators derived from market prices suggest that the risk of financial problems in large Nordic banking groups is low (see box on page 36).

Chart 2.2 Net interest income and interest margin.<sup>1</sup> All Norwegian banks.<sup>2</sup> Percent and percentage points. 1988 – 2017



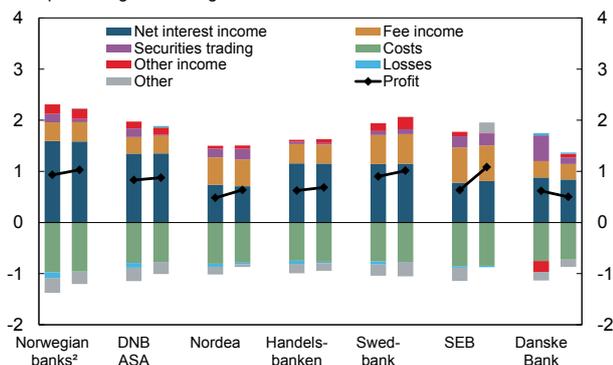
1) Interest income, interest expenses and net interest income as a percentage of total assets. Lending rates and deposit rates in percent. Interest margin in percentage points.  
2) Financial report data for parent banks and Norwegian mortgage companies without foreign branches are used for the period 1988–2008. From 2009, data for Norwegian banking groups are used.  
Sources: Finanstilsynet (Financial Supervisory Authority of Norway), Statistics Norway and Norges Bank

Chart 2.3 Return on equity after tax for Norwegian<sup>1</sup> and European<sup>2</sup> banks. Four-quarter moving weighted average. Percent. 2015 Q3 – 2018 Q2



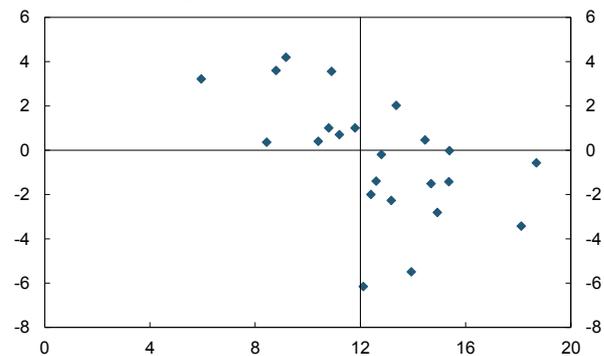
1) Weighted average of DNB Bank, Nordea Bank Norge (to 2016 Q4), SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør (from 2016 Q1), SpareBank 1 Østlandet (from 2016 Q3) og SpareBank 1 Nord-Norge. Consolidated figures.  
2) Based on a sample of 187 European banks. The sample varies over time.  
Sources: European Banking Authority (EBA), Norwegian banking groups' quarterly and annual reports and Norges Bank

Chart 2.4 Composition of earnings for large Nordic banking groups. As a percentage of average total assets. 2017 and 2018<sup>1</sup>



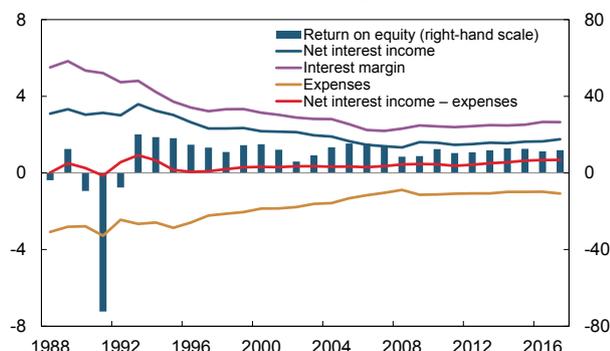
1) Based on data from the first half of 2018.  
2) DNB Bank, SpareBank 1 SR-Bank, SpareBank 1 SMN, Sparebank 1 Østlandet, SpareBank 1 Nord-Norge and Sparebanken Sør.  
Sources: SNL / S&P MI and Norges Bank

Chart 2.5 Current year return on equity (horizontal scale) and next-year change in return on equity (vertical scale). All Norwegian banks.<sup>1</sup> Percent and percentage points. 1994 – 2017



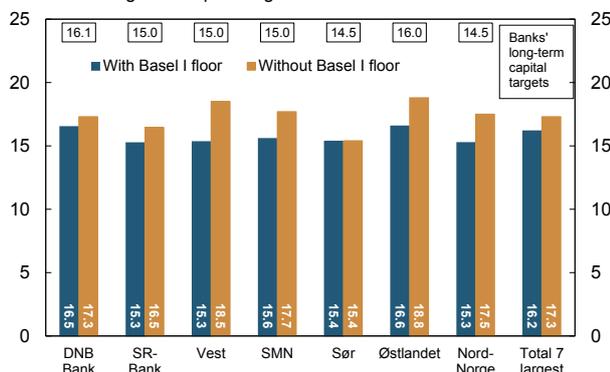
1) Return on equity estimated based on financial report data for parent banks and Norwegian mortgage companies without foreign branches in the period 1994–2008. From 2009, data for Norwegian banking groups are used.  
Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Chart 2.6 Net interest income, expenses and interest margin.<sup>1</sup>  
All Norwegian banks.<sup>2</sup> Percent and percentage points. 1988 – 2017



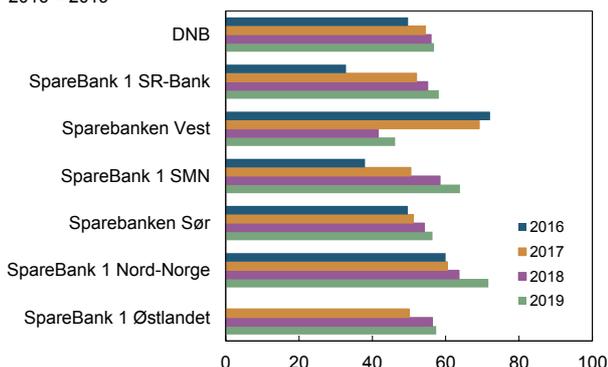
1) Net interest income and expenses as a percentage of total assets. Interest margin in percentage points and return on equity in percent.  
2) Financial report data for parent banks and Norwegian mortgage companies without foreign branches are used in the period 1988–2008. From 2009, data for Norwegian banking groups are used.  
Sources: Finanstilsynet (Financial Supervisory Authority of Norway), Statistics Norway and Norges Bank

Chart 2.7 Large Norwegian banking groups' Common Equity Tier 1 capital ratios<sup>1</sup> and long-term capital targets. Percent. At 2018 Q2



1) Includes entire profit for 2018 Q1 and 2018 Q2.  
Sources: Banks' quarterly reports and Norges Bank

Chart 2.8 Dividend payout ratio for the largest Norwegian banks. Percent. 2016 – 2019<sup>1</sup>



1) Actual dividends for 2016 and 2017. Expected dividends for 2018 and 2019 (consensus estimate of analysts at 25 October 2018).  
Sources: Bloomberg, DNB Markets and Oslo Børs

A review of the annual reports of the large banks in Norway show that they have return on equity targets of around 12%. Data from the period 1994–2017 indicate that banks make adjustments to improve return on equity if returns are below target (Chart 2.5).

Banks can improve return on equity in a number of ways. One possibility is to reduce costs. Another is to improve income, eg by increasing interest margins. Since the beginning of the 1990s, cost reductions have enabled banks to maintain profitability while reducing interest margins (Chart 2.6). Mergers, efficiency enhancements and the development of digital self-service platforms have reduced banks' needs for staffing and physical locations. Since the financial crisis, both the number of Norwegian bank employees and the number of branches have fallen considerably. Efficiency improvements have entailed temporary restructuring costs, but the long-term trend is nevertheless a net cost reduction.

### Bank profitability in the longer term

Bank profitability is expected to remain solid in the coming years. The overall risk of bank losses is assessed as relatively low in the short term (Section 4.3). Mainland GDP growth is expected to be solid over the coming year.<sup>3</sup> Projections from Norges Bank's bankruptcy probability model indicate that banks' credit losses will remain low ahead. However, there is still some uncertainty about the need for further restructuring in oil-related enterprises.

Banks' interest margins are likely to remain broadly unchanged ahead. Over the past year, return on equity has been close to most large banks' 12% target. In the somewhat longer term, new providers of banking services may lead to intensified competition and pressure on banks' interest margins.<sup>4</sup>

## 2.2 SOLVENCY

All Norwegian banks meet the capital requirements and the Common Equity Tier 1 (CET1) ratios of the large banks exceed their long-term capital targets. This improves banks' lending capacity and ability to pay dividends ahead.

3 See Monetary Policy Report with financial stability assessment 3/18.

4 See box on page 21 of Financial Stability Report 2017.

### Banks meet capital requirements

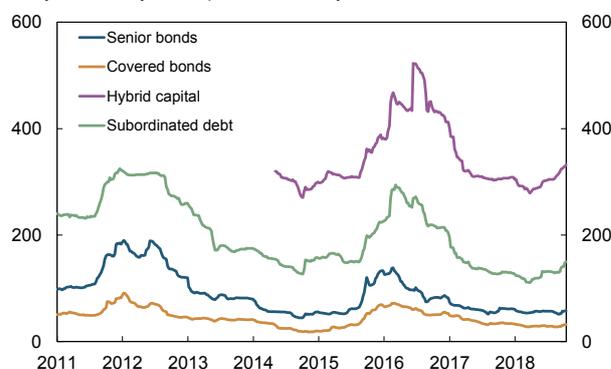
Banks have increased their Common Equity Tier 1 (CET1) ratios since the financial crisis in 2008, primarily by retaining earnings. All Norwegian banks fulfil the capital requirements. The CET1 ratios of large banks exceed their long-term targets (Chart 2.7). Fulfilment of capital targets boosts banks' lending capacity and ability to pay dividends ahead. Banks' dividend payout ratios rose in 2017 and are expected to remain high for most banks in 2018 and 2019 (Chart 2.8).

Many parts of the EU capital framework (CRR/CRD IV) have still not been implemented in Norway. The Ministry of Finance circulated for comment a proposal to implement the remaining parts of the framework in Norwegian law. Norges Bank endorsed the proposals in its consultation statement of 30 August 2018.<sup>5</sup> Transposition of the remaining requirements into Norwegian law will harmonise Norwegian and European rules and also enable Norwegian banks to report somewhat higher capital ratios without this reflecting improved solvency. The capital requirement for smaller loans to small and medium-sized enterprises will be reduced by nearly 24% (SME discount factor). Finanstilsynet has performed calculations showing that the SME discount factor increases CET1 capital ratios by 1 percentage point or more for over half of Norwegian banks. In addition, rules will be relaxed for banks using internal ratings-based models (IRB banks), which will no longer have to use the Basel I floor for risk-weighted assets when calculating their capital ratios (Chart 2.7).

Finanstilsynet has proposed changes in the rules for identifying systemically important banks whereby weight is given to market share for corporate loans in different regions. Under the proposal, banks with at least 10% of the corporate credit market shall be regarded as systemically important. The proposed changes will entail the classification of DNB Bank, SpareBank 1 Nord-Norge, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet, SpareBank 1 SR-Bank and Sparebanken Vest as systemically important and will require these institutions to meet an additional CET1 capital requirement of 2 percentage points and an additional leverage ratio requirement of 1 percentage point.

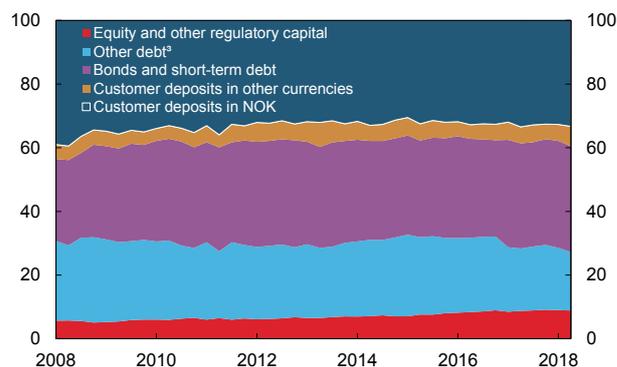
5 See Norges Bank's consultation statement on implementation of the EU solvency framework (CRR/CRD IV) in Norway (in Norwegian only), 30 August 2018.

Chart 2.9 Risk premiums in Norway.<sup>1</sup> Spread over three-month Nibor. Five-year maturity. Basis points. 7 January 2011 – 19 October 2018



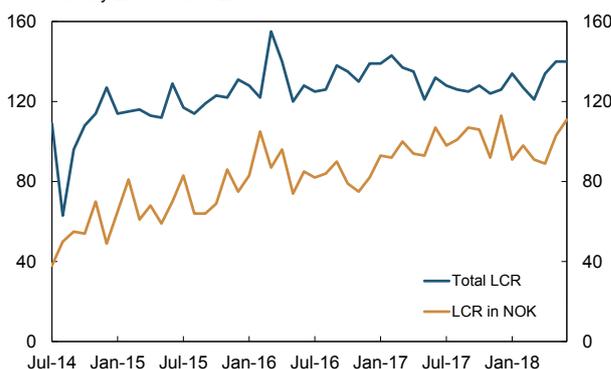
1) On bonds issued by Norwegian banks and mortgage companies.  
Source: Nordic Bond Pricing

Chart 2.10 Funding structure.<sup>1</sup> Norwegian banks and covered bond mortgage companies.<sup>2</sup> Percent. 2008 Q1 – 2018 Q2



1) Not consolidated. Adjusted for the swap arrangement.  
2) Nordea Bank Norge is excluded from 2017 Q1.  
3) Other debt includes intra-group debt, financial derivatives, repurchase agreements etc.  
Source: Norges Bank

Chart 2.11 Liquidity Coverage Ratio (LCR). All Norwegian banks. Percent. July 2014 – June 2018



Source: Finanstilsynet (Financial Supervisory Authority of Norway)

## 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 value of the stock of HQLA is subject to haircuts in calculating the LCR.

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

In Norway, banks and mortgage companies must maintain a minimum LCR of 100% for all currencies in total and for each significant foreign currency. In addition, banks with EUR and/or USD as significant currencies must maintain a minimum LCR in NOK of 50%.

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

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

The NSFR was 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 NSFR.

See *Financial Stability Report 2015* for more information on the LCR and NSFR.

In 2017, the Basel Committee revised capital adequacy standards, largely completing its post-crisis work to strengthen banking regulation (see box on page 23). The new standards include a more risk-sensitive standardised approach to credit risk and a new floor for risk-weighted assets based on the standardised approach. The transition from the Basel I floor to the new floor will probably entail an easing for Norwegian IRB banks. The new rules are to be introduced gradually from 2022. Some work remains to flesh out the rules, including those for the standardised approach. The rules will be added to CRR/CRD IV and implemented in Norway via the EEA Agreement.

### 2.3 FUNDING

*Banks have ample access to funding and satisfy liquidity requirements. Liquidity risk related to short-term foreign currency funding has been reduced. Several banks must issue new debt instruments to meet new debt structure requirements. At the same time, a number of central banks are unwinding their asset purchase programmes, which may increase funding costs somewhat in a transitional period.*

Norwegian banks and mortgage companies have ample access to wholesale funding in both NOK and foreign currency. In recent years, risk premiums on banks' long-term wholesale funding have edged down and are below the average for the past ten years (Chart 2.9). Customer deposits are the most important funding source for Norwegian banks. Deposits account for around 40% of total bank funding, while bonds and short-term paper account for just over 30% (Chart 2.10). The latter instruments largely comprise bonds with long maturity, over half of which are covered bonds.

Norwegian banks satisfy the Liquidity Coverage Ratio (LCR) requirements. Both the total LCR and the LCR in NOK have risen in recent years (Chart 2.11). A high LCR is intended to reduce banks' vulnerabilities to funding shortfalls. However, banks may be vulnerable if they lose access to funding over the LCR's 30-day horizon. A Net Stable Funding Ratio (NSFR) requirement may reduce these vulnerabilities. The NSFR is not yet finalised or implemented either in Norway or the EU. Norwegian banks report their NSFR and already satisfy the Basel Committee's proposal for the NSFR (Chart 2.12).

### Central banks unwinding asset purchase programmes

Since the financial crisis, a number of central banks have purchased government bonds and other securities on a large scale, which has contributed to pushing down long-term yields.<sup>6</sup> The low yields have induced investors to invest in riskier assets with higher expected returns. This has reduced risk premiums on banks' wholesale funding and created favourable funding conditions, also for Norwegian banks.

