



NORGES BANK

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**MONETARY
POLICY REPORT**
WITH FINANCIAL STABILITY ASSESSMENT

Norges Bank

Oslo 2017

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Monetary Policy Report with financial stability assessment

The *Report* is published four times a year, in March, June, September and December. The *Report* assesses the interest rate outlook and forms the basis for Norges Bank's advice on the level of the countercyclical capital buffer. The *Report* includes projections of developments in the Norwegian economy.

At the Executive Board meeting on 13 September 2017, the economic outlook, the monetary policy stance and the need for a countercyclical capital buffer for banks were discussed. On the basis of that discussion and the advice of Norges Bank's executive management, the Executive Board made its decision on the key policy rate at its meeting on 20 September 2017. The Executive Board also approved Norges Bank's advice to the Ministry of Finance on the level of the countercyclical capital buffer. The Executive Board's assessment of the economic outlook and monetary policy strategy is provided in "The Executive Board's assessment". The advice on the level of the countercyclical capital buffer is submitted to the Ministry of Finance in connection with the publication of the *Report*. The advice is made public when the Ministry of Finance has made its decision.

The *Report* is available at www.norges-bank.no.

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MONETARY POLICY IN NORWAY

OBJECTIVE

Norges Bank's operational implementation of monetary policy shall be oriented towards low and stable inflation. The operational target of monetary policy is annual consumer price inflation of close to 2.5% over time.

IMPLEMENTATION

Norges Bank operates a flexible inflation targeting regime, so that weight is given to both variability in inflation and variability in output and employment. In general, the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary disturbances are not taken into account.

Monetary policy influences the economy with a lag. Norges Bank sets the interest rate with a view to stabilising inflation at target in the medium term. The horizon will depend on disturbances to which the economy is exposed and the effects on prospects for the path for inflation and the real economy.

DECISION PROCESS

The key policy rate is set by Norges Bank's Executive Board. Decisions concerning the interest rate are normally taken at the Executive Board's monetary policy meetings. In recent years, the Executive Board has held six monetary policy meetings per year. From 2018, there will be eight meetings per year.

The *Monetary Policy Report* is published four times a year in connection with four of the monetary policy meetings. At a meeting one to two weeks before the publication of the *Report*, the background for the monetary policy assessment is presented to and discussed by the Executive Board. On the basis of the analysis and discussion, the Executive Board assesses the consequences for future interest rate developments. The final decision on the key policy rate is made on the day prior to the publication of the *Report*.

REPORTING

Norges Bank reports on the conduct of monetary policy in the *Monetary Policy Report* and the *Annual Report*. The Bank's reporting obligation is set out in Article 75c of the Constitution, which stipulates that the Storting shall supervise Norway's monetary system, and in Section 3 of the Norges Bank Act. The *Annual Report* is submitted to the Ministry of Finance and communicated to the King in Council and to the Storting in the Government's *Financial Markets Report*. The Governor of Norges Bank provides an assessment of monetary policy in an open hearing before the Standing Committee on Finance and Economic Affairs in connection with the Storting deliberations on the *Financial Markets Report*.

COUNTERCYCLICAL CAPITAL BUFFER

The objective of the countercyclical capital buffer is to bolster banks' resilience to an impending downturn and counter possible procyclical effects of banks' lending practices.

The Regulation on the Countercyclical Capital Buffer was issued by the Government on 4 October 2013. The Ministry of Finance sets the level of the buffer four times a year. Norges Bank draws up a decision basis and provides advice to the Ministry regarding the level of the buffer. The decision basis includes Norges Bank's assessment of systemic risk that is building up or has built up over time. In drawing up the basis, Norges Bank and Finanstilsynet (Financial Supervisory Authority of Norway) exchange relevant information and assessments. The advice and a summary of the background for the advice are submitted to the Ministry of Finance in connection with the publication of Norges Bank's *Monetary Policy Report*. The advice is published when the Ministry of Finance has made its decision.

Norges Bank will recommend that the buffer rate should be increased when financial imbalances are building up or have built up. The buffer rate will be assessed in the light of other requirements applying to banks. The buffer rate may be reduced in the event of an economic downturn and large bank losses, with a view to mitigating the procyclical effects of tighter bank lending.

The buffer rate shall ordinarily be between 0% and 2.5% of banks' risk-weighted assets. The requirement will apply to all banks with activities in Norway. The buffer rate is set at 1.5% and will increase to 2.0%, effective from 31 December 2017.

Executive Board's assessment

Norges Bank's Executive Board has decided to keep the key policy rate unchanged at 0.5%. The Executive Board's current assessment of the outlook and balance of risks suggests that the key policy rate will remain at today's level in the period ahead.

Economic growth among Norway's trading partners has picked up in recent years, and unemployment has fallen. Wage growth abroad has remained moderate, but since autumn 2016 inflation has edged up on the back of higher energy prices. Recent developments suggest that economic growth among trading partners will be a little higher in 2017 than projected earlier, and inflation appears to be broadly as expected. The level of international interest rates is still very low, but market interest rate expectations indicate that interest rates abroad will move up slightly faster than envisaged in the June 2017 *Monetary Policy Report*.

Following several years of weak developments in the Norwegian economy, growth has picked up. Low interest rates, improved competitiveness and an expansionary fiscal policy have contributed to the upturn. So far in 2017, economic growth has been in line with the projections in the June *Report*. Employment has risen and unemployment has fallen. The improvement in the labour market has occurred at a somewhat faster pace than assumed in June. Oil spot and futures prices have edged higher.

There are prospects that overall capacity utilisation in the Norwegian economy will continue to rise in the coming years. It appears that petroleum investment will bottom out in 2017. On the back of higher capacity utilisation, non-oil business investment is also likely to pick up. Higher imports among trading partners will boost exports from Norway. On the other hand, the correction in the housing market suggests that housing investment will not continue to grow in the coming years. In addition, fiscal policy will likely prove to be less expansionary than it has been in recent years. Overall, the growth outlook for the Norwegian economy is little changed since the June *Report*.

The operational target of monetary policy is annual consumer price inflation of close to 2.5% over time. Since summer 2016, inflation has edged down, and developments since the June *Report* have been broadly as projected. In August, the twelve-month rise in consumer prices adjusted for tax changes and excluding energy products (CPI-ATE) was 0.9%. The krone is stronger than assumed in June, which in isolation will pull down inflation. Moderate wage growth will also weigh down on inflation in the coming period.

The risks to the outlook appear to be balanced. Improved confidence indicators and higher consumption growth may be signs of a shift in economic sentiment. This may result in higher-than-projected growth ahead. On the other hand, there is a risk that growth will be dampened by a more marked slowdown in housing investment than envisaged or that the expected upswing in business investment will prove to be more modest than assumed.

The rapid rise in house prices and high debt growth have increased the vulnerability of households in recent years. Since spring, house prices have fallen, and price developments in recent months have been weaker than expected. Household credit growth remains high. Low house price inflation will curb debt accumulation but it will take time

for household vulnerabilities to recede. The correction in the housing market may lower the risk of an abrupt and more pronounced decline further out.

The Executive Board judges that there is a continued need for an expansionary monetary policy. Interest rates abroad are low. Capacity utilisation in the Norwegian economy is below a normal level, and the outlook suggests that inflation will remain below 2.5% in the coming years.

In its discussion of monetary policy, the Executive Board emphasises that capacity utilisation in the Norwegian economy is on the rise and that it appears to be somewhat higher than previously assumed. Inflation has declined as expected. Wage growth will likely remain moderate, and the outlook for inflation for the next few years is little changed. Inflation expectations appear to be firmly anchored, and the increase in capacity utilisation suggests that inflation will pick up further out. The changes in the outlook and the balance of risks imply a somewhat earlier increase in the key policy rate than projected in the *June Report*. Uncertainty surrounding the effects of monetary policy suggests a cautious approach to interest rate setting, also when it becomes appropriate to increase the key policy rate.

On the basis of an overall assessment, the Executive Board decided to keep the key policy rate unchanged at 0.5%. The Executive Board's current assessment of the outlook and the balance of risks suggests that the key policy rate will remain at today's level in the period ahead. The decision was unanimous.

Øystein Olsen
20 September 2017

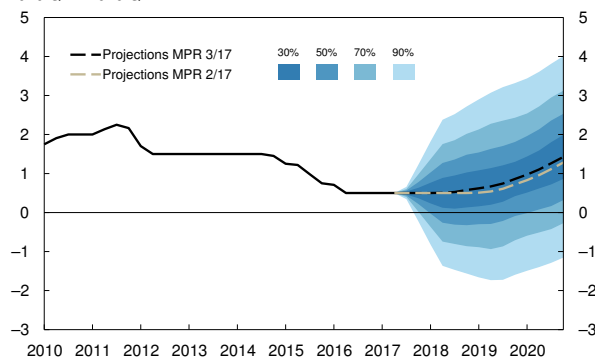
1 Overall picture

Growth in the Norwegian economy has gained momentum, but capacity utilisation remains below a normal level. Registered unemployment has fallen more than assumed in the June 2017 *Monetary Policy Report*, while growth in mainland GDP has been in line with projections. Inflation has slowed approximately as expected. Inflation is low.

The analyses and assessments in this *Report* imply that the key policy rate is kept at 0.5% in the coming year, followed by a gradual increase to close to 1.5% towards the end of 2020. The key policy rate forecast is little changed on the June *Report*, but implies a somewhat earlier rate increase.

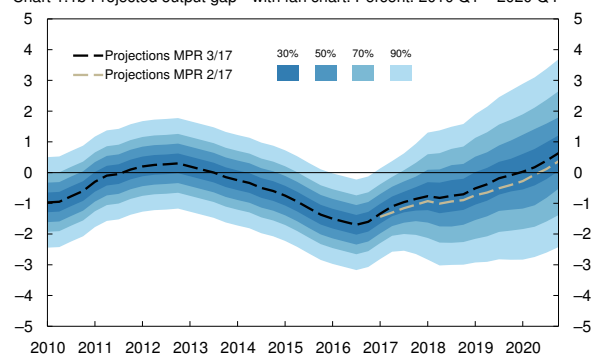
Capacity utilisation is expected to rise gradually and to be somewhat above a normal level in 2020. The projections for capacity utilisation are somewhat higher than in the June *Report*. Inflation is projected to increase to just below 2% at the end of 2020. Compared with the June *Report*, the projection for inflation is little changed for the coming years, but is slightly higher towards the end of the projection period.

Chart 1.1a Key policy rate with fan chart.¹⁾ Percent. 2010 Q1 – 2020 Q4²⁾



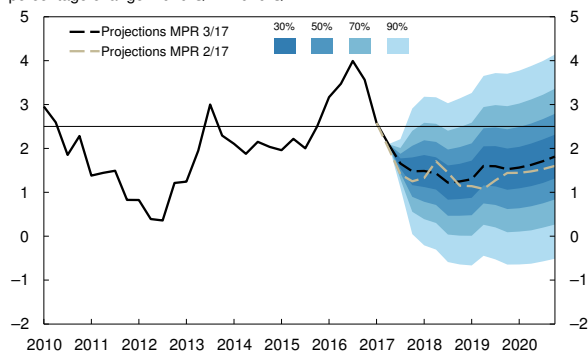
1) The fan charts are based on historical experience and stochastic simulations in Norges Bank's main macroeconomic model, NEMO. The fan chart for the key policy rate does not take into account that a lower bound for the interest rate exists.
2) Projections for 2017 Q3 – 2020 Q4 (broken line).
Source: Norges Bank

Chart 1.1b Projected output gap¹⁾ with fan chart. Percent. 2010 Q1 – 2020 Q4



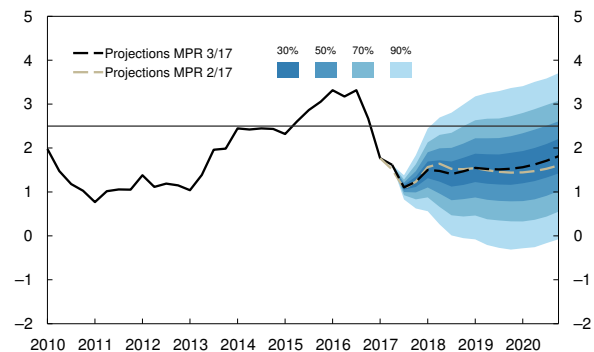
1) The output gap measures the percentage deviation between mainland GDP and projected potential mainland GDP.
Source: Norges Bank

Chart 1.1c Consumer price index (CPI) with fan chart. Four-quarter percentage change. 2010 Q1 – 2020 Q4¹⁾



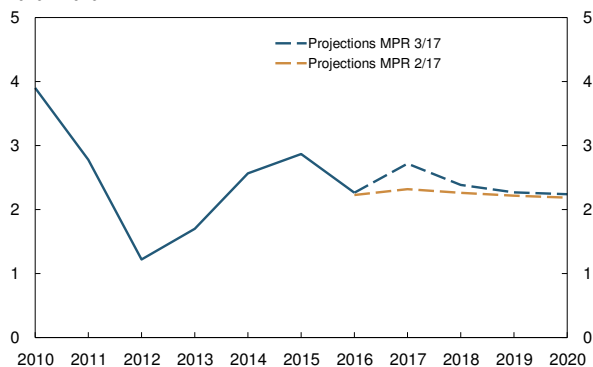
1) Projections for 2017 Q3 – 2020 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 1.1d CPI-ATE¹⁾ with fan chart. Four-quarter percentage change. 2010 Q1 – 2020 Q4²⁾



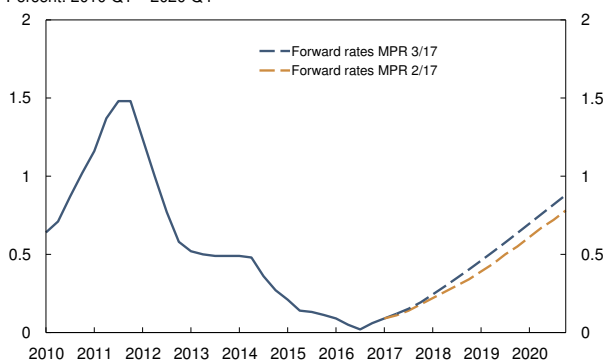
1) CPI adjusted for tax changes and excluding energy products.
2) Projections for 2017 Q3 – 2020 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 1.2 GDP for Norway's trading partners.¹⁾ Annual percentage change. 2010 – 2020²⁾



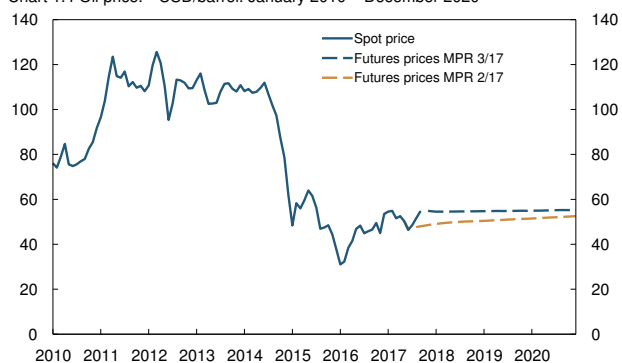
1) Export weights, 25 main trading partners.
2) Projections for 2017 – 2020 (broken lines).
Sources: IMF, Statistics Norway, Thomson Reuters and Norges Bank

Chart 1.3 Three-month money market rates for Norway's trading partners.¹⁾ Percent. 2010 Q1 – 2020 Q4²⁾



1) Based on money market rates and interest rate swaps. For information about the aggregate for trading partner interest rates, see *Norges Bank Papers* 2/2015.
2) Orange and blue broken lines show forward rates at 16 June 2017 and 15 September 2017 respectively.
Sources: Thomson Reuters and Norges Bank

Chart 1.4 Oil price.¹⁾ USD/barrel. January 2010 – December 2020²⁾



1) Brent Blend, USD/barrel.
2) Futures prices (broken lines) are the averages of futures prices for the period 11 September – 15 September 2017 for MPR 3/17 and 12 June – 16 June 2017 for MPR 2/17.
Sources: Thomson Reuters and Norges Bank

1.1 GLOBAL DEVELOPMENTS AND OUTLOOK

The upturn among trading partners continues

GDP growth among trading partners as a whole has ranged between 2% and 3% over the past three years (Chart 1.2). Unemployment has fallen. So far in 2017, growth has been higher than assumed in the *June Report*, and the projection for 2017 has been revised up. Growth projections for the years ahead are little changed. The pace of growth is expected to gradually slow on the back of tighter monetary and fiscal policy in a number of countries, but will remain above 2% throughout the projection period.

The fall in oil prices from 2014 contributed to a marked decline in consumer price inflation among trading partners. Wage growth has remained moderate. Inflation picked up in the second half of 2016 and into 2017, partly fuelled by higher energy prices. Inflation excluding energy products has also risen, but remains relatively low. Since the *June Report*, inflation abroad has been lower than expected, partly reflecting temporary factors. Wage growth and inflation are expected to rise gradually in the years ahead, in pace with rising capacity utilisation. The projections for consumer price inflation among trading partners are little changed from the *June Report*.

Weak developments in the real economy and low inflation and wage growth over several years have contributed to a historically low level of global interest rates. For the years ahead, there are prospects of a gradual rate increase. Market interest rate expectations indicate a slightly faster increase than envisaged in the *June Report* (Chart 1.3).

The oil spot price has risen to around USD 55 per barrel. In the period ahead, oil prices are assumed to move in line with futures prices, which now indicate an oil price approximately at today's level in the years ahead. Both spot and futures prices are somewhat higher than at the time of the *June Report* (Chart 1.4).

1.2 THE ECONOMIC SITUATION IN NORWAY

Money market rates have fallen

Interest rates in Norway are also at historically low levels. Norges Bank's key policy rate has stood at 0.5% since March 2016. Nevertheless, the money market rate rose through autumn 2016, owing to a higher money market premium. The money market

premium has now fallen back and to a slightly lower level than assumed in the *June Report*. The premium is projected to remain close to today's level in the years ahead. The projection is slightly lower than in the *June Report*.

The krone exchange rate weakened considerably in the wake of the fall in oil prices that began in summer 2014. Through 2016, the krone strengthened on the back of higher oil prices and a wider interest rate differential against trading partners (Chart 1.5). In the first half of 2017, lower oil prices and a narrower interest rate differential led to a partial reversal of the earlier appreciation. Since the time of the *June Report*, the krone has strengthened somewhat more than expected. The interest rate differential has continued to narrow since June, but with somewhat higher oil prices, market participants may now have a more positive view on holding NOK.

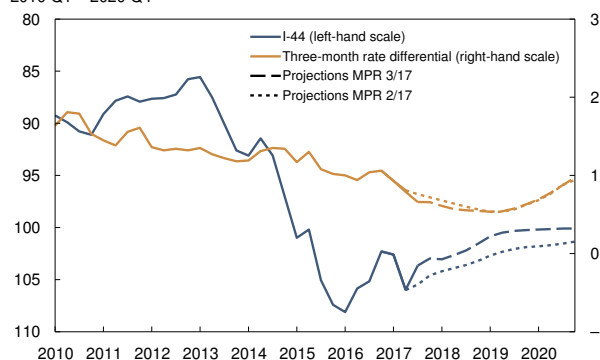
Higher capacity utilisation

Growth in the Norwegian economy has gained momentum over the past year. Low interest rates, improved competitiveness and an expansionary fiscal policy have contributed to the upturn. It appears that petroleum investment will bottom out in 2017. In 2017 Q1 and Q2, mainland GDP rose by 0.7%, approximately as projected in the *June Report*. For the second half of 2017, the pace of growth is projected to be slightly lower. The projection is in line with the results of the regional network survey (Chart 1.6). In August, contacts reported a pickup in the pace of growth through the first half of 2017, but they expected somewhat weaker developments in the second half of the year.

The improvement in the labour market has been somewhat stronger than assumed in the *June Report*. Employment is higher than expected, and registered unemployment has fallen faster than projected. The regional network survey indicates that employment will continue to rise in the coming period (Chart 1.7).

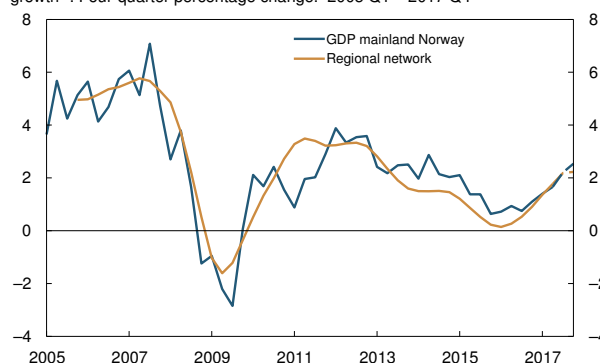
Capacity utilisation in the Norwegian economy remains below a normal level. Capacity utilisation declined in the period to autumn 2016 and has since risen. Labour market developments suggest that there is less slack than projected in the *June Report*. Overall, capacity utilisation through 2017 is estimated to have been somewhat higher than assumed in the *June Report*.

Chart 1.5 Three-month money market rate differential between Norway¹⁾ and trading partners²⁾ and import-weighted exchange rate index (I-44)³⁾. 2010 Q1 – 2020 Q4⁴⁾



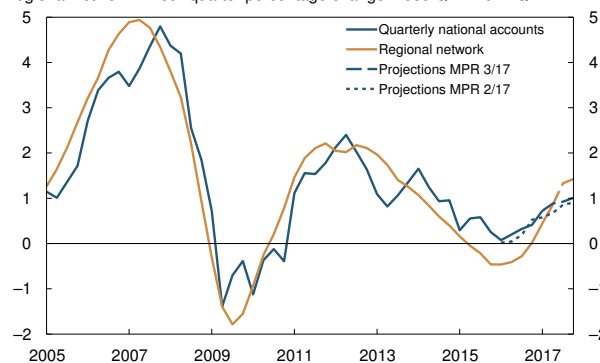
1) Key policy rate plus Norwegian money market premium. The calculations are based on the assumption that the key policy rate forecast is priced into the money market.
2) Forward rates for trading partners at 15 September 2017 and 16 June 2017. The aggregate for trading partner interest rates is described in *Staff Memo 2/2015*, Norges Bank.
3) A positive slope denotes a stronger krone exchange rate.
4) Projections for 2017 Q3 – 2020 Q4 (broken lines).
Sources: Thomson Reuters and Norges Bank

Chart 1.6 GDP for mainland Norway¹⁾ and regional network's indicator of output growth²⁾. Four-quarter percentage change. 2005 Q1 – 2017 Q4³⁾



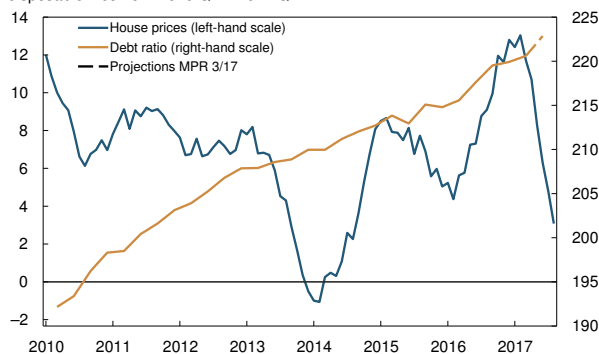
1) Seasonally adjusted.
2) Reported output growth past three months converted to quarterly figures (solid line). The quarterly figures are calculated by weighting together three-monthly figures based on when the survey was carried out. For 2017 Q3 expected output growth is estimated by weighting together reported growth over the past three months and expected growth in the next six months and 2017 Q4 is expected growth in the next six months (broken orange line).
3) Projections for 2017 Q3 – 2017 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 1.7 Growth in employment in the quarterly national accounts and regional network¹⁾. Four-quarter percentage change. 2005 Q1 – 2017 Q4²⁾



1) Reported output growth past three months (solid line). Quarterly figures are calculated by weighting together three-monthly figures based on when the survey was carried out. For 2017 Q3, expected output growth is estimated by weighting together reported growth over the past three months and expected growth in the next three months and 2017 Q4 is expected growth in the next three months (broken orange line).
2) Projections for 2017 Q3 – 2017 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 1.8 House prices. Twelve-month percentage change. January 2010 – August 2017. Household debt ratio. Debt as a percentage of disposable income¹⁾. 2010 Q1 – 2017 Q2²⁾



1) Disposable income is adjusted for estimated reinvested dividend income for 2000 Q1 – 2005 Q4 and reduction of equity capital for 2006 Q1 – 2012 Q3. For 2015 Q1 – 2017 Q2 growth in disposable income excluding dividends is used.
2) Projections for 2017 Q2.
Sources: Eiendomsværdi, Finn.no, Real Estate Norway, Statistics Norway and Norges Bank

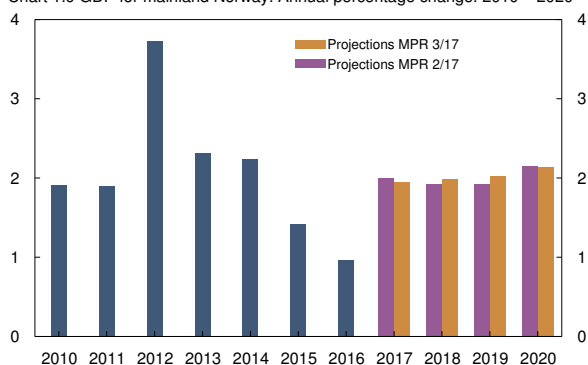
The rapid rise in house prices and high debt growth have increased the vulnerability of households in recent years (Chart 1.8). Since spring, house prices have fallen, and price developments in recent months have been weaker than expected. Household credit growth remains high. Low house price inflation will curb debt accumulation but it will take time for household vulnerabilities to recede. The correction in the housing market may lower the risk of an abrupt and more pronounced decline further out.

Broadly unchanged inflation projections for 2017

Consumer price inflation has fallen sharply since summer 2016. The decline has been most pronounced for imported consumer goods, but also the rise in prices for domestically produced goods and services has slowed. In August, the twelve-month rise in consumer prices adjusted for tax changes and excluding energy products (CPI-ATE) was 0.9%. Developments in inflation since the June Report have been approximately as projected. As in the June Report, inflation is expected to pick up through autumn. The projection is little changed.

Annual wage growth is projected at 2.4% in 2017. The projection is unchanged from the June Report and is in line with the norm for this year's wage settlement.

Chart 1.9 GDP for mainland Norway. Annual percentage change. 2010 – 2020¹⁾



1) Projections for 2017 – 2020.
Sources: Statistics Norway and Norges Bank

1.3 MONETARY POLICY AND PROJECTIONS

Interest rate forecast little changed

The analyses and assessment in this Report imply that the key policy rate is kept at 0.5% in the coming year, followed by a gradual rate increase to close to 1.5% towards the end of 2020. The key policy rate forecast is little changed on the June Report, but implies a somewhat earlier rate increase (Chart 1.1 a).

Stronger global growth, a slightly faster rate increase abroad, the rise in oil prices and higher capacity utilisation in Norway pull up the forecast for the key policy rate, as does a lower money market premium. On the other hand, it appears that wage growth will remain moderate, even though capacity utilisation is higher than previously assumed. Together with a stronger krone, this pulls down the rate path. Uncertainty regarding the effects of monetary policy suggests a cautious approach to interest rate setting, also when it becomes appropriate to increase the key policy rate. The Bank's overall judgement suggests a slightly less

THE PROJECTIONS IN THE JUNE 2017 MONETARY POLICY REPORT

The analysis in the June 2017 Report implied that the key policy rate would be kept unchanged at 0.5% in 2017 and 2018, followed by a gradual increase from 2019. With this path for the key policy rate, inflation was projected to be somewhat above 1.5% at the end of 2020. Capacity utilisation was assessed to be lower than normal, and the projections implied that it would rise gradually and reach a normal level in 2020.

pronounced upward adjustment of the interest rate path than new information alone would indicate.

