Øystein Olsen: Economic perspectives

Annual address by Mr Øystein Olsen, Governor of the Norges Bank (Central Bank of Norway), to the Supervisory Council of Norges Bank and invited guests, Oslo, 12 February 2015.

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Accompanying charts can be found at the end of the speech.

An oil-driven economy

It is no coincidence that the walls in this hall cover the monetary history of modern Norway. The exhibit begins with the speciedaler from 1817 and continues up to the current banknote series. Money is at the core of central banking. The central bank's task is to ensure the availability of means of payment and to preserve trust in the value of money. Low and stable inflation is the primary objective of monetary policy.

People must also be assured that banknotes are genuine. It has become increasingly difficult to prevent the counterfeiting of banknotes. The current banknote series is due for replacement and work on a new series is well underway.

The new banknotes are intended to function as a calling card for Norway. The choice of the sea as the theme embraces both our past and present.

We have always made good use of the opportunities the sea has provided. It has been our lifeblood, and it has been a main artery. Fishing, shipping and trade have been a source of livelihood for many. With its changing face and magical power, it has also inspired artists.

> *"Nothing is so boundless as the sea, nothing so patient."*[1]

So begins Alexander Kielland's first novel. Kielland, who was born and raised in Stavanger, could scarcely suspect the inconceivable wealth the sea was so patiently concealing under the sea floor.

The discovery of oil was the start of an amazing era for the Norwegian economy. When the first oil was brought to the surface in 1971, income levels in Norway were low compared with other western countries (*see Chart 1*).

The picture has reversed since then. We have gradually caught up to the wealthiest nations. Measured by GDP per capita, Norway now ranks at the top (*see Chart 2*).

The large revenues from the oil industry have been managed soundly. Norway's economy is in good order. Well-functioning institutions and a high degree of trust between different groups in society provided a good starting point. At an early stage, it was established that the oil and gas resources belong to the Norwegian people. The tax system and framework conditions for the petroleum industry were designed so that the large revenues would accrue to the state. The stage was set for greater prosperity, with prospects for growth in both public and private consumption.

The discovery of oil in the North Sea provided ample opportunities for Norwegian business and industry. The extraction of oil at great sea depths would require the development of new technologies. This also entailed the building up of expertise in our own country, which would secure a full order book for many years ahead – not only off our own shore. The activities on the Norwegian continental shelf would provide a boost to other industries in Norway.

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[1] Alexander Kielland (1880): *Garman & Worse* (Translation by W.W. Kettlewell).

Developing a new industry and spending the associated revenues also entailed challenges. The challenges were discussed in a white paper in 1974, Report no. 25 to the Storting, entitled “The role of the petroleum industry in Norwegian society”. If room was to be provided for supplying the oil sector and for increased consumption of goods and services, other industries would have to give way. The mechanisms described in the white paper are well known.

I quote:

> *“A transfer of production and jobs between firms and industries can occur via increased domestic cost pressures.”*
>
> *“Labour market pressures provide increased opportunities (...) for wage earners to find higher paid jobs.”*
>
> *“Firms in export- or import-competing industries (...) may be forced to downscale (...).”*

The country was indeed braced for structural changes and the attendant costs. But the white paper made it clear that restructuring was a necessary precondition for reaping the benefits of economic growth.

We now know, more than 40 years later, that the structural changes did indeed come to pass. The industry structure of our economy has changed.

A growing number of firms, not only machinery companies, have targeted the oil industry. Labour shedding in some sectors has freed up labour for other uses.

Oil companies have shown the capacity and the willingness to pay. Tax rules have favoured investment spending. Earnings have been solid. The companies’ employees have been wage winners here in Norway (*see Chart 3*).

A state-of-art oil service industry has emerged. New products and technological solutions have been developed. For many, the contracts on the Norwegian continental shelf have been a springboard to new export markets.

There is a wide array of examples of company turnarounds. Let me offer one: The manufacturing company Øglænd in Rogaland, established by Jonas Øglænd from Sandnes as far back as in the 1860s, launched the bicycle brand DBS in 1932, which later became a household name in Norway. Today, the company, which is one of Norges Bank’s regional network contacts, is one of the world’s leading producers of suspension systems. Its customers are mainly oil and gas production companies. The company has more than doubled its turnover over the past three years. Around three-quarters of its sales are outside Norway.

The oil and gas industry has been decisive for the strong growth in the Norwegian economy over the past 40 years. But the past 15 years stand out. From the end of the 1990s, the price of North Sea oil rose from about USD 10 per barrel to over USD 100 per barrel. Large shares of the sizeable oil revenues were transferred to our sovereign wealth fund, the Government Pension Fund Global (GPFG). GPFG assets are now more than double the GDP of Norway’s mainland economy.

High oil prices and a profitable petroleum production industry have been accompanied by record-high oil investment in recent years (*see Chart 4*). The level in 2014 was equivalent to overall investment in domestic non-oil industries. The positive spillovers to the oil service industry and other private operators have been substantial. Employment has remained high and unemployment low, even when the financial crisis hit in 2008.

The Norwegian economy has made use of favourable winds and seized the opportunities offered. The other side of the coin is an economy that has become increasingly dependent on oil, and thereby more vulnerable to changes in oil prices and petroleum revenues. The vulnerability manifests itself in several ways.

A large share of the business sector and the labour market is now linked to the oil industry. A relatively small share is directly employed in the oil and gas production industry. But if account is taken of all the suppliers to the petroleum sector, about 1 in 9 jobs in Norway, a total of 300 000, are linked to the oil industry.[2] Exports from Norway to the oil industry in other countries account for a growing share of this activity, and this may be a path forward in the face of a decline in petroleum investment in Norway. But should oil prices concurrently fall, that path may narrow.

