ECONOMIC PERSPECTIVES

Address by Governor Øystein Olsen to the Supervisory Council of Norges Bank and invited guests on Thursday 14 February 2019

THURSDAY
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Analyses and charts are based on information up to and including 12 February 2019.

NORGES BANK

Economic perspectives 2019

Good morning, Kristoffer! It is now 6:00 am on Friday, 15 February 2030. The temperature is 7 degrees and it's raining. You have been through four sleep cycles and can get up without violating the terms and conditions of your health insurance. The health module recommends cereal with oat milk for breakfast. I have bought oat milk, which was delivered at 4:00 am.

News of relevance to you:

The new government quarter opens today – your space is finally ready.

Your investments in Green Equities have risen by 20 percent, on news of the major trade and environmental technology agreement concluded between the United States and China.

The trading platform Nett sustained a hacker attack last night. Customer data were stolen, and customers are leaving the platform. I managed to withdraw 8 000 of the 67 000 kroner you had uploaded to the platform before all accounts were frozen. The rest of your money may be lost.

In yesterday's Annual Address, the Governor of Norges Bank announced that the next generation of central bank digital currency will be managed by artificial intelligence for a trial period.

Have a nice day.

INTRODUCTION

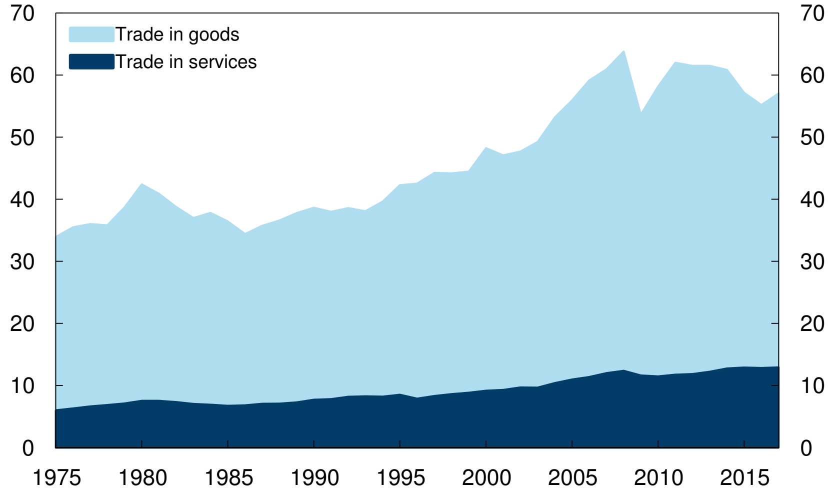
From a not too distant future, let's return to the present day. We can already see the contours of the digital tools used by Kristoffer and his digital assistant. Technology is advancing at a rapid pace. Every day we rely on new technology as we tap our payment cards on the reader. We also have to adapt to new developments on many other fronts. A shift in production methods and consumption is underway in response to global warming. The world economy is marked by densely interwoven trade flows, but also by uncertainty about the path ahead.

INTERNATIONAL ECONOMIC COOPERATION IS CREAKING

Throughout history, technological innovation and increased trade in goods and services have been important sources of growth and development. The two driving forces have functioned in tandem. Trade barriers have been reduced in recent decades. Faster transport and advanced communications systems have greatly facilitated access to ever bigger markets. Global value chains have emerged, and service providers can be located far from customers. With free-flowing capital, we can invest globally.

Since the 1970s, world trade has grown rapidly (Chart 1). As a percentage of world GDP, international trade has almost doubled. Goods are still the dominant component, but trade in services has been on the rise. A host of new countries have also increased their share in world trade. Substantial technological and economic lags have been reduced. The world's economic balance has shifted.

Chart 1 World trade[1)] has grown markedly.
Percent of global GDP. 1975 – 2017



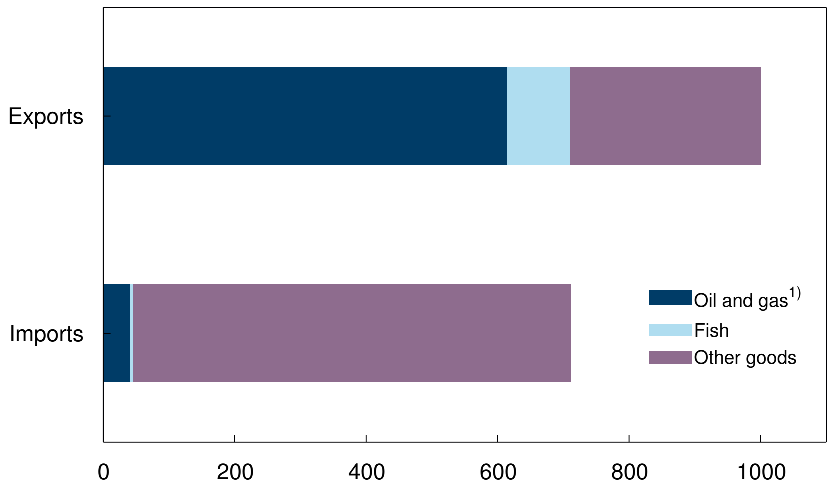
1) Trade is defined as the sum of exports and imports of goods and services.
Source: World Bank

A more closely interwoven world economy has facilitated specialisation, innovation and better use of local comparative advantages. The room for exchanging ideas and knowledge has expanded. Increased competition and innovation have gone hand in hand.

Efficient global trade is particularly advantageous for small open economies, like Norway. Norway has benefitted greatly from the opportunities afforded by trade with other countries.

It is almost impossible to imagine today's welfare level without the specialisation brought about thanks to a world of open borders. Norway exports a limited range of goods and services to the world market (Chart 2). This allows Norway to finance imports of numerous finished goods, which are cheaper than if we had manufactured them at home. Labour is thereby freed up for use in education, health and other services.

Chart 2 Exchange of goods gives Norway opportunities.
Trade in goods. In billions of NOK. 2018



1) Includes refined oil products.
Sources: Statistics Norway and Norges Bank

Access to capital and technology abroad has enabled us to develop new industries based on domestic natural resources. Hydropower and the oil industry are prime examples. We now invest our petroleum wealth in capital markets. The Government Pension Fund Global (GPFG) allows Norway to take a share in global value added. It gives us a cushion and helps trim the Norwegian state's dependence on domestic economic developments.

We need other countries – more than they need us.

The foundation for today's global trade cooperation was laid in the years following the Second World War. Institutions such as the IMF and the World Bank fostered closer economic cooperation between countries. The ratification of the General Agreement on Tariffs and Trade (GATT) marked the beginning of a gradual reduction of tariff barriers, which culminated in a rule-based, multinational trade system under the aegis of the World Trade Organization (WTO).

History has shown that the trend towards a more open and liberal world order can reverse, as seen in the interwar period. This may now be happening again.

Brexit, the UK's exit from the EU, may take place a few weeks from now, and is the first major setback for European integration in several decades.

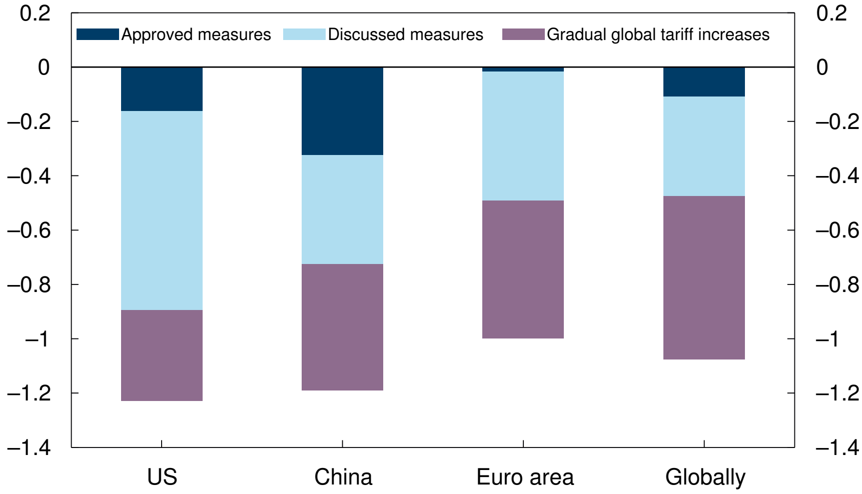
The scaling back of tariffs has stopped, and new tariff barriers are being erected. Recent barriers include new measures to prevent foreign investment in national infrastructure. At the same time, the WTO's position has weakened, making it more difficult both to resolve disagreements and carry out needed regulatory reforms.

Last year was marked by trade tensions between the United States and China. The United States raised tariffs on a range of imports, and China retaliated in kind.

The immediate effects of increased tariffs are higher selling prices on goods liable to tariffs, adversely affecting consumers and producers who rely on imported input goods. We have also seen that growing uncertainty is dampening business' investment appetite. The tariff increases have already had an impact on Chinese and US GDP.

The negative effects of the measures taken so far are fairly moderate (Chart 3). The danger is that trade tensions deepen, and that retaliatory measures lead to a negative spiral. More countries could be drawn into the conflict, with an even broader rise in tariff rates. In that case, not only the United States and China would be affected, but also Europe and the rest of the world.

Chart 3 Trade tensions curb world GDP.
Estimated effect on GDP after three years.[1] Percent



1) The effects are based on model estimates from the IMF and Norges Bank. *Approved measures* are described in the box "Trade conflicts create uncertainty" in *Monetary Policy Report* 3/18. *Discussed measures* include a 25 percent tariff on all US imports from China and a 25 percent tariff on US imports of cars and car parts, in addition to retaliatory measures by countries affected. *Gradual global tariff increases* imply a 1 percentage point annual increase in tariffs on all imported goods in all countries over the coming years.
Sources: IMF and Norges Bank

Protectionism means reduced growth capacity, putting at risk the gains brought about by open borders. If the world enters a new period of rising trade barriers, a prime engine of growth and development may lose its momentum.

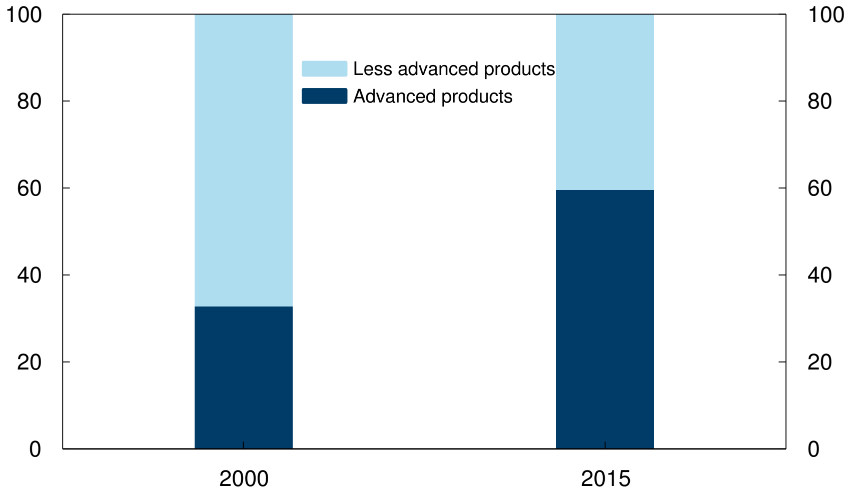
The most serious consequences of new tariff barriers will be faced by developing countries. The WTO has more than 160 member countries. Many of the new countries have experienced rapid growth. Living standards have improved for large population groups.

But not everyone has reaped the gains associated with globalisation and trade. Some have lost. Income gaps have widened. This explains to a large extent the opposition to globalisation and international cooperation.

The current trade tensions are also about power and influence. Many Asian countries are emerging as important drivers of the digital economy. In Europe, we have long looked to the United States for new technology trends. China is now sailing forth as a competitor. The country is rapidly adopting artificial intelligence and using big data.

Exports are shifting from simple to more complex products (Chart 4). Coloured pencils and textiles are being replaced by mobile phones and advanced MR scanners.

Chart 4 China exports more advanced products.
Share of China's exports[1)]



1) The data are from Chapter 2 of the *OECD Economic Outlook*, June 2017.
Sources: OECD and Norges Bank

China is now the world's next largest economy[1] and is competing with advanced western countries in many arenas. This has prompted discussions about market access, intellectual property rights and trade balances.

Global economic integration is not straightforward, but the shortcomings in today's framework for global trade must be dealt with through reform and not increased protectionism. New barriers will not help poor regions or those that have been left behind in western economies.

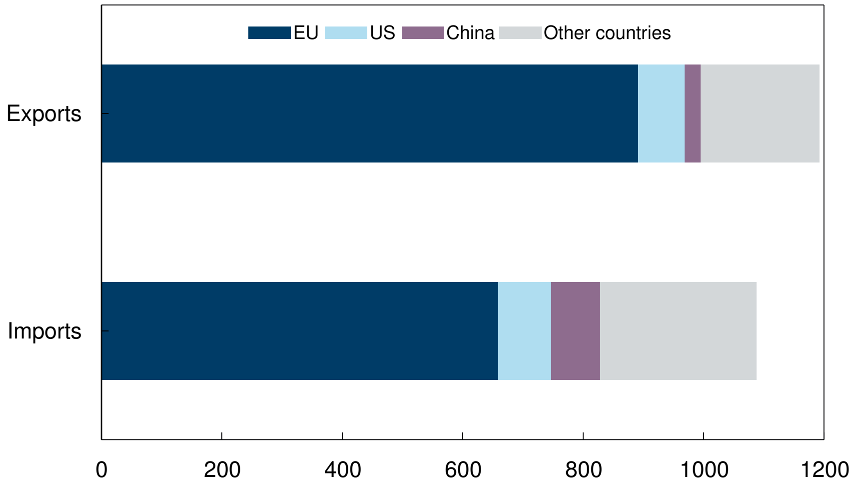
For Norway, exports of goods and services account for more than a third of GDP. Norwegian businesses are part of global value chains. This means that protectionist measures can spill over into the Norwegian economy even if Norway is not targeted.

The international framework and trade agreements we have with other countries are essential to the Norwegian economy. The EEA agreement is of particular importance.

Thanks to the free flow of goods, services, labour and capital within the EEA area, Norway's domestic market is about 100 times bigger than it would have been otherwise. A good half of our trade with other countries is with EU countries (Chart 5). Common regulations and product standardisation facilitate market access for Norwegian firms.

1 Based on GDP at market rates.

Chart 5 We trade mostly with the EU.
Goods and services. In billions of NOK. 2017



Sources: Statistics Norway and Norges Bank

Norwegian business and industry may soon feel the consequences of Brexit. The UK is an important trading partner. The UK's exit from the EU means it will also exit the EEA agreement, creating uncertainty for many firms.

At the same time, international economic cooperation is creaking. In the years ahead, the multilateral trade system is at risk of being undermined, which may leave us with a more fragmented system. This may adversely affect small countries in particular. In that situation, it would be injudicious for Norway to compromise its current agreements with Europe.

CLIMATE CHANGE REQUIRES STRUCTURAL ADJUSTMENTS

The world needs more cooperation, not less. We are facing a climate crisis that can only be addressed by engaging in a common global effort.

Last year's report from the UN climate panel was alarming. If work to reduce greenhouse gas emissions is not intensified, global warming could spin out of control. A warmer planet will have serious consequences.

Major changes in production methods and consumption patterns are needed in order to mitigate global warming. Measures taken must lead to concrete reductions in global emissions and should be cost-efficient.

Emissions pricing is essential to reducing greenhouse gas emissions. The polluter must pay. The consequences of not having applied this principle at a global level are now coming into evidence. To quote one of last year's Nobel laureates in economics, William D. Nordhaus: "The result is too much burning of fossil fuels, too much climate change, and too many harms to humans, wildlife, ecosystems, and more."[2]

It is a demanding task to put into place adequate measures. The gains from lower emissions are shared by all – also by those who do not contribute, which creates a free-rider incentive both at the global and national level. Moreover, there is opposition

2 Nordhaus, W. D. (2018): Speech delivered at the Nobel Banquet in Stockholm, 10 December 2018.

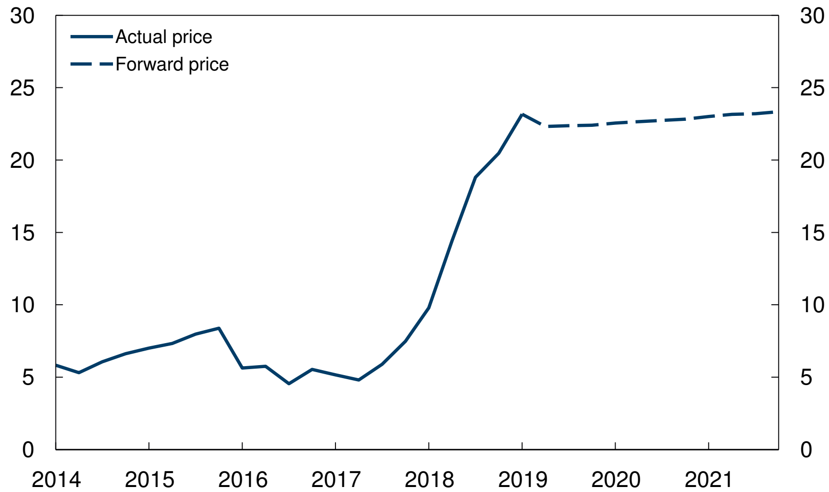
to environmental taxes, not only among low-income groups. Subsidies and support are more readily embraced – and thus tend to be favoured by policy-makers even if their effect on global emissions is often not commensurate with the cost.

An international emissions trading system could ensure equal pricing of emissions across countries and sectors. At a global level we have not reached this goal, but important progress is being made.

The EU Emissions Trading System and national taxes together cover much of the greenhouse gas emissions in Europe. In Norway, over 80 percent of these emissions are covered by emission allowances or taxes.

The price of emission allowances in the EU has long been so low that the emissions trading system has been of marginal consequence. But allowances are now being removed from the market. This has led to a fivefold price rise (Chart 6). The system is beginning to work.

Chart 6 Higher prices for European CO_2 emissions.
Allowance price.[1)] EUR per megatonne of CO_2 equivalents. 2014 Q1 – 2021 Q4



1) For 2019 Q1, the average spot price for January 2019 is shown.
Sources: Thomson Reuters and Norges Bank

The shift towards a greener and more sustainable economy places heavy demands on businesses and investors, but also creates opportunities.

Technological advances and innovation are necessary for achieving more sustainable economies. Economic instruments such as emission allowances and taxes make the quest for new solutions profitable. Climate policy has already led to rapid-fire progress in the area of solar, wind and battery technology. Old, polluting equipment is gradually being replaced by new, cleaner and greener technology.

At the same time, climate change entails new risks for business and industry. Climate risks include the impact of climate change, uncertainty surrounding future climate policy and potential disruptive technologies.

Expected return and risk are influenced by firms' response to potential structural changes. That is why many investors require companies to report on climate issues, as has the GPFG. Managing climate risk is part of the GPFG's systematic work in the area of responsible investment.

Financial investors must manage climate risk on a par with other risks. Virtually all economic activities lead to emissions, either directly or from complex production chains. Climate risks are therefore difficult to isolate and quantify, both at firm and sector level.

Identifying the winners in the green transition is a demanding exercise. Kristoffer, whom we met in the introduction, had earned a lot on his investment in Green Equities. But Kristoffer is realistic. He knows that he is not guaranteed a solid return in the long term, even if the fund is marketed as part of the renewable energy economy.

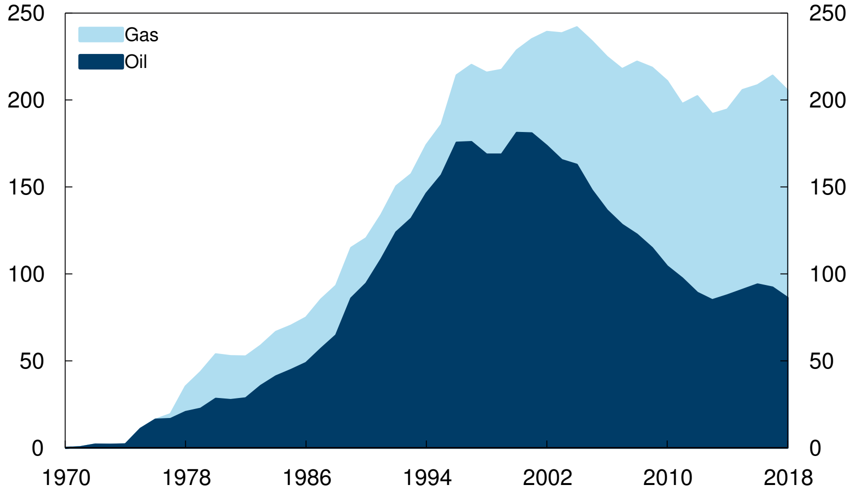
The financial sector has to adapt to climate risk, but does not have effective tools to address the climate issue. It is doubtful whether defining emissions from sectors or individual businesses as unethical will make a difference. The responsibility for measures to combat global warming must rest with the authorities. The solution lies in economic instruments that promote structural change.

STRUCTURAL CHANGE GENERATES GROWTH

A shift in consumption patterns and production methods towards lower emissions will reduce demand for fossil fuels. This can influence oil and gas activities in Norway. We have always known that oil and gas activities will be phased out sooner or later. Oil and gas are non-renewable resources. A stricter global climate policy may mean that this will occur sooner than foreseen earlier.

But Norwegian oil and gas production will remain profitable for quite some time. The supply of clean energy is still limited. Today, coal accounts for a large share of global energy demand. Demand for natural gas may increase as countries move towards a greener economy. In Germany, phasing out coal faster than planned is being discussed. Norwegian gas can play an important role in a transition phase (Chart 7).

Chart 7 Important role for Norwegian gas.
Annual production. Standard cubic metre of oil equivalents. In millions. 1970 – 2018[1)]



1) Preliminary figures for 2018.
Source: Norwegian Petroleum Directorate

There is still global demand for oil and gas. If we reduce production on the Norwegian shelf earlier than planned, other suppliers are ready to take over. The climate impact of an earlier reduction would therefore be marginal, while the costs to Norway would be substantial.

The oil industry has been an economic engine for Norway for close to 50 years. The revenues from this industry have improved the welfare of today's citizens and the citizens of tomorrow. The spillover effects from the oil sector to the wider Norwegian economy are substantial. Throughout our country there are oil-related jobs to be found. More than 10 percent of all employed persons in Norway are either directly or indirectly working for the oil industry.[3] Innovation and skills development in the industry have also benefitted other sectors.

The oil industry has been through a demanding period of personnel cuts, cost savings and rationalisation. The restructuring in the industry that was already underway became even more pressing when oil prices collapsed in 2014. Today, oil companies are hiring again, and will likely continue to do so in the coming years. But we must be prepared for a time when the industry is no longer expanding, but gradually declining, and we will need growth in other industries.

Businesses must drive structural change and innovation, but the authorities can provide favourable operating conditions to promote an innovative and sustainable business sector. Norway ranks high on the ease of doing business index[4], supported by solid institutions, a high degree of confidence and a solid welfare system.

History has shown that Norwegian business and industry have a strong capacity to adapt. Many of today's oil service operators had a long history in other industries before moving into the oil sector. A prime example is the shipbuilding industry, which faced a sharp drop in demand for ships in the 1970s. The industry had resources and skills that could be reoriented to production of platforms and other inputs in the oil industry. In hindsight, this was a fortunate stroke of serendipity.

Companies in other industries have also seen the opportunities afforded by new technology or changes in operating conditions. One example is Borregaard. The company has existed through several industrial revolutions. An abundant supply of timber and hydropower from the Sarpsfossen waterfall was a good starting point. Through the years, new technology was adopted – from water-driven sawmills in the 1600s to waterfall power at the end of the 1800s, and to today's fully automated activities. Timber has steadily found new applications in Borregaard's products, such as building materials, biofuels and medicine – with timber always as the main raw material.[5]

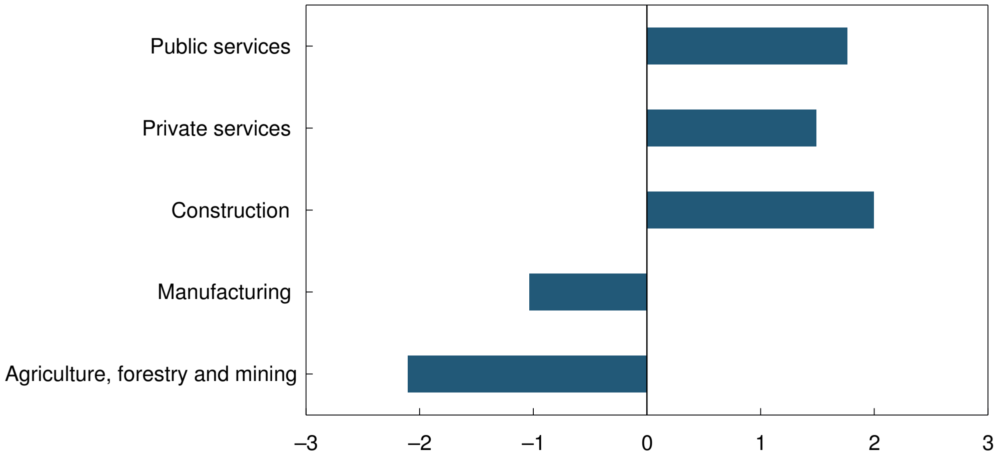
Norway's industry structure is in flux. In the past decades, the manufacturing industry has continued to decline (Chart 8), reflecting increased automation and relocation abroad. Increased prosperity has generated more demand for both private and public services. Employment has shifted towards the service sector.

3 Blomgren, A. et al (2015) "Industribyggerne 2015" [Industry builders 2015]. *IRIS Report* 2015/031 (Norwegian only).

4 World Bank "Ease of doing business index". https://data.worldbank.org/indicator/IC.BUS.EASE.XQ.

5 Throughout its history, Borregaard has had various owners and names. See eg Bergh, T. and E. Lange (1989) *Foredlet virke – Historien om Borregaard 1889–1989* [Processed timber – The story of Borregaard]. Ad Notam forlag AS, Oslo (Norwegian only), and www.borregaard.no for more information.

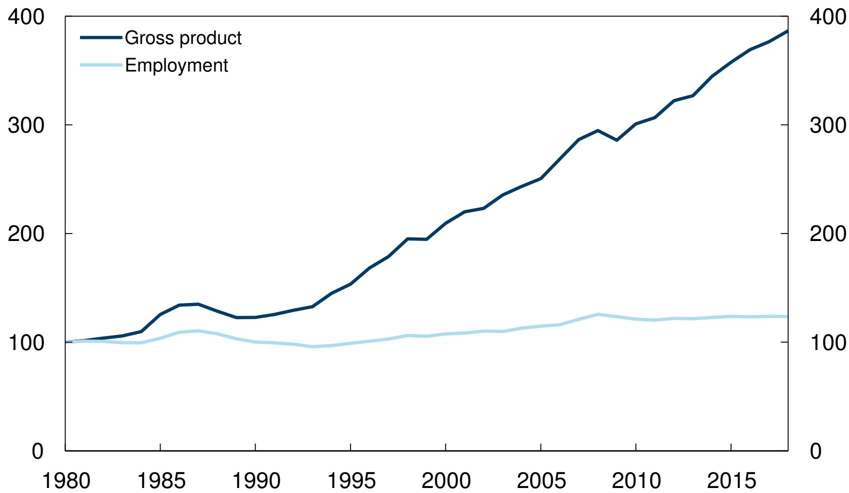
Chart 8 Employment shifts towards services.
Annual average change in number of employed in the period 1980 – 2018. Percent



Sources: Stastistics Norway and Norges Bank

The service industry has reaped gains in the form of increased productivity through restructuring and adoption of new technology. The banking industry was among the first to do so. The distributive trade sector has grown in recent decades without any notable increase in employment (Chart 9). Productivity growth has been high. Use of new technology and the shift away from private shops to chain stores have reduced distribution and administration costs. Digital technology is now driving yet another shift, towards online shopping.

Chart 9 High productivity growth in retail sales.
Index. 1980 = 100. 1980 – 2018



Sources: Statistics Norway and Norges Bank

In other areas, intermediaries are changing or disappearing. Travel, cinema tickets and doctor appointments are bought or made online. Government agencies, banks and insurance companies are offering more and more do-it-yourself online services.

Restructuring involves job losses, with potentially painful consequences for those affected. But over time labour is freed up for employment in other higher value added jobs, generating gains in the form of cheaper goods and services. Structural change is the basis for growth and welfare.

AN EVOLVING PAYMENT LANDSCAPE

New and more efficient forms of payment are playing an important role in the ongoing transformation of supply chains.

Customers are steadily being offered new and simpler payment solutions. Bank cards have largely replaced cash. Using a PC or mobile phone, we pay for goods and services online or use a mobile app to transfer money to friends. Mobile phone payments account for nearly three out of four payments between private individuals.

It's a short step to other new technologies. Facial recognition and fingerprint technologies are being incorporated into payment solutions. In the United States, Amazon has opened a shop where customers hardly notice paying while on their way out. Sensors ensure that the items are paid for.

For Kristoffer paying for goods was even simpler. His electronic assistant saw to both ordering and paying. This may become commonplace in a few years.

Traditionally, Norwegian banks have shown a strong adaptation capacity and have been drivers and early adopters of new payment technologies. Many of the solutions we use today have been developed by Norwegian banks – often in collaboration with each other.

Banks' role in the payment system is being challenged. Small specialist operators and global tech giants have their eye on payment services. Some of these may integrate proprietary payment solutions for purchasing goods and services online.

New regulations in the pipeline will facilitate increased competition. Banks will have to give other operators direct access to the account system so that customers can freely choose among payment providers. In a few years, it may be possible to transfer funds automatically between accounts and digital platforms based on a person's transaction data.[6]

In response to greater competition, banks should further develop existing services and offer new solutions. There is still room to speed up payments. Payment costs are substantial for businesses. Innovations that integrate payment solutions into firms' accounting systems could yield considerable gains. More efficient solutions are also needed for cross-border payments.

Among the newcomers to payment services we find tech giants like Apple, Google and Alibaba. They have strong market power in other markets and many users, giving them a potential advantage as payment service providers. If they become dominant payment service providers, some of the gains from stronger competition may be eroded.

Privacy considerations may also be challenged. Our payment histories contain personal, and potentially sensitive, data. For some of the new payment operators, it is precisely such personal data that form the core of their business. Sensitive data must not fall into the wrong hands. Today, most of us trust that Norwegian banks take privacy seriously. Perhaps this trust will be the banks' most important competitive advantage ahead.

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6 For more information about developments in the payment system, see *Financial Infrastructure Report* 2018. Norges Bank.

In recent years, various forms of electronic money and digital currencies have emerged that differ from traditional forms of money, in particular in that they have no institutional backing.

An example is electronic money used on closed digital platforms, which are operated by commercial companies. Even though these platforms are subject to government regulation, this money may be lost if the company behind it goes bankrupt. This may be what Kristoffer experiences in 2030.

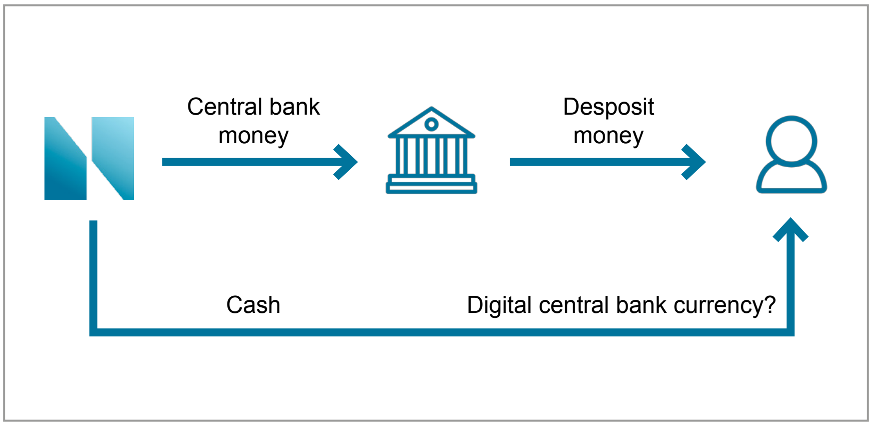
Cryptocurrencies like Bitcoin are not backed by any institution or company, pulverising responsibility for those types of currencies. No one is responsible for ensuring stability and confidence. Speculation, manipulation and security breaches have led to substantial swings in value. Cryptocurrencies are therefore unsuitable as monetary units. Time will tell whether the underlying technology proves to be useful.

The payment system is one of the most important infrastructures in a modern economy. Stability and security standards must be high. A failure in the payment system would affect important societal functions and large parts of the economy. The changes underway will give us a more efficient payment system in the form of better and less costly payment services. At the same time, rapidly evolving technologies pose new challenges. Regulation and supervision must therefore be adapted to changes in the payment operator landscape and technological developments.

Norges Bank has a primary responsibility for Norway's monetary system.

Under the Norges Bank Act, Norges Bank has the sole right to issue cash (Chart 10). The Bank also issues central bank money in the form of funds held by banks in their accounts with Norges Bank. These are the funds banks use for interbank settlements. The core of the payment system is Norges Bank's settlement system. In 2018, an average of NOK 248 billion passed through this settlement system – every single day.

Chart 10 The Norwegian payment system.



Source: Norges Bank

If necessary, Norges Bank can supply liquidity to the payment system. Norges Bank is the bankers' bank.

In addition, Norges Bank has a special responsibility for the payment system. The Bank oversees and supervises various components of the payment system and should drive new and efficient solutions.

Today, nearly all payments from customers' bank accounts are made using deposit money.[7] This is money created by banks. When people borrow money from a bank, the bank credits the same amount to an account. The money deposited was created at the instant the loan was made. Deposit money circulates through the banking system, in and out of people's accounts and is only to a limited extent converted to cash. As long as we have confidence in both the value of the Norwegian krone and in the banking system, we will also have confidence in deposit money.

The cash provided by Norges Bank has important attributes. While deposit money is a claim on a private bank, cash is a claim on the central bank. Cash is a safe alternative if private payment solutions are not functioning or do not meet the expectations of the public in terms of security and efficiency. Even though the use of cash has declined, cash is still in use and has important contingency functions.

But new digital alternatives are emerging. Norges Bank is therefore considering whether the central bank should also offer the public central bank digital currency.[8] Like cash, central bank digital currency will be a claim on the central bank. It will have to be designed to be a risk-free alternative to private payment solutions and to function in a contingency in the same way as cash does. It can be based on account systems, as we know them today, or it can be a digital variant of banknotes and coins. The latter alternative will entail a clear distinction between central bank digital currency and banks' deposit money.

In the future, central bank digital currency may be necessary for ensuring an efficient and robust payment system. Its most important purpose will be to underpin confidence in the monetary system.

MONETARY STABILITY

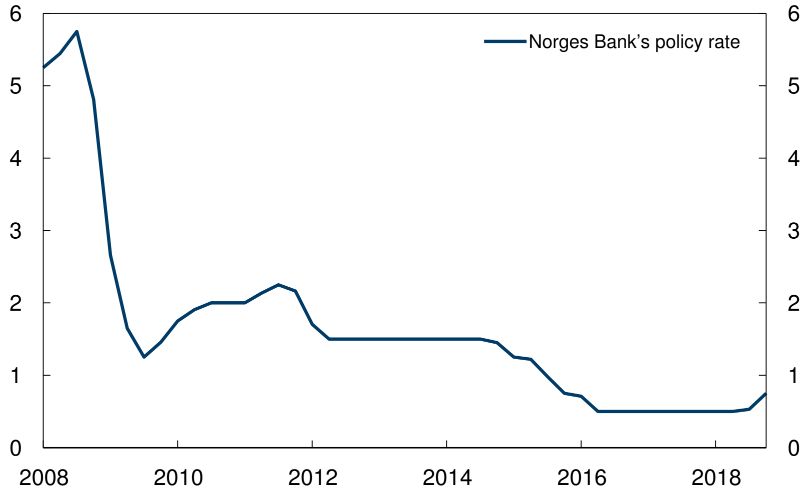
In order to serve as generally accepted means of payment, money must have a stable value guaranteed in a credible manner. There must be trust that money will be worth as much tomorrow as it is today. This is the primary task of monetary policy.

In September 2018, Norges Bank raised the policy rate for the first time in seven years (Chart 11), reflecting the favourable developments in the Norwegian economy. The effects of the fall in oil prices in 2014 have faded, and both output and employment show solid growth. Underlying inflation is close to the 2 percent target. If economic developments prove to be in line with expectations, the policy rate will be raised gradually and cautiously ahead.

7 Kloster, A. (2019) "Hvordan skapes penger?" [How is money created?]. Blog post on bankplassen.norges-bank.no, 4 January 2019 (Norwegian only).

8 Norges Bank (2018) "Central bank digital currencies". *Norges Bank Papers* 1/2018.

Chart 11 First policy rate hike in seven years.
Percent. 2008 Q1 – 2018 Q4



Source: Norges Bank

The risk outlook is dominated in particular by the global developments mentioned, that is Brexit and the danger of a broader trade conflict. If growth abroad proves to be lower than anticipated, there will be spillovers to the Norwegian economy. Uncertainty surrounding the effects of a higher policy rate also suggests proceeding with caution in interest rate setting.

Monetary policy is the first line of defence in managing the economy. As long as inflation remains under control, monetary policy can react quickly to changes in the outlook for output and employment. If the effects are pronounced, other policy areas, including fiscal policy, will also have to contribute. In this respect, Norway is in a favourable position: the government has financial leeway in the form of savings in the oil fund. In other countries, particularly in the euro area, the picture is quite different. Public finances are weak. Over the past decade, monetary policy has had to assume almost sole responsibility for getting these economies back on their feet.

After a few years of solid growth in the euro area, growth has fallen back. The interest rate level in Europe remains low, and monetary policy normalisation will take time. In this environment, new negative shocks would be very untimely for those economies. The policy space available for coping with a new downturn is limited.

CONCLUSION

To conclude, globalisation, digitalisation and structural changes are facets of the same long-term trend – we are in the midst of a technology-driven growth process that encompasses much of the world. It is easy to focus on the downsides, but we must also keep our eyes fixed on the big picture: never before have so many taken part in a journey with such a great leap in prosperity.

But growth is unevenly distributed. The winners in global competition are reaping substantial rewards, while broad categories of wage earners in the traditional industrial economies have been left behind. The harmful effects of rising inequality must be taken seriously.

Our friend Kristoffer from the year 2030 awoke to rain and mild weather, and the news that an electronic platform had been hacked. Perhaps the money he had on that platform had vanished. But some of the news was positive. Today’s two major economies, China and the United States, had worked together and made progress in addressing climate challenges. Trends that now appear to be leading us in the wrong direction can change course.

My successor announced that the next generation of central bank digital currency would be managed by artificial intelligence. That is not likely to happen. The responsibility for the monetary system cannot be relegated to models and algorithms. The choices we make as a central bank must be based on thorough analyses, discussions and human judgement. Come what may.