The art of targeting inflation

BY LARS HEIKENSTEN AND ANDERS VREDIN
Lars Heikensten is First Deputy Governor and Anders Vredin is Head of the Research Department.

Sveriges Riksbank – the Swedish central bank – is, by most accounts, the world's oldest central bank. Despite this status, the institutional structure of the Riksbank must certainly rank among the world's newest. In late 1998, the Swedish parliament, or Riksdag, approved changes to the Riksbank Act that not only significantly altered the organisation of the central bank and its relationship to the rest of government, but also formalised objectives representing a decade-long evolution towards an inflation-targeting regime. Although low inflation has been the primary objective for Swedish monetary policy since 1993, it was not until 1999 that a price stability objective was implemented as the law of the land.

During most of the 20th century, Swedish monetary policy had been governed by the objective of keeping the value of the domestic currency fixed in terms of foreign currencies (the nominal exchange rate). In the new regime, with an explicit inflation target and a floating exchange rate, the Riksbank had to formulate new principles for monetary policy. The Riksbank had to reorganise and reformulate its ways of monitoring macroeconomic developments and implementing monetary policy. In particular, credibility for the new low inflation target had to be established in the market as well as among the public at large. Earlier, the Riksbank had adjusted its short-term borrowing rate for private banks in response to currency flows, so as

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This paper has been written as a contribution to a collection of similar papers from other central banks, the initiative being taken by David Altig at the Federal Reserve Bank of Cleveland. The speech by Meyer (1998) has been a source of inspiration. Comments from David Altig, Martin Andersson, Claes Berg, John Carlson, Petra Geraats, Marianne Nessén, Torsten Persson, Eva Srejber and Lars Svensson are gratefully acknowledged.

to keep the exchange rate stable and to protect the foreign exchange reserves. In the new regime, and given that inflation cannot be controlled exactly in the short run, interest rate changes were instead motivated by the goal of achieving the inflation target in a medium-run or average sense, and by maintaining the public's confidence in such a strategy.

The new strategy developed gradually, in response to practical experiences both in Sweden and in other inflation-targeting countries.

How was the Riksbank to keep track of the development of inflation? How was it to determine when short-term interest rates should be changed and by how much? How should the Riksbank communicate its new strategy to the public in general and to financial markets in particular? The new strategy developed gradually, in response to practical experiences both in Sweden and in other inflation-targeting countries – specifically the Bank of Canada, the Reserve Bank of New Zealand, the Reserve Bank of Australia, and, in particular during recent years, the Bank of England – and to academic research about inflation targeting.

Monetary policy strategies defined as inflation-targeting regimes have certain characteristic features.[1] *Firstly*, this policy has been associated with a desire to formulate explicit and increasingly precise objectives for monetary policy, in particular numerical inflation targets. *Secondly*, steps have been taken to create an institutional setting that makes the central bank strongly committed to its objectives. *Thirdly*, the inflation-targeting central banks have developed particular decision-making processes, where inflation forecasts play a very important role. A key word in this context is transparency. An explicit objective renders policy more transparent, because it makes it easier for the public to understand the central bank's actions. An explicit objective also makes it easier to evaluate monetary policy and hold the central bank accountable for its decisions. This, in turn, both strengthens the commitment to the target and gives the central bank incentives to be transparent, so that policy actions can be evaluated on the basis of all relevant information. Finally, transparency stimulates improvements to the central bank's internal preparatory work and decision-making processes, an aspect not discussed much in the literature but of great practical importance. For instance, publication of central banks' inflation forecasts will lead external experts to scrutinise both the forecasts as such, and the relation between forecasts and policy actions.

[1] Different economists make somewhat different interpretations of inflation targeting. Our list is consistent with, e.g., Svensson (1999, 2001).

In this paper we will describe monetary policy-making in Sweden today.[2] We will start by presenting the main features of the new legislation for the Riksbank that came into effect in 1999 and some of the steps that were taken prior to that. This sets the scene for a description of the mechanics of the policy process. Finally, we discuss some strategic problems the new regime has faced. We do believe that Sweden's inflation-targeting regime has been successful and has certain advantages over other ways of conducting monetary policy. But we also want to stress that inflation-targeting central banks are still struggling with many classic problems that central banks around the world find it difficult to deal with. The problems naturally become more obvious when monetary policy has an explicit target and is implemented under a high degree of transparency.

The Riksbank's independence

On 19 November 1992, Sveriges Riksbank abandoned its policy of pegging the value of the krona to a trade-weighted average of foreign currencies.

On 19 November 1992, Sveriges Riksbank abandoned its policy of pegging the value of the krona, the Swedish currency, to a trade-weighted average of foreign currencies. A new "nominal anchor" for monetary policy had to be defined. The krona had been repeatedly devalued since the middle of the 1970s and to continue with the unilaterally pegged exchange rate policy (even with some new target level) was not considered to be a realistic alternative, at least not for the moment. At the time, Sweden was not yet a member of the European Union (EU) and participation in the European system of pegged exchange rates, the Exchange Rate Mechanism (ERM), was not feasible in the near future. Neither were the experiences of money stock targeting in other countries encouraging. Furthermore, the financial system was in the midst of a deep crisis, which made the stability of money demand questionable and successful targeting of the money stock unrealistic.

On 15 January 1993 the Riksbank decided that from 1995 onwards there would be a target for Swedish inflation of 2 per cent per year.

In this environment, Sveriges Riksbank decided to declare, on 15 January 1993, that the flexible exchange rate policy would be combined with an explicit target for inflation. The decision was partly based on the recent positive experiences of such a strategy in other countries. Contacts with the Bank

[2] For discussions of the development of the Riksbank's approach to inflation targeting, see, e.g., Heikensten & Vredin (1998), Berg (1999) and Berg & Lindberg (2001).

of Canada had been particularly intensive and useful.[3] Specifically, the Riksbank decided that from 1995 onwards there would be a target for Swedish inflation of 2 per cent per year. The inflation target was defined in terms of the consumer price index (CPI). It was decided to have a transitional period, 1993–94, because large initial inflationary impulses were expected from the depreciation of the krona (around 20 per cent) and increases in indirect taxes. But it was also made clear that even after 1994 it was not to be expected that the inflation target would be fulfilled exactly. The target was accompanied by a "tolerance interval" of ±1 percentage point.

As this history unfolded, the independence of the Riksbank gradually increased. A higher degree of independence had already developed over time in response to the successful policy changes in other countries in the late 1970s and early 1980s and the negative experiences from "stagflation" in Sweden. One step, implemented in 1988, was the decision to make the Riksbank Governor's term in office longer (five years) than the election cycle (three years, at that time). A pattern that had become virtually automatic, whereby the Governing Board (Riksbanksfullmäktige) was chaired by an under-secretary of state from the Ministry of Finance, was also broken at that time. Another milestone was the government's explicit announcement in 1991 that low inflation was an overriding political goal.

The priority given to price stabilisation and the Riksbank's strong standing became apparent when the exchange rate was defended during the currency crises in 1992. Although this involved extremely high interest rates, the Riksbank's decisions had broad political support. In the very turbulent years 1991 to 1994 the objective of low inflation thus gave the Riksbank a strong say in economic policy matters, even to the extent that some outside observers got the impression that the Riksbank was more or less dictating policy.

The change to an inflation-targeting regime in early 1993 was not accompanied by any change in the legislative framework for the Riksbank.

The change to an inflation-targeting regime in early 1993 was not accompanied by any change in the legislative framework for the Riksbank. The decision to adopt an explicit inflation target was taken by the Riksbank's Governing Board. At that time, the Governing Board consisted of seven members elected by the Riksdag (the parliament), plus an eighth member, the Governor, appointed by the first seven. The new inflation-targeting regime thus had political support in the sense that it had been

[3] It is worth noting that Sweden also had positive experiences of price level targeting in the 1930s, see Berg & Jonung (1999). This, however, probably had very little influence on the decisions taken in 1992/93.