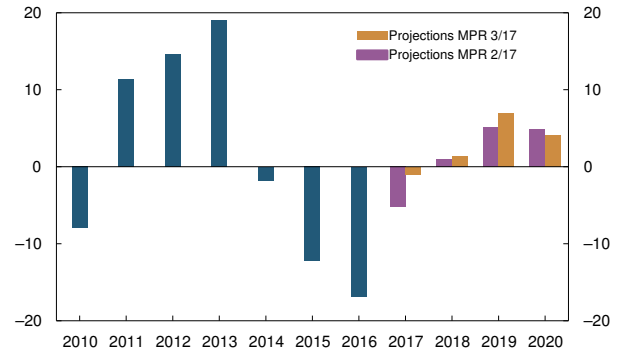
Inflation is expected to remain low in the years ahead. Towards the end of 2020, the four-quarter rise in the CPI is projected to increase to just below 2%. Compared with the *June Report*, the projections for inflation are little changed for the coming years, but are slightly higher towards the end of the projection period (Chart 1.1c and 1.1d). Capacity utilisation is expected to rise gradually in the years ahead to somewhat above a normal level in 2020. The projection for capacity utilisation is somewhat higher than in the *June Report* throughout the projection period (Chart 1.1b).

The krone is projected to appreciate slightly in the coming years, partly on the back of an expected widening of the interest rate differential further out. Compared with the *June Report*, the krone exchange rate is projected to be a little stronger throughout the projection period.

The mainland economy is expected to grow by 2% in 2017, with the pace of growth remaining broadly unchanged in the years ahead (Chart 1.9). The projections are little changed since the time of the *June Report*. The increase in the pace of growth between 2016 and 2017 primarily reflects stronger growth in household consumption and housing investment, and what appears to be a reversal in the decline in petroleum investment (Chart 1.10). The correction in the housing market suggests that housing investment will not continue to grow in the coming years. Beginning in 2018, public demand is expected to make a markedly smaller contribution to growth (Chart 1.11). A greater share of demand growth is then expected to come from business investment, net exports and petroleum investment.

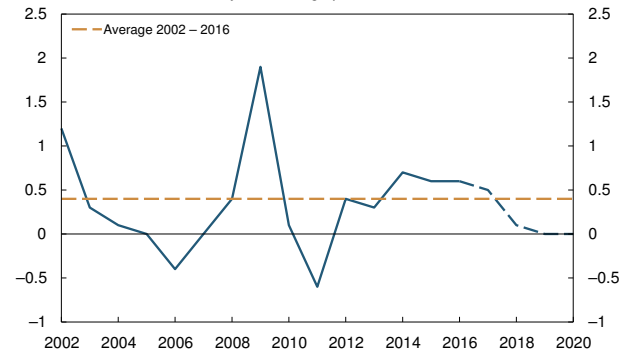
Employment is expected to rise by around 1% annually in the years ahead. The projection is little changed from the *June Report*, but the level of employment will remain higher until the end of 2020, since employment has recently risen more than expected. Likewise, unemployment is projected to remain somewhat lower than anticipated in the *June Report* (Chart 1.12). A gradually tightening labour market and rising productivity growth are expected to push up wage growth in the years ahead.

Chart 1.10 Petroleum investment. Annual percentage change. 2010 – 2020¹⁾



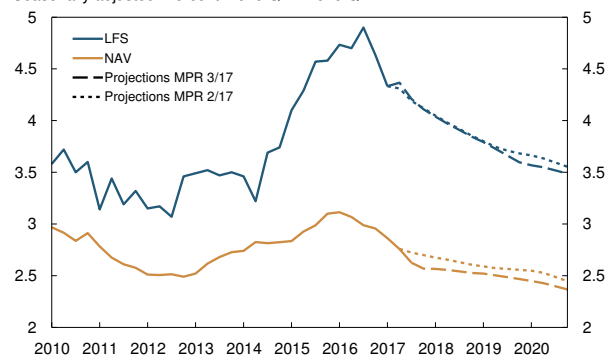
1) Projections for 2017 – 2020.
Sources: Statistics Norway and Norges Bank

Chart 1.11 Change in structural non-oil deficit as a share of trend GDP for mainland Norway. Percentage points. 2002 – 2020¹⁾



1) Projections for 2017 – 2020 (broken blue line).
Sources: Ministry of Finance and Norges Bank

Chart 1.12 Unemployed as a share of the labour force. LFS¹⁾ and NAV²⁾. Seasonally adjusted. Percent. 2010 Q1 – 2020 Q4³⁾

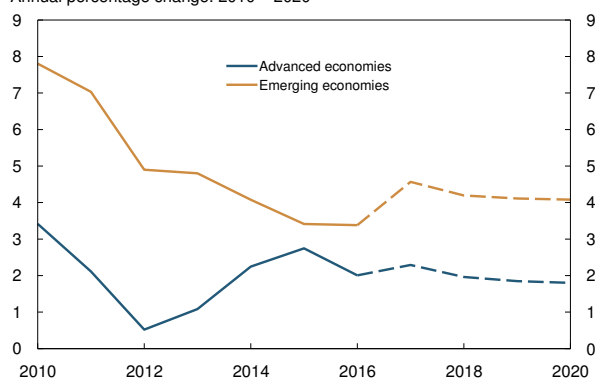


1) Labour Force Survey.
2) Registered unemployment.
3) Projections for 2017 Q3 – 2020 Q4 (broken lines).
Sources: Norwegian Labour and Welfare Administration (NAV), Statistics Norway and Norges Bank

2 The global economy

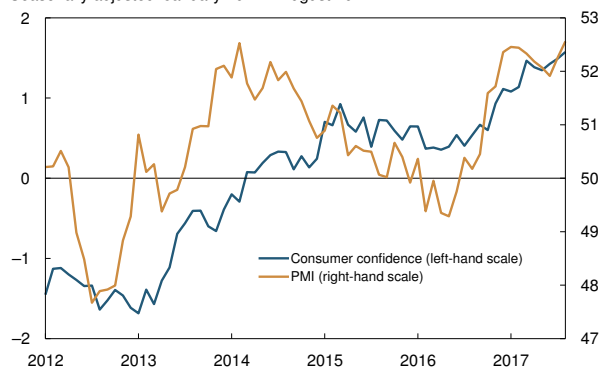
The upturn among Norway's trading partners is continuing in both advanced and emerging economies. Various confidence indicators are at high levels. Norges Bank projections for growth in GDP among trading partners have been revised up for 2017. From 2018, GDP growth is expected to be somewhat lower than in 2017, around that projected in the June 2017 *Monetary Policy Report*. Consumer price inflation has abated more than expected, but is projected to move up in the coming years. Oil prices are somewhat higher than assumed in the June *Report*. Expected money market rates among trading partners are a little higher than in the June *Report*.

Chart 2.1 GDP for Norway's trading partners.¹⁾
Annual percentage change. 2010 – 2020²⁾



1) Export weights. 25 main trading partners.
2) Projections for 2017 – 2020 (broken lines).
Sources: Thomson Reuters and Norges Bank

Chart 2.2 Global confidence indicators. PMI¹⁾ and consumer confidence index²⁾.
Seasonally adjusted. January 2012 – August 2017



1) Manufacturing PMI. GDP-weighted index for Norway's trading partners.
2) GDP-weighted index of standardised consumer confidence indexes for the US, UK, euro area and Sweden.
Sources: Thomson Reuters and Norges Bank

2.1 GROWTH, PRICES AND INTEREST RATES

Higher growth among trading partners in 2017

Economic growth has picked up in both advanced and emerging economies (Chart 2.1). Growth has been higher than expected among most of Norway's trading partners. Overall trading partner GDP growth is projected at 2.7% in 2017, which is higher than in the June *Report*. Growth is projected at an annual rate of around 2.3% in the coming years (Annex Table 1). The projections imply an increase in capacity utilisation to a normal level in the course of the next few years.

Household and business confidence indicators remain at high levels (Chart 2.2). In the near term, employment growth is expected to remain high and financial conditions to remain favourable. This will contribute to sustaining growth in consumption and investment in most countries. The upswing in investment is expected to continue further ahead, resulting in higher productivity growth in many countries. At the same time, the impulses from fiscal and monetary policy will likely be weaker than earlier. In the following years, growth is therefore expected to be somewhat lower than in 2017.

In line with the improvement in the global growth picture, the projections for overall import growth among trading partners have been revised up. In isolation, increased imports among trading partners contributes to boosting Norwegian exports.

There is uncertainty surrounding global economic developments. On the one hand, given the high level of household and business confidence indicators, growth may prove to be stronger than projected in this *Report*. On the other hand, geopolitical uncertainty and new protectionist measures may dampen global growth to a further extent than assumed.

Lower-than-projected inflation, but an increase expected ahead

Consumer price inflation among main trading partners edged up in the latter half of 2016 and into 2017, partly fuelled by higher energy prices. In recent months, however, inflation has been lower than expected, partly reflecting temporary factors. Oil prices have increased somewhat since the *June Report*, which will push up consumer price inflation in the near term. Oil spot prices are around USD 55 per barrel (see box on page 17).

Core inflation in advanced economies has been low for a long time. Despite the improvement in the labour market in many countries, wage growth remains low. This reflects both low growth in labour productivity since the financial crisis and continued slack in a number of countries. However, core inflation has picked up among several of Norway's main trading partners in recent months (Chart 2.3). Consumer price inflation is projected to edge up in pace with rising capacity utilisation in the period to 2020 (Annex Table 2). On balance, the projections for consumer price inflation among trading partners are broadly in line with the projections in the *June Report*.

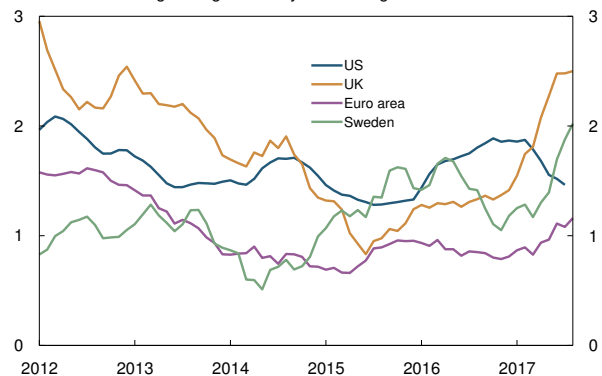
Slight rise in international interest rates

The international interest rate level is very low. Since the *June Report*, US and German interest rates have shown little change, while Swedish and UK rates have moved up (Chart 2.4).

In recent months, a number of central banks have signalled that they are closer to tightening monetary policy. Market participants' policy rate expectations for trading partners have, on balance, moved slightly higher since the *June Report* (Chart 1.3 in Section 1)

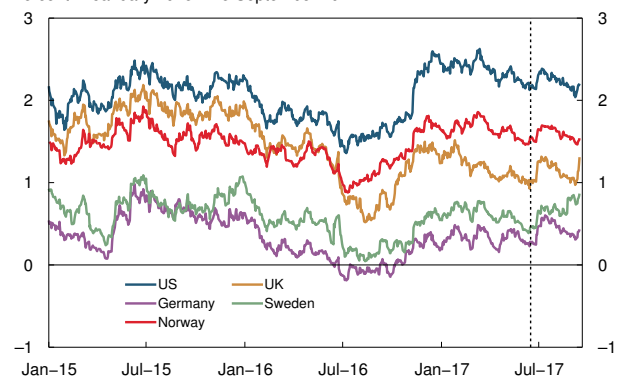
The central banks in the US, euro area, UK and Sweden have not changed their policy rates since the

Chart 2.3 Core CPI¹⁾ in selected countries. Twelve-month percentage change. Three-month moving average. January 2012 – August 2017²⁾



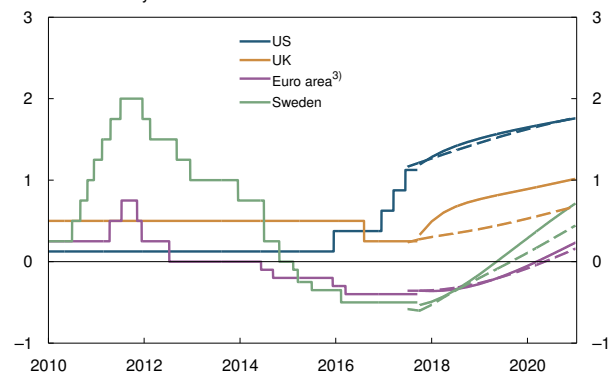
1) CPI excluding the most volatile components (mainly food and energy products).
2) The latest observation for the US is July 2017.
Source: Thomson Reuters

Chart 2.4 Yields on ten-year government bonds in selected countries. Percent. 1 January 2015 – 15 September 2017¹⁾



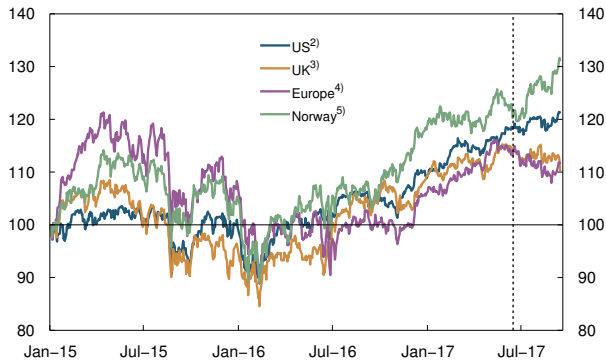
1) MPR 2/17 was based on information through 16 June 2017, indicated by the vertical line.
Source: Bloomberg

Chart 2.5 Policy rates and estimated forward rates¹⁾ in selected countries. Percent. 1 January 2010 – 31 December 2020²⁾



1) Forward rates at 16 June 2017 (broken lines) and 15 September 2017 (solid lines). Forward rates are based on Overnight Index Swap (OIS) rates.
2) Daily data through 15 September 2017. Quarterly data from 2017 Q4.
3) ECB's deposit rate. Eonia from 2017 Q4.
Sources: Bloomberg, Thomson Reuters and Norges Bank

Chart 2.6 Equity price indexes in selected countries. 2 January 2015 = 100. 2 January 2015 – 15 September 2017¹⁾



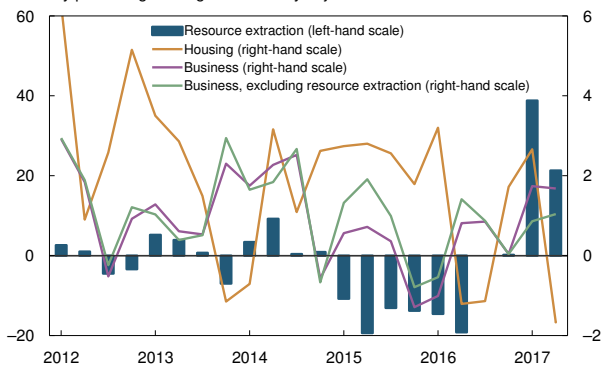
1) MPR 2/17 was based on information through 16 June 2017, indicated by the vertical line.
 2) Standard and Poor's 500 Index.
 3) Financial Times Stock Exchange 100 Index.
 4) Stoxx Europe 600 Index.
 5) OSE Benchmark Index.
 Source: Bloomberg

June Report. The Federal Reserve's forecast suggests a further interest rate hike this year, while forward rates do not indicate a rate hike until spring 2018 (Chart 2.5). The Federal Reserve has also signalled that it will start reducing its balance sheet.

The European Central Bank (ECB) asset purchase programme expires at the end of 2017. Market participants expect that the programme will be extended, but with lower monthly asset purchases than is the case today. Forward rates imply an interest rate hike in the beginning of 2019.

The Bank of England has indicated that it expects to tighten monetary policy somewhat in the coming months. Forward rates suggest that the policy rate will be raised towards the end of 2017, around half a year earlier than expected at the time of the June Report.

Chart 2.7 Investment in the US. Quarterly percentage change. Seasonally adjusted. 2012 Q1 – 2017 Q2

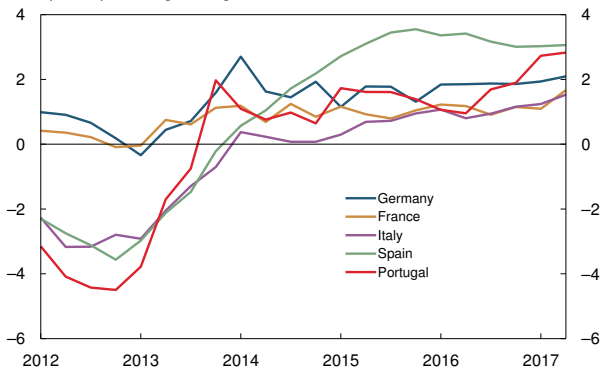


Source: Thomson Reuters

Owing to surprisingly strong economic data, market participants expect the policy rate in Sweden to increase somewhat faster than in the June Report, and the Swedish krona has appreciated markedly. The central bank has revised up the policy rate forecast somewhat and indicates that the policy rate has bottomed out.

Overall, equity indexes in advanced countries are little changed (Chart 2.6). The broad European equity index Stoxx 600 slid somewhat, while US equities have advanced since the June Report. The MSCI index for emerging economies has also made gains in the period.

Chart 2.8 GDP for selected countries in the euro area. Four-quarter percentage change. 2012 Q1 – 2017 Q2



Source: Thomson Reuters

2.2 COUNTRIES AND REGIONS

Expansionary US fiscal policy less likely

Growth in the US picked up in the second quarter after a period of subdued growth around the turn of the year, with GDP rising more than expected in the June Report. Growth in private consumption and business investment in particular was solid, while housing investment declined. Business investment has been heavily influenced by oil market conditions over the past years. Two years of sharp declines in investment in natural resource extraction was followed by an upward shift after the turn of the year (Chart 2.7), with investment rising by more than 50% between the

latter half of 2016 and the first half of 2017. In addition, investment in production equipment has been solid in recent quarters.

Indicators of business investment intentions point to continued firm growth. At the same time, consumption growth is expected to lose some momentum ahead. While labour market conditions have improved substantially, wage growth remains moderate. Nominal wage growth is expected to edge up as available slack is taken up. So far, political agreement has not been reached on health and tax reforms, and a budget for 2018 has yet to be approved. Fiscal impulses are expected to be somewhat weaker than assumed in the *June Report*. The GDP forecasts for 2018 have therefore been revised down somewhat, while the forecasts for subsequent years remain virtually unchanged. Annual GDP growth is projected at between 2% and 2.2% through the projection period.

Improved growth outlook for the euro area

Euro-area GDP growth has picked up in recent quarters. Second-quarter growth was somewhat higher than projected in the *June Report* and confirmed the picture provided by various confidence indicators, which have increased considerably so far this year. All euro-area countries are now experiencing an upturn, and growth differentials have narrowed (Chart 2.8). Growth has been particularly strong in Spain, where GDP has increased by 10% over the past three years. The upturn in the euro area is broadly spread across sectors and demand components. Consumption growth is strong as a result of considerable improvements in labour market conditions, particularly in southern Europe. The number of employed in the euro area has increased by over 2m in the past 12 months. Unemployment has declined from 10% to 9.1% in the same period, and indicators for business employment intentions point to further improvement.

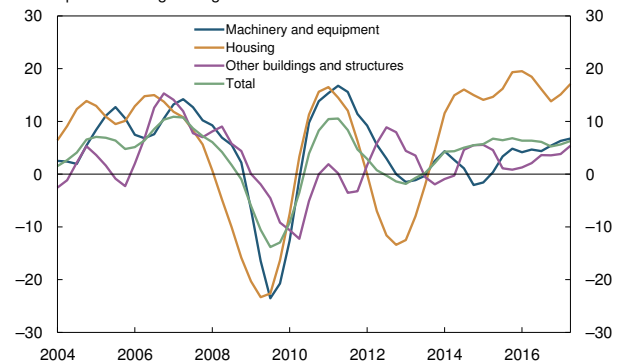
In recent years, growth has been supported by low commodity prices, reduced fiscal austerity and an expansionary monetary policy, which have contributed to fuelling credit growth and weakening the exchange rate. The euro has recently appreciated while commodity prices have increased. Looking ahead, growth is also likely to be restrained by the challenges linked to still-high debt levels and low

Chart 2.9 Wage growth in the UK. Twelve-month percentage change. Three-month moving average. January 2004 – July 2017



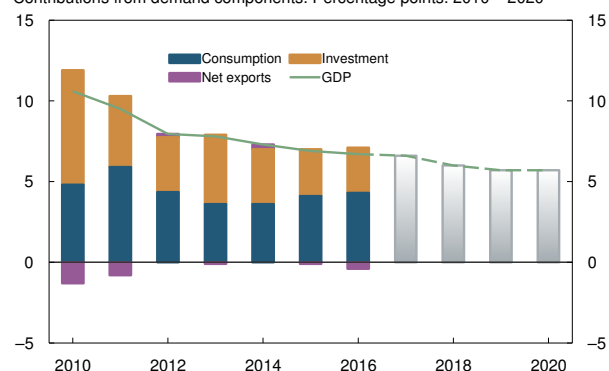
1) Nominal wage growth deflated by the consumer price inflation. Source: Thomson Reuters

Chart 2.10 Investment in Sweden. Four-quarter percentage change. Three-quarter moving average. 2004 Q1 – 2017 Q2



Source: Statistics Sweden

Chart 2.11 GDP in China. Annual percentage change. Contributions from demand components. Percentage points. 2010 – 2020¹⁾



1) Projections for 2017 – 2020 (broken line and shaded bars). Sources: Thomson Reuters and Norges Bank

labour force growth in a number of countries. Euro-area GDP growth is projected at 2.1% in 2017, slowing to 1.7% in 2018 and 1.5% in 2020. The projections are higher throughout the projection period compared with the *June Report*.

Low growth in the UK

Growth in the UK slowed in the first half of 2017 following several years of strong growth. Household confidence indicators have dropped to their lowest levels since the EU referendum, and retail sales have fallen sharply so far this year. House price inflation has also declined. At the same time, employment is rising and unemployment is moving down. Several factors indicate, however, that there are available labour resources. Among other things, the number of part-time employees who prefer to work more hours has stayed high at the same time as wage growth remains moderate. Real wage growth has turned negative again (Chart 2.9), partly reflecting the sharp rise in prices that has followed the depreciation of sterling.

Looking ahead, growth in private consumption is expected to be sluggish, partly reflecting weakened purchasing power and increased uncertainty as the deadline nears for the UK's negotiations with the EU on withdrawal arrangements. The UK government has not yet presented a full plan for managing the EU withdrawal process. Norges Bank's projections are based on the assumption that there will not be a notable disruption in trade relations between the UK and the EU after the negotiation deadline comes to a close in 2019. Uncertainty associated with withdrawal is nevertheless expected to weigh on business investment in the coming years. On balance, annual GDP growth is expected at around 1.5% through the projection period, in line with that projected in the *June Report*.

Surprisingly high growth in Sweden

The Swedish economy appears to be continuing to grow at the high rates recorded in 2015 and 2016. In 2017 Q2, growth was appreciably higher than expected. Growth was primarily driven by strong investment activity (Chart 2.10). Housing market activity has been vigorous. The strong cyclical upswing is also reflected in the labour market where employment

is still rising rapidly. As expected, export growth has picked up in line with solid growth among Sweden's trading partners. Looking ahead, tightened economic policy and capacity constraints will contribute to curbing growth in domestic demand and output. GDP growth has been revised up for 2017 and 2018 to 3.2% and 2.5%, respectively. Growth is then projected to slow to around 2% annually, in line with that projected in the *June Report*.

Growth in emerging economies remains solid

Growth in China has remained above 6.5% in recent years, in line with the authorities' objective. So far in 2017, growth has been stronger than projected in the *June Report*. Consumption has made the largest contribution to growth in recent years (Chart 2.11). Real estate investment is still growing rapidly in spite of measures by the authorities to restrain activity in the housing market. Tighter credit conditions are expected to dampen GDP growth later this year. The growth projection for 2017 has been revised up to 6.6%. As the rebalancing from debt-financed investment to private consumption continues, growth is expected to drift down to below 6% annually, approximately as projected in the *June Report*.

In emerging economies excluding China, overall growth has been a little higher than projected in the *June Report*. Brazil is affected by political unrest, and it now appears less likely that labour market and pension reforms will be implemented in the near term. The attendant uncertainty will probably weigh on investment in the short term. In Russia, growth has picked up further from a low level. The growth projection for 2017 has been revised up, but new US sanctions have increased the uncertainty surrounding developments ahead. Growth in emerging economies excluding China is projected to increase from 3.6% in 2017 to 4% in 2019 and 2020. The projection for 2017 has been revised up compared with the *June Report*.

DEVELOPMENTS IN OIL AND GAS PRICES

Oil prices fell from around USD 110 per barrel in summer 2014 to around USD 30 per barrel at the start of 2016. The decline reflected a global oil supply glut (Chart 2.12). In recent years, growth in oil consumption has picked up again while production growth has slowed. At the end of 2016, OPEC and several other countries entered into an agreement to cut oil production in the first half of 2017 by close to 1.8m barrels per day. In May 2017, the agreement was extended to end-March 2018.

After hovering between USD 50 and 55 per barrel between December 2016 and May 2017, oil prices declined to almost USD 45 in June. This is partly related to the strong growth in US oil production. From March, OPEC production also increased, but OPEC reaffirmed in July that the production limits would apply, and Saudi Arabia also signalled a cut in exports. Lower oil prices also halted the increase in the number of active rigs in the US (Chart 2.13). Since August, oil prices have increased to around USD 55 per barrel.

Global oil consumption rose markedly in Q2 following weak growth in Q1. Oil inventories in the OECD area have declined since April, and may fall further if OPEC applies the production cuts as announced. In isolation, this could lead to higher oil prices, but the cuts will likely be offset by a further increase in US oil production.

In the longer term, non-OPEC production growth may decline as a result of the fall in global oil investment in 2015 and 2016. Investment in existing reserves is picking up, but exploration investment is still on the decline.¹ New field developments and the number of new oil discoveries fell in 2016 to the lowest level recorded since the 1950s. New field developments continued to fall in 2016 from a low level in 2015. On the other hand, international oil companies are still cutting costs so that new projects can be profitably exploited at steadily lower prices. Moreover, global oil consumption may moderate further out owing to energy efficiency gains and strong growth in renewable energy sources.

Oil prices are assumed to move in line with futures prices (Chart 1.4 in Section 1). Futures prices indicate that prices will remain at around USD 55 to the end of 2020, somewhat higher than assumed in the June Report.

