Lars Heikensten: Thoughts on how to develop the Riksbank's monetary policy work

Speech by Mr Lars Heikensten, Governor of the Sveriges Riksbank, at the Swedish Economics Association, Stockholm, 22 February 2005.

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Introduction

Allow me to begin by thanking you for the invitation to once again visit the Economics Association and speak about monetary policy.

Since I was here a year ago there has been a relatively lively debate, by Swedish standards, on monetary policy. Some commentators have focused on the currently low inflation rate, but what has really added fuel to the debate is the rise in unemployment that has occurred despite record-low interest rates and strong growth. Other participants have centred on the low interest rates, voicing concerns over their implications for credit growth, household debt and the housing market.

I don't intend to enter into this discussion today, however. Instead, I would like to take advantage of the opportunity to have a more fundamental discussion about the Riksbank's monetary policy framework, its monetary policy analysis and the possibilities to improve the material underpinning our decisions. I shall describe the changes that we are planning to make to our methods. At the same time I should stress that it is not a question of changing the Bank's monetary policy strategy.

The Riksbank's inflation targeting policy today

An explicit target and a clear intellectual framework

The Riksbank's decision in 1993 to let its policy be guided by an inflation target was a fairly new approach at the time.[1] The idea had only really been tried in three other countries before (New Zealand, Canada and the United Kingdom). An inflation target has considerable advantages over the methods of conducting monetary policy under a floating exchange rate that have been tried before, e.g. a target for the growth rate of money. Communication becomes simpler when the operational target agrees with the final one. In addition, an explicit target facilitates a stabilisation of inflation expectations and enables policy to be evaluated. The inflation target also has the advantage of capturing all important variables in one single variable. The inflation forecast is influenced not only by interest rates but also by an assessment of credit developments, the exchange rate and other factors of significance to demand.

The monetary policy objective laid down by Parliament is to maintain price stability. The Riksbank has operationalised this objective in the shape of a quantitative target for the inflation rate: the annual increase in the consumer price index, CPI, should be 2 per cent. Around this target is a tolerance band of +/- 1 percentage point, the purpose of which is both to make clear that inflation from time to time will deviate from 2 per cent and that the Riksbank's ambition is to limit such deviations.

Since the effects of monetary policy are exerted with a certain lag the Riksbank must adopt a forward-looking approach and base its interest rate decisions on a forecast of future developments. Before each decision, therefore, we prepare forecasts of factors such as inflation developments and the business cycle over the next two years. Since December 2000 we have often found reason to supplement the forecasts two years ahead with a qualitative assessment of the longer term.

We have also worked with a simple policy rule: If inflation is forecast to be above target one to two years ahead we normally raise the repo rate, and vice versa if the forecast is below target. We haven't followed this rule mechanically, of course. That is exactly why the word ”normally” is always included

1 See Heikensten, L., “Behind the Riksbank's massive walls – establishing the inflation targeting policy 1995-2003", Sveriges Riksbank Economic Review 3, 2003, 45–80, for a more in-depth account of the analytical framework for monetary policy and how it was developed up to 2003.

in the formulation of the policy rule. It is a rule that on average provides a good description of the Bank's policy.

The policy rule was introduced in 1997, primarily due to a desire to make policy even more transparent. The studies available at the time, all of which are uncertain, indicated that interest rate adjustments tended to have their largest impact on inflation in this time perspective. For my part I also considered it important to focus the difficult forecasting work on the time perspective that was deemed to be the most essential for monetary policy and not become too involved in discussions about a more uncertain future. This argument was strengthened in my opinion when the Riksbank's decision-making process became a collective undertaking. With a less explicit rule and an entirely flexible time horizon our discussions would have risked focusing – more than would have been desirable – on the choice of time perspective, at the cost of a discussion about what we actually know about the present and what we believe about developments over the coming two years.

Consideration of real developments

Allow me also to say a few words about the background to the clarification of the principles for monetary policy that the Riksbank decided on at the start of 1999. When the inflation target was established in 1993 we understood even then that it couldn't be applied mechanically. That was intimated, among other things, in a statement that the target was not to begin to apply fully until 1995, in order thereby to cushion the effects of the inflationary impulses that were predicted during 1993 and 1994 following the krona's fall and the change in indirect taxes. There were also several occasions during the latter half of the 1990s when policy was not conducted slavishly on the basis of CPI forecasts. That was because it was obvious that it could result in absurd consequences. For example, the rate cuts in 1996 and 1997 had caused a decrease in the CPI via housing costs. This could have resulted in the claim that interest rates should have been lowered further, as a direct consequence of the fact that they had only just been cut sharply. However, it wasn't until the turn of the year 1998/1999 that the Riksbank developed a coherent, explicit approach to these issues. It had been preceded by a long discussion, where the main idea had been to change from the CPI to a different index, in which the components that fluctuated most due to temporary reasons would be excluded. However, the more we discussed this the clearer it became that there was no index that always provided the best picture of inflationary pressures in the economy. For this reason we opted instead for an approach whereby we, in connection with each decision, would make it as clear as possible what considerations were guiding policy at the time. This would enable our actions to be evaluated in a better way than before.

The clarification states that monetary policy should normally be centred on bringing inflation to target one to two years ahead. It also identifies two cases when the Riksbank may depart from this rule: transitory effects on inflation and large deviations from the target. By transitory effects is meant that some particular factors affect the forecast of inflation one to two years ahead, but that the effects are expected to dissipate without the need for any monetary policy action. By large deviations from the target is meant that inflation has deviated so much from the target that there may be reason to bring it back to target over a longer period than the normal two-year horizon. A faster return to target could give rise to undesired fluctuations in output and employment, for example.

In practice this approach has often led us to focus our monetary policy analysis and discussion on the inflation measure UND1X, as there is generally always reason to disregard the effects on inflation of indirect taxes and subsidies as well as of changes in interest rates. In some situations we have also decided to study inflation measures from which other price changes have been excluded, e.g. in spring 2001, when the prices of a number of goods such as electricity, heating oil, petrol, telecommunications and different kinds of food rose; and 2003, when it was primarily fluctuations in electricity prices that had a very sharp impact on inflation for a period.

Inflation and inflation expectations in line with the target

The result of the Bank's policy can be illustrated in different ways. Let me begin with the most obvious gauge, the inflation outcome. If we start with the date that was set in the original decision – the beginning of 1995 – CPI inflation up to today has averaged 1.4 per cent. If we instead go back to January 1993, when the new policy was announced, the same figure is 1.7 per cent. If we focus on UND1X, the underlying measure that guided policy especially in recent years but also during a large part of the period 1996-1999, the corresponding figures are 1.8 and 2.0 per cent, respectively (see Figure 1).

Whether this constitutes a good result or not is open to discussion, of course. Allow me here to simply say that when the target was adopted, and as an observer outside the Bank, I thought like many others that it would be very difficult to bring inflation down sustainably to a level around 2 per cent. What is particularly interesting in this context is that it has proved possible to establish a regime with a low inflation rate, close to the target, and to combine it with firm economic growth, which over these years has averaged almost 3 per cent a year, compared with about 2 per cent during the two previous decades. If anything, economic growth also appears to have become more stable since the inflation target was introduced.[2]

Another way to assess policy is to study whether we have acted in the way that we say we will, i.e. followed our policy rule. Figure 2 shows our interest rate adjustments on the vertical axis and our inflation forecasts' deviation from the target two years ahead on the horizontal axis. As we can see there is a clear relationship between forecast deviations from target and our decisions, but there are also points in Figure 2 that deviate from the average behaviour. These points chiefly relate to the forecasts we produced when we chose not to counter the effects of energy prices on inflation. So it seems that we have essentially acted in line with how we have said we will normally act.

Yet another way to evaluate the result of our policy is to investigate whether it is credible. The most important factor here is that inflation expectations 2 years ahead and beyond have been firmly anchored to our target since the regime was stabilised in 1997-1998. That conclusion holds up fairly well regardless of the method used (see Figure 3).

Our ambition to be transparent derives, among other things, from a desire to avoid unnecessary movements or unease in the financial markets. To illustrate our performance in this regard the Riksbank has conducted a number of studies over the years, of which some have been published.[3] The picture we've received is that our policy has essentially been intelligible and that it hasn't resulted in any sharp fluctuations in financial prices that could have been avoided. International comparisons as well as surveys and similar studies that have been carried out by external analysts in the media, for example, confirm that the Bank's monetary policy communication has worked fairly well. However, this doesn't mean – and I want to stress this – that there are no examples of episodes when our communication in my opinion could have been better.

My conclusion is that the Bank's policy in the past ten years has worked well. Nonetheless there is of course every reason to reflect on whether the analysis that we carry out and the framework that we follow in our monetary policy work could be improved. That is the aim of the rest of my speech.

Some thoughts on how to develop the Riksbank's monetary policy work

Methodological aspects

Let me begin by addressing an issue that is of a rather technical or methodological nature, but that, as we also shall see, has a number of further consequences: the choice of repo rate on which the inflation forecast is based.

Since 1996 the Riksbank's Inflation Reports have presented overall assessments of the economy and inflation that have served as a guide for policy. From the fourth Report in 1997 these have included numerical, relatively detailed forecasts. The published forecasts have consistently been based on the assumption of an unchanged repo rate, above all because forecasts arrived at in that way make it easy to motivate changes in policy. Before a monetary policy decision the Bank makes clear whether it expects inflation to deviate from the target or not, given the current interest rate level. If the forecast is above or below target it shows clearly that there is reason to consider whether the repo rate needs to be changed.

The framework applied by the Riksbank has been the established practice in inflation-targeting countries. But as early as the mid-1990s the Reserve Bank of New Zealand, for example, opted for a

2 The volatility, measured as the standard deviation of GDP growth, was 1.9 percentage points during the period 1970-1992. Since 1995 the corresponding standard deviation has been 1.3 percentage points.

3 See Andersson, M., Dillén, H. and Sellin, P., "The yield curve and the Riksbank's signalling", Sveriges Riksbank Economic Review 3, 2002, 5-19.

different method, publishing forecasts based on the interest rate path that they thought gave the best target fulfilment. Our academic advisers have also repeatedly said that we should prepare forecasts based either on how the market expects interest rates to evolve or that we, as in New Zealand, should work out what interest rate path is consistent with reaching the inflation target.[4]

Against this background we at the Riksbank have of course discussed over the years the question of what importance we should attach to different interest rate assumptions in our internal work and when we publish forecasts. When making decisions we have also had many other kinds of model-based estimates and scenarios to go on than those published. Moreover, from October 1999 until March 2003, our Inflation Report contained boxes in which we published estimates based on a survey of market expectations of the repo rate.[5] The estimates were seldom given any great significance in the monetary policy debate, however.

So what are the points of attaching greater importance to, and also publishing forecasts based on, other interest rate assumptions than a constant repo rate? There are chiefly two:

The first point has to do with comparability and the possibilities to assess our forecasts. As things currently stand the Riksbank's forecasts can be difficult to compare with others, since other forecasters do not normally base their forecasts on an unchanged policy rate. This risks confusing those that monitor the Riksbank and compare our forecasts with others in, for example, the media. So it is possible that an interest rate assumption that is more consistent with the market's view of how the interest rate will develop could make our communication easier in certain situations. That is especially true of course if there is a large deviation between the assumption of an unchanged repo rate and a more realistic assumption of the rate's path. What is clear in any case is that ex post assessments of forecasts of economic and inflation developments become generally easier if they are based on an assumption that better reflects the interest rate expectations of market players.

The other point has to do with the fact that it becomes easier to produce consistent forecasts and scenarios. This is particularly important when preparing estimates and developing scenarios in a somewhat longer-term perspective than the usual two years, which can sometimes be valuable in order, for example, to show the effect on inflation of shocks that are judged to be temporary. The assumption of a constant repo rate becomes generally more unrealistic the longer the forecast horizon is extended. When the difference between the market's view of the future repo rate and the assumption of an unchanged repo rate has been large, it has also been complicated to link assumptions about short-term interest rates to a reasonable picture of, for instance, future long-term rates, since long-term rates depend on expectations of how short-term rates will evolve.

Up to now the Riksbank has chosen to highlight forecasts based on an unchanged repo rate; this has basically worked well, not least in terms of communication. Little by little, however, the Bank's monetary policy work has evolved to the extent that there are now sufficient analytical resources with which to deepen the discussion in this area. The approach used so far has also, as the Bank's analysis has developed, felt like a bigger restriction in the internal work than before. The perceptions of how the Riksbank acts seem also to have become so well established that the communication risks of presenting forecasts with different interest rate scenarios appear smaller today than before. I should also mention here that a couple of other inflation-targeting countries with which we have an extensive professional exchange – the UK and Norway – have recently begun to attach much greater importance to forecasts based on other assumptions than a constant policy rate and that this appears to have worked well.

We expect to be able to make use of our development work as early as the next Inflation Report. In that Report we intend to publish forecasts based on implied forward rates, a measure that may not be exactly the same as market expectations of the future repo rate, due, among other things, to maturity premiums, but that nevertheless are a reasonable approximation. It doesn't really matter that much whether one chooses to condition the forecast on implied forward rates, surveys that attempt to give a more direct reading of market expectations, or some other fairly reasonable assumption about future monetary policy. We have chosen, however, to use implied forward rates, since this is a relatively

4 See, for example, Svensson, L., "Monetary Policy and Real Stabilization" in Rethinking Stabilization Policy, A Symposium Sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 29-31, 2002, 261-312.

5 The only exceptions were Inflation Report 2001:1 and 2001:2 when no such estimates were published, since market expectations largely coincided with the assumption of an unchanged repo rate.

simple way to get a fairly reasonable idea of future monetary policy. What is important to underline, though, is that the paths we publish on the basis of implied forward rates should not be taken as a sign of our own judgement of the future path of the repo rate. Experience also shows that the situation often changes so that the actual repo rate path turns out to be a different one than that implied by forward rates. Allow me also to stress that we intend as usual to present a forecast on the assumption of an unchanged repo rate in order to maintain continuity and transparency in our analysis.

Communication

One advantage of using implied forward rates is, as I just mentioned, that it becomes more meaningful to produce forecasts over a longer time frame. It also makes it easier to estimate and present scenarios that can illustrate some of the problems that we face. Allow me to considerer two different issues, both of which have come to the fore in recent years, and thereby show how our developed methods can be used to improve primarily our communication but also our own understanding of the problems we have to address.

The first relates to situations when there have been particular shocks to the inflation outlook that we have judged to be of a temporary nature. Perhaps the best example of this is 2002 to 2003, when electricity prices suddenly began to rise to record-highs as a result of lower water levels in Sweden and Norway as well as colder weather than usual. There was reason to believe that the electricity prices would fall back and that this would then also have a marked impact on inflation. We thus followed the strategy that we had established in our clarification from 1999, and explained that policy should disregard the temporary effects of the fluctuations in electricity prices. On this particular occasion it was appropriate to calculate an alternative measure of inflation, UND1X excluding energy, and this measure was therefore used as a basis for policy.

Figure 4 gives a fairly good idea of the nature of the decision facing us. Inflation was driven up at the start of 2003, when electricity prices rose, and then fell again during the latter half of 2003 and 2004 when the rise in electricity prices dropped out of the inflation data. If we instead look at UND1X excluding energy the picture is considerably less dramatic. When we looked ahead to forecast developments the picture also proved very different depending on whether we focused on UND1X or on the same measure excluding energy prices. That the outcome for UND1X excluding energy didn't turn out exactly as we expected is a different matter, attributable to imported inflation turning out lower and productivity proving higher than anticipated. However, that doesn't take away from the fact that we essentially made the right assessment about electricity price developments.

This problem could also have been described with a forecast of inflation in a longer time frame. Let me illustrate this line of thought with a stylized example (see Figure 5). The developments in energy prices were expected to contribute first to inflation being above target and then to the expectation that it would be clearly below target 1-2 years ahead. If we look at UND1X excluding energy prices this measure was projected to be roughly in line with the target over the entire forecast period. With a forecast that only extends over the first two years it is not evident that inflation will gradually return to being in line with the target. One possibility then is to show a measure that excludes the energy prices and on the basis of this measure explain why the Bank does not want to counter the shock. Another is to extend the forecast horizon somewhat. That illustrates more clearly that the fluctuations are not expected to have a lasting effect on inflation.

There is reason to underscore that this way of working, where we extend the time horizon, does not of course mean that we can escape the truly difficult question: is the rise or fall in inflation temporary and what is the conclusion for monetary policy? But the point is that once you have put your foot down on this issue you can presumably sometimes explain your conclusions more clearly if you describe how you expect the situation to develop in the longer run.

The other issue has to do with how alternative interest rate paths can be used to illustrate the choices facing monetary policy. Let me use the Riksbank's interest rate decision in December 2004 as an example. On that occasion we left the rate unchanged despite the fact that inflation was forecast to be below our target of 2 per cent during the greater part of the next two years. With inflation forecast to be so low during such a large part of the forecast period it would have been possible to justify a further rate cut. But there were also arguments in the opposite direction. The most important was that demand was already growing markedly faster than the economy was deemed capable of sustaining in the long run. The vigorous growth was anticipated to continue and so it wasn't weak demand that was causing the low inflation. Instead, the low inflation was being caused by unexpectedly high productivity

and unexpectedly low price increases for imported goods, something that in itself could be expected to further stimulate growth in the period ahead. An additional factor was that the repo rate was already at an unusually low level, which could partly explain the increase in households' debt burden and the continued rise in housing prices. Even though debt levels were not deemed to be a threat to financial stability, another rate cut could have further fuelled house price inflation and indebtedness. That in turn could have given rise to future problems when monetary policy eventually would most likely have to be tightened. None of these arguments in themselves were the key factor in deciding to leave the repo rate unchanged, but taken together they indicated nevertheless the need for a certain measure of caution.

In this kind of situation it can be interesting to consider how different future paths for the interest rate can be expected to affect both the real economy and inflation. Figure 6 shows resource utilisation in two different cases: one based on an unchanged repo rate and another on the implied forward rates that applied during the autumn. At that time the implied forward rates were indicating that the repo rate would be raised very shortly and that it would then rise to levels around 4.5 per cent in the longer term. Resource utilisation picks up in both cases, turning positive after about a year. But if the repo rate is raised according to the implied forward rate at the time, resource utilisation drops, turning negative again during 2007, whereas it remains positive throughout the whole period covered by the example if the rate is held constant. The situation also differs somewhat between the two alternatives when it comes to inflation (see Figure 7). With last autumn's implied forward rate, inflation never reaches the inflation target, while, with an unchanged repo rate, it can be expected to overshoot the target just beyond the traditional two-year horizon.

What this example illustrates is that an unchanged repo rate entailed a continued rise in resource utilisation, which in turn drove up inflationary pressures beyond the two-year horizon. At the same time, the forecast based on the market's assessment of the future repo rate shows that there didn't have to be any hurry to begin to hike rates. A repo rate path consistent with implied forward rates led in this example to inflation never reaching the target.

Examples like this can of course never give an exact answer to when the repo rate should be adjusted. What they can do is increase our understanding about the consequences of different options. In this case they can help us to narrow down a number of reasonable scenarios for policy a few quarters ahead. And in this particular example an unchanged repo rate was certainly one such reasonable option for a period.

Allow me for safety's sake to emphasise that the conclusions for monetary policy of both the alternative forecasts – the Inflation Report's usual main scenario and the estimates based on implied forward rates – can generally be expected to be the same. Regardless of whether we reason on the basis of the simple policy rule, which relates the forecast of inflation one to two years ahead – under the assumption that the repo rate is held constant – to the current decision, or whether we study forecasts based on implied forward rates, for example, we can reach the conclusion that it was reasonable to leave the repo rate unchanged in December and that the repo rate sooner or later will need to be raised. The point is that paths derived from different interest rate assumptions make it possible to some degree to quantify and weigh up various monetary policy options against each other.

So, to sum up it is easy to see that the monetary policy communication can be made easier in various ways if the forecast horizon is extended. The new methods that have been developed can also facilitate the creation of alternative scenarios to more clearly understand and communicate the considerations facing the Bank.

Conducting monetary policy

I should like to conclude by mentioning a third perspective. This does not concern methodology for forecasting, or how monetary policy is communicated, but how policy is actually conducted.

From time to time the view is expressed in the general debate that monetary policy should be conducted in a more "pragmatic" manner, more like the Federal Reserve in the United States. It is not always easy to understand exactly what this entails, but one thought appears to be that the Riksbank has in some way bound itself too tightly to the framework that we and many other inflation-targeting countries abide by. Even though, when looking back over the past ten years of monetary policy, I cannot see any situation where we have been curbed by our analytical framework and thereby made some tangible error in our policy, I believe this issue is worth discussing.

Let me just take this opportunity to note that my impression is that there has been a convergence process within the central bank world. Countries that have conducted a more ”pragmatic” policy like that in the United States, which is less governed by clearly-described principles have been working on making more information publicly available and establishing a clearer framework for their policy. At the same time, inflation-targeting countries have been discussing in greater depth the various problems that sometimes prevent policy from following the simplest principles.

The Riksbank’s approach to new monetary policy issues or problems is, as has been pointed out earlier, that we keep to a relatively well-specified framework. This is our starting point when considering the monetary policy stance to be taken. If, for instance, we wish to deviate from the usual policy rule, we can do so, but we then make the requirement of ourselves that we can motivate this on the basis of the framework we use and the flexibility we apply. It is difficult to see any reason to change this system. In my opinion, it has served us well and forced us to improve our thinking with regard to tackling the various problems that arise.

The new analysis and forecasting methods do not change the framework for our monetary policy. We still have the same target, the same ambition to achieve this target in two years and the same arguments for taking real developments into account when deciding the details of the policy. However, we now have new data on which to base our decisions and new opportunities for communicating them.

Conclusion

Let me try to summarise my message here. I believe that most people agree that inflation-targeting has worked well on the whole. We know that since inflation-targeting was introduced, Sweden has gone from being a high-inflation economy to an economy with low inflation and stable wage increases. The lower inflation rate has not led to weaker output growth; GDP growth has on average been higher under the new regime. It also appears that, if anything, the real stability of the economy has improved.

Nevertheless, there is always good reason to consider how monetary policy can be developed and improved. To this end, I have discussed how the Riksbank’s monetary policy work can be developed.

This has included what could be termed technical improvements; for instance, greater use of other assumptions than an unchanged repo rate and an extended forecast horizon when producing and presenting data. The advantage of using, for example, implied forward rates as a basis is that they can often be a more realistic assumption than an unchanged interest rate. This can in turn allow more and better alternative scenarios, which can illustrate different aspects of monetary policy including the consequences for inflation and resource utilisation over a longer time horizon.

It has also included the Riksbank’s communication. Working with a longer time horizon provides a better overview of the effects of temporary influences on inflation. Scenarios containing different assumptions regarding the repo rate and using a longer time horizon can also contribute to a clearer illustration of the considerations monetary policy has to take into account with regard to balancing inflation against real economic aspects. I have also discussed this.

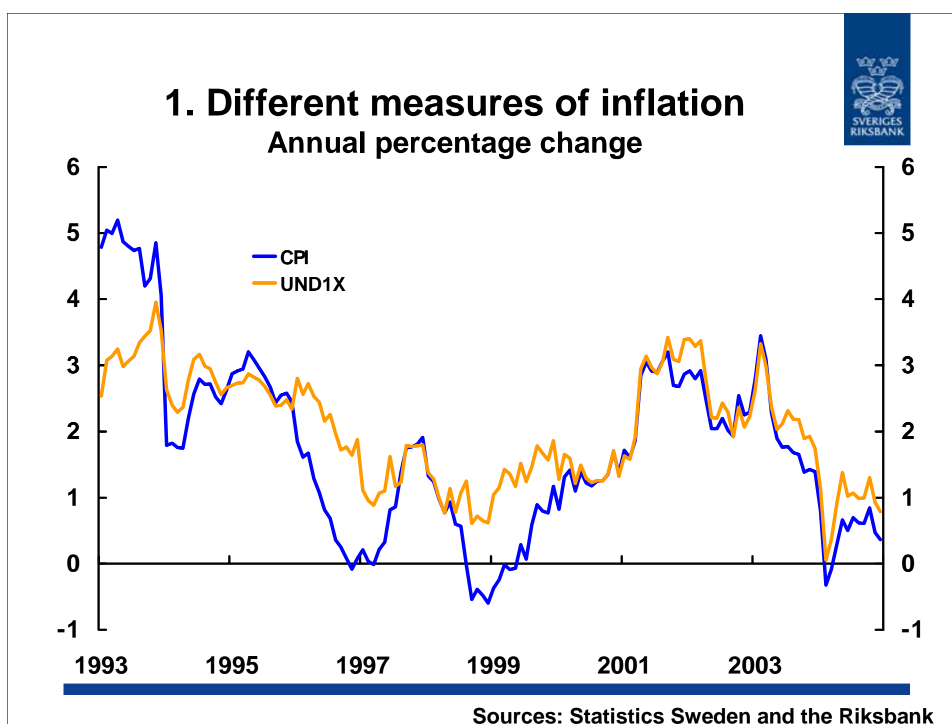
The primary advantage of supplementing the assumption of an unchanged repo rate with alternative interest rate paths and making longer-term forecasts is that it makes it easier to explain the monetary policy message. The simple policy rule – which involves interest rate decisions being based on inflation normally being returned to the target one to two years ahead – will continue to provide a good guide to our actions. The guidelines in the clarification from 1999 will thus continue to form the basis of our monetary policy. When the decisions need to take account of other information than that significant for inflation one to two years ahead, the new working method should make it easier to understand how this is done.

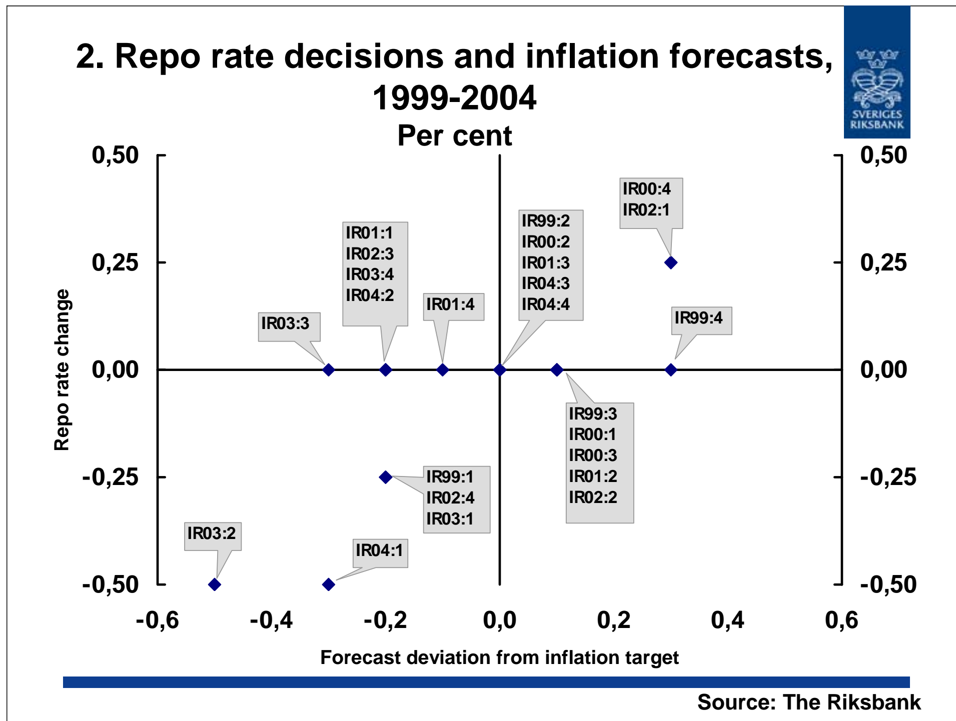
Discussing an entire interest rate path can also create the conditions for a more balanced discussion of monetary policy. This can involve when we intend to change our monetary policy stance and how quickly we should proceed. What will happen if we wait a while before changing the interest rate? This type of consideration is probably more important than detailed discussions about tenths of a percentage point in a forecast.

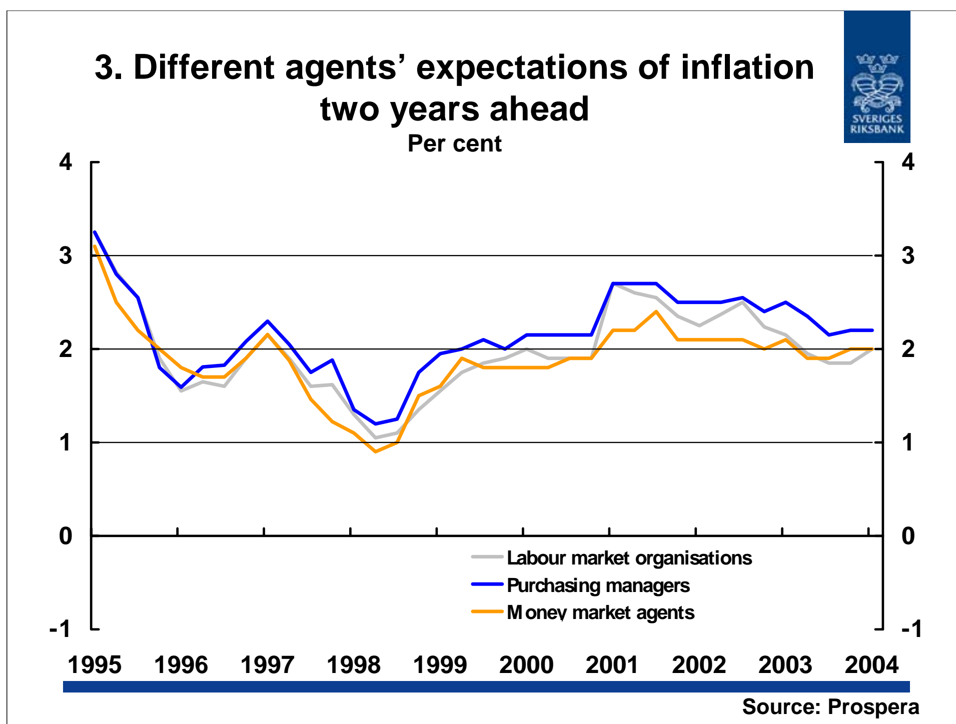
In conclusion, I have also mentioned the fundamental framework that governs monetary policy. This is mainly because it is sometimes claimed in the general debate that the Riksbank and other inflation-targeting countries have bound themselves too tightly to a particular model and that a more “pragmatic” policy system would give better results. My conclusion is that our method of working is

sufficiently flexible to manage the necessary balance. As I see it, there are major advantages to a system like ours, with a clear target, publication of the background data, a policy rule, etc. It provides our activities with stability, both at the staff level and in the Executive Board's discussions and communications. We are also forced to systematically examine all new ideas and issues that arise against the framework we apply, which has proved an intellectually fruitful exercise.

However, what I have tried to show here is that the methods we now use can sometimes enable us to produce more interesting data for monetary policy and to describe our considerations in a more pedagogical manner. They can make it easier to demonstrate the flexibility of the inflation-targeting regime we work with. Whether this will then have an impact on the monetary policy debate in Sweden, and ultimately on the policy conducted, is a very difficult question that only the future can answer. One consolation for those who wish for an answer is that they can form an opinion of how the Executive Board develops its view of monetary policy through the Inflation Reports, speeches and the minutes of the monetary policy meetings published.

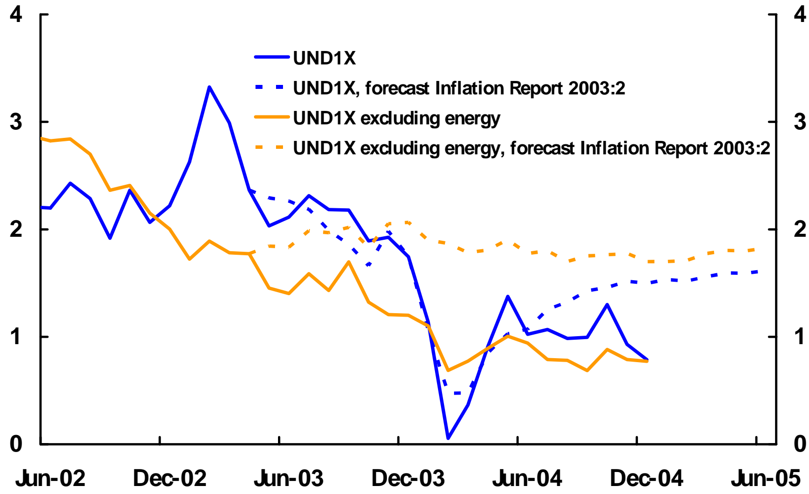



2. Repo rate decisions and inflation forecasts, 1999-2004
Per cent
SVERIGES RIKSBANK
Repo rate change
0,50
0,25
0,00
-0,25
-0,50
-0,6
-0,4
-0,2
0,0
0,2
0,4
0,6
IR00:4
IR02:1
IR99:2
IR00:2
IR01:3
IR04:3
IR04:4
IR01:1
IR02:3
IR03:4
IR04:2
IR01:4
IR03:3
IR99:4
IR99:3
IR00:1
IR00:3
IR01:2
IR02:2
IR99:1
IR02:4
IR03:1
IR03:2
IR04:1
Forecast deviation from inflation target
Source: The Riksbank


3. Different agents' expectations of inflation two years ahead
Per cent
SVERIGES RIKSBANK
4
3
2
1
0
-1
Labour market organisations
Purchasing managers
Money market agents
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Source: Prospera

4. Inflation with and without energy prices

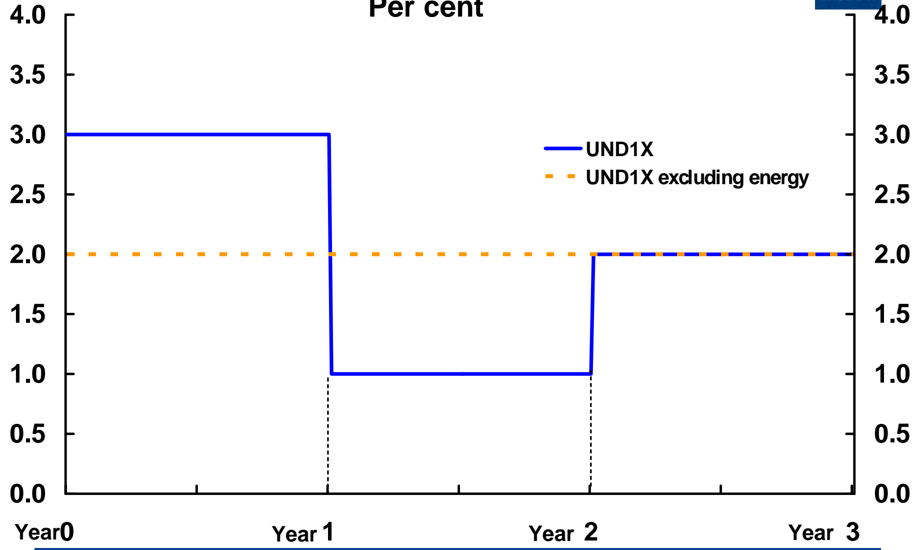
Annual percentage change



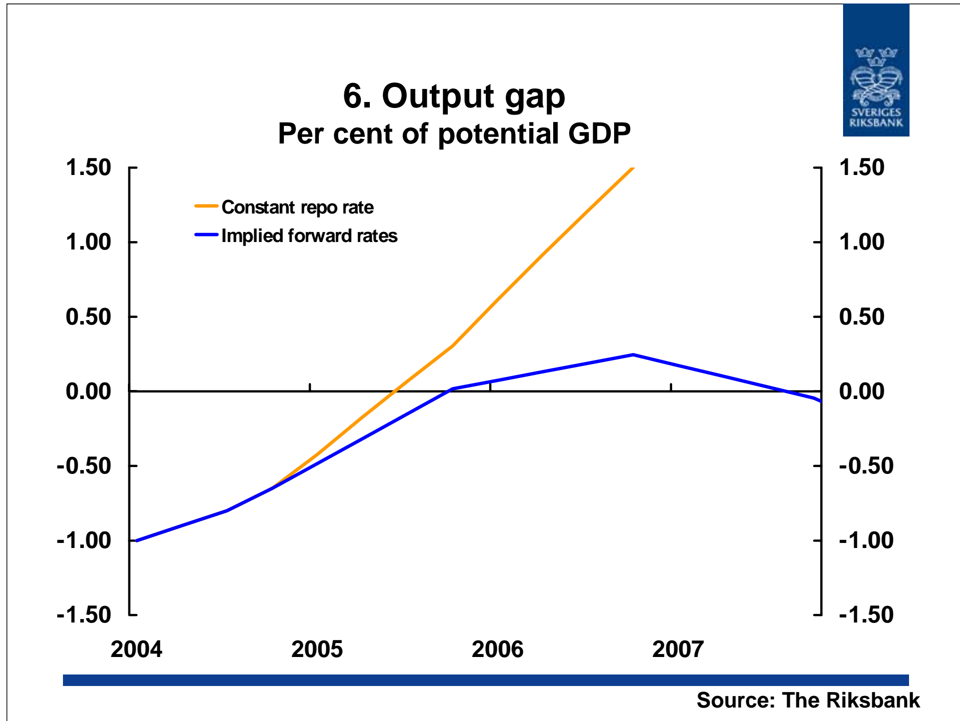
Sources: Statistics Sweden and the Riksbank

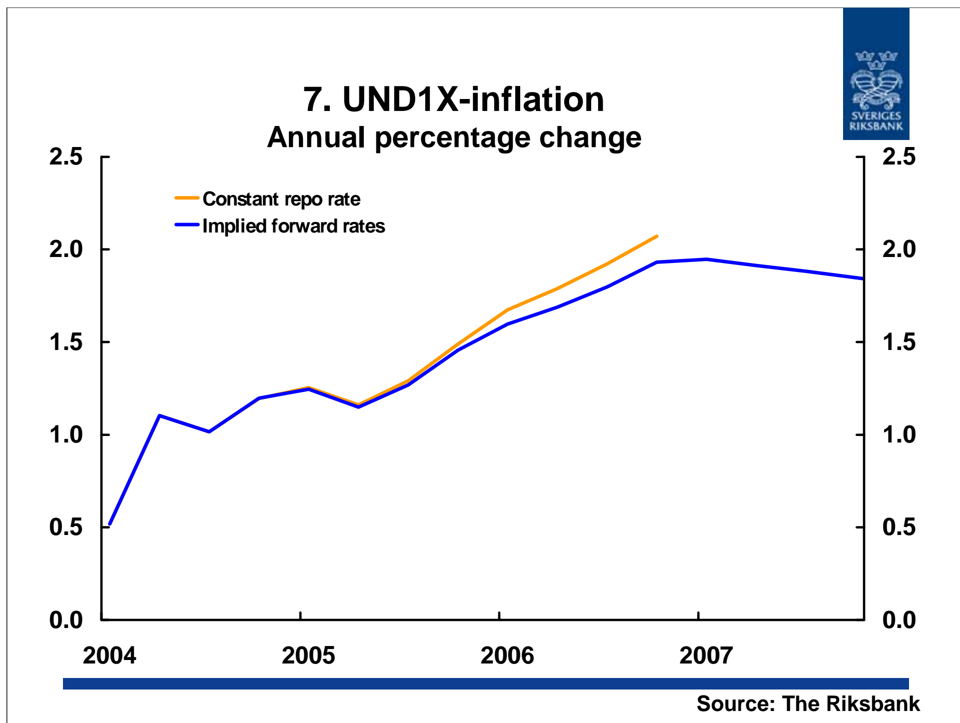
5. A schematic outline of inflation developments with and without energy prices

Per cent



Source: The Riksbank


6. Output gap
Per cent of potential GDP
Constant repo rate
Implied forward rates
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
2004
2005
2006
2007
Source: The Riksbank
SVERIGES RIKSBANK


7. UND1X-inflation
Annual percentage change
Constant repo rate
Implied forward rates
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
Source: The Riksbank
SVERIGES RIKSBANK