

Karolina Ekholm: The role of forecasts in monetary policy

Speech by Ms Karolina Ekholm, Deputy Governor of the Sveriges Riksbank, held at Handelsbanken, Stockholm, 11 May 2010.

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The theme I have chosen for today's speech is the role of forecasts in the monetary policy decision-making process. Given the events in recent days, I realise that many people are probably more curious about how we at the Riksbank view the problems with public finances in southern Europe than about our methods for making and using forecasts. So I shall begin with a few words about this.

The EU countries have now decided to implement several measures aimed at preventing the public finance problems in Greece from creating new problems in the financial markets and possibly leading to a new economic downturn. The Riksbank considers it a very positive sign that a large rescue package with measures has now been presented to promote financial stability in Europe. We all gain from safeguarding stability. However, it is still too early to say exactly what effects the new package will have.

Here in Sweden the financial markets are functioning, but this does not rule out the possibility that they will suffer contagion effects from the international financial markets. Swedish banks have only small direct exposures towards the so-called PIIGS countries (Portugal, Italy, Ireland, Greece and Spain) and are well-capitalised in an international comparison. However, the Riksbank follows developments closely and has regular contacts with Swedish banks and with other central banks. We are as always prepared to take whatever measures are necessary to safeguard financial stability. If we need to take action we will, as usual, make it clear what we intend to do, how we will do it and when we will do it.

The recent developments illustrate something that has direct relevance to the theme of my speech today – namely the difficulty in capturing all of the relevant factors when making forecasts. Sweden has little trade with Greece and our banks have little exposure towards the country. Nevertheless, Greece's problems are important factors when we try to predict future developments in the Swedish economy. And this leads me back to what I had actually intended to talk about today – the role of forecasts in monetary policy.

Probably like many other economists outside the bank world, I was very sceptical of forecasts when I came to the Riksbank last year. To me, making forecasts appeared to be an activity that required very elaborate machinery, with complicated models and vast amounts of data, the results of which were nevertheless usually incorrect. Since then I have gained a new perspective, both with regard to the process of making forecasts and their role in monetary policy decision-making. Today I intend to share with you some of my new insights into this field.

One thing that I of course knew from the beginning is that forecasts – regardless of the uncertainty of their accuracy – must be made when one is making a decision and future developments affect which decision alternative appears most appropriate. This applies in particular to monetary policy decisions. As monetary policy affects inflation and resource utilisation with some time lag, we need to gain an idea of how inflation and resource utilisation will look in the future to be able to decide on what is the most appropriate repo rate now. But unlike when deciding on, for instance, investment in a particular share, it is not possible to disregard the fact that the interest rate decision itself affects future developments. We therefore also make a forecast of our own future decisions, which is affected by the current decision. This makes particular demands of our forecasting.

One question that one can pose is to what extent the Executive Board is involved in the forecasts of future repo rate decisions. This is a forecast of what stance we, this group of six individuals, will take at future monetary policy meetings. Today I shall therefore describe the

process leading up to the repo rate path, that is, the Riksbank's forecast of the future repo rate.

Forecasts are of course always uncertain to a greater or lesser degree. The most recent financial crisis is a very good example of this. Few forecasters predicted the developments in the world economy that have affected the Swedish economy over the last year or so. In this speech I shall begin by explaining why the Riksbank makes forecasts and then go on to describe the forecasting process and how it is connected to the monetary policy decisions. One important question in this context is what stance decision-makers should take with regard to risks that are not captured by quantified forecasts. The best thing is to try to develop tools that can quantify the probability of a particular scenario, and to improve the analysis of what impact this scenario would have on the economy. But this is not always possible and I shall discuss my views on this problem.

Forecasts are a central part of inflation-targeting monetary policy

The primary argument for a central bank to make forecasts is that monetary policy has an impact with a time lag. The Riksbank conducts a policy of flexible inflation targeting. This means that, in addition to stabilising inflation around the target of 2 per cent, the Riksbank also aims to stabilise resource utilisation around a normal level. The Riksbank varies its steering interest rate, the repo rate, to attain the inflation target. However, the effects of monetary policy on the economy come with a fairly long time lag. This means that prior to each monetary policy decision it is necessary to analyse how different repo rate decisions can be expected to affect inflation and resource utilisation over the coming years. Choosing the alternative connected to the forecast that provides the best target fulfilment is sometimes called forecast targeting.¹

A further argument for making forecasts is that the efficiency of monetary policy can be improved through transparency and credibility. By publishing our forecasts and explaining how our monetary policy decisions relate to them we make it easier for the outside world to have correct expectations of how the Riksbank will react to new information. It is important that we are clear about how the Riksbank views developments and what effects the monetary policy decisions are expected to have.

Forecasts and uncertainty

As I said, forecasts are always uncertain. Neither the Riksbank nor other forecasters have access to all of the information that has significance for the development of the economy during the forecast period. Shocks to the economy can occur suddenly and surprise the forecasters. It is thus impossible to avoid forecasting errors.

One example of a time of great uncertainty over future economic developments is the recent financial crisis. One indicator of this uncertainty is reflected in the broad spread between the different analysts' forecasts. According to the compilation of around 30 different forecasters' assessments in "Consensus Forecasts" (CF), which has, for instance, compiled forecasts for GDP growth each month since 1989, the uncertainty over developments in the US economy was the largest it has been in at least 20 years.² It was on the whole greater than during the recessions at the beginning of the 1990s and 2000s and, above all, it lasted longer this time. Statistics regarding this are only available from 1995 for Sweden, but they nevertheless show

¹ See the article "Policy expectations and policy evaluations: the role of transparency and communication" by Lars E.O. Svensson in Sveriges Riksbank Economic Review no.1 2010 (p. 62).

² This applies regardless of whether one calculates the uncertainty in terms of standard deviations in the forecasts, or the difference between the highest and lowest assessment.

that the uncertainty rose rapidly and was high in Sweden during the most recent financial crisis. In recent months the uncertainty that can be measured in the CF has declined somewhat with regard to the United States and even more with regard to Sweden, where it has returned to the historical average level.

If one does not have anything else to go on, a forecast can be based on what is known as an autoregressive model. What this means is a model where the forecasts for a variable are solely dependent on its earlier outcomes and a random error term and where one assumes that the variable tends to return to a normal level according to historical patterns. However, forecast evaluations carried out by the Riksbank show that on average there is an added value in making active and more sophisticated forecasts for at least up to 1–1 ½ years ahead. The accuracy of the forecasts depends on what variable one looks at, but for inflation, for instance, the more sophisticated forecasts show a better forecasting performance up to two years ahead.

The Riksbank makes forecasts for GDP, inflation and the repo rate among other things, but sometimes there are also other aspects that need to be weighed into the balance in one way or another when monetary policy decisions are made. A current example is developments in the Swedish housing market, which have been discussed in connection with monetary policy recently. House prices have continued to rise during the economic downturn and growth in household credits has remained at a high level. Some say that this creates risks for the real economy further ahead, with households burdened by high interest costs and possible downward adjustments in house prices when mortgage rates return to more normal levels. Should the risk of such a development further ahead affect the monetary policy decision made now? If so, how and to what extent? It is important to try to quantify those risks – both upside and downside risks – in one way or another, and as far as possible, that are considered important with regard to future developments.³ It will then be easier during the actual decision to take a systematic stance to the uncertainty that always prevails regarding future developments. I shall return later to how this uncertainty can be dealt with in the forecasting and decision-making processes.

How are forecasts made at the Riksbank?

Models and assessments complement one another

Let me briefly describe the forecasting process at the Riksbank.⁴ The Riksbank uses both models and expert assessments in its forecasting work. The picture of the forecasting process that I had before I came to the Riksbank was one where data are fed into complex models which then spit out forecasts. This is of course incorrect. The Riksbank works hard to spread the impressions we gain at the many international meetings we regularly attend. We also carry out our own company interviews to try to capture development tendencies before they become visible in the statistics. Models are necessary to put together the whole picture of the analysis and are often used to simulate what various risk scenarios might entail for inflation and monetary policy. But they do have their limitations and the analysis must also take into account information beyond what the models can handle.

One model that is known outside of the Riksbank is Ramses, which is a variant of the dynamic stochastic general equilibrium models that have become popular in the central bank world.⁵ Ramses is an internally consistent model of how the economy as a whole fits

³ By risk I mean here the weighing together of the probability that something will occur and the consequences of its occurrence.

⁴ For a more detailed description of the forecasting process, see the speech entitled “The monetary policy decision-making process” by Irma Rosenberg, June 2008.

⁵ RAMSES stands for the Riksbank’s Aggregated Macro model for Studies of the Economy in Sweden.

together. It is a very useful tool in analysing different scenarios and different action alternatives, and it thus functions as a basis for the discussions on which monetary policy would be best.

But the results from model estimates in Ramses and other models are always complemented with, for instance, assessments by sector experts. In the shortest possible perspective – particularly the current quarter, but also to some extent the following quarter – the sector expert often has an information advantage compared with the information contained in Ramses and other models. The sector expert may also have information on different economic policy measures, in addition to monetary policy measures, which could affect the economy throughout the forecast period. One example could be different types of fiscal policy measures that are decided on. It may be difficult to directly include the effects of such measures in the models, due to insufficient resources. The forecasting work at the Riksbank can therefore be described as an interplay between model use and assessments, where the latter can be fairly important, particularly in extreme conditions such as during the financial crisis.

A topical example of how the published forecast can differ from the results in Ramses is the GDP forecast for Sweden in the most recent Monetary Policy Update. The published forecast for the coming years is a much higher GDP growth than the Ramses results would indicate. The final assessment in the Update was that the labour market would develop more strongly than was predicted in Ramses. The most recent labour market indicators pointed in this direction. Moreover, the assessment was that the krona would be weaker than in the Ramses forecast, which contributes to higher export growth.

The forecasting process

The forecasting work begins in the Monetary Policy Department, normally around six weeks prior to the monetary policy meeting. At least this is the case when a Monetary Policy Report is going to be published, otherwise the process is slightly shorter.⁶ The process begins with the forecasting work on international developments. A preliminary draft for this forecast is presented at a meeting to which we members of the Executive Board are invited. Assessments and analyses of developments in the Swedish and international financial markets are often presented at this meeting, too. This information is used in the work on making forecasts for the real economy in Sweden. First an assessment is made of the current situation, then there is a review of the results of the forecasting models. After this there are new meetings, at which draft forecasts and analyses of the labour market, wages, inflation and public finances are discussed. These meetings aim to bring together different views and to reach a joint picture of developments and of the conditions for the Swedish economy, including the labour market and inflation.

Using these analyses as a base, a forecast for the Swedish and international economies is made. Moreover, proposals are presented both for the repo rate decision at the next monetary policy meeting and for the forecasted repo rate path. These proposals normally reflect the stance the Executive Board usually takes with regard to inflation and resource utilisation. They are thus based on historical relationships between the Executive Board's decisions and the development of the economy.⁷

⁶ However, one should bear in mind that forecasting work is actually a continuous process. Even between the forecasting rounds, we often analyse the international economy and the Swedish economy for reasons other than to make forecasts. For instance, background reports are written prior to Executive Board members taking part in international meetings, in which both economic activity and economic policy are discussed.

⁷ The reason for the proposal being based on the Executive Board's historical behaviour rather than on the staff's perception of what constitutes a well-balanced monetary policy is discussed by Hallsten and Tägtström in the article "The decision-making process – how the Executive Board of the Riksbank decides on the repo rate" in Sveriges Riksbank Economic Review no. 1 2009 (p. 78).

If we members of the Executive Board consider that there are any special risks that should be examined, then simulations and sensitivity calculations are made for alternative scenarios. Simulations are also regularly made with regard to illustrating the effects of conducting an alternative monetary policy. This part of the monetary policy decision-making process is important, as it provides a base for the Executive Board to be able to choose the decision alternative that appears to provide the best target fulfilment.

The staff's proposal for monetary policy is the most important base for the discussion at a longer meeting that includes a large number of analysts from the Monetary Policy Department and the Executive Board, and which is normally held around two weeks prior to the monetary policy meeting. The Financial Stability Department of the Riksbank also plays an important role in the analysis work and therefore takes part in this meeting. The Riksbank has always considered it important to monitor developments in the financial markets and in the Swedish banks, and this has been particularly important in the forecasting work during the financial crisis. The Executive Board members' input is important at this meeting and may in particular affect the forecast for the repo rate. However, this has repercussions for the forecasting work as a whole, as the future repo rate affects most of the other variables in the forecasts. The Executive Board may also have views on other parts of the forecasts than the repo rate path, but the discussion usually mainly centres on what is a well-balanced monetary policy.

At a shorter meeting that usually takes place the day after the large meeting, the members of the Executive Board have the opportunity to discuss the main scenario and give their views on it in a more limited circle. The Executive Board's perceptions regarding the economy and thus monetary policy are then woven in with the other information in the Monetary Policy Reports, including alternative scenarios and updates that provide background material for the monetary policy meetings.

The forecasts and the monetary policy decisions

The Executive Board's priorities and perceptions

The members of the Executive Board may have different perceptions regarding many different factors, which affect the monetary policy they consider to be the most well-balanced. We can have different opinions regarding the economic situation, about the impact of our interest rate policy on the economy, and about how much importance should be attached to stabilising the real economy if this involves a greater deviation from the inflation target. We may also have differing opinions on how risks not directly captured in the forecasts should be included in our deliberations.

However, there is no scope for presenting six different repo rate decisions and six different repo rate paths which exactly represent the six Executive Board members' opinions. In this case the decision-making situation would be very difficult. It would probably also entail the chairman's repo rate path most often being the one voted through. The chairman decides on how the different proposals should be set against one another in turn and thus has the opportunity to eliminate the alternatives in an order that increases the likelihood of his own repo rate path being in the final battle. Moreover, he has the casting vote. This means that the different opinions must instead be brought together into a compromise as far as this is possible.

The Monetary Policy Reports and Updates that we publish can thus be said to reflect the average stance of the members of the Executive Board. If one or more of us considers that the opinions expressed in the Report or Update differ too much from our own opinion to be able to express support from them, we must enter a reservation at the monetary policy meeting. We have, of course, also had the opportunity to put forward any dissenting opinions during a number of earlier meetings. When a member of the Executive Board enters a reservation at a meeting, it therefore rarely comes as a surprise to those initiated in the

forecasting process or to the rest of the Executive Board. Most of the Executive Board members believe that they know roughly how their colleagues on the Executive Board will vote at the actual meeting. This is usually true, according to the conclusions of a study made by the Monetary Policy Department, and which is based on a questionnaire sent to all current and previous members of the Executive Board.⁸ The reservation and motivation are published after the monetary policy meeting, in the press release and in the minutes of the meeting.

Important to quantify the risks

Normally, all risks that may have significance for the monetary policy decisions have been gone through by the Monetary Policy Department or the Financial Stability Department. But events may of course occur that are impossible to predict, or risks may arise at a later stage in the process that are very difficult to evaluate, such as the effects of the Lehman Brothers bankruptcy in autumn 2008. One central issue with regard to how the monetary policy decision-making process is set up is what stance the decision-makers, that is, the Executive Board, should take with regard to risks that for various reasons are not directly incorporated in the forecasts. If individual Executive Board members consider that there are observable risks and suspect that these may have significant consequences, the Riksbank will of course try to analyse these in depth. But it is not always easy to quantify such risks, and thus it may be difficult to include them in the actual forecast. The question then is how these risks should be taken into account in the monetary policy decisions.

I consider it important to try to quantify as far as possible the risks deemed relevant to the monetary policy decisions. This is particularly so when it comes to risks with a low probability, but which would have substantial consequences for the way the economy develops, such as a burst housing bubble, so it is important to try to quantify how the risks are affected by the various alternative actions. There have recently been a number of discussions regarding whether the low policy rate we have had since last summer increases the risk of a Swedish housing market crash further ahead. My personal assessment is that extremely low interest rates lead to some increase in the risk that housing prices will be pushed up to unsustainable levels. But this increased risk must be weighed against the risk of higher interest rates hampering the recovery in the economy.