Norwegian gas prices are still substantially lower than in the period 2011–2013. UK and continental gas prices rose sharply towards the end of 2016 and into 2017, but then fell back. Gas prices have recently edged up again. Export prices for Norwegian gas are expected to follow other European gas prices. The International Energy Agency's (IEA) medium-term report on gas for 2017 indicates that gas prices may stay at today's level for a prolonged period ahead.²

1 See IEAs *World Energy Investment 2017*
2 See IEAs *Gas 2017*

Chart 2.12 Balance in the global oil market. In millions of barrels per day. 2012 Q1 – 2017 Q2

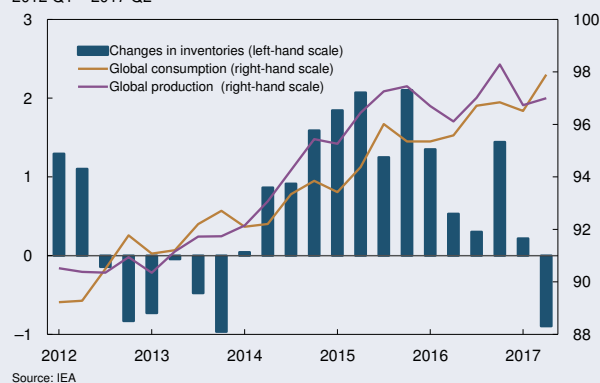
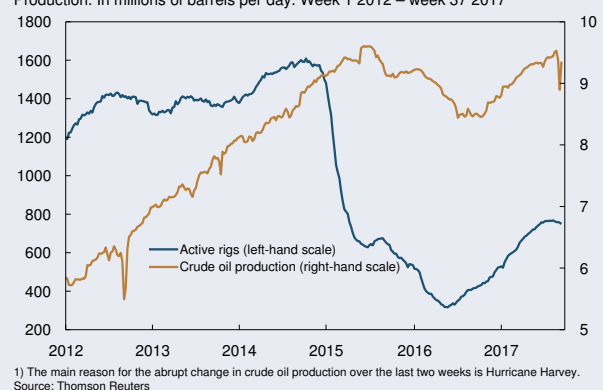


Chart 2.13 Active rigs and crude oil production in the US.¹⁾ Production. In millions of barrels per day. Week 1 2012 – week 37 2017



3 The Norwegian economy

Growth in the Norwegian economy has gathered momentum over the past year. Employment has risen and unemployment has fallen, but capacity utilisation is still below a normal level. The mainland economy is expected to grow by 2% in 2017, with the pace of growth remaining broadly unchanged in the years ahead. Unemployment is projected to fall gradually, and capacity utilisation is expected to be somewhat above a normal level in 2020. Inflation has slowed markedly since summer 2016 and wage growth is moderate. Inflation is projected to pick up to just below 2% at the end of the projection period.

INTEREST RATES AND RISK PREMIUMS

Three-month Nibor, which is the money market rate with three-month maturity, is an important reference rate in the Norwegian money market. A considerable share of bank funding is priced on the basis of this rate. The level of three-month Nibor is roughly determined by two factors: the market's expectation of the average key policy rate over the next three months and a risk premium, which is generally referred to as the money market premium. Nibor is constructed as a foreign exchange swap rate. The banks that quote Nibor start with a USD interest rate and adjust it for the price of converting USD into NOK in the foreign exchange swap market. This means that international conditions, such as a higher premium in the USD rate or a higher price for converting USD into NOK, can have a direct impact on the premium in the Norwegian money market rate, Nibor.

When banks borrow in the bond market, they pay a risk premium on top of Nibor. Premiums for the individual bonds vary with banks' creditworthiness and with the maturity of the bonds. The price of banks' wholesale funding has an impact on the level of deposit and lending rates for households and businesses.

3.1 FINANCIAL CONDITIONS

Lower money market premiums

The money market rate has fallen since the beginning of the year and is slightly lower than assumed in the June 2017 *Monetary Policy Report* (Chart 3.1). Money market premiums rose in autumn 2016 in connection with the introduction of new regulations for US money market funds. As expected, the increase was temporary, but the premiums now seem to have stabilised at a lower level than previously assumed. Near-term market expectations with regard to the key policy rate have remained stable since the June *Report*.

The three-month Nibor premium is assumed to be 35 basis points to the end of the projection period. This is close to the current level and slightly lower than assumed in the June *Report*. Together with the key policy rate forecast, this implies that the money market rate will remain broadly at today's level in 2017 and 2018 before gradually increasing (Chart 3.2). Compared with the June *Report*, the projection for the money market rate is little changed for 2017 and 2018 and slightly higher towards the end of the projection period.

The price of banks' long-term wholesale funding has also edged down recently. If risk premiums in the bond market remain at today's level, the average premium on banks' wholesale funding outstanding will gradually fall through the projection period. This will, in isolation, push down banks' average funding costs.

Somewhat earlier rise in lending rates

Higher funding costs through 2016 led banks to raise their lending rates slightly, effective from the beginning of 2017 (Chart 3.3). Since then, the combination of falling funding costs and unchanged lending rates

has resulted in higher margins on loans to households. Lending rates for enterprises have fallen approximately in pace with the decrease in the money market rate. For the years ahead, banks' margins on loans to households are expected to decline towards a more normal level. This implies that household lending rates will first edge down, then increase gradually as the money market rate rises. The projections imply that the rise in lending rates will occur somewhat earlier than assumed in the *June Report*.

Krone exchange rate stronger than projected

The krone exchange rate, as measured by the import-weighted exchange rate index I-44, weakened considerably in the wake of the fall in oil prices that began in summer 2014 (Chart 3.4). Through 2016, the krone strengthened on the back of higher oil prices and a wider interest rate differential against trading partners. In the first half of 2017, lower oil prices and a narrower interest rate differential led to a partial reversal of the earlier appreciation.

Since the *June Report*, the krone has strengthened somewhat more than expected. The krone has appreciated in particular against the US dollar, while the exchange rate against sterling, the euro and the Swedish krona is little changed. The interest rate differential has continued to narrow since June, but with somewhat higher oil prices, market participants may now have a more positive view on holding NOK.

The krone is projected to appreciate slightly in the coming years, partly on the back of an expected widening of the interest rate differential further out. Compared with the *June Report*, the krone exchange rate is projected to be a little stronger throughout the projection period.

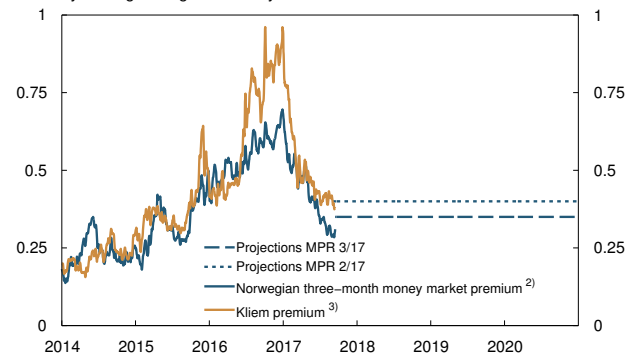
3.2 OUTPUT AND DEMAND

Stronger growth in the mainland economy

After a few years of weak growth in the Norwegian economy in the wake of the fall in oil prices, growth accelerated at the end of 2016 and into 2017. The pickup was driven by a weaker krone, low interest rates and an expansionary fiscal policy, combined with a slower decline in petroleum investment.

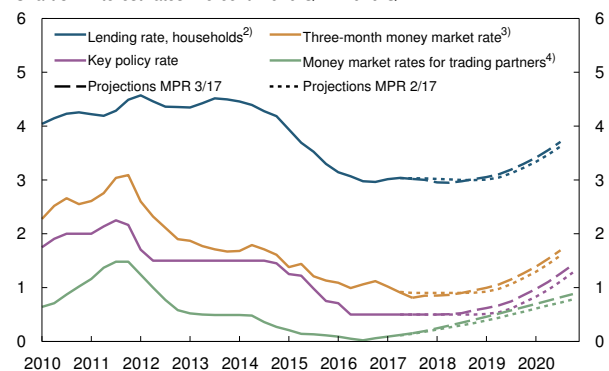
According to the quarterly national accounts (QNA), mainland GDP increased by 0.7% in both the first and

Chart 3.1 Three-month money market premium. Percentage points. Five-day moving average. 1 January 2014 – 31 December 2020¹⁾



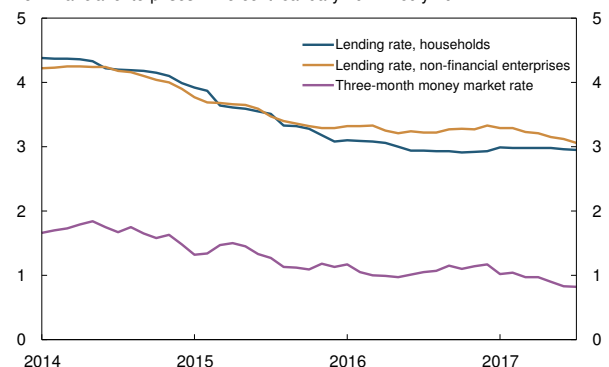
1) Projections for 2017 Q3 – 2020 Q4 (broken lines).
2) Norges Bank estimates of the difference between the three-month money market rate and the expected key policy rate.
3) The Klem premium is intended to reflect European banks' cost of USD interbank borrowing. In practice, the Klem rate is the European money market rate, Euribor, swapped into USD.
Sources: Bloomberg, Thomson Reuters and Norges Bank

Chart 3.2 Interest rates. Percent. 2010 Q1 – 2020 Q4¹⁾



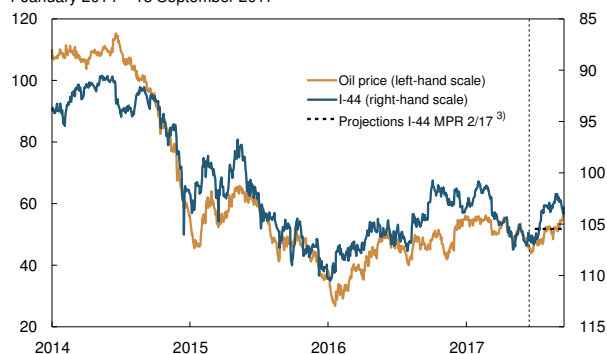
1) Projections for 2017 Q3 – 2020 Q4 (broken lines).
2) Average interest rate on all loans to households from banks and mortgage companies.
3) Key policy rate plus Norwegian money market premium. The calculations are based on the assumption that the key policy rate forecast is priced into the money market.
4) Based on money market rates and interest rate swaps. The aggregate for trading partner three-month interest rates is described in *Norges Bank Memo 2/2015*.
Sources: Statistics Norway, Thomson Reuters and Norges Bank

Chart 3.3 Money market rates and lending rates for households and non-financial enterprises.¹⁾ Percent. January 2014 – July 2017



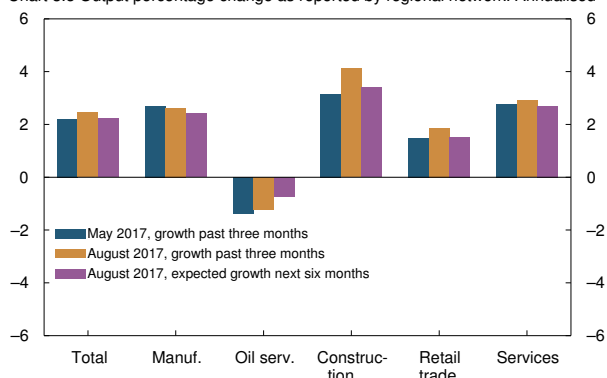
1) Average interest rate on all loans to households and non-financial enterprises from banks and mortgage companies. Fifty largest banks and mortgage companies.
Sources: Statistics Norway and Norges Bank

Chart 3.4 Oil price¹⁾ and import-weighted exchange rate index (I-44)²⁾. 1 January 2014 – 15 September 2017



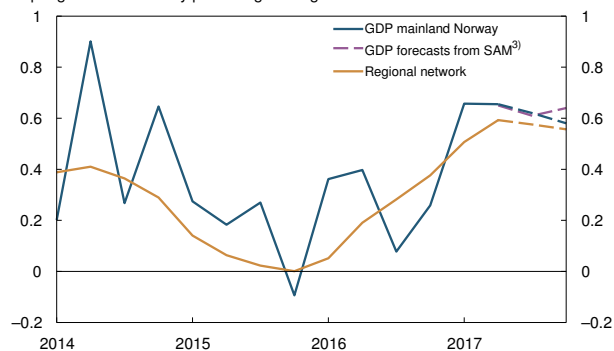
1) Brent Blend, USD/barrel.
 2) A positive slope denotes a stronger krone exchange rate.
 3) MPR 2/17 was based on information through 16 June 2017, indicated by the vertical line.
 Sources: Thomson Reuters and Norges Bank

Chart 3.5 Output percentage change as reported by regional network. Annualised



Source: Norges Bank

Chart 3.6 GDP for mainland Norway and regional network's indicator of output growth¹⁾. Quarterly percentage change. 2014 Q1 – 2017 Q4²⁾



1) Reported output growth past three months converted to quarterly figures (solid line). The quarterly figures are calculated by weighting together three-monthly figures based on when the survey was carried out. For 2017 Q3 expected output growth is estimated by weighting together reported growth over the past three months and expected growth in the next six months. 2017 Q4 is expected growth in the next six months as reported in August (broken orange line).
 2) Projections for 2017 Q3 – 2017 Q4 (broken lines).
 3) System for Averaging short-term Models.
 Sources: Statistics Norway and Norges Bank

the second quarter of 2017, approximately as projected in the *June Report*.

Norges Bank's regional network contacts reported in August that growth over the preceding three months had been slightly higher than in the previous period. Growth picked up in most industries (Chart 3.5). Overall, network contacts expected the pace of growth to slow a little over the second half of 2017. Some enterprises reported that uncertainty in the housing market was weighing on expectations.

Growth in mainland GDP is expected to be slightly lower in the second half of 2017 compared with the first half of the year (Annex Table 3a). The projections are in line with the forecasts from Norges Bank's System for Averaging short-term Models (SAM) and regional network expectations (Chart 3.6). The projections are little changed from the *June Report*.

Annual mainland GDP growth is projected at 2% in 2017 and is expected to remain broadly unchanged to end-2020. In 2017, household consumption, housing investment and public sector demand are making the strongest contribution to growth. This picture is expected to change in the years ahead. The correction in the housing market implies a decline in housing investment from 2018. At the same time, it is assumed that the fiscal stimulus will be close to zero in the years ahead (see box on page 32). On the other hand, it appears petroleum investment will bottom out in 2017 and will increase in the years ahead. The petroleum investment projections are discussed in detail in a box on page 33. Non-oil business investment and exports are also expected to make a positive contribution to growth as from 2018. The projections for mainland GDP growth are little changed from the *June Report*.

Higher growth in consumption in 2017

Growth in household consumption slowed through 2015 and into 2016, probably dampened by weak employment growth and moderate wage growth. Low mortgage rates and an increase in the value of housing wealth have probably prevented a sharper decline, and the household saving ratio has fallen markedly. The slowdown in consumption growth applied to consumer goods, while growth in services consumption held up (Chart 3.7). Developments

reflect high goods inflation in this period. Growth in goods consumption picked up in the second half of 2016 and into 2017, in pace with falling goods inflation.

Household consumption rose markedly and more than expected in 2017 Q2. The Kantar TNS and Opinion expectations indicators show that consumer confidence has risen (Chart 3.8). Growth in household consumption is projected to be somewhat higher in the near term than projected in June, although not as high as in the second quarter.

Further ahead, higher employment growth and higher real wage growth are expected to push up household consumption. Higher mortgage rates further out will have the opposite effect. With increased household debt ratios (Chart 1.8 in Section 1), higher mortgage rates will reduce household disposable income more than previously. Annual growth in household consumption is projected to increase from 1.5% in 2016 to 2.7% in 2017 and 2018, then decrease somewhat in 2019 and 2020 (Chart 3.9). The projections are higher than in the *June Report*. The projections imply that the saving ratio will continue to fall in 2017 and then remain little changed in the years ahead (Chart 3.10).

The recent strong growth in consumption and the positive confidence indicators may suggest that consumption growth will be higher than projected. On the other hand, lower house prices may induce households to increase saving ahead.

Lower house price inflation

House prices rose sharply through 2016 and were 13% higher in December than twelve months earlier. House price inflation has gradually slowed in 2017 and house prices have been falling since spring (Chart 3.11). Changes in the regulation on residential mortgage loans that became effective from the turn of the year have probably had a dampening impact on the rise in house prices. House price developments have been weaker than assumed in the *June Report*.

There are wide regional differences in the housing market. House price inflation in Oslo showed the strongest rise in 2016 and has shown the most pronounced decline since the turn of the year.

Chart 3.7 Household consumption of goods and services. Four-quarter percentage change. Seasonally adjusted. 2010 Q1 – 2017 Q2

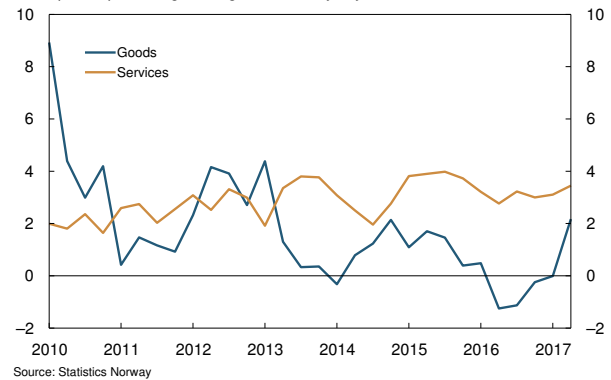


Chart 3.8 Consumer confidence. Net values. Kantar TNS trend indicator for households. 2005 Q1 – 2017 Q3. Opinion consumer confidence index (CCI). May 2005 – August 2017

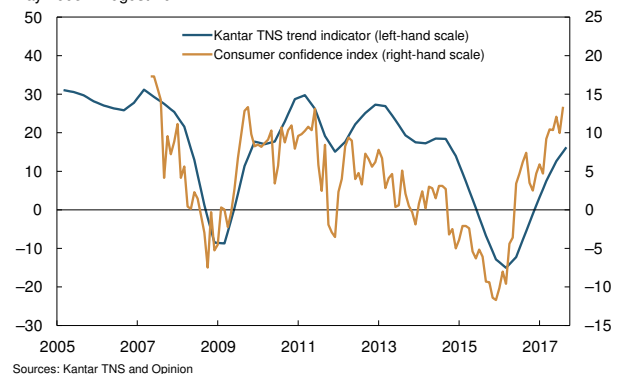
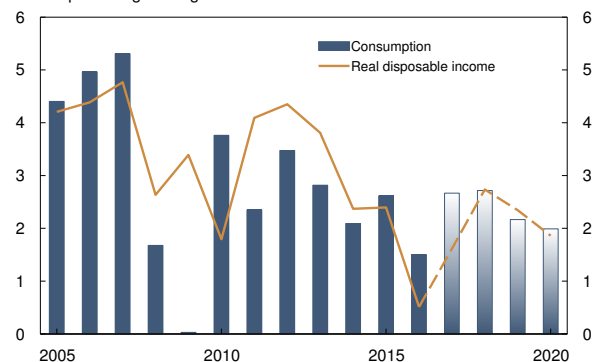
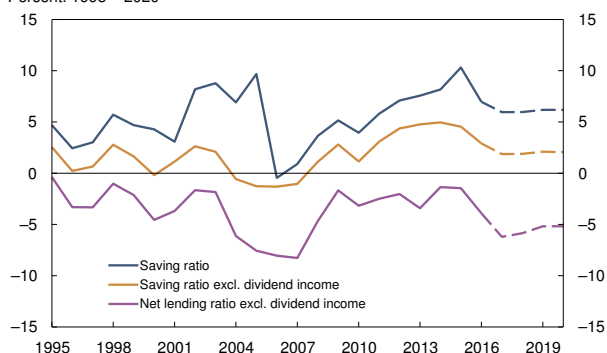


Chart 3.9 Household consumption¹⁾ and real disposable income²⁾. Annual percentage change. 2005 – 2020³⁾



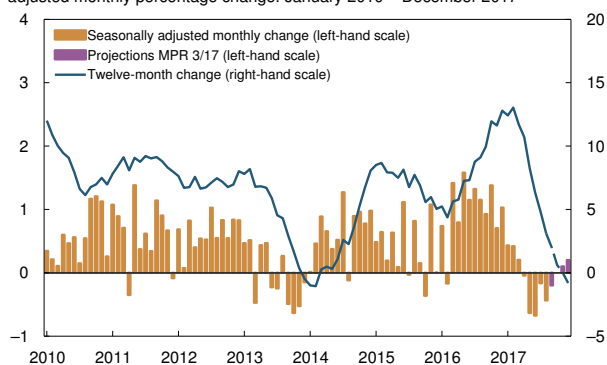
1) Includes consumption for non-profit organisations.
2) Excluding dividend income. Including income for non-profit organisations. Deflated by the CPI.
3) Projections for 2017 – 2020 (broken line and shaded bars).

Chart 3.10 Household saving and net lending as a share of disposable income. Percent. 1995 – 2020¹⁾



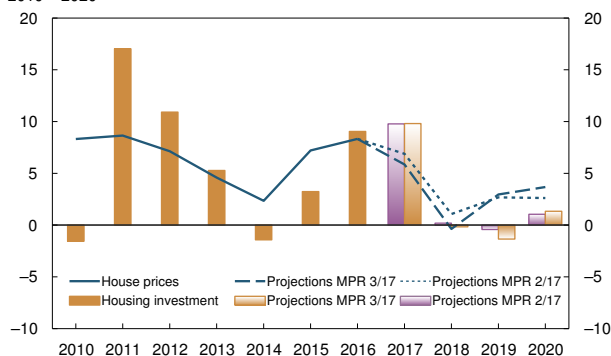
¹⁾ Projections for 2017 – 2020 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 3.11 House prices. Twelve-month percentage change and seasonally adjusted monthly percentage change. January 2010 – December 2017¹⁾



¹⁾ Projections for September 2017 – December 2017.
Sources: Eiendomsverdi, Finn.no, Real Estate Norway and Norges Bank

Chart 3.12 Housing investment and house prices. Annual percentage change. 2010 – 2020¹⁾



¹⁾ Projections for 2017 – 2020 (broken lines and shaded bars).
Sources: Eiendomsverdi, Finn.no, Real Estate Norway, Statistics Norway and Norges Bank

The stock of homes for sale has increased somewhat in recent months. Furthermore, the number of completed dwellings is expected to rise further, as a consequence of a large number of housing starts in recent years. This may contribute to keeping house price inflation low in the period ahead. In the coming years, prospects for higher mortgage rates point towards lower house prices, while an improving labour market and accelerating income growth are pushing in the opposite direction. Annual house price inflation is projected to slow in 2017 and 2018, edging up again thereafter (Chart 3.12). The projections for house price inflation have been revised down compared with the June Report.

Household debt continues to rise faster than income, and growth in household debt has been in line with the June projections. Even though house prices are falling and the regulation on residential mortgage loans has been tightened, it will take time for household debt growth to recede. This is partly because transaction prices are still at high levels. The number of homes that will be completed and will require financing is also expected to increase.

High house price inflation and debt growth have increased vulnerabilities in the household sector in recent years. Low house price inflation will curb debt growth, but it will take time for household sector vulnerabilities to recede. The correction in the housing market may contribute to reducing the risk of an abrupt and more pronounced decline further ahead. Developments in house prices and debt are discussed further in Section 5.

Housing investment rose markedly through 2015 and 2016 and has continued to grow in 2017. In 2017 Q2, housing investment was 9% higher than in the same period in 2016. Lower house prices will act as a drag on housing investment growth. After several years of substantial growth, housing investment has reached a high level, and lower house prices could lead to a fall in investment in the period ahead. Higher interest rates will push in the same direction. Nevertheless, housing investment is expected to hold up in the near term as a large number of housing projects have been sold and started but have not yet been completed. Annual growth in housing investment is projected to be high in 2017 and to slow thereafter

(Chart 3.12). Compared with the *June Report*, the projections for growth in housing investment in 2018 and 2019 have been revised down.

The decrease in house prices may be more pronounced than expected, which may dampen growth in the Norwegian economy, for example through lower housing investment. Recently, the rise in the number of housing starts has outpaced population growth, and housing investment as a share of GDP has reached a high level.

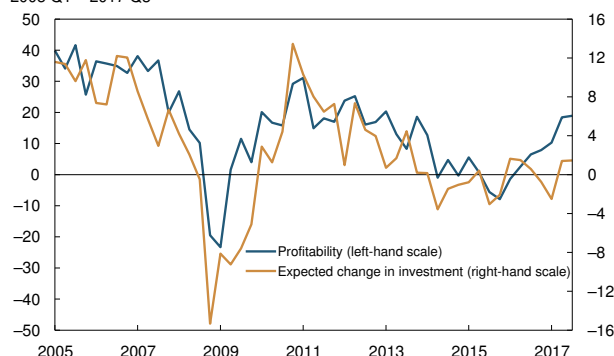
Higher growth in business investment

Mainland business investment picked up in 2016 after slowing through the preceding three years. Investment has fallen so far in 2017, and developments have been slightly weaker than expected.

Investment developments reflect weak demand for goods and services from the business sector. In August, contact enterprises in Norges Bank's regional network reported plans to increase investment over the next 12 months (Chart 3.13). At the same time, Norges Bank's expectations survey shows that business leaders expect an increase in profitability for their own businesses in the coming year. After several years of low levels of investment, many businesses will likely need to increase investment to accommodate higher demand in the years ahead. The improvement in cost-competitiveness has boosted profitability substantially in some segments of the export sector. However, many export firms will likely have to increase capacity in order to raise output. The upswing in the Norwegian economy and among Norway's trading partners therefore implies that business investment will pick up (Chart 3.14). Substantial planned investment in the utilities sector will also boost business investment growth ahead. Further ahead, higher interest rates will have a dampening impact on investment growth.

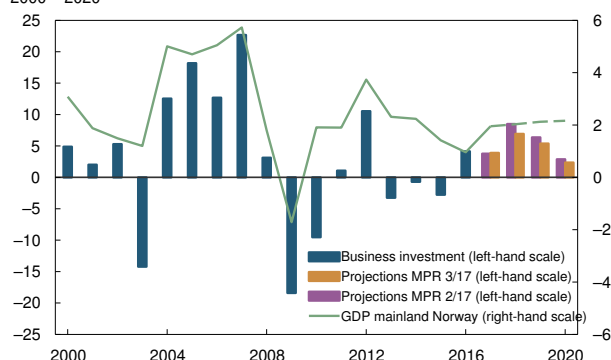
There is a risk that the expected upswing in business investment may be more modest or occur later than projected. The projections indicate that business investment as a share of GDP will increase ahead (Chart 3.15). The weak developments in investment so far in 2017 may indicate that investment needs are lower than assumed. On the other hand, historical experience has shown that an upswing in the

Chart 3.13 Expected profitability¹⁾ and investment²⁾ next 12 months. 2005 Q1 – 2017 Q3



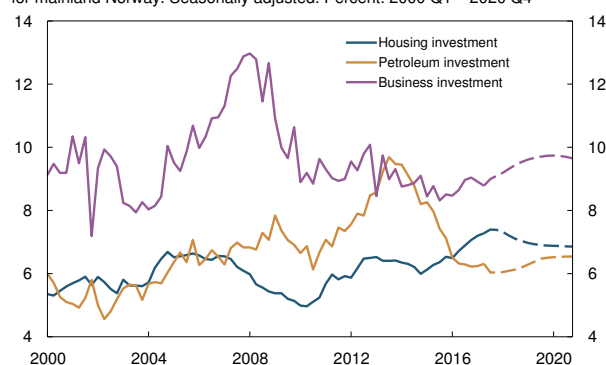
1) Norges Bank's expectations survey. Difference between the share expecting "improved profitability" and the share expecting "reduced profitability".
2) Norges Bank's regional network. Percentage change. Weighted average of manufacturing, oil service, retail trade and services.
Sources: Epinion and Norges Bank

Chart 3.14 Business investment and GDP. Annual percentage change. 2000 – 2020¹⁾



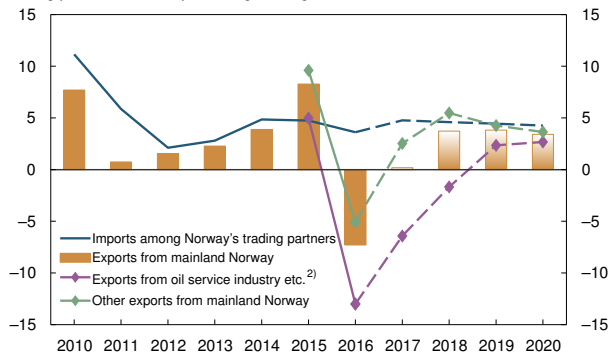
1) Projections for 2017 – 2020.
Sources: Statistics Norway and Norges Bank

Chart 3.15 Housing, petroleum and business investment as a share of GDP for mainland Norway. Seasonally adjusted. Percent. 2000 Q1 – 2020 Q4¹⁾



1) Projections for 2017 Q3 – 2020 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 3.16 Exports from mainland Norway and imports among Norway's trading partners. Annual percentage change. 2010 – 2020¹⁾



1) Projections for 2017 – 2020 (broken lines and shaded bars).
 2) Groups of goods and services in the national accounts where the oil service industry accounts for a considerable share of exports.
 Sources: Statistics Norway, Thomson Reuters and Norges Bank

economy can result in a considerable increase in business investment. It is therefore also possible that business investment growth will be higher than projected.