As the global economy has improved, many major central banks have ended or signalled that they would end their asset purchase programmes.<sup>7</sup> This implies that net central bank holdings of government bonds and other securities will no longer be increasing. However, it will take time before central bank holdings to fall because most central banks are continuing to reinvest maturing bonds.<sup>8</sup>

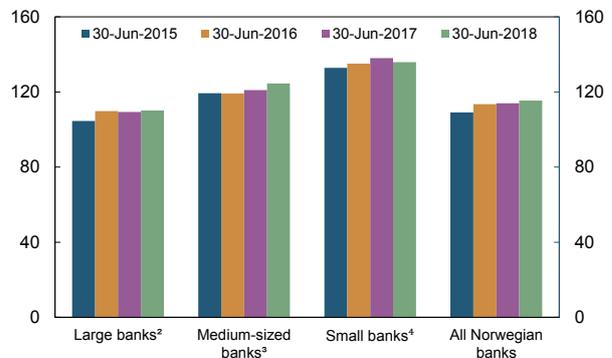
Bank funding costs may rise as central bank holdings gradually shrink. Banks with a high wholesale funding ratio will be most at risk of higher funding costs, which may lead to higher household and corporate lending rates.

### Norwegian banks dependent on covered bonds

Norwegian banks largely fund lending with covered bonds (Chart 2.13). Norwegian banks and mortgage companies are the largest investor category in the Norwegian market, holding over 50% of the total (Chart 2.14). At the end of June 2018, covered bonds accounted for over half of banks' high quality liquid assets (HQLA) in NOK (Chart 2.15).<sup>9</sup> Preliminary calculations performed by Norges Bank and Finanstilsynet shows that banks are dependent on a well-functioning covered bond market (see box on page 47).

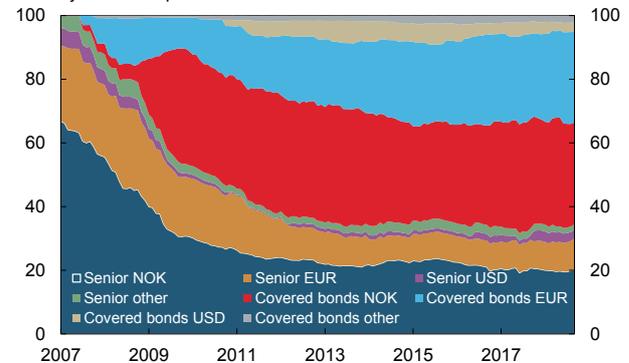
Norwegian banks' substantial covered bond holdings amplify the connectedness of Norwegian financial

Chart 2.12 Net stable funding ratio (NSFR). All Norwegian banks.<sup>1</sup> Percent. 2015 Q2 – 2018 Q2



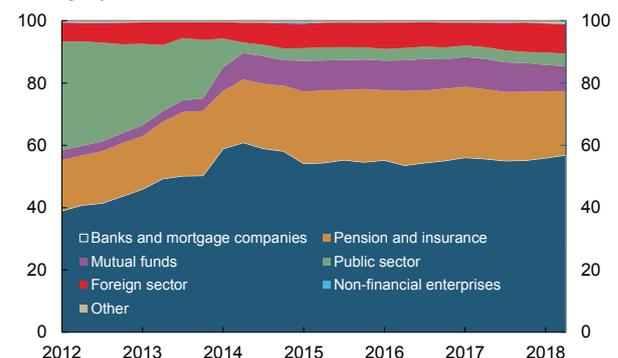
1) Consolidated data where available. Parent banks otherwise.  
 2) DNB, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet and SpareBank 1 Nord-Norge.  
 3) Banks with total assets above NOK 10bn.  
 4) Banks with total assets below NOK 10bn.  
 Source: Finanstilsynet (Financial Supervisory Authority of Norway)

Chart 2.13 Outstanding wholesale funding in Norway. Norwegian banks and covered bond mortgage companies. By bond and currency. Percent. January 2007 – September 2018



Sources: Bloomberg and Stamdata

Chart 2.14 Bonds issued by mortgage companies in NOK. Holdings by sector. Percent. 2012 Q1 – 2018 Q2



Source: Statistics Norway

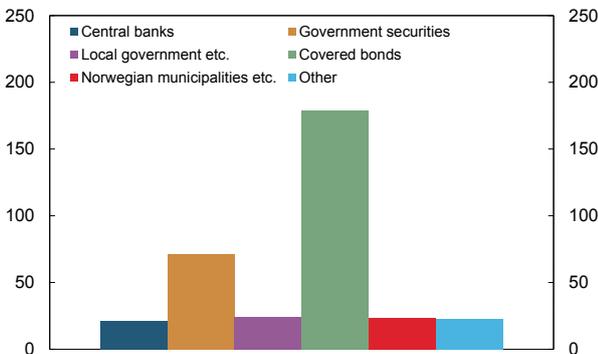
6 See eg Borio, C. and A. Zabai (2016) "Unconventional monetary policies: a re-appraisal". BIS Working Papers 570 and De Rezende, R. B., D. Kjellberg and O. Tysklind (2015) "Effects of the Riksbank's government bond purchase on financial prices". *Riksbank Economic Commentaries* 13/2015.

7 See also box on page 44 of *Monetary Policy Report with financial stability assessment* 4/17.

8 The Federal Reserve, Bank of England and Sveriges Riksbank have ended their net purchases of various kinds of securities. The European Central Bank (ECB) will terminate its programme at the end of 2018. Both the Bank of England and the Riksbank roll over maturing bonds. The ECB has also signalled that it would follow suit. The Federal Reserve no longer reinvests maturing assets.

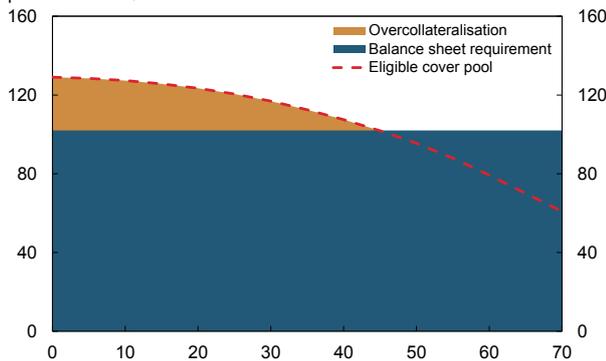
9 The rules allow covered bonds to comprise up to 70% of banks' liquidity portfolio.

Chart 2.15 Stock of liquid assets in NOK by asset type. Norwegian banks and covered bond mortgage companies. After haircut. In billions of NOK. 30 June 2018



Source: Finanstilsynet (Financial Supervisory Authority of Norway)

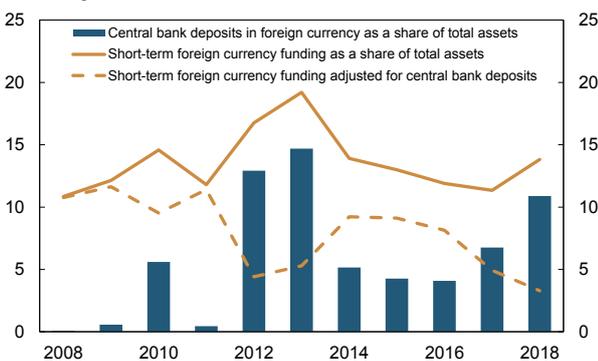
Chart 2.16 Norwegian covered bond mortgage companies' eligible cover pool and overcollateralisation (vertical scale) after a fall in house prices (horizontal scale).<sup>1</sup> Outstanding volume of covered bonds and price fall in percent. 2018 Q2



1) These calculations assume that 3% of mortgages with LTV of 60% and below and 5% of the remainder default. Overcollateralisation will be below 2% given an approx. 40% fall in house prices.

Sources: Norwegian mortgage companies reports and Norges Bank

Chart 2.17 Short-term foreign currency funding. Share of total assets.<sup>1</sup> All Norwegian banks. Percent. 30 June 2008 – 30 June 2018<sup>2</sup>



1) Comprises deposits from foreign customers and central banks and, debt securities with less than 12 months' residual maturity.

2) Annual data as of 30 June.

Source: Norges Bank

institutions and may constitute a systemic risk. This may intensify liquidity problems for Norwegian banks in situations where funding dries up and many banks are forced to liquidate large covered bond holdings at the same time. This may lead to a rapid decline in the value of banks' liquidity portfolio. A concurrent fall in house prices may worsen liquidity problems by forcing further sales of liquid assets. It is therefore important that banks' HQLA under the LCR can be traded without causing appreciable price changes. According to Norges Bank's semi-annual survey of liquidity in the Norwegian bond and short-term paper market, market participants assess the liquidity of Norwegian covered bonds and government securities as fairly good and little changed over the past half year.<sup>10</sup>

Compared with other corporate bonds, covered bonds trade at lower risk premiums in both the Norwegian and global markets.<sup>11</sup> Owing to high collateralisation ratios, the risk of losses on covered bonds is low compared with other bonds. A substantial fall in house prices would have to occur before banks have to add new residential mortgages to the cover pool for covered bonds outstanding (Chart 2.16). Extensive use of covered bonds as a funding source has contributed to a lengthening of maturities on Norwegian banks' wholesale funding, which reduces refunding risk. In periods of market turbulence, covered bonds' market liquidity has deteriorated less than that of unsecured bank bonds.

### Short-term foreign currency funding and liquidity risk

Many international banks, including DNB, fund lending with short-term deposits and short-term paper in foreign money markets. Such short-term wholesale funding in foreign currency accounts for around 14% of Norwegian banks' funding.

Short-term funding must be rolled over frequently, and it has been shown that such funding may dry up in turbulent times. Historically, professional investors such as money market funds, large companies and other banks have been quick to withdraw deposits

<sup>10</sup> The survey also shows that liquidity continues to be regarded as somewhat above average for Treasury bills and government bonds, while corporate bond liquidity is regarded as good. Covered bonds are regarded as the most liquid.

<sup>11</sup> See *Financial Stability Report 2015* for a Special Feature on covered bonds as a funding source.

from banks in which they have lost confidence. Foreign money market funds are the largest purchasers of DNB's short-term paper, and maturities vary between one day and one year. The US money market reform in autumn 2016 reduced Norwegian banks' short-term paper funding.<sup>12</sup>

Short-term foreign currency funding is largely matched by central bank deposits and investments in other liquid paper. Adjusted for central bank deposits, which are highly liquid and safe, banks' short-term foreign currency funding has been reduced in recent years. The share of short-term foreign currency funding not matched by central bank deposits is now around 4%, down from around 8% in 2016 (Chart 2.17). In recent years, the maturity of banks' short-term foreign currency funding has edged up, possibly indicating that vulnerabilities associated with short-term foreign currency funding have moderated somewhat.

### New class of non-preferred liabilities may increase bank funding costs in the short term

On 1 January 2019, the new bank recovery and resolution framework will enter into force in Norway. An important element of this framework is a minimum requirement for eligible liabilities and own funds (MREL). The MREL shall consist of a loss-absorbing element and a recapitalisation element. In its consultation memorandum on MREL, Finanstilsynet has proposed that the recapitalisation requirement be met with non-preferred liabilities and own funds, ie a new class of non-preferred liabilities (Tier 3) and/or regulatory capital. Norges Bank supports this proposal in its consultation response (see box on page 38). Tier 3 is intended to absorb losses prior to ordinary senior debt, but after regulatory capital (see Table 2.2). Market participants expect that the largest banks will issue Tier 3 instruments as ordinary senior debt matures and that banks will not satisfy MREL using excess regulatory capital alone.

A few European banks have already issued Tier 3 instruments. Banks and investors expect that the premium for Tier 3 will lie between the risk premiums for subordinated debt and ordinary senior debt (Chart 2.18). The risk premium on ordinary senior debt may fall when banks issue a new debt instrument

that is to absorb losses prior to ordinary senior debt. In the short term, funding costs may rise since the risk premium on new Tier 3 funding will be above that for senior debt, and the risk premium on senior debt already outstanding is fixed until maturity. A fall in premiums on ordinary senior debt will not contribute to lower funding costs until existing senior debt matures and banks issue new senior debt. In the longer term, this is not expected to lead to an appreciable increase in banks' overall funding costs.

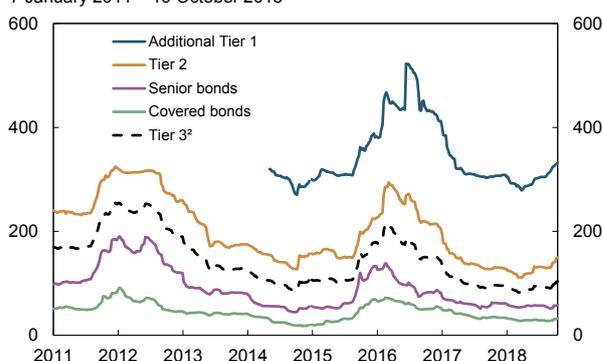
It has yet to be clarified which banks will have to meet both a loss-absorbing and a recapitalisation element (full MREL). It is therefore difficult to ascertain Norwegian banks' needs for issuing Tier 3 instruments. The rating agency, Moody's, expects that the seven largest savings banks<sup>13</sup> in Norway will have an overall need to issue NOK 200bn in Tier 3 over the next five years.<sup>14</sup> This amount may prove to be higher. In its consultation memorandum, Finanstilsynet assumes that the majority of Norwegian banks may have to meet the MREL in full (see also box on page 38). By comparison, the issuance needs of the large Swedish banks overall come to just under SEK 500bn.<sup>15</sup>

13 DNB, SpareBank 1 SR-Bank, SpareBank 1 SMN, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, Sparebanken Vest and Sparebanken Sør.

14 Moody's Financial Institutions, *Norway's draft MREL proposal is credit positive for senior bondholders*. Published for subscribers on 2 August 2018.

15 Handelsbanken, SEB, Swedbank and Nordea (Nordea is included, even though Nordea changed its domicile to Finland on 1 October 2018).

Chart 2.18 Potential risk premium for senior non-preferred debt (Tier 3) compared with other risk premiums in Norway.<sup>1</sup> Basis points. 7 January 2011 – 19 October 2018



1) Risk premiums on bonds issued by Norwegian banks and mortgage companies.  
2) Average of subordinated debt capital and senior bank bonds.  
Sources: Nordic Bond Pricing and Norges Bank

12 See *Financial Stability Report 2017* for more information on the US money market reform.

## RISK INDICATORS DERIVED FROM MARKET PRICES

From a system perspective, it is important to assess the risk that several banks will experience problems simultaneously. This risk depends on the risk in individual banks, but also on the interdependencies among banks. In this box market information is used to estimate the probability that several Nordic banks will experience problems at the same time.

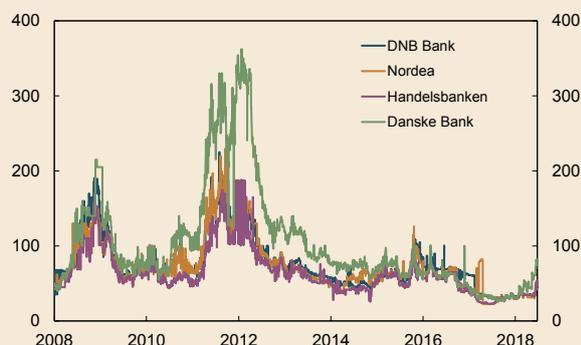
The risk of financial problems at large systemically important banks is important in financial stability assessments. Market information may be useful for the authorities in bank oversight. In addition, the authorities have access to confidential information about banks. A close working relationship among Nordic regulators ensures that risk assessments will be shared.

There are a number of indicators of risk at individual banks, including credit ratings. Information from securities markets, such as the risk premium on unsecured bonds, credit default swap (CDS) prices and equity prices can also be used. Such information reflects the market's assessment of risk. Risk measured by CDS prices was high in large Nordic banking groups during the eruption of the financial crisis in 2008 and during the euro crisis in 2011–2012 (Chart 2.19). Risk can also be measured by distance to default<sup>1</sup>. Measured by distance to default, risk was highest during the financial crisis in 2008–2009 (Chart 2.20).

From a system perspective, it is important to assess the risk that several banks will experience problems simultaneously. This risk depends on the risk in individual banks, but also on the interdependencies among banks. Market information has been used to estimate the probability that several Nordic banks will experience problems at the same time.<sup>2</sup> The estimated probability of financial problems at one or more of the large Nordic banks was high during the financial crisis in 2008 and during the euro crisis in 2011–2012 (Chart 2.21). The probability

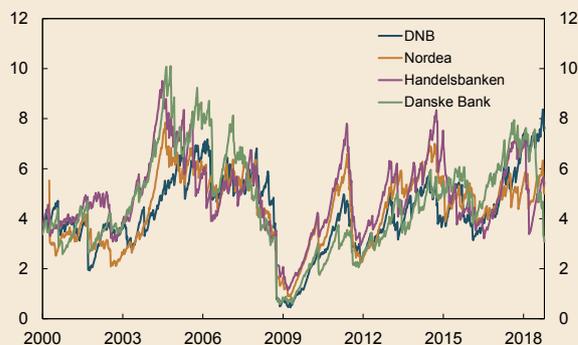
- 1 Distance to default measures are derived from stock prices and measure how many standard deviations the value of a bank's assets must fall before the value of the bank's assets equals the value of its liabilities. This is explained in detail in Aronsen, P.A. and Nordal, K.B., "Solvensavstand og andre risiko-indikatorer for banker" [Distance to default and other bank risk indicators], *Staff Memo 6/2009*, Norges Bank (in Norwegian only).
- 2 The probability is derived so that the present value of CDS premium payments is equal to the present value of expected losses from a credit event. The correlation between changes in banks' CDS premiums is used to estimate the probability that several banks will experience problems at the same time. The probabilities derived from market prices are often referred to as risk-neutral probabilities. See eg box 8 in *Financial Stability Review*, ECB, June 2012 or Segoviano, M.A. and Goodhart, C. (2009) "Banking stability Measures", IMF Working Paper 09/4, for a further discussion.

