A decade of forward guidance in Norway

Speech by Governor Øystein Olsen, Norges Bank, at a seminar held at Columbia University, New York City, on 8 April 2014.

Please note that the text below may differ from the actual presentation.

Thank you for inviting me to Columbia University. Economists in Norges Bank have been greatly inspired by researchers from this institution, and we have had the pleasure of hosting scholars from Columbia at a number of conferences in Norges Bank. Some of our economists have also been here as visiting scholars. It is therefore a particular pleasure for me to be here today.

'Forward guidance' as an element of monetary policy has attracted attention in the aftermath of the international financial crisis. With key policy rates in some countries constrained at a lower bound, statements about central banks' future actions have been used to affect interest rate expectations.

Norges Bank has published explicit numerical interest rate forecasts as a *regular* part of our monetary policy communication for ten years. The interest rate forecast is our preferred way of guiding economic agents' interest rate expectations. As such, our version of forward guidance has been reasonably successful.

The topic of my talk is our framework for forward guidance and the experience gained over a decade of practising our approach. Although circumstances differ, our experience may also be of value to others.

Forward guidance in general

Up until the 1990s, the code of conduct among central bankers was one of secrecy. Today, however, central banks strive to be transparent. This development reflects a general trend towards greater transparency in modern societies. For some central banks, including Norges Bank, a change from fixed exchange rates to an inflation targeting regime also highlighted the importance of greater transparency.

Transparency is necessary for accountability. With accountability the central bank can build credibility and trust, both by showing that the objectives are actually attained in the longer run, and by explaining deviations from targets. Forward guidance, understood as information about future policy intentions, may be viewed as a natural extension of this accountability framework.

Economic agents are forward-looking, and hence the future stance of monetary policy matters to them. As Michael Woodford has stated, *"For not only do expectations about policy matter, but, at least under current conditions, very little else matters."* [1]

In macroeconomic theory, the importance of expectations has been appreciated since the rational expectations revolution of the 1970s. In the early 1990s, theorists started to model

monetary policy as setting the interest rate. [2] Central bankers have since had a theoretical framework with both forward-looking agents and monetary policy specified in terms of the key interest rate. Under this framework, monetary policy becomes more powerful if the agents understand the reaction pattern of the central bank. When a disturbance hits the economy, the policy response required to stabilise the economy is smaller if the central bank can affect the whole term structure than if monetary policy only works through the short-term interest rate. [3] However, the importance of forward guidance depends on the degree to which expectations are forward-looking.

In principle, economic agents may be able to calculate how the central bank will respond to changing conditions if they know both the model of the economy and the objectives and reaction pattern of the central bank. Expected future interest rates may then align well with the central bank's own interest rate intentions, and there will be no need for the central bank to communicate its policy intentions.

In practice, a model description of the economy is just that – a model, which always will be a simplification. The central bank's reaction pattern may also be adjusted over time. Judgement is applied when responding to shocks, and a specific reaction function will only provide a simplified representation of the central bank reaction pattern. Regular information about policy intentions is therefore necessary for the public to learn and revise their expectations. This is also the rationale for forward guidance.

In theory, forward guidance may also work as a commitment device and help the central bank stabilise the economy in a more efficient way. [4] The merits of this are debated, and it may be most relevant in a situation where the interest rate has reached a lower bound. Forward guidance about *how* the central bank plans to reach its targets may nevertheless help establish confidence among agents that the objectives will actually be achieved. Forward guidance may thereby indirectly make an inflation target more credible, and thus contribute to anchoring inflation expectations.

For forward guidance to work as intended, there are some preconditions. First, economic agents must indeed understand the announced reaction pattern. A second, and related issue, is that the conditionality of the guidance must be understood. A commonly raised concern is that the public might perceive the guidance as unconditional promises rather than conditional statements. Yet another requirement is that the guidance must affect the agents' expectations. I will address these issues in more detail when I discuss our experience of forward guidance in Norway.

Many central banks started to provide some kind of forward guidance in the late 1990s. There is now a consensus view among central bankers that providing information about policy intentions enhances the effects of monetary policy. However, no consensus has emerged on *how* to provide it. We may distinguish between three main categories of forward guidance:

The traditional form of forward guidance has been to give *qualitative* statements about future intentions. For instance, some central banks have indicated the anticipated direction of the next change in the policy rate. In 1999, Norges Bank started to make statements such as *"the probability that the next change in interest rates will be an increase is greater than*

the probability of a reduction". Another example is the Federal Reserve, which has used "code" words such as *"bias towards"* or *"balance of risks"*, indicating the same.

A second approach to forward guidance has been adopted by some central banks when key policy rates have been at a zero lower bound. With a constrained room for maneuver in monetary policy, central banks have found it useful to communicate specific conditions likely to be fulfilled before a change in the stance of monetary policy should be considered. In the aftermath of the international financial crisis, conditional statements both related to the likely *time* it would take before a tightening should be considered and statements about thresholds for some variables have been used. Both the Federal Reserve and the Bank of England have for instance been linking future policy actions to specific unemployment thresholds.

Publishing the central bank's own interest rate forecast as a regular part of monetary policy communication is a third type of forward guidance. The Reserve Bank of New Zealand was the first central bank to pursue this approach in 1997, followed by Norges Bank in 2005. [5] This type of forward guidance is also conditional, and it is typically accompanied by a consistent forecast for output and inflation. As the interest rate forecasts are revised, market participants learn over time how the central bank normally responds to different types of shocks. When the central bank explains how it plans to achieve its target, it may also improve confidence and credibility.

Forward guidance in Norway

Before I present our version of forward guidance, let me give you a brief background on the Norwegian economy and our monetary policy framework.

[Chart: The Norwegian economy]

Norway is a small, open, natural resource-rich economy. About a quarter of our GDP is related to oil and natural gas extraction. A large part of the petroleum production is exported and the bulk of the revenues saved in a sovereign wealth fund. [6] A strong fiscal position, along with a well anchored inflation targeting regime, allowed us to use both fiscal and monetary policy actively during the recent international financial crisis. The unemployment rate has stayed around and below four percent during recent years, and the inflation rate has been low and stable.

This picture seems rosy, but there are concerns: property prices have risen sharply over the last 20 years and households are heavily indebted.

Norges Bank was given a formal inflation target for its monetary policy in March 2001. The operational target of monetary policy is annual consumer price inflation of close to 2.5 percent over time. Monetary policy shall also contribute to stabilising output and employment. In this respect, the inflation targeting regime is flexible.

Norges Bank's Executive Board comprises seven members, including the Governor, Deputy Governor and five external members. The Board decides collectively on the key policy rate, normally six times a year. [7] Our *Monetary Policy Report with financial stability assessment*

is published on a quarterly basis. Analyses and discussions on interest rate decisions are reflected in the *Report*. Together with press conferences after our monetary policy meetings, the *Report* is the main channel for our communication of monetary policy. Since 2013, the *Report* also includes an evaluation of financial stability conditions, which is also used as a background for Norges Bank's recommendation on a countercyclical capital buffer for banks.

[Chart:Timeline: The first years of Norges Bank forward guidance]

In 2004, we started to publish our first quantitative guidance in the form of a "strategy interval" for the key policy rate four months ahead. In November the following year, we published for the first time our own interest rate forecast for the next three years. Prior to that, we had established and published criteria for an appropriate interest rate path. [8]

Up until November 2005, the analyses and forecasts in our reports had been based on either a constant interest rate path or an interest rate path as implied by the forward market. At this point however, our conclusion was that it would be easier to interpret, evaluate and communicate our view of the economy when it was based on a path for the interest rate that we considered to be appropriate. In addition, it made our communication better aligned with our analytical framework and with theory.

[Chart: Our interest rate forecast is conditional]

Our forecast for the key policy rate [9] is presented in a panel together with forecasts for inflation and the output gap. The chart shows the forecasts in the most recent *Monetary Policy Report*, published just two weeks ago. There is substantial uncertainty associated with the projections, as illustrated by empirically based fan charts. The fan chart for the policy rate also illustrates the conditionality of the forecast: Although we control the key interest rate, the forecast for the interest rate is conditional on the outcomes for other variables, which are uncertain.

[Chart: The system for monetary policy analysis and forecasting]

When we decided to publish our own interest rate forecast, more transparency and documentation were required regarding our models. Our core policy model, NEMO (Norwegian Economy MOdel), is used as a starting point to derive our interest rate forecast. Over time, we have also established an apparatus for nowcasting [10] in order to steadily improve our assessment of initial conditions. In addition we collect information about the current economic situation from our regional network of business contacts. A set of models are used for cross checks and the assessment of exogenous assumptions.

Our core policy model NEMO is a New Keynesian dynamic stochastic general equilibrium (DSGE) model for a small open economy. The model has many features that are similar to corresponding models in other central banks. Recently we have extended the model to include financial frictions and also an explicit banking sector and a housing market.

As soon as we abandoned an exogenous assumption of future key policy rates, we had to take a stand on how to formulate monetary policy within our core model. Analytically, deriving the monetary policy reaction pattern with a loss function is a useful and practical

approach. We have developed an improved apparatus for solution algorithms for DSGE models in order to be able to solve for the endogenous interest rate path in different ways and under different assumptions.

The interest rate path that we derive from the model analysis serves as a benchmark for the policy discussions of the Executive Board. The analytical loss function that we use in NEMO to solve for this path reflects our criteria for an appropriate interest rate path.

The first criterion is that the interest rate should be set with a view to stabilising inflation at target or bringing it back to target after a deviation has occurred. The second criterion is that our inflation targeting regime should be flexible. Hence, the interest rate path should provide a reasonable balance between the path for inflation and the path for overall capacity utilisation in the economy.

We have learned that stabilising inflation involves important trade-offs in a small open economy. Let me elaborate a bit on this point: Shortly after we adopted inflation targeting in 2002-2003, efforts to dampen inflationary pressures resulted in a strong krone appreciation, with strong impacts on the economy. Later, in the mid-2000s, when inflation was low while at the same time growth was strong, low interest rates at home and abroad contributed to amplifying the cyclical upturn in Norway.

In the light of our experience, it is fair to say that our inflation targeting regime has become more flexible over time.

The third criterion is that the interest rate path should reflect a *robust* monetary policy. By this we mean that the interest rate should be set so that monetary policy mitigates the risk of a build-up of financial imbalances. Moreover, acceptable developments in inflation and output should be likely under alternative assumptions about the functioning of the economy. Implementing these concerns analytically is not straightforward, however. We are working intensively to refine our approach to these concerns in our analytical framework.

[Chart: Criteria for an appropriate interest rate path]

This chart illustrates how the forecasts for the key policy rate, output and inflation evolve when the various criteria are taken into account. The illustration is from our third *Monetary Policy Report* in 2012. If monetary policy at that time had given weight only to the low level of inflation, the key policy rate should have been lowered sharply and kept close to zero for some time, as indicated by the red dotted line in the upper left panel. Inflation would then have been predicted to pick up relatively fast, partly owing to a weaker exchange rate.

Taking into account our second criterion for an appropriate interest rate path, the key policy rate would have been somewhat higher in the short term, as indicated by the blue dotted line. Inflation would have been predicted to take somewhat longer to rise towards the target, but developments in output and employment would have been more stable.

Finally, taking into account considerations of robustness (criterion 3), we reached the interest rate forecast indicated by the black dotted line.

[Chart: Decomposition of change in the interest rate path]

Our communication of interest rate decisions is aided by a decomposition of changes in the interest rate path. This is a model-based illustration of how the change in the interest rate forecast from one report to the next can be decomposed into contributions from exogenous disturbances. The intention is to communicate the driving forces behind any changes in the interest rate path.

The chart illustrates the different forces behind the change in the interest rate path from the last report in 2012 to the last report in 2013. [11] The key policy rate was kept at a lower level through 2013 than projected at the end of 2012. At the same time, the forecasts for 2014 and 2015 were revised downwards. The primary reason for the revision was weaker-than-expected developments in the Norwegian economy. Capacity utilisation and cost growth were both lower than projected. At the same time, there were prospects that growth ahead would be lower than previously assumed. Moreover, growth among Norway's trading partners and interest rates abroad were lower than projected, and banks' lending spreads were higher than expected. Conversely, a substantial depreciation of the krone through the year, which was viewed mainly as due to an increase in the risk premium, kept the interest rate forecast from falling further. A decline in premiums in the money market also pulled in the same direction.

Experiences

So far I have discussed the motivation for forward guidance and how we implement it in Norges Bank. Let me now share some of our experiences with you.

As a starting point, let me again address the preconditions for forward guidance to enhance the effect of monetary policy that I mentioned previously. I will try to illuminate two questions: 1) Is our reaction pattern and the conditionality of our interest rate forecast understood? and 2) Do we affect the expectations of economic agents?

[Chart: Decomposition of change in the interest rate path: Forecasts]

Prior to the announcement of a new interest rate forecast, many of the market analysts publish *their own forecast of our interest rate path*. These forecasts are usually accompanied by a discussion of the factors pushing the expected revision of our path in either direction. Some analysts even publish their own assessment of our decomposition of the interest rate change, quantifying the estimated effects from different factors. The charts show the forecasts of the change in our interest rate path provided by three different macroanalysts prior to the publication of the October 2011 *Monetary Policy Report*. Our published change in the path and its decomposition are shown in the lower panel to the right.

As shown in the chart, the forecasts are quite accurate, which is a typical pattern. We take this as an indication that market participants in general understand our reaction pattern. It also indicates that the agents correctly perceive our interest rate path as a conditional forecast, and not as an unconditional promise.

[Chart: Changes in money market rates after monetary policy announcements]

The next chart shows the changes in money market rates on the day of a new monetary policy announcement. It indicates that market movements around monetary policy meetings have been marginally smaller since we introduced our own interest rate forecasts in October 2005. Announcing the whole interest rate path has not resulted in more pronounced market reactions than before. Instead, the graph could be taken to mean that we have become somewhat more predictable overall. But other factors may also have contributed to smaller market movements: reduced volatility may also be related to the very low level of interest rates during recent years.

[Chart: December 2013: Small market reactions after policy announcement]

As I noted earlier, in a world of perfect and symmetric information, where the reaction pattern of the central bank is known to all, there would be no need for forward guidance. Agents would not pay any attention to our forecasts, as these would already be internalised in expectations and reflected in asset prices. But it is also the case in the real world that the *better* we are at communicating our reaction pattern, the *less* attention our forward guidance will receive. For this reason, it will be hard to identify the contribution of publishing the interest rate forecast.

This chart shows a typical example of an announcement where our new path had been anticipated. The market interest rate path prior to our meeting in December last year (blue dashed line) was already well aligned with the new interest rate path to be published (the purple solid line). [12] On this occasion, our new interest rate forecast just confirmed what the market had already learned and expected from our reaction pattern. In such a case, the market interest rate path works as an automatic stabiliser: If the market expects the outlook for the economy to change, and it – correctly – anticipates the central bank's reaction to it, the appropriate tightening or loosening will be reflected in market rates even before any action is taken.

The example illustrates an important point: By being transparent and by regularly and over time providing information about the revisions of the forecasts, economic agents are kept up to date with the central bank's reaction pattern.

Since the world changes, our interest rate forecast may at times come as somewhat of a surprise. And in situations where we observe that market participants are not well enough informed about our reaction pattern, we do not hesitate to surprise the market.

The huge shock to the international – and hence the Norwegian – economy during the financial crisis in 2008 may serve as an example. In this case, we were able to guide the market and affect expectations when we presented a new interest rate forecast.

[Chart: December 2008: Market rates shifted down markedly after policy announcement]

As shown by the black line in this chart, we cut the key policy rate substantially at the monetary policy meeting in December 2008. The dashed blue line, which shows the market path the day *before* we announced the rate cut, indicates that a significant cut was anticipated by the market. However, in addition to cutting the policy rate, we also published a new interest rate forecast, shown by the solid purple line, which was considerably lower

than our previous forecast, shown by the dashed purple line. The market had not fully anticipated this, and forward rates shifted down markedly after the meeting, as indicated by the solid blue line. The interpretation could be that we provided news to the market about the strength of the action deemed necessary by Norges Bank as a response to the financial crisis. On this special occasion, when uncertainty was larger than usual, we believe that publishing the interest rate forecast was particularly helpful in making monetary policy more effective. This example suggests that we can indeed guide the market and affect expectations.

[Chart: Interest rate expectations one year ahead]

Further evidence supporting our ability to affect expectations comes from household survey data. In this chart, the purple line shows a diffusion index of households' bank rate expectations one year ahead. [13] The index correlates well with our forecast for the change in the key policy rate over the coming year, derived from each vintage of our interest rate forecast. The chart is consistent with households being well informed about the interest rate changes predicted by Norges Bank.

Concluding remarks

Let me summarise:

Norges Bank has provided forward guidance through publishing conditional forecasts for the key policy rate for almost a decade. Our overall experience is positive. We have indications that our reaction pattern is well understood, that agents understand the conditionality of our forecast and that they do pay attention to our predictions of future rates.

Over time, however, we should be measured on whether we meet our overriding objective, price stability. A credible interest rate forecast shedding light on the reaction pattern of the central bank provides a clear commitment to price stability and contributes to anchoring expectations.

How forward guidance is best provided will depend on economic and institutional factors. A decade of forward guidance in Norway indicates, however, that regularly publishing our own interest rate forecasts is a robust strategy.

However, there are unsolved issues. After the international financial crisis, robustness and the interaction between monetary policy and financial stability have become more pressing concerns for monetary policymakers.

This issue is on our research agenda. We have initiated a three-year research project, where we will seek to review different aspects of our inflation targeting framework, including the question of how to take financial stability into account. Moreover, for a small open economy, large terms of trade shocks may represent a particular challenge, also for monetary policy.

In our search for answers and our efforts to steadily improve our implementation of flexible inflation targeting, we look to academia. Therefore, let me again emphasise how much I appreciate the opportunity to be here today.

Thank you for your attention.

Footnotes

[1] Woodford, M. (2005): "Central Bank Communication and Policy Effectiveness," *NBER Working Paper* 11898.

[2] See Taylor, J. (1993): "Discretion versus policy rules in practice," *Carnegie Rochester Conference Series on Public Policy* 39, and Henderson, D. and W. McKibbin (1993):"A comparison of some basic monetary policy regimes for open economies: Implications of different degrees of instrument adjustment and wage persistence," *Carnegie-Rochester Conference Series on Public Policy*, 39.

[3] According to Geraats (2006): "Transparency of Monetary Policy: Theory and Practice," CESifo Economic Studies 52 (1), central banks seem to have embraced transparency for its perceived economic benefits, rather than accountability requirements.

[4] To illustrate, we may consider an inflation-targeting central bank facing inflation below the target. In order to reach the inflation target in this situation, promising to allow inflation to overshoot the target later might help increase inflation today. Commitment in this sense would in practice involve some form of price-level targeting, rather than inflation targeting.

[5] In addition to New Zealand and Norway, the central banks in Sweden, the Czech Republic and Israel currently publish interest rate forecasts. In addition, the Federal Reserve publishes the individual interest rate forecasts of the members of the Federal Open Market Committee (FOMC).

[6] Norway's sovereign wealth fund (the "Government Pension Fund Global") is managed by Norges Bank Investment Management (NBIM) and is invested in international capital markets.

[7] For details on our institutional framework, see Qvigstad, J. with I. Fridriksson and N. Langbraaten (2013): "Monetary policy committees and communication," *Norges Bank Staff Memo* 2/2013.

[8] For details, see Qvigstad, J. (2005): "When does an interest rate path "look good"? Criteria for an appropriate future interest rate path – A practician's approach," *Norges Bank Staff Memo* 6/2005.

[9] The key policy rate is the interest rate on banks' overnight deposits in Norges Bank.

[10] Norges Bank has developed a system, SAM (System for Averaging Models), for averaging short-term forecasts for inflation and mainland GDP provided by different models.

[11] This setup is from Norges Bank *Annual Report 2013*. In each monetary policy report, we present a decomposition of the contribution from different factors to the change in the interest rate path in relation to the previous report. The most recent report shows the change in the interest rate path through 2016.

[12] Norges Bank's forecasts of market rates are calculated as a forecast of the key policy rate plus an estimated 3-month interbank risk premium. Both are given as quarterly averages.

[13] When the index is above 50, the share of households that expect bank rates a year ahead to be *higher* than today is larger than the share that expect it to be *lower*.