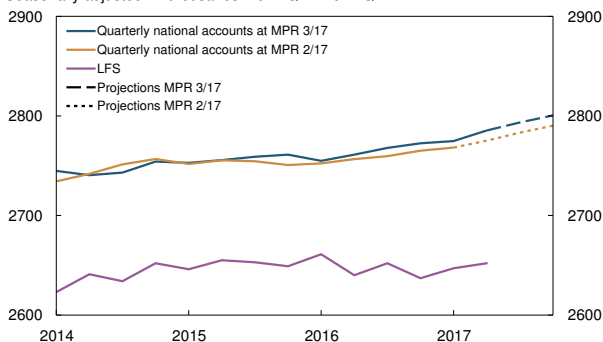
Prospects for growth in mainland exports

Mainland exports fell markedly in 2016, primarily reflecting the substantial decline in demand from the global petroleum industry. Stoppages and other supply-side constraints also weighed on exports in 2016. Exports picked up in the first half of 2017, but export growth has been lower than projected in the June Report.

Reports from Norges Bank's regional network indicate that oil service industry exports will continue to shrink in the near term, but that the decline will be somewhat less pronounced. Exports from this sector are projected to increase from 2018 as a result of higher global offshore investment.

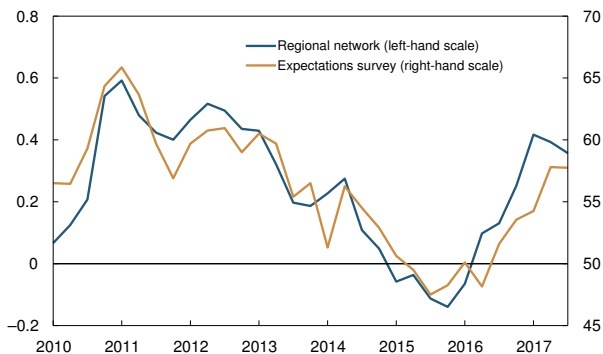
The depreciation of the krone exchange rate since 2013 has led to a considerable improvement in Norwegian firms' cost-competitiveness. This improvement, combined with the rise in imports among Norway's trading partners, will boost other mainland exports ahead. Overall mainland exports are projected to remain broadly unchanged between 2016 and 2017. For the years ahead, export growth is expected to be solid (Chart 3.16). The projection for export growth in 2017 has been revised down from the June Report. For the years ahead, the projections are little changed.

Chart 3.17 Employment in the QNA and the LFS.¹⁾ Seasonally adjusted. In thousands. 2014 Q1 – 2017 Q4²⁾



1) The QNA (quarterly national accounts) and the LFS (Labour Force Survey) normally show different levels of employment. This is because the LFS only counts permanent residents, while the national accounts also include temporary residents.
 2) Projections from 2017 Q3 – 2017 Q4
 Sources: Statistics Norway and Norges Bank

Chart 3.18 Expected change in employment. Regional network.¹⁾ Quarterly percentage change. Norges Bank's expectations survey. Diffusion index.²⁾ 2010 Q1 – 2017 Q3



1) Expected change in employment next three months.
 2) Share of business leaders expecting "more employees" in their own firm in the following 12 months + (1/2 * share expecting "unchanged number of employees").
 Sources: Epinion and Norges Bank

Sluggish growth in the economy has kept import growth low in recent years. In the first half of 2017, imports picked up and at a significantly faster pace than projected in June. After unusually strong growth so far in 2017, import growth is expected to slow in the period ahead. Oil and non-oil business investment tend to have a relatively high import content, and an increase in overall investment ahead points towards higher import growth. On the other hand, the improvement in Norwegian firms' cost-competitiveness in recent years could imply that the import share in investment will be lower than earlier, particularly for oil investment. Recently, Norwegian firms have won a larger share of offshore contracts on the Norwegian shelf. Annual import growth is projected to

be lower in 2018 than in 2017, with a gradual increase thereafter.

3.3 LABOUR MARKET AND CAPACITY UTILISATION

Rise in employment

After weak developments in 2015, employment increased through 2016, according to the QNA, and has continued to rise in 2017 (Chart 3.17). Employment rose more than projected in the *June Report* between Q1 and Q2, while employment for the preceding quarters was revised up in the QNA. Employment has risen in particular in the public sector and the construction industry. The Labour Force Survey (LFS) presents a somewhat different picture from the QNA, showing a fall in employment through 2016 and weaker growth so far in 2017. The LFS is a sample survey and will show wider short-term fluctuations than the QNA, which is based on a broader set of data than the LFS.

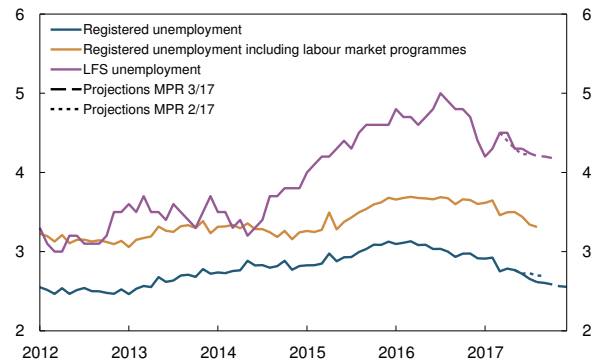
Reports from Norges Bank's regional network indicated in August that employment would continue to grow over the next three months and at a somewhat faster pace than assumed in the *June Report*. The results of Norges Bank's expectations survey for Q3 also suggest that employment will continue to rise (Chart 3.18).

Lower unemployment

Registered unemployment rose through 2015 and reached a peak at the beginning of 2016 (Chart 3.19). Since then, registered unemployment has decreased. In oil-dependent regions, registered unemployment has fallen to 3.2% (Chart 3.20). In the rest of the country, unemployment was 2.4% in August. Registered unemployment has fallen more than assumed in the *June Report*. LFS unemployment peaked in summer 2016 and has since receded. The gap between LFS unemployment and registered unemployment has narrowed recently, but is still wider than the pre-2015 normal level.

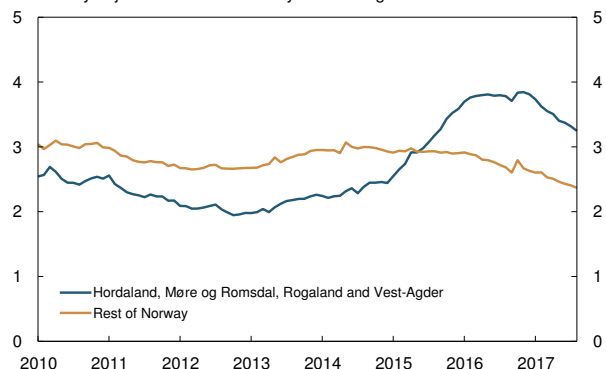
There are signs that the period of downsizing in the wake of the oil price decline is coming to an end. The number of people laid off fell in the first half of 2017, and there has been a decline in stoppages reported to NAV. The number of job vacancies has increased since the end of 2015 (Chart 3.21). The number of

Chart 3.19 Unemployed as a share of the labour force. LFS¹⁾ and NAV²⁾. Seasonally adjusted. Percent. January 2012 – December 2017³⁾



1) Labour Force Survey.
2) Registered unemployment.
3) Projections for September 2017 – December 2017 (registered unemployment) and July 2017 – October 2017 (LFS)
Sources: Norwegian Labour and Welfare Administration (NAV), Statistics Norway and Norges Bank

Chart 3.20 Registered unemployment by county. Share of labour force. Seasonally adjusted. Percent. January 2010 – August 2017



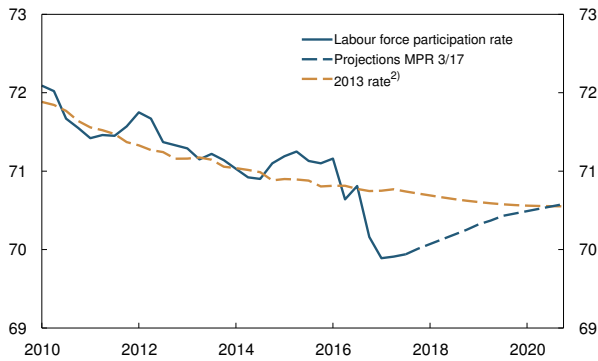
Sources: Norwegian Labour and Welfare Administration (NAV) and Norges Bank

Chart 3.21 Job vacancies. Seasonally adjusted. In thousands. 2010 Q1 – 2017 Q2



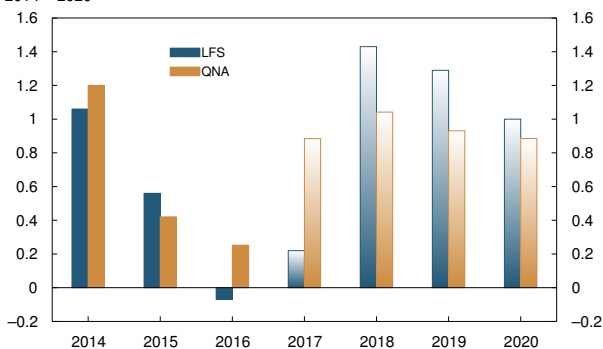
Source: Statistics Norway

Chart 3.22 Labour force participation rates. Labour force as a share of the population (aged 15 – 74). Seasonally adjusted. Percent. 2010 Q1 – 2020 Q4¹⁾



1) Projections 2017 Q3 – 2020 Q4.
2) Developments in the labour force participation rate for the population (aged 15 – 74) at constant 2013 rates for each age cohort. The line slopes downward because a growing number of persons are entering age groups with lower labour force participation rates, owing to population ageing. 2013 is chosen because capacity utilisation is deemed to be close to a normal level that year.
Sources: Statistics Norway and Norges Bank

Chart 3.23 Employment in LFS¹⁾ and QNA²⁾. Annual percentage change. 2014 – 2020³⁾



1) Labour Force Survey.
2) Quarterly national accounts.
3) Projections for 2017 – 2020 (shaded).
Sources: Statistics Norway and Norges Bank

CAPACITY UTILISATION

Capacity utilisation, or the output gap, is the difference between actual and potential output. Potential output, which is determined by potential productivity and the potential labour force, cannot be observed and must be estimated. Calculations of trend GDP can be used to estimate potential output retrospectively. The estimates of current potential output and the current output gap are based on an overall assessment using a number of indicators and models. In this assessment, particular weight is given to labour market developments.

vacancies also increased somewhat in the oil industry and in manufacturing in the first half of the year.

Increased labour force participation rate

Owing to population ageing and lower net migration, growth in the working-age population has slowed in recent years. It is assumed that labour immigration will edge up in the years ahead, but that population growth will decline further in the period to 2020. The projections for demographic developments are unchanged from the *June Report*.

The labour force participation rate, ie the labour force as a share of the working-age population, declined through 2015 and 2016. The decline reflects a weak labour market and an increase in the share of older workers in the labour force. The labour force participation rate normally varies with the business cycle. Many exit the labour market during downturns and return when job prospects improve.

Cyclical developments point towards an increase in the labour force participation rate ahead. The ageing of the population points in the opposite direction (Chart 3.22). This is because an increasing number of people are moving into age groups where labour force participation is low. Overall, the labour force participation rate is projected to rise gradually in the years ahead. The projections are slightly higher than in the *June Report*.

Employment is higher than assumed in the *June Report*, but employment growth in the period ahead is expected to be broadly as projected in June. The projections are based on the assumption that employment as measured by the LFS will rise somewhat more than employment according to the QNA in the years ahead (Chart 3.23), reducing the gap between the two measures of employment. Unemployment is expected to decline gradually in the years ahead. The projections are somewhat lower than in the *June Report* (Chart 1.12 in Section 1).

Reduced slack in the economy

According to the Bank's assessment, capacity utilisation in the Norwegian economy has been lower than normal over the past few years and fell until autumn 2016. The fall in capacity utilisation reflects sluggish GDP growth and the increase in unemployment in

the wake of the fall in oil prices. At the same time, growth in potential output declined, due to lower population growth and lower productivity growth. Lower productivity growth may reflect several years of low growth in business investment.

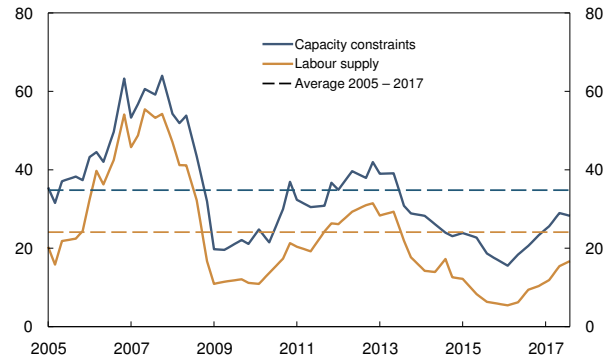
Demographic developments imply a continued low level of growth in the potential labour force ahead. Underlying productivity growth is estimated to increase somewhat, to about 1% on an annual basis for the years ahead. Overall, potential output for the years 2018–2020 is assumed to increase by an annual average of 1.6%, unchanged from the *June Report*.

Growth in the mainland economy has picked up since autumn 2016 and has been higher than estimated potential output growth. Labour market developments also imply that there is a lower degree of slack in the Norwegian economy. Employment has increased and unemployment has fallen. The labour force participation rate is below a normal level, but appears to be rising (Chart 3.22). At the same time, wage growth appears to remain moderate, indicating a continued degree of slack.

In August, regional network contacts reported an increase in the share of enterprises citing labour supply as a constraint on output (Chart 3.24). The share is nevertheless still somewhat lower than normal. The share of contacts reporting that they would encounter problems accommodating a rise in demand was little changed.

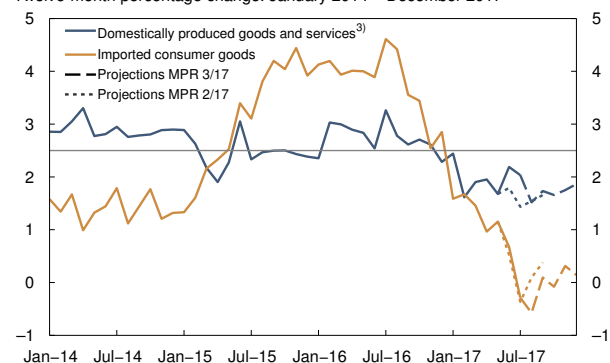
Overall, the Bank's current assessment is that capacity utilisation passed a trough in 2016 Q3 and has gradually moved up since then (Chart 1.1b in Section 1). Capacity utilisation is still assessed to be lower than normal, but to have been somewhat higher through 2017 than assumed in the *June Report*. This is in particular a reflection of lower-than-expected registered unemployment and a stronger-than-projected rise in employment. GDP growth is expected to be higher than potential growth in the years ahead, and capacity utilisation is therefore expected to rise gradually and be somewhat above a normal level in 2020. The projections for capacity utilisation ahead have been revised up somewhat from the *June Report*.

Chart 3.24 Capacity constraints and labour supply as reported by regional network.¹⁾ Percent. January 2005 – August 2017



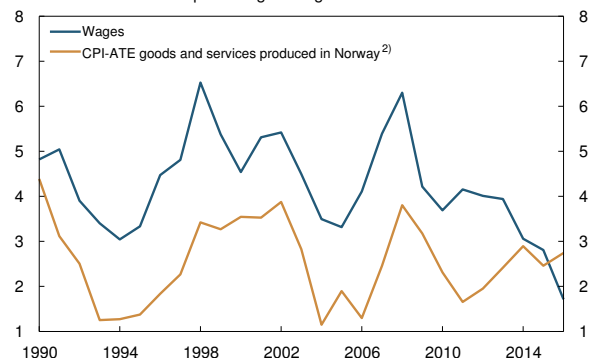
1) Share of contacts that will have some or considerable problems accommodating an increase in demand and the share of contacts reporting that output is being constrained by labour supply. Source: Norges Bank

Chart 3.25 CPI-ATE¹⁾ by supplier sector. Twelve-month percentage change. January 2014 – December 2017²⁾



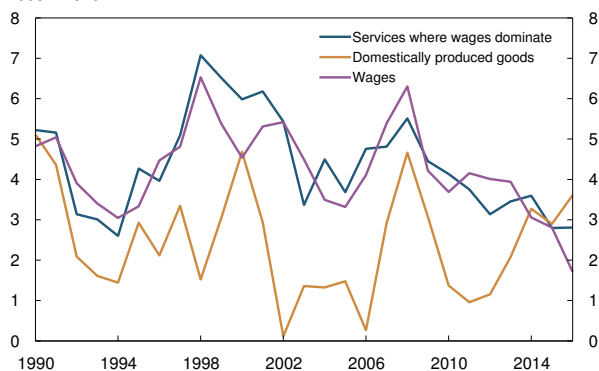
1) CPI adjusted for tax changes and excluding energy products.
2) Projections for September 2017 – December 2017 (broken lines).
3) Norges Bank's estimates.
Sources: Statistics Norway and Norges Bank

Chart 3.26 Wages and goods and services produced in Norway in the CPI-ATE¹⁾. Annual percentage change. 1990 – 2016



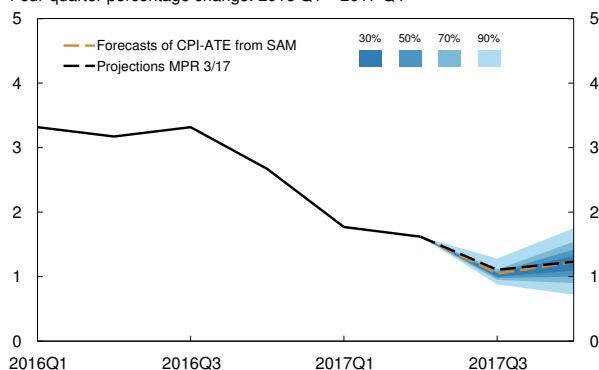
1) CPI adjusted for tax changes and excluding energy products.
2) Norges Bank's estimates.
Sources: Norwegian Technical Calculation Committee for Wage Settlements, Statistics Norway and Norges Bank

Chart 3.27 Wages, prices for services where wages dominate and domestically produced goods.¹ Annual percentage change. 1990 – 2016



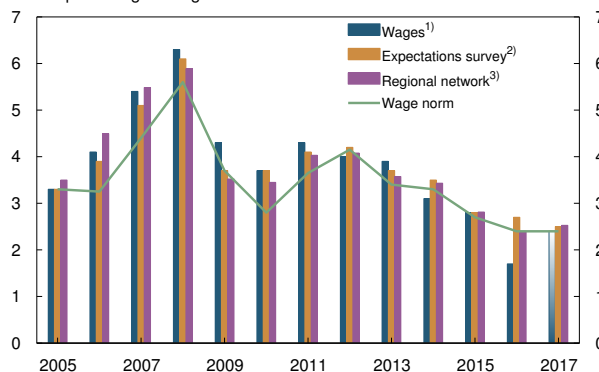
1) The price series have been spliced with price series from previous supplier sectors in 2003.
Sources: Statistics Norway and Norges Bank

Chart 3.28 CPI-ATE¹ in MPR 3/17 with fan chart given by SAM². Four-quarter percentage change. 2016 Q1 – 2017 Q4³



1) CPI adjusted for tax changes and excluding energy products.
2) System for Averaging short-term Models.
3) Projections for 2017 Q3 – 2017 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 3.29 Wages, wage norm and wage expectations. Annual percentage change. 2005 – 2017



1) Historical annual wage growth from Statistics Norway. Norges Banks' projections for 2017 (shaded bar).
2) Social partners' wage growth expectations for the current year as measured in Q3 each year.
3) Expected wage growth for the current year as reported by regional network in August/September each year.
Sources: Epinion, Statistics Norway and Norges Bank.

3.4 COSTS AND PRICES

Inflation has been broadly as expected

Inflation has fallen markedly since summer 2016. The decline has been most pronounced for imported consumer goods, but the rise in prices for domestically produced goods and services has also slowed (Chart 3.25). Lower inflation primarily reflects the krone appreciation since the beginning of 2016 and the waning effects of the preceding krone depreciation.

The decline in wage growth in recent years has also had a dampening effect on inflation. The overall rise in prices for domestically produced goods and services has nevertheless slowed to a lesser extent than implied by its historical relationship with wage growth (Chart 3.26). This is due to factors such as slower productivity growth and the krone depreciation in the period to summer 2016, which probably also underpinned the rise in prices for domestically produced consumer goods. Consumer services price inflation has to a greater extent tracked developments in wage growth (Chart 3.27).

Since the *June Report*, consumer price inflation has slowed approximately as projected (Annex Table 3d). In August, the twelve-month rise in prices for domestically produced goods and services was as expected, while the twelve-month rise in prices for imported consumer goods was a little lower than expected. The decline in inflation between July and August partly reflects developments in food prices. Twelve-month CPI inflation has been approximately as assumed, in spite of higher-than-projected energy price inflation.

Projections for inflation in 2017 broadly unchanged

Updated calculations from SAM indicate that CPI-ATE inflation will pick up through autumn and winter (Chart 3.28). The projections in this *Report* are close to the SAM forecasts and are on the whole unchanged since the *June Report*. The rise in prices for domestically produced goods and services appears to be slightly higher than previously expected, while the rise in prices for imported consumer goods will likely be a little lower. Lower imported inflation reflects the recent krone appreciation. For overall CPI inflation, prospects for somewhat higher energy price inflation than projected in June contribute to a small upward revision.

Prospects for continued moderate wage growth

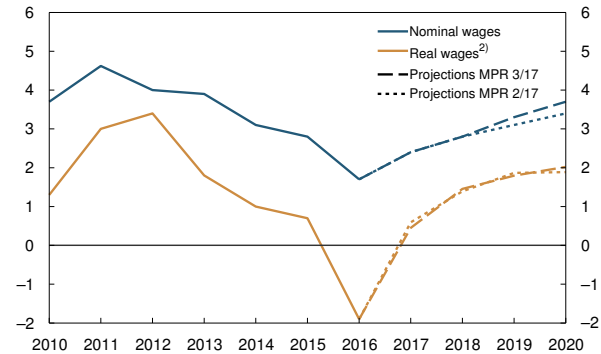
In recent years, wage growth has been restrained by the decline in oil prices, lower capacity utilisation and lower underlying productivity growth. Wage growth has nevertheless been weaker than would normally be implied by the Bank's capacity utilisation estimates. This may be an indication of a higher degree of moderation in the wage settlements in the wake of the fall in oil prices than observed in previous downturns. Moderate wage growth among several of Norway's trading partners in recent years may also have had a dampening impact on wage growth in Norway. Following the fall in oil prices, overall annual wage growth has also been dampened by a considerable decrease in the number of employees in high-wage industries. It is assumed that such compositional effects on wage growth will be less prominent in the years ahead. Workforce reductions in oil-related industries have slowed and differences in wage levels between these industries and others have diminished somewhat.

For 2017, annual wage growth is expected to rise to 2.4%. The projection is unchanged from the June Report and is in line with the wage settlement norm and with the results of Norges Bank's expectations survey and reports from the regional network (Chart 3.29). With prospects for higher CPI inflation, real wage growth is projected to be slightly lower in 2017 than assumed in the June Report.

A tighter labour market and higher capacity utilisation are expected to result in a gradual rise in wage growth throughout the projection period (Chart 3.30). The projections imply a relatively moderate increase in wages in the years ahead compared with previous upturns. The projections for wage growth must be viewed in the light of prospects for continued weak productivity growth and wage moderation that appears to be stronger than previously assumed. The projection for wage growth in 2018 is unchanged from the June Report and is in line with the results of the expectations survey. Further out in the projection period, it is assumed that higher capacity utilisation than previously expected will also result in higher wage growth.

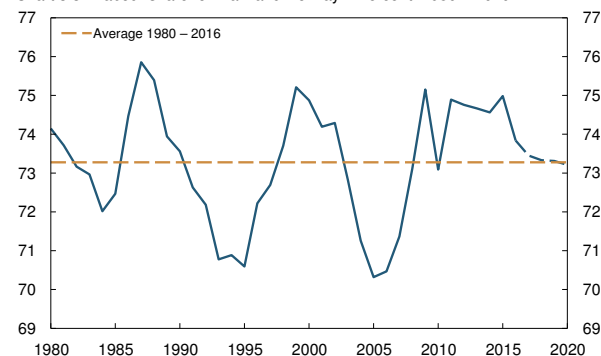
In spite of moderate wage growth, the labour share has held firm in recent years (Chart 3.31) as productiv-

Chart 3.30 Wages. Annual percentage change. 2010 – 2020¹⁾



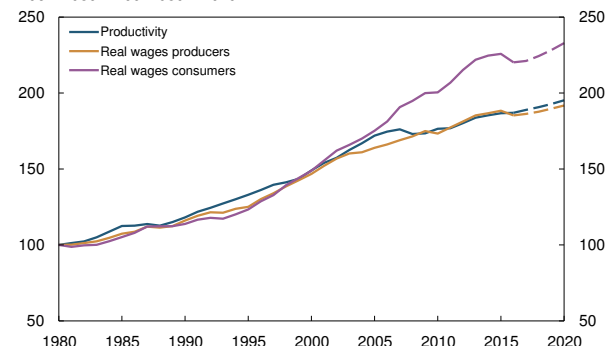
1) Projections for 2017 – 2020 (broken lines).
2) Nominal wage growth deflated by the CPI.
Sources: Norwegian Technical Calculation Committee for Wage Settlements, Statistics Norway and Norges Bank

Chart 3.31 Labour share for mainland Norway.¹⁾ Percent. 1980 – 2020²⁾



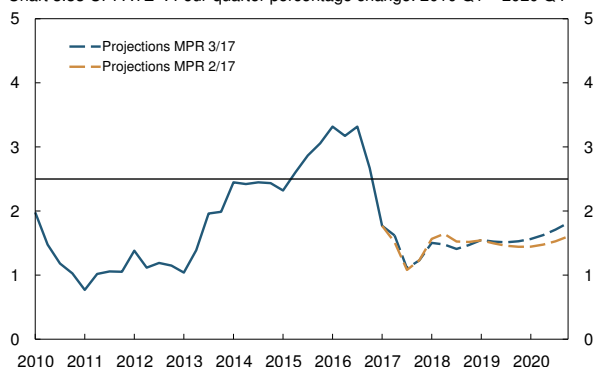
1) Labour costs as a share of the sum of labour costs and operating profit.
2) Projections 2017 – 2020 (broken blue line).
Sources: Statistics Norway and Norges Bank

Chart 3.32 Productivity, real wages for producers¹⁾ and consumers²⁾. Index. 1980 = 100. 1980 – 2020³⁾



1) Labour costs deflated by producer prices.
2) Labour costs deflated by consumer prices.
3) Projections 2017 – 2020 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 3.33 CPI-ATE¹⁾. Four-quarter percentage change. 2010 Q1 – 2020 Q4²⁾



1) CPI adjusted for tax changes and excluding energy products.
 2) Projections for 2017 Q3 – 2020 Q4 (broken lines).
 Sources: Statistics Norway and Norges Bank

ity growth has also fallen and firms have not had the room to improve margins through price setting. It is assumed that the labour share will decline to a level close to its historical average in the course of 2017 and then remain approximately unchanged in the years ahead. At the same time, real wage growth, as measured by the consumer price index, is expected to show a moderate increase, primarily as a result of prospects for low imported inflation (Chart 3.32). The projections in this *Report* are consistent with a normalisation of the labour share together with an increase in household purchasing power.