Table 1. Sweden's steps towards inflation targeting and central bank independence

1988	A new Riksbank Act: • The chairman of the Governing Board is no longer appointed by the government, but by the other seven members of the Board. • The Governor's term in office is made longer (five years) than that of the rest of the Board and the parliament (three years, at the time).
1991	The government declares that low inflation is an overriding goal for stabilization policy.
1992	The Riksbank abandons the pegged exchange rate policy in November, after repeated speculative attacks against the krona.
1993	January: The Riksbank declares an explicit inflation target. February: A parliamentary committee presents a proposal for a new Constitution and Riksbank Act, including a price stability objective for monetary policy and increased central bank independence. The proposal does not achieve enough political support and is not formally presented to the parliament. October: The first inflation report is published, as a report from the Riksbank's *Economics Department*.
1995	Sweden becomes a member of the European Union. The first Inflation Report signed by the *Governor* is published in November.
1997	The Riksbank starts to publish its inflation forecasts. The Riksbank starts to publish Financial Stability Reports. A new proposal for a price stability objective and increased central bank independence is presented, this time under broad political consensus.
1999	The new Constitution and amended Riksbank Act come into effect. Clarifications about the inflation-targeting strategy are published in the Riksbank's *Quarterly Review*.

decided by the Governing Board, in turn elected by the parliament. In reality, however, the issue was still controversial and a proposal by a government committee to legislate a price stability objective and also give the Riksbank more legal independence did not attract enough political support to be presented to the parliament in 1993. Legal reforms did eventually pass however and came into effect in 1999. Sweden's road to central bank independence is summarized in Table 1.

The price stability objective now has a strong legal foundation. The amended Riksbank Act states that the "objective of the Riksbank's operations shall be to maintain price stability".[4] Moreover, the Riksbank is now governed by an Executive Board (Direktion) with six members who are also full-time employees of the Bank – the Governor and five Deputy Governors. These are appointed by a General Council, which in turn is elected by the parliament and consists of eleven members. The six members of the Executive Board are appointed for six-year

[4] Both the earlier and the amended law also state that "In addition, the Riksbank shall promote a safe and efficient payment system".

terms, with overlapping mandates so that normally one appointment is made each year. Among its tasks, the General Council makes proposals to the Riksdag on the allocation of the profit of the Riksbank. The Chairman and the Vice-Chairman of the General Council have a right to participate in the Executive Board's meetings, and to ask questions, but do not have the right to make proposals or to vote. The Riksbank's organizational structure is depicted in Figure 1.

The operations of the Riksbank are thus managed by the Executive Board,

Figure 1. The Riksbank's organizational structure

GENERAL COUNCIL
- 11 members elected by parliament
- The Council appoints the members of the Executive Board
- Council members are not employees of the Bank

EXECUTIVE BOARD
- One Governor and five Deputy Governors
- The Governors are full-time employees
- The Executive Board manages the Bank, and makes decisions on interest rates

Preparatory Groups
- Chaired by Deputy Governors
- Prepare the Executive Board's decisions
- Members from various departments

DEPARTMENTS

All departments are organized directly below the Executive Board

- **Administration Department**
- **Financial Stability Department**
- **Market Operations Department**
- **Monetary Policy Department**

- Communications Department
- Internal Auditing Department
- International Department
- IT Department
- Research Department
- Risk Management Department
- Secretariat of the Executive Board

implying that the Bank has "instrumental independence" from its principal. A high degree of independence is secured in several ways that impede interference with central bank operations. The Constitution Act says that the "General Council may sever a member of the Executive Board from his appointment only if he no longer meets the requirements which are made on him to be able to carry out his duties or if he has been guilty of serious misconduct". The Riksbank Act states that "Members of the Executive Board may not seek nor take instructions when they are fulfilling their monetary policy duties".

Sweden had to make the Riksbank more independent in order to comply with the Maastricht Treaty.

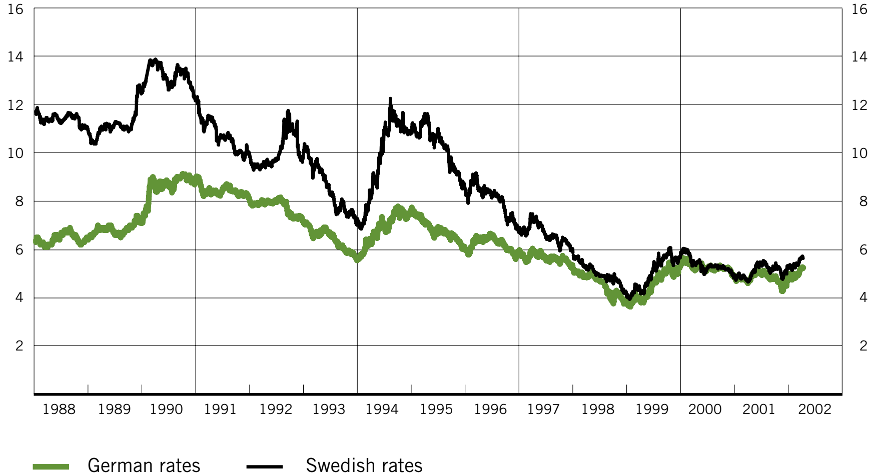
There were several reasons why the Riksbank was made more legally independent in 1999. Most important was perhaps that Sweden had to make the Riksbank more independent in order to comply with the Maastricht Treaty, which Sweden in effect had signed up to on becoming a member of the EU in 1995. Although Sweden has not adopted the euro and is therefore not a full participant in the EMU, there has been broad political support in Sweden for the idea that technical and practical preparations should be made for a possible future full membership.[5] Besides, the general idea that the central bank could be independent has gradually received more support in Swedish society. This is probably partly due to a favourable macroeconomic development. Inflation has remained low, while growth and employment have increased after the deep crisis in the early 1990s.

Greater openness and clarity in monetary policy seem to have improved the legitimacy of the Riksbank.

But the communication strategy chosen by the Riksbank has also been important. Greater openness and clarity in monetary policy seem to have improved the legitimacy of the institution, thereby strengthening the arguments for independence and weakening those against it. Attitudes to the Riksbank and its policy have improved substantially after record lows in the early 1990s. Most indicators show that the inflation target was credible well in advance of formal independence in 1999 (see Figures 2 and 3). The ten-year interest-rate differential relative to Germany decreased from around 4.5 percentage points in April 1995 to around 0.35 percentage points in December 1998, and the legislative changes had little concurrent effect on inflation expectations. In the surveys of public attitudes to the institution and its policy that the Riksbank has arranged

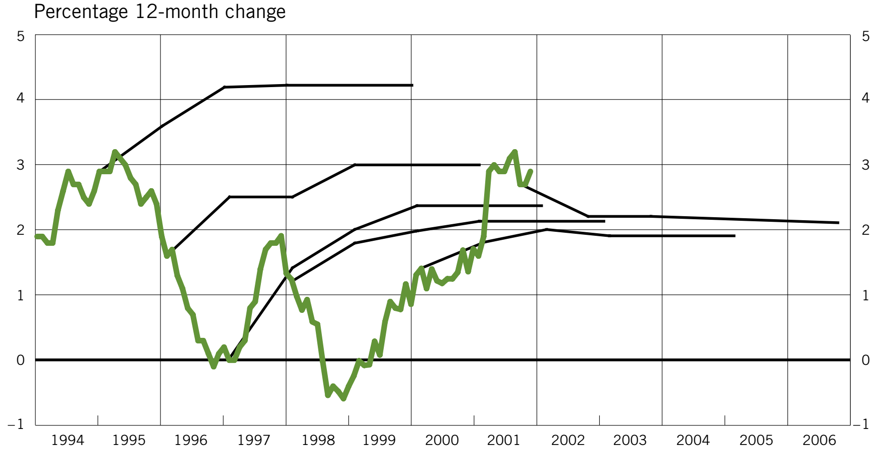
[5] The parliament's decision to make the Riksbank more independent was taken before the government's decision to postpone membership in the EMU. This timing was probably not co-incidental; legal independence for the Riksbank was viewed as useful to maintain credibility for the inflation target as long as Sweden is not a full member of the EMU.

Figure 2. Ten-year German and Swedish interest rates
Per cent



since 1996, 37 per cent of the population thought the Riksbank was credible in December 1996, while the corresponding figure in October 1998 was 49 per cent, followed by 55 per cent in September 1999. Asked whether the Riksbank had pursued an appropriate monetary policy, 50 per cent answered yes in December 1996, 57 per cent in October 1998 and 61 per cent in September 1999.

Figure 3. CPI and money market agents' inflation expectations
Percentage 12-month change



Sources: Prospera Research AB and Statistics Sweden.

Taken together, these observations suggest that the Riksbank's legitimacy has increased gradually, and that support for the institution was quite strong even before the amendments to the Riksbank Act. To make the Riksbank formally independent with an explicit price stability objective was for many reasons less controversial in 1999 than in 1993.

Since the Riksbank is free to formulate its inflation target, it has more "goal independence" than New Zealand and the United Kingdom.

In this context it is important to stress that central bank independence is more than a legal framework; neither is independence a one-dimensional concept, it is a matter of degree. The Riksbank is in most respects legally more independent than the Reserve Bank of New Zealand and the Bank of England. In New Zealand, the Reserve Bank is an agency under the government and the inflation target is determined in a contract between the government and the Reserve Bank's governor. In the U.K., the inflation target is given to the Bank of England by the government. Since the Riksbank is free to formulate its inflation target itself, it has more "goal independence". The Riksbank Act may of course be changed by the parliament, but in practice many political obstacles, especially the Maastricht Treaty, make this very unlikely. This Treaty also provides the legal foundation for the European Central Bank (ECB). Nevertheless, the ECB in reality probably has more independence than the Riksbank since it is even less likely that the EMU countries will agree to change the treaty than that Sweden will renege unilaterally. In addition, the fact that the EMU includes many countries and governments makes it more difficult to form strong political pressures against the ECB.[6]

The mechanics of the policy process

Around eight meetings of the Executive Board per year are devoted primarily to decisions on monetary policy.

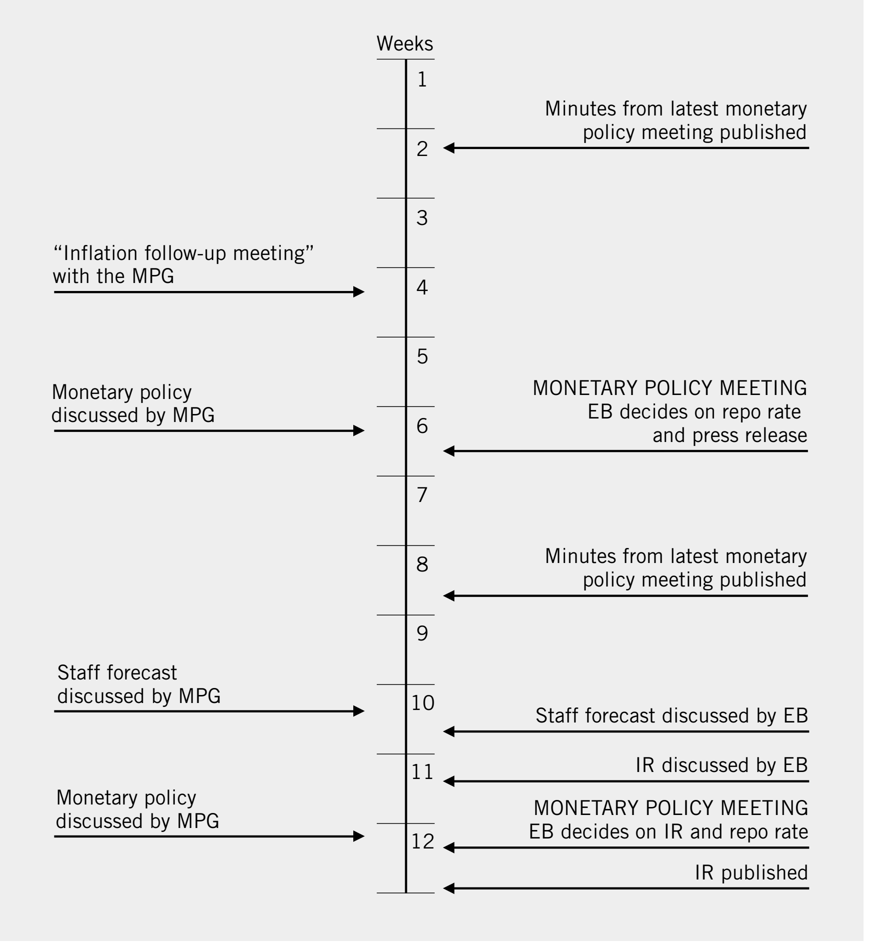
Since the Executive Board is collectively responsible for all the operations of the Riksbank, it has to meet frequently to take all kinds of decisions. Normally, this implies a meeting once a fortnight. Monetary policy is not on the agenda for most of these meetings but around eight meetings a year are devoted primarily to decisions on monetary policy. These special meetings are

[6] In terms of exchange rate policy (decisions to make interventions) the Riksbank appears to have more independence than both the Bank of England and the ECB. The Swedish government determines the exchange rate regime but once the regime has been decided, the Riksbank is responsible for exchange rate policy and can attempt to influence the exchange rate in a particular direction without having the government's approval.

announced four to six months in advance, and edited minutes of the meetings are published with a delay of around two weeks. Four of the special meetings on monetary policy coincide with publications of the Inflation Report. This means that the decision-making process during a year can be described in terms of four 12–13-week cycles, each ending with the publication of an Inflation Report and containing another monetary policy meeting halfway through. The process is presented schematically in Figure 4.

As noted in Figure 4, drafts of Inflation Reports are discussed a couple of

Figure 4. The Riksbank's monetary policy process



EB Executive Board
MPG Monetary Policy Group
IR Inflation Report

times by the Executive Board before the final Report is published. This means that, in addition to the pre-announced special meetings on monetary policy, issues relating to monetary policy may come up at a further eight or so meetings of the Executive Board. Events that threaten the inflation target and require immediate policy responses may of course also occur in between the eight pre-announced meetings. This was the case when the Riksbank joined other central banks in lowering the interest rate after the terrorist attacks in the United States in September 2001, and when interventions in the foreign exchange market were made in June the same year. The Executive Board has recently declared that it intends to be equally transparent about such unusual policy actions, not because this is required by law, but to promote credibility.[7]

In the rest of this section, we first describe the process leading up to the Executive Board's decision on monetary policy. Then we discuss the intricate issue of the roles of the different board members, in relation to each other as well as to the rest of the staff. Finally, we describe some characteristic features of the forecast-based monetary-policy strategy the Riksbank has chosen.

The preparation of monetary policy decisions

The description of the policy process in Figure 4 shows that the Executive Board's meetings on monetary policy are preceded by meetings of a Monetary Policy Group (MPG). This group is chaired by one of the Deputy Governors and meets roughly once a week. At these meetings the staff of professionals, primarily from the Monetary Policy Department, makes presentations on recent macroeconomic developments. The MPG's discussions are intended to assess the quality of the material and the line of reasoning that will subsequently be presented to the Executive Board.

The Executive Board's meetings on monetary policy are preceded by meetings of a Monetary Policy Group.

Although Executive Board decisions on Riksbank matters are made by the members collectively, there is a division of labour in the preparatory work. One Deputy Governor is thus responsible for preparing the decisions on monetary policy, another for preparing decisions related to financial stability, and yet others for preparing issues relating to research, administration, etc. The Deputy Governor in charge of preparing monetary policy decisions chairs the meetings of the

[7] New routines for foreign exchange market interventions have been decided after June 2001; see Heikensten & Borg (2002).

Monetary Policy Group (MPG) and also decides the Group's membership, the aim being to bring together the staff members who are expected to contribute most to the discussion of monetary policy matters.[8] Currently, the MPG includes the heads of the departments for Monetary Policy, Market Operations, Research, and International Affairs, as well as a few advisors and some other economists from the Monetary Policy Department. It should be stressed that the MPG also discusses issues other than the current macroeconomic situation and monetary policy. Since the group meets every week, it also has time for discussions of more methodological matters. The agenda for the MPG is set by its chairman together with the head of the Monetary Policy Department.

The discussions at the Executive Board's monetary policy meetings differ somewhat depending on whether or not they are held in connection with the publication of an Inflation Report. Here we shall describe the meetings that lead up to the publication of an Inflation Report and involve a monetary policy decision. For the intervening meetings the process is simpler but follows a similar stepwise pattern.

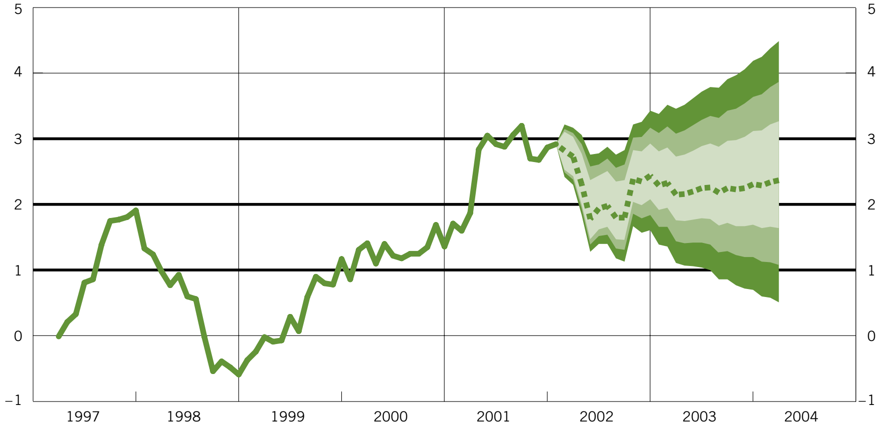
Two to three weeks before the publication of the Inflation Report the Board receives a forecast prepared by the Monetary Policy Department.

About two to three weeks before the publication of the Inflation Report the Board receives a forecast prepared by the Monetary Policy Department. On the basis of this, the Board forms its view of inflation two years ahead. Presentations supplementing written reports are given by the staff. Questions are asked and comments given by the Board members, and the discussion is usually quite lively.

The meeting follows a pre-set structure, starting with the international picture and moving on to financial market developments. The assumptions concerning interest rates and exchange rates receive special attention, partly because all forecasts are supposed to start from the technical assumption that the policy instrument will be unchanged. The discussion of Swedish inflation is more or less based on an expectations-augmented Phillips curve framework. Thus, supply and demand conditions in the Swedish economy are discussed along with various measures of the "output gap", and the picture of inflation is elaborated with inflation expectations and possible supply shocks. A decision on the forecast in the so-called main scenario is taken, followed by a discussion of the risks in the picture.

[8] As noted in Figure 1 (page 10), there are other preparatory groups than MPG, dealing with other kinds of policies by the Board than monetary policy (international issues, financial stability, research, administration).

Figure 5. CPI forecasts with uncertainty intervals
Percentage 12-month change



Note. The uncertainty intervals show the 50, 75 and 90 per cent chances of CPI inflation being within the respective range. The dotted line represents the main scenario's forecast; the horizontal lines at 1, 2 and 3 per cent are the Riksbank´s inflation target and the tolerance interval for the annual change in the CPI.

Sources: Statistics Sweden and the Riksbank.

Finally, forecasts including various risk scenarios are produced, and later presented in the form of a fan chart that provides a sense of the range of uncertainty associated with the projections (see Figure 5).[9]

On the basis of the discussions, the staff compile a draft of the Inflation Report that is sent to the Board for discussion one week later.

These discussions take about 11/2 to 3 hours. Already at this stage it is usually fairly clear how the members of the Executive Board view the situation and what they are likely to think about the setting of policy instruments a few weeks later. Members who do not think they will go along with the main thrust of the description of macroeconomic conditions will also normally indicate that at this time. On the basis of the conclusions from the discussions, a draft of the Inflation Report is written by the staff in consultations with the responsible Deputy Governor and sent to the Board for discussion one week later. At this meeting the Board thoroughly reviews the texts and finalises them.

[9] See Blix & Sellin (1998, 1999) for a description of a method that can be used to construct uncertainty intervals based on sector experts' judgements.

Setting the interest rate

After another week, the meeting for setting the instrumental rate is held.

After another week, the meeting for setting the instrumental rate is held. The starting point for this meeting is the by now completed Inflation Report. The members of the Board are presented with any new information since the previous week's meeting and are asked if they can approve the Report. In recent years all the members have usually agreed on the overall picture but there have been a few instances of dissent. Against this background, the setting of the policy rate is then discussed.

The Riksbank's policy instrument is the interest rate on one-week repurchase agreements with the private banks. Repurchase agreements are made every week, i.e., more frequently than the Executive Board's decisions on monetary policy, but it is only as a result of decisions by the Board that the repo rate is changed. Before the repo rate is announced, usually on Tuesdays at 9.30 a.m., the Riksbank makes a forecast of the banks' borrowing needs for the coming week. The announcement of the repo rate is thus associated with an announcement of the planned total size of the repurchase agreement. The total amount is allocated between the Riksbank's counterparties (the primary dealers) in proportion to their bids. The result is announced one hour after the first announcement (usually Tuesdays at 10.30 a.m.) and the banks receive the liquidity the day after.[10]

If there were major errors in the Riksbank's forecast of the banks' borrowing needs, the overnight interest rate could become quite volatile. In practice, in order to stabilise the overnight rate the Riksbank typically (but at its own discretion) makes loans to and accepts deposits from the banks at the going repo rate ±10 basis points. The Riksbank thus has an almost horizontal supply curve for liquidity at the intended repo rate.

At each monetary policy meeting, the prospects for inflation are assessed and the Board decides whether the repo rate should be changed.

The Riksbank's monetary policy may thus be described in terms of two stages. In the very short run, between the Board's monetary policy meetings (usually a period not longer than six weeks), the Riksbank supplies the money that is demanded at its set one-week rate. At each monetary policy meeting, the prospects for inflation are assessed and the Board decides whether the repo rate should be changed.

A monetary policy meeting starts with a summary of the MPG's view on interest rate policy, presented by the Deputy Governor who chairs the MPG and is

[10] For further discussions of the Riksbank's interest rate policy, see Mitlid & Vesterlund (2001).

responsible for preparing monetary policy decisions. The MPG is not required to produce a unanimous recommendation, and there is no voting in that group. The purpose of the recommendations is primarily to give the Executive Board some ideas about the most relevant policy issues and options and to provide a good foundation for the subsequent discussion.[11]

The interest rate is set by a majority vote.

After all the members of the Executive Board have presented their assessment of the appropriate monetary policy action – the Governor usually chooses to be the last one to present his – there may be some discussion before the Board votes on the interest rate. The interest rate is set by a majority vote.[12] Any minority views are explicitly recorded in the minutes, as formal reservations against the majority decision.

Finally, each of the eight special monetary policy meetings ends with a decision on a press release explaining the Board's decision. This release, which has also been prepared by the MPG, summarises the Board's majority view and is thus not a consensus-based document summarising the discussion.[13] It is an important policy document, particularly when no press conference is held, as is normally the case when there is no new Inflation Report or a decision to change the instrumental rate.

The roles of the staff and the Board members

The Riksbank has decided to give the staff a prominent role in the process.

Setting up a policy process of this kind clearly raises many difficult questions.[14] One concerns the *role of the staff* relative to the Board. The Riksbank has, much like the US Fed, decided to give the staff a prominent role in the process. This is manifested in the right of the staff to present full and comprehensive forecasts without the direct prior involvement of any Board member. This is for example not the case in the Bank of England, where the Monetary Policy Committee itself puts together the forecast on the basis of various pieces and model results presented by the staff.

Moreover, the staff members participate in the meetings of the Riksbank's

[11] Even though more members of the Executive Board than the MPG's chairman may attend the group's meetings, they never participate when the MPG discusses policy recommendations.

[12] In principle, there may be six different alternative suggestions and no majority for any. In practice, however, the Board's discussions usually lead to the emergence of two alternatives.

[13] From time to time there have been complaints from market participants that the minutes convey different signals about future policy actions from those in the press release. This is hardly surprising in that the latter presents the *majority* view while the minutes reflect a discussion and include the views of *all* the participants.

[14] See Heikensten (2000) for a discussion of the arguments behind the present set-up for policy making.

Executive Board and may present their views. This is for example not the case in the ECB, where one of the Board members does the presentations without any staff in the room.

There are several reasons for the model chosen by the Riksbank. Giving the staff a strong role in making forecasts is motivating and educational, partly because it makes them better informed as to which issues the Executive Board is most concerned about. That in turn is likely to result in the staff taking more responsibility and making more relevant analyses and presentations in the future. It is also a way of broadening the competence of the staff and preparing them for possible future Board membership.

Core members of the MPG participate in Board meetings.

Another important issue concerns the *roles of the various Board members*. The policy-making process at the Riksbank is very open internally. The core members of the MPG participate in Board meetings, thereby ensuring that the presented material is in line with the MPG's discussions. Also, members of the Executive Board other than the MPG's chairman are invited to participate in most of the MPG's meetings. The idea behind these principles is twofold. First, to secure that the Board can base its final decision on several fairly independent views, and second to promote an environment in which the influence of the Executive Board members primarily reflects their background and familiarity with the policy issues, rather than their responsibilities in the Riksbank's organisation. Still, the Governor has a prominent role, both by virtue of his casting vote in all matters decided by the Executive Board and because he chairs the meetings and thus can influence how the discussions (and, perhaps, negotiations) are moving. The Deputy Governor responsible for monetary policy exerts an influence as chairman of the MPG and in that role proposing decisions on rates as well as preparing press releases. In the end, however, it is our impression that the influence of the various Board members primarily reflects their background, experience of and competence in the relevant subjects and issues at hand.

The forecast-based strategy

The Riksbank's monetary policy is often described in terms of a simple rule of thumb. The following quote is from the Inflation Report from October 1999:[15]

[15] Similar formulations have been expressed both before and after October 1999, and the first (but somewhat less precise) statement of the Riksbank's rule of thumb appeared in the Inflation Report from September 1997.

"if the overall picture of inflation prospects (based on an unchanged repo rate) indicates that in twelve to twenty-four months' time inflation will deviate from the target, then the repo rate should normally be adjusted accordingly."

Large parts of the staff's analysis and the policy discussions are thus focused on the forecasts of inflation one to two years ahead, although nowadays there is also a brief outlook three years ahead. There are various arguments for a forecast-based monetary policy. One has to do with the idea that as it takes time before monetary policy exerts its full impact on the economy, the central bank cannot control inflation perfectly in the short run. Another argument is that, even if it could, the central bank presumably would not want to keep inflation exactly on target all the time. By focusing on forecast inflation, monetary policy refrains from reacting to temporary fluctuations in inflation, and thereby avoids large fluctuations in nominal interest rates. The desirability of this form of interest rate smoothing is related to the question about whether monetary policy should pay any attention to other objectives than price stability, such as the stability of GDP, employment or financial markets.

Since the mid 1990s the Riksbank has explicitly declared that it is not a "strict" but a "flexible" inflation targeter.

In the early stages of the inflation-targeting regime the Riksbank did not publicly express any concerns about the real side of the economy. Since the mid 1990s, however, the Riksbank has explicitly declared that it is not a "strict" but a "flexible" inflation targeter (like most other central banks today). The horizon at which the Riksbank aims to meet its inflation target is therefore not independent of real economic developments, neither does the Riksbank want to counter all transitory changes in inflation. This policy also has legal support. In the preparatory documents on the Riksbank's independence it is said that the "Riksbank, as an agency under the Riksdag, should accordingly have an obligation to support the general economic policy objectives to the extent that these do not conflict with the price stability objective". The task of the Executive Board is thus to implement this notion of "flexible" inflation targeting.

There is of course no exact and mechanical forecast-based policy rule.[16] For instance, various measures of "core" or "underlying" inflation are used to distinguish transitory from permanent movements in the CPI, and such filtered inflation measures have at times been more decisive for monetary policy than CPI forecasts. From time to time monetary policy decisions have also been influenced,

[16] For some empirical estimates of the Riksbank's reaction function, see Jansson & Vredin (2001) and Berg, Jansson & Vredin (2002).

at least marginally, by financial market conditions that were not entirely reflected in actual or forecast inflation.[17]

The information the Inflation Reports provide about the Riksbank's policy decisions and forecasts enables the public to evaluate the Bank's actions.

It is obvious that an inflation-targeting, forecast-based monetary policy like this does not minimise the degree of discretion in monetary policy. At the same time, the discretion ary element of policy is limited by certain rules the Riksbank has decided to impose on itself. The Inflation Reports are very important in this context. They provide incentives to make careful analyses and they discipline the internal discussions (as described above). They also convey such information about the Riksbank's policy decisions and forecasts to the public, including the publication of the forecasts themselves, that the Bank's actions can be evaluated. The minutes from the Board meetings are also useful for such purposes.

The Riksbank's principal, the Swedish parliament or Riksdag, has good reasons to evaluate the actions of its independent central bank. However, even before the amended legislation was adopted in 1999, the Governor took an initiative for an open hearing about monetary policy before the Riksdag's Finance Committee. The amended Riksbank Act requires the Riksbank to hand over a written report on monetary policy to the Parliamentary Finance Committee at least twice a year. The Riksbank has chosen to use the Inflation Reports for this purpose and some Reports thus contain separate sections with the Riksbank's own evaluation of its policy. Each year (before 15 February), moreover, the Executive Board is also required by the Riksbank Act to submit a report to the Riksdag on the Riksbank's operations during the previous year.

Strategic issues in inflation targeting

The Riksbank has tried to pursue and explain its policy as simply and transparently as possible.

The principles behind Sweden's monetary policy and the mechanics of the policy process may seem rather simple. Indeed, the Riksbank has – like the other inflation-targeting central banks – deliberately tried to pursue and explain its policy as simply and transparently as possible. This form of monetary policy is now often viewed

[17] The best examples of this are the decisions taken during the global financial crisis in the fall of 1998 and after 11 September 2001.

as "international best practice" and other central banks have been recommended to follow the examples of their inflation-targeting colleagues.[18]

Nevertheless, important problems remain and are repeatedly discussed in the meetings of the MPG and the Executive Board. Many are classic problems of monetary policy and not associated with the inflation-targeting strategy as such, although they are perhaps easier to see in such a relatively transparent framework. For instance, questions about the implications of uncertainty and about the central bank's optimal response to asset price fluctuations (in particular, stock prices and exchange rates) have been re-investigated by policy makers and researchers within the inflation-targeting framework.[19] In the following we will however focus on certain issues that are more directly tied to the inflation-targeting approach and the Riksbank's policies: the definition of the inflation target, the nature of the Executive Board's collective decision-making, and the appropriate degree of transparency.

What should the inflation target be, and what deviations can be accepted?

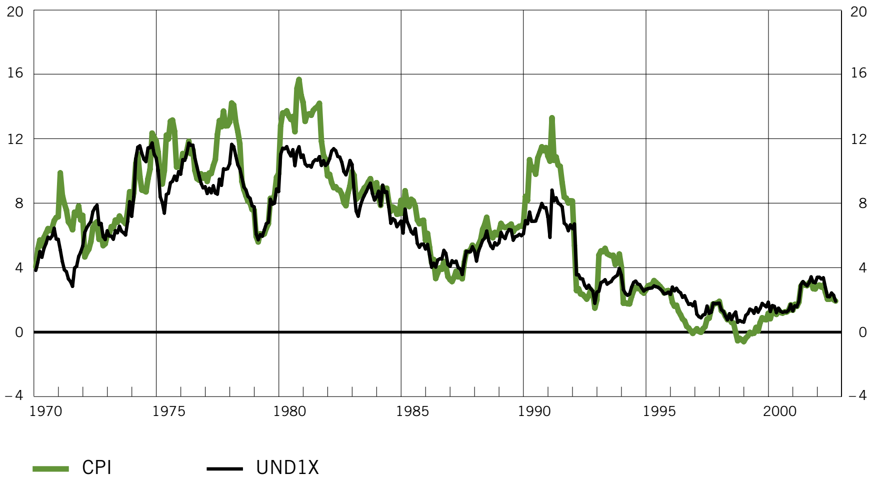
There is the question of which definition of inflation is most relevant from a monetary policy perspective.

The Riksbank's inflation target is defined in terms of the CPI. In addition to the appropriate level of the inflation target (which has been extensively discussed elsewhere), there is the question of which definition of inflation is most relevant from a monetary policy perspective. Many central banks use measures of "core" or "underlying" inflation in their analyses and rhetoric. The Riksbank has used a measure that excludes indirect taxes and subsidies as well as house mortgage interest payments. The rationale for this is most easily understood by referring to the Riksbank's experience from 1997 and 1998 (see Figure 6). At that time, CPI inflation was continuously below the target, despite large cuts in the repo rate during 1996. The Riksbank gradually understood that one property of the CPI may give rise to "perverse" short-run effects of monetary policy. When the repo rate is lowered as inflation prospects improve, this lowers house mortgage interest expenditure. Thus, a lower repo rate may initially lead to lower inflation, as measured by the CPI. This does not, of course, imply that higher inflation should be met by a more expansionary policy; over time (and

[18] See Svensson, et al. (2002).

[19] See Adolfson (2002) and Söderström (2001, 2002) for work on such issues that has been done at the Riksbank.

Figure 6. CPI and a measure of "core" inflation (UND1X)
Percentage 12-month change



Source: Statistics Sweden.

perhaps even in the short run) the "perverse" effects are presumably dominated by aggregate demand effects.[20]

Indirect taxes and subsidies also have CPI effects that are hard to handle for central banks. Changes in indirect taxes and subsidies lead to immediate changes in the price level, sometimes with small effects on future inflation. Since monetary policy can do little to counteract such price shocks in the short run, it has been argued that monetary policy should aim to stabilise inflation adjusted for those factors.

Other inflation-targeting countries have decided to formulate their inflation targets in terms of "core" or "underlying" inflation.

Other inflation-targeting countries have similar experiences and have decided to formulate their inflation targets – or at least explain their monetary policy decisions – in terms of measures of "core" or "underlying" inflation excluding interest payments and indirect taxes and subsidies. It should be stressed, however, that the theoretical basis for these measures is unclear.[21] Essentially, the problem with most measures of "core" or "underlying" inflation is that they exclude certain *categories of goods or services* from the CPI, whereas economic theory suggests that an optimal monetary policy should respond differently to dif-

[20] Theoretical explanations of the "prize puzzle" have been offered by, e.g., Altig et al. (2002) and Barth & Ramey (2000).

[21] For a theoretical analysis, see Nessén & Söderström (2001). Bryan, Cecchetti & Wiggins II (1997) also discuss how core inflation should be measured.

ferent *shocks* (which may affect the prices of many different goods and services). On the other hand, if the policy that would be optimal under ideal circumstances is not viewed as feasible in practice, the central bank may want to adhere to some simple and transparent rule for the relation between a certain inflation measure and the policy instrument. But commonly applied measures of "core" inflation do not seem to be justifiable on such grounds either.

The Riksbank has encountered several difficulties when it comes to implementing the idea of "core inflation targeting".

The Riksbank has encountered several difficulties when it comes to implementing the idea of "core inflation targeting" in practice. First, some government subsidies and charges are not defined as subsidies or indirect taxes in the CPI system, but still cause similar problems for monetary policy (the problems are not overcome just by focusing monetary policy on an index excluding subsidies and indirect taxes). For instance, during the year 2000 discussions within the Riksbank concerned the appropriate response to an expected country-wide cap on the charges for nursery care. Such a reform was expected to lead to a one-time drop in the CPI during 2002, but formally no direct subsidy was involved, since this service is financed and primarily supplied by local governments at non-market prices. Hence, both the CPI forecasts and the measures of "underlying" inflation suggested that inflation would be below the target two years ahead. It was still questionable whether the reform of the day nursery charges really justified lower interest rates.

A second problem with a monetary policy rule that focuses on any of the common measures of "core" or "underlying" inflation is that many supply and demand shocks give rise to large one-time effects on the price level and small persistent effects on inflation. Should monetary policy not counteract the inflationary effects of such shocks either, if it has been decided that changes in indirect taxes and subsidies warrant no reaction? This question has been very important during 2001 and 2002, when various supply shocks have raised prices of food and energy. Many central banks do attach considerable weight to measures of "core" inflation that exclude expenditures on food and energy. The risk with such an approach is that the central bank in effect stabilises the price of a consumption basket that excludes a large part of consumption expenditures.

Furthermore, computing the effects of any specific shock on any specific inflation measure is very difficult without a fairly sophisticated economic model. Measures of "core" inflation are usually intended to exclude the "direct" effects on CPI from certain price shocks, using the fixed weights in the CPI. Yet, it remains unclear if the effects measured in this way are what matter for monetary policy. For instance, changes in indirect taxes or oil prices may have general equilibrium effects on consumer prices that dominate the first-round effects (at least eventually). Neither economic theory nor practical experience provides any clear guidance on how monetary policy should respond to such shocks, but the idea that a certain price index would invariably yield an unambiguous signal about the optimal policy seems ill-founded.

The Riksbank has decided not to use one specific "core" index for all situations.

The Riksbank has decided not to use one specific "core" index for all situations. The intention instead is always to communicate exactly on what forecast or other grounds the interest rate decision has been based, what deviations from the target are acceptable in any given situation because of temporary supply shocks.[22] The most important instrument for this communication is the Inflation Report. The purpose of this transparency is to commit the Riksbank to a precise discussion of these matters, which probably improves our knowledge in the long run and makes it easier to evaluate monetary policy ex post. This strategy allows for discretionary policy but it still seems to be consistent with the type of flexible monetary policy rules advocated by some academic economists, for instance Taylor (1993).

The principle of forecast-based inflation targeting itself can also be viewed as a way of systematically handling the problems with short-term CPI fluctuations. If monetary policy is based on the forecast of inflation some quarters ahead, very temporary movements in inflation will be filtered out of the inflation numbers to which the central bank reacts.

Problems of collective decision-making

When the Swedish parliament amended the Riksbank Act in 1998 it was decided that a Board of six members would manage the Riksbank collectively, including the decisions on interest rates. This was in line with the structures in many other central banks within the EU, a fact which probably affected the decision. In the academic literature on monetary policy, however, the policy maker is usually a single individual. This means that actual policy-making raises a number of difficult and important issues that have not attracted much analytical attention.

As noted above, one characteristic feature of inflation targeting (in Sweden and elsewhere) is the desire to be transparent about the objectives of monetary

[22] The Riksbank's views on output stabilisation and CPI versus core inflation targeting have been expressed in more detail in the Inflation Reports and by Heikensten (1999), who presents and explains a formal decision on these issues taken by the newly elected Executive Board at its first meeting in January 1999.

policy and the policy-making process. To aid the Riksbank's new Executive Board in structuring its discussions and analyses and in forming a view on monetary policy and also communicating this view, in January 1999 the Board presented a suggested policy framework. This included several aspects from the existing set-up, such as the 2 per cent inflation target and the rule of thumb relating the repo rate to the inflation forecast at the 1 to 2-year horizon. The way temporary deviations from the target would be handled was spelt out more explicitly than before (see Heikensten (1999)). The Board unanimously agreed to these principles.

One characteristic feature of inflation targeting is the desire to be transparent about the objectives of monetary policy.

Minutes of the Board's monetary policy meetings are published. There have, of course, been differences of opinion in the Board that are documented in the minutes. (The minutes are edited, however, i.e., they are not transcripts.) When interpreting the minutes and the differences of opinion, one important question is whether the collective decision should be regarded as "preerence aggregation" or "information aggregation".[23] Mervyn King, among others, has stressed that the different views in a monetary policy committee should be the consequence not so much of members having different objectives ("preference "), but rather of their different views on what is a good or bad policy decision in a certain situation, given the objective of reaching the explicit target at a certain horizon ("information aggregation"). It is probably correct to say that one purpose of the explicit and rather detailed framework for policymaking applied by the Riksbank (and other central banks with explicit inflation targets) is to limit the room for disagreements due to different preferences about policy objectives. That is, there should be little room for systematic differences in opinion reflecting, for example, Board members being "hawks" or "doves".

One purpose of the framework for policy making is to limit the room for disagreements due to different preferences about policy objectives.

As a reading of the published minutes will show, differences of opinion within the Riksbank's Executive Board have indeed most frequently reflected minor differences in the Board members' forecasts. From time to time there has also been some disagreement on more fundamental relationships: the effect on inflation from capacity utilisation; the persistence of shocks to the nominal exchange rate; the proper interpretation of various indicators of inflation expectations; the optimal target horizon; and the optimal response to fluctuations in financial markets

[23] We are grateful to Torsten Persson for emphasising this distinction.

(monetary aggregates and equity prices). In this sense, the Board's discussions have concerned "information aggregation".

One obvious reason behind the six-member Board is that the parliament wanted to secure a broad representation of Swedish society in the monetary policy process.

However, against the background of earlier controversies about the independence issue, one fairly obvious reason behind the six-member Board is that the parliament wanted to secure a broad representation of Swedish society in the monetary policy process.[24] Different parameters in an implicit loss function (including output and inflation stabilisation) do seem to have played a role in the Swedish case. Besides, the willingness to pursue an activist policy, i.e., the preference for interest rate smoothing, appears to have differed somewhat across Board members. Thus, some members appear to have been more "hawkish" than others over this period. That is, the Board's monetary policy meetings are partly about "preference aggregation". It should be emphasised, however, that the pattern in these respects is far from clear; the time horizon is short and it is too early to draw any firm conclusions. In principle, the hypothesis that individual Board members have the same preferences could be tested, for instance by researchers outside the Riksbank, if the minutes provide sufficiently detailed information about policy decisions (and over a sufficiently long period).

Although questions about "information aggregation" versus "preference aggregation" have never been explicitly addressed during the Board meetings, the difficult problem of how to construct a joint forecast has of course had to be dealt with. With individual accountability of the kind the Riksbank cultivates, it might not have been surprising to get six different forecasts. In practice, however, the divergence between members has been rather small. Members have tried to arrive at a common view in the monetary policy meetings on the basis of the forecast presented by the staff. The Riksbank decided in 1999 to vote on the Inflation Reports and to open up for dissenting views. Dissent has been recorded only when differences of opinion concerning the forecast of inflation have been sufficiently significant to motivate a different view on interest rates. It may be worth noting that in this respect the Riksbank's Executive Board works somewhat differently from the Bank of England's Monetary Policy Committee, where the Inflation Re-

[24] Another argument that supports this hypothesis is that it was clear from the start that a management structure of this kind is unlikely to be the most efficient for taking decisions on other kinds of issues than monetary policy, e.g., regarding organisational questions and corporate culture.

ports are consensus documents covering the views of all members.[25] The fact that the Riksbank's Inflation Reports contain a coherent forecast from a majority of the Executive Board has simplified communication with the outside world.

Another difficult task is to form a common view on the almost unlimited number of possible risk scenarios and the nature of the uncertainty surrounding the inflation forecasts. These Board discussions are now based both on a "top down" approach, starting with descriptions of various conceivable scenarios, often also presented in figures by the staff, and a "bottom up" analysis beginning with the uncertainty surrounding the variables that currently seem most important. A table prepared by the staff, indicating the probability of alternative outcomes for some of the more important variables in the forecast and the role these variables play for the final outcome, is presented as a complement to the published fan charts (see Table 2).[26] The Board discusses both the alternative outcomes and their probabilities, and decides on a distribution of inflationary outcomes using both such tables and fan charts.

Table 2. Scenarios and probabilities
Per cent

Scenario	Inflation forecast two years ahead	Deviation from two years ahead	Probability	Contribution to difference between mode and mean forecast two years ahead
Main scenario (mode)	2.2	0.0	65	0.00
Scenario 1	2.0	–0.2	10	–0.02
Scenario 2	2.3	0.2	10	0.02
Scenario 3	2.8	0.6	15	0.09
Sum			100	0.10

Scenario 1: Lower consumption in the U.S. and stagflation in Europe
Scenario 2: Higher consumption in the U.S.
Scenario 3: Higher domestic inflation pressure

How transparent can we be?

Most initiatives towards increased transparency have been taken by the Riksbank itself.

During the last decade, several central banks have become much more transparent about their objectives and policy processes. With increased focus on monetary policy after the shift in paradigm during the 1980s, and hence increased central bank independence, it has been necessary for politicians and the general public to be able to

[25] For instance, in the Bank of England's Inflation Reports "the fan charts represent the MPC's best collective judgment".

[26] Figure 5 shows that the distribution around the inflation forecast is skewed such that there is a higher probability of inflation above the main scenario (the mode of the forecast distribution) than below. Table 2 shows how such a situation could arise.

hold the central bank more openly accountable for its policies. In this situation, it has also been in the central banks' own interest to provide as good information as possible. In Sweden, most initiatives towards increased transparency have been taken by the Riksbank itself. One reason for this is that transparency has been important not only for improving the Bank's external communication and reputation, but also for raising the quality of the internal work – all important arguments made internally have to be explained externally. Central bank transparency is thus a good thing, and one may conclude that the more transparency, the better.

The Riksbank does not see any convincing arguments for deliberate central bank secrecy.[27] For instance, the Bank does not share the view that important pieces of central bank information should be kept secret because the general public cannot understand complicated economic analyses. There are many financial market analysts and media that can help the public to overcome such problems.[28] The major obstacle to transparency may be that central banks themselves do not fully understand how the economy works.

Reasons why central banks cannot be fully transparent are not difficult to find. One important fact is that policy making is to a large extent based on judgements, i.e., decisions are affected not only by explicit models of the economy but also, and perhaps primarily, by the policy makers' own interpretations of the situation. Besides being unavoidable, this is desirable, since explicit models of necessity are simplifications of reality and their accuracy is uncertain. But it also means that policy makers are virtually precluded from being fully transparent about their reasons for reaching a particular decision.

Even if full transparency were feasible, its production would come at a cost. Although central banks have softer budget constraints than other authorities, they should not use that advantage to avoid weighing the benefits of all their activities against the costs. Given this, the production of more information about the policy process has to be weighed against investments in deeper analyses of the economy. The Riksbank's experience in this area can be described as a production cycle. During the first years of inflation targeting there were large investments in analysis. Thereafter, transparency gradually increased. At the moment, we are taking steps to prevent the efforts towards greater transparency from crowding out more

[27] This is not to deny that there are good theoretical arguments against transparency; see Geraats (2002) for a survey. But we claim that they are not the reasons why central banks have been against transparency in practice.

[28] See Green (2001) for a discussion of whether central banks have an informational advantage and the implications for transparency.

in-depth, long-term analyses. There may be a trade-off between transparency in the short and the longer run.

In the end, transparency is not desirable for its own sake, but primarily to improve the public's access to such information about the macro economy and monetary policy that enables them to understand the reasons for monetary policy decisions. Thereby, monetary policy can gain acceptance and become predictable.

Transparency can enable monetary policy to gain acceptance and become predictable.

Concluding comments

The fact that low inflation is a relatively recent phenomenon has been important for the policy framework created by the Riksbank. With the strong Keynesian and parliamentary traditions in Sweden, and the scepticism the Riksbank encountered after the deep crisis in the early 1990s, it was important to find ways of quickly regaining legitimacy and credibility. A new framework was needed that would quickly provide new policy recommendations and help shape inflation expectations. In designing this framework the Riksbank chose to draw on experience from many other countries. But the Bank has also proceeded with new ideas developed internally, frequently guided by discussions with academics.

Inflation targeting was believed to be a fruitful strategy, a belief that has been supported by what has happened both in terms of interest rates and other measures of credibility, and by changing attitudes in Swedish society towards the Riksbank and its policies. Of particular importance in this context have been (i) the use of an explicit symmetric target; (ii) the publication of Inflation Reports including explicit forecasts; and (iii) a rule of thumb for the relation between policy decisions and inflation forecasts. When these three aspects of the framework had been put in place, it became easier for the financial markets and for other observers to understand the Riksbank and to evaluate monetary policy *ex ante* as well as *ex post*. The clear framework also helped the Riksbank in focusing and improving its work, which in turn has supported its position in the eyes of the outside world.

There are obvious similarities between the ways the Fed's Open Market Committee and the Riksbank's Executive Board conduct monetary policy. But there are also differences. Some of the differences have to do with perceived differences in the so-called transmission mechanisms and their implications for inflation prospects. Sweden is a small and open economy. Important effects on economic activity and inflation come not only via trade in goods and services but nowadays, and perhaps more importantly, via the international financial markets, capital flows, exchange rates and other asset prices. These channels are often influenced not so much by monetary policy in Sweden as by the policies pursued in other countries or areas, in particular the US and the euro area. Another important difference from the US is that price and wage formation in Sweden is in many markets more concentrated and centralised, sometimes resulting in rather abrupt changes in inflation. Furthermore, low inflation has been established in Sweden only during the last ten years, making it difficult to estimate all important transmission mechanisms with confidence.

Two kinds of critique against inflation targeting have been common in recent years. One is that the inflation-targeting approach is overly simplistic.

Two kinds of critique against inflation targeting have been common in recent years. One argument is that the inflation-targeting approach is overly simplistic: following what are taken to be simple rules means that important aspects of monetary policy are neglected. We do not agree. Obviously, any relatively simple framework cannot solve all of the problems we and other central banks encounter. But our experience is that the inflation-targeting approach gives a good structure for precise discussions and analyses. This, in turn, helps in the work of improving analyses and policy. We would hardly have got to where we are today in our thinking on policy issues had we not been constantly forced to wrestle with questions about how new problems we have faced could be dealt with within our own relatively precise framework.

The second is that inflation targeting cannot be implemented until policy is reasonably credible and the central bank demonstrates a capacity to make good inflation forecasts.

A second type of critique is that inflation targeting cannot be implemented until policy is reasonably credible and the central bank demonstrates a capacity to make good inflation forecasts. We do not believe in this either. Although our forecasts have not been extremely good, we have nevertheless gained credibility by openly discussing them and the reasons for the errors. In fact, the Riksbank would claim that the Swedish experience shows that the clear framework provided by inflation targeting is particularly important precisely when there is great uncertainty concerning policy and future inflation. The Riksbank also believes that the positive experiences in Sweden and other countries with explicit inflation targets are important information for all central banks and a strong argument for clear frameworks also in countries where low inflation is already well established.

References

Adolfson, M., (2002), "Implications of Exchange Rate Objectives under Incomplete Exchange-Rate Pass-Through", Sveriges Riksbank Working Paper Series No. 135.

Altig, D., Christiano, L., Eichenbaum, M. & Lindé, J., (2002), "Technology Shocks and Aggregate Fluctuations", unpublished manuscript.

Barth, M. J. III & Ramey, V. A., (2000), "The Cost Channel of Monetary Transmission", University of California, San Diego, Discussion Paper No. 2000-08.

Berg, C., (1999), "Inflation Forecast Targeting: The Swedish Experience", *Sveriges Riksbank Economic Review* No. 3, pp. 40–66.

Berg, C., Jansson, P. & Vredin, A., (2002), "How Useful Are Simple Rules for Monetary Policy? The Swedish Experience", Sveriges Riksbank Working Paper Series, forthcoming.

Berg, C. & Jonung, L., (1999), "Pioneering Price Level Targeting: The Swedish Experience 1931 – 1937", *Journal of Monetary Economics* 43, pp. 525–551.

Berg, C. & Lindberg, H., (2001), "Conducting Monetary Policy with a Collegial Board: The New Swedish Legislation One Year On", in J. Kleineman (ed.), *Central Bank Independence*, Kluwer Law International/Norstedts Juridik, pp. 51–66.

Blix, M. & Sellin, P., (1998), "Uncertainty Bands for Inflation Forecasts", Sveriges Riksbank Working Paper Series No. 65.

Blix, M. & Sellin, P., (1999), "Inflation Forecasts with Uncertainty Intervals", *Sveriges Riksbank Quarterly Review* No. 2, pp. 12–28.

Bryan, M. F., Cecchetti, S. G. & Wiggins II, R. L., (1997), "Efficient Inflation Estimation", Working Paper No. 9707, Federal Reserve Board of Cleveland.

Geraats, P. M., (2002), "Central Bank Transparency", unpublished manuscript.

Green, E. J., (2001), "Central Banking and the Economics of Information", in Santomero, A. M., Viotti, S. & Vredin, A. (eds.), *Challenges for Central Banking*, Kluwer Academic Publishers, pp. 155–171.

Heikensten, L., (1999), "The Riksbank's Inflation Target – Clarification and Evaluation", *Sveriges Riksbank Quarterly Review* No. 1, pp. 5–17.

Heikensten, L., (2000), "Openness and Clarity in Monetary Policy – Swedish Experiences", speech at SEB customer meeting, Stockholm, March 20, 2000.

Heikensten, L. & Borg, A., (2002), "The Riksbank's Foreign Exchange Interventions – Preparation, Decision and Communication", *Sveriges Riksbank Economic Review* No. 1, pp. 25–45.

Heikensten, L. & Vredin, A., (1998), "Inflation Targeting and Swedish Monetary Policy – Experience and Problems", *Sveriges Riksbank Quarterly Review* No. 4, pp. 5–33.

Jansson, P. & Vredin, A., (2001), "Forecast-Based Monetary Policy in Sweden, 1992 – 1998: A View from Within", Sveriges Riksbank Working Paper Series No. 120.

Meyer, L., (1998), "Come with Me to the FOMC", The Gillis Lecture, Willamette University, Salem, Oregon, April 2, 1998.

Mitlid, K. & Vesterlund, M., (2001), "Steering Interest Rates in Monetary Policy – How does it Work?", *Sveriges Riksbank Economic Review* No. 1 2001, pp. 19–41.

Nessén, M. & Söderström, U., (2001), "Core Inflation and Monetary Policy", *International Finance* 4, pp. 401–439.

Svensson, L. E. O., (1999), "Inflation Targeting as a Monetary Policy Rule", *Journal of Monetary Economics* 43, pp. 607–654.

Svensson, L. E. O., (2001), "What is Wrong with Taylor Rules? Using Judgment in Monetary Policy through Targeting Rules", manuscript.

Svensson, L. E. O., Houg, K., Solheim, H. O. A. & Steigum, E., (2002), "An Independent Review of Monetary Policy and Institutions in Norway", Norges Bank Watch 2002, Centre for Monetary Economics.

Söderström, U., (2001), "Targeting Inflation with a Prominent Role for Money", Sveriges Riksbank Working Paper Series No. 123.

Söderström, U., (2002), "Monetary Policy with Uncertain Parameters", *Scandinavian Journal of Economics* 114, pp. 125–145.

Taylor, J. B., (1993), "Discretion versus policy rules in practice", *Carnegie Rochester Conference Series on Public Policy* 39, pp. 195–214.