

■ Transparency under Flexible Inflation Targeting: Experiences and Challenges

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ABSTRACT

I report some personal views and reflections on transparency experiences and transparency challenges following my first year and a half as Deputy Governor at Sveriges Riksbank regarding (1) flexible inflation targeting, (2) the role of transparency in inflation targeting and committee decisions on instrument-rate paths, (3) the management of interest-rate expectations, and (4) the publishing of attributed minutes. I also mention some future developments and improvements in transparency and flexible inflation targeting that I believe would be desirable.

1. Introduction

This paper reports some personal views and reflections on transparency experiences and transparency challenges following my first year and a half as Deputy Governor and Executive Board Member of the Riksbank. They are eclectic and preliminary first words, not my final word on the topic.

The paper is organized as follows. Section 2 discusses flexible inflation targeting, section 3 discusses the role of transparency in inflation

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targeting, section 4 reviews the arguments for and against publishing instrument-rate paths, and section 5 discusses aspects of committee decisions on instrument-rate paths and some of my experience from decision-making on the Riksbank's Executive Board. Section 6 reviews the Riksbank's management of interest-rate expectations, and section 7 discusses some aspects of having attributed minutes. Section 8, finally, mentions some future developments and improvements in transparency and flexible inflation targeting that I believe would be desirable. Appendices include a chronological list of important events in Riksbank communication and documents reporting the Riksbank's communication policy.

2. Flexible inflation targeting

Like other inflation-targeting central banks, the Riksbank conducts so-called flexible inflation targeting.¹ This means that the Riksbank conducts monetary policy so as to stabilize inflation around the inflation target, but it also attaches some weight to stabilizing the real economy. By stabilizing the real economy I mean stabilizing a measure of resource utilization, such as the output gap, properly defined. Flexible inflation targeting can then be represented by the standard quadratic loss function,

$$L_t = (\pi_t - \pi^*)^2 + \lambda(y_t - \bar{y}_t)^2,$$

where L_t denotes the loss in period t , π_t denotes inflation in period t , π^* denotes the inflation target, $\lambda > 0$ is the relative weight placed on output-gap stabilization, y_t denotes (log) output, \bar{y}_t denotes (log) potential output, and $y_t - \bar{y}_t$ denotes the output gap in period t . Strict inflation targeting ($\lambda = 0$), corresponding to King's (1997) "inflation nutter", would mean that the Riksbank only aims at stabilizing inflation around the inflation target without any concern for the stability of the real economy.² Maximum stability of inflation around the inflation target would require very aggressive contractionary or expansionary policy depending on whether inflation seems to fall above or below the inflation target and would cause a lot of instability of the real economy. No inflation-targeting central bank that I know of, and certainly not the Riksbank, behaves in this way. Real-world inflation targeting is always flexible inflation targeting ($\lambda > 0$), not strict. The relative weight placed on the stability of the real economy, λ , may vary between different countries and central banks, but it is never zero.

¹ The terms "strict" and "flexible" inflation targeting were to my knowledge first introduced in a paper of mine presented at a conference at the Bank of Portugal in 1996, later published as Svensson (1999).

² The term "inflation nutter" for a central bank that is only concerned about stabilizing inflation was introduced in a paper by Mervyn King at a conference in Gerzensee, Switzerland, in 1995. This was later published as King (1997).

When discussing flexible inflation targeting and the weight placed on stabilizing the real economy, it is important to remember that there is a crucial difference between the inflation target and the implied target for resource utilization. The inflation target is subject to choice by the central bank, government, or parliament. The central bank can achieve sustainable inflation at any nonnegative level. The central bank can affect both the average level and the stability of inflation. In contrast, the average level of resource utilization is not subject to choice. The central bank can only affect the stability of resource utilization, not its sustainable level. The central bank can only affect the stability of output around its normal level, not that normal level itself. What corresponds to a normal level of resource utilization is determined by other factors than monetary policy, such as technical change and the workings and efficiency of the economy.³

Some authors (for instance, Meyer 2004) have emphasized a suggested contrast between so-called hierarchical and dual mandates for central banks. Such a contrast is a red herring. Under flexible inflation targeting, regarding *average* inflation and *average* resource utilization (the *first* moments of these variables), there is a *hierarchical* mandate in the sense that there is an explicit central-bank target only for the former and the central bank cannot do anything about the latter. Regarding the *stability* of inflation and resource utilization, there is a *dual* mandate in the sense that the central bank tries to achieve both. Under flexible inflation targeting there is hence both a hierarchical and a dual mandate, and there is no conflict between the two. Whether the central bank's mandate is described as dual (as is often the case for the Fed) or as hierarchical (as is often the case for the ECB and the Riksbank), there is no implication that the implicit loss function or the actual policy is different in any essential way.⁴

We can see this in more detail by taking the unconditional mean, the (long-run) average of the loss function above. We then get

$$E[L_t] = (E[\pi_t] - \pi^*)^2 + \text{Var}[\pi_t] + \lambda \text{Var}[y_t - \bar{y}_t],$$

where $E[\]$ denotes the unconditional mean (the [long-run] average), $\text{Var}[\]$ denotes the unconditional variance and we have assumed that the unconditional mean of the output gap is zero, $E[y_t - \bar{y}_t] = 0$ (when potential output is properly defined). That is, the average loss equals the sum of

³ Except that very bad and unstable monetary policy, for instance with very high and variable inflation, will cause the market mechanism and the real economy to work less well and therefore reduce average resource utilization.