Moreover, labour costs in Norway have reached high levels. The cost level in the business sector has increased sharply in relation to our trading partners (*see Chart 5*). With lower activity and earnings from the petroleum sector, oil service companies must seek inroads into other markets, which may be demanding with a high cost level.

Substantial oil revenues and spillovers from the oil sector have driven up house prices and household debt. Debt has risen markedly faster than income. The debt burden on both younger and older households has increased, but the burden on younger households is heaviest (*see Chart 6*). Today's households of age 30 have an average debt equivalent to three times their disposable income. Ten years ago, the burden on households of the same age was substantially lower.

Households have borrowed heavily to buy primary and secondary homes, possibly on the expectation of continued high income growth. The price of an average dwelling has almost doubled over the past ten years, with the sharpest rise in cities located near oil industry areas.

High debt levels give rise to vulnerabilities. The risk of default on residential mortgages, with large direct losses for banks, is nonetheless small. We have a solid social safety net, which provides an assurance in the event of income shortfalls. But in the case of a downturn that leads to higher unemployment, the high debt levels will prove uncomfortable for many households. Should house prices fall at the same time, the degree of discomfort will increase. If house prices fall by 30 percent, one in four households will hold debt in excess of the value of their dwelling.[3] If many households curb consumption in order to reduce debt, the economy in aggregate will be adversely affected. Firms may then encounter payment problems, with a risk that rising bank losses may amplify the downturn.

From a unique economic position to restructuring

Oil prices have fallen by nearly 50 percent since summer. The price decline comes on top of a planned adjustment to a lower activity level in the oil sector.

We have experienced that oil prices fluctuate. Market expectations indicate that prices will edge up again from today's level. Low growth in the world economy has restrained growth in oil consumption, while the high prices prevailing in recent years have led to increased supply and more energy-efficient production methods. Last year, growth in global oil demand hit a five-year low, while non-OPEC production was record-high.

New shale oil extraction technology has boosted the global supply of oil. Over three years, US oil production rose by more than 50 percent (*see Chart 7*). The additional supply from US shale oil is more than twice as high as Norwegian oil production.

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[2] Estimate based on calculations in Blix Prestmo, Strøm and Midsem (2015): *Ringvirkninger av petroleumsnæringen i norsk økonomi* [Spillovers from the petroleum industry to the Norwegian economy]. Forthcoming report from Statistics Norway. Petroleum-related exports from mainland Norway are also included.

[3] Share of home-owning households. Debt is here defined as gross debt less bank deposits.

Even though the price decline is putting a brake on exploration activity and the development of new fields, we can expect further advances in the new technology and its wider use. Looking ahead, we must prepare ourselves for an environment of lower oil prices compared with the levels seen in recent years. It would be unwise to act on the assumption that oil prices will again settle around USD 100 per barrel.

It has long been clear that activity on the Norwegian continental shelf would decline. The fall in oil prices in recent months has accelerated and amplified an announced decline in activity. Norwegian exporters of oil-related goods and services to other oil-producing nations may also face a decline.

This does not mean that the oil age is nearing an end. Nearly half of known oil and gas reserves on the Norwegian continental shelf have not yet been extracted.[4] Over the past few years, large new discoveries have been made. One of them – Johan Sverdrup – will soon be ready for development. The Norwegian oil service industry can expect new orders. Nonetheless, the Norwegian economy must adapt to considerably lower demand from the oil sector. From being in a unique economic position, Norway is now headed for a period of restructuring.

The Norwegian business sector showed a high degree of willingness and ability to shift to oil-related activity during the boom. The proximity to the continental shelf was an advantage for many firms. The shift to an oil-driven economy with a high wage capacity has been a comfortable journey. The journey forward, where the oil service industry must downscale and other trade-exposed industries must grow, will be more challenging. After many years of relatively high wage growth in Norway, the domestic cost level must again be brought more closely into line with that of our trading partners.

A necessary adjustment of the cost level in Norway can occur by means of lower wage growth in Norway than in other countries and a depreciation of the krone exchange rate. The economic policy pursued will be of importance for how the adjustment takes place.

In Norway, monetary policy is geared towards keeping inflation low and stable. The operational target of monetary policy is consumer price inflation of close to 2.5 percent over time. The inflation target provides the economy with a nominal anchor. When inflation expectations are firmly anchored, monetary policy serves as the first line of defence when the economy turns down.

Over time, monetary policy can only influence inflation. Monetary policy cannot assume a primary responsibility for delivering the necessary structural changes in the Norwegian economy. But via the exchange rate channel, monetary policy can help facilitate the necessary restructuring process.

Without our own national currency the situation would be more challenging. The social partners would have to go it alone. The experience of some European countries shows that this can be demanding. With a floating exchange rate, the necessary adjustment of the cost level can take place faster, and may prove less painful. The krone exchange rate can function as a stabiliser. The depreciation of the krone through autumn last year indicates that this mechanism is functioning (*see Chart 8*).

The monetary policy credibility built up over the years is now of considerable benefit. Continued confidence that inflation will remain low and stable over time is a necessary precondition for a pronounced weakening of the krone concurrent with a low key policy rate. The benefit associated with a currency of our own disappears if the temporary rise in inflation associated with a krone depreciation is countered by higher wage increases. The result would be a higher key policy rate and a stronger exchange rate than would otherwise be the

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[4] Including reserves that have been approved for development by holders of oil rights and other proven resources in fields and discoveries. Source: *The shelf in 2014*, Norwegian Petroleum Directorate.

case and, not least, higher unemployment. The social partners have a particular responsibility in this regard.