Low inflation in the years ahead

Inflation is expected to remain low in the years ahead (Chart 3.33). Overall, the inflation projections for the years ahead are little changed. At the end of 2020, four-quarter CPI inflation is projected to be just below 2%, which is slightly higher than projected in the June *Report*. Prospects for higher wage growth and capacity utilisation than assumed in the June *Report* contribute to a small upward revision of the projection for domestic inflation, while a slightly stronger krone exchange rate pulls the projection for imported inflation in the opposite direction.

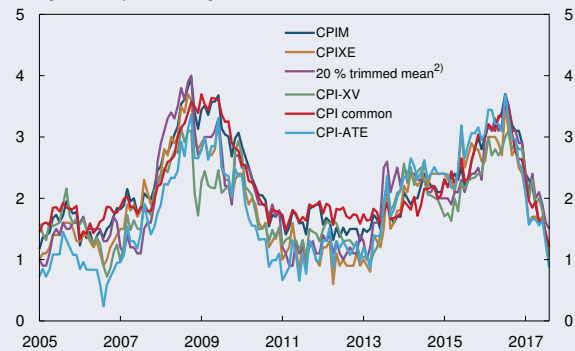
Wage growth may pick up to a lesser extent in the years ahead than assumed in this *Report*. Wage growth among several of Norway's trading partners has been lower since the financial crisis than historical relationships between unemployment and wages would imply.¹ There are prospects that wage growth among trading partners will remain fairly moderate. It is possible that Norway will also experience moderate wage growth in combination with relatively low levels of unemployment. A long period of low inflation may generate expectations that inflation will remain low. This could in itself lead to a slower rise in wage growth and inflation than currently projected. On the other hand, historical experience shows that the labour share normally increases in periods of rising capacity utilisation. It is therefore also possible that wage growth ahead will be stronger than assumed in this *Report*.

1 See box on page 18 of the June 2017 *Monetary Policy Report* (2/17).

CROSS-CHECK OF THE CPI-ATE

Indicators of underlying inflation, such as the CPI-ATE, can be useful in order to look through temporary variations in inflation. However, because of the way such indicators are constructed, permanent price changes can also be perceived as temporary. Therefore, as a cross-check, the Bank monitors developments in several different indicators of underlying inflation. So far in 2017, twelve-month CPI-ATE inflation has fallen by 1.2 percentage points. Both the decline in CPI-ATE inflation so far in 2017 and the level of the twelve-month inflation rate in August are closely in line with developments in other indicators of underlying inflation (Chart 3.34).

Chart 3.34 Indicators of underlying inflation¹⁾. Twelve-month percentage change. January 2005 – August 2017



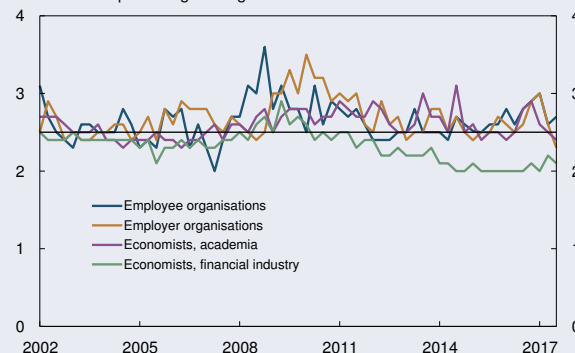
1) For a review of the indicators, see Husabo, E. (2017) "Indicators of underlying inflation in Norway". Staff Memo, Norges Bank (forthcoming).
2) Due to a reorganisation of the statistics at the detailed level, there is a break in the series in January 2016 and January 2017.

Sources: Statistics Norway and Norges Bank

INFLATION EXPECTATIONS

Inflation expectations influence many economic decisions, including price-setting and wage determination. Anchored inflation expectations will make it easier for monetary policy to fulfil the objective of price stability and contribute to stable developments in output and employment. Inflation expectations are often referred to as anchored when medium-term and long-term inflation expectations show little response to new information and remain at a stable level close to the inflation target. In recent years, long-term inflation expectations have generally remained close to 2.5% (Chart 3.35). Expectations among both employer and employee organisations as a whole and economists in academia and in the financial industry fell slightly between 2017 Q2 and Q3.

Chart 3.35 Expected consumer price inflation five years ahead. Twelve-month percentage change. 2002 Q1 – 2017 Q3



Source: Epinion

ASSUMPTIONS CONCERNING FISCAL POLICY

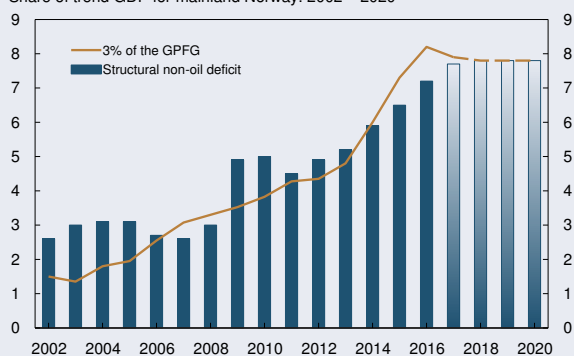
The fiscal policy assumptions in this *Report* are based on the revised budget for 2017. Petroleum revenue spending in 2017, as measured by the structural non-oil deficit, is projected to be 7.7% of trend GDP for mainland Norway in 2017, as in the *June Report*. The change in the deficit as a share of trend GDP is used as a simple measure of the effect of the government budget on demand for goods and services. For 2017, this fiscal stimulus is assumed to be 0.5 percentage point.

Petroleum revenue spending is assumed to be equivalent to 2.9% of the value of the Government Pension Fund Global (GPF) in 2017. From 2018, the technical assumption is applied that spending will be equivalent to 3.0% of the value of the GPF, equal to the requirement concerning the expected real return on the Fund. This entails a fiscal stimulus of 0.1 percentage point in 2018, with petroleum revenue spending remaining unchanged thereafter, measured as a share of mainland GDP (Chart 3.36). The assumptions rely on developments in the Fund that are in line with the revised budget.

Growth in public sector demand in 2017 is now projected to be somewhat lower than in the *June Report*. This is because demand in previous quarters was revised down somewhat when the national accounts figures for the second quarter were published. The growth projections for the years ahead are broadly unchanged. After several years of appreciably higher growth in public sector demand than in the economy as a whole, there are prospects that public sector demand will grow at approximately the same pace as mainland GDP in 2017. As from 2018, growth in public sector demand is expected to be considerably lower than growth in the mainland economy (Chart 3.37).

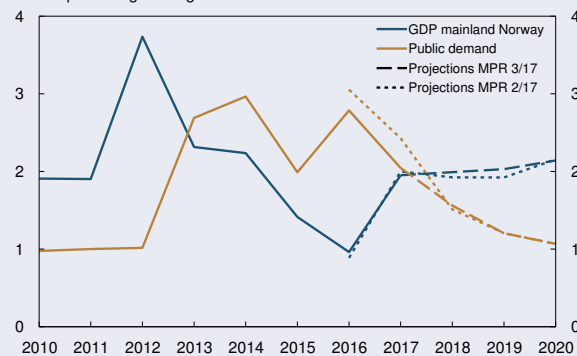
The relatively strong growth in public spending of recent years has been accompanied by tax cuts. The tax rate on ordinary income, for example, has been reduced from 28% to 24%. Further net tax cuts are not expected in the period ahead. The National Budget for 2017 signalled a further reduction in income tax to 23% in 2018. In this *Report*, the technical assumption is applied that this tax cut will be financed by revenue increases in other areas.

Chart 3.36 Structural non-oil deficit and 3% of the GPFG¹⁾.
Share of trend GDP for mainland Norway. 2002 – 2020²⁾



1) Government Pension Fund Global.
2) Projections for 2017 – 2020 (broken line and shaded bars).
Sources: Ministry of Finance and Norges Bank

Chart 3.37 Public sector demand and GDP for mainland Norway.
Annual percentage change. 2010 – 2020¹⁾



1) Projections for 2017 – 2020 (broken lines).
Sources: Statistics Norway and Norges Bank

PROJECTIONS FOR PETROLEUM INVESTMENT

Investment in the petroleum industry has declined considerably in recent years. The decline primarily reflects weak industry profitability as a result of the fall in oil and gas prices in 2014 and 2015 and the rapid rise in costs in the industry in the preceding years. Oil and oil service companies have cut costs substantially since 2013. As a result, break-even prices for a number of planned projects have fallen from USD 60–80 per barrel to below USD 40. These projects will thereby be profitable if oil prices are in line with assumptions (see Section 1).

The investment intentions survey and the national accounts indicate that the fall in petroleum investment in 2017 will be less pronounced than projected in the *June Report*, particularly at constant prices. The fall in petroleum investment is now estimated at 1% in volume terms and 4.5% in value terms between 2016 and 2017.

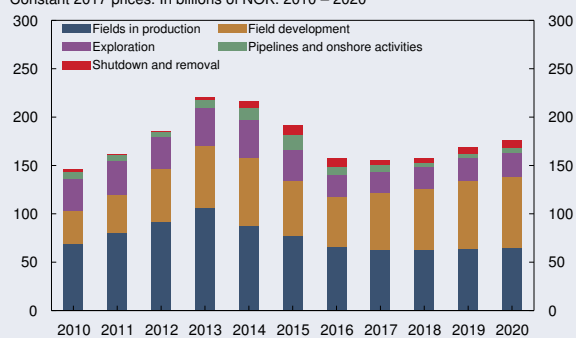
A number of development projects have been launched, which will pull up investment ahead. Investment in volume terms is projected to increase by around 1% in 2018 and by a total of 11% between 2018 and 2020. The projections for the investment level in 2018–2020 have been revised up in the light of new information concerning a number of development projects.

Investment in *fields in production* has fallen by around NOK 40bn since 2013 and accounts for two-thirds of the decline in petroleum investment. Investment in fields in production is projected to fall by a further NOK 3bn in 2017 and remain at about the same level in 2018. In 2019 and 2020, investment is projected to show a moderate increase as a number of projects have become profitable as a result of the cost reductions (Chart 3.38). The Valhall Vestflanke project is expected to be launched in 2017 and phase 3 of the Troll project in 2018.

Spending on *field development* has fallen far less than investment in fields in production, reflecting the considerable investment involved in the development of the Johan Sverdrup project since its launch in 2015 (Chart 3.39). Several small and medium-sized development projects have also commenced over the past year. The development of the Snefrid Nord field has started since the *June Report*. The Yme, Snadd, Fenja, Storklakken, Skarfjell, Johan Castberg and Snorre Expansion projects are expected to commence during the next half year. In addition, phase two of the Johan Sverdrup development project is projected to start in autumn 2018. Several other field development projects are scheduled to start in the period 2018–2020. Overall, expenditure on field development is projected to show an upswing through the projection period.

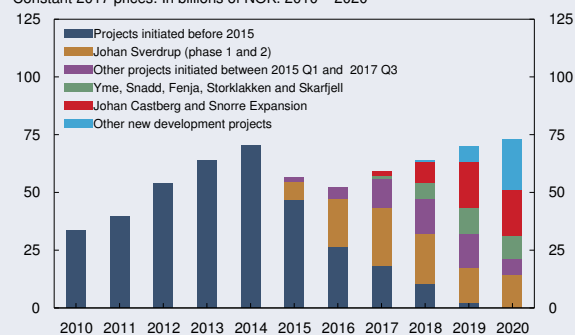
Investment in *exploration* has fallen by almost half since 2013 and 2014. Exploration investment is projected to remain broadly unchanged in 2017 and 2018. Exploration activity is expected to edge up again thereafter, driven by the decline in drilling costs since 2014 and prospects that the oil price will remain above USD 50 per barrel, while relatively weak results from exploratory drilling in the Barents Sea in 2017 will have a dampening effect.

Chart 3.38 Petroleum investment.
Constant 2017 prices. In billions of NOK. 2010 – 2020¹⁾



¹⁾ Projections for 2017 – 2020. Figures for 2010 – 2016 are from Statistics Norway's investment intentions survey and deflated by the price index for petroleum investment in the national accounts. The index is projected to fall by 3.5% between 2016 and 2017 and to be unchanged between 2017 and 2018. Sources: Statistics Norway and Norges Bank

Chart 3.39 Field development.
Constant 2017 prices. In billions of NOK. 2010 – 2020¹⁾



¹⁾ Projections for 2017 – 2020 and for the breakdown of investment in 2015 and 2016. Figures for total development investment for 2010 – 2016 are from Statistics Norway's investment intentions survey and deflated by the price index for petroleum investment in the national accounts. The projections are based on reports to the Storting, impact analyses, forecasts from the Norwegian Petroleum Directorate, Statistics Norway's investment intentions survey and current information about development investments. Sources: Statistics Norway and Norges Bank

4 Monetary policy analysis

The analyses and assessments in this *Report* imply that the key policy rate is kept at 0.5% in the coming year, followed by a gradual rate increase to close to 1.5% towards the end of 2020. The key policy rate forecast is little changed on the June 2017 *Monetary Policy Report*, but implies a somewhat earlier rate increase. Stronger growth abroad, higher oil prices and higher capacity utilisation in the Norwegian economy pull up the path for the key policy rate, while a stronger krone exchange rate and prospects for continued moderate wage growth despite higher capacity utilisation pull down the path. Capacity utilisation is projected to rise gradually and to be somewhat above a normal level in 2020. Inflation is projected to move up to just below 2% at the end of the projection period.

Chart 4.1 CPI. Four-quarter percentage change. 1985 Q1 – 2017 Q2

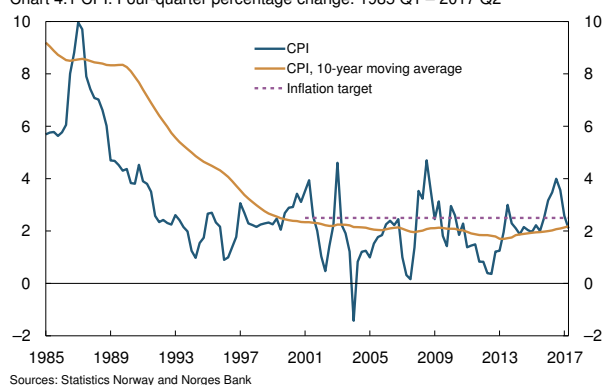
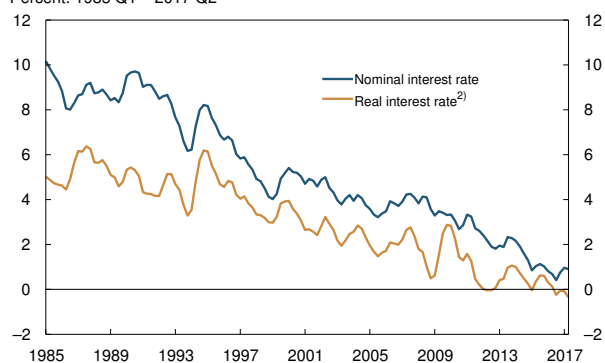


Chart 4.2 Yields on 10-year government bonds. 14 OECD countries.¹⁾ Percent. 1985 Q1 – 2017 Q2



1) Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Sweden, Switzerland, UK, US and Norway. Unweighted average.
2) The real interest rate is calculated using the nominal government bond yield less average inflation by the consumer price index over the past year.

4.1 OBJECTIVES AND RECENT DEVELOPMENTS

Low and stable inflation

Monetary policy is geared towards keeping inflation low and stable. The operational target of monetary policy is annual consumer price inflation of close to 2.5% over time. In the period since the introduction of inflation targeting, inflation has on average been around 2% (Chart 4.1).

The key policy rate is set with a view to maintaining inflation close to 2.5% over time without causing excessive fluctuations in output and employment. The monetary policy trade-offs take account of conditions that imply a risk of particularly adverse outcomes for the economy and of uncertainty regarding the functioning of the economy (see box on criteria for an appropriate interest rate path on page 40).

Very low key policy rate

The interest rate level is very low, both internationally and in Norway (Chart 4.2). The real interest rate level that is neither expansionary nor contractionary, commonly referred to as the neutral real interest rate, has likely declined over a long period. Norges Bank's estimate of the neutral real interest rate has been gradually revised down in line with global developments. The neutral nominal money market rate in Norway is assumed to range between 2½% and 3½% (see Special Feature in *Monetary Policy Report* 3/16). The decline in the neutral real interest rate has itself pushed down the key policy rate.

The oil price decline since 2014 and sluggish developments abroad have had a dampening effect on growth and inflation in Norway. Capacity utilisation in the Norwegian economy is below a normal level, and inflation is below 2.5%. The key policy rate has therefore been set lower than what the Bank considers to be a neutral level.

Persistently low interest rates add to vulnerabilities in the financial system. By taking into account the risk associated with very low interest rates, monetary policy can contribute to long-term economic stability. The uncertainty surrounding the effect of very low interest rates also suggests a cautious approach to interest rate setting. In recent years, the key policy rate has therefore been set at a somewhat higher level than the projections for inflation and capacity utilisation alone would imply.

4.2 NEW INFORMATION AND ASSESSMENTS

New information implies a slightly higher interest rate path

With the aid of Norges Bank's macroeconomic model NEMO, the effects of new information, including new projections for the current and following quarter, and new projections for variables that are not determined in the model have been analysed. NEMO is described in a Special Feature on page 41. In the analysis, the key policy rate forecast from the previous *Report* is maintained (Chart 4.3a).

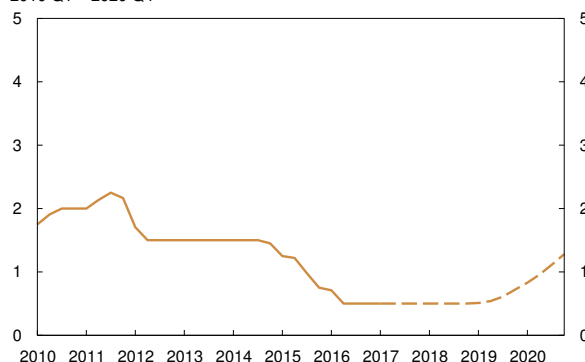
The model-based analysis suggests that inflation will be little changed in the coming years and slightly higher in 2019 and 2020 compared with the projections in the June *Report* (Chart 4.3b). The krone exchange rate will remain slightly stronger than projected in June, while capacity utilisation will be somewhat higher than in the June *Report* throughout the projection period (Chart 4.3c).

The model-based analysis suggests, on balance, a slightly higher path for the key policy rate, reflecting prospects for slightly higher capacity utilisation and inflation.

Interest rate forecast little changed

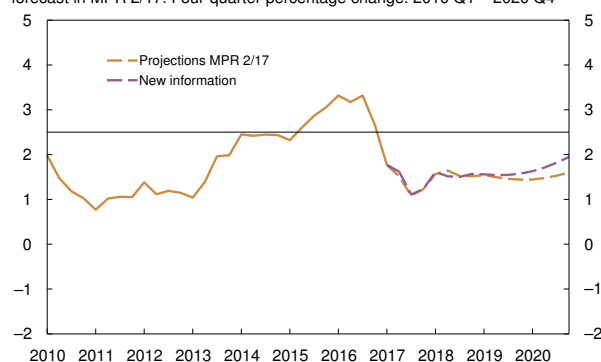
Monetary policy also takes account of conditions that imply a risk of particularly adverse outcomes for the

Chart 4.3a Key policy rate. Projections in MPR 2/17. Percent. 2010 Q1 – 2020 Q4¹⁾



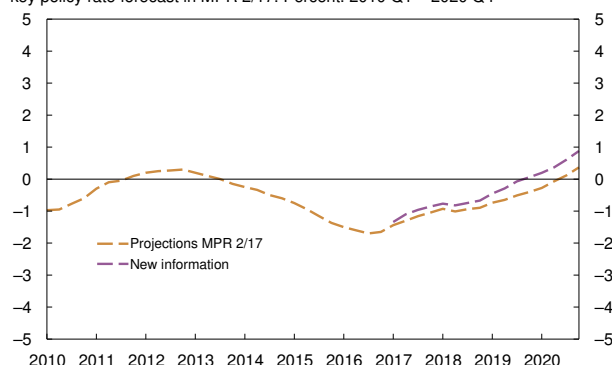
1) Projections for 2017 Q2 – 2020 Q4 (broken line).
Source: Norges Bank

Chart 4.3b CPI-ATE¹⁾. Projection conditional on new information and key policy rate forecast in MPR 2/17. Four-quarter percentage change. 2010 Q1 – 2020 Q4²⁾



1) CPI adjusted for tax changes and excluding energy products.
2) Projections for 2017 Q2 – 2020 Q4 (broken lines).
Sources: Statistics Norway and Norges Bank

Chart 4.3c Projected output gap. Projection conditional on new information and key policy rate forecast in MPR 2/17. Percent. 2010 Q1 – 2020 Q4



Source: Norges Bank

economy and of uncertainty concerning the functioning of the economy.

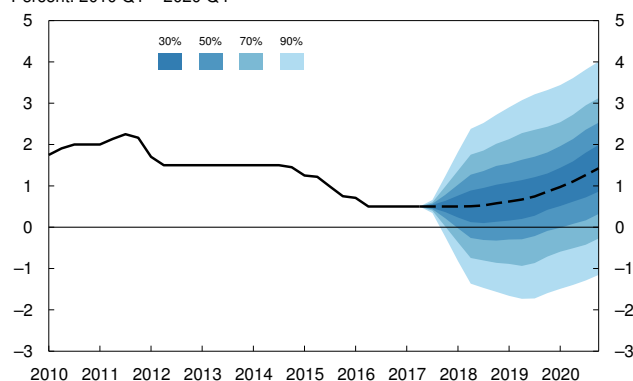
The rapid rise in house prices and high debt growth have increased the vulnerability of households in recent years (Chart 1.8). Since spring, house prices have fallen, and price developments in recent months have been weaker than expected. Household credit growth remains high. Low house price inflation will curb debt accumulation but it will take time for household vulnerabilities to recede. The correction in the housing market may lower the risk of an abrupt and more pronounced decline further out.

The analyses and assessments in this *Report* imply that the key policy rate is kept at 0.5% in the coming

year, followed by a gradual rate increase to close to 1.5% towards the end of 2020 (Charts 4.4 a-d). The key policy rate forecast is little changed on the June *Report*, but implies a somewhat earlier rate increase (Chart 4.5).

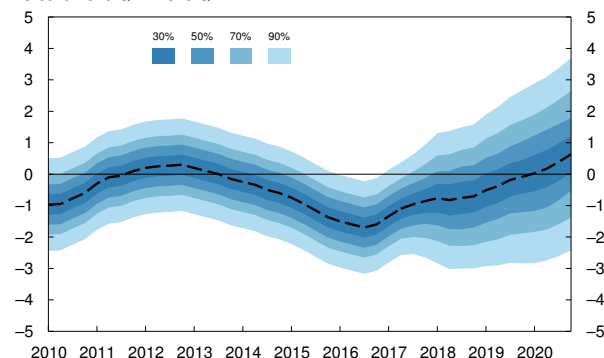
With a key policy rate consistent with the interest rate forecast in this *Report*, inflation is expected remain low in the years ahead. At the end of 2020, inflation is projected to be just below 2%. Compared with the June *Report*, the inflation projections are little changed for the coming years but are slightly higher towards the end of the projection period. Capacity utilisation is projected to rise gradually and to be somewhat above a normal level in 2020. The projections for

Chart 4.4a Key policy rate with fan chart.¹⁾
Percent. 2010 Q1 – 2020 Q4²⁾



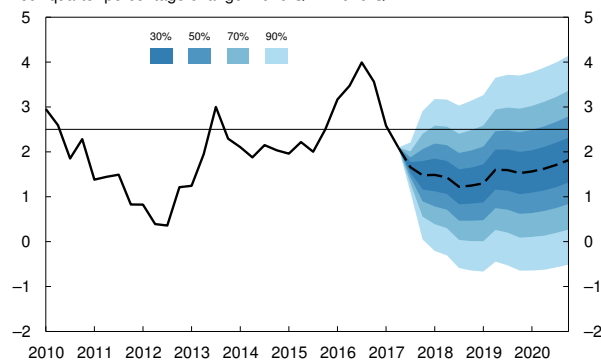
1) The fan charts are based on historical experience and stochastic simulations in Norges Bank's main macroeconomic model, NEMO. The fan chart for the key policy rate does not take into account that a lower bound for the interest rate exists.
2) Projections for 2017 Q3 – 2020 Q4 (broken line).
Source: Norges Bank

Chart 4.4b Projected output gap¹⁾ with fan chart.
Percent. 2010 Q1 – 2020 Q4



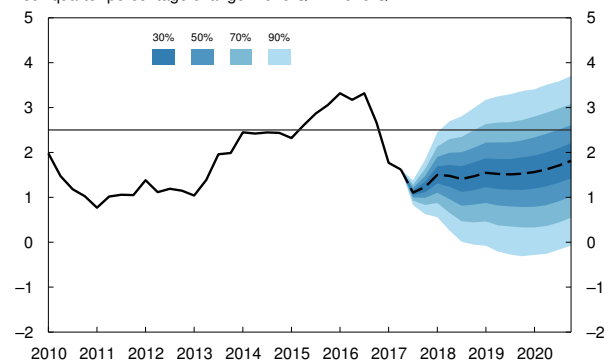
1) The output gap measures the percentage deviation between mainland GDP and projected potential mainland GDP.
Source: Norges Bank

Chart 4.4c CPI with fan chart.
Four-quarter percentage change. 2010 Q1 – 2020 Q4¹⁾



1) Projections for 2017 Q3 – 2020 Q4 (broken line).
Sources: Statistics Norway and Norges Bank

Chart 4.4d CPI-ATE¹⁾ with fan chart.
Four-quarter percentage change. 2010 Q1 – 2020 Q4²⁾



1) CPI adjusted for tax changes and excluding energy products.
2) Projections for 2017 Q3 – 2020 Q4 (broken line).
Sources: Statistics Norway and Norges Bank

capacity utilisation are somewhat higher than in the *June Report* throughout the projection period.

The forecast implies that the money market rate will remain at approximately today's level in 2017 and 2018, before rising gradually. Compared with the *June Report*, the projections are little changed for 2017 and 2018 and slightly higher towards the end of the projection period.

The real interest rate, defined as the money market rate less the current inflation rate, will rise throughout the projection period, but owing to higher inflation, the rise in the real interest rate will be less than the increase in the key policy rate. Compared with the *June Report*, the real interest rate forecast is now somewhat lower in 2019 and 2020.