⁴ See Svensson (2002) and (2004) for more discussion of this point.

three terms. The first term is the square of the gap between average inflation and the inflation target, the second term is the variance of inflation and the last term is the relative weight placed on output-gap stabilization times the variance of the output gap. The second and the third term represent the dual part of the mandate. There is substitution between the variance of inflation and the variance of the output gap, with λ being the marginal rate of substitution of inflation variance for output-gap variance. The first term represents the hierarchical part of the mandate. Only average inflation appears. In order to minimize this term, average inflation should just be set equal to the inflation target. There is no substitution between average inflation and average output or the average output gap.

Because of the lags between monetary-policy actions and the effect on inflation and the real economy, effective flexible inflation targeting has to rely on forecasts of inflation and the real economy. Flexible inflation targeting can be described as “forecast targeting”. The central bank chooses an instrument-rate path so that the forecast of inflation and resource utilization “looks good.” That the forecast “looks good” means that inflation is on target and resource utilization normal or, when inflation and/or resource utilization deviate from target and/or normal, respectively, inflation goes to target and resource utilization goes to normal at an appropriate pace.⁵ From a more technical perspective, that the forecast “looks good” means that it is optimal in the sense of minimizing a standard intertemporal quadratic loss function that is the expected discounted sum of future period losses,

$$E_t \sum_{\tau=0}^{\infty} \delta^{\tau} L_{t+\tau},$$

where E_t denotes expectations in period t and $0 < \delta < 1$ is a discount factor.⁶

Previously, flexible inflation targeting has often been described as having a fixed horizon, such as two years, at which the inflation target should be achieved. However, as is now generally understood, under optimal stabilization of inflation and the real economy there is no such fixed horizon at which inflation goes to target or resource utilization goes to normal. The horizon at which the inflation forecast is close to the tar-

⁵ The idea that inflation targeting implies that the inflation forecast can be seen as an intermediate target was introduced in King (1994). The term “inflation-forecast targeting” was introduced in Svensson (1997), and the term “forecast targeting” in Svensson (2005). See Svensson and Woodford (2005) and especially Woodford (2007a, b) for more discussion and analysis of forecast targeting.

⁶ In a situation with forward-looking private-sector expectations, the minimization of the loss function should be under so-called commitment in a timeless perspective. This means that the central bank behaves with a certain consistency over time and does not try to manipulate private-sector expectations for short-run benefits. See Svensson and Woodford (2005) for details and Berge (2007) for an example of a real-world application for Norges Bank.

get and/or the resource-utilization forecast is close to normal depends on the initial situation of the economy, the initial deviation of inflation and resource utilization from target and normal and the nature and size of the estimated shocks to the economy (Faust and Henderson 2004, Giavazzi and Mishkin 2006, Smets 2003). In line with this, many or even most inflation-targeting central banks have more or less ceased to refer to a fixed horizon and instead refer to the “medium term”.⁷ With the linear models of the transmission mechanism that are standard for central banks, reasonable or optimal paths for inflation and resource utilization approach target and normal asymptotically. This makes it difficult to specify a horizon. From this point of view, half times (the time it takes to reduce the inflation or output gap by half) would have been better statistics than horizons. As noted in Svensson (1997, p. 1132):

[S]ome weight on output[-gap] stabilization motivates a gradual adjustment of the ... inflation forecast towards the ... inflation target... The less weight on output[-gap] stabilization, the faster the adjustment towards the ... inflation target.

In more technical terms, in a variant of the simple model of Svensson (1997), the inflation forecast that “looks good” in period t for inflation in period $t + \tau > t$, $\pi_{t+\tau,t}$ will satisfy

$$\pi_{t+\tau,t} - \pi^* = c(\lambda)(\pi_{t+\tau-1,t} - \pi^*) = c(\lambda)^\tau(\pi_t - \pi^*),$$

where the coefficient $c(\lambda)$ satisfies $0 < c(\lambda) < 1$ and is an increasing function of the relative weight on output-gap stabilization, λ . That is, if inflation initially deviates from the inflation target, $\pi_t - \pi^* \neq 0$, the inflation forecast approaches the inflation target gradually so the deviation from the target of the inflation forecast τ periods ahead is a fraction $c(\lambda)^\tau$ of the initial deviation from the target. Thus, the inflation forecast approaches the target asymptotically and is in finite time never exactly equal to the target. The half-time, the number of periods after which the deviation has been halved, is then equal to the number $-\log 2 / \log c(\lambda)$.⁸ If the half-time is

⁷ The *Policy Target Agreement* for the Reserve Bank of New Zealand (2007) states that “the policy target shall be to keep future CPI inflation outcomes between 1 and 3 per cent on average over the medium term.” The Bank of England states that “the MPC’s aim is to set interest rates so that inflation can be brought back to target within a reasonable time period without creating undue instability in the economy.” The Reserve Bank of Australia states “[m]onetary policy aims to achieve this [a target for consumer price inflation of 2-3 per cent per annum] over the medium term.” Norges Bank states in its *Monetary Policy Report* that “Norges Bank sets the interest rate with a view to stabilising inflation close to the target in the medium term.” In contrast, the Bank of Canada (2006) mentions a more specific target time horizon: “[T]he present policy of bringing inflation back to the 2 per cent target within six to eight quarters (18 to 24 months) is still appropriate generally, although specific occasions may arise in which a somewhat shorter or longer time horizon might be appropriate.”