Chart 2.19 CDS-prices<sup>1</sup> for large Nordic banking groups. Basis points. 28 April 2008 – 19 October 2018



1) Five-year euro CDS contracts on senior debt. Sources: Bloomberg

Chart 2.20 Distance to default for large Nordic banking groups. Number of standard deviations. 7 January 2000 – 19 October 2018<sup>1</sup>



1) Weekly observations. Sources: Banks' quarterly reports, SNL/ S&P and Norges Bank

of two or more banks' failing at the same time are much lower than the failure of a single bank. The probability is edging up at the end of the period due to increased CDS prices.

The interrelationship of risk in individual banks can be illustrated by the probability of a bank failing assuming that another bank has already failed (Table 2.1). Danske Bank stands out because, in the market's view, it is least interlinked with the other banks. The probability that DNB, Handelsbanken or Nordea will experience financial problems if Danske Bank fails is about 2% to 5%. If Nordea or Handelsbanken experiences financial problems, the probability that DNB will also experience problems increases to about 11% to 12%.

**Table 2.1 Probability<sup>1</sup> that a bank will default if another bank defaults. Four Nordic banks. Percent. Average for the period 1 January 2018 – 19 October 2018**

	DNB Bank	Nordea	Handelsbanken	Danske Bank
DNB Bank	100	12.2	11.2	2.1
Nordea	11.7	100	15.8	2.7
Handelsbanken	11.2	16.3	100	5.2
Danske Bank	2.6	3.2	6.2	100

1) Probability that a bank will default conditioned on the default of the bank in the column. Probabilities are derived from five-year euro CDS prices on senior debt.

Sources: Bloomberg and Norges Bank

**Chart 2.21 Probability of two or more simultaneous bank<sup>1</sup> defaults.<sup>2</sup> Percent. 24 August 2008 – 19 October 2018**



1) DNB Bank, Nordea, Handelsbanken and Danske Bank.

2) Annualised probabilities derived from the price of five-year euro CDS contracts on senior debt.

Kilder: Bloomberg and Norges Bank

## MINIMUM REQUIREMENT FOR OWN FUNDS AND ELIGIBLE LIABILITIES (MREL)

*The minimum requirement for own funds and eligible liabilities (MREL) is an important part of the bank recovery and resolution framework that will apply in Norway from 1 January 2019. In a consultation memorandum, Finanstilsynet has proposed rules for the formulation of MREL for Norwegian banks, which Norges Bank endorses in the main.*

In order to facilitate resolution of banks without recourse to taxpayer funds, the EU has implemented the Bank Recovery and Resolution Directive (BRRD), based on experience from the financial crisis. The minimum requirement for own funds and eligible liabilities (MREL) is an important part of the new bank resolution framework that will apply in Norway from 1 January 2019,<sup>1</sup> as part of the implementation of the BRRD in Norway.<sup>2</sup> As the resolution authority in Norway, Finanstilsynet is tasked with drawing up detailed recovery plans for any bank deemed too important to be closed and wound up under normal insolvency proceedings. The size of the MREL will be a part of the recovery plans for each of these banks.

The Ministry of Finance determines whether a failing bank should be closed or resolved. If resolution is necessary for ensuring the continuity of the bank's critical functions or to avoid systemic contagion, this option shall be chosen over a winding-up under normal insolvency proceedings.

As part of a resolution, equity will be written down to cover the bank's losses. If the losses are greater than equity, subordinated debt and higher ranking debt, if any, are written down. Moreover, portions of the remaining liabilities may be converted to new equity, to enable continuity of the bank's critical functions. To ensure a swift and efficient process, the bank must hold sufficient debt that can be written down quickly and, if necessary, converted to equity. For that reason, Finanstilsynet must set a minimum requirement for individual banks for such convertible debt.

The rules for the MREL will be formulated by the Ministry of Finance, on the basis of Finanstilsynet's proposal, which have been circulated for comment<sup>3</sup> and are largely based on the European Commission proposal from November 2016<sup>4</sup>. In its response<sup>5</sup>, Norges Bank endorsed the following recommendations in the consultation memorandum:

- **Size of the MREL.** The MREL shall consist of a loss-absorbing element plus a recapitalisation element. The loss-absorbing element shall be equal to the sum of minimum regulatory capital requirements and any Pillar 2 requirements. The recapitalisation element shall correspond to the minimum regulatory capital requirements and any Pillar 2 requirements, plus the combined buffer requirement, excluding the countercyclical capital buffer. The MREL will be set as a percentage of banks' risk-weighted exposures, just like for risk-weighted capital requirements.
- **Institutions to be covered by an MREL.** Member states have considerable flexibility for determining which banks will be subject to resolution and thus required to meet the full MREL amount, i.e. both the loss-absorbing

<sup>1</sup> See new Chapter 20 of Act No. 17 of 10 April 2015 relating to financial institutions and financial groups (Financial Institutions Act).

<sup>2</sup> See, eg, box on page 19 in *Financial Stability Report 2017*.

<sup>3</sup> See Finanstilsynet (2018) *Høring. Forskrifter til endringer i finansforetaksloven og til lov om Bankenes sikrings fond* [Consultation. Regulations to amend the Financial Institutions Act and the Act on the Norwegian Banks' Guarantee Fund], 29 June 2018 (in Norwegian only).

<sup>4</sup> See European Commission's proposed amendments to the BRRD from November 2016.

<sup>5</sup> See Norges Bank's consultation statement on regulations to amend the Financial Institutions Act and the Act on the Norwegian Banks' Guarantee Fund, 19 September 2018 (in Norwegian only).

element and the recapitalisation element. This depends in part on the bank's importance for financial stability. In its consultation memorandum, Finanstilsynet argues for subjecting the majority of Norwegian banks to a full MREL. Norges Bank is of the opinion that resolving rather than closing smaller banks may be relevant if a large number of banks are in trouble at the same time. It may therefore be reasonable also to subject many smaller banks to a full MREL. Nevertheless, in Norges Bank's view, subjecting a bank to a full MREL must not imply that the bank will be resolved no matter what, if it is on the verge of failing.

- **Liability items eligible for the MREL.** The MREL may be met with regulatory capital and liabilities that satisfy certain requirements (see following bullet point). However, equity used to meet the combined buffer requirement under the capital adequacy rules may not, at the same time, be used to meet the MREL. This ensures that the buffers can function as intended.
- **Priority ranking requirement.** All liabilities used to meet the MREL shall be non-preferred, ie, they shall rank below ordinary senior bonds and ordinary unsecured debt instruments. Both subordinated debt and non-preferred senior debt (Tier 3) are thus eligible for meeting the MREL (Table 2.2). The priority ranking requirement will apply in full from 31 December 2022.
- **Publication of the MREL.** Norges Bank endorses Finanstilsynet's proposal that all institutions subject to an MREL must publish both the requirement and information about the capital and liabilities used to meet the MREL. This also pertains to information about maturity and priority ranking.

The potential impact of MREL rules on bank funding costs is discussed in Section 2.3.

**Table 2.2 Liabilities and equity – priority ranking. From highest (1) to lowest (7)**

1	Guaranteed deposits and the deposit guarantee claims due to the repayment of banks' guaranteed deposits	
2	Deposits from persons and small and medium-sized enterprises in excess of the guaranteed amount	
3	Bonds, short-term paper and other ordinary, unsecured debt without priority and deposits from large enterprises in excess of the guaranteed amount	
4	Non-preferred senior debt (Tier 3)	
5	Subordinated debt capital (Tier 2)	} Regulatory capital
6	Preferred capital securities (hybrid capital, Additional Tier 1 – AT1)	
7	Common Equity Tier 1 (CET1) capital	

# 3 Stress test – banks' response to a pronounced downturn

3.1 FRAMEWORK AND STRESS SCENARIO	40	BOX: Crisis depth in the stress test	46
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The stress test is based on the current risk outlook and assesses banks' behaviour in the event of a pronounced downturn in the Norwegian economy. In the stress test, banks need to draw down their countercyclical capital buffer and a portion of the other buffers in order to maintain lending in the event of a pronounced downturn in the Norwegian economy. In such a situation, a reduction in buffer requirements may reduce the procyclical effects of tighter bank lending. The stress test suggests that a larger portion of the total buffer requirement should be time-varying.

**Table 3.1 Macroeconomic aggregates in the stress scenario. Percentage change from previous year<sup>1</sup>**

	2018 <sup>2</sup>	2019	2020	2021	2022
GDP, mainland Norway	2.5	-1.3	-1.1	2.0	1.9
Private consumption	2.2	0.5	-0.7	1.2	1.7
Registered unemployment (rate, level)	2.4	4.4	5.9	5.2	4.6
3-month Nibor (level)	1.1	1.7	1.8	1.3	1.0
Weighted risk premium for covered bonds and senior bank bonds <sup>3</sup> (level)	0.6	0.7	0.8	0.9	1.0
House prices	0.9	-4.8	-17.7	-4.1	5.9
Credit (C2), households <sup>4</sup>	5.7	2.4	-0.1	0.5	0.6
Credit (C2), non-financial enterprises in mainland Norway <sup>4</sup>	5.0	-6.0	1.4	-0.8	-2.5
Loan losses (rate, level)	0.1	1.8	2.3	2.0	2.1
Countercyclical capital buffer requirement (rate, level)	2.0	0.0	0.0	0.0	0.0

1 Unless otherwise stated. Levels are measured as annual averages.

2 Projections for 2018 Q3 to 2018 Q4 for mainland GDP, private consumption, unemployment, 3-month Nibor, house prices and credit to households are from *Monetary Policy Report 3/18*.

3 The higher premiums only have an effect on new bonds.

4 Change in stock measured at year-end.

Sources: Eiendomsverdi AS, Finn.no, Real Estate Norway, Norwegian Labour and Welfare Administration (NAV), Statistics Norway and Norges Bank

## 3.1 FRAMEWORK AND STRESS SCENARIO

The stress test analyses banks' behaviour in the event of a pronounced downturn. The stress scenario involves a pronounced global downturn, higher risk premiums, lower house prices and elevated bank loan losses.

### Purpose of the stress test

The purpose of the stress test is to analyse the macroeconomic effects of banks' behaviour in the event of a pronounced downturn in the Norwegian economy. The test is framed to assess how banks affect, and are affected by, economic developments.<sup>1</sup> Capital requirements influence banks' behaviour. Time-varying capital requirements compel banks to build capital buffers in good times that can be drawn on in the event of a crisis.

The stress test is based on the global risk outlook discussed in Section 1. Norway, as a small open economy, is exposed to foreign shocks. Domestic financial imbalances that have built up can make the Norwegian economy more vulnerable to negative foreign shocks and amplify the effects of a downturn.

1 A detailed description of the stress test framework will be presented in Andersen, H., K. Gerdrup, R. M. Johansen and T. Krogh "Stresstester i beslutningsgrunnlaget for motsyklisk buffer" [Stress tests in the decision basis for the countercyclical capital buffer]. *Staff Memo* (forthcoming), Norges Bank.

The stress scenario is regarded as a pronounced, but conceivable, downturn for the Norwegian economy (see also the box on page 46).

The stress scenario is not a forecast of economic developments during a pronounced downturn. In a crisis, a number of extraordinary measures would typically be implemented to achieve economic policy objectives. During and following the 2008 financial crisis, for example, many countries loosened fiscal policy, and several central banks undertook large-scale asset purchases. The financial crisis showed that banks' pre-crisis capital levels were inadequate. The stress test focuses on the dampening impact of time-varying capital requirements on a downturn. No extraordinary fiscal or monetary policy measures are therefore applied other than, as a technical assumption, setting the key policy rate at zero.

### Economic downturn

The stress scenario involves a marked reduction in global GDP and increased risk premiums in financial markets. Possible reasons for such developments are growing protectionism and trade conflicts, which reduce global trade and fuel uncertainty. The limited monetary and fiscal space still evident in many countries could amplify the global downturn. In the stress test, higher risk premiums on bank funding, which have been very low for a long period, lead to tighter financial conditions. Oil prices fall by almost 40%, owing to lower global trade.

The shocks have a severe impact on the Norwegian economy, and vulnerabilities associated with high household debt ratios and elevated property prices amplify the downturn (see Table 3.1). As a technical assumption, the key policy rate is reduced to zero. At the same time, the increase in risk premiums in money market is assumed to be larger than the reduction in the key policy rate, resulting in higher money market rates.

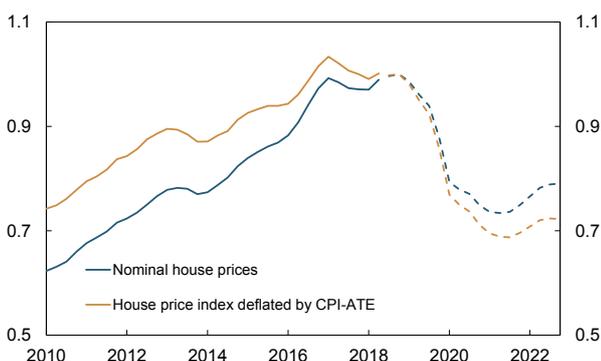
In the stress scenario, higher lending rates, reduced income growth and weaker prospects lead to a sharp fall in house prices and housing investment. House prices fall by more than 25% (Chart 3.1).

The high level of household debt spurs households to tighten consumption considerably when house prices fall and lending rates increase, particularly households with high debt ratios and small liquidity reserves.<sup>2</sup> A marked reduction in household income expectations amplifies the fall in household consumption.

Owing to higher interest expenses and a weak economy, default rates rise on both household and commercial loans. On the back of higher default rates and reduced collateral values, banks' loan losses increase sharply, especially on corporate exposures (Chart 3.2). The losses in the stress test are high from a historical perspective, but lower than during the banking crisis at the beginning of the 1990s (see box on page 42). The estimated loan losses do not take

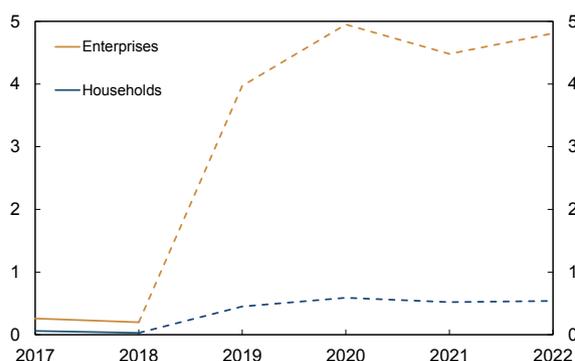
<sup>2</sup> See K. Gerdrup and K. N. Torstensen (2018) "The effect of higher interest rates on household disposable income and consumption – a static analysis of the cash-flow channel". *Staff Memo 3/2018*. Norges Bank.

Chart 3.1 House prices in the stress scenario. Index. 2018 Q4 = 1. 2010 Q1 – 2022 Q4<sup>1</sup>



<sup>1</sup> Projections for 2018 Q3–2022 Q4. Sources: Eiendomsverdi, Finn.no, Real Estate Norway and Norges Bank

Chart 3.2 Loan losses as a share of gross loans to the sector in the stress scenario. Percent. 2017 – 2022<sup>1</sup>

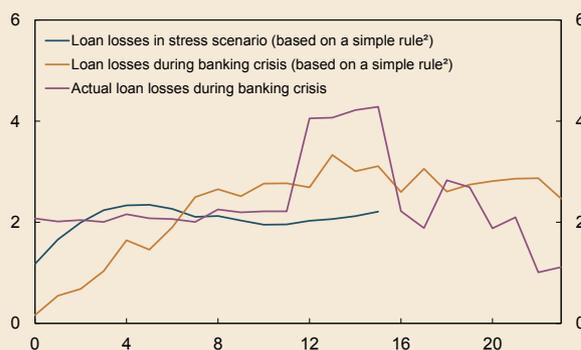


<sup>1</sup> Historical loss distribution is used to allocate loan losses to enterprises and households. Sources: SNL/S&P MI and Norges Bank

## “RULE OF THUMB” FOR LOAN LOSSES IN THE STRESS TEST

Banks’ loan losses in the stress scenario follow a simple rule<sup>1</sup> for total losses on corporate and household loans as a function of GDP developments. This relationship captures fairly well the path for loan losses during the Norwegian banking crisis (Chart 3.3). The distribution of loan losses across industries has not been specifically analysed, even though the loss rate can vary considerably from industry to industry.<sup>2</sup> For example, the loss rate on commercial real estate (CRE) loans during the banking crisis was very high.<sup>3</sup> A similar loss rate on CRE loans today would result in larger total losses in the banking sector because the share of banks’ total corporate lending to this industry has increased. On the other hand, stricter regulations and improved credit standards may suggest a lower loss rate. (See box on page 56 for a discussion of Norwegian banks’ exposure to the CRE and real estate development.)

