# SPEECH

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# ■ The repo rate path - experiences three years on

Around three years ago the Riksbank began publishing its own forecasts for the repo rate, and there were many reasons for doing this. It made the forecasts more consistent and it was now easier to evaluate the Riksbank's forecast in relation to those of other analysts. We were also given an opportunity to describe alternative paths for economic developments, which was a good educational tool that further contributed to increasing transparency. Publishing a whole path for the repo rate was also one step towards becoming more open and clear. It also improved the chances of steering longer term expectations . Experiences so far show that the work on the repo rate and its publication have functioned well. The monetary policy discussions focus more on long-term issues, and they now concern the whole repo rate path rather than an individual decision. This is good. Today the repo rate path is a natural part of monetary policy. Moreover, the repo rate path has served us well during the crisis, in that we could clearly signal that the interest rate was expected to remain low over a long period of time.

Market participants' expectations of the repo rate have rarely been exactly the same as the Riksbank's expectations. My assessment so far is that the deviations have not been a problem. It is not reasonable to believe that we and the market participants will always reach the same conclusions. Inflation expectations are well-anchored around the target, which is the most important indication that the market has confidence in monetary policy.

## Why publish our own repo rate forecast?

To put it plainly: a forecast for growth and inflation requires an assumption about the interest rate. The inflation target was introduced in 1995, and it was then assumed in the forecasts that the repo rate would be unchanged during the forecast period. This had an advantage in terms of clarification; if the forecast for inflation was that it would overshoot the target (be higher than 2 per cent) a couple of years ahead, then the repo rate would be raised, and vice versa. However, an unchanged repo rate throughout the forecast period was an unrealistic assumption. The realisation came gradually that the forecasts needed to be based on a more realistic view of the future repo rate. It was decided that the Bank would use market expectations, as reflected in implied forward rates, as a base.[1] From autumn 2005 the Riksbank began working with this new assumption in its forecasts.

Once this "second step" had been introduced, a further question arose. Although a future repo rate being in line with forward rates was a more realistic assumption than a constant repo rate, situations could arise where the forward rate path did not agree with what the Riksbank considered to be the "best" forecast for the repo rate. Moreover, it was difficult to communicate how "appropriate" the forward rate path was as an interest rate forecast, and the logical consequence of this was to quite simply go on to publish our own interest rate forecast. The period with implied forward rates as a forecast assumption can therefore be regarded as a learning process on the road towards publishing our own interest rate forecasts, which has several advantages compared with using forward rates.[2]

When we began publishing our own repo rate path, this was the start of a learning process for us at the Riksbank, but also for market participants. I believe that we have made a lot of progress in this direction.

### *Monetary policy through "management of expectations"*

The established view today is that a large part of the monetary policy effect is through influencing expectations among participants in the economy. By publishing our own repo rate forecasts we improve the opportunities to influence rates with longer maturities by influencing the general public's expectations of future repo rates ("management of expectations"), something that proved very useful during the financial crisis.

Figure 1 shows the development of the repo rate and market rates with different maturities. We see that the Riksbank has considerable influence over developments in market rates with maturities of up to six months. The repo rate path also has significance for developments in long-term rates, although other factors than expected repo rates, such as international events, may have significance in the development of long-term interest rates.