⁸ The half-time T period is the solution to the equation $c(\lambda)^T = 1/2$ and will be an increasing function of λ .

one year, the deviation to the target at a one-year horizon is a half of the initial deviation, at a two-year horizon the deviation is a quarter and at a three-year horizon the deviation is an eighth of the initial deviation. If the initial inflation rate is 4 percent and the target is 2 percent, at a one-year horizon the inflation forecast is at 3 percent, at a two-year horizon the forecast is at 2.5 percent and at a three-horizon the forecast is at 2.25 percent. If the central bank puts less relative weight on output-gap stabilization (λ is lower), the coefficient $c(\lambda)$ is lower and the inflation forecast approaches the inflation target at a faster rate and shorter half-time, but still asymptotically. Thus, there is no specific horizon at which the inflation forecast reaches the target and, at any given horizon, the distance between the forecast and the target is proportional to the initial distance between inflation and the target. This behavior of the optimal inflation forecast is typical also for more complicated models of the transmission mechanism, such as Ramses, the Riksbank's dynamic stochastic general-equilibrium (DSGE) open-economy model (Adolfson, Laséen, Lindé, and Villani (ALLV) 2007).⁹

The above implies that imposing the constraint that the inflation forecast must equal the inflation horizon at a specific horizon, say two years, will lead to an inefficient policy, in the sense that removing the constraint will allow for more stable inflation without destabilizing the real economy, a more stable real economy without destabilizing inflation, or both more stable inflation and a more stable real economy.

After each policy decision, the Riksbank publishes and explains its interest-rate path and its forecast of inflation and the real economy, presented as mean forecasts with uncertainty intervals. Such publication is an example of the exceptionally high degree of transparency (in a historical perspective) that characterizes inflation targeting. Let me now turn to the role of transparency in flexible inflation targeting.

3. The role of transparency in flexible inflation targeting

What is the role of transparency in monetary policy in general and in flexible inflation targeting in particular? It is now well understood that monetary policy in general and inflation targeting in particular comprise what is

⁹ In a more complicated model with several predetermined variables and shocks, the optimal inflation forecast will be a weighted sum of terms similar to the right-hand side in the above equation, with different initial sizes and coefficients c (eigenvalues), which may result in more complicated shapes of the inflation forecast. The optimal inflation forecast will still approach the inflation target asymptotically, sometimes with cycles of decreasing amplitude around the target, and for long horizon the term with the largest coefficient (eigenvalue) will dominate the shape of the inflation forecast. See Klein (2000) and Svensson (2007) for the solution of stochastic linear difference equations with forward-looking variables, optimal policies, and their properties.

called “management of expectations” (Woodford 2004, 2005). Monetary policy affects inflation and the real economy mainly through its effects on private-sector expectations about future interest rates, inflation and the real economy. Expectations of future instrument rates (the expected instrument-rate path) matter and affect the yield curve and longer nominal interest rates. Expectations of future inflation affect actual inflation and longer real interest rates. Expectations of future developments of the real economy and longer real interest rates affect current decisions and plans for the real economy. Thus, transparency makes monetary policy more effective in a direct way by enabling more effective management of private-sector expectations.

Interestingly, as emphasized by Blinder, Ehrmann, Fratzscher, De Haan, and Jansen (2008) and Blinder (2008b), in a hypothetical world of a fully-informed and rational private sector in a stationary environment with a stationary monetary policy, symmetric information between the central bank and the rest of the economy, and rational expectations, there is no specific role for central bank communication. The private sector would be fully informed about monetary policy and be able to make the best predictions of future policy. Any central-bank communication would be redundant. Many macroeconomic models assume this world, but the fact that we discuss the role of transparency and believe that transparency matters means that we have left this hypothetical world.

In the realistic situation of information asymmetry when the central bank knows more about its monetary policy and its policy intentions than the private sector, transparency about monetary policy can reduce private-sector uncertainty about monetary policy and make monetary policy easier to predict. One reason for information asymmetry about policy is that monetary policy may change, for instance, because new monetary policy committee (MPC) members have been appointed with a different interpretation of the central bank’s mandate or because on-the-job learning and policy improvements better achieve the mandate. Furthermore, since the central bank normally devotes more resources to analyzing and forecasting the economy than any private-sector agent, transparency in the form of central-bank information about and forecasts of the economy in general may provide additional information to the private sector and hence reduce its uncertainty about the state and development of the economy.

Transparency also enables more effective external scrutiny and evaluation of monetary policy. This strengthens the incentive of the central bank to achieve its stated objectives and to provide good analysis

and decisions. This provides another role for transparency in monetary policy.¹⁰

Finally, independent central banks are powerful and headed by unelected officials. Transparency ensures more effective democratic accountability of these officials and banks. This is also important for the legitimacy of independent central banks in democratic societies (Blinder, Goodhart, Hildebrand, Wylosz, and Lipton 2001).