Factors behind changes in the interest rate forecast

The forecast for the key policy rate is based on the criteria for an appropriate interest rate path (see box on page 40), an overall assessment of the situation in the Norwegian and global economy and Norges Bank's perception of the functioning of the economy. Chart 4.6 illustrates the factors that have influenced changes in the interest rate forecast. The overall change in the interest rate forecast from the *June Report* is shown by the black line. The model NEMO is used as a tool for interpreting the driving forces in the economy, but there is no mechanical relationship between news that deviates from the Bank's forecasts and the effect on the interest rate path. The Executive Board provides an account of its use of judgement in the "Executive Board's assessment" at the beginning of the *Report*.

Global growth has been higher than expected, and the projections for trading partners' GDP growth have been revised up. This suggests in isolation an increase in Norwegian exports. Together with prospects for a slightly faster interest rate increase abroad, this suggests a higher interest rate path (green bars).

The premium in the money market rate has declined faster than assumed in the *June Report*, and the premium is also expected to be slightly lower in the period ahead than previously projected. With the same path for the key policy rate as assumed in June,

Chart 4.5 Key policy rate. Percent. 2010 Q1 – 2020 Q4¹⁾

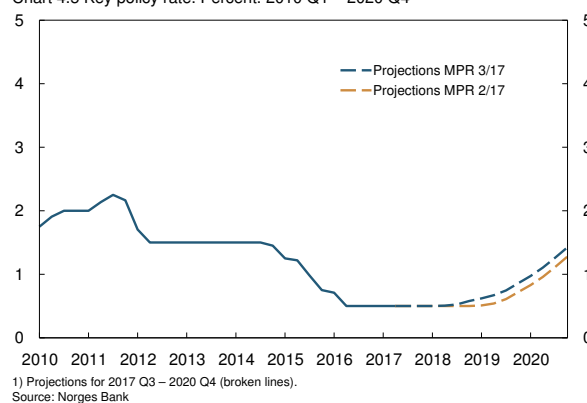
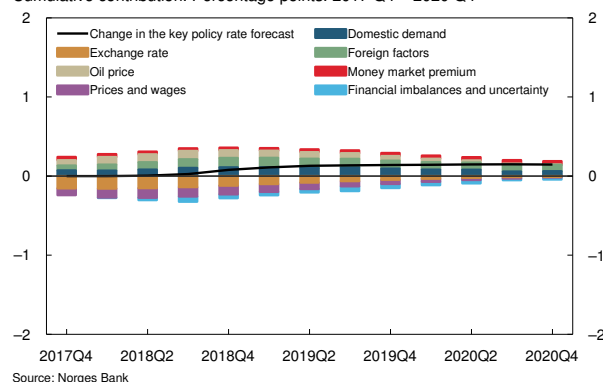


Chart 4.6 Factors behind changes in key policy rate forecast since MPR 2/17. Cumulative contribution. Percentage points. 2017 Q4 – 2020 Q4



the result would be a lower money market rate. This pulls up the interest rate path (red bars).

Oil prices are somewhat higher than assumed in June. This suggests higher exports, higher petroleum investment and higher wage growth. At the same time, higher oil prices contribute to a stronger krone. The overall effect of higher oil prices is somewhat higher activity in the Norwegian economy, with inflation slightly lower in the near term and slightly higher in the longer term. Higher oil prices pull up the interest rate path (beige bars).

Employment has risen and unemployment has declined more than projected in June. Capacity utilisation is now assessed as being somewhat higher than projected earlier. Household consumption has been higher than projected, and the projections for petroleum investment have been revised up more than indicated by the rise in oil prices. On the other hand, house price inflation has been lower than projected, which in isolation contributes to lower economic activity ahead than previously anticipated. Overall, domestic demand pulls up the interest rate path (dark blue bars).

Higher capacity utilisation would normally imply higher wage growth. However, it does not appear that wage growth in 2017 will prove to be higher than projected in the *June Report*. This may suggest that the relationship between wage growth and capacity utilisation is temporarily somewhat weaker than assumed. This may also have a restraining effect on wage growth in the years ahead. The relatively low wage growth may be an indication of a higher degree of moderation in the wage settlements in the wake of the fall in oil prices than observed in previous downturns. Moderate wage growth among many of Norway's trading partners in recent years may also have had a dampening effect on wage growth in Norway. In isolation, lower wage growth pulls down the interest rate path (purple bars).

The krone exchange rate has appreciated more than anticipated in June. Higher oil prices suggest a stronger krone, but a slightly narrower interest rate differential against trading partners pulls in the opposite direction. The krone has appreciated more than

the model framework can explain on the basis of movements in oil prices and the interest rate differential. An appreciation of the krone leads to lower inflation and reduced economic activity. In isolation, this suggests a lower interest rate path (orange bars).

Since the *June Report*, new information suggests on balance a small upward adjustment of the interest rate path throughout the projection period. When the key policy rate is very low, the uncertainty surrounding the effects of monetary policy is greater than when the rate is at a more normal level. Even minor changes in monetary policy may then lead to reactions that are difficult to predict and result in fluctuations in financial markets and asset prices. Uncertainty surrounding the effects of monetary policy suggests proceeding with greater caution in interest rate setting by reacting somewhat less to news that changes the economic outlook, whether the news pulls in the direction of a lower or a higher key policy rate. The Bank's overall judgement suggests a slightly less pronounced upward adjustment of the interest rate path than new information alone would indicate. This use of judgement is expressed by the light blue bars.

4.3 UNCERTAINTY AND CROSS-CHECKS

The interest rate forecast is uncertain

The projections in this *Report* are based on Norges Bank's assessment of the economic situation and the functioning of the economy and the effects of monetary policy. Projections are uncertain. If the economic outlook changes or if our understanding of the relationship between the interest rate level, inflation and the real economy changes, the key policy rate forecast may be adjusted.

The risks to the outlook appear to be balanced. Improved confidence indicators and higher consumption growth may be signs of a shift in economic sentiment. This may result in higher-than-expected growth ahead. It is also possible that wage growth ahead will prove to be stronger than assumed. According to the Bank's projections, the labour share will be unchanged ahead, while historical experience suggests that the labour share normally rises in periods of rising capacity utilisation. This suggests a higher interest rate path than projected in this *Report*.

On the other hand, there are factors that may suggest a lower key policy rate than implied by the forecast. The correction in the housing market has led to uncertainty about house price developments and housing investment ahead. A sharper-than-anticipated correction in the housing market will result in lower activity in the Norwegian economy. There is also a risk that the expected upswing in business investment will prove to be more modest than assumed. Weaker developments in investment will lead to a lower level of economic activity.

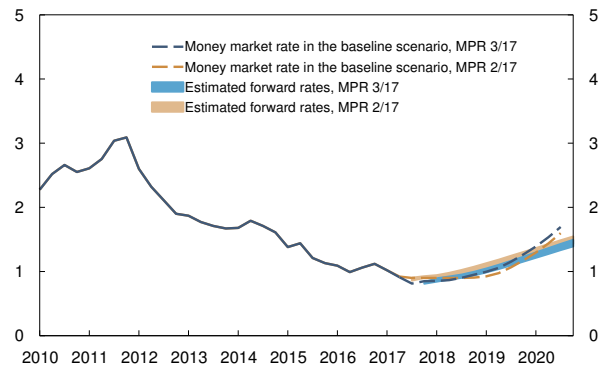
It is possible that the rise in wage growth ahead will be less pronounced than assumed in this *Report*. Global wage growth has remained moderate, despite improvements in the labour market. A long period of slow inflation may give rise to expectations that inflation will remain low. This alone can contribute to a slower rise in wage growth and inflation than projected in this *Report*, which suggests a lower interest rate path.

Cross-checks indicate consistency over time

Forward rates in the money and bond markets can function as a cross-check of whether monetary policy is consistent with earlier communication and the Bank's response pattern. Experience shows that at times the Bank's projection for the money market rate will diverge from forward rates. Since the June *Report*, estimated forward rates are little changed and are close to the Bank's forecast for the money market rate (Chart 4.7).

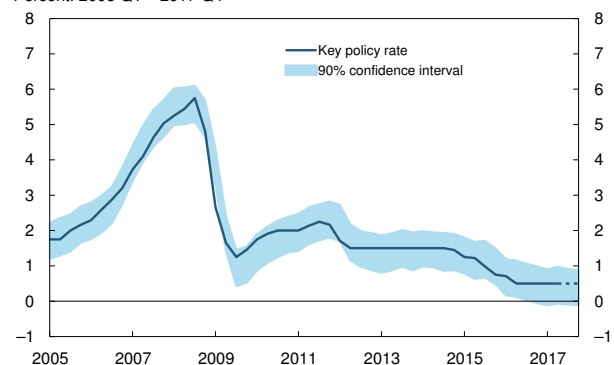
A simple rule based on Norges Bank's previous interest rate setting can also be a cross-check of the consistency of monetary policy over time. Chart 4.8 shows such a rule, where the key policy rate is determined by developments in inflation, wage growth, mainland GDP growth and foreign interest rates. The interest rate in the previous period is also taken into account. The model parameters are estimated on historical data from 1999 to the present. The projections are based on the estimates for the relevant variables up to and including 2017 Q4. The uncertainty in this model is illustrated by the blue band. The chart shows that the key policy rate forecast is close to the middle of the band.

Chart 4.7 Three-month money market rate in the baseline scenario¹⁾ and estimated forward rates²⁾. Percent. 2010 Q1 – 2020 Q4³⁾



1) Key policy rate in the baseline scenario plus Norwegian money market premiums. The calculations are based on the assumption that the key policy rate forecast is priced into the money market.
2) Forward rates are based on money market rates and interest rate swaps. The orange and blue bands show the highest and lowest rates in the period 5 June – 16 June and 4 September – 15 September, respectively.
3) Projections for 2017 Q3 – 2020 Q4 (broken lines).
Sources: Thomson Reuters and Norges Bank

Chart 4.8 Key policy rate and interest rate path that follows from Norges Bank's average pattern of interest rate setting.¹⁾ Percent. 2005 Q1 – 2017 Q4²⁾



1) Interest rate movements are explained by developments in inflation, mainland GDP growth, wage growth and three-month money market rates among trading partners, as well as the key policy rate in the preceding period. The equation is estimated over the period 1999 Q1 – 2017 Q2. For further discussion, see *Staff Memo 3/2008*, Norges Bank.
2) Projections for 2017 Q3 – 2017 Q4 (broken line).
Source: Norges Bank

CRITERIA FOR AN APPROPRIATE INTEREST RATE PATH

The operational target of monetary policy is annual consumer price inflation of close to 2.5% over time. In its conduct of monetary policy, Norges Bank operates a flexible inflation targeting regime so that weight is given to both variability in inflation and variability in output and employment when setting the key policy rate. The Bank regards the following set of criteria as a guideline for an appropriate interest rate path:

1. The inflation target is achieved:

The interest rate path should stabilise inflation at target or bring inflation back to target after a deviation has occurred.

2. The inflation targeting regime is flexible:

The interest rate path should provide a reasonable balance between the path for inflation and the path for capacity utilisation in the economy.

3. Monetary policy is robust:

The interest rate path should take account of conditions that imply a risk of particularly adverse economic outcomes and of uncertainty surrounding the functioning of the economy. A build-up of financial imbalances may increase the risk of sudden shifts in demand further out. A robust monetary policy should therefore seek to mitigate the risk of a build-up of financial imbalances. Uncertainty surrounding the effects of monetary policy normally suggests a cautious approach to interest rate setting. This may reduce the risk that monetary policy will have unintended consequences. In situations where the risk of particularly adverse outcomes is substantial, or where confidence in the nominal anchor is in jeopardy, it may be appropriate in some cases to pursue a more active monetary policy than normal.

The consideration of robustness is included because it may yield improved performance in terms of inflation, output and employment over time. The various considerations expressed in the criteria are weighed against each other. The Executive Board provides an account of the reasoning behind its judgement in the "Executive Board's assessment" at the beginning of the *Report*.

The macroeconomic model NEMO – mechanisms and driving forces

NEMO ("Norwegian Economy Model") is the primary model used by Norges Bank in analysing the Norwegian economy and monetary policy. The model has been continually refined since it was first used in 2006. It is based on economic theory and research and exhibits features similar to models used by other central banks. Together with a broad set of information, short-term models and judgemental assessments, Norges Bank uses NEMO in forecasting the interest rate, inflation and other key variables in the Norwegian economy. In addition, the model is a useful tool in efforts to understand the underlying forces driving economic fluctuations.

More recent research at Norges Bank (see Bergholt et al (2017)¹) has analysed how the international oil market and oil price movements affect the Norwegian economy. On the basis of this research, NEMO has been augmented with a separate petroleum sector (see Gerdrup et al (2017)²), which has strengthened the Bank's basis for assessing the impact of the fall in oil prices in recent years.

NEMO models the behaviour of households, firms, private banks and the central bank. The task of monetary policy in the model is to help to stabilise the economy and bring inflation back to target when the economy is exposed to shocks. The model contains a Norwegian and a foreign sector. It is assumed the foreign sector affects the Norwegian economy, but the converse is not the case. This is a common assumption in a model of a small, open economy. The new version of the model also contains oil producers in Norway and abroad, which demand investment goods from Norwegian oil service companies. Oil service companies use labour, capital and goods from other mainland firms to produce investment goods.

The oil market is specified in a simple manner. The demand for oil depends on the global activity level, while supply is determined outside the model. In the model, oil price movements that cannot be explained by changes in the global activity level can be attributed to oil supply shocks.

In NEMO, the effect of oil price movements on the Norwegian economy will differ if they are due to supply or demand factors. An oil price fall and expectations of lower oil prices reduce oil producers' demand for investment goods. A reduction in petroleum investment affects the Norwegian economy by lowering demand for labour, capital and goods and services from the wider economy. Consequently, growth in wages and private consumption is reduced. If the oil price fall is due to increased supply in the international oil market, the decline in the Norwegian economy will be restrained because a lower oil price stimulates demand among Norway's trading partners. If the oil price fall is due to an international economic downturn, lower demand for goods from traditional export firms will amplify the downturn in the Norwegian economy.

In the model, the oil price also affects the Norwegian economy through the exchange rate. An oil price fall raises the risk premium for investments in NOK. This leads to a weaker krone exchange rate, which improves the competitiveness of Norwegian export firms.

The model's interpretation of economic driving forces

In economic models such as NEMO, developments in variables determined *in* the model (endogenous variables) will be determined by the magnitude of variables determined *outside* the model (exogenous variables or shocks). The various shocks will typically operate through a number of channels and affect the economy over an extended period.

1 Bergholt, D., V.H. Larsen and M. Seneca (2017) "Business Cycles in an Oil Economy". *Journal of International Money and Finance* (forthcoming).
 2 Gerdrup, K., E.M. Kravik, K.S. Paulsen and Ø. Robstad (2017) "Documentation of NEMO – Norges Bank's core model for monetary policy analysis and forecasting". *Staff Memo 8/2017*, Norges Bank.

In NEMO, the endogenous variables will oscillate around a long-term equilibrium level that is determined by structural conditions in the economy. Since the equilibrium level cannot be observed, statistical methods and judgement are used to estimate equilibrium levels on the basis of historical data. NEMO is used to find the combination of shocks that most likely explains the oscillations around the estimated equilibrium level.

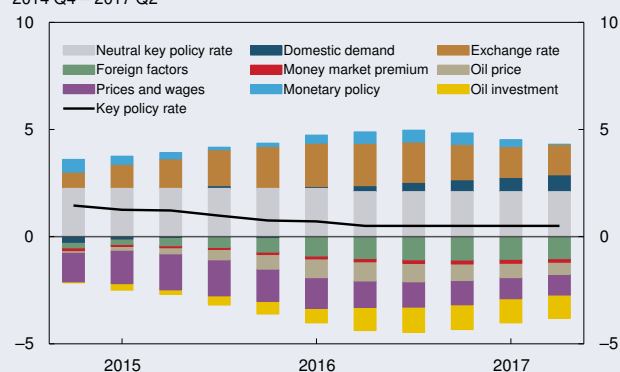
Chart 1 shows the model's historical decomposition of the key policy rate for the period 2014 Q4 to 2017 Q2. The black line shows the actual key policy rate, while the estimated equilibrium level (the estimated neutral key policy rate) is illustrated by the grey bars.³ The other bars in the chart show the effects of the shocks in the model to the key policy rate. Since the shocks are estimated to persist for some time, the bars will also include shocks that have occurred in previous periods and that continue to affect the economy. Built-in inertia in the model ensures that the impact of shocks can be prolonged.

According to NEMO, the Norwegian economy was exposed to several types of shock in the period covered in the chart. The model finds that total domestic demand was weak at the beginning of the period, but that it picked up in 2016, partly owing to increased housing investment and higher public demand (dark blue bars). In isolation, these factors suggested a higher key policy rate through the period. A krone exchange rate that was weaker than can be explained by the interest rate differential against other countries and the oil price, is interpreted by the model as an increase in the risk premium for investing in NOK (orange bars). The weaker krone in the period stimulated the export sector and kept inflation elevated, which in isolation suggested a higher key policy

rate. A lower oil price and low petroleum investment (beige and yellow bars, respectively), weak growth and low interest rates among trading partners (green bars) and lower wage growth – in the model interpreted as a temporary structural shift in wage formation (purple bars) – suggested a lower key policy rate in the period. The relatively low wage growth may be an indication of a higher degree of moderation in the wage settlements in the wake of the fall in oil prices than observed in previous downturns. Somewhat higher money market premiums suggested a slightly lower key policy rate in the period (red bars). The light blue bars reflect a somewhat higher key policy rate than expected developments in inflation and capacity utilisation suggested in isolation. This may be due to financial stability considerations and a cautious approach to interest rate setting.

The model-based decomposition of the key policy rate does not take into account judgemental assessments of the current situation or of developments ahead as they appear in forecasts in the *Monetary Policy Report*. There is therefore not a direct relationship between Chart 1 and the "interest rate accounts" presented in the *Reports*.

Chart 1 Shock decomposition of the key policy rate.¹⁾ In percentage units. 2014 Q4 – 2017 Q2



³ The estimated neutral key policy rate in NEMO is based on Norges Bank's published estimates. The estimate now lies in the lower part of the band for the neutral interest rate (see Special Feature in *Monetary Policy Report* 3/16).

¹⁾ In NEMO, 26 observable variables are used for identifying 26 different types of shock. In the chart, shocks are sorted into categories to simplify the presentation. Source: Norges Bank

5 Financial stability assessment

– decision basis for the countercyclical capital buffer

Household credit growth remains high, and growth in corporate credit from Norwegian banks and the bond market has picked up since the turn of the year. House prices have long risen faster than household income, but have declined in recent months. High property price inflation over a longer period and a persistent rise in household debt ratios suggest that financial imbalances have built up. Low house price inflation will curb debt accumulation, but it will take time for household vulnerabilities to recede. The largest banks continued to increase their capital ratios in 2017 Q2 and appear to have met their capital targets.

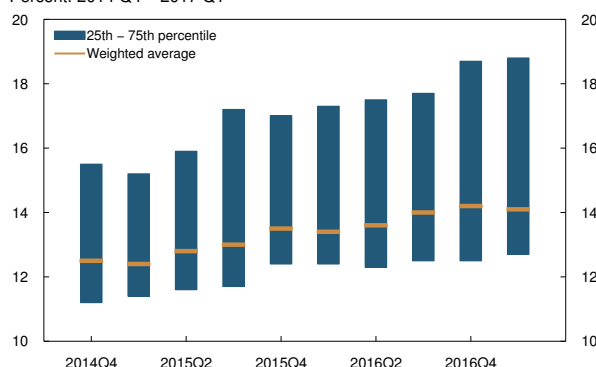
5.1 INTERNATIONAL DEVELOPMENTS

The global economic upturn appears to have taken hold. Together with low interest rates, this has improved the debt-servicing capacity of households and enterprises. Equity and bond prices have shown little change through summer. Financial market volatility is historically low, despite substantial uncertainty related to factors such as US economic policy and the outcome of the negotiations between the UK and the EU on withdrawal terms. Any repricing of risk premiums may lead to a decline in asset values and increase debt-servicing costs. This may pose a threat to international financial stability. Despite persistently low profitability, European banks have continued to strengthen their capital base. Common Equity Tier 1 (CET1) capital ratios (risk-weighted) averaged 14% in 2017 Q1, following an increase of almost 2 percentage points over the past two years (Chart 5.1), although substantial differences remain between and within countries. The leverage ratio was 5% in 2017 Q1.

5.2 CREDIT

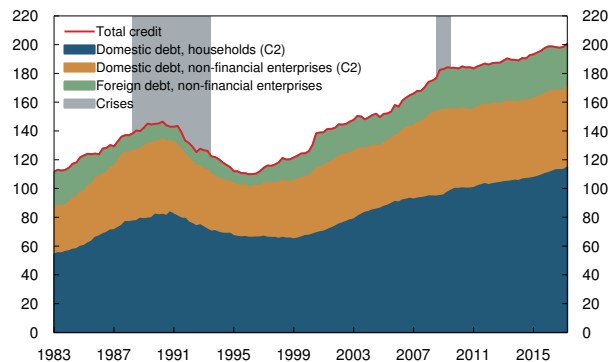
Credit has long been rising faster than mainland GDP (Chart 5.2). The rise in total credit primarily reflects strong growth in household debt over the past decade. In the same period, the rise in corporate debt has been more in line with GDP. In 2017 Q2, growth in total credit rose faster than GDP and more than its estimated trend (Chart 5.3). This is attributable to

Chart 5.1 Common Equity Tier 1 (CET1) capital ratios for the largest EU banks.¹⁾ Percent. 2014 Q4 – 2017 Q1



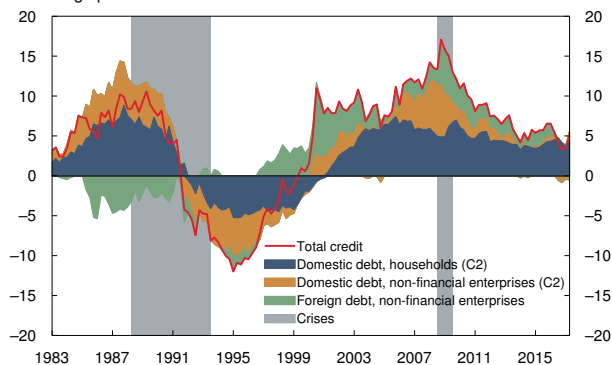
¹⁾ Based on 189 banks. Source: European Banking Authority (EBA) Risk Dashboard

Chart 5.2 Credit mainland Norway as a share of mainland GDP. Percent. 1983 Q1 – 2017 Q2



Sources: IMF, Statistics Norway and Norges Bank

Chart 5.3 Decomposed credit gap. Credit mainland Norway as a share of mainland GDP. Deviation from trend with augmented HP filter.¹⁾ Percentage points. 1983 Q1 – 2017 Q2



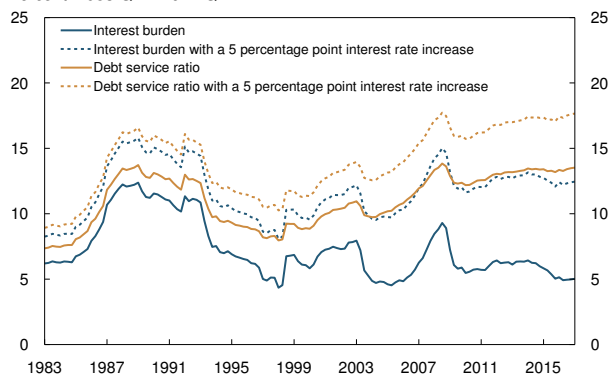
¹⁾ One-sided Hodrick-Prescott filter estimated on data augmented with a simple projection. Lambda = 400 000. Sources: IMF, Statistics Norway and Norges Bank

growth in corporate debt from domestic sources and stable household credit growth.

High household debt growth

Household debt has risen faster than household income for a long period, resulting in higher debt ratios. Debt service ratios, measured as interest and ordinary principal payments as a share of income, have picked up (Chart 5.4). Despite the low level of interest rates, debt service ratios are close to the levels prevailing during the banking crisis at the end of the 1980s. With higher household debt, an increase in lending rates has a greater impact on the interest burden and debt service ratio now than earlier.

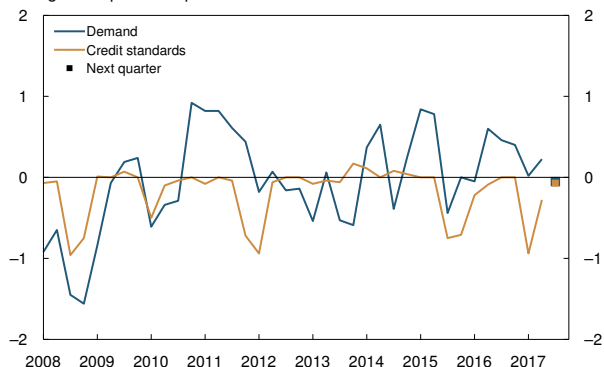
Chart 5.4 Household interest burden and debt service ratio.¹⁾ Percent. 1983 Q1 – 2017 Q1



¹⁾ The interest burden is calculated as interest expenses as a percentage of disposable income plus interest expenses. The debt service ratio also includes estimated principal payments on an 18-year mortgage. Disposable income is adjusted for estimated reinvested dividend income for 2003 – 2005 and reduction of equity capital for 2006 Q1 – 2012 Q3. Growth in disposable income excluding dividend income is used for the period 2015 Q1 – 2017 Q1. Sources: Statistics Norway and Norges Bank

Growth in household credit is higher than in summer 2016 and has been fairly stable over the past six months. At the same time, income growth has remained weak. Since the beginning of the year, house price inflation has slowed markedly. With rapid house price inflation in 2016 and an increase in the number of completed dwellings, debt growth is expected to remain elevated in the period ahead. Low house price inflation (see discussion in Section 3) will curb debt growth, but it will take time for household sector vulnerabilities to recede.

Chart 5.5 Credit demand and banks' credit standards.¹⁾ Change from previous quarter. Households. 2008 Q1 – 2017 Q2



¹⁾ The banks respond on a scale of +/-2. In the aggregated figures, banks are weighted by the size of their balance sheets. Negative values denote lower demand or tighter credit standards. Source: Norges Bank's Survey of Bank Lending

COUNTERCYCLICAL CAPITAL BUFFER

Banking regulation and macroprudential measures are the first line of defence against financial instability. Banks should build and hold a countercyclical capital buffer when financial imbalances are building up or have built up. Norges Bank's assessment of financial imbalances is based on developments in credit, property prices and bank funding. The assessment of financial imbalances forms the basis for the Bank's advice to the Ministry of Finance on the level of the countercyclical capital buffer (see boxes on pages 4 and 54). The buffer rate is set at 1.5% and will increase to 2.0%, effective from 31 December 2017.

The banks included in Norges Bank's Survey of Bank Lending reported a slight tightening of credit standards for households in 2017 Q2 (Chart 5.5). As the reason for the tightening, the banks cited the changes in the regulation on requirements for new residential mortgage loans, which entered into force at the start of the year. In 2017 Q1, the banks reported a considerable tightening of credit standards. In 2017 Q2, the banks also reported somewhat wider margins on loans to households as a result of reduced funding costs. The banks do not expect any changes in either margins or credit standards in 2017 Q3.