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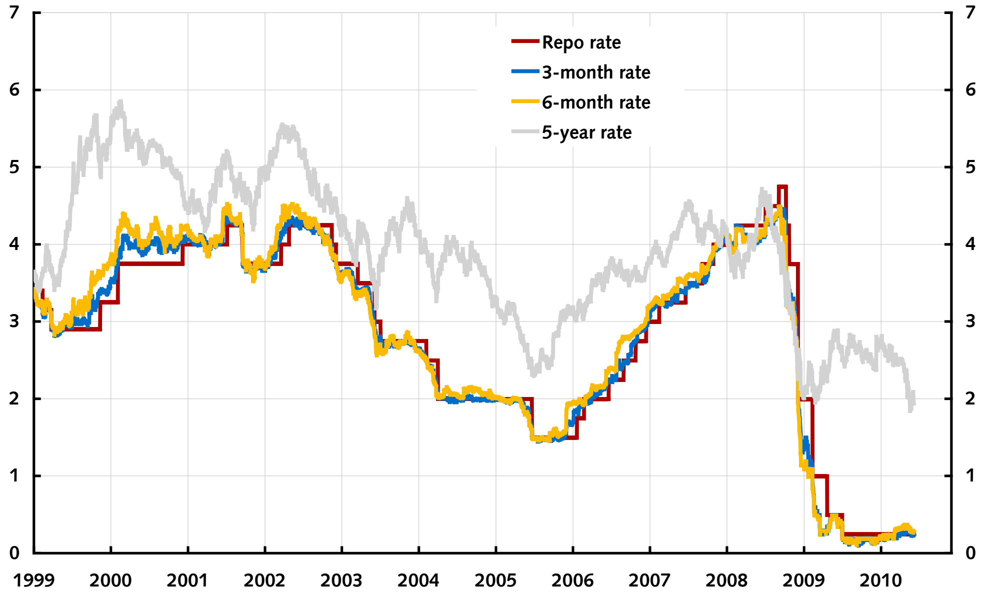
[1] See Irma Rosenberg's speech "The Riksbank and monetary policy" in September 2005, on the reasons for changing over to implied forward rates in the forecasts.

[2] See, for example, Michael Woodford (2005): "Central Bank Communication and Policy Effectiveness", paper presented at the conference *Inflation Targeting: Implementation, Communication and Effectiveness* Sveriges riksbank

## Figure 1. Interest rates at different maturities in Sweden

Per cent




Note. The interest rates refer to treasury bills and government bonds.

Sources: Reuters EcoWin and the Riksbank

Greater openness and clarity from the Riksbank creates better conditions to govern expectations in the corporate and household sectors. The publication of a repo rate path can be regarded as a contribution to this. Any forecast for the Swedish economy made by any reasonable type of model also generates a forecast for the repo rate. So why should one then "hide the most central forecasting variable", as my Executive Board colleague Lars Svensson put it.[3]

A particular advantage in publishing one's own repo rate path is the opportunity to describe alternative scenarios for future economic developments and the consequences they would have for monetary policy. This has made it easier for market participants and households to judge how we Executive Board members will act with regard to the repo rate depending on the different alternative paths for growth and inflation.

The Monetary Policy Report shows alternative scenarios, not merely for economic developments, but also for the repo rate. The alternative scenarios for the repo rate show different monetary policy alternatives. What would happen to the economy if the Riksbank followed a repo rate path that was higher or lower than that in the main scenario? The consequences of various monetary policy alternatives can thus be compared. This can systematically justify the repo rate path chosen by the Riksbank.

[3] See Lars E.O. Svensson, "Policy expectations and policy evaluations: the role of transparency and communication", Economic Review 2010:1, Sveriges riksbank.

## Introduction of repo rate path not entirely uncontroversial

Many people welcomed the Riksbank's decision to introduce its own repo rate path. However, there were also some misgivings. For example, there were fears that confidence in the Riksbank might be harmed if the actual repo rate in the future deviated from the earlier forecast. This was also the type of misgiving expressed when the Riksbank began publishing forecasts for inflation and growth. In addition, there was concern that the Riksbank might hesitate to change the repo rate forecast for reasons of prestige, even if circumstances indicated this was necessary.

If there were fears that the Riksbank might be unwilling to change the repo rate path when the situation required, this fear has come to nought. Autumn 2008 is a very good example of this. Now, three years after its introduction, I believe I dare say that the repo rate path is regarded as a natural part of the Riksbank's policy. I also believe that the discussion outside of the Riksbank is characterised more by long-term discussions on monetary policy than on individual decisions.

I shall now go on to briefly describe how the repo rate forecast is produced.

### *How is the repo rate path determined?*

The publication of our repo rate forecasts makes greater demands than previously on the internal preparation work. The new method of working requires a greater interaction between the staff and the Executive Board, and the Board members are involved at an earlier stage of the process. This is made easier by members of the Executive Board being full-time employees and not merely being called together for monetary policy meetings. So what does the practical work leading to the published repo rate path actually entail?