The Riksbank is ranked among the world's most transparent central banks (Dincer and Eichengreen 2007, Eijffinger and Geraats 2006).¹¹ After much internal work, in May 2008 the Riksbank's Executive Board adopted an explicit communication policy for all the Riksbank's activities, not only monetary policy (Sveriges Riksbank 2008a, reproduced below as appendix 2). The communication of monetary policy was revised and is described in a separate appendix (Sveriges Riksbank 2008b, reproduced below as appendix 3). A separate document provides the Riksbank's detailed rules for communication (Sveriges Riksbank 2008c). These documents are all available on the Riksbank's website, www.riksbank.com. Thus, the Riksbank is not only very transparent; it is also very transparent about its transparency and communication.

4. Publishing instrument-rate paths

Publishing inflation and real-economy forecasts is already common among inflation-targeting central banks. The Fed has also taken steps toward publishing more informative forecasts by the FOMC. Publishing an interest-rate path is still relatively rare. The Reserve Bank of New Zealand (RBNZ) started doing this in 1997.¹² Norges Bank followed in 2005, the Riksbank in February 2007 (Ingves 2007, Rosenberg 2007), Sedlabanki Islands (the central bank of Iceland) in March 2007 (Sedlabanki Islands 2007), and the Czech National Bank in 2008 (Czech National Bank 2007).

Why is publishing an interest-rate path so rare? An interest-rate forecast or some assumption about the interest-rate path is necessary for an inflation and real-economy forecast. Central banks have used different assumptions about the interest-rate path, such as a constant interest rate or a path given by market expectations as revealed by the forward rates implied by the yield curve. A constant interest rate is often a conspicuously unrealistic and time-inconsistent interest-rate forecast. Implied for-

¹⁰ In Faust and Svensson (2001), increased transparency induces the central bank to pursue a policy closer to the socially optimal one.

¹¹ Apel and Vredin (2007) provide a thorough account of the development of the Riksbank's transparency and communication up to the early spring of 2007. Geraats (2008) provides a detailed survey of transparency trends in central banking.

¹² The June 1997 *Monetary Policy Statement* of the RBNZ contains in table 2 (p. 10) and in figure 9 (p. 22) a projection of the nominal 90-day interest rate for the next three years.

ward rates may result in inflation and real-economy forecasts that do not “look good,” and central banks using this interest-rate assumption have sometimes felt compelled to comment that an interest-rate path higher or lower than the implied forward rates would be more appropriate. A sizable literature has demonstrated the different problems that anything other than the central bank’s best interest-rate forecast may lead to (see, for instance, Woodford 2007a).¹³

Furthermore, a published forecast of the interest rate is useful to the private sector and a better forecast is more useful to the private sector. The central bank should have an obvious information advantage about its own intentions for its instrument rate and be able to produce the best forecast, and, as argued in the previous section, publishing its own interest-rate forecast should be the most effective way for the central bank to manage private-sector interest-rate expectations. Given this logic, and given the increased acceptance of the idea that monetary policy is about managing expectations, it is rather strange that still so few central banks publish their own interest-rate forecast.

One argument against publishing an interest-rate forecast that has been voiced is that the private sector might believe that the forecast is a firm commitment and not a conditional forecast that is based on the current state of the economy and the nature and size of the estimated shocks to the economy. However, I did not learn of any such misunderstanding in New Zealand when I conducted my review in 2000 of monetary policy in New Zealand (Svensson 2001), where an interest-rate forecast had been published since 1997. Nor have I learned of any such misunderstanding in Norway since 2005 or in Sweden since 2007 (in Sweden at least not after the first few months, see below). Central banks that publish interest-rate forecasts emphasize the conditional nature of the forecast in their publications and also emphasize the uncertainty of the forecasts by publishing uncertainty intervals around the central forecast (except in New Zealand where the private sector and the financial market seem to understand this even without any explicit uncertainty intervals in the graphs). The Riksbank has many times repeated the mantra “it is a forecast, not a promise.” The private sectors and financial markets in the relevant countries seem to have understood this. It would be a very strange coincidence if the private sectors and financial markets in New Zealand, Norway, Sweden, Iceland, and the Czech Republic are systematically more sophisticated and more understanding than those in the rest of the world.

¹³ Jansson and Vredin (2004) provide a discussion of decision-making at the Riksbank and related problems before the introduction of the Riksbank’s own repo-rate path.

Some recent arguments in the literature against publishing instrument-rate paths seem somewhat contrived. A much-noted paper by Morris and Shin (2002) shows that public information may reduce social welfare. Because public information is known by all private agents and will affect the behavior of all private agents, it is rational for each private agent to attach more weight to public information than to private information. If the public information is of poor quality, private agents end up attaching more weight to poor-quality information, which may deteriorate social welfare. However, Svensson (2006) shows that this requires public information to be extremely bad and have a variance of measurement errors (a noise level) that is at least eight times that of private information. In contrast, central-bank information is likely to be at least as good as private-sector information, and central-bank information about its own intentions could be much better than private-sector information. For a conservative benchmark of equally good public and private information, public information always improves social welfare in the Morris-Shin model. In more realistic variants of the Morris-Shin model, several papers have demonstrated that public information is usually beneficial (see Svensson 2006 for references).

