

Øystein Olsen: How does the key policy rate operate?

Speech by Mr Øystein Olsen, Governor of Norges Bank (Central Bank of Norway), at the Centre for Monetary Economics (CME), BI Norwegian Business School, Oslo, 25 September 2018.

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Accompanying [charts](#) of this speech.

Introduction

Just over a week ago, we marked the tenth anniversary of an event that shook the global economy. The Lehman Brothers bankruptcy added fuel to a smouldering financial crisis, which gathered strength and spread quickly. Financial market activity came to a halt. Investors demanded high risk premiums. Faced with a crisis that could lead the economy into a deep recession, central banks cut policy rates sharply and injected liquidity into the market. It was the beginning of ten years of historically low interest rates and the use of unconventional instruments. It would take a long time to get economies back on their feet again.

For Norway, the financial crisis brought an abrupt end to a three-year long period of gradual increases in the key policy rate. In the course of autumn 2008, the key policy rate was lowered three times, by a total of 2.75 percentage points. By the following summer, the key policy rate had been lowered further, to 1.25 percent. Even though growth in the Norwegian economy picked up fairly quickly, Norwegian interest rates over the next few years were influenced by a persistently low international interest rate level. The fall in oil prices in 2014 led to a further reduction in the key policy rate in Norway.

Chart: Gradual normalisation of monetary policy

Last week, Norges Bank raised the key policy rate for the first time in seven years. If the economy evolves as currently envisaged, last week's decision will be the beginning of a gradual normalisation of the interest rate level. This is good news. It means that the Norwegian economy is performing well. The effects of the fall in oil prices in 2014 have unwound. The economy has shown solid growth in recent years and the labour market has been improving. The upturn in trading partners' economies, higher oil prices and low interest rates have lifted growth in Norway.

The outlook for the Norwegian economy implies that the key policy rate will be raised in the years ahead. Capacity utilisation is close to a normal level. Underlying inflation is close to the 2% inflation target. The key policy rate is being raised to prevent pressures in the economy from intensifying and triggering a surge in prices and wages. Raising the rate also reduces the risk of a renewed rapid rise in property prices and debt. High price and wage inflation and a further build-up of financial imbalances would increase the risk of a sharp economic downturn further out.

There are a number of factors to suggest that the key policy rate should be raised at a gradual and cautious pace. An environment of low global interest rates limits the room for manoeuvre. Raising the key policy rate in Norway too rapidly in the period ahead could act as a brake on the upturn in such a way that unemployment rises and inflation becomes too low. Uncertainty about the effects of higher interest rates also suggests a cautious approach to interest rate setting. We have experienced a long period of low interest rates and rising household debt ratios. The effect of higher interest rates will therefore likely be more pronounced than the effect of earlier rate increases. I will return to this later.

The risk outlook also reflects growing global protectionism and turbulence in some emerging economies. Lower-than-expected global growth will have spillover effects on the Norwegian economy.

The interest rate level the Bank envisages for the years ahead is modest compared with historical interest rate levels. In the Bank's assessment, the level of the so-called neutral interest rate has fallen over time (see Brubakk et al (2018) and Norges Bank (2018)). The key policy rate is therefore not expected to be as high as in earlier upturns.

The objective of monetary policy is to maintain low and stable inflation and contribute to high and stable output and employment over time. As monetary policy is to be flexible and forward-looking, the key policy rate is lowered when the economy is entering a downturn. Similarly, the key policy rate should be raised before the economy overheats.

Monetary policy affects inflation, output and employment through several channels.

One important channel is the exchange rate channel. Changes in the krone exchange rate affect economic activity in some business sectors and prices for imported goods and services. The krone exchange rate has acted as a shock absorber, as it did in 2014. A sharp depreciation of the krone dampened the negative effects of the fall in oil prices on the real economy. A low key policy rate contributed to underpinning a weak krone. At the same time, the responsible actions of the social partners restrained domestic cost inflation. The exchange rate and the interest rate differential will continue to be important factors ahead.

The key policy rate also has a direct impact on household and corporate demand. The rate reduction in 2014 stimulated consumption and investment. Now that growth has gained a foothold, we can take our foot off the pedal a little. Gradually higher interest rates will reduce the pressure that would otherwise have been generated by higher activity, higher employment and higher wage growth.

A third channel is often referred to as the expectations channel. For monetary policy to be effective, changes in the key policy rate must pass through to market rates. Monetary policy effectiveness increases if changes in the key policy rate influence expectations of future interest rate levels. An investment is made to provide a profit over a number of years, and mortgage payments have to be met throughout the term of the loan. So today's interest rate level is not the only important factor. The interest rate path we published last week showed that the key policy rate will probably be raised gradually. When households and firms perceive signals concerning future interest rate developments as credible, the impact of interest rate increases that lie ahead may occur earlier.

Communication enhances the effectiveness of monetary policy

Communication about the evolution of the economy is therefore an important part of Norges Bank's monetary policy. We communicate our view of the economic situation and our monetary policy trade-offs in various ways. The Bank's most important channel of communication is the monetary policy report. The report contains a thorough review of new information that is relevant to the evolution of the Norwegian economy and the background for the interest rate decision. Last week, the Bank launched a new product – *Pengepolitikken kort fortalt* [Monetary policy in brief]. [1] We believe there is a need for this. This product is designed for Norwegian readers looking for a more generalised, brief description of the background for the interest rate decision. The fundamental message conveyed is of course the same as in the Bank's monetary policy report.

Norges Bank has published forecasts for the key policy rate three to four years ahead since 2005. If the economy evolves as envisaged by Norges Bank, this is the Bank's best forecast for future key policy rate levels. The interest rate forecast is thus a summary of the message in the monetary policy report.

It is important to remember that the interest rate forecast is a conditional forecast and not a promise. The interest rate path has been revised frequently, and sometimes fairly substantially – as during the financial crisis and in the wake of the oil price fall in 2014. Nor are market

expectations of future interest rates necessarily aligned with Norges Bank's interest rate path. On the contrary, the two curves have often diverged to some extent, particularly at somewhat longer horizons.

Norges Bank's analyses nonetheless indicate that we are successful in steering market expectations in the desired direction (Brubakk et al (2017)), for example by publishing the interest rate path. The analyses also find that central bank and market revisions of interest rate paths in the periods between monetary policy meetings are strongly correlated. This suggests that market participants have a good understanding of the central bank's response pattern and of how monetary policy will react to new information about economic developments.

Need for alternative reference rates

Chart: From key rate to money market rate ...

Market expectations of future interest rates are reflected in the Norwegian monetary market rate – three-month Nibor. This rate can be decomposed into the average expected key policy rate over the next three months and a risk premium, usually referred to as the money market premium. Over time, three-month Nibor has tracked the key policy rate.

Three-month Nibor is a so-called reference rate, used as a basis for the pricing of many financial contracts in Norway, such as loan contracts and interest rate swaps. In its capacity as a reference rate, Nibor is a key element linking the key policy rate with the interest rates facing households and enterprises.

Chart: ... and on to mortgage rates

The interest rates paid by households and enterprises on their bank loans are set to cover banks' costs as well as to provide a return on equity for the banks' shareholders. A large share of banks' costs consists of the cost of wholesale loans to fund retail lending. Prices for these loans will typically be formulated as a premium on top of three-month Nibor. Changes in Nibor will thereby affect banks' funding costs and lending rates for households and enterprises.

Reference rates are used to hedge against future changes in the general interest rate level. The pricing of bank bonds can serve as an example. When the interest rate on a bond is set at the reference rate plus a fixed risk premium, both the bank's interest expenses and the bond purchaser's interest income will depend on the level of the reference rate – and thereby on the general interest rate level. When the two parties agree to the contract, they can then focus on the contract's specific conditions, such as the credit risk associated with the issuing bank.

Internationally, Libor and Euribor are important reference rates. Libor is quoted for several currencies, including USD and GBP. Euribor is the reference rate for the euro area. Reference rates are widely used, particularly in the derivatives market. The total value of contracts linked to USD Libor is estimated at close to USD 200 trillion. This is around ten times the size of US GDP (Federal Reserve 2018). [2]

In the years following the financial crisis, reference rates have been the focus of considerable criticism, and work is in progress internationally to reform and improve them (Dudley (2018), Duffie and Stein (2015), Lund (2018)).

Reference rates deserve critical attention, for a number of reasons. First, the basis for the current rate-setting process has become increasingly inadequate. Libor and Euribor were supposed to reflect the price of unsecured interbank loans. But the calculation of reference rates is only to a limited extent based on actual trades. This is because the volume of unsecured interbank loans is very small for maturities of more than a few days. In the years since the financial crisis, activity in this market has declined considerably. Banks quoting money market

rates at longer maturities have therefore increasingly had to base their submissions on judgement and information from other markets.[\[3\]](#)

Second, some reference rates, in particular Libor, but also Euribor, have been the target of manipulation. Participants that were both active in the market and involved in quoting interest rates were able to make substantial profits by manipulating rate submissions. Some instances of misconduct that have been uncovered have also resulted in fines, legal proceedings and convictions.[\[4\]](#)

Control and monitoring requirements in relation to Libor submissions have been tightened, and a number of banks have become sceptical of taking on the legal risk involved in being a panel bank. The UK Financial Conduct Authority has finalised an agreement with the Libor panel banks whereby the banks have committed to remain as submitters until the end of 2021 (Bailey (2017)). After this time, the authorities can no longer guarantee that quotes will be submitted for Libor. Prospects that Libor may be discontinued in a few years' time have amplified the need to establish alternatives to today's reference rates.

Some countries have already published recommendations for alternative reference rates. All the proposals are based on the shortest rates, ie overnight rates, as the new reference rates are required to be based on actual, observed transactions.

The transition to new reference rates in other countries also has an impact on the use of reference rates in Norway. The removal of foreign ibor rates would change the markets on which the Norwegian banking sector currently relies.

Norges Bank has, in consultation with Finance Norway, taken the initiative to establish a working group with a mandate to consider alternative reference rates for the Norwegian market. The working group comprises Norwegian banks and branches of foreign banks with a good understanding of the Norwegian money market. Finance Norway and Norges Bank have observer status, while Norges Bank also provides secretariat support.[\[5\]](#)

Reference rates play an important role, for the impact of monetary policy and in financial contracts. In only a few years' time, Nibor may be replaced by other reference rates. This may affect the design of a range of financial contracts. Preparing for new reference rates will require ample time and planning. When the working group presents its proposals in 2019, an important first step will also have been taken in Norway.

How will consumption be affected by a rise in interest rates?

Let me return to today's situation. There are now prospects for a gradual rise in interest rates in the years ahead.

A less expansionary monetary policy aims to prevent the economy from overheating further ahead. Households account for a substantial portion of demand in the economy. Households' response to higher rates will therefore have a considerable impact on the effectiveness of the interest rate increase. In the Bank's current assessment of the outlook for the Norwegian economy, it is assumed that the gradual rise in interest rates will curb growth in household consumption somewhat.

Many households have likely become accustomed to a low interest rate level over the past few years. In the past ten years, the key policy rate has been reduced as many as 13 times. In the meantime, household debt ratios have increased. Almost one quarter of total debt is now held by households that have never experienced an interest rate increase. With a higher level of debt, an interest rate change will have a more pronounced impact. At the same time, uncertainty about the effect of interest rate changes has increased, suggesting a cautious approach to interest rate setting.

The rise in interest rates affects consumption through various mechanisms. Some of these mechanisms operate with a lag. Household disposable income will be affected by slightly more subdued growth in employment and wages. Higher interest rates may also curb the rise in house prices, resulting in a smaller rise in housing wealth than would otherwise have been the case.

Other consequences of an interest rate increase will have a more direct impact on private consumption.

First, higher interest rates push up the cost of consumption today relative to consumption tomorrow. Debt-financed consumption becomes more costly, while saving provides a higher return, pointing towards lower consumption today. Credible signals that the interest rate will remain at a higher level ahead may amplify this effect.

Second, the interest rate increase has a direct impact on household disposable income. The strength of this channel will depend on the overall debt level and the distribution of debt (Gerdrup et al (2018)).

While higher interest rates means increased expenses for some, interest income increases for others. If housing wealth is disregarded, Norwegian households as a whole are in a net debt position. As higher interest rates means higher net interest expenses, a higher interest rate level will in isolation reduce household purchasing power.

Chart: Household debt has increased

The elevated debt level has amplified this effect. Debt as a share of household income has increased by 12 percentage points since Norges Bank last raised the key policy rate. Measured as a share of household income, debt is approaching double its level in 2000. Bank deposits have risen considerably less than loan debt. The negative effect of an interest rate increase on household income thereby carries relatively greater weight than previously.

Chart: Greater impact of interest rate increase on disposable income

In other words, an interest rate increase will curtail household purchasing power more than previously. In 2000, a one percentage point rise in the key policy rate would have resulted in an increase in net interest expenses equivalent to less than $\frac{1}{2}$ percent of household disposable income. In 2017, this share increased to one percent of disposable income. An interest rate increase therefore probably has a stronger effect on private consumption than previously.

How much stronger the impact of the interest rate depends on how debt is distributed across household groups. Changes in the distribution of debt can thereby have consequences for the effect of monetary policy. Analyses based on microdata for the household sector can provide useful insight.

International studies have shown that households with limited financial buffers tend to allow temporary income changes, for example as a result of changes in interest expenses, to impact fully on consumption. This is supported by a study recently conducted on Norwegian data (Fagereng et al (2018)). This study finds that the relative decrease in consumption after a reduction in income, referred to by economists as the marginal propensity to consume, depends on households' financial situation.

The literature also refers to the "wealthy hand-to-mouth" (Kaplan and Violante (2018)), ie households with high incomes, illiquid housing assets and relatively high loan-to-value ratios. In the face of higher interest expenses, this group may well react by making a considerable adjustment in consumption.

Chart: Debt and wealth vary through the life cycle

Households' financial position can largely be inferred from the stage in the life cycle. The chart shows how assets and debt vary with age. On average, the highest level of debt is for households in the 30–40 age group. An interest rate increase will have the greatest impact on this group, which also has modest financial buffers. [6] This group's wealth primarily comprises illiquid housing assets that may be difficult to draw on in hard times.

Debt is lower for the older age groups. These groups include people who entered the housing market when house prices were lower. Since many have built up liquid wealth in the form of bank deposits or other kinds of assets, net interest income could increase for some. An interest rate increase would likely have a smaller effect on consumption in this group than in younger groups.

The oldest age groups are virtually debt-free. Many older households have substantial housing wealth and money in the bank. Higher interest rates therefore mean higher disposable income and could provide room for some increase in consumption.

Chart: Higher debt ratios in all age groups

We have experienced a period of sharply rising house prices and debt. The price of entry into the housing market has increased. The 35–45 age group has shown the largest increase in debt ratios, measured in percentage points. Debt ratios in both this group and the somewhat younger groups now average around three times post-tax income. These groups have a high marginal propensity to consume. The elevated debt level in these age groups amplifies the cash-flow channel.

But young and middle-aged households are not the only groups to borrow more than previously. A somewhat larger share of total household debt is now in fact held by the older age groups. More debt among the older households reflects the fact that older adults are also active in the housing market and are taking on more debt.

To the extent an interest rate increase now curbs growth in household consumption more than previously, it is because many households have taken on substantial debt, not because there has been a noticeable change in the distribution of debt.

Chart: Higher interest expenses for many households

Since there has been a broad increase in debt ratios across age groups, many households will feel the effects of higher lending rates. The chart shows the effect of a one percentage point rise in interest rates on disposable income for the different age groups. In a comparison of the profile in 2016 with the profile in 2005 and 2010, the most striking feature is that interest burdens rise in many age groups. The age profile itself is little changed. A similar chart showing the distribution of higher interest expenses across income deciles would have shown the same picture.

Even though many households will feel the effects of higher interest expenses, the increase will be manageable for most people. The share of households with high debt relative to income, low debt-servicing capacity and a high loan-to-value ratio is small, and lower than just a few years ago (Norges Bank (2017)).

Chart: Higher bank deposits dampen some of the effect of higher debt

How quickly an interest rate increase will lead to lower growth in consumption also depends on the size of households' financial buffers. Buffers in the form of bank savings can be drawn down if interest expenses rise, reducing the need to adjust consumption. Even though some households have little in the way of financial buffers, many households' buffers are larger than just a few years ago. Despite the rise in debt ratios between 2010 and 2016, an interest rate increase will lay claim to a smaller share of bank deposits, particularly for the groups with the highest level of net debt. This will counteract some of the effect a higher level of debt has had on

the impact of an interest rate increase via the cash-flow channel.

Studies of heterogeneity provide new insight into how the key policy rate operates. The use of different types of microdata is therefore a priority for Norges Bank. We want to include the knowledge gained from microdata in the Bank's analytical apparatus, and work is in progress to develop a general equilibrium model using heterogeneous agents. The model takes into account that debt ratios depend on the lifecycle stage of the household. The effect of the labour market situation also varies across age groups. All these model features influence the strength of monetary policy's impact.

The new model has the potential to be a useful supplement to the Bank's main model, NEMO. Neither the household debt-to-GDP ratio nor the distribution of debt and assets across age groups are constant. Over time, changes in these variables can influence the effect of the interest rate on the economy. The combination of an ample supply of microdata and more complex model analyses will strengthen the analytical basis for monetary policy.

Conclusion

Let me conclude. After a long period of low interest rates, the key policy rate is again on the rise. The rate increase can be expected to be gradual and is a response to the solid activity we now see in the Norwegian economy. Solid activity also means higher employment and prospects for higher wage growth, and Norwegian households will be better off financially despite the rise in interest rate expenses.

With the high level of household debt, the rate increase will likely have a greater impact on private consumption than earlier. However, the strength of this impact is uncertain. This suggests a cautious approach to interest rate setting – a strategy we are now pursuing.