In December last year, Norges Bank lowered the key policy rate by 0.25 percentage point to 1.25 percent. Norges Bank gave weight to the weakening of the growth outlook for the Norwegian economy observed through autumn. Already last winter, oil companies announced a period of downscaling, with cuts in investment, headcounts and costs. This tendency is being reinforced by the sharp fall in oil prices, which is having adverse spillover effects on the mainland economy and may lead to higher unemployment.

Low interest rates may increase the risk that debt and asset prices reach unsustainable levels. Financial imbalances may trigger or amplify an economic downturn. Norges Bank gives weight to this consideration in interest rate setting. The goal is to avoid an abrupt economic downturn and higher unemployment further out.

If financial imbalances build up, the countercyclical capital buffer for banks may be increased. The authorities may also have to consider other, more targeted measures in response to rapid rises in house prices and debt in order to mitigate the risk associated with the high level of household debt.

Norway has been among the first countries to introduce new capital requirements for banks and their capital ratios have increased. Norwegian banks are therefore more resilient to shocks than only a few years ago. A solidly capitalised banking system also has a greater capacity to intermediate credit during a period of restructuring.

Norwegian government finances are solid. This has been of great benefit, particularly during the financial crisis. It may be tempting to increase public spending to soften the impact of a fall in oil prices on the real economy. The risk is that it may hold back the restructuring that is needed if oil prices remain low for a long period. Increased public spending may push up the cost of labour and stem the flow of labour to other exposed industries.

When the economy turns down, with a pronounced rise in unemployment, fiscal policy can help support economic activity. But the Norwegian economy is still far from being in a crisis situation. Unemployment remains low.

The international economic picture is mixed

Six years have now passed since the global economy was severely hit by the financial crisis. The Norwegian economy quickly rebounded, supported by robust public finances and strong growth in the petroleum sector. Other advanced economies have experienced a more difficult time (*see Chart 9*). Excessive debt, in both the private and public sector, has led to weak activity and high unemployment in many of those countries.

Global growth can be expected to pick up gradually over the coming years. The fall in oil prices is a positive factor for the world economy. But the picture is mixed. In the US, the recovery is on a firm footing. An expansionary monetary policy appears to be having the intended effect and both consumption and investment have turned up again. Unemployment has come down. The federal budget deficit has been substantially reduced partly thanks to higher economic activity. Developments in the UK and Sweden, two of Norway's major export markets, have also been positive, although inflation remains a challenge.

The situation in the euro area appears to be more problematic. A large portion of the workforce is idle alongside production equipment. Inflation is worryingly low. Monetary policy easing and substantial liquidity provision to the banking sector have so far not been sufficient. Moreover, the impetus from emerging economies has waned. Sluggish investment is the main drag on growth in Europe. Elevated uncertainty surrounding economic developments, high corporate debt and tight bank credit standards are holding back the willingness and ability to invest. The result is a self-reinforcing mechanism that is difficult to unravel.

With policy rates near zero, the central banks of major advanced countries have employed unconventional measures to stimulate activity and combat the risk of deflation. Large-scale securities purchases, including government bonds, have been made. The bonds are recorded in central banks' balance sheets. The US and the UK were among the first countries to launch asset purchasing programmes in the wake of the financial crisis. Until recently, the European Central Bank (ECB) had largely used a different channel, namely supplying large loans to the banking system on favourable terms. Three weeks ago, the ECB decided to take it a step further and will soon start purchasing government bonds on a large scale.

Government bond buying drives up prices and pushes down yields. The purchases may also push up equity prices and prices of riskier assets. The aim of these central bank operations is to stimulate lending and investment via lower long-term interest rates. There is evidence to suggest that the measures have contributed to softening the downturn and boosting production in the UK and the US.

The ECB's asset purchase programme may prove to have a weaker effect on interest rates and investment in the euro area. Long-term interest rates are already very low. Inflation is at risk of becoming negative and is propping up real interest rates. The willingness of firms to invest is still being restrained by uncertainty and weak growth prospects.

When central banks buy government bonds on a large scale, they pay using new money. A common concern is that pumping new money into the economy fuels inflation. Conditions have not been normal in recent years, however. The challenge now facing the euro area is weak growth combined with the risk of falling prices.

Even though growth in the world economy is gradually picking up, it is unlikely that we will again see the high growth rates observed in the years prior to the financial crisis. Perhaps this is not something to wish for either. Some of that growth was driven by unsustainable borrowing.

Several conditions suggest that the traditional advanced economies are facing more deep-rooted challenges. Productivity growth has declined since the 1970s (*see Chart 10*). Through several decades to the end of the 20th century, an expanding labour force and higher education attainment contributed to driving the economy forward. Growth was accompanied by solid returns and considerably higher real interest rates than observed in recent years.

These growth impulses are fading away. The labour force is expanding at a slower pace in many countries. If productivity and labour force participation do not increase by a considerable margin, the return on fixed investment will fall. Low growth and low real interest rates may be the new norm.

The Government Pension Fund Global (GPFG) – further growth depends on future returns

Over the past 20 years, Norway has accumulated considerable foreign financial assets. Today, the Government Pension Fund Global (GPFG) is one of the world's largest sovereign wealth funds. The GPFG represents our collective savings and is to be managed to the benefit of both current and future generations. As an investor, the GPFG makes capital available for economic activity in other countries. The return on that capital will thereby be a result of the value added in those countries.

The GPFG is a long-term, responsible investor. The objective of investment management is to achieve the highest possible return at acceptable risk levels. Norges Bank's work on responsible investing underpins that objective. As a long-term investor, a healthy and sustainable development of investee companies and markets is in our interest.

The work on responsible investing has evolved in pace with the increasing size of the GPFG. As from this year, Norges Bank is charged with the task of issuing decisions on observation

or exclusion of companies on the recommendation of the Council on Ethics. In such matters, Norges Bank can also consider using other ownership instruments. The aim is to establish a chain of instruments that can be used in the work on responsible investing.

So far, our nation has earned a solid return on its financial assets. The cumulative return on the GPFG since its inception amounts to over NOK 2 000 billion. This is equivalent to about a third of total GPFG capital at the end of 2014.

Our return measure includes both capital gains and direct cash flows, which comprise dividend and interest income. Equity prices are volatile. Dividend and interest income is more reliable. Given the large size of the GPFG, this cash flow has become substantial and is higher than the revenues from major exports such as fish and metals (*see Chart 11*).

Over a third of the GPFG is invested in bonds. The real interest rate on high-grade government bonds is the starting point for calculating the rate of return. In recent years, those yields have been close to zero (*see Chart 12*).

Low bond yields reflect global economic conditions: Governments, businesses and households are seeking to save more, while demand for safe investments has increased. Central banks' substantial asset purchases are pushing in the same direction. Low yields may also reflect modest expectations of economic growth further ahead.

There is no return without risk. The GPFG features a very long investment horizon and a sizeable capacity to bear short-term risk. This is why the chosen allocation to equities is relatively high. It is also the reason why the GPFG has moved into real estate. Looking ahead, we should also consider whether the allocation to real assets should be increased at the expense of bonds.

Historically, equities have yielded higher returns than bonds. We also expect that to be the case ahead. But it is doubtful that equity prices will continue to rise at the same pace as in recent years. Weak or moderate growth in the real economy will feed through to the return on equities.

So far, the GPFG has earned an annual real return of 3.8 percent. We must be prepared for the possibility that it will be lower, perhaps below 3 percent.

Since the turn of the millennium, the government has received substantial revenues from the petroleum sector (*see Chart 13*). A large share has been saved and transferred to the GPFG. At the same time, the spending of petroleum revenues over the fiscal budget has increased. The revenue stream from the continental shelf is now declining. We are approaching the point where government spending of petroleum revenues will exceed the revenues deriving from the petroleum sector.

Over the past ten years, substantial amounts, about NOK 250 billion a year on average, have been transferred to the GPFG. At today's oil price, transfers to the GPFG will quickly fall towards zero, soon leading to a situation where its current income is limited to interest and dividend income (*see Chart 14*). Next year, it may be necessary to spend some of the return to cover the non-oil budget deficit.

The GPFG is nearing the peak

The decline in oil revenues ahead gives rise to new challenges for the Norwegian economy. But we must not forget that we have a good starting point. During a period of high oil prices, we have transformed oil in the ground into financial wealth. We have avoided making public sector budgets dependent on volatile income. The GPFG and the fiscal rule have been the main elements of the policy pursued. Let me recall the background for the fiscal rule.

The fiscal rule emerged from the economic discussion around the turn of the millennium. During the time before the rule was established in 2001, inflows into the GPFG increased sharply thanks to high oil prices and there were expectations of considerable future

revenues. It was demanding to restrain spending, while it was clear that future pension obligations would be substantial.

The fiscal rule provided us with a long-term strategy for spending petroleum revenues. Even though most of the income was to be saved, the rule provided for increased spending of petroleum wealth.

The phasing-in of petroleum revenues was to be adapted to the economic cycle and be in line with the expected real return over time. The capital was to be preserved so that it would also benefit future generations.

Fiscal policy was not set on autopilot. The rule was simple, but flexible. This has been one of its strong points.

In the initial years under the fiscal rule, petroleum revenue spending rose approximately in pace with the GPFG's capital. The fiscal rule, based on a real return of 4 percent, thereby provided an effective constraint on petroleum revenue spending over the fiscal budget. In recent years, high oil prices and solid returns have resulted in strong growth in the value of the GPFG. This has provided scope for substantial increases in petroleum revenue spending, although spending has been around 3 percent of the GPFG's value in recent years. In a period of low unemployment and solid economic growth, it has been appropriate to set aside a greater share of the revenues.

Recent years have been characterised by wide fluctuations in returns, with extreme variability during the financial crisis. Volatility on the world's stock exchanges and in financial markets impacts the market value of the GPFG and thereby the anchor for fiscal policy. Although the depreciation of the krone has increased the GPFG's current value in krone terms, this veils the fact that its international purchasing power is unaffected by changes in the krone's value. Such volatility has become more difficult to manage as the GPFG has grown in size.

Oil prices have fallen sharply over the past six months. Even if prices edge up again, we have been reminded of the uncertainty associated with future revenues. Lower oil prices imply slower growth in the GPFG than previously estimated. In the longer term, this means less money in the national coffer, with an attendant reduction in Norway's fiscal space.

At an oil price of around USD 60 per barrel, transfers to the GPFG may come to a halt. Rather, it seems that at today's level of petroleum revenue spending there will soon be a need to make transfers from the GPFG to the fiscal budget. Measured as a share of GDP, the GPFG may have already reached the peak.

Calculations in the National Budget for 2015 illustrate this point (*see Chart 15*). The broken red line shows the trajectory for fiscal space assuming a real return of 4 percent. The estimation is based on the oil price level prevailing late last summer.

If the return is closer to 3 percent, there will be little room for increasing petroleum revenue spending over the fiscal budget. On the contrary, in the course of a few decades, petroleum revenue spending as a share of GDP will have to be reduced, that is to say fiscal policy will have to be tightened.

If, in addition, the oil price settles more permanently around the level observed so far this year, fiscal policy must be adjusted earlier. If petroleum revenue spending follows the real return, we will be heading for a period of sizeable fiscal retrenchment each year. In addition, pension obligations will show a pronounced rise further ahead.

The fall in oil prices has been a reminder of the uncertainty surrounding future petroleum revenues. The same applies to the return on GPFG capital. The three paths illustrate the uncertainty we are facing, but they also illustrate another important point.

Spending the return will ultimately lead to a flattening of the GPFG, which will then decline as a percentage of GDP. It has always been clear that this will happen at some point in the

future. What is new is that this may be the case here and now. At today's oil price, the GPFG may have reached the peak. In that case, petroleum revenue spending as a percentage of GDP must be reduced to avoid using more than the return on the GPFG.

Even if the oil price and the rate of return follow a path that allows the GPFG to grow for a period ahead, petroleum revenue spending should be restrained. By keeping spending well below the upper bound, the need for fiscal retrenchment further ahead can be reduced.

The fiscal rule has functioned as a long-term guideline for fiscal policy for nearly 15 years. It has served its purpose. The time has now come to show restraint. A sensible risk adjustment is now to refrain from increasing petroleum revenue spending further from today's level. The era of rising petroleum revenue spending may be behind us.

Conclusion

The more than forty-year-old white paper on the role of the petroleum industry in Norwegian society was far-sighted and proved to be on the mark. The structural changes described in it have come to pass. The resulting growth in prosperity was more difficult to predict. The development of an advanced oil service industry is an industrial adventure in its own right. We have extracted large quantities of oil and gas at very favourable prices, and have set aside a sizeable portion of the revenues – to the benefit of future generations.

The oil age is far from over. But activity in the petroleum sector has passed the peak. In addition, we must be prepared for lower returns in the oil industry.

The white paper also provides a glimpse into a time when belief in government intervention in the economy was far greater than today. That regulatory optimism has diminished significantly. We are left with an important recognition: The key to economic progress is the ability to restructure.

We cannot rely solely on the sea to carry us forward: Let me again quote Kielland:

> *"It is not true that the sea is faithless, for it has never promised anything..."*

Where our journey takes us is our own responsibility. Come what may.

Thank you for your attention.

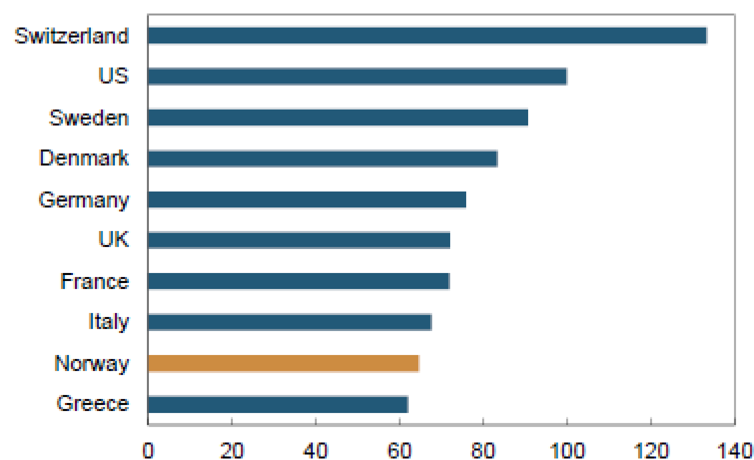
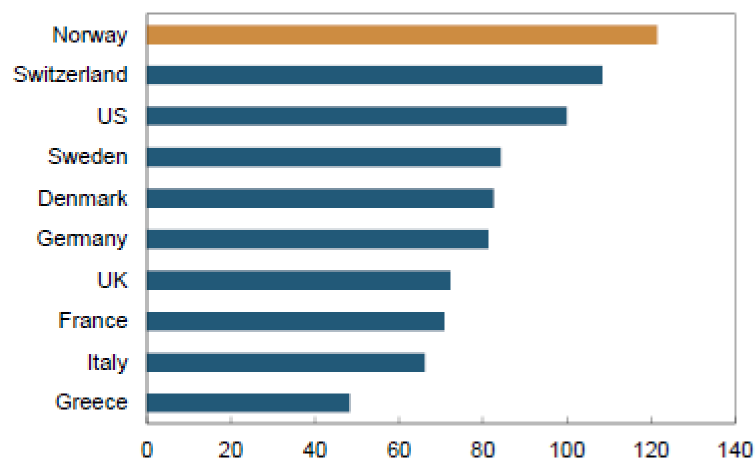
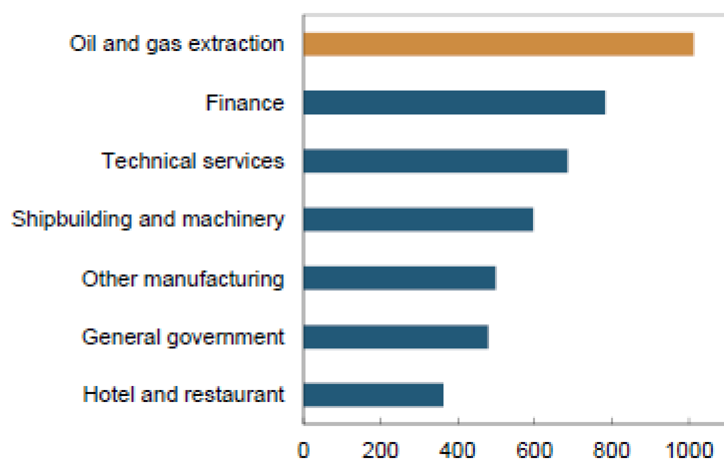


Chart 2 GDP per capita in 2013.
PPP adjusted. Index. US=100



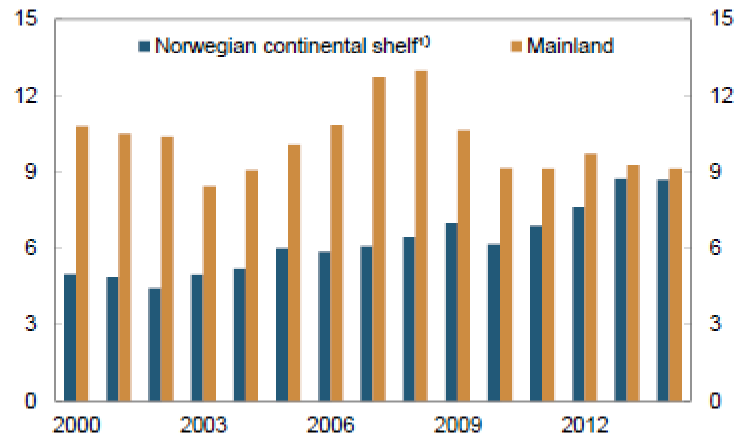
Sources: OECD and Norges Bank

Chart 3 Wages per full-time equivalent (FTE) by industry.
In thousands of NOK. 2014



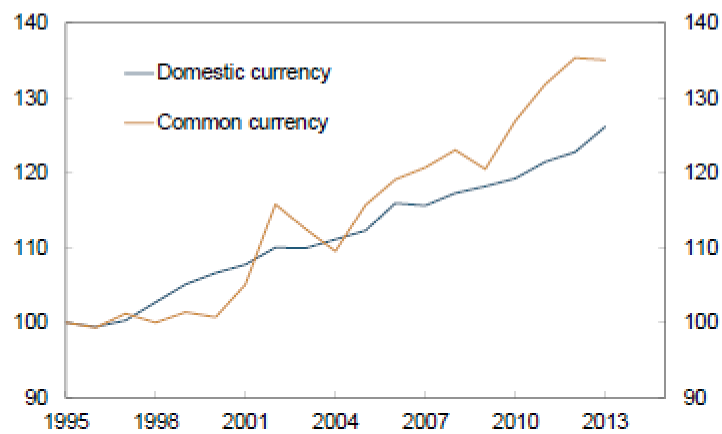
Sources: Statistics Norway and Norges Bank

Chart 4 Business investment.
In percent of mainland GDP



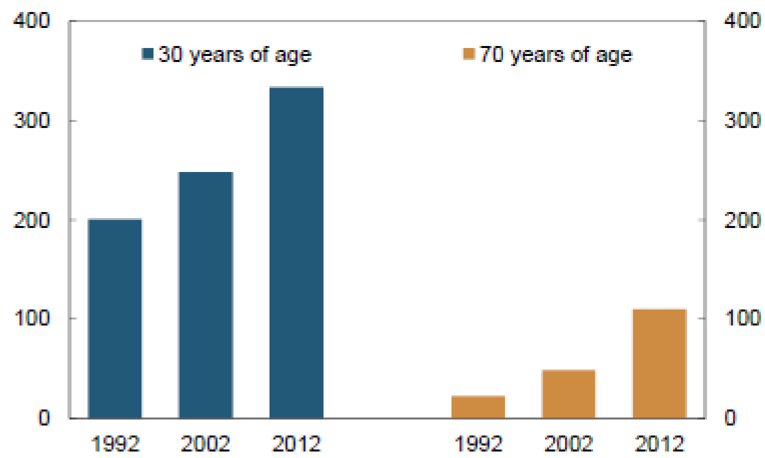
1) Extraction and pipeline transport.
Sources: Statistics Norway and Norges Bank

Chart 5 Labour costs[1] relative to trading partners.
Index. 1995=100. 1995–2013



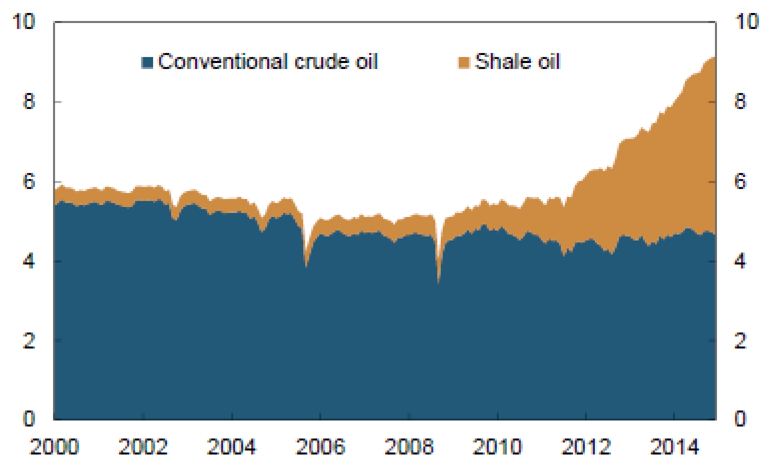
1) Hourly labour costs.
Sources: The Technical Reporting Committee on Income Settlements and Norges Bank

Chart 6 Household[1)] debt to disposable income. Percent



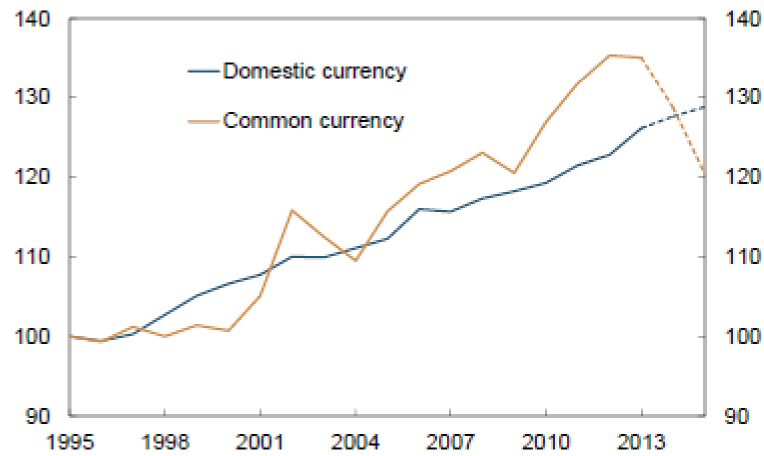
1) Home-owning households (excluding self-employed) where the main income earner is respectively 30 and 70 years of age.
Sources: Statistics Norway and Norges Bank

Chart 7 US crude oil production. Million barrels per day



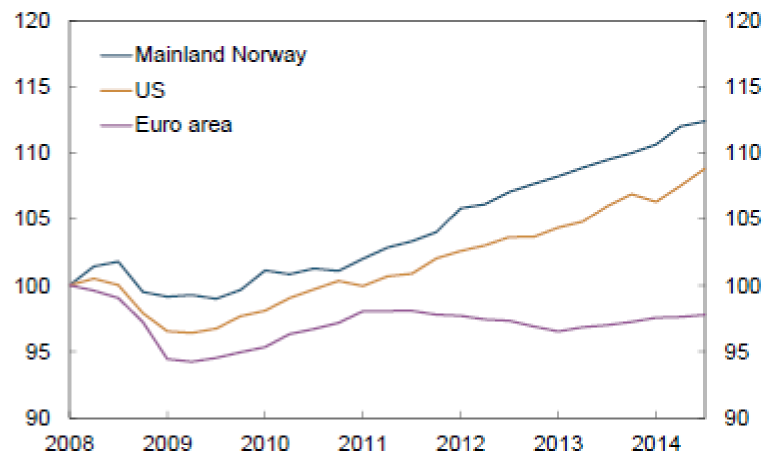
Sources: Energy Information Administration (EIA) and Norges Bank

Chart 8 Labour costs[1)] relative to trading partners.[2)]
Index. 1995=100. 1995–2015



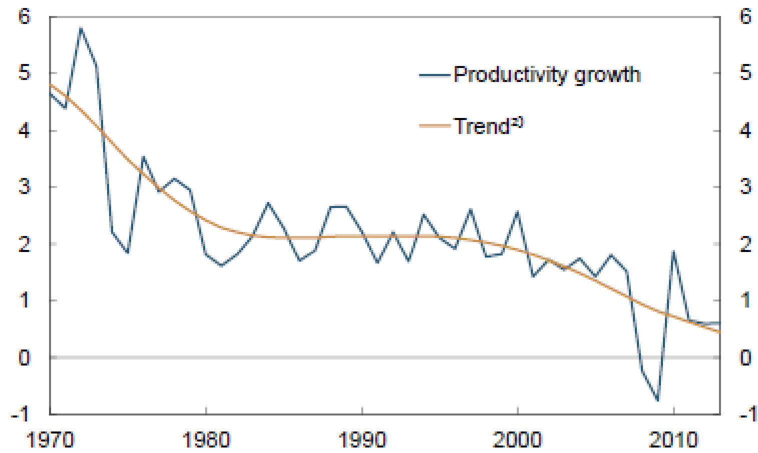
1) Hourly labour costs.
2) Data for 2015 are based on wage estimates in the December 2014 *Monetary Policy Report* and the average exchange rate between 1 Jan. 2015 and 10 Feb. 2015.
Sources: The Technical Reporting Committee on Income Settlements and Norges Bank

Chart 9 Gross domestic product.
Seasonally adjusted. Volume index. 2008 Q1=100



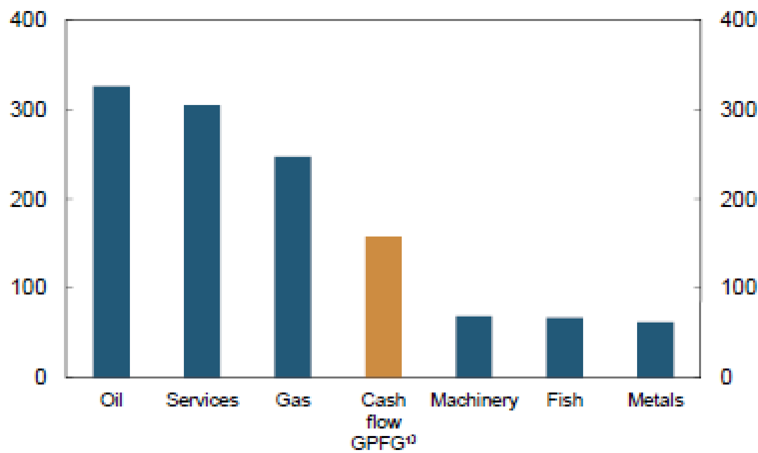
Source: Thomson Reuters

Chart 10 Productivity growth in the OECD area[1). GDP per hour worked. Annual growth. Percent



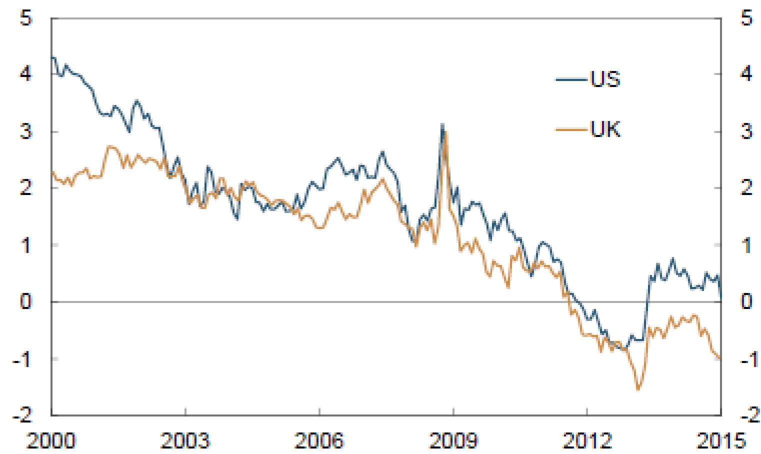
1) 20 OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.
2) Hodrick-Prescott filter with lambda = 100.
Sources: The Conference Board (Total Economy Database) and Norges Bank

Chart 11 Exports and the GPFG's dividend, interest and rental income. In billions of NOK. 2014



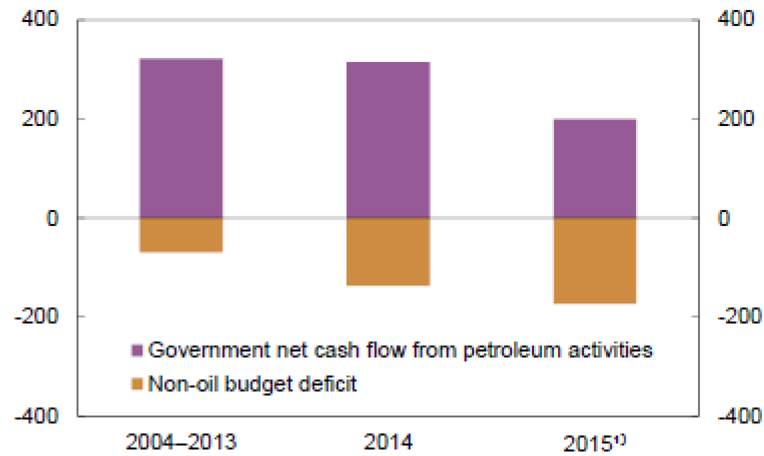
1) GPFG's cash flow comprises dividend, interest and rental income.
Sources: Statistics Norway and Norges Bank

Chart 12 International real interest rates.[1]
End of the month. Percent



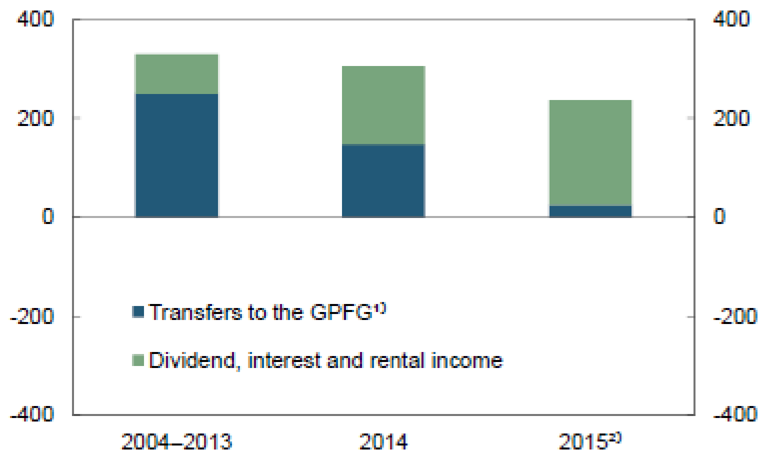
1) Market yields on 10-year inflation-linked government bonds.
Source: Bloomberg

Chart 13 Petroleum revenues and petroleum revenue spending. In billions of NOK



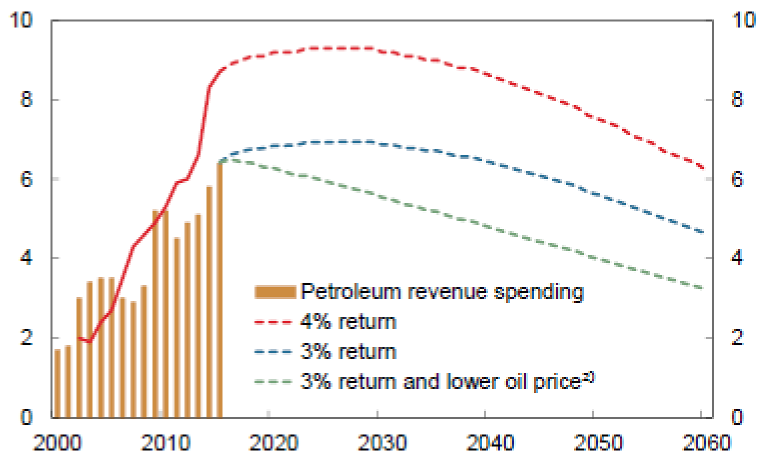
1) Assuming an oil price of NOK 400 per barrel.
Sources: Ministry of Finance and Norges Bank

Chart 14 Transfers to the GPFG and dividend, interest and rental income. In billlions of NOK



1) Actual transfers to the GPFG in the calendar year of application.
2) Assuming an oil price of NOK 400 per barrel. GPFG income in 2015 is set equal to 3.3 percent of the value of the GPFG, i.e. the average over the period 2010–2014.
Sources: Ministry of Finance and Norges Bank

Chart 15 Different return scenarios for the GPFG.[1)]
In percent of mainland GDP



1) Assuming actual spending corresponds to the return as from 2016 and in all subsequent years.
2) Assuming an oil price of 400 per barrel in NOK (2015) to the end of the estimation period.
Sources: Ministry of Finance and Norges Bank