Gersbach and Hahn (2008b) assume that announcing a plan for the future instrument-rate path would introduce a new term in the central-bank loss function, corresponding to a loss from deviating from previously announced paths (due to the resource costs of providing explanations for, or diminished prestige from, such deviations). Under this assumption they show that the central bank will deviate from the optimal policy in order not to surprise the market and argue therefore that such announcements may imply a social loss. Given the assumption, this result is not surprising. However, it is really an argument that the central bank should regard its instrument-rate path as a forecast and not as a commitment. Dale, Orphanides, and Österholm (2008) show that the communication of poor central-bank information that is perceived by the private sector as good can be costly. This is not surprising either. However, as mentioned, central-bank forecasts of their future policy actions should for obvious reasons normally be more informed than outsiders' forecasts of these intentions. Furthermore, central banks can and do provide information about the accuracy of their information, for instance in the form of uncertainty intervals (fan charts). Providing information about the whole probability distribution of a central-bank forecast is an obvious way to allow the private sector to assess its quality.

5. Committee decisions on instrument-rate paths: difficult or even impossible?

Another argument that has been voiced is that a genuine committee would find it difficult or even impossible to agree on an instrument-rate path (Goodhart 2005). Agreeing on a single number, the current instrument rate, can be difficult enough; agreeing on a sequence of numbers, the instrument-rate path, would be too difficult. Therefore, only a central bank with a single decision maker can determine an instrument-rate path. According to this argument, publishing an instrument-rate forecast may work for RBNZ, where the Governor is the single decision maker, and for Norges Bank, where the instrument-rate forecast can be seen as the Bank's and the Governor's forecast presented to the Board, but it would not work for a genuine committee. From this point of view, the experience at the Riksbank is very relevant, since there the instrument-rate forecast is decided by the Executive Board, and the Board is a six-member individualistic committee where each member has equal weight and influence (except that the Governor has the tie-breaking vote). How can the Riksbank's Executive Board ever agree on an instrument-rate path?

In previous work (Svensson 2007), I have actually suggested a simple aggregation mechanism with which a committee of any size can agree on a path, the median path. According to this mechanism, each board member would draw his or her preferred instrument-rate path in the same diagram, with the instrument rate along the vertical axis and the time along the horizontal axis. Then a new path, the median path, is created by for each time (along each vertical line) taking the median instrument rate. This mechanism has the advantage that extreme paths by any member do not affect the median path. It has the disadvantage that the median path would often be composed of sections of different individual paths and not necessarily be an optimal path. Therefore, the median path should be seen as the starting point for new negotiations among the members and resulting adjustments of the path. My guess is that such a mechanism would normally converge after a few rounds of negotiation.

However, at the Riksbank, there has never been any need to propose this mechanism. The Executive Board has been able to agree on a path by majority voting without any such aggregation mechanism. How can this be possible?¹⁴

The way it has worked so far is that interactions between the staff and Board members during a series of meetings (see Rosenberg 2008 for

¹⁴ Actually in Swedish public administration, more precisely in the *Administrative Procedure Act* 1986:233, there are explicit procedures for voting, dissenting, and decision-making that can be applied if needed in more complicated decisions.

details on the decision-making process) result in a main interest-rate path (and corresponding forecast of inflation and the real economy) in a main scenario, which as a result of these discussions is a likely majority view. At the final policy meeting, the Executive Board then discusses this main scenario and possible alternatives, and then votes on the main scenario and possible alternatives. Dissenters state what interest-rate decision and path they prefer and the reasons for this. It has not been more complicated than that. One or several Board members could request that one or several detailed scenarios with alternative instrument-rate paths and corresponding forecasts of inflation and the real economy are included as an alternative to the main scenario and voted on. This has not yet happened, but it might in the future, and I do not see that it would be a problem.

That it need not be more complicated than this should not come as a surprise. Most committees other than MPCs deal with multidimensional rather than one-dimensional objects and vote on such multi-dimensional objects. Monetary policy is actually exceptional in terms of the simplicity and low-dimensionality of both the objectives and controls (although a path rather than a single instrument rate increases the control dimension somewhat). Most committees have more complex objectives and more complicated multi-dimensional control variables. The way it works in practice in most committees is that normally only a few representative alternatives of multi-dimensional objects are prepared and voted on. For instance, think about a parliament or a government voting on a few tax proposals, each involving a myriad of different taxes.

The publishing of an interest-rate path and the need therefore to decide on an instrument-rate path has some very desirable side effects. As noted above, there is general agreement that the whole interest-rate path rather than the current short rate is what matters for the forecast of inflation and the real economy. Publishing the instrument-rate path seems to focus the minds of the Executive Board and the staff on the right thing, the path rather than the current instrument rate. The policy discussion naturally becomes forward-looking, as it should be. At the Riksbank, I have noticed that the discussion in the Board and among the staff is mostly about the path and its consequences for inflation and the real economy, not about the current instrument rate. The decision about the current instrument rate is mostly just a consequence of the decision about the path.

