

## **Irma Rosenberg: The monetary policy decision-making process**

Speech by Ms Irma Rosenberg, First Deputy Governor of the Sveriges Riksbank, at Riksbanken, Stockholm, 13 June 2008.

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The Riksbank is considered to be one of the most open central banks in the world.<sup>1</sup> Openness has also been one of the basic principles in shaping our activities. If an independent central bank is to be perceived as credible it must be possible for outsiders to understand its decisions and to assess its activities. We have therefore tried to be as open and clear as possible about what we do and why we do it. This increases the credibility of our monetary policy and makes it easier to anchor inflation expectations around the target. Part of this openness entails clearly describing how our analyses are achieved and the processes for making interest rate decisions.

I believe that most people are familiar with the way we conduct monetary policy in general. We look ahead and base our monetary policy on forecasts. We have held many speeches on this subject. But how do we go about producing a forecast that leads to a decision on the interest rate? This is probably not as well-known and I intend to talk about it today. In recent years we have changed our methods of working in a number of fields. For example, since the beginning of 2007 we report very clearly the future interest rate path we expect to see. Our forecasts of inflation and other components, like the interest rate decisions, are based on a forecast of the future repo rate path. These forecasts change as new information is received, but we report our current views of the future every time we publish a monetary policy decision.

### **The Riksbank is governed by an Executive Board**

The year 1999 is a natural starting point when describing the process for monetary policy decision-making. This was when the price stability target was prescribed by law and the Riksbank was given a more independent position with regard to our principal, Sveriges Riksdag (the Swedish parliament). This entailed a major change with regard to our decision-making and the way we work in relation to the General Council of the Riksbank.

As you already know, the work at the Riksbank has been headed since 1999 by an Executive Board consisting of six members, one of whom is Governor of the Riksbank and Chairman of the Executive Board. The members are appointed for a period of six years at a time. Normally the periods of office for the different members overlap to create continuity in the work of the Bank. Previously it was the Governing Council of the Riksbank, whose members are appointed by the Riksdag, who governed the Bank together with the Governor. Today the General Council has more of a controller function. They appoint the members of the Executive Board, but do not have any influence over, for instance, the decisions on the repo rate. It is the Executive Board which independently makes the decisions.

The Executive Board is what is usually known as an individualistic committee.<sup>2</sup> This means that each member has an individual responsibility. Interest rate decisions are made by voting and the members can then publicly express their views. The Bank of England also has this type of committee. In this, we differ from a number of other central banks, although most

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<sup>1</sup> See, for instance, Dincer and Eichengreen (2007).

<sup>2</sup> For a review of different monetary policy decision-making models, see Blinder and Wyplosz (2004).

have a committee that makes decisions on the interest rate.<sup>3</sup> One exception is, for instance, New Zealand, where the central bank governor is alone in making the decisions.

Many other central banks instead have a collegial committee. In this case the members reach a decision which they then all publicly support. Any differences of opinion are kept within the group; outwardly they speak with one voice. The way they reach a decision varies. In what is known as a genuinely collegial committee the decision is preceded by an internal discussion where each member puts forward his or her views. The ECB is an example of this type of committee. In an autocratically collegial committee, on the other hand, it is the chairman who more or less dictates the group's "consensus". Some researchers have considered the Federal Reserve's FOMC committee under the leadership of Alan Greenspan to be an example of such a committee.<sup>4</sup> The changes made recently indicate that the FOMC is more of an individualistic committee. The Riksbank is one of the central banks with the most pronounced individual responsibility.

### **Major changes in the way the material for the decision is produced**

During the years I have worked at the Riksbank there have been major changes in the work on producing the material for monetary policy decision-making.

Six years ago our forecasts were based on the assumption that the repo rate would be held unchanged, regardless of whether or not this was a realistic assumption. The forecasts extended two years ahead, compared with the current three years. The analysis was to a great extent based on assessments and discussions. Formal models were used but did not play the same central role as they do today. Although this functioned fairly well, it also involved limitations. For example, it is difficult to see how alternative scenarios – something that is being given greater scope in our analysis – could be used without a more coherent model. The fact that we are now using models more also makes it easier to explain how a forecast is made and to assess the forecasts.