The monetary policy decision-making process normally follows an established preparatory process.[4] During a number of weeks employees in the Monetary Policy Department prepare draft forecasts for economic developments, including the repo rate. After this there are meetings together with the Executive Board of the Riksbank, and a main scenario for economic developments, including the repo rate, is drawn up. Of course, the main scenario is based on a combination of model-based forecasts and assessments.

During the forecasting process, the main scenario presented at the monetary policy meeting has in practice become a scenario that is supported by a majority of the Executive Board members. If there are any reservations against the main scenario or the monetary policy decision, these are made clear at the monetary policy meeting.

Thus, the monetary policy decision is preceded by a long process. As the decision now also includes the Board's view of the future repo rate, more in-depth and long-term discussions are required than if it was merely a question of whether or not to alter the repo rate. The repo rate path has entailed a fruitful change.

[4] For a more detailed description of the preparatory work prior to the monetary policy decisions, see Kerstin Hallsten and Sara Tägtström (2009): "The decision-making process – how the Executive Board of the Riksbank decides on the repo rate," Economic Review 2009:1, Sveriges riksbank.

## The role of the repo rate path during the financial crisis

When we began to make repo rate forecasts a few years ago, I do not believe anyone expected a situation like the one we had when GDP fell by 5 per cent in 2009. During the financial crisis several central banks were forced to cut their policy rates to close to zero. This has entailed restrictions on future decisions, as the nominal interest rate has a lower bound. The classical argument in favour of this lower bound is that the nominal interest rate on cash is zero, and that a negative interest rate would mean that economic agents would hoard banknotes. There are many discussions in the academic world as to whether the lower bound lies at zero or slightly below.[5] I will not go in to it here, but merely note that a majority of us on the Executive Board has regarded the current repo rate as in practice being the lower bound.

This zero interest rate problem received much attention in the academic world in connection with the Japanese central bank cutting its policy rate to zero as a result of the economic stagnation in the 1990s. One of the possible solutions if a central bank has cut its policy rate to its lower bound, and wants to cut it further, is to promise a policy rate around zero for a long time to come. Over time this would have a similar effect to cutting the interest rate to below zero and then raising it to above zero.

### *The repo rate path facilitated communication*

During the financial crisis, lessons from this research became surprisingly topical for a number of countries in addition to Japan. The repo rate path fulfilled a central role here, as it enabled the Riksbank to make clear its intentions for monetary policy during an uncertain situation. When the Riksbank cut the repo rate to 0.25 per cent in July last year, the repo rate path signalled a low repo rate for a long period ahead. I believe this gave us an advantage over many other central banks, who tried to use purely verbal methods to signal that their policy rates would be low for a long time.

Credibility plays an important role in monetary policy. One central issue in this context is the inflation target. If a central bank "promises" low inflation, but the economic agents do not find this credible, it will not have the desired effect. It is possible to inspire confidence in the inflation target by the central bank being politically independent. What does this have to do with the zero interest rate problem and the repo rate path? What I mean is that the existence of a repo rate path in connection with cutting the repo rate to 0.25 per cent, provided credible evidence that a low interest rate over a long period of time was what was needed to attain the Riksbank's monetary policy objective of an inflation rate close to the target, and to stabilise resource utilisation. One could say that we put our cards on the table.[6]

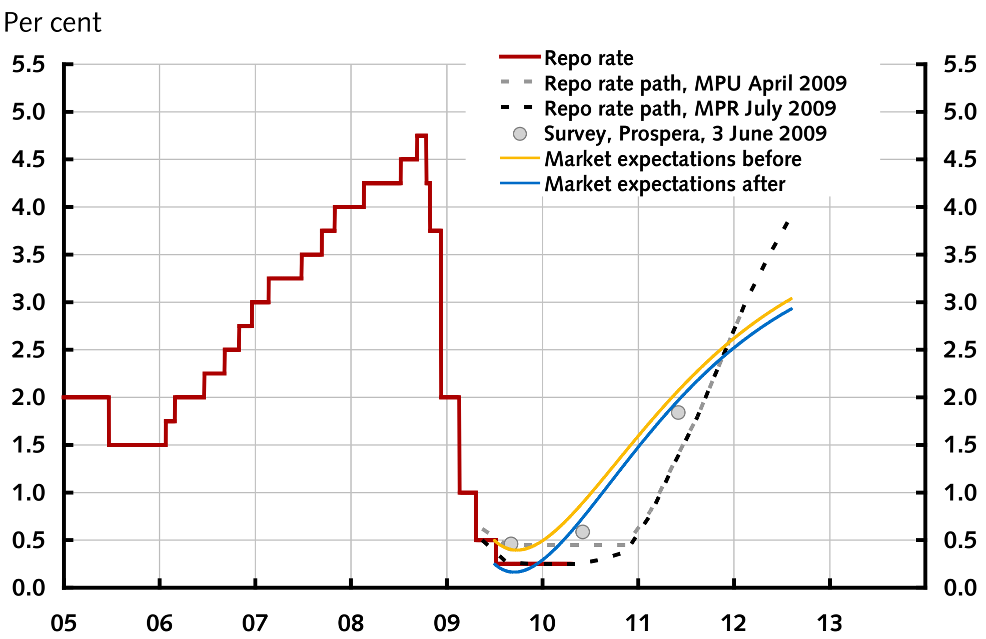
Figure 2 shows the relationship between market expectations according to forward rates and the Riksbank's repo rate path in connection with the repo rate being cut to 0.25 per cent in July 2009. The Riksbank's forecast indicated that the repo rate would remain at this low level until the second half of 2010. The

[5] One argument in favour of the bound possibly being below zero is that there are handling costs for cash. This would then mean that one can accept a negative interest rate to refrain from cash and invest in interest-bearing assets. See, for example, Meredith Beechey, and Heidi Elmér (2009), "The lower limit of the Riksbank's repo rate", Economic Commentaries no 11, 2009, Sveriges riksbank.

[6] In addition to the repo rate cut of 0.25 per cent, the Riksbank has granted loans at a fixed interest rate for the purpose of bringing down actual interest rates paid by companies and households.

forward rates prior to the publication of the repo rate path indicated that the repo rate would not be cut to 0.25 per cent and that increases in the repo rate would begin as early as the end of 2009. Surveys carried out by Prospera indicated that expectations were in line with the forward rates. Although the forward rates were adjusted down after the publication of the repo rate path, the pricing still showed that expectations were set at a first repo rate increase at the end of 2009. Where the Riksbank's forecast indicated a first repo rate increase, the forward rate was already up at around 1.5 per cent. This large deviation caused considerable discussion, partly concerning the current situation and monetary policy, and partly more general as to whether it is a problem if market expectations deviate from the Riksbank's forecast. As shown in Figure 2, however, market expectations were lower than the Riksbank's repo rate forecast at the end of the forecast period. Seen across the entire forecast period, therefore, the average deviation is not so great. With hindsight, we can also note that in summer 2009 market expectations deviated considerably from the repo rate outcome we can see so far.

**Figure 2. The repo rate path and market expectations in July 2009**




Note. Market expectations are based on forward rates. "Before" are the closing rates on the day before the repo rate path was published and "After" are the closing rates on the day it was published. Prospera's survey covers money market participants.
Sources: Reuters EcoWin, TNS SIFO Prospera and the Riksbank

A recurring phenomenon during the three years with our own repo rate path has been that market expectations of the repo rate have from time to time deviated from the Riksbank's repo rate forecast. Allow me to comment further on this.

## Market expectations and the repo rate path

As I mentioned earlier, one important purpose of publishing a repo rate path is to influence expectations among the participants in the economy. The established view at present is that monetary policy has its main impact by influencing expectations of future interest rates. A natural question here is if the Riksbank's repo rate path has differed from other agents' expectations of the repo rate, and how large the deviations have been. What role do the differences between market expectations and the Riksbank's forecasts play?

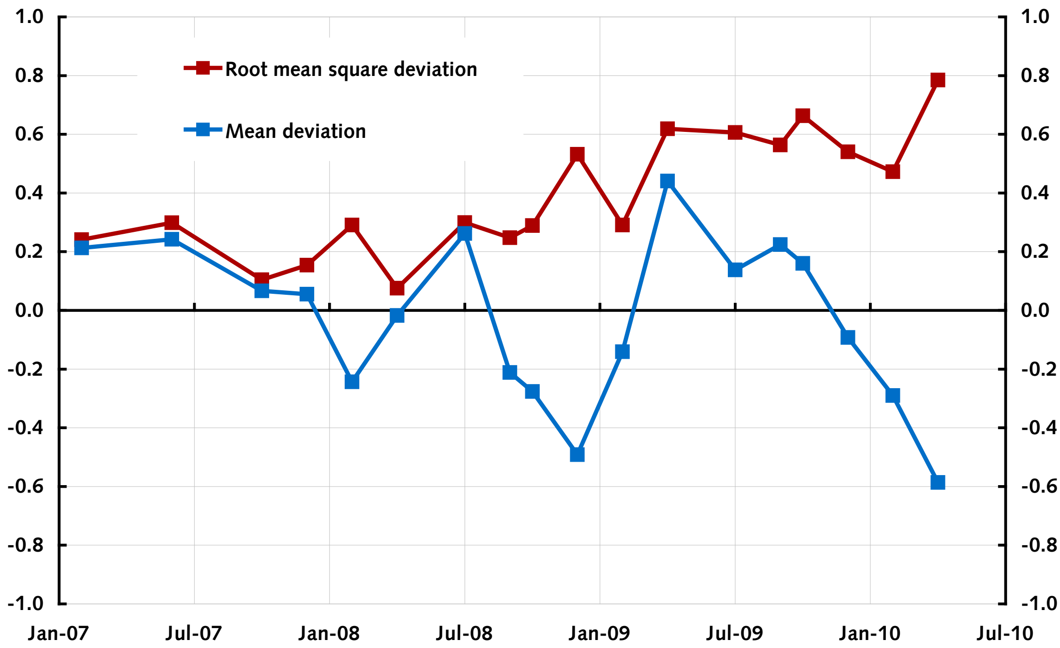
### *How large are the deviations…*

As we have seen, the Riksbank, the market and other economic agents can have different views on how the repo rate will develop. Sometimes the differences are small, and sometimes they are large.

Figure 3 shows two summarising measures for the deviations between market expectations according to forward rates and the Riksbank's repo rate forecast at the time of all 18 publications.[7] We can see that the deviations have become larger since the financial crisis erupted, which is natural as uncertainty increases. Looking at the whole period since 2007, however, there does not appear to be any systematic deviation in any direction (the average deviation is approximately zero for the whole period). It is important to point this out. One question that may nevertheless arise is why market expectations deviate from the Riksbank's forecast.

**Figure 3. Deviations during the forecasting horizon between the repo rate path and market expectations according to forward rates**

Percentage points




Note. For a description of the calculations, see footnote 7.

Sources: Reuters EcoWin and the Riksbank

[7] The measures show the following: at the time of a given forecast the difference between market expectations and the Riksbank's forecast for the repo rate 1 to 12 quarters ahead are measured. This thus gives 12 different deviations for each time of publication. One measure gives the average of all 12 deviations. The other measure shows a "standard deviation", where the sign of the deviation is unimportant.

*…and what are they due to?*

To begin with, I would like to make the reservation that market expectations cannot be observed, they can only be estimated. Some of the deviations may thus be due to the fact that we have not succeeded in adjusting the forward rates for various types of premium. In addition to this, there are a number of other possible explanations for the deviations.

In one sense it may be natural that market expectations deviate from the Riksbank's repo rate forecast. Market agents may have a different picture of future inflation and economic developments as a whole, which would motivate a different repo rate in the future. Even if market agents share the Riksbank's view of economic developments, there may well be a deviation with regard to future interest rates. This can be due to different views regarding the transmission mechanism, that is, the effects of the repo rate on the economy.

*Are the deviations a problem?*

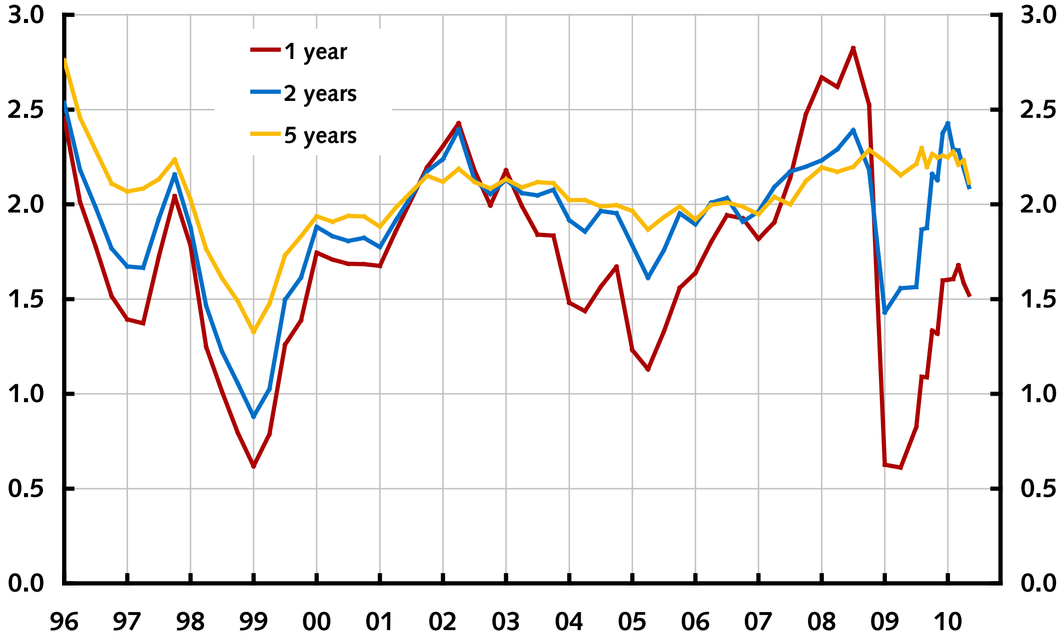
As I mentioned earlier, one reason for publishing repo rate paths is the opportunity to effectively steer market expectations. We have seen that market expectations sometimes deviate from the Riksbank's published path. One reason for this is that the uncertainty over future economic developments has been unusually great during the financial crisis. However, I would like to tone down the importance of the deviation between market expectations and the Riksbank's repo rate path. There has not been any systematic deviation in either direction, if one looks as the average of the repo rate paths and market expectations over three years.

*Inflation expectations are a decisive factor for credibility*

My view is that the decisive factor for a central bank with an inflation target is inflation expectations. Expectations should be anchored around the inflation target in the long run. I say "long run", as inflation expectations in the short term vary considerably in accordance with actual inflation. Figure 4 shows inflation expectations 1, 2 and 5 years ahead according to Prospera's survey for money market participants. We can see that inflation expectations 5 years ahead have been around 2 per cent during the past 10 years. I interpret this to mean that there is still unshaken confidence in the inflation target.

**Figure 4. Money market participants' inflation expectations according to Prospera**

Per cent




Note. Monthly data from September 2009. Quarterly data prior to this.

Source: TNS SIFO Prospera

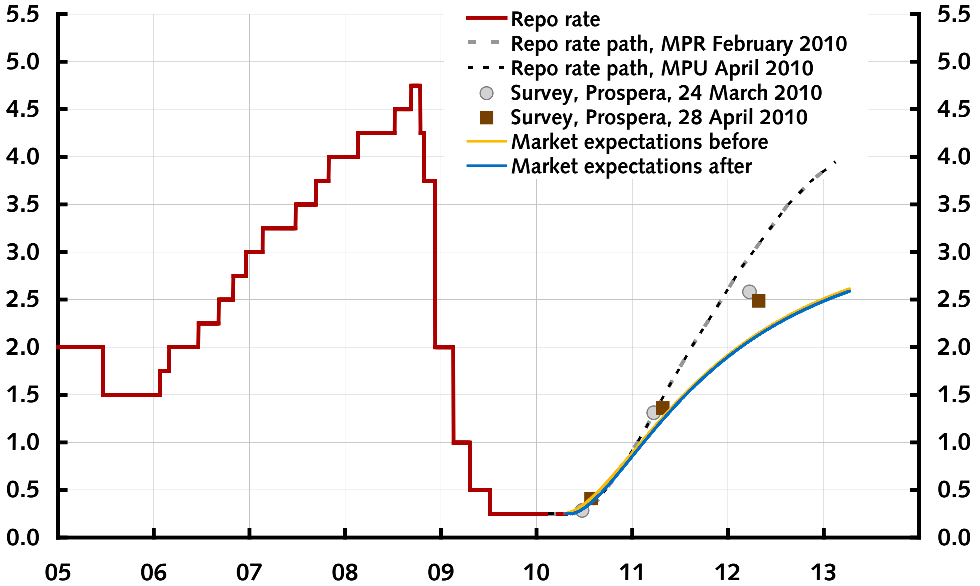
I have so far discussed our experiences of publishing repo rate paths. Let me now go on to discuss the most recent repo rate path in the Monetary Policy Update published in April this year.

## Some aspects of the current repo rate path

Figure 5 shows the repo rate path from the Monetary Policy Update in April together with market expectations of the repo rate. For the coming year both forward rates and survey expectations were very close to the Riksbank's forecast. Expectations as expressed in the surveys agree fairly well with the Riksbank's forecast, even in the longer run. However, expectations according to forward rates were much lower than the Riksbank's repo rate path in the longer run. The total deviation between the repo rate path and forward rates can also be seen on the far right in Figure 3.

■ **Figure 5. The repo rate path and market expectations in April 2010**

Per cent




Note. Market expectations are based on forward rates. "Before" are the closing rates on the day before the repo rate path was published. "After" are the closing rates on the day it was published. Prospera's survey covers money market participants.

Sources: Reuters EcoWin, TNS SIFO Prospera and the Riksbank

### *The real repo rate path*

How expansionary is the monetary policy that follows on from the Riksbank's repo rate path? One way to gain an idea of this is to look at the development of the real interest rate. The real interest rate is the most important for the development of the real economy, as it is the interest rate on which consumption and investment decisions are based. It is defined as the nominal interest rate minus expected inflation. The Riksbank also publishes forecasts for the real repo rate in its Monetary Policy Reports.

Figure 6 shows the Riksbank's forecast from the April Monetary Policy Update together with different measures of market participants' expected real repo rate.[8] Let us begin by looking at the Riksbank's forecast for the real repo rate. We can note that the real repo rate is presently below zero, and according to the Riksbank's forecast it is not expected to be above zero until the end of this year. If the forecast proves correct, the real repo rate will have been negative for a two-year period – this is very unusual in an historical perspective. The Riksbank's assessment is that a long-term normal level for the real repo rate is around 2 per

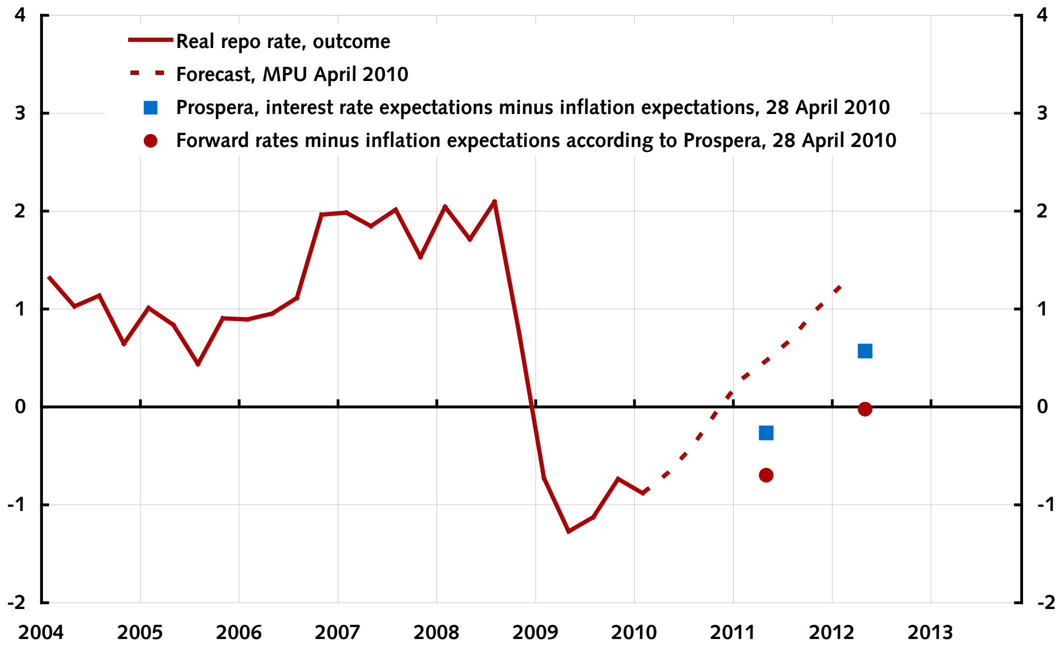
[8] The real repo rate forecast is calculated as a mean value of the Riksbank's repo rate forecast for the coming year minus the inflation forecast (CPIF) for the corresponding period. Prospera's interest rate and inflation expectations are based on surveys carried out on 28 April and 28 April-7 May respectively. Interpolation has been used for the interest rate and inflation expectations to produce the expected repo rate for the coming year and inflation expectations for the corresponding period. "Forward rates minus Prospera inflation expectations" shows nominal forward rates from 28 April for the coming year minus inflation expectations according to Prospera for the corresponding period.

cent.[9] Seen from this perspective, the repo rate path thus indicates a very expansionary monetary policy.

We have previously seen that in April the market was expecting a lower nominal repo rate in relation to the Riksbank's forecast. Figure 6 shows that this also appeared to apply to the real repo rate.

**Figure 6. The Riksbank's real repo rate forecast**

Per cent




Sources: Sources: Reuters EcoWin, TNS SIFO Prospera and the Riksbank
Note. See footnote 8 for a description of the calculation of the real repo rate expectations.

## Concluding thoughts

Publishing our own repo rate path was a further step towards openness and transparency in the Riksbank's monetary policy. Our forecast for the repo rate is reported in the same way as other important forecast variables. We can also use alternative scenarios to illustrate how the Executive Board may respond with its monetary policy if economic developments deviate from the main scenario.

When the Riksbank introduced the repo rate path there were fears that many analysts would stop making their own forecasts and slavishly follow the Riksbank. The merit of having many different assessments would be lost. However, this has not been the case. There was also concern that we would avoid changing the repo rate path, even when this was motivated by changed conditions. This has not happened either. "The repo rate path is a forecast, not a promise," this has been a message that the Riksbank has communicated all along.

Experiences so far show that the work on the repo rate path and publication of the path have functioned well. To crown it all, we have gained a monetary policy discussion that is aimed more at long-term issues and not merely at whether or

[9] See the box "What is a normal level for the repo rate?" in the Monetary Policy Report, February 2010 for a discussion of a normal level for the repo rate. See also Björn Lagerwall "Real interest rates in Sweden", Economic commentary no. 5, 2008, Sveriges riksbank, for a discussion of real interest rates.

not the interest rate should be altered a stage. My view is that our own repo rate path is quite clearly preferable to the other two alternatives that were tested. I believe that this is also the predominant view of most of those outside of the bank, now, three years later.

The repo rate path served us well during the crisis. We were able to clearly signal that the repo rate will be low for a long period of time to alleviate the effects of the fall in demand and to attain the inflation target. There have been slight differences of opinion among us Executive Board members with regard to the time when an increase in the repo rate will begin. But these have been only slight, the larger moves have been clear. It has been necessary to have a low repo rate over a long period of time. In this context, changes in the repo rate amounting to 0.25 percentage points slightly sooner or later do not make a significant difference.  According to our repo rate forecast in April, the real repo rate will have been below zero for two years, and it will remain low throughout the forecast period.

There have been and are differences between the market agents' expected repo rate and the repo rate path. However, there are also difficulties in measuring market expectations through forward rates. This applies in normal cases and even more so in times of financial crisis. Even if it is the case, we can probably note that the differences have been rather the rule than the exception. There has been no systematic deviation in any one direction. All in all, I think that with the aid of the repo rate path we have succeeded relatively well in steering expectations.

In connection with the introduction of the repo rate path, there were discussions as to whether there would be a confidence crisis if the market does not "buy" our repo rate path. But, as shown, this does not need to be an expression of mistrust. And talking about confidence, my view is that the final proof that households and companies have confidence in the Riksbank's monetary policy is that inflation expectations are anchored close to the target of two per cent. Surveys indicate clearly that inflation expectations in the long run are very well anchored around the inflation target. I interpret this to mean that the general public has confidence that the Riksbank will adapt its monetary policy to attain the inflation target.