Since my colleagues on the Board decided to publish an instrument-rate path in February 2007, before my appointment in May 2007, I only have experience of policy meetings where the instrument-rate path is the focus. I do not have any experience from policy meetings where the instrument-rate path is not discussed. Indeed, I find it difficult to imag-

ine how one can have a coherent monetary-policy discussion while only discussing the current instrument-rate level and not the instrument-rate path.

If agreeing on publishing an instrument-rate path works fine for a genuine committee of six, I would think that it would work for a committee of nine, and why not twelve or nineteen? However, one thing that may facilitate working with an instrument-rate path is that at the Riksbank we are full-time Board members that participate continuously in the several-week long decision-making process during which the main and alternative instrument-rate paths are worked out. There may be some special difficulties for MPCs with part-time members or members that are not located in the same place. Still, I believe these difficulties can be overcome, with some good will, and that it is likely to be worth it given the considerable benefits of working with an instrument-rate path.

Inflation targeting is unique among alternative monetary-policy regimes in that there seem to be no regrets and no drop-outs, at least not so far (but almost two decades have already passed). Compare this to monetary targeting or fixed exchange rates! Instead, central banks that have introduced inflation targeting seem, at least so far, to have concluded that it is the only sensible thing to do. If anything, they may regret that they did not begin earlier. (This does not, of course, imply that no improvements and innovations can be made. The rate of improvements and innovations among inflation-targeting central banks is pretty impressive, I would say, especially compared to other monetary-policy regimes.) In particular, with today's problems of high inflation, weak real-economy outlooks, and the transmission mechanism and aggregate demand in some countries affected by a credit crunch, what monetary-policy regime could be better designed to find the best available compromise between stable inflation and a stable real economy?

I believe the same lack of regret will be the case for publishing the instrument-rate path. I am not aware of any regrets in New Zealand, which has the longest experience, and I am not aware of any regrets in Norway. I have never heard any regrets from my colleagues at the Riksbank. Instead, we believe discussing, deciding on and publishing an instrument-rate path is the only sensible thing to do. I believe we are becoming more and more convinced about this. Is it not obvious that not considering and not deciding on an instrument-rate path implies an incomplete decision-making process? And is it not obvious that not publishing an internal instrument-rate path implies hiding the most important and useful information for the private sector?

6. The Riksbank's management of interest-rate expectations

As mentioned above, one reason for increased transparency and publishing the instrument-rate path is that this enables the central bank to more effectively manage interest-rate expectations. What then is the Riksbank's record in managing interest-rate expectations? How have market expectations of future interest rates been affected by the repo-rate paths the Riksbank has published (the repo rate is the Riksbank's instrument rate). Figures 1-10 illustrate this by comparing the announced repo-rate path with the implied market forward interest rates at the end of the day before the announcement ("Before") and at the end of the day of the announcement ("After"). The implied forward-rate curves have been adjusted by the staff for possible risk premia, so as to be the staff's best estimate of market expectations of future repo rates. Depending on the maturity, the forward-rate curve is derived from the rates for STINA (Tomorrow-Next Stibor interest-rate swaps) contracts, FRAs (Forward Rate Agreements), or interest-rate swaps.

Figure 1 is from the first announcement of a repo-rate path, on February 15, 2007. The black step-shaped solid curve shows the actual repo rate. The black dotted curve shows the announced repo rate. The yellow (gray for a black-and-white printer) solid curve shows the implied forward rates the day before the announcement, and the red (black for a black-and-white printer) solid curve shows the implied forward rates after the announcement. Comparing the yellow/gray and the black dotted curve, we see that the market expected a higher repo-rate path than the Riksbank announced. Comparing the yellow/gray and the red/black curve, we see that market expectations shifted down slightly, but not all the way to the announced repo-rate path. The market seemed not to believe that the Riksbank would actually follow its own path, and there were many comments expressing surprise and criticism of how low the path was.

There were policy announcements on March 30 and May 4, 2007, when the repo rate was held unchanged. On these occasions no full *Monetary Policy Report*, no repo-rate path and no forecasts of inflation and the real economy were published (the *Monetary Policy Report* is published three times a year). Figure 2 is from the next time a repo rate was published, on June 20, 2007. This was my first policy meeting. During the spring of 2007, wage settlements were higher and productivity outcomes were lower than the Riksbank had forecasted. Because of the resulting increase in inflation pressure and the strong outlook for the real economy, the Riksbank shifted up the repo-rate path quite a bit. The old repo-rate path from February 15 is shown as the grey dotted curve. On

this occasion, market expectations before the announcement were quite in line with the new repo-rate path for the first year and a half, but higher than the path at longer horizons. After the announcement, market expectations shifted up slightly. Interestingly, they then shifted away from the new repo-rate path, as if the market anticipated future upward revisions of the repo-rate path. Perhaps the market still did not believe that the Riksbank was likely to follow its own path.

The next policy announcement was on September 7, 2007. The repo-rate was increased in line with the path published in June. On this occasion, no repo-rate path and no forecasts of inflation and the real economy were published, but the Riksbank stated that it would from the next policy announcement, in October, publish a repo-rate path and forecasts of inflation and the real economy after each policy meeting, not only at the three policy meetings per year with a full *Monetary Policy Report*.