However, without properly quantifying these risks the decision-makers have to rely on their gut feeling in their deliberations. There are many reasons why gut feeling may be a poor guide with regard to making this type of decision. In the field of cognitive research, for instance, one speaks of the neglect of probability bias, that is, a tendency to entirely disregard the probability of various scenarios actually occurring when people make decisions under conditions of uncertainty. It is common to entirely disregard the fact that the scenario may never occur or that one is completely over-estimating the probability of the scenario. This is far from the only cognitive bias that decision-makers might be affected by. But it is one that can be reduced by systematically trying to evaluate the probability of various scenarios occurring. It is also important to try to illustrate how the decision that is to be taken will increase or decrease the probability of these scenarios.

There is thus a need for decision-makers to put their uncertainty in a concrete form and the uncertainty should decline if the risks are identifiable and quantified. It is really only possible to quantify them with the aid of models. A decline in demand on the housing market and a fall in housing prices could – through negative effects on household wealth – have clearly negative effects on consumption. This subdues growth and employment and pushes down inflation. If one believes that the risk of such a scenario is affected by the level of the repo

⁸ See “Picking the Brains of MPC Members”, Mikael Apel, Carl Andreas Claussen and Petra Lennartsdotter, Sveriges Riksbank Working Paper Series No. 237, January 2010.

rate, one must take this into account in the monetary policy decision. But the risk of a low repo rate increasing the probability of such a scenario must thus be weighed against the positive effects on employment it will lead to during the forecast period. The clearer we can be about how we assess these different risks – and take them into account in a systematic manner – the easier it will be for those outside the Riksbank to understand how the repo rate decision is affected by various factors.

I cannot say exactly how probable it is that house prices will fall in Sweden. The only thing I can say today is that the rapid increase in lending to households creates certain risks. This can lead to some households borrowing so much that they will experience difficulty in meeting interest and amortisation payments in the future. To avoid this, which would make it more difficult to attain price stability and stable resource utilisation, the interest rate needs to be raised relatively soon.

Conclusions

Forecasts are always uncertain and both the Riksbank and other analysts make forecasting errors. However, forecasts are a necessary part of the monetary policy conducted in Sweden. This is because monetary policy's effects on the economy come with a time lag and it is therefore necessary to look ahead to attain the inflation target. Moreover, the forecasts show how the Executive Board was thinking when the monetary policy decision was made, which is an important part of our communication with the general public. One can also note that the forecast evaluations show that thorough forecasts are better than just assuming that developments follow the indications given by an auto-regressive model.

The Riksbank uses both models and expert assessments in its forecasting work. The models are necessary if one wants to analyse the effects of different policy alternatives. They also help us to quantify different types of risk scenario. It is sometimes very difficult to formulate a risk scenario so that it can be fed into a model. An example of this is the risk of a financial crisis. Nevertheless, we should have the ambition to quantify the risks that are considered relevant to our monetary policy decisions. The more information we receive on the effects that different risk scenarios have on the economy, the clearer the base for the monetary policy decisions will be. Then it is necessary for decision-makers to realise that it is not always possible to explicitly include all possible scenarios in the forecast. Sometimes this is impossible due to lack of resources.

In principle, we Executive Board members have insight and the possibility to discuss the forecasts with the Monetary Policy and Financial Stability Department throughout the whole of the forecasting process. We can then question the assessments made. The Board members' assessments of which risks are most relevant for the decision naturally also affect which analyses are made by the Monetary Policy Department. The analyses published in Monetary Policy Reports and Updates are normally just one part of those made during a forecasting round. Of course, the entire Executive Board does not always agree with the analyses presented as these are the results of a compromise where the different opinions are weighed together. But in this case it is clear, either from the Board member's contribution to the debate as published in the minutes, or in the form of a reservation entered. In this way the general public has very good insight into how we Executive Board members have thought when making our decision.