In recent years we have made some major changes that have had significance for the way we organise our internal forecasting work. The main change being that we now base our forecasts on our own view of the future repo rate path and we give this forecast relatively large significance when communicating our monetary policy. We have also worked extensively on bringing in new, larger models, such as general equilibrium models, into the forecasting work.

### **The forecasts are the result of an interplay between models and assessments**

Our toolbox for making forecasts consists of assessments, theories, empirical studies and models. These tools complement one another and have different roles in the work. They are all important and necessary to make as good forecasts as possible.

As the economy is so extremely complex, we use various macroeconomic models to help us piece together a coherent picture of the economy. These models are based on modern economic theory, empirical studies and practical experience of different correlations in the economy. This makes it easier for us to make a consistent assessment of how the different parts of the economy will develop. If one merely studies individual correlations one misses the interdependence existing between the different parts and sectors of the economy. There is a considerable risk that the different parts of the analysis will not hold together.

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<sup>3</sup> Pollard (2004) shows that 79 out of 88 central banks have committees which make interest rate decisions.

<sup>4</sup> See Blinder and Wyplosz (2004). FOMC stands for Federal Open Market Committee.

But models are merely simplifications of the reality. They must be supplemented with analyses and assessments by experts in different fields. The experts have important insights into the real situation that the models are unable to capture. Forecasts based on models provide a good starting point and help to structure the discussions. The experts then adjust the models' forecasts on the basis of their specific knowledge and assessments. The assessments become particularly important when unusual events and structural changes occur in the economy. Such models, which are merely based on historical correlations, may have difficulty dealing with these.

### **Major advances in academic research regarding macro models**

In recent years models have come to play an increasingly important role in the forecasting work. This is also the case for many other central banks. The background is that methods have developed very quickly with regard to the empirical properties and forecasting performance of large structural macro models. There have also been major advances with regard to time series models, that is, models focusing on regularities in data and based to a lesser extent on economic theory.<sup>5</sup> Increasingly powerful computers have played an important role in this context. They enable us to make advanced and time-consuming calculations.<sup>6</sup>

Structural macro models have been based to a greater extent than before on micro based theory of household and corporate behaviour. For example it is assumed in the models that there are various market imperfections combined with nominal and real rigidities. The agents in the model also have rational expectations, that is, they use the information available in the best possible way when they make their decisions. This type of model is usually referred to in the research literature under the generic term of New Keynesian DSGE models.<sup>7</sup> The methods have been developed in close cooperation between academic researchers and economists at central banks who have exchanged ideas and experiences.

### **The Riksbank has developed its own macro model for the Swedish economy**

At the Riksbank we have developed a dynamic macro model for the Swedish economy which is known as Ramses.<sup>8</sup> This is a so-called general equilibrium model and belongs to the group of New Keynesian DSGE models. General here means that it tries to explain the whole economy and not merely a particular section of it, such as private consumption or the labour market. The fact that it is an equilibrium model means that it assumes that market mechanisms create a balance between supply and demand in the different markets of the economy.

Ramses is currently used to make forecasts, to interpret economic developments and to calculate the effects of monetary policy, for example. Some areas are not yet very well developed in Ramses. This includes, for example, fiscal policy and the credit market. We therefore use partial models that focus on certain individual variables as a complement to Ramses. We also use so-called Bayesian VAR models. A VAR model is a system of equations, which can be used for instance to capture the average variation in macro data.<sup>9</sup> In

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<sup>5</sup> In academic research these models are usually called models of reduced form.

<sup>6</sup> For a review of the results from the models and their forecasting performance see Adolfson et al (2007a).

<sup>7</sup> DSGE stands for Dynamic Stochastic General Equilibrium Models.

<sup>8</sup> RAMSES stands for the Riksbank's Aggregated Macro model for Studies of the Economy in Sweden. For a more detailed description see Adolfson et al (2007b).

<sup>9</sup> VAR stands for vector autoregressive model.

a Bayesian VAR model some form of subjective information prior to estimation is used, for instance how high the long-term sustainable growth rate is.

In general, the further ahead we look, the more importance we give to economic theory and the assumptions of long-term equilibrium in Ramses and the Bayesian VAR models. To gain an impression of the current situation in the Swedish economy we instead use different time series models and indicator models. These are used to make forecasts 1-2 quarters ahead. The forecasts are then used as starting values in the large macro models. Of course there are also substantial elements of assessments of what comprises a probable development for the economy throughout the entire process.

### **Material for our assessments and forecasts comes from many sources**

On the whole, we use official statistics and the results of surveys from authorities such as Statistics Sweden and the National Institute of Economic Research and their counterparts in other countries. We also closely follow the assessments made by other forecasters in Sweden and abroad and regularly evaluate our own forecasting performance. We also bring back new impressions from the many international meetings we regularly attend. In addition, the Riksbank has begun to carry out its own company surveys. This involves our employees visiting companies around the country and hearing their views on the economic situation. This is a means of obtaining explanations of what we can see in the official statistics and of capturing tendencies before they appear in the statistics.

### **The process begins with a discussion of the risks**

Before I go in greater detail into how we make forecasts, I would like to make some general observations. Firstly, making forecasts is a continuous process. Many of us at the Riksbank, both Executive Board members and employees in the different departments, closely monitor economic activity. The increased use of models makes it easier to some extent to update the forecasts when new information is received. But we only make a new, thorough and coherent assessment of what all the new information means for future monetary policy in connection with our monetary policy meetings, which are held six times a year.

Another observation is that the Executive Board as a collective is now more involved in the forecasting process than it was a few years ago. This is largely because we have chosen to publish our forecast for the repo rate. I shall return to this shortly.

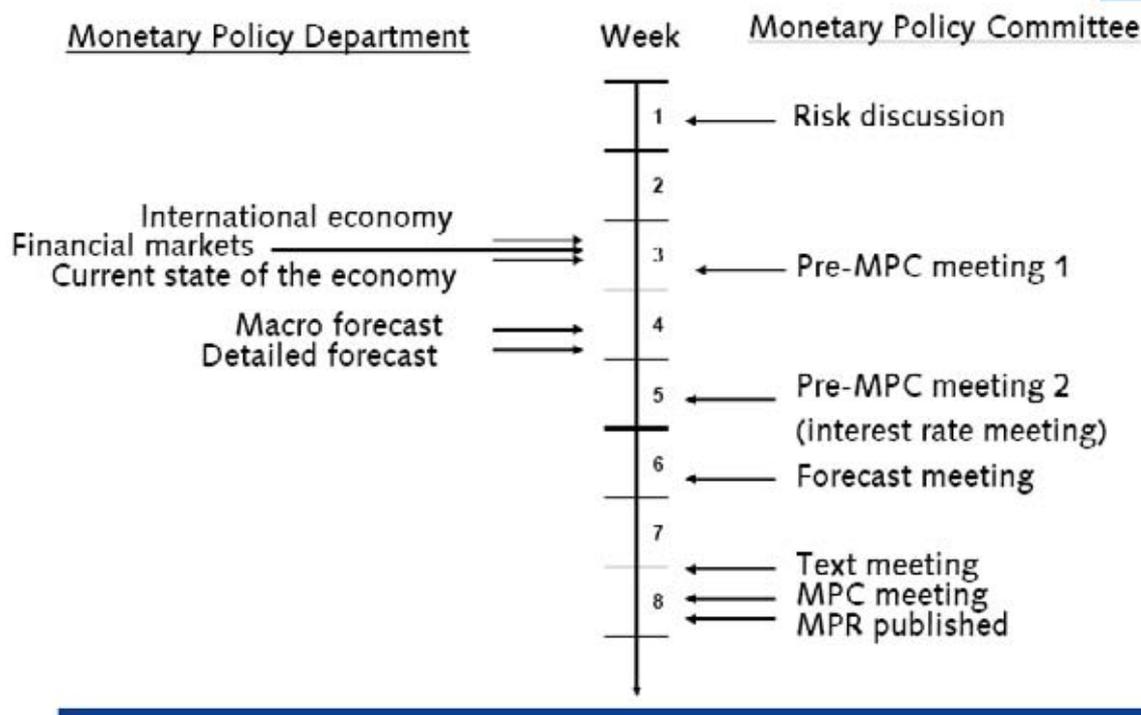
A third observation concerns the logic of the process. We try to deal with that which is independent of our own monetary policy at an early stage. Sweden is a small, open economy, so the international forecasts can be settled without taking into account what may later crystallise into a well-balanced Swedish monetary policy. The current situation in the Swedish economy is also largely independent of what the Executive Board determines at the next meeting, in that it takes time before monetary policy has an effect on the economy and inflation.

But please note that we have a relatively broad definition of the "current situation". The National Accounts are published with a lag of almost one quarter. They are our most important source of statistics regarding the real economy. This means that we often do not know at the start what the outcome was for the economy during the previous quarter. This means that an assessment must be made for both the previous quarter and the current quarter. We use various indicators that are published on a monthly basis to make this assessment.

So what is the actual process for making the forecasts? It usually starts around eight weeks before the monetary policy meeting (see Figure 1). This is the case when a Monetary Policy Report is going to be published; otherwise the process is slightly shorter. In total, around 30

economists are involved in some phase of the forecasting work, together with the Executive Board members.

## The monetary policy decision-making process



The material for the monetary policy meetings is mainly produced in the Monetary Policy Department in close cooperation with the Executive Board. The process begins with a *risk meeting*. The participants at this meeting are the Executive Board, employees of the Monetary Policy Department, some employees from other departments and some advisers to the Executive Board. The purpose of the meeting is to capture at an early stage various types of risk and alternative sequences of events for the economy that we envisage in the future. The discussions at this meeting are relatively unbiased and take a broad perspective.

It is at this meeting that the alternative scenarios begin to take shape, those that are later described in Chapter 2 of the Monetary Policy Report and that show how the economy might develop if particular events occur. The scenarios can be used as a kind of counter-example to explain why the Executive Board considers that the main scenario is the one that at present gives the most well-balanced monetary policy. It can also illustrate different risks that an individual member wishes to illustrate or perhaps even a scenario that one person prefers instead of the main scenario.

Our experience is that the work on the different scenarios makes it easier for us Executive Board members to agree on a main scenario that the majority of us can support. The results are then presented at something called the *first large monetary policy group meeting*. This meeting is held in roughly the third week of the eight-week long forecasting process. Of course, we also have the capacity to produce new alternative scenarios later on in the process if this is necessary.

## **Several different meetings lead up to the main scenario**

Prior to the first large monetary policy group meeting a number of meetings are held within the Monetary Policy Department. The Executive Board members are invited to attend these meetings, but they are mainly intended to be working meetings for the economists. The discussions are often at a relatively detailed and technical level. It is at these meetings that the forecasts in the main scenario begin to take shape. The main scenario is the development we consider to be the most probable and which is described in Chapter 1 of the Monetary Policy Report.

Important new statistics and new events in Sweden and abroad are presented and analysed at these meetings. There are also comparisons with how developments relate to the earlier assessments. The purpose is to gain an impression of the current status of the economy.

For a small, open economy like Sweden the natural starting-point for the forecasting work is how economic activity and inflation develop in the world around us. The forecasting work therefore begins with an *international outlook meeting*, which has the purpose of reaching a preliminary forecast for international events.

Soon after this a *financial market meeting* is held. At this meeting there is a discussion of market participants' expectations of the repo rate and how these have changed since the previous monetary policy meeting. These are then compared with the model forecasts for the repo rate and how these have changed. In addition, there are analyses and discussions of what has happened in the financial markets since the previous assessment. House prices, credits, stock market rates, exchange rates, money supply, international rates and so on are also discussed at this meeting.

After this a *current status meeting* is held, where the focus is on the current situation in the Swedish economy. One particularly important aspect is to assess how much of the Swedish economy's total resources in the form of labour and machinery are currently being used to a normal extent. Apart from new information on the current economic situation, there are also discussions of other new information that may be important for the forecasts in the slightly longer term.

## **The first monetary policy group meeting with the Executive Board summarises new information**

After this it is time for the *first large monetary policy group meeting*. The entire Executive Board and most of the members of the Monetary Policy Department take part in this meeting. In addition, a number of advisers to the Executive Board and employees of the Financial Stability Department usually take part. A summary of the new information and the current status of the economy in Sweden and abroad is presented at the meeting. We also run through the alternative scenarios ordered at the risk meeting a few weeks earlier and discuss whether they really capture the risks that we Executive Board members envisage. We also have the opportunity at this meeting to request more information on various issues considered important to the coming decision. The meeting usually takes around three hours.

## **Monetary Policy Department establishes its forecasts**

At approximately the same time as the meeting with the Executive Board, the Monetary Policy Department establishes its view of macroeconomic developments over the coming three years. In a preliminary stage it focuses on around ten key variables such as inflation, interest rates, GDP, number of hours worked, exchange rates and resource utilisation. The forecasts are produced on the basis of the exogenous conditions, the international forecasts, the model forecasts for the Swedish economy conditional on the current situation and assessments. The forecast for the interest rate path produced by the Monetary Policy Department is meant to reflect the Executive Board's normal, historical behaviour. It is not

any form of recommendation from the Department. All of this is discussed at a *macro forecasting meeting* in the Monetary Policy Department.

When the overall macroeconomic picture has been established, the economists chisel out the different points of the forecast in more detail. For instance, they make a complete forecast of the components in the balance of resources and in the labour market. Finally they check the overall picture to ensure that the different parts of the forecast hold together and have been added up correctly. In total, the economists forecast around fifty variables. All of these are then compiled into an internal document that summarises the Department's view of how inflation and economic activity will develop in the future. Another document is also created, explaining how the forecasts are affected by model results and assessments.

None of the Executive Board members takes part in this stage. The idea is that the product then reported to us will as far as possible be a civil servants' product. It should not be influenced by the ideas of the different Executive Board members. The civil servants thus hold a relatively strong position in the process. The Executive Board's main contribution is not to get involved in all of the details of the forecasts – instead we shall highlight different perspectives and broaden the analysis. The fact that the civil servants produce their own draft forecasts also contributes to strengthening and maintaining the internal competence.

### **The Executive Board discusses the forecast at the second large meeting**

The Monetary Policy Department then presents its forecast for the main scenario to the Executive Board at the *second large monetary policy group meeting*. This takes place in week five, that is, approximately three weeks prior to the monetary policy meeting. The organisation of this meeting differs from the first one. The meeting is divided into two parts. The first part of the meeting is open to the majority of the employees of the Monetary Policy Department. The civil servants then report their outlook on the economy over the coming years. They present the results from any in-depth reports ordered by the Executive Board. There is now an opportunity for us Executive Board members to ask questions about and express opinions on the forecasts to the different sector experts.

The second part of the meeting is held in a smaller circle consisting of the Executive Board, senior staff at the Monetary Policy Department, a couple of advisers and representatives of the Communications Secretariat. It is now that the Executive Board discusses and expresses opinions on the main scenario on the basis of its assessments. This may sometimes mean giving different weight to alternative macroeconomic scenarios, that is, the risks. The main scenario is then adjusted in accordance with the views of the Executive Board. In this situation the forecasts, including the interest rate forecasts, may be regarded as a well-founded guess as to which main scenario will receive the support of a majority of the Executive Board members a few weeks later. But there is still a possibility for the Executive Board to make changes to the forecasts. The Executive Board can also ask the civil servants to provide further in-depth reports or follow up certain issues. These are then presented 1-2 days later at a follow-up meeting with the Executive Board.

Here I would like to take the opportunity to refer to the current round of forecasts. On Monday we will be discussing the Swedish macroeconomic outlook at the second large monetary policy group meeting. This means that we Executive Board members are entering an intense phase of the monetary policy process. The decision-making situation we have had during the spring has on the one hand concerned rising inflation and on the other hand signs of a slowdown in economic activity. In both respects the outcome for Sweden has been slightly worse than we had anticipated in the April Monetary Policy Update. The inflation figure for May was 0.4 percentage points higher than we had forecast in April. A large part of this deviation is due to energy prices having increased more than we had expected. At the same time, growth was lower. The National Accounts for the first quarter of this year show that GDP growth was 2.2 per cent, which was 0.6 percentage points less than we had forecast in April. In principle, we are now facing the same type of problems in our deliberations, that is,

rising inflationary pressure and weaker economic activity. The way we Executive Board members finally decide to balance these factors and all of the other new information we will receive is something we will return to at our monetary policy meeting on 2 July. We are six Board members and it is during the coming weeks that each person will finally form his or her opinion of how the economy will develop in the future and what monetary policy is required to attain the inflation target at the same time as avoiding excessive fluctuations in the real economy.

### **Material reworked into a Monetary Policy Report**

After the second large monetary policy group meeting the Monetary Policy Department continues its work and compiles the first draft of the Monetary Policy Report. The Department now has close contacts with the Executive Board. A formal Executive Board meeting is held the week after the second meeting with the focus being on the forecasts. The editorial work on the Monetary Policy Report continues and is regularly checked with the members of the Executive Board. A few days prior to the monetary policy meeting we have another formal Executive Board meeting where we go through the text of the report in detail and where the report is tabled. However, the forecast can be changed as late as during the monetary policy meeting. It is not until the monetary policy meeting that the text and forecasts of the Monetary Policy Report are finally determined.

### **The Executive Board makes interest rate decisions through a majority vote**

The Executive Board holds six monetary policy meetings a year. If necessary we can meet more often. The number of meetings is not stipulated by law, but is determined by us Executive Board members.

We make decisions on the current level of the repo rate at the monetary policy meetings. We also agree on which interest rate path is most appropriate at the present time. The decisions are made through a majority vote, where the Chairman of the Executive board has a casting vote, and they are announced in a press release.

In addition to the Executive Board members, a number of employees from the Monetary Policy Department and the Communications Secretariat take part in the meeting, as well as some advisers and legal advisers. In addition, the Chairman and Vice Chairman of the General Council regularly take part in the meetings and thus obtain a good insight into the work of the Executive Board. They both have the right to express opinions, but not to put forward proposals or take part in any decisions. In total, around 20 persons are usually present at the meeting.

What happens at a monetary policy meeting? There is an agenda which states the order in which we will discuss the different items. The meeting usually begins with a brief update on how the financial markets have developed, including market expectations of the repo rate with regard to our meeting, and other new, important information that has been received in the last few days. This is followed by a summary of the main elements in the Monetary Policy Report or the Monetary Policy Update.

After these introductory words from the civil servants, I and my colleagues go on to discuss economic developments over the coming three years. First we deal with economic activity and inflation abroad and in Sweden. Each person puts forward his or her view of the current economic situation and how the interest rate needs to be adjusted to attain the inflation target. There is no predetermined order as to who will begin the discussion. The discussion is fairly free at this stage. During the course of the process each one of us has formed his or her own opinion, but of course the formal decision is not made until the actual meeting. The Chairman of the Executive Board usually concludes by summarising the discussions held

and what proposals have been put forward regarding the current interest rate. After this we move on to the decision and vote.

To give the general public insight into the decision-making process and to make it easier to assess our activities, we take minutes at the meeting which the bank then publishes. As of summer 2007, we also write the member's names in the minutes. The minutes are published around two weeks after the monetary policy meeting.

### **Interest rate decision announced on the day after the monetary policy meeting**

A press release is published the day after each monetary policy meeting. This contains the most important reasons for and considerations behind the majority decision. The press release also contains the Riksbank's forecasts for economic activity and inflation and a description of what monetary policy is currently considered to be well balanced. In connection with the publication of the interest rate decision we also hold a press conference where journalists are given the opportunity to ask questions.

In connection with three of the monetary policy meetings a *Monetary Policy Report* is published. On the other occasions a shorter *Monetary Policy Update* is published instead. This contains a more limited number of forecasts for the central macro variables.

That is to say, it is the majority view that is reflected in the press releases and the reports. Any differences of opinion can be seen in the minutes of the monetary policy meetings. There it is stated in detail how each of the members has argued and voted. But before the minutes are published it is the majority line that applies when we Executive Board members make speeches outside of the Riksbank. After that we members are each free to describe our personal differences of opinion regarding the interest rate decision.

### **Constant assessment means that we are always prepared for change**

Let me round off. Today I have talked about the major changes in recent years in the way we produce material used as a base for our interest rate decisions. Some of these have come about because the methods of making forecasts in general have developed, something that also affects other central banks.

Other changes have been shaped by the specific conditions that apply in Sweden. The Riksbank's independent position makes demands on us to be open and clear, what economists usually term transparency. The Riksbank's decision to begin publishing its own forecasts for the repo rate is a step in the work on increasing transparency and further improving our analysis.<sup>10</sup>

The new assumption for the repo rate has led to the Executive Board becoming more involved in the forecasting process. We are constantly evaluating our forecasts to see how successful they are at capturing developments. This also means we are constantly striving to improve our ways of working. If we make any major changes that have significance for our forecasts we will of course let you know.

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<sup>10</sup> For a more detailed justification of the decision to publish our own interest rate forecast, see Irma Rosenberg's speech "Riksbank to introduce own path for the repo rate", held on 17 January 2007.

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