Figure 3 shows the announcement on October 30, 2007. The Riksbank kept the repo-rate path unchanged. Market expectations were quite in line with the repo-rate path and there were no significant shifts in expectations at the announcement. Now the market seemed to take the repo-rate path more seriously than in February and in June.

Figure 4 shows the announcement on December 19, 2007. The Riksbank again kept the repo-rate path unchanged, which was expected by the market, and there were no significant changes in expectations at the announcement. During the fall, the inflation forecast shifted up and the real-economy forecast became weaker. On balance, the Riksbank thought that the old repo-rate path was still good.

Figure 5 shows the announcement on February 13, 2008. Again the Riksbank kept the repo-rate path unchanged, and it increased the repo rate accordingly. This time market expectations were not in line. Bad news about the U.S. economy and increasing problems in financial markets in the U.S. and Europe led the market to expect no repo-rate increase and a much lower repo-rate path. The Riksbank already had a rather pessimistic forecast for the U.S. economy, and the bad news was not out of line with this forecast. Furthermore, the direct effects of the U.S. economy on the Swedish economy are not so large, which the market seemed to underestimate. In any case, there was a big surprise for the market, and there were many angry comments. Although ex post the Riksbank's explanation and decision seemed to be accepted, there were complaints about the Riksbank not having prepared the market for the forthcoming decision. As seen in figure 5, market expectations shifted up significantly towards the Riksbank's repo-rate path, but expected forward rates were still up to 50 basis points below the published repo-rate path about 1.5 years ahead.

Repo-rate paths and market expectations
Per cent

Figure 1. February 15, 2007

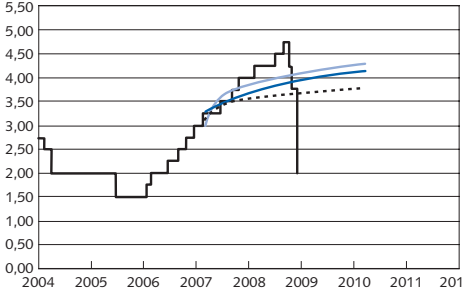


Figure 2. June 20, 2007

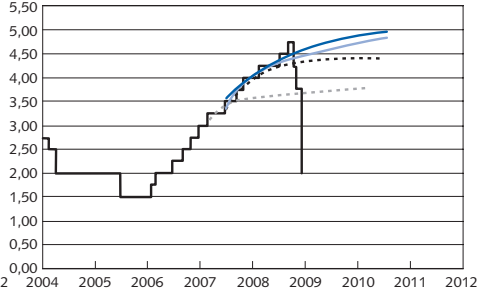


Figure 3. October 30, 2007

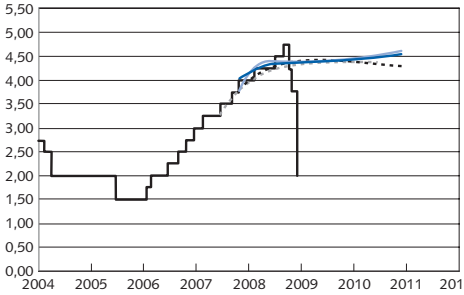


Figure 4. December 19, 2007

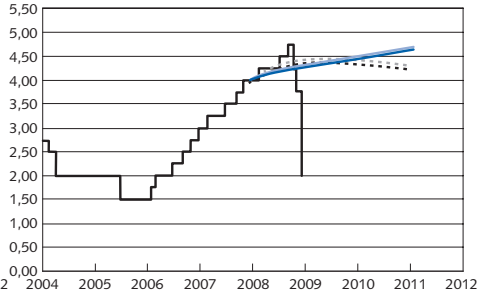


Figure 5. February 13, 2008

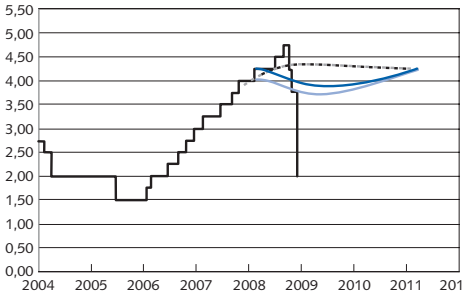
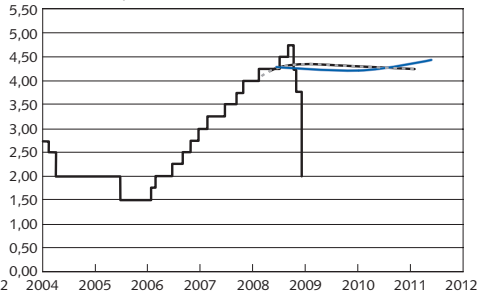


Figure 6. April 23, 2008



— Repo rate - - - Old repo rate path ···· New repo rate path — Day before — Day after