Chart 3.3 Loan losses as a share of gross loans in the stress scenario and comparison with the banking crisis.<sup>1</sup> Percent. Quarters into the stress scenario



1) 1988 Q1 is set as the first quarter of the banking crisis.  
2) The simple rule gives losses as a share of gross lending as a function of GDP developments.  
Sources: Statistics Norway and Norges Bank

1 See Hardy D. C and C Schmieder (2013) “Rules of Thumb for Bank Solvency Stress Testing”. *IMF Working Paper* 13/232.

2 See Andersen, H and H. Winje (2017) “Average risk weights for corporate exposures: what can 30 years of loss data for the Norwegian banking sector tell us”. *Staff Memo* 2/2017. Norges Bank.

3 See Kragh-Sørensen K. and H. Solheim (2014) “What do banks lose money on during crises?”. *Staff Memo* 3/2014. Norges Bank.

account of new accounting rules for impairment recognition (IFRS 9), introduced in 2018. Under IFRS 9, banks will likely have to recognise losses earlier in the downturn than previously.

Financial turbulence results in losses on banks’ securities portfolios and higher risk premiums on bank funding. Owing to the fall in securities markets, banks have to write down the value of their stock of equities by 40% and fixed-income instruments by 5% in 2019. The value of these instruments is kept unchanged thereafter. Banks’ borrowing costs rise on the back of higher risk premiums and remain high throughout the stress period, despite a lower key policy rate.

Historical experience shows that liquidity problems in the banking sector can create and amplify financial crises (see box on page 47). The stress test assumes a substantial rise in risk premiums on bank funding, but all the banks retain access to funding in the stress period.

## 3.2 BANKS’ ADJUSTMENT TO CAPITAL REQUIREMENTS

The stress test is conducted for a macro bank comprising nine large banks. In the stress scenario, the macro bank has to tighten lending to meet capital requirements. In order to maintain credit supply, the macro bank has to draw on the countercyclical capital buffer and a portion of the other buffers.

### Banks’ adjustment in the stress test

The macro bank in the stress scenario is a weighted average of nine large banks<sup>3</sup> with varying profitability and capital ratios. The stress test focuses on developments in the macro bank and does not incorporate the effect of differences in the banks’ behaviour.

The macro bank faces a total CET1 capital requirement under Pillar 1 of 14%, corresponding to the total requirement for systemically important banks. It must

3 DNB Bank, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, Sbanken and Sparebanken Møre.

also satisfy the Pillar 2 requirement set by Finanstilsynet (Financial Supervisory Authority of Norway). The average Pillar 2 requirement for the banks in the stress test is 1.8%, bringing the total capital requirement for the macro bank to 15.8%. The macro bank also holds an additional buffer above the total capital requirement, and at the start of the stress period, the macro bank has a CET1 ratio of 16.2%.<sup>4</sup>

In the event of an economic downturn and substantial bank losses, the countercyclical capital buffer can be lowered to mitigate the procyclical effects of tighter bank lending. As a technical assumption, the rate is set at zero throughout the stress period, releasing capital for the macro bank and reducing the total capital requirement to 13.8%.

Large losses on loans and securities lead to weak results for the macro bank throughout the stress period. Consequently, growth in the macro bank's CET1 capital falls markedly (Chart 3.4). By the end of the stress period, CET1 capital is almost 14% lower than at the beginning. At the same time, risk weights increase somewhat as a result of higher credit risk exposure. Both factors reduce the CET1 ratio (Chart 3.5).

The fall in the capital ratio is reduced by the macro bank's adjustment to meet the capital requirement. Cost-cutting measures through the stress period keep

operating expenses broadly unchanged as a share of operating income. In addition, the macro bank does not pay dividends in the stress period. To what extent banks could maintain interest margins in the event of a downturn is uncertain, but historically, margins have been relatively stable (Chart 2.2). The macro bank is assumed to increase lending rates during the stress period, pushing up margins against borrowing costs on average by approximately 20 basis points (see box on page 44 for an estimate of the effects when interest margins are kept unchanged). In total, these measures dampen the fall in CET1 capital.

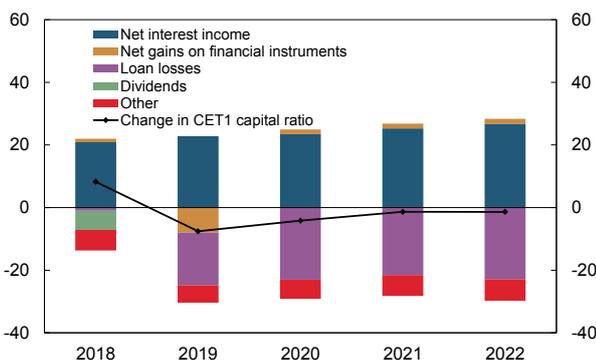
The macro bank also reduces the fall in the capital ratio by tightening the supply of new loans, achieved by raising collateral requirements. Lower demand for loans, as a result of weak housing market developments and lower corporate investment, also curbs lending growth. In total, this results in fairly flat growth in household lending and lower corporate lending.<sup>5</sup>

Banks can also make other adjustments that reduce the need to curb the supply of new loans. One possibility is to issue new equity capital, although this will likely be both costly and difficult in a situation of high losses, financial turbulence and a weak economic

4 This figure is based on estimated retained earnings for 2018.

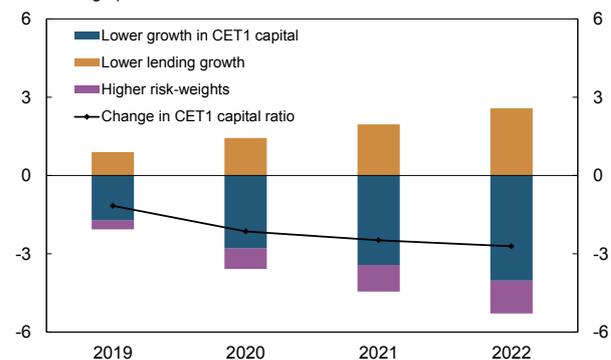
5 The economic impact of tighter lending by the largest Norwegian banks depends on whether the other banks, especially the branches of foreign banks, follow suit. This is not analysed in the stress test. Over the past ten years, branches of foreign banks have experienced higher volatility in lending growth than Norwegian banks (see Turtveit, L.T. (2017) "Branches of foreign banks and credit supply". *Economic Commentaries* 3/2017. Norges Bank.

Chart 3.4 Change in Common Equity Tier 1 (CET1) capital in the stress scenario and contribution from different components. Percent. 2018<sup>1</sup> – 2022



1) Figures for 2018 are based on simple projections for the second half of the year. Sources: SNL/S&P MI and Norges Bank

Chart 3.5 Cumulative change in Common Equity Tier 1 (CET1) capital ratio in the stress scenario and estimated contributions from different components.<sup>1</sup> Percentage points. 2019 – 2022



1) The contributions show the effect of the different components' deviation from an estimated trend. The trend for both CET1 capital and total lending is set at 3.5%, while the risk weights have no trend. Source: Norges Bank

outlook. This option is ruled out in the stress test. Another possibility is selling assets, but at distressed prices this can entail considerable losses. Fire sales can push prices down further and weaken earnings across the banking sector. The impact of such network effects is not assessed in this stress test.

### Banks' response amplifies the downturn

In the stress test, the macro bank amplifies the downturn in the Norwegian economy if it tightens lending to comply with the capital requirements. Higher lending rates and stricter collateral requirements dampen credit growth, investment and consumption. Weaker economic developments lead in turn to higher

## EFFECT OF CHANGE IN INTEREST MARGINS

Interest margins have a significant impact on Norwegian banks' earnings. The stress scenario assumes that the macro bank's lending rates increase on average by 20 basis points more than deposit rates, lifting earnings and dampening the fall in capital ratios.

To illustrate the importance of higher interest margins, two model exercises have been performed. In both of these, the macro bank's interest margins are kept constant, rather than increasing as in the stress scenario.

In the first exercise, it is assumed that the macro bank will otherwise behave in the same way as in the stress scenario. Since earnings are lower, the capital ratio falls by 1 percentage point more than in the stress scenario (see Table 3.2). Somewhat lower lending rates push up household and corporate demand, resulting in slightly higher credit and GDP growth than in the stress scenario.

The second exercise assumes that the macro bank keeps the capital ratio at the same level as in the stress scenario by further tightening collateral requirements for new loans. Both GDP and credit developments will then be weaker than in the stress scenario.

**Table 3.2 The stress scenario and exercises with interest margins kept constant. Percent.**

		2019	2020	2021	2022
Stress scenario	Mainland GDP <sup>1</sup>	-1.3	-1.1	2.0	1.9
	Total credit <sup>2</sup>	-0.4	0.4	0.1	-0.3
	Common Equity Tier 1 (CET1) (rate, level) <sup>3</sup>	15.0	14.1	13.7	13.5
Exercise 1	Mainland GDP <sup>1</sup>	-1.3	-1.1	2.1	2.0
	Total credit <sup>2</sup>	-0.4	0.6	0.3	0.0
	Common Equity Tier 1 (CET1) (rate, level) <sup>3</sup>	14.8	13.6	13.0	12.3
Exercise 2	Mainland GDP <sup>1</sup>	-1.4	-1.2	1.9	1.8
	Total credit <sup>2</sup>	-1.7	-1.5	-2.4	-4.1
	Common Equity Tier 1 (CET1) (rate, level) <sup>3</sup>	15.0	14.1	13.7	13.5

1 Change from previous year.

2 Credit to households (C2) and non-financial enterprises in mainland Norway. Change in stock measured at year-end.

3 Measured at year-end.

Source: Norges Bank

default rates and loan losses, thus counteracting some of the increase in the macro bank's capital ratio.

Setting the countercyclical capital buffer requirement at zero slows the decline. If the buffer were kept at the current level of 2%, banks would further tighten lending to meet the buffer requirement (Chart 3.6). The result would be weaker GDP growth and a more pronounced fall in credit supply (Chart 3.7).

The decline is less pronounced if the macro bank does not tighten lending, but instead draws on remaining buffer capital after the countercyclical capital buffer rate is set at zero. The capital ratio then becomes almost 1.5 percentage points lower than the total capital requirement (Chart 3.6).<sup>6</sup> The fall in credit is substantially reduced, while the decline in GDP is somewhat smaller (Chart 3.7).

The adjustment where the macro bank also draws on buffer capital in addition to the countercyclical buffer is in line with the intention behind the capital adequacy regulation.<sup>7</sup> Nor does the macro bank breach the leverage ratio requirement or announced MREL requirements.<sup>8</sup> Nevertheless, banks may not wish to draw on buffer capital. Banks in breach of the buffer requirements may risk higher funding costs. Furthermore, higher levels of uncertainty surrounding

future developments may induce banks to hold larger capital buffers. In addition, the design and enforcement of the capital adequacy regulations will have an impact. Banks in breach of capital requirements must immediately notify Finanstilsynet and present a plan to restore compliance with the total capital requirement. In addition, the regulations set restrictions on dividend payments for banks that draw on the buffers. Finanstilsynet is also empowered to impose a number of restrictions.<sup>9</sup> If the consequences of breaching the total capital requirement are perceived as costly or uncertain, banks may be reluctant to use the buffers, even in the event of substantial losses.

The countercyclical capital buffer rate will be increased when financial imbalances build up and can be lowered in the event of an economic downturn and substantial bank losses. To create predictability for banks in connection with a reduction in the buffer rate, the authorities are also required to estimate a period during which the buffer rate is highly unlikely to be increased. This may allow banks to reduce their capital targets without weakening the supply and price of funding. The countercyclical capital buffer regulation thus enables banks to draw on their buffer capital to maintain profitable lending. The stress test suggests that a larger portion of the total buffer requirement should be time-varying. Therefore, the buffers should be sufficiently high before banks as a whole incur substantial losses.

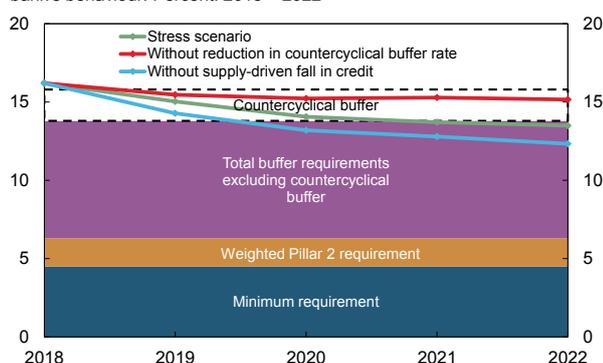
6 We find this adjustment by reducing the macro bank's capital target until the desired adjustment results in flat corporate credit growth through the stress period. In this situation, household credit growth is positive.

7 See also Section 2 in the 2017 *Financial Stability Report*.

8 Assuming that, at the outset, the macro bank satisfies MREL requirements.

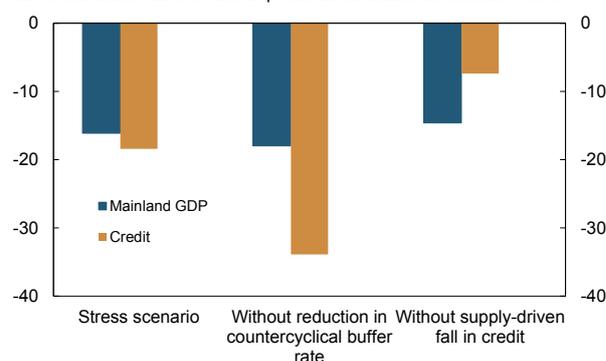
9 These can include restrictions on bonus payments or instructions not to pay dividends and interest on Tier 1 capital. Finanstilsynet can also require operational changes. In addition, the capital adequacy regulations empower Finanstilsynet to revoke the licences of banks that do not comply with capital requirements.

Chart 3.6 Common Equity Tier 1 (CET1) ratio and the CET1 requirement under Pillar 1 and Pillar 2<sup>1</sup> under different assumptions about the macro bank's behaviour. Percent. 2018 – 2022



1) Pillar 2 requirements for the banks in the stress test are weighted by their risk-weighted assets. Sources: Finanstilsynet (Financial Supervisory Authority of Norway), SNL/S&P MI and Norges Bank

Chart 3.7 Total change through the stress period<sup>1</sup> in mainland GDP and credit under different assumptions about banks' behaviour. Percent



1) Defined as the cumulative deviation from an estimated trend for GDP and the deviation from an estimated trend at the end of the stress scenario for total credit. The trend for the GDP volume is set to 1% and the trend for credit is set at 3.5%. Source: Norges Bank

## CRISIS DEPTH IN THE STRESS TEST

*The depth of the crisis in the stress test is cross-checked using an empirical relationship between the depth and length of the downturn and the level of financial imbalances.*

Empirical analyses show that the impact of financial crises is more severe when preceded by a rapid build-up of financial imbalances.<sup>1</sup> In line with the empirical findings, it is assumed that the depth and length of the downturn in the stress test will be more severe when preceded by substantial imbalances. Norges Bank uses the macroeconomic model NEMO to generate a consistent scenario in the stress test. The depth of the crisis as generated by NEMO is cross-checked using empirical calculations based on data from 20 OECD countries back to 1975.<sup>2</sup>

The analysis uses the credit gap, which is the difference between credit relative to GDP and an estimated trend, as an indicator of financial imbalances. The credit gap is a broad measure that cannot capture all imbalances. Vulnerabilities can increase in parts of the financial system, and the system can become more interwoven, without being reflected in an aggregated credit measure. The relationship between financial imbalances and effects on the economy can also vary across countries and over time. The analysis does not control for the impact of fiscal, monetary, exchange rate or macroprudential policy on downturns. For example, banking crises in countries with a fixed exchange rate regime can be more severe than in countries with an inflation-targeting regime and a floating exchange rate.

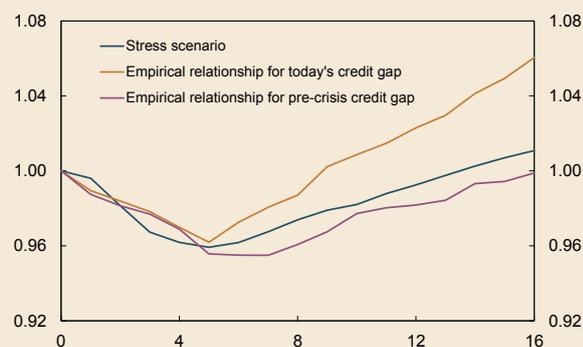
Two values of the credit gap are used to cross-check the depth of the crisis. One is the current level and the other is the average gap over the five years prior to the financial crisis. The latter value is intended to reflect the uncertainty surrounding the level of financial imbalances.

Chart 3.8 shows that the path of GDP in the stress scenario is consistent with the empirical relationship between imbalances and downturns for the two different credit gap levels. GDP in the stress scenario is below GDP calculated using the current level of the credit gap, but above GDP calculated using the average credit gap for the five years prior to the financial crisis.

1 See eg Jorda, O., M. Schularick and A.M. Taylor (2013) "When credit bites back". *Journal of Money Credit and Banking*, 45.

2 The data set and dating of financial crises are based on Anundsen, A.K., Gerdrup, F. Hansen and K. Kragh-Sørensen (2016) "Bubbles and crises: The role of house prices and credit". *Journal of Applied Econometrics*.

Chart 3.8 Mainland GDP in stress scenario and empirical relationship for crisis depth.<sup>1</sup> Index. Quarter before the start of the crisis = 1. Quarters into the stress scenario



1) The empirical relationship shows GDP developments through a crisis as a function of the pre-crisis credit gap.  
Source: Norges Bank

## LIQUIDITY STRESS TESTING FRAMEWORK

*Finanstilsynet and Norges Bank are collaborating on developing a liquidity stress testing framework for Norwegian banks and covered bond mortgage companies. Liquidity stress testing is a tool for assessing banks' vulnerability to funding shortfalls and impaired liquidity. Liquidity stress tests can supplement other liquidity and funding analyses, liquidity requirements and oversight.*

Central banks and supervisory authorities have traditionally focused on bank solvency stress testing. However, historical experience shows that bank liquidity problems can both give rise to and exacerbate financial crises.

Finanstilsynet and Norges Bank are collaborating on developing a liquidity stress testing framework for Norwegian banks and covered bond mortgage companies. The purpose of the liquidity stress test is to assess banks' vulnerability to funding shortfalls and impaired liquidity under different scenarios and time horizons. It can provide useful information on where measures to address liquidity problems should be deployed.

### Framework

The liquidity stress test assesses an individual bank's liquidity and funding situation under different financial market and economic scenarios. Liquidity stress tests are conducted using a model that uses data banks already report to the authorities. Some of these data have never been used previously. For this reason, the underlying data quality is uncertain, and the results must therefore be interpreted with caution.

The model is a cash flow analysis of inflows and outflows from assets, liabilities and off-balance sheet items. The model estimates cash flows based on assumptions regarding expected behavioural reactions of the bank itself, customers, other banks and other market participants. The assumptions are based on existing literature in the field, history, liquidity coverage ratio (LCR) factors and quantitative assessments.

The estimated cash flows determine the bank's short-term funding needs. Cash flows from the bank's assets are determined in part by interest payments on loans and securities and assumptions regarding loan principal repayments and granting of new assumptions regarding loan growth. Cash flows from bank funding are determined by the maturity structure of existing funding and assumptions regarding access to new funding under different scenarios. The potential for issuing new covered bonds is calculated in the model. For example, a fall in house prices will reduce the number of residential mortgages that can be financed by covered bonds. The collateral associated with mortgages already transferred to the mortgage lender also falls in value. Loans that are eligible for transfer to a mortgage company and cover pool assets held by a mortgage company in excess of the requirement can be used to issue new covered bonds.

The model assesses the bank's survival horizon<sup>1</sup> both with a liquidity reserve corresponding to the stock of liquid assets under the LCR and an enlarged liquidity reserve. Securities in the liquidity reserve are subject to a haircut under assumptions of a fall in value in a period of market stress.

The model tests different scenarios of bank-specific stress and of domestic and global market stress with two different degrees of severity:

- **Bank-specific stress.** A bank is downgraded by the rating agencies, eg, owing to a lawsuit against the bank, poor risk management or cybercrime.
- **Domestic market stress.** A sharp fall in Norwegian house prices triggers domestic market stress.
- **Global market stress.** Turbulence in global markets increases risk premiums, reduces market liquidity and results in a weaker Norwegian krone.

<sup>1</sup> The survival horizon is calculated from the inception of the stress period until net liquidity is negative.

### Banks dependent on a well-functioning covered bond market

Preliminary calculations show that deposit run-offs are the primary driver of outflows (Chart 3.9). Wholesale funding shortfalls are also an important factor. In addition, large off-balance sheet commitments, such as credit and liquidity lines, result in negative cash flows in the model. On the other hand, a high share of loans has a positive effect on cash flow under assumptions of lower lending growth.

Preliminary calculations show that banks depend on using their potential to issue new covered bonds in many of the scenarios outlined here. This requires the covered bond market to be open. Market liquidity can change quickly. Liquidity in normal times and in periods of market turbulence can differ considerably, as the financial crisis showed. There is limited experience with how easily Norwegian covered bonds can be traded and issued, or to what extent their value will hold up under stressed conditions, especially in the case of a sharp fall in house prices. The Norwegian covered bond market was created in 2007, but during the financial crisis covered bonds were mainly used in the swap arrangement<sup>2</sup> and not traded in the market. Since covered bonds account for a large share of Norwegian banks' liquidity reserves and their funding, market liquidity and value preservation of covered bonds will be crucial for banks' survival horizon. If banks are unable to use eligible cover pool assets to issue new covered bond funding when domestic stress is severe, the model estimates a considerable fall in the survival horizon (Chart 3.10).

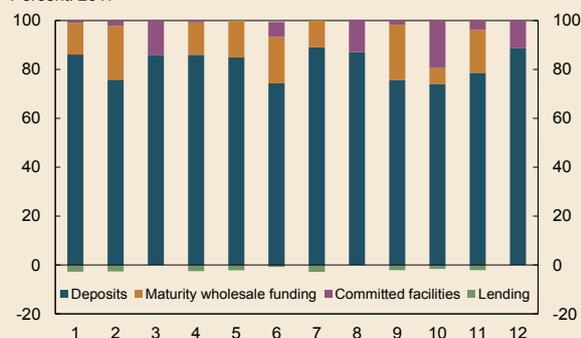
### Other risks not captured by the model

A number of risks are not sufficiently captured by the model, owing both to a lack of data and to model limitations. Liquidity risk owing to banks' inflows and outflows in different currencies and systemic risk owing to bank interconnectedness are not assessed in the model. There is little history to draw on, and predicting market behaviour in the next crisis is difficult. Liquidity stress testing can therefore be enhanced by using more extensive underlying data and scenarios that include additional risks.

Drawing a clear distinction between liquidity and solvency problems can be difficult, but the risks should preferably be assessed all together. Stress tests that do not assess the interaction between solvency and liquidity may underestimate banks' risks. Modelling solvency and liquidity jointly is made difficult by the time horizons and natures of liquidity and solvency problems, which usually are very different.

<sup>2</sup> See Norges Bank's web pages on the swap arrangement for more information.

Chart 3.9 Net outflows under bank-specific stress.<sup>1</sup> Selected banks randomised along the horizontal scale. Share of total outflows. Percent. 2017



<sup>1</sup> Net outflows as a share of total outflows over a 360-day period of bank-specific stress. Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

Chart 3.10 Share of banks<sup>1</sup> in a negative liquidity situation (vertical scale). Survival horizon when domestic market stress is severe (horizontal scale). With and without option of issuing new covered bonds. Percent. Year-end 2017



<sup>1</sup> The largest banks in Norway. Sources: Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

# 4 Corporate debt and the link to the real estate market

4.1 DEVELOPMENTS IN CORPORATE DEBT	49	BOX: Corporate financing is changing	55
• Debt has increased in pace with operating revenue since the financial crisis	50	BOX: Norwegian banks' exposure to commercial real estate and real estate development	56
4.2 COMPOSITION OF CORPORATE CREDIT BY SOURCE	51		
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In recent years, non-financial corporate debt has risen in pace with operating revenue. Growth in bond lending has in periods been somewhat stronger than growth in bank lending, but bank loans remain the most important source of financing. Banks' commercial real estate (CRE) exposures represent a vulnerability in the Norwegian financial system. Losses on these loans are generally low in normal times, but a large share of these loans can trigger bank losses in the event of a sharp fall in property prices. Estimates from Norges Bank's bankruptcy probability model indicate that banks' corporate loan losses will remain low ahead.

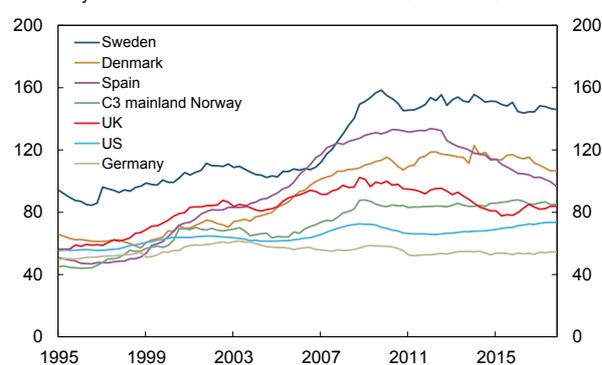
## 4.1 DEVELOPMENTS IN CORPORATE DEBT

Since the financial crisis, non-financial corporate debt has increased in pace with operating revenue. Enterprises have the capacity to service debt in the event of a moderate increase in interest rates. High debt increases the exposure of real estate development and CRE enterprises to substantial rises in interest rates more than enterprises in other sectors.

High credit-driven investment growth may indicate greater vulnerability and poses a risk to financial stability. Corporate debt grew markedly faster than pre-crisis GDP in Norway and many other countries (Chart 4.1). Norwegian corporate debt is not particularly high compared with other countries.<sup>1</sup>

CRE and real estate development exposures account for a considerable share of banks' total corporate loans (Chart 4.2). Over a longer period, lending to

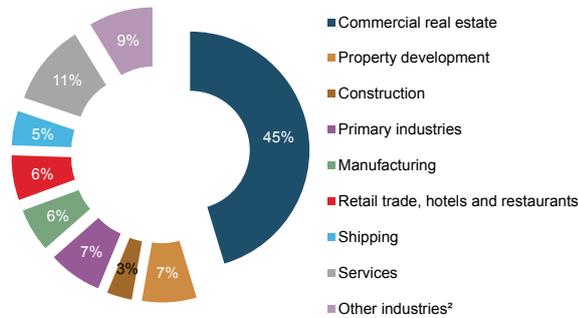
Chart 4.1 Credit to non-financial enterprises relative to GDP. In Norway and selected countries. Percent. 1995 Q1 – 2017 Q4



Sources: Bank for International Settlements (BIS), Statistics Norway and Norges Bank

<sup>1</sup> Definitions of corporate credit vary across countries. International comparisons may therefore be misleading.

Chart 4.2 Lending to the corporate market<sup>1</sup> by all banks and mortgage companies. Percent. At 30 June 2018



1) Total corporate loans NOK 1 427bn  
 2) Other industries comprise "Oil service", "Other transportation", "Electricity and water supply" and "Extraction of natural resources". Here, "Oil service" is narrowly defined.  
 Source: Norges Bank

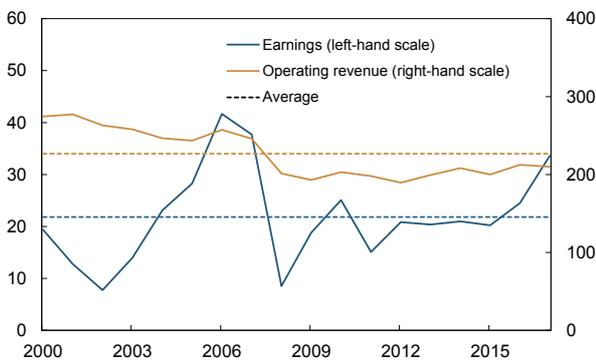
these sectors has increased more than lending to certain others, such as foreign shipping, retail trade and manufacturing.

### Debt has increased in pace with operating revenue since the financial crisis

Prior to the financial crisis, corporate debt grew more rapidly than operating revenue. Since the financial crisis, debt has risen approximately in pace with operating revenue (Chart 4.3).

Corporate earnings<sup>2</sup> were solid just before the financial crisis and high relative to debt. During the financial crisis, operating revenue fell somewhat but earnings fell by considerably more owing to higher costs. Along with rapid debt growth, this resulted in a sharp decline in earnings relative to debt.

Chart 4.3 Operating revenue and earnings as a share of net-interest bearing debt. Mainland non-financial enterprises. Annual financial statements. Percent. 2000 – 2017

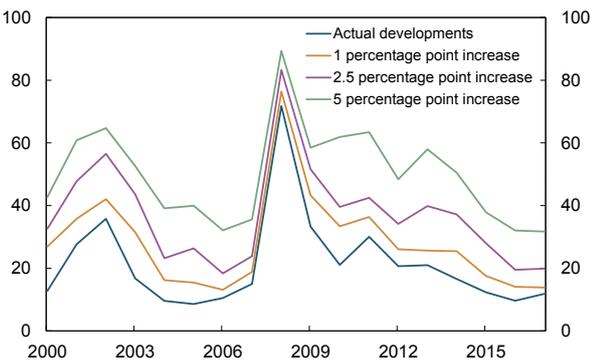


Source: Norges Bank

In recent years, both higher operating revenue and lower costs have boosted earnings. At the end of 2017, the ratio of earnings to debt was above the historical average for the period 2000–2017.

Consolidated financial statements data<sup>3</sup> show that corporate groups with negative earnings in 2017 accounted for approximately 12% and 7% of CRE and real estate development liabilities, respectively (Charts 4.4 and 4.5). For other sectors as a whole, the corresponding share is 22% (Chart 4.6). The share rises slightly with isolated interest rate increases of 1 and 2.5 percentage points. The increase becomes substantial when the interest rate is increased by 5 percentage points. Over 30% of total debt will then be for vulnerable corporate groups.

Chart 4.4 Share of debt in group companies with negative earnings in the event of different interest rate increases. Commercial real estate. Percent. 2000 – 2017



Source: Norges Bank

For CRE and real estate development enterprises, earnings have historically been cyclically sensitive. The share of debt of enterprises with negative earnings was high in both 2001–2003 and 2008–2009. If interest rates had risen by 5 percentage points in 2008, enterprises with negative earnings would have accounted for almost 90% of CRE sector debt.

CRE is unique owing to the particularly high ratio of debt to operating revenue in this sector. For CRE enterprise, a rise in interest rates will represent a large

2 Earnings are defined as ordinary profit before tax.  
 3 Since debt and earnings are split among several companies with complex corporate structures, it is relevant to look at financial statements that show the corporate groups as a whole in analyses at company level.

share of operating revenue (Chart 4.7). A rise in interest rates will also represent a larger share of operating revenue for real estate development enterprises than for non-real estate enterprises.

Interest rate sensitivity is not only linked to debt level, but must also be assessed in the light of industry-specific factors such as the level of average operating margins, fixed-rate borrowing and opportunities to adjust prices. There are a number of factors that make CRE enterprises less vulnerable to interest rate increases than their high debt ratios would imply. CRE enterprises generally let properties under long-term leases and opt to pay a fixed rate on at least a portion of their debt over the terms of these leases. The CRE sector is also characterised by high operating margins in normal times.

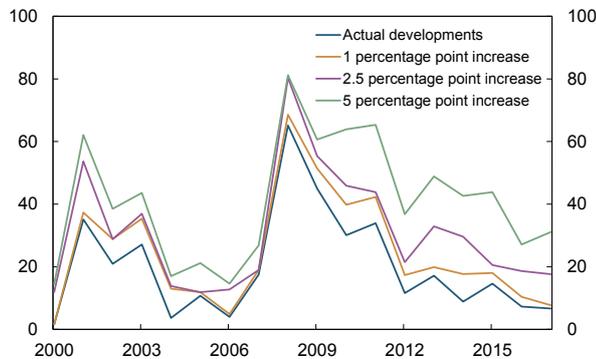
## 4.2 COMPOSITION OF CORPORATE CREDIT BY SOURCE

In recent years, bond financing has increased in some business sectors. On the whole, banks are still clearly the main source of corporate financing in Norway. New institutions and new technology may over time change the make-up of corporate borrowing. This has little bearing on overall corporate credit as yet.

### Bank or market financing?

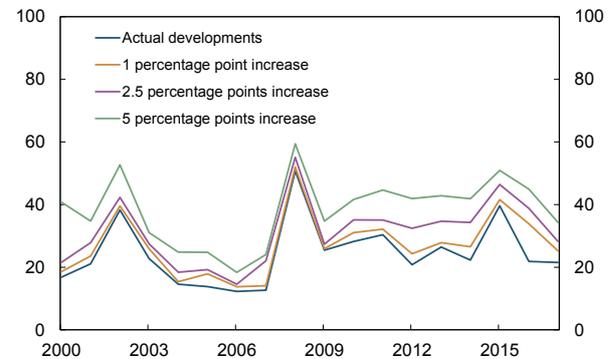
Corporate borrowers' share of banks' overall lending has fallen, while the share of mortgage loans has increased (Chart 4.8). The growth in mortgage lending reflects rapidly rising house prices, while mortgage lending has been profitable for banks. Banks may therefore have focused on increasing their market shares in this sector. Moreover, government banks,

Chart 4.5 Share of debt in groups with negative earnings at different interest rate increases. Real estate development. Percent. 2000 – 2017



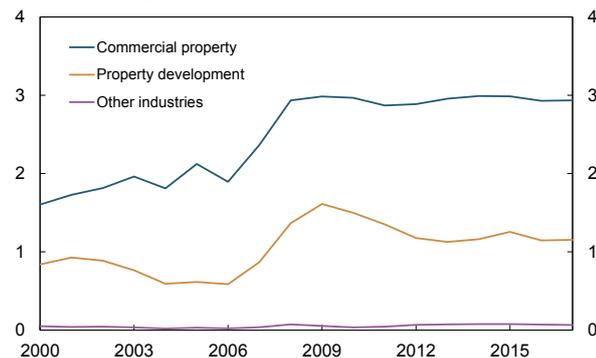
Source: Norges Bank

Chart 4.6 Share of debt in group companies with negative earnings in the event of different interest rate increases. Norwegian mainland industries excluding commercial real estate and real estate development. Percent. 2000 – 2017



Source: Norges Bank

Chart 4.7 Net effect of a 1 percentage point increase in interest rates as a share of operating revenue. Percent. 2000 – 2017



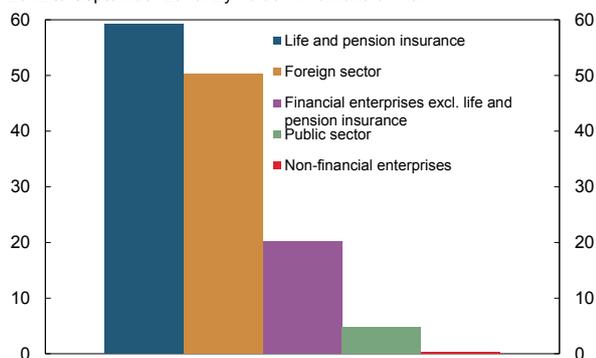
Source: Norges Bank

Chart 4.8 Lending to retail and corporate markets as a share of total lending. From banks and mortgage companies. Percent. January 1990 – December 2017



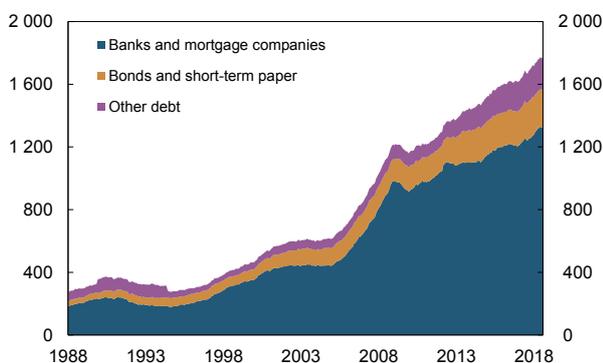
Source: Norges Bank

Chart 4.9 Increase in outstanding short-term paper and bond debt issued by non-financial enterprises in the Norwegian bond market. From December 2012 to September 2018. By holder. In billions of NOK



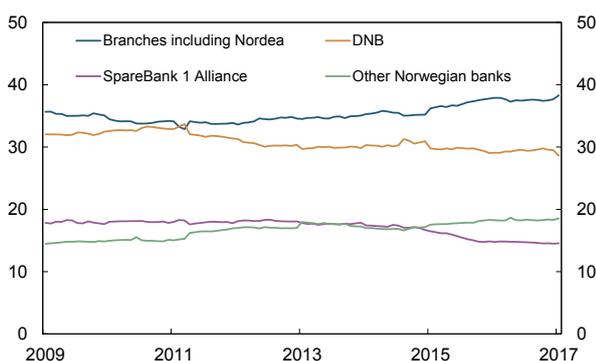
Source: Statistics Norway

Chart 4.10 Domestic credit to Norwegian non-financial enterprises (C2). Stock. In billions of NOK. January 1988 – August 2018



Sources: Statistics Norway and Norges Bank

Chart 4.11 Banks and mortgage company CRE lending. By banking group. Percent. May 2009 – December 2017



Source: Norges Bank

such as the Norwegian State Housing Bank, have reduced their activity.

For some types of corporate loans, banks have become subject to higher regulatory capital requirements. This may have helped to increase the issuance of corporate bonds, a large percentage of which are purchased by Norwegian insurance companies and foreign investors (Chart 4.9).<sup>4</sup> The use of market financing has increased for CRE enterprises in particular, but from a low level as CRE enterprises have historically made little use of market financing. Despite greater use of market financing, bank loans are still the most important source of corporate debt capital (Chart 4.10).

Firms' borrowing behaviour may have implications for the types of shocks to which the financial system is vulnerable. Bank financing may be a more stable credit source in periods of considerable financial stress. On the other hand, competition and alternative sources may lower the cost of financing. In the case of market financing, investors also bear more of the credit risk directly rather than through institutions that are important for the financial infrastructure, such as banks. This may limit spillovers from large losses.

In parallel with the increasing reliance of corporates on the bond market, alternative platforms have emerged for extending credit. Some of this credit is granted by non-bank institutions. For now, the volume of non-bank lending is small. For a detailed discussion of new financing forms, see box on page 55.

### Distribution of corporate loans across banks

Corporate exposures vary across banks and banking groups. For the large majority of banks, corporate exposures are moderate. In total loan volume, DNB, the large foreign branches (Nordea, Danske Bank and Handelsbanken) and the largest regional savings banks, dominate.

In recent years there has been a redistribution of corporate loans among banking groups, particularly CRE exposures. Branches, including Nordea, have increased their shares of these loans somewhat (Chart 4.11). The shift has been most pronounced for Danske

<sup>4</sup> Note that in April 2018, Finanstilsynet changed its interpretation of these rules and now permits higher capital requirements for real estate loans for insurance companies. See Finanstilsynet (2018): Rapport etter tematisk oppfølging av forsikringstekniske avsetninger [Report following thematic supervision of insurance technical provisions] (in Norwegian only).

Bank and Handelsbanken. Compared with the large Swedish and Danish banks, Norwegian-regulated banks are subject to somewhat higher capital requirements for certain types of corporate exposures.<sup>5</sup> A more uniform capital framework in Europe is expected ahead (see discussion in Section 1.3).

### 4.3 BANKS' LOSS RISK

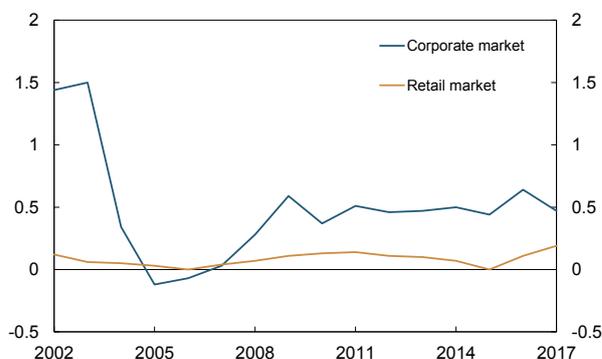
The overall risk of bank losses is assessed as relatively low in the short term. In recent years, losses have primarily been on oil-related exposures, and oil-related enterprises may require further restructuring. In the longer term, CRE exposures may be a source of considerable bank losses if property prices were to fall sharply. Historically, CRE is the sector that has inflicted the largest losses on banks during crises, and vulnerabilities associated with high commercial property prices have increased.

Bank losses have historically been highest on corporate loans (Chart 4.12). Most of these losses are attributable to either company- or industry-specific factors and have no close relationship with cyclical developments in general. Banks' exposures to many industries that traditionally have accounted for a relatively high share of losses, such as fishing and aquaculture, are low.

Following the fall in oil prices in 2014, banks' losses on oil-related exposures increased markedly (Chart 4.13). The losses on loans to these industries accounted for approximately two-thirds of banks' total corporate loan losses in 2016. After many of these businesses were restructured, losses on loans to these industries fell in 2017.

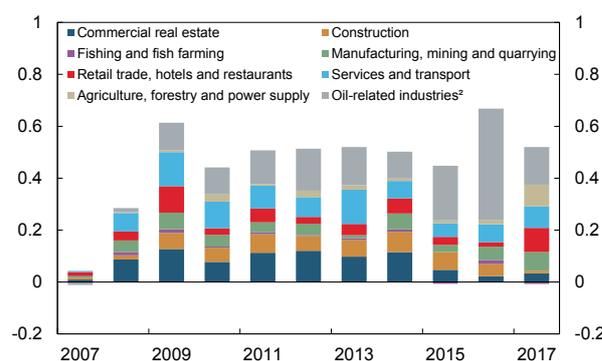
The debt-servicing capacity of the oil service industry remains weak (Chart 4.14). In the most highly leveraged segments, drilling and supply, debt-servicing capacity continued to fall in 2017 and has remained low in 2018 despite the rise in oil prices. Even though a large number of businesses have restructured, the market values of both equity and bonds in these segments remain low compared with book values. This indicates expectations of weak earnings and a potentially high risk of losses in the future. In the supply segment in particular, small buffers remain before banks need to recognise further losses.<sup>6</sup>

Chart 4.12 Banks' loan losses as a share of lending to the relevant market. All banks. Percent. 2002 – 2017



Source: Norges Bank

Chart 4.13 Banks' loan losses to enterprises as a share of total corporate lending. Contribution by sector.<sup>2</sup> 2007 – 2017

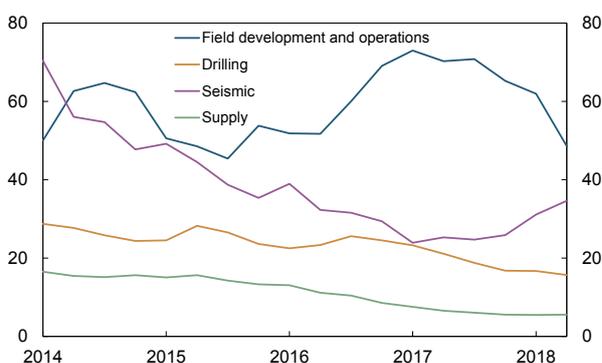


1) All banks in Norway except subsidiaries of foreign banks. Nordea is a branch of a foreign bank from 2017, but is still included in the 2017 data.

2) Some industries have been reclassified to extract oil-related industries.

Source: Norges Bank

Chart 4.14 Debt-servicing capacity<sup>1</sup> in the oil service industry. Percent. 2014 Q1 – 2018 Q2



1) Earnings before interest, taxes, depreciation and amortisation (EBITDA) for the last four quarters as a percentage of net interest-bearing debt. The EBITDA measure has been standardised by Bloomberg. Manual adjustments for EBITDA have been made where erroneous registrations appear in Bloomberg's measure.

Sources: Bloomberg and Norges Bank

<sup>5</sup> See Turtveit, L.T. (2017) "Branches of foreign banks and credit supply". *Economic Commentaries* 3/2017. Norges Bank.

<sup>6</sup> See forthcoming on Bankplassen blog, Hjelseth, I.N. (2018) "Are loans to the oil industry still high-risk?".

Norges Bank estimates the bankruptcy probability of mainland enterprises as an indicator of expected credit losses.<sup>7</sup> The number of bankruptcies has increased somewhat so far in 2018 compared with 2017, but the share of bank debt held by companies that have gone bankrupt appears to be slightly lower than in the corresponding period in 2017. Bankruptcies are often registered with some lag, and current bankruptcy data largely reflect developments in 2017. Norges Bank's bankruptcy probability model indicates that the share of problem loans will remain fairly stable in the coming period (Chart 4.15). These developments reflect the favourable cyclical situation.

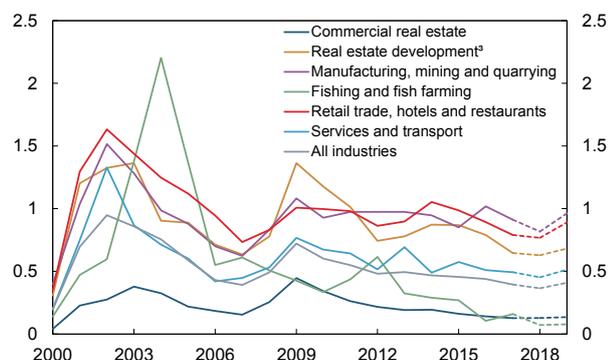
### Real estate exposures pose a possible risk to the banking system

The extent to which exposures to an individual sector can create problems for the banking system as a whole depends on:

- The total volume of bank loans to the sector
- The share of the loan that is expected to be lost in the event of default or bankruptcy
- The extent to which loss risk is correlated with general downturns and losses in other asset classes

7 Debt-weighted bankruptcy probabilities have historically been a good indicator of banks' losses. See Hjelseth, I.N. and A. Raknerud (2016) "A model of credit risk in the corporate sector based on bankruptcy prediction", *Staff Memo 20/2016*. Norges Bank.

Chart 4.15 Estimated credit risk<sup>1</sup> by industry. Percent. 2000 – 2019<sup>2</sup>



1) Estimated bankruptcy-exposed bank debt per industry as a share of total bank debt in the industry.  
 2) Model projections for 2018 and 2019.  
 3) For 2000–2003, the series contains the entire construction industry.  
 Source: Norges Bank

The past 20 years have been characterised by rising property prices, and the credit risk associated with CRE exposures has been low (Chart 4.15). However, the large proportion of CRE exposures represents a possible concentration risk for Norwegian banks (Chart 4.2). During crises, commercial property prices often fall sharply, considerably raising the probability of default of property-related loans. Experience from banking crises in Norway and abroad have shown that losses on commercial property loans were substantial contributors to solvency problems in the banking sector.<sup>8</sup>

The wide difference in risk between upturns and downturns may induce banks to underestimate the risk of losses on CRE exposures. Downturns accompanied by large losses on commercial property exposures are rare occurrences. However, commercial property loans may be granted with relatively short maturities. Moreover, banks will not necessarily take into consideration the possibility that a large number of banks incur losses at the same time, potentially amplifying a crisis. Over time, commercial property loans may be priced in a way that does not reflect the total risk that these loans represent. Finanstilsynet (Financial Supervisory Authority of Norway) requires banks' models to be based on experience from the banking crisis, with uncertainty in the data set taken into account. Banks that use internal ratings-based (IRB) models for calculating capital requirements should give considerable weight to loss experience from crises when calculating risk weights for commercial property loans.

Moreover, a fall in property prices can have spillovers to real estate development, to which banks are also heavily exposed. Bankruptcy risk in this sector is relatively high and varies more over a normal business cycle than for CRE. The risk in real estate development is particularly associated with the degree of pre-sales and settlement risk (see box on page 56). The loss probability increases when real estate prices fall.

8 See Kragh-Sørensen, K. and H. Solheim (2014): "What do banks lose money on during crises?", *Staff Memo 4/2014*. Norges Bank.

## CORPORATE FINANCING IS CHANGING

*In recent years, enterprises have gained access to several alternative sources of financing. While traditional banks are offering new digital services, separate digital credit and equity platforms are being established.*

An increasing number of banks process household loan applications digitally. Some banks are also establishing these solutions for corporate loans, especially for small and medium-sized enterprises. A number of the solutions integrate offers for corporate banking services in established accounting solutions, in part to offer invoice financing or factoring services. Invoice financing can provide small enterprises with better access to liquidity. It can also contribute to an increase in overall debt in the sector. The solutions were originally developed by specialised banks, but traditional banks are now also establishing positions in this segment. The scale remains relatively modest but is expected to grow as better technological solutions are introduced. A challenge for invoice financing is pricing services commensurate with risk.

While banks are undergoing changes, new digital participants offering new services are emerging. New financial technology, often referred to as “fintech”, is a wide term encompassing both technological innovations and companies with the intention of improving or creating new services in the financial sector. The most widely used example in Norway is crowdfunding.<sup>1</sup> Crowdfunding companies offer digital platforms that directly link investors with enterprises in need of loans or equity capital.

Crowdfunding has grown rapidly in many countries. Crowdfunding is widespread in China and the US, and the largest crowdfunding market in the EU is the UK.<sup>2</sup> An increasing number of participants are also entering the Norwegian market. Crowdfunding represents a small share of corporate loans in Norway as yet.

New forms of financing may entail new challenges, particularly in ensuring that investors are provided with sufficient information. There is no common regulation of financial crowdfunding in the EU, but the European Commission has proposed an EU regulation. In Norway, there is no specific regulation for crowdfunding, but participants are subject to legislation including the Financial Institutions Act and the Securities Trading Act.<sup>3</sup> Pure credit intermediation is exempt from the licensing requirement if certain terms and conditions are satisfied.

<sup>1</sup> See *Norway's financial system 2018* for more information on crowdfunding in Norway.

<sup>2</sup> See Official Norwegian Reports *NOU 2018: 5 Kapital i omstillingens tid – Næringslivets tilgang til kapital* [Capital at a time of restructuring – Corporate access to capital] for more information (in Norwegian only).

<sup>3</sup> See *Norway's financial system 2018* for more information.

## NORWEGIAN BANKS' EXPOSURE TO COMMERCIAL REAL ESTATE AND REAL ESTATE DEVELOPMENT

*A substantial share of Norwegian banks' exposures is to commercial real estate (CRE) and real estate development. Credit risk on exposures to these two segments depends on property prices. The persistent strong growth in selling prices for office space in Oslo increases the risk of a marked fall in prices.*

At year-end 2017, CRE and real estate development loans amounted to slightly more than 50% of Norwegian banks' total corporate exposures (Chart 4.2). Even if both segments are tied to real estate, they assume different types of risk. Moreover, real estate development is associated with both residential and commercial real estate.

### **Credit risk on real estate development loans**

Real estate development is part of the construction industry (see box below). Real estate development accounts for almost 80% of construction company bank debt (Chart 4.16). This analysis therefore focuses on the real estate development sector rather than the entire construction sector.

Real estate developers plan and initiate projects. Selvaag, OBOS and Veidekke are examples of major national participants in this market, and there are also a number of regional participants. Some developers also operate as contractors or own interests in construction companies.

## REAL ESTATE DEVELOPMENT - PART OF THE CONSTRUCTION INDUSTRY

The cyclical risk in real estate is largely related to the construction of new buildings. In the national accounts, this activity is classified as construction. Construction includes enterprises that develop, build and maintain buildings and infrastructure. The industry comprises three subgroups:

- Building construction
- Civil engineering
- Specialised construction

Building construction is further divided into:

- Building project development (real estate development)
- Building construction

Civil engineering is focused on the construction of infrastructure and has little direct exposure to the real estate market. Specialised construction comprises enterprises that are specialised in a specific construction activity.

Building construction and civil engineering enterprises are typically labour-intensive and generate a large part of the industry's output. Real estate development requires less labour but locks up considerably more capital in the period between when land is purchased and when building projects are completed.

The credit risk on loans to real estate development companies is closely linked to price developments in the real estate market.

Developers generally aim for 50–60%<sup>1</sup> of units to be sold before construction starts. Banks usually impose similar pre-sale requirements for loans to developers.

Developers face settlement risk on contracts already signed, which increases if house prices fall. Pre-sold units are often secured on a deposit, for example 10% of the selling price.<sup>2</sup> Buyers that cancel contracts must normally cover any losses incurred by developers. In the event of substantial price declines, the deposit may not necessarily cover the entire loss. The developer must then collect the remainder of the claim from the buyer directly.

Real estate developers build more than just dwellings. Approximately one fourth of the volume pertains to the construction of commercial buildings.<sup>3</sup> There are normally also pre-sale requirements for commercial real estate (CRE) projects in the form of signed leases. In Norway, deductions for input VAT are granted under certain conditions if the building is let within the six months following completion.<sup>4</sup> Real estate developers therefore have strong incentives to delay construction until leases are signed. This arrangement may have contributed to a reduction in the construction of commercial real estate with uncertain future rental income.

Even though the credit risk on real estate development loans has been low in recent years, the risk of losses will be considerable in situations where real estate prices fall. Developers may also find it difficult to meet the pre-sale requirement if the market expects falling prices. New projects could be then halted. In Sweden, developers initiated very few new housing construction projects in 2018 because households do not want to commit to purchasing dwellings with scheduled completion further ahead while prices are falling.

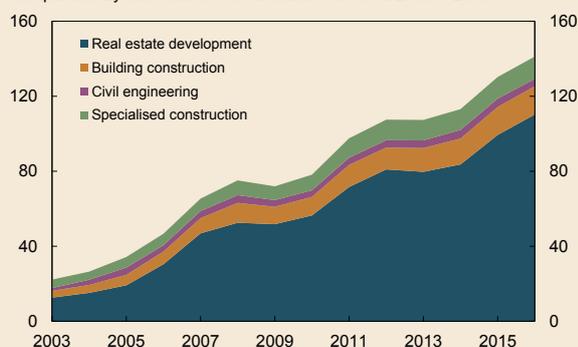
1 Selvaag, Veidekke, Solon Eiendom and OBOS are examples of major participants operating with a set target for pre-sales.

2 According to market participants, there are regional differences in deposit amounts.

3 Assuming that the following real estate segments are commercial: office buildings, retail buildings, hotel buildings and restaurant buildings. Source: Statistics Norway

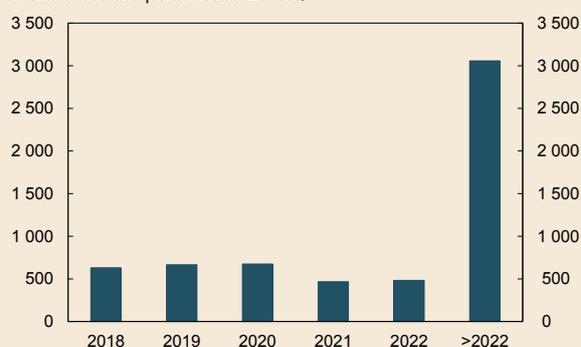
4 If the building is vacant for more than six months following completion, immediate deductions are not granted for input VAT. Instead, the total input VAT will serve as the basis for a right to deduct that can be exercised over the following 10 years. When the building is rented to a taxable entity, the lessor can write off one tenth of input VAT annually. See Dyrnes, Gjems-Onstad et al (2017) *Lærebok i merverdiavgift*, 5. utgave [VAT textbook, 5th edition] (in Norwegian only) and Ministry of Finance (2007) "Fortolkningsuttalelse om justering av inngående merverdiavgift for kapitalvarer" [Interpretive statement on input VAT deductions for capital goods] (in Norwegian only).

Chart 4.16 Debt in the construction industry. From banks and mortgage companies. By each sub-sector. In billions of NOK. 2003 – 2016



Source: Norges Bank

Chart 4.17 Expiring office leases in Oslo. In thousands of square metres. 2018 Q3



Source: Arealstatistikk

## **Risk related to commercial real estate**

CRE companies own and manage real estate for such uses as office or retail space, hotels and logistics. There are substantial differences across segments, and the credit risk on loans varies.

Banks are likely to have considerable exposures to the office segment.<sup>5</sup> Offices are largely owned by parties other than those using them, and ownership is diversified. Office rents are normally set when contracts are signed and are adjusted annually for inflation. Leases are normally irrevocable and may only be broken if a tenant goes bankrupt.<sup>6</sup> A relatively large share of the stock of office space is in large cities. In the short term, the credit risk on loans to office building landlords will depend on tenants' probability of going bankrupt. When leases expire, the landlord will be vulnerable to developments in market rents and vacancy rates. Office rents often fluctuate with the business cycle. Companies with lease expirations distributed over time will be less vulnerable to a fall in rents and higher vacancy rates. The distribution of leases expiring in the coming years appears to be fairly balanced (Chart 4.17).

Retail real estate is a large segment that includes shopping centres, urban commercial space and large detached shops. Leases for retail spaces differ from office leases in that rents are often tied to tenants' turnover, but include a fixed minimum amount. Fluctuations in tenants' turnover therefore directly affect landlords' rental income. Shopping centre ownership is concentrated, but for other retail real estate, ownership is more diversified. Strong growth in online shopping can pose a threat to the traditional retail industry and lead to a decline in rental income over time.

Hotel ownership is dominated by a few entities. Rents under hotel leases are also often based on turnover combined with a lower minimum amount. In some instances, the hotel operators are the owners of the property.

Commercial and residential property prices correlate even though these products differ. Commercial real estate can be converted to residential real estate, and vice versa. In recent years, a number of office buildings in Oslo have been converted into residences.

Commercial real estate is capital intensive, and the sector's interest-bearing debt is high compared with other sectors. Interest rate increases may therefore considerably raise interest expenses and weaken earnings. The effect of an interest rate increase on earnings will depend on the amount of floating- versus fixed-rate debt (see Section 4.1 on the effects of higher interest rates). The term of loan contracts is also a factor. Liquidity requirements make it more advantageous for banks to offer loan contracts with shorter maturities, which may increase borrowers' refinancing risk.

### **Does a sharp rise in commercial property prices imply a greater risk of a price correction?**

Historical experience from Norway and other countries shows that commercial property prices have often risen considerably ahead of a substantial fall.<sup>7</sup> When a sharp rise in prices coincides with an increase in bank's CRE exposures, the credit risk on banks' loans to CRE companies increases.

<sup>5</sup> See Hagen, M. (2016) "Commercial real estate in Norway", *Economic Commentaries 6/2016*. Norges Bank. Most of DNB's lending is to CRE companies, with the office segment accounting for half of DNB's exposure.

<sup>6</sup> Leases with greater flexibility have become somewhat more common in recent years.

<sup>7</sup> See Hagen, M. and F. Hansen (2018) "Driving forces behind European commercial real estate prices prior to a sharp fall in prices", *Staff Memo 1/2018* Norges Bank.

This is also known to be the case in other countries. In the US, real estate prices fell in the early 1990s and during the financial crisis. During these periods, default rates on commercial property loans were significantly higher than on loans to other sectors (Chart 4.18).

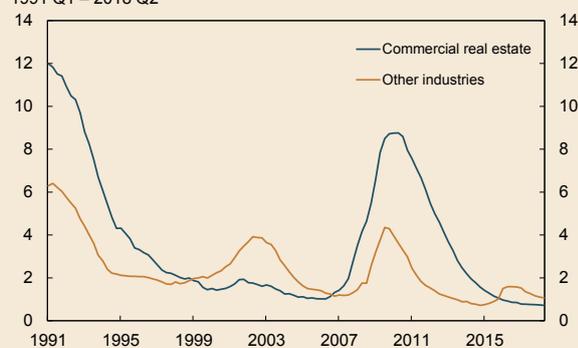
The debt-servicing capacity of CRE companies is primarily determined by the rental market, which in turn is determined by office space supply and demand. Historically, office space demand has largely varied with GDP growth.

Selling prices for office space in Oslo have risen markedly in the past decade, owing in large part to lower yields (Chart 1.14). This increases the risk of a fall in prices in the event of a marked rise in interest rates. In addition, vacancy rates have fallen and office rents have risen in Oslo. Overall credit growth has also been fairly high even though growth in banks' credit to CRE companies has been moderate. A growing number of CRE market participants are relying on bond financing.

Despite a solid rental market in recent years, construction activity in Oslo appears to have been fairly moderate (Chart 4.19). According to the real estate company Entra's Consensus Report, participants expect a moderate number of new office building completions in the coming years.

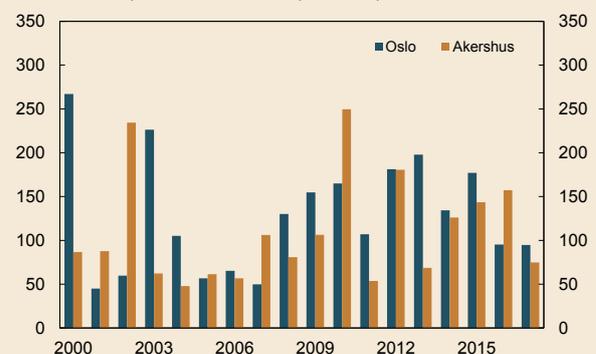
Outside of Oslo, the rise in commercial property prices has been considerably less pronounced. Particular attention has been directed towards development areas outside large cities, such as Forus near Stavanger and Sandsli near Bergen. Much of the commercial spaces in these areas have been rented to oil-related industries. The Forus rental market weakened substantially following the fall in oil prices in 2014.

Chart 4.18 Default rates on commercial real estate loans in the US. As a share of lending to the industry. Seasonally adjusted. Percent. 1991 Q1 – 2018 Q2



Source: FRED Database, Federal Reserve Bank of St. Louis

Chart 4.19 Construction activity in Oslo and Akershus. Completions in thousands of square metres over the past four quarters. 2000 – 2017



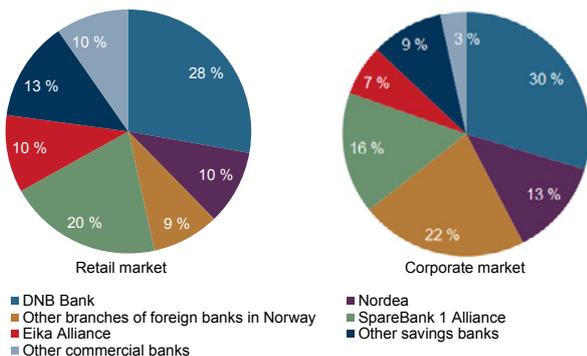
Source: Statistics Norway

# Annex 1

## The Norwegian banking sector

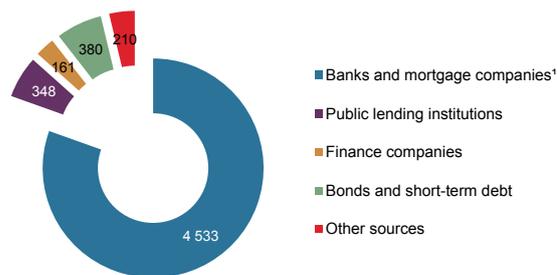
See also *Norway's financial system 2018* for a description of the Norwegian financial system.

Chart 1 Lending market shares in the Norwegian banking sector.<sup>1,2</sup> Percent. At 30 June 2018



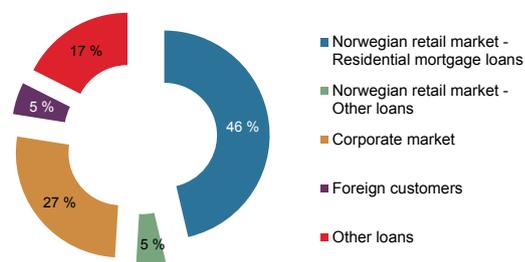
1) All banks and mortgage companies in Norway.  
2) See Table 2.  
Source: Norges Bank

Chart 2 Gross domestic lending to the non-financial sector by credit source. In billions of NOK. At 30 June 2018



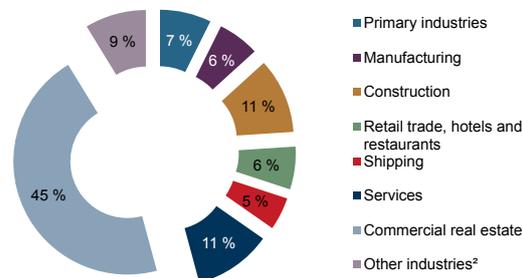
1) All banks and mortgage companies including Eksportfinans.  
Source: Statistics Norway

Chart 3 Lending<sup>1</sup> by all banks and mortgage companies. Percent. At 30 June 2018



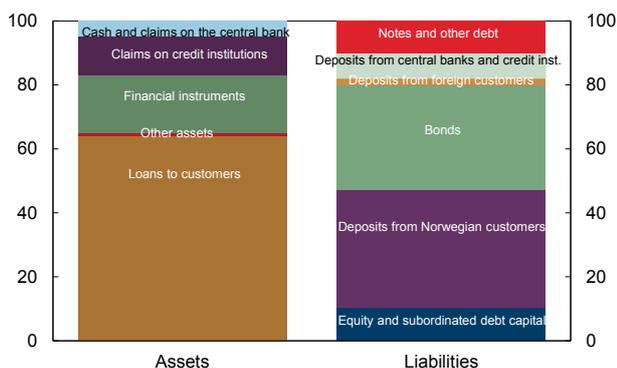
1) Total lending of NOK 5 373bn.  
Source: Norges Bank

Chart 4 Lending to the corporate market<sup>1</sup> by all banks and mortgage companies. Percent. At 30 June 2018



1) Total corporate loans NOK 1 427bn  
2) Other industries comprise "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 sheet<sup>1</sup> of Norwegian-owned banks and covered bond mortgage companies.<sup>2</sup> Percent. At 30 June 2018



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

**Table 1** Structure of the Norwegian financial industry at 30 June 2018

	Number	Lending (NOK bn)	Total assets (NOK bn)
Banks (excluding branches of foreign banks)	127	1 912	3 801
Branches of foreign banks	12	840	1 396
Mortgage companies (including branches of foreign companies)	33	1 766	2 102
Finance companies (including branches of foreign companies)	45	161	190
State lending institutions	3	348	359
Life insurance companies (excluding branches of foreign companies)	12	119	1 530
Non-life insurance companies (excluding branches of foreign companies)	56	2	179
		NOK bn	
Market value of equities and equity certificates, Oslo Børs		2 785	
Outstanding domestic bond and short-term paper debt		2 178	
Issued by public sector and state-owned companies		767	
Issued by banks		324	
Issued by other financial institutions		583	
Issued by other private enterprises		206	
Issued by non-residents		297	
GDP Norway (2017)		3 304	
GDP mainland Norway (2017)		2 798	

Sources: Finanstilsynet (Financial Supervisory Authority of Norway), Oslo Børs, Statistics Norway, VPS and Norges Bank

**Table 2** Market shares<sup>1</sup> of banks and mortgage companies in Norway at 30 June 2018. Percent

	Gross lending to		Deposits from	
	Retail market <sup>9</sup>	Corporate market <sup>10</sup>	Retail market <sup>9</sup>	Corporate market <sup>10</sup>
DNB Bank <sup>2</sup>	28	30	30	36
Nordea <sup>3</sup>	10	13	7	12
Branches of foreign banks in Norway <sup>4</sup> (excluding Nordea)	9	22	5	18
SpareBank 1 Alliance <sup>5</sup>	20	16	19	14
Eika Alliance <sup>6</sup>	10	7	13	8
Other savings banks <sup>7</sup>	13	9	13	9
Other commercial banks <sup>8</sup>	10	3	14	2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Total (NOK bn)</b>	<b>2 737</b>	<b>1 427</b>	<b>1 226</b>	<b>706</b>

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 AB (Publ), branch in Norway and Nordea Eiendomskreditt.

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

5 SpareBank 1 SR-Bank, SpareBank 1 SMN, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, the other eleven savings banks in the Sparebank 1 Alliance, SpareBank 1 Boligkreditt og BN Bank, one commercial mortgage lender, one mortgage lender and one other residential mortgage lender.

6 Eika Boligkreditt, Eika Kredittbank, 67 savings banks and three commercial banks which are owner of Eika Gruppen AS and three other residential mortgage lenders.

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

8 Sbanken ASA, Santander Consumer Bank AS, Eksportfinans, Gjensidige Bank ASA, Storebrand Bank, Landkreditt Bank, 19 other commercial banks and five 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's<sup>1</sup>, total assets, leverage ratio<sup>2</sup>, capital adequacy<sup>2</sup> and return on equity for Nordic and Norwegian banks at 30 June 2018. Consolidated figures

	Credit rating		Total assets (NOK bn)	Leverage ratio (%)	Common Equity Tier 1 (CET1) capital ratio (%)	Return on equity		
	Short- term	Long- term				2016	2017	2018 Q1-Q2
Nordea Bank	P-1	Aa3	5 420	5.0	19.9	11.5	7.7	12.0
Danske Bank	P-1	A2	4 730	4.2	15.9	11.9	13.6	10.8
Handelsbanken	P-1	Aa2	2 851	4.2	21.4	13.1	10.7	13.6
SEB	P-1	Aa2	2 563	4.7	19.3	7.8	9.0	13.9
DNB	P-1	Aa2	2 517	6.6	16.2	10.1	10.1	11.0
Swedbank	P-1	Aa2	2 406	4.5	23.6	15.8	14.4	17.1
SpareBank 1 SR-Bank	P-1	A1	224	7.5	14.8	10.0	11.0	11.4
Sparebanken Vest	P-1	A1	182	7.1	15.0	13.1	11.0	12.5
SpareBank 1 SMN	P-1	A1	160	7.4	15.0	11.3	11.5	14.4
Sparebanken Sør	P-1	A1	118	9.1	15.3	11.6	9.7	9.6
SpareBank 1 Østlandet	P-1	A1	120	7.3	16.1	10.5	10.2	11.4
SpareBank 1 Nord-Norge	P-1	A1	104	7.3	14.7	12.0	12.9	13.3

1 Rating at 23 October 2018. Moody's scale of rating: Short-term: P-1, P-2,... Long-term: Aaa, Aa1, Aa2, Aa3, A1, A2,...

2 The share of the interim result included in the calculation of the CET1 capital ratio varies across institutions. The higher the proportion of (positive) interim result included, the higher the CET1 ratio. Owing to different national rules, such as consolidation rules for life insurance companies and the Basel I transitional floor, CET1 capital figures are not directly comparable across jurisdictions.

Sources: Banks' quarterly reports, Moody's and Norges Bank

**Table 4** Banks<sup>1</sup> losses on loans<sup>2</sup> to various industries and sectors as a percentage of lending to the respective industries and sectors<sup>3</sup>

Industries											Lending in
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2017
Agriculture, forestry and fishing	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.0	0.2	0.0	90.7
of which: Fish farming, hatcheries	0.6	0.8	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.0	11.6
Extraction of crude oil and natural gas	0.0	0.1	0.0	0.1	0.4	-0.1	0.2	0.2	6.8	4.4	8.1
Manufacturing, mining and quarrying	0.5	0.9	0.7	0.7	0.7	0.2	1.0	1.3	1.7	1.1	53.0
of which: Manufacturing		0.9	0.9	0.4	0.5	0.2	1.2	0.6	1.0	0.3	40.9
of which: Ship and boat building		0.8	-0.1	2.7	2.0	0.0	0.0	-0.2	0.4	8.8	5.5
Electricity and water supply, construction	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.7	123.5
of which: Construction	0.7	0.9	1.5	1.5	1.2	1.5	2.0	1.6	1.0	0.2	39.8
Retail trade and auto repair, hotels and restaurants	0.5	1.4	0.4	0.8	0.3	0.6	0.8	0.4	0.3	1.6	55.1
of which: Retail trade and auto repair	0.5	1.6	0.3	0.8	0.3	0.6	0.9	0.5	0.3	1.9	44.4
of which: Hotels and restaurants	0.4	0.4	0.5	0.7	0.5	0.3	0.5	0.3	0.3	0.2	10.7
Shipping and pipeline transport	0.1	1.4	1.4	1.7	2.1	2.1	1.4	1.8	2.5	0.3	34.2
Other transport and communications	0.1	1.4	1.4	1.2	0.6	2.1	0.1	0.5	2.3	1.0	52.9
Business services and real estate activities	0.3	0.4	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	379.0
of which: Real estate activities	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.1	0.1	0.1	323.6
of which: Professional, financial business services		0.6	0.2	0.3	0.4	0.3	0.6	0.7	1.0	0.9	55.3
Other service industries	0.2	0.4	0.6	0.1	0.4	0.2	0.8	0.1	0.0	0.2	29.0
<b>Total for all industries</b>	<b>0.3</b>	<b>0.6</b>	<b>0.4</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.7</b>	<b>0.5</b>	<b>825.4</b>
<b>Retail market</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>1022.0</b>						
<b>Other<sup>4</sup></b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.5</b>	<b>0.1</b>	<b>0.1</b>	<b>751.9</b>
<b>Total</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>2599.3</b>

1 All banks in Norway including foreign branches. Nordea is a branch of a foreign bank from 2017. The figures do not include mortgage companies.

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

3 The changes in losses on loans to some industries between 2016 and 2017 were relatively large, primarily reflecting sizeable losses on individual exposures or reversals of losses for some banks.

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

Source: Norges Bank

**Table 5** Loan defaults.<sup>1</sup> All banks and covered bond mortgage companies.<sup>2</sup>  
At year-end

Year	Loan defaults. Percentage of lending to sector			Loan defaults. Percentage of lending to private sector			Total
	Households	Enterprises	Others	Households	Enterprises	Others	
1990	4.9	7.6	3.1	3.1	2.6	0.1	5.7
1991	6.3	10.2	3.1	4.1	3.4	0.1	7.5
1992	8.2	11.5	1.9	5.2	3.9	0.1	9.2
1993	6.5	10.6	0.4	4.3	3.5	0.0	7.7
1994	4.8	6.9	0.7	3.2	2.2	0.0	5.4
1995	3.7	4.6	0.3	2.4	1.5	0.0	3.9
1996	2.8	3.3	0.4	1.9	1.0	0.0	2.9
1997	2.1	2.1	0.2	1.4	0.7	0.0	2.1
1998	1.5	1.3	0.1	0.9	0.4	0.0	1.4
1999	1.3	1.5	0.1	0.9	0.5	0.0	1.4
2000	1.3	1.4	0.1	0.8	0.5	0.0	1.3
2001	1.3	1.7	0.0	0.8	0.6	0.0	1.4
2002	1.3	3.5	0.1	0.8	1.1	0.0	2.0
2003	1.1	3.2	0.1	0.7	1.0	0.0	1.7
2004	0.8	1.8	0.1	0.6	0.5	0.0	1.1
2005	0.7	1.0	0.0	0.5	0.3	0.0	0.8
2006	0.6	0.7	0.1	0.4	0.2	0.0	0.6
2007	0.5	0.5	0.0	0.4	0.2	0.0	0.5
2008	0.8	0.9	0.0	0.5	0.3	0.0	0.8
2009	1.1	1.6	0.1	0.7	0.5	0.0	1.3
2010	1.2	1.8	0.1	0.8	0.6	0.0	1.4
2011	1.0	1.9	0.2	0.7	0.6	0.0	1.3
2012	1.0	1.8	0.7	0.7	0.6	0.0	1.2
2013	0.9	1.8	0.3	0.6	0.5	0.0	1.2
2014	0.8	1.5	0.1	0.6	0.4	0.0	1.0
2015	0.7	1.3	0.2	0.5	0.4	0.0	0.9
2016	0.7	1.5	0.1	0.5	0.4	0.0	0.9
2017	0.7	1.4	0.1	0.5	0.4	0.0	0.9

1 Loan defaults in the first half of 2018 are excluded from the table, owing to a change in the reporting of banking statistics and the introduction of the accounting principles in IFRS 9.

2 Covered bond mortgage companies included from 2005.

Source: Norges Bank

# Annex 2

## Regulatory reform

Banks' capital, liquidity and risk management	Progress
Revisions to the IRB approach for credit and operational risks	The Basel Committee has recommended revisions to the IRB approach to credit risk, which aim to simplify the framework and reduce differences in risk-weighted assets that cannot be explained by differences in underlying risk. The Committee has also proposed removing the option to use the IRB approach to calculate capital requirements for operational risk. The recommendations have not yet been incorporated into EU legislation.
New standardised approach	The Basel Committee has recommended revisions to the standardised approach for credit risk, which aim to enhance the risk sensitivity of capital requirements under the standardised approach and ensure that the standardised approach is a suitable alternative to the IRB approach. The recommendations have not yet been incorporated into EU legislation.
New capital floor for the IRB approach	The Basel Committee has recommended a new floor IRB banks' risk-weighted assets to be phased in from 2022. The recommendations have not yet been incorporated into EU legislation. Under the old Basel I floor, the capital requirement shall not be lower than 80% of the requirement under the Basel I rules. Under the new floor, the capital requirement shall be at least 72.5% of the requirement under the standardised approach. The Basel I floor was in force until end-2017 in the EU regulation and will lapse in Norway when the EU regulation is incorporated into the EEA Agreement. The date for incorporating the EU regulation into the EEA agreement has not been finalised
SME discount	New rules on reduced capital requirements for loans to small and medium sized enterprises (SME discount) will enter into force when the EU regulation relating to this discount is incorporated into the EEA Agreement. The date for incorporating the EU regulation into the EEA Agreement has not been finalised.
Net Stable Funding Ratio (NSFR)	The Basel Committee's recommendation on the Net Stable Funding Ratio (NSFR) was published in 2014. The European Commission submitted draft legislation for the NSFR in 2016 and the requirement will be introduced two years after final approval.

Bank recovery and resolution	Progress
Financial Stability Board (FSB) - TLAC	In November 2015, the FSB issued total loss absorbing capacity (TLAC) standards for global systemically important banks (G-SIBs). G-SIBs must have a minimum TLAC of 16% of risk-weighted assets and 6% of the Basel III leverage ratio denominator by 1 January 2019. From January 1 2022, the minimum requirements will increase to 18% and 6.75%, respectively. No Norwegian banks have been designated as G-SIBs.
EU - Bank Recovery and Resolution Directive (BRRD)	The BRRD became EU law on 1 January 2015. Bail-ins (debt written down or converted into equity) as a crisis resolution tool entered into force on 1 January 2016. The Directive will be implemented in Norway through amendments to the Financial Institutions Act. The amendments enter into force on 1 January 2019.
EU - Minimum requirement for own funds and eligible liabilities (MREL)	The MREL is defined in Commission Delegated Regulation (EU) of 23 May 2016 and consists of a loss absorption amount and an amount necessary for recapitalisation. In November 2016, the Commission proposed revisions of the BRRD, among other things to harmonise MREL with the FSB standard for TLAC. The proposal has been deliberated in the European Council and the Parliament, which are now negotiating on its final form. Finanstilsynet has proposed regulations to implement MREL in Norway on the basis of the Commission's proposal. See box on page 38.
Deposit guarantee	In 2014, the EU approved a new Directive on Deposit Guarantee Schemes that stipulates a deposit guarantee of EUR 100 000 per depositor. The Directive has been implemented in Norway through amendments to the Financial Institutions Act. The amendments enter into force on 1 January 2019. However, the upper limit on the deposit guarantee of NOK 2m per depositor per bank will be maintained until further notice.
Securities settlement	On 22 September 2016, the Ministry of Finance laid down a regulation pursuant to Section 4-2 of the Act Relating to Payment Systems, etc. concerning settlement of securities. Under the regulation, financial instruments that are available in settlement accounts in a central securities depository, and deposits in a securities settlement account with Norges Bank or another settlement bank, may be used for securities settlement on the same business day as the opening of insolvency proceedings. From June 2018, VPS (Norwegian Central Securities Depository) and Norges Bank have adapted their rules and contracts and their routines in accordance with the regulation.

Other	Progress
Markets in Financial Instruments Directive II (MiFID II)	MiFID II is a revision of MiFID I as a response to a number of market developments. For example, MiFID II has introduced requirements for participants to limit the risk of instability and market manipulation from high-frequency trading (HFT). Participants must ensure that algorithmic trading systems are resilient to different market conditions and must also provide the supervisory authority with detailed information about the algorithms they use. MiFID II was implemented in Norway by a regulation on 1 January 2018.
Recovery and resolution of central counterparties (CCPs)	In 2016, The European Commission proposed new rules for the recovery and resolution of central counterparties (CCPs) based on recommendations from the FSB. The rules contain many of the same tools that have been approved for bank recovery and resolution, including early intervention, preparation of recovery and resolution plans and the establishment of resolution colleges for each CCP containing all the relevant authorities in the countries the CCP operates. The Council's Working Party on Financial Services and the European Parliament Committee for Economic and Monetary Affairs are both working on proposed changes to the Commission's proposed rules that they will bring to the trilogue negotiations (between the Commission, the Council and the European Parliament) on a final legislative text.
Central Securities Depository Act and disclosure of information on bondholders	The Ministry of Finance has conducted a consultation of a draft Central Securities Depository (CSD) Act. Its aim is to implement forthcoming EEA rules that correspond to EU Regulation No 909/2014 on improving securities settlement in the EU and the Central Securities Depository Regulation (CSDR). The CSDR is the first common regulation of CSDs in the EEA and contains provisions that regulate the issuers of financial instruments, trading venues, CCPs, collective investment undertakings and certain banks. The draft CSD Act also contains rules on disclosure of information on bondholders. The consultation responses are now under consideration by the Ministry of Finance. The CSDR has not yet been incorporated into the EEA Agreement.
Pension funds	In June 2018, the Ministry of Finance decided that pension funds must comply with capital requirements based on a simplified application of Solvency II. The new requirement will be in force from 1 January 2019.
Regulation on requirements for new residential mortgage loans	In June 2018, the Ministry of Finance laid down a new regulation on requirements for new residential mortgage loans in force between 1 January 2018 and 31 December 2019. The new regulation is largely a continuation of the regulation that entered into force on 1 January 2017. The regulation restricts both loan-to-value (LTV) and debt-to-income (DTI) ratios and includes requirements for principal repayment and debt-servicing capacity in the event of an interest rate increase.
Consumer Credit Regulation	On 27 September 2018, the Ministry of Finance circulated for comment a draft regulation on prudent consumer lending practices. The proposal largely implements existing guidelines in the form of a regulation, with requirements for credit assessments, debt-to-income and debt servicing ratios and principal repayment (see box on page 20). In the interest of consumer protection, no "speed limit" is included in the proposal. Norges Bank supported the draft regulation in its consultation response of 29 October 2018.
Second Payment Services Directive – PSD2	In Prop. 110 L (2017–2018), Amendments to the Financial Institutions Act (Second Payment Services Directive) of 22 June 2018, the Ministry of Finance proposed rule changes to implement the public-law provisions of PSD2 in Norwegian law, which are under deliberation in the Storting. 5 October was the closing date for the Ministry of Justice consultation on a new regulation on payment services to ensure provisional implementation of the most important private-law provisions of PSD2. The rules in the draft regulation will be subsequently incorporated into a new Financial Contracts Act. Norges Bank has submitted consultation responses in both processes.

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Financial Stability Report 2018