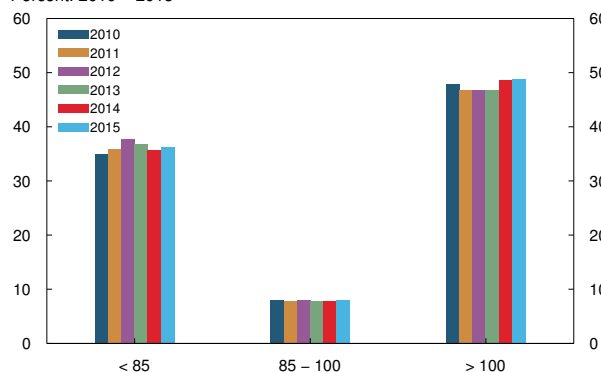
Banks' lending to households is generally secured on dwellings. Tax assessment data show that half of total household debt (excluding student loans) exceeds the estimated market value¹ of the dwellings (Chart 5.6). The distribution of total household debt by debt ratio was fairly stable between 2010 and 2015. According to the regulation on new residential mortgage loans, repayment mortgages shall generally not exceed 85% of the dwelling's value when the loan is approved. The tax assessment data do not take any additional collateral into account and the value of holiday homes is excluded. In isolation, a fall in house prices will lead to an increase in the share of total debt with high debt ratios.

Slightly higher corporate debt growth

Growth in mainland corporate debt has been moderate in recent years. In recent months, growth in total corporate credit has edged up, particularly as a result of higher credit from domestic sources (Chart 5.7).

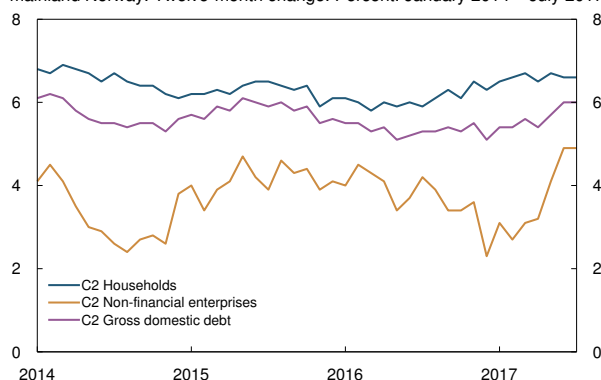
Growth in corporate credit from domestic sources has long been supported by lending from banks and mortgage companies (Chart 5.8). Since the turn of the year, growth in corporate credit from Norwegian banks and the bond market has picked up. Growth in bank lending has been held up by lending to enterprises in commercial real estate (CRE), services and construction (Chart 5.9). So far this year, bond debt has increased in the real estate sector, while the petroleum sector is moving in the opposite direction. In total, Norwegian enterprises have raised just over NOK 40bn in bond funding since the turn of the year, about double that obtained in the same period in

Chart 5.6 Distribution of debt by loan-to-value ratio.¹⁾ Share of loan volume.²⁾ Percent. 2010 – 2015



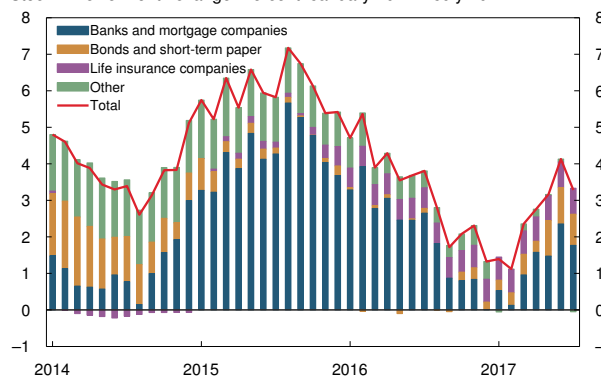
1) Total debt excluding student loans.
2) Non-homeowning households with debt are not included. Hence, the bars do not sum up to 100 for each year.
Sources: Norwegian Tax Administration and Norges Bank

Chart 5.7 Credit to households and non-financial enterprises in mainland Norway. Twelve-month change. Percent. January 2014 – July 2017



Sources: Statistics Norway and Norges Bank

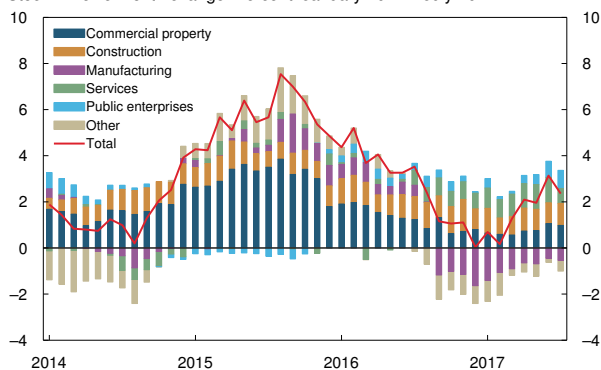
Chart 5.8 Credit to non-financial enterprises, by source. Stock. Twelve-month change. Percent. January 2014 – July 2017



Source: Statistics Norway

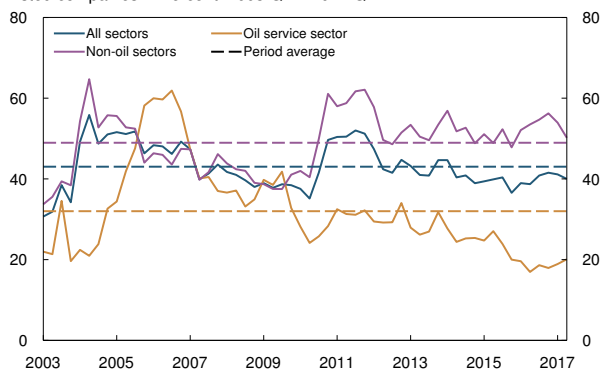
1 Estimated market values are based on the Norwegian Tax Administration's tax values.

Chart 5.9 Credit from banks and mortgage companies, by sector. Stock. Twelve-month change. Percent. January 2014 – July 2017



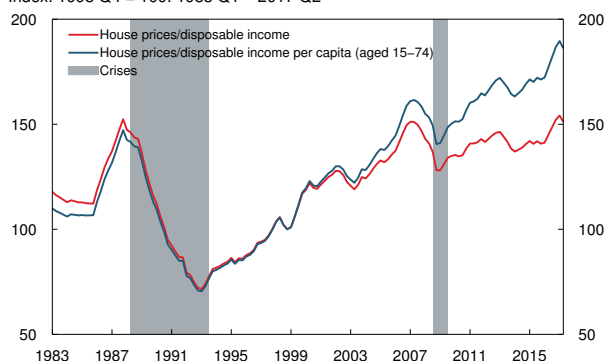
Sources: Statistics Norway and Norges Bank

Chart 5.10 Debt-servicing capacity¹⁾ and historical averages. Listed companies.²⁾ Percent. 2003 Q1 – 2017 Q2



1) Earnings before interest, tax, depreciation and amortisation (EBITDA) for the previous four quarters as a percentage of net-interest bearing debt.
2) Norwegian non-financial companies listed on Oslo Børs, excluding oil and gas extraction. Norsk Hydro is excluded to end-2007 Q3.
Sources: Bloomberg and Norges Bank

Chart 5.11 House prices relative to disposable income.¹⁾ Index. 1998 Q4 = 100. 1983 Q1 – 2017 Q2



1) Disposable income adjusted for estimated reinvested dividend income for 2003 – 2005 and reduction of equity capital for 2006 Q1 – 2012 Q3. Growth in disposable income excluding dividend income is used for 2015 Q1 – 2017 Q2.
Sources: Eiendomsverdi, Finn.no, Norwegian Association of Real Estate Agents (NEF), Real Estate Norway, Statistics Norway and Norges Bank

2016. Both high- and low-yield enterprises have ample access to funding, and the volume of issues so far this year is the highest since 2014.

The banks in Norges Bank's lending survey reported unchanged credit demand and unchanged credit standards for enterprises in 2017 Q2. The banks do not expect any changes in credit demand or credit standards in Q3, which along with increased corporate credit growth, underpins the impression that credit-worthy enterprises have ample access to credit.

The debt-servicing capacity of listed companies has declined in the past two quarters (Chart 5.10). Shipping companies with high debt pulled down on the earnings to net interest-bearing debt ratio in 2017 Q2. Oil service companies increased their debt-servicing capacity in 2017 Q2. These companies have, over a long period, raised equity capital through equity issues and debt conversions. The market value of oil service companies' equity is significantly lower than book value, which suggests that there may be a need for further write-downs and restructurings ahead. Market values of equity for other companies have remained at a stable level for several years.

5.3 PROPERTY PRICES

Both residential and commercial property prices have risen substantially for a long period. This has contributed to increased debt accumulation. The ratio of house prices to disposable income is still close to the level prevailing prior to the financial crisis, but has declined somewhat after the fall in house prices (Chart 5.11). Measured relative to per capita disposable income, house prices are substantially higher than the level prevailing prior to the financial crisis.

Slowing house price inflation

House prices have fallen in recent months following a rapid rise through much of 2016 (Chart 5.12). Amendments to the regulation on residential mortgage loans have likely contributed to the decline. Twelve-month house price inflation in Norway has fallen considerably. Although house price inflation showed the steepest fall in Oslo, where it had showed the sharpest rise in 2016, house price inflation has also slowed in other parts of the country (Chart 5.13). House prices in most cities are lower than they were when prices peaked in spring.

In the past two years, the square metre price in Oslo has moved up considerably more than in other cities (Chart 5.14). At their highest, prices in Oslo were around two-thirds higher than house prices in Bergen and Trondheim. Since May, when price differences were at their widest, the price level in Oslo has come closer to that of the other cities. In the decade to 2015, the square metre price in Oslo was approximately 40% above the corresponding prices in Bergen and Trondheim. Developments varied somewhat more in Stavanger and Tromsø.

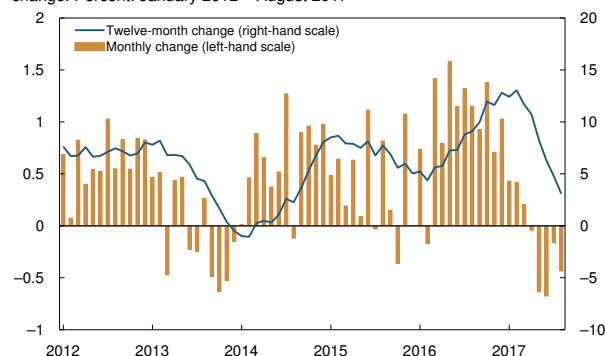
In recent months, the number of existing homes listed for sale in Oslo has risen. At the same time, home sales have remained stable after having edged down earlier in 2017. The stock of homes for sale has thus increased to slightly higher levels than at the end of 2013. The stock of homes for sale has also increased somewhat in the rest of the country.

New home sales have declined significantly in recent months, particularly in eastern Norway. New home sales in eastern Norway over the past 12 months have remained at a high level (Chart 5.15). In the rest of the country, new home sales have been more stable. A high share of housing construction projects are sold before they are built, and the number of housing starts in eastern Norway has continued to rise in recent months (Chart 5.16). The number of completed dwellings in eastern Norway is expected to rise further, and, along with the increase in the stock of unsold existing homes, is expected to contribute to low house price inflation ahead (see Section 3). The correction in the housing market may reduce the risk of an abrupt and more pronounced decline further ahead.

Rising office rents in Oslo

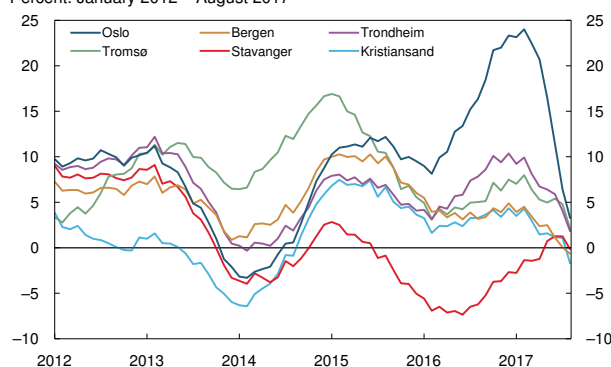
Banks have considerable CRE exposures, which makes them vulnerable to developments in the CRE sector. Office rents in Oslo have increased in most areas over the past six months, and the office vacancy rate has fallen (Chart 5.17). In the period ahead, market participants expect a further decline in the office vacancy rate, driven by low activity in construction and somewhat higher demand. This may push up rents ahead. The required rate of return for prime real estate in Oslo appears to have stabilised in the past six months after having fallen for a long period.

Chart 5.12 House prices. Twelve-month change and seasonally adjusted monthly change. Percent. January 2012 – August 2017



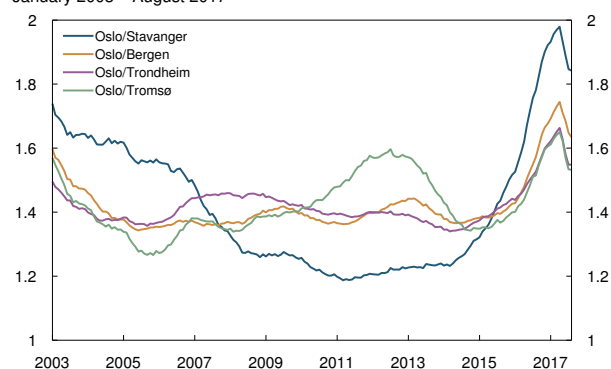
Sources: Eiendomsverdi, Finn.no and Real Estate Norway

Chart 5.13 House prices. Twelve-month change. Percent. January 2012 – August 2017



Sources: Eiendomsverdi, Finn.no and Real Estate Norway

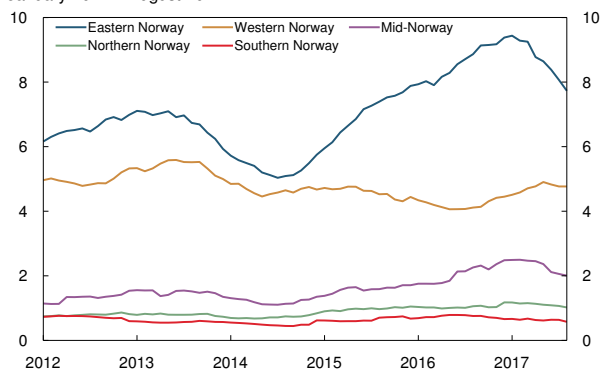
Chart 5.14 Estimated price per square metre in Oslo relative to other cities.¹⁾ January 2003 – August 2017



¹⁾ Prices per sq.m. at end-August are based on observations from the past six months. Prices per sq.m. are extended by using past growth in the house price index of the relevant city.

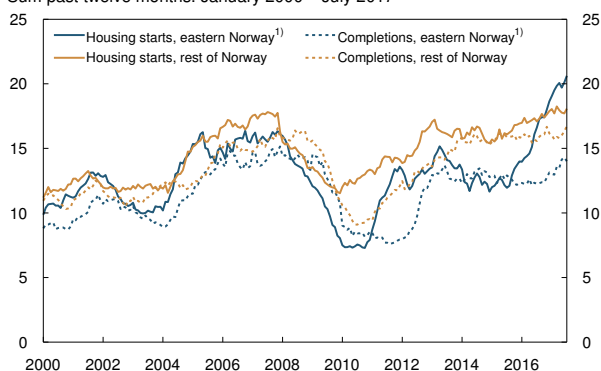
Sources: Eiendomsverdi, Finn.no and Real Estate Norway

Chart 5.15 New home sales. In thousands. Sum past twelve months. January 2012 – August 2017



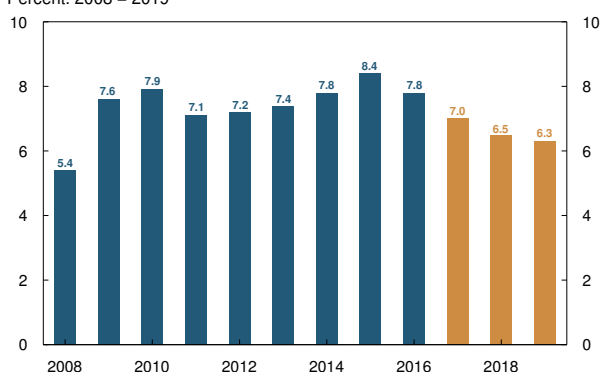
Sources: Norwegian Home Builders' Association, Prognosecenteret and Norges Bank

Chart 5.16 Housing starts and completions. In thousands. Sum past twelve months. January 2000 – July 2017



1) Akershus, Buskerud, Hedmark, Oppland, Oslo, Telemark, Vestfold and Østfold. Sources: Statistics Norway and Norges Bank

Chart 5.17 Office vacancy rates in Oslo and Bærum at year-end.¹⁾ Percent. 2008 – 2019²⁾



1) Calculated as the average of projections from different analysts at 30 June 2017. 2) Projections for 2017 – 2019. Source: Entra

In other cities, developments in office rents have been mixed over the past six months. Office rents have continued to fall in parts of Stavanger with a substantial oil industry presence, while rents have been fairly stable in Bergen and Trondheim.

5.4 BANKS

Profitability for large Norwegian banks has been solid in recent years, but return on equity declined somewhat from autumn 2014 to the beginning of 2017. In the period between 2017 Q1 and Q2, return on equity increased for the largest Norwegian banks, but was still somewhat lower than at the same time in 2016.

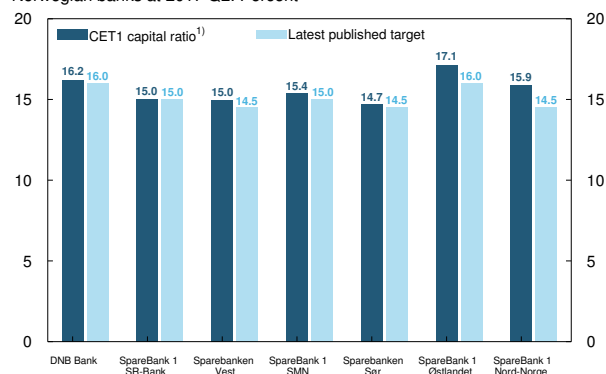
Some of the factors that have weighed on profitability in the past two years appear to have reversed. A number of large Norwegian banks expect loan losses to be lower in 2017 than in 2016. Banks' overall loan losses increased in 2016, especially on oil-related exposures, but have fallen since the turn of the year. Completed restructurings in the petroleum and offshore sectors have contributed to the decrease in losses. The crisis in the petroleum industry has also had fewer spillover effects in other industries than banks expected. At the same time, there is still uncertainty surrounding the need for additional restructuring in the oil-related sector.

At the end of 2017 Q2, all the large Norwegian banks met the total Common Equity Tier 1 (CET1) capital requirement (Pillar 1 and Pillar 2) that applies from end-2017. Most banks also have achieved their own targets for the CET1 ratio, which are higher than the total requirement (Chart 5.18). From the end of June 2017, banks were also required to meet the leverage ratio requirement. DNB, which is regarded as systemically important, is subject to a 6% leverage ratio requirement, while other banks are subject to a 5% requirement. The largest Norwegian banks report a leverage ratio of around 7% at the end of 2017 Q2.

Growth in Norwegian banks' corporate lending has increased over the first half of 2017 (Chart 5.19). At the same time, growth in lending by branches of foreign banks has declined from high levels. Since Norwegian banks have now achieved their capital targets, there is room for lending growth ahead.

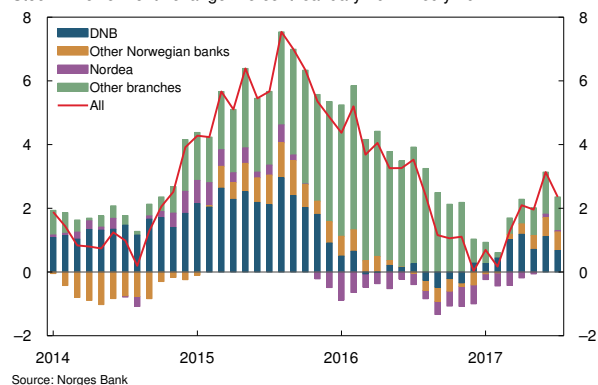
Banks have ample access to wholesale funding. Overall, banks have raised less funding so far in 2017 than in the same period in 2016. Risk premiums on senior bonds and covered bonds issued by Norwegian banks and mortgage companies have fallen somewhat since the June *Report*. Banks' wholesale funding ratio has edged down over the past few years (Chart 5.26).

Chart 5.18 Common Equity Tier 1 (CET1) capital ratios and targets for large Norwegian banks at 2017 Q2. Percent



1) Includes complete result for 2017 H1.
Sources: Banks' quarterly reports and Norges Bank

Chart 5.19 Corporate lending by banks and mortgage companies. Stock. Twelve-month change. Percent. January 2014 – July 2017



HOUSE PRICES AND REQUIREMENTS RELATING TO RESIDENTIAL MORTGAGE LOANS IN SCANDINAVIA

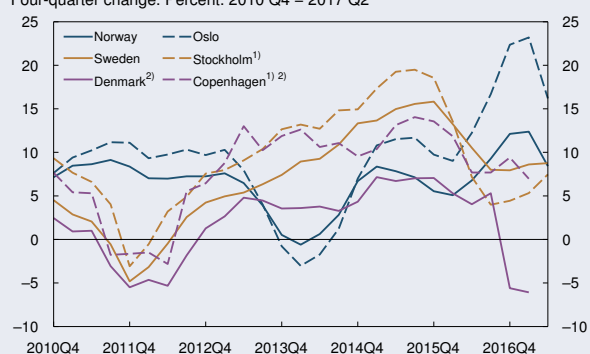
In recent years, house prices have risen considerably in all three of the Scandinavian countries (Chart 5.20). House price inflation in the capitals has long been higher than in the countries as a whole, but recently, developments have been more varied. In recent years, the authorities in these three countries have tightened requirements relating to residential mortgage loans:

- The Norwegian requirements relating to banks' residential mortgage lending were tightened effective from January 2017. A maximum debt-to-income (DTI) ratio requirement of five times gross income was introduced and the loan-to-value (LTV) ratio requirement for loans with interest-only periods and for secondary home purchases in Oslo was tightened to 60%. The flexibility given to banks to deviate from the requirements was tightened for mortgage loans in Oslo to 8% of the value of loans approved each quarter. The requirement that borrowers have the capacity to service debt in the event of a 5 percentage point increase in interest rates was retained.
- The Swedish financial supervisory authority has recommended tightening the amortisation requirement effective from January 2018¹: households with debt exceeding 4.5 times gross income must repay a minimum of 1% of the loan annually in addition to the 2016 amortisation requirements at 2% annually for households with LTV ratios above 70% and 1% for households with LTV ratios between 50% and 70%.
- The Danish Ministry of Industry, Business and Financial Affairs has recently called on credit institutions to limit the share of mortgages granted in Copenhagen and Aarhus to households with a DTI ratio of more than four times gross income and whose mortgage has interest-only periods or a variable rate to a maximum of 15% of total mortgage lending.² The request supplements credit guidance issued by the Danish Financial Supervisory Authority in 2016. The guidance applies to areas where house price inflation is high and contains recommendations for debt-servicing capacity in the event of an interest rate increase, amortisation requirements for customers with negative equity, equity requirements for customers with high DTIs and special requirements for customers who temporarily own two dwellings.

1 See Finansinspektionen (2017) "Förslag till ett skärpt amorteringskrav för hushåll med höga skuldkvoter" [Proposal for tighter amortisation requirements for highly indebted households] (in Swedish only).

2 See Erhvervsministeriet (2017) "Erhvervsministeren anmoder kreditinstitutterne om at udvise forsigtighed i långivningen til boligkøb i vækstområder" [The Minister of Industry calls on credit institutions to show prudence in lending for home purchases in high-growth areas] (in Danish only).

Chart 5.20 House prices in selected countries and capitals.
Four-quarter change. Percent. 2010 Q4 – 2017 Q2



1) Flats only.

2) The latest observation is 2017 Q1.

Sources: Eiendomsverdi, Finn.no, Real Estate Norway, Statistics Denmark and Valueguard

COUNTERCYCLICAL CAPITAL BUFFERS IN OTHER COUNTRIES

The objective of the countercyclical capital buffer is to mitigate systemic risk, and the buffer is set on the basis of national conditions. EU capital adequacy legislation (CRD IV/CRR) provides for international reciprocity, ie that buffer rates must be recognised across borders.¹ This means that banks operating in several countries must comply with buffer rates that are applicable in the borrower's home country.

The Norwegian regulation on recognition of countercyclical capital buffers entered into force on 1 October 2016. For exposures in EU countries, the buffer rate in the relevant country must be recognised.² In principle, countercyclical capital buffer rates in non-EU countries must also be recognised. For exposures in countries that have not set their own rate, the Norwegian buffer rate applies. The Ministry of Finance may set different rates for exposures in non-EU countries, and Norges Bank is to provide advice on these rates. The letter containing Norges Bank's advice on the countercyclical capital buffer in 2017 Q2 stated that there is no basis at present for recommending different rates.

The total countercyclical buffer requirement applicable to Norwegian banks will depend on the countries in which they have exposures. Most countries where Norwegian banks have fairly large exposures have set their rates at 0% (Table 1).

TABLE 1 Countercyclical capital buffers in countries where Norwegian banks' exposures are largest

Country	Current buffer rate	Norwegian banks' exposure ¹
Sweden	2%	8.4%
US	0%	4.1%
Denmark	0%	3.0%
UK	0%	2.5%
Lithuania	0%	2.1%
Finland	0%	1.9%
Poland	0%	1.8%
Latvia	0%	1.2%
Singapore	0%	1.1%
Canada	-	1.1%

¹ Share of risk-weighted assets (cf Article 3 of ESRB 2015/3). Average for the period 2015 Q2 to 2017 Q2. Includes banks that have submitted Templates C09.01 and C09.01 as part of their CRD IV reporting, with the exception of Nordea, which is no longer a Norwegian bank as from 1 January 2017.

Sources: Bank for International Settlements (BIS), the European Systemic Risk Board (ESRB), Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank

¹ Buffer rates of up to 2.5% must be automatically recognised across EU countries. The limit is lower than 2.5% during a phasing-in period between 2016 and 2019. The European Systemic Risk Board (ESRB) recommends in general that higher rates should also be recognised (see ESRB (2014) *Recommendation on guidance for setting countercyclical buffer rates*).

² An overview of the countercyclical capital buffer rates currently applicable in EU countries is provided on the ESRB website: *National policy – countercyclical capital buffer*. A similar overview for Basel Committee jurisdictions is available on the BIS website: *Countercyclical capital buffer*.

MEASURING FINANCIAL IMBALANCES AND BUFFER GUIDE¹

Norges Bank's assessment of financial imbalances is based on the credit-to-GDP ratio, developments in property prices and banks' wholesale funding ratio.

Total household and corporate debt has long been rising faster than mainland GDP (Chart 5.2). Over the past year, total credit has been growing slightly faster than GDP and the gap between the total credit-to-GDP ratio and the estimated trend has widened somewhat (Chart 5.21).² This primarily reflects higher growth in corporate credit from domestic sources (Chart 5.3), but also somewhat above-trend household credit growth. Growth in corporate foreign debt has been below the estimated trend.

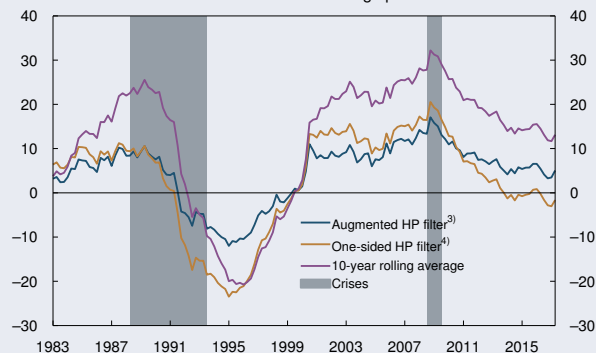
The Basel Committee on Banking Supervision has proposed a simple rule for calculating a reference rate for the countercyclical capital buffer (a buffer guide) based on the credit-to-GDP ratio.³ The buffer guide is 1.0% in 2017 Q2 when the trend is estimated using a one-sided HP filter augmented with a simple projection, while the buffer guide is 0% when the trend is estimated using a one-sided HP filter (Chart 5.22).

House prices relative to disposable income declined between 2017 Q1 and Q2 after rising substantially in 2016 (Chart 5.11). The deviation from estimated trends also decreased between 2017 Q1 and Q2, but is still higher than at the same time in 2016 (Chart 5.23). Real commercial property prices have risen considerably in recent years and deviations from estimated trends have increased (Chart 5.24 and 5.25). The most recent observation in the commercial property price indicator was for 2016 Q4. Banks' wholesale funding ratio has shown little change in recent years. The ratio decreased slightly in 2017 Q2, and the decline was greater than estimated trends (Chart 5.26 and 5.27).

Norges Bank has developed early warning models for financial crises based on credit and property price indicators.⁴ The blue area in Chart 5.28 shows estimated crisis probabilities based on a large number of combinations of explanatory variables and trend estimation methods. The chart shows that the estimated crisis probabilities have declined since the financial crisis, but that the spread between the predictions from the different models is slightly wider than at the same time in 2016.

- 1 See also "Criteria for an appropriate countercyclical capital buffer", *Norges Bank Papers* 1/2013.
- 2 There is considerable uncertainty related to trend estimation. Norges Bank has so far applied three different methods of trend estimation (see page 30 in Norges Bank (2013), *Monetary Policy Report* 2/13).
- 3 See Bank for International Settlements (2010), *Guidance for national authorities operating the countercyclical capital buffer*.
- 4 See box on page 40 in Norges Bank (2014), *Monetary Policy Report* 3/14 and Norges Bank (2014), "Bubbles and crises: The role of house prices and credit", *Norges Bank Working Papers* 14/2014.

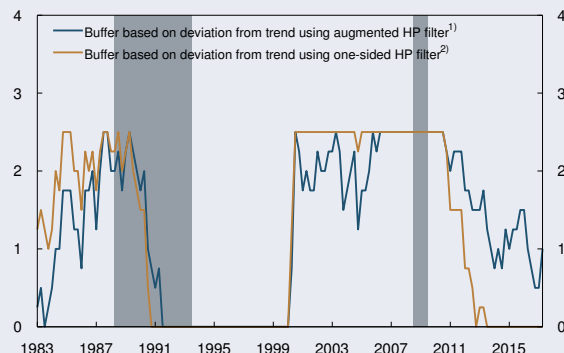
Chart 5.21 Credit gap. Total credit mainland Norway¹⁾ as a share of mainland GDP. Deviation from estimated trends²⁾ Percentage points. 1983 Q1 – 2017 Q2



- 1) The sum of C2 households and C3 non-financial enterprises for mainland Norway (all non-financial enterprises pre-1995). C3 non-financial enterprises comprises C2 non-financial enterprises and foreign debt for mainland Norway.
- 2) The trends are estimated based on data from 1975 Q4 onwards.
- 3) One-sided Hodrick-Prescott filter estimated on data augmented with a simple projection. Lambda = 400 000.
- 4) One-sided Hodrick-Prescott filter. Lambda = 400 000.

Sources: IMF, Statistics Norway and Norges Bank

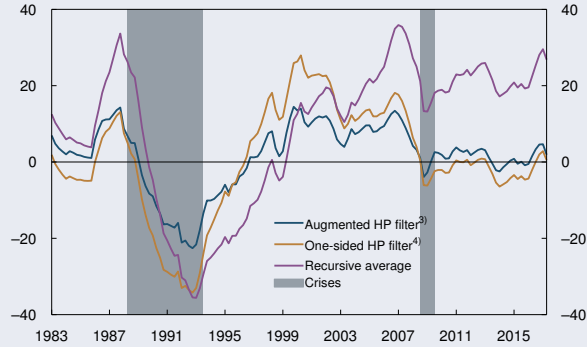
Chart 5.22 Reference rates for the countercyclical capital buffer under alternative trend estimates. Percent. 1983 Q1 – 2017 Q2



- 1) One-sided Hodrick-Prescott filter estimated on data augmented with a simple projection. Lambda = 400 000.
- 2) One-sided Hodrick-Prescott filter. Lambda = 400 000.

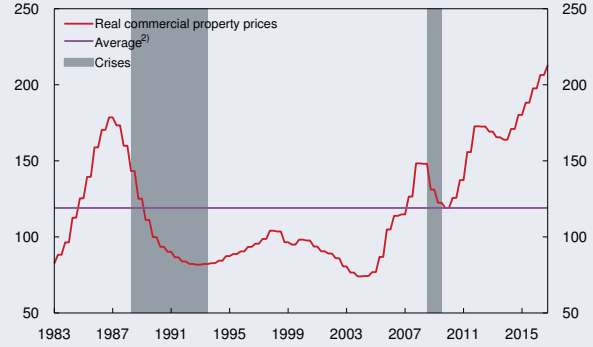
Sources: IMF, Statistics Norway and Norges Bank

Chart 5.23 House price gap. House prices relative to disposable income¹⁾ as deviation from estimated trends.²⁾ Percent. 1983 Q1 – 2017 Q2



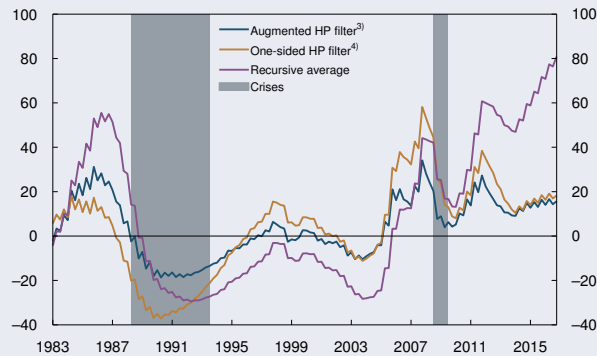
1) Disposable income adjusted for estimated reinvested dividend income for 2003 – 2005 and reduction of equity capital for 2006 Q1 – 2012 Q3. Growth in disposable income excluding dividend income is used for 2015 Q1 – 2017 Q2.
 2) The trends are estimated based on data from 1978 Q4 onwards.
 3) One-sided Hodrick-Prescott filter estimated on data augmented with a simple projection. Lambda = 400 000.
 4) One-sided Hodrick-Prescott filter. Lambda = 400 000.
 Sources: Eiendomsverdi, Finn.no, Norwegian Association of Real Estate Agents (NEF), Real Estate Norway, Statistics Norway and Norges Bank

Chart 5.24 Real commercial property prices.¹⁾ Index. 1998 = 100. 1983 Q1 – 2016 Q4



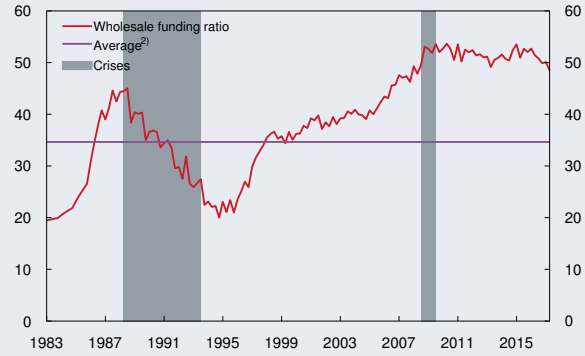
1) Estimated selling prices for centrally located high-standard office space in Oslo. Deflated by the GDP deflator for mainland Norway.
 2) Based on data from 1981 Q2 onwards.
 Sources: Dagens Næringsliv, OPAK, Statistics Norway and Norges Bank

Chart 5.25 Commercial property price gap. Real commercial property prices¹⁾ as deviation from estimated trends.²⁾ Percent. 1983 Q1 – 2016 Q4



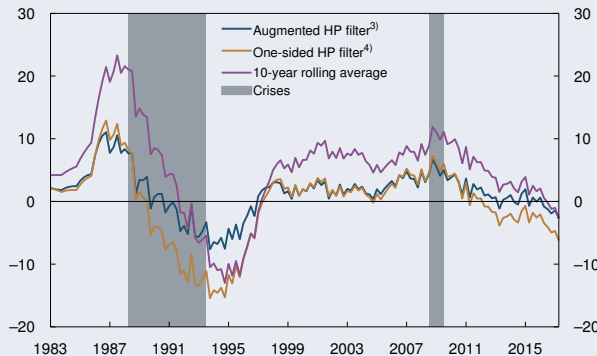
1) Estimated selling prices for high-standard office space in Oslo deflated by the GDP deflator for mainland Norway.
 2) The trends are estimated based on data from 1981 Q2 onwards.
 3) One-sided Hodrick-Prescott filter estimated on data augmented with a simple projection. Lambda = 400 000.
 4) One-sided Hodrick-Prescott filter. Lambda = 400 000.
 Sources: Dagens Næringsliv, OPAK, Statistics Norway and Norges Bank

Chart 5.26 Banks¹⁾ wholesale funding ratio. Percent. 1983 Q1 – 2017 Q2



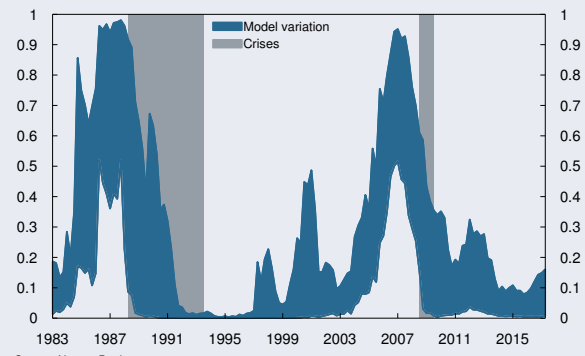
1) All banks and covered bond mortgage companies in Norway except branches and subsidiaries of foreign banks.
 2) Based on data from 1975 Q4 onwards.
 Source: Norges Bank

Chart 5.27 Wholesale funding gap. Banks¹⁾ wholesale funding ratio as deviation from estimated trends.²⁾ Percentage points. 1983 Q1 – 2017 Q2



1) All banks and covered bond mortgage companies in Norway except branches and subsidiaries of foreign banks.
 2) The trends are estimated based on data from 1975 Q4 onwards.
 3) One-sided Hodrick-Prescott filter estimated on data augmented with a simple projection. Lambda = 400 000.
 4) One-sided Hodrick-Prescott filter. Lambda = 400 000.
 Source: Norges Bank

Chart 5.28 Estimated crisis probabilities based on various model specifications. 1983 Q1 – 2017 Q2



Source: Norges Bank

CRITERIA FOR AN APPROPRIATE COUNTERCYCLICAL CAPITAL BUFFER¹

The countercyclical capital buffer should satisfy the following criteria:

- 1. Banks should become more resilient during an upturn**
- 2. The size of the buffer should be viewed in the light of other requirements applying to banks**
- 3. Stress in the financial system should be alleviated**

The countercyclical capital buffer should be increased when financial imbalances are building up or have built up. This will strengthen the resilience of the banking sector to an impending downturn and strengthen the financial system. Moreover, a countercyclical capital buffer may curb high credit growth and mitigate the risk that financial imbalances trigger or amplify an economic downturn.

Experience from previous financial crises in Norway and other countries shows that both banks and borrowers often take on considerable risk in periods of strong credit growth. In an upturn, credit that rises faster than GDP can signal a build-up of imbalances. In periods of rising real estate prices, debt growth tends to accelerate. When banks grow rapidly and raise funding for new loans directly from financial markets, systemic risk may increase.

Norges Bank's advice to increase the countercyclical capital buffer will as a main rule be based on four key indicators: i) the ratio of total credit (C2 households and C3 mainland non-financial enterprises) to mainland GDP, ii) the ratio of house prices to household disposable income, iii) real commercial property prices and iv) wholesale funding ratios for Norwegian credit institutions.² The four indicators have historically risen ahead of periods of financial instability.

As part of the basis for its advice on the countercyclical capital buffer, Norges Bank will analyse developments in the key indicators and compare the current situation with historical trends (see box on page 52). Norges Bank's advice will also build on recommendations from the European Systemic Risk Board (ESRB). Under the EU Capital Requirements Directive (CRD IV), national authorities are required to calculate a reference buffer rate (a buffer guide) for the countercyclical buffer on a quarterly basis.

There will not be a mechanical relationship between the indicators, the gaps or the recommendations from the ESRB³ and Norges Bank's advice on the countercyclical capital buffer. The advice will be based on the Bank's professional judgement, which will also take other factors into account. Other requirements applying to banks will be part of the assessment, particularly when new requirements are introduced.

The countercyclical capital buffer is not an instrument for fine-tuning the economy. The buffer rate should not be reduced automatically even if there are signs that financial imbalances are receding. In long periods of low loan losses, rising asset prices and credit growth, banks should normally hold a countercyclical buffer.

The buffer rate can be reduced in the event of an economic downturn and large bank losses. If the buffer functions as intended, banks will tighten lending to a lesser extent in a downturn than would otherwise have been the case. This may mitigate the procyclical effects of tighter bank lending. The buffer rate will not be reduced to alleviate isolated problems in individual banks.

The key indicators are not well suited to signalling when the buffer rate should be reduced. Other information, such as market turbulence and loan loss prospects for the banking sector, will then be more relevant.

¹ See also "Criteria for an appropriate countercyclical capital buffer", *Norges Bank Papers* 1/2013.

² As experience and insight are gained, the set of indicators can be developed further.

³ See European Systemic Risk Board (2014), "Recommendation on guidance for setting countercyclical buffer rates".

Annex

Monetary policy meetings in Norges Bank

Tables and detailed projections

Monetary policy meetings in Norges Bank

Date ¹	Key policy rate ²	Change
13 December 2017		
25 October 2017		
20 September 2017	0.50	0
21 June 2017	0.50	0
3 May 2017	0.50	0
14 March 2017 ³	0.50	0
14 December 2016	0.50	0
26 October 2016	0.50	0
21 September 2016	0.50	0
22 June 2016	0.50	0
11 May 2016	0.50	0
16 March 2016	0.50	-0.25
16 December 2015	0.75	0
4 November 2015	0.75	0
23 September 2015	0.75	-0.25
17 June 2015	1.00	-0.25
6 May 2015	1.25	0
18 March 2015	1.25	0
10 December 2014	1.25	-0.25
22 October 2014	1.50	0
17 September 2014	1.50	0
18 June 2014	1.50	0
7 May 2014	1.50	0
26 March 2014	1.50	0
4 December 2013	1.50	0
23 October 2013	1.50	0
18 September 2013	1.50	0
19 June 2013	1.50	0
8 May 2013	1.50	0
13 March 2013	1.50	0
19 December 2012	1.50	0
31 October 2012	1.50	0
29 August 2012	1.50	0
20 June 2012	1.50	0
10 May 2012	1.50	0
14 March 2012	1.50	-0.25
14 December 2011	1.75	-0.50
19 October 2011	2.25	0
21 September 2011	2.25	0

1 The interest rate decision has been published on the day following the monetary policy meeting as from the monetary policy meeting on 13 March 2013.

2 The key policy rate is the interest rate on banks' sight deposits in Norges Bank. This interest rate forms a floor for money market rates.

By managing banks' access to liquidity, Norges Bank ensures that short-term money market rates are normally slightly higher than the key policy rate.

3 *Monetary Policy Report 1/17* was published on 16 March 2017, two days after the monetary policy meeting.

TABLE 1 Projections for GDP growth in other countries

Change from projections in <i>Monetary Policy Report 2/17</i> in brackets	Share of world GDP ¹			Change from previous year. Percent				
	PPP	Market exchange rates	Trading partners ⁴	2016	2017	2018	2019	2020
US	15	23	9	1.5 (-0.1)	2.1 (0.1)	2.2 (-0.2)	2.1 (0)	2 (0)
Euro area	12	17	32	1.8 (0.1)	2.1 (0.2)	1.7 (0.1)	1.6 (0.1)	1.5 (0.1)
UK	2	4	10	1.8 (0)	1.6 (-0.1)	1.5 (0)	1.6 (0)	1.6 (0)
Sweden	0.4	0.7	11	3.1 (0.2)	3.2 (0.7)	2.5 (0.3)	2.1 (0)	2.1 (0)
Other advanced economies ²	7	10	20	1.9 (0.1)	2.2 (0.2)	2.1 (0.1)	2.1 (0.1)	2 (0)
China	18	14	6	6.7 (0)	6.6 (0.1)	6 (0.1)	5.7 (0)	5.7 (0)
Other emerging economies ³	19	12	12	2 (0.1)	3.6 (0.4)	3.9 (0)	4 (0)	4 (0)
Trading partners ⁴	73	78	100	2.3 (0.1)	2.7 (0.3)	2.4 (0.1)	2.3 (0.1)	2.2 (0)
World (PPP) ⁵	100	100		3.2 (0)	3.6 (0.2)	3.6 (0)	3.6 (0)	3.6 (0)
World (market exchange rates) ⁵	100	100		2.4 (-0.1)	3 (0.2)	3 (0)	2.9 (0)	2.9 (0)

1 Country's share of global output measured in a common currency. Average 2013–2015.

2 Other advanced economies in the trading partner aggregate: Denmark, Switzerland, Japan, Korea and Singapore. Export weights.

3 Emerging economies in the trading partner aggregate excluding China: Brazil, India, Indonesia, Russia, Turkey, Poland and Thailand. GDP weights (market exchange rates) are used to reflect the countries' contribution to global growth.

4 Export weights, 25 main trading partners.

5 GDP weights. Three-year moving average. Norges Bank's estimates for 25 trading partners, other estimates from the IMF.

Sources: IMF, Thomson Reuters, Statistics Norway and Norges Bank

TABLE 2 Projections for consumer prices in other countries

Change from projections in <i>Monetary Policy Report 2/17</i> in brackets	Trading partners ³	Trading partners in the interest rate aggregate ⁴	Change from previous year. Percent				
			2016	2017	2018	2019	2020
US	7	21	1.3 (0)	2 (0)	2.2 (-0.1)	2.3 (-0.2)	2.3 (-0.1)
Euro area	34	53	0.2 (0)	1.6 (0.1)	1.3 (0)	1.5 (0)	1.6 (0)
UK	8	7	0.7 (0)	2.6 (0)	2.5 (0)	2.3 (0)	2.2 (0)
Sweden	15	12	1 (0)	1.8 (0.3)	2.2 (0.1)	2.9 (0)	2.9 (0)
Other advanced economies ¹	15		0.3 (0)	1.1 (-0.1)	1.3 (-0.1)	1.7 (0)	1.8 (0)
China	12		2 (0)	1.9 (-0.2)	2.2 (-0.2)	2.7 (0)	2.7 (0)
Other emerging economies ²	10		6 (0)	4.1 (-0.3)	4.5 (-0.1)	4.8 (0)	4.7 (0)
Trading partners ³	100		1.1 (0)	1.9 (0)	2 (0)	2.2 (-0.1)	2.3 (0)
Trading partners in the interest rate aggregate ⁴			0.6 (0)	1.8 (0.1)	1.7 (0)	1.9 (-0.1)	2 (0)

1 Other advanced economies in the trading partner aggregate: Denmark, Switzerland, Japan, Korea and Singapore. Import weights.

2 Emerging economies in the trading partner aggregate excluding China: Brazil, India, Indonesia, Russia, Turkey, Poland and Thailand. GDP weights (market exchange rates).

3 Import weights, 25 main trading partners.

4 Norges Bank's aggregate for trading partner interest rates includes the euro area, Sweden, UK, US, Canada, Poland and Japan. Import weights. For more information, see "Calculation of the aggregate for trading partner interest rates", *Norges Bank Papers 2/2015*.

Sources: IMF, Thomson Reuters, Statistics Norway and Norges Bank

Table 3a GDP for mainland Norway. Quarterly change. Seasonally adjusted. Percent

	2017			
	Q1	Q2	Q3	Q4
Actual	0.7	0.7		
Projections in MPR 2/17		0.6	0.6	
Projections in MPR 3/17			0.6	0.6

Sources: Statistics Norway and Norges Bank

Table 3b Registered unemployment (rate). Percent of labour force. Seasonally adjusted

	2017						
	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	2.7	2.7	2.6				
Projections in MPR 2/17	2.7	2.7	2.7	2.7			
Projections in MPR 3/17				2.6	2.6	2.6	2.6

Sources: Norwegian Labour and Welfare Administration (NAV) and Norges Bank

Table 3c LFS unemployment (rate). Percent of labour force. Seasonally adjusted

	2017						
	Apr	May	Jun	Jul	Aug	Sep	Oct
Actual	4.5	4.3	4.3				
Projections in MPR 2/17	4.4	4.3	4.2	4.2			
Projections in MPR 3/17				4.2	4.2	4.2	4.2

Sources: Statistics Norway and Norges Bank

Table 3d Consumer prices. Twelve-month change. Percent

	2017						
	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Consumer price index (CPI)							
Actual	1.9	1.5	1.3				
Projections in MPR 2/17	1.6	1.0	1.4	1.8			
Projections in MPR 3/17				2.1	1.5	1.4	1.5
CPI-ATE¹							
Actual	1.6	1.2	0.9				
Projections in MPR 2/17	1.3	0.8	1.1	1.3			
Projections in MPR 3/17				1.2	1.1	1.3	1.3
IMPORTED GOODS IN THE CPI-ATE¹							
Actual	0.7	-0.3	-0.6				
Projections in MPR 2/17	0.5	-0.4	0.1	0.4			
Projections in MPR 3/17				0.1	-0.1	0.3	0.1
DOMESTICALLY PRODUCED GOODS AND SERVICES IN THE CPI-ATE^{1,2}							
Actual	2.2	2.0	1.5				
Projections in MPR 2/17	1.8	1.4	1.5	1.7			
Projections in MPR 3/17				1.7	1.7	1.7	1.9

1 CPI adjusted for tax changes and excluding energy products.

2 The aggregate "domestically produced goods and services in the CPI-ATE" is calculated by Norges Bank.

Sources: Statistics Norway and Norges Bank

TABLE 4 Projections for main economic aggregates

Change from projections in <i>Monetary Policy Report 2/17</i> in brackets	In billions of NOK	Percentage change from previous year (unless otherwise stated)				
	2016	2016	2017	2018	2019	2020
Prices and wages						
Consumer price index (CPI)		3.6 (0)	1.9 (0.1)	1.3 (-0.1)	1.5 (0.3)	1.7 (0.2)
CPI-ATE ¹		3.0 (0)	1.4 (0)	1.5 (-0.1)	1.5 (0)	1.7 (0.2)
Annual wages ²		1.7 (0)	2.4 (0)	2.8 (0)	3.3 (0.2)	3.7 (0.3)
Real economy						
Gross domestic product (GDP)	3117	1.1 (0)	1.5 (0.3)	1.1 (0)	1.4 (0.2)	2.3 (-0.1)
GDP, mainland Norway	2717	1.0 (0.1)	2.0 (0)	2.0 (0.1)	2.0 (0.1)	2.1 (-0.1)
Output gap, mainland Norway (level) ³		-1.6 (0)	-1.1 (0.1)	-0.8 (0.1)	-0.3 (0.3)	0.3 (0.3)
Employment, persons, QNA		0.2 (0)	0.9 (0.1)	1.0 (0)	0.9 (0)	0.9 (0)
Labour force, LFS ⁴		0.3 (0)	-0.3 (0)	1.1 (0.2)	1.0 (0.1)	0.8 (0)
LFS unemployment (rate, level)		4.7 (0)	4.3 (0.1)	3.9 (-0.1)	3.7 (0)	3.5 (-0.1)
Registered unemployment (rate, level)		3.0 (0)	2.7 (-0.1)	2.5 (-0.1)	2.5 (-0.1)	2.4 (-0.1)
Demand						
Mainland demand ⁵	2764	2.6 (-0.1)	3.0 (0.1)	2.5 (0.1)	1.9 (0)	1.7 (0.1)
- Household consumption ⁶	1419	1.5 (-0.1)	2.7 (0.6)	2.7 (0.4)	2.2 (0.2)	2.0 (0.2)
- Business investment	238	4.1 (1.0)	3.9 (0.1)	6.9 (-1.6)	5.4 (-1.0)	2.4 (-0.5)
- Housing investment	185	9.0 (-0.9)	9.8 (0)	-0.2 (-0.4)	-1.4 (-1.0)	1.3 (0.3)
- Public demand ⁷	922	2.8 (-0.3)	2.0 (-0.4)	1.6 (0.1)	1.2 (0)	1.1 (0)
Petroleum investment ⁸	165	-16.9 (-0.5)	-1.0 (4.2)	1.3 (0.3)	7.0 (1.9)	4.1 (-0.8)
Mainland exports ⁹	590	-7.3 (-1.3)	0.2 (-0.9)	3.7 (-0.1)	3.8 (0.2)	3.4 (0)
Imports	1037	2.3 (1.5)	4.3 (2.1)	0.4 (-1.4)	2.1 (0)	2.4 (0.1)
House prices and debt						
House prices		8.3 (0)	6.0 (-1.0)	-0.4 (-1.5)	3.0 (0.3)	3.7 (1.1)
Credit to households (C2)		6.1 (0)	6.6 (0)	6.3 (-0.4)	6.1 (-0.4)	5.9 (-0.4)
Interest rate and exchange rate (level)						
Key policy rate ¹⁰		0.6 (0)	0.5 (0)	0.5 (0)	0.7 (0.1)	1.2 (0.2)
Import-weighted exchange rate (I-44) ¹¹		105.3 (0)	103.8 (-0.9)	102.4 (-1.3)	100.5 (-1.7)	100.1 (-1.5)
Money market rates, trading partners ¹²		0.1 (0)	0.1 (0)	0.3 (0)	0.5 (0)	0.8 (0.1)
Oil price						
Oil price, Brent Blend. USD per barrel ¹³		44 (0)	52 (2)	55 (5)	55 (4)	55 (3)

1 CPI adjusted for tax changes and excluding energy products.

2 Annual wage growth is based on the Norwegian Technical Calculation Committee for Wage Settlements' definitions and calculations. 2016 data are from the quarterly national accounts.

3 The output gap measures the percentage deviation between mainland GDP and projected potential mainland GDP.

4 Labour Force Survey.

5 Household consumption and private mainland gross fixed investment and public demand.

6 Includes consumption for non-profit organisations.

7 General government gross fixed investment and consumption.

8 Extraction and pipeline transport.

9 Traditional goods, travel, petroleum services and exports of other services from mainland Norway.

10 The key policy rate is the interest rate on banks' deposits in Norges Bank.

11 The weights are estimated on the basis of imports from 44 countries, which comprise 97% of total imports.

12 Based on three-month money market rates and interest rate swaps.

13 Spot price 2016. The spot price for 2017 is calculated as the average spot price so far in 2017 and futures prices for the remainder of the year. Futures prices for 2018-2020. Futures prices are calculated as the average for the period 11-15 September 2017.

Sources: Eiendomsverdi, Finn.no, Norwegian Labour and Welfare Administration (NAV), Norwegian Technical Calculation Committee for Wage Settlements (TBU), Real Estate Norway, Statistics Norway, Thomson Reuters and Norges Bank

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