Figure 7. July 3, 2008

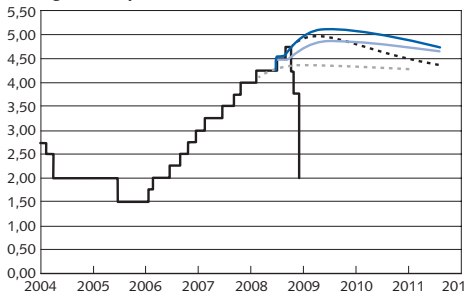
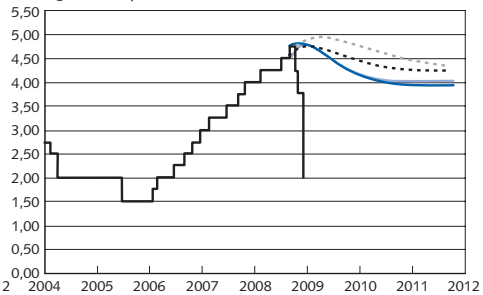
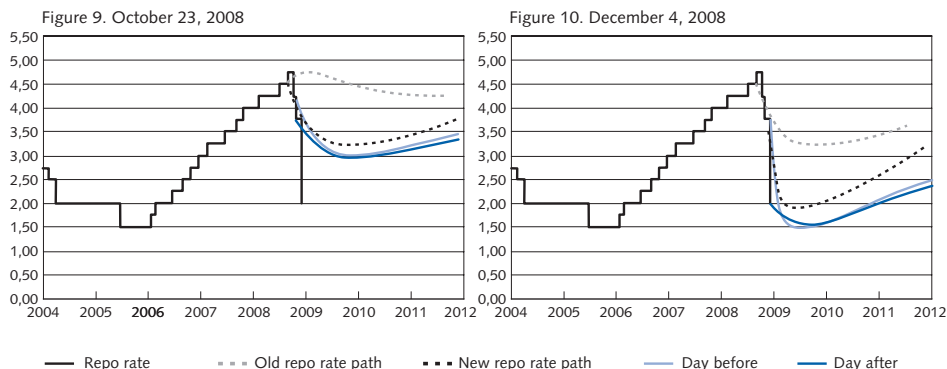


Figure 8. September 4, 2008





Apparently the market did not at this time believe that the Riksbank would follow the new repo-rate path but soon adjust it downwards.

Figure 6 shows the next policy announcement, on April 23, 2008. The repo-rate path was kept unchanged and the repo rate was held constant in line with the path. This was expected by the market and there were no shifts in expectations at the announcement.

Figure 7 shows the next policy announcement, on July 3, 2008. Because of increased inflation and inflation pressure with the outlook for the real economy only marginally weaker, the repo-rate path was shifted up quite a bit and the repo rate was increased by 25 basis points to 4.50 percent. The market had expected an increase and a higher repo-rate path, but not quite as high. Expectations of the future repo rate shifted up significantly towards the path and even exceeded the repo-rate path at horizons longer than a year.

Figure 8 shows the next policy announcement, on September 4, 2008. The Riksbank increased the repo rate by 25 basis points to 4.75 percent, but the future repo-rate path was shifted down. The market had anticipated a shift down in the repo-rate path but was surprised about the increase in the current repo rate. There were no changes in market expectations at the announcement except at the very short horizon.

The next few announcements were dominated by a rapidly deteriorating situation and outlook for the real economy and a rapidly falling inflation forecast after mid-September. On October 8, 2008, after an extra policy meeting, the Riksbank announced that it had lowered the repo by 50 basis points to 4.25 percent in a coordinated move to lower instrument rates by the Bank of Canada, the Bank of England, the European Central Bank, the Federal Reserve and the Swiss National Bank. No repo-rate path was published on this occasion.

Figure 9 shows the next policy announcement, on October 23, 2008, after a regular policy meeting. The Riksbank lowered the repo rate by 50 basis points to 3.75 percent and lowered the repo-rate path substantially.

The market expected a somewhat lower path and there were minor shifts in expectations following the announcement.

On December 1, the Riksbank announced that it would move its planned policy meeting for December 16 to December 3. Figure 10 shows the announcement on December 4. The Riksbank lowered the repo rate by 175 basis points to 2 percent, the largest change since the start of inflation targeting in January 1993. The repo-rate path was lowered substantially. The market had expected an even lower repo-rate path and there were hardly any shifts in expectations at the announcement.

These ten observations are of course too few to draw any reliable conclusions, and too few for much quantitative analysis. They also coincide with a period of several changes in the Riksbank's communication and corresponding learning by both the Riksbank and the market (see the appendix for major events in Riksbank communication). The last two are from the period of increased financial stress after mid-September and hence from a very abnormal situation. However, the observations show that the Riksbank may both keep the repo-rate path unchanged and change it quite a bit, depending on the situation. Any observer should, after these observations, realize that the repo-rate path is a conditional forecast, not an unconditional commitment. Furthermore, whereas the market may not have taken the first repo-rate paths in February and June 2007 very seriously, the market seems to have taken the repo-rate path more seriously thereafter, except in February 2008 when the market expected a much lower path and adjusted only part of the way towards the new repo-rate path. When there has been a significant shift in market expectations, they have always shifted in the direction of the Riksbank's repo-rate path, except for longer maturities in June 2007 and July 2008. On seven or eight out of ten occasions, the market has done quite a good job of predicting the Riksbank's new repo-rate path, also when it has shifted quite a bit from the previous path, and even during the last two dramatic announcements with big downward adjustments (although the market expected even lower repo-rate paths). I believe one cannot reject the hypothesis that the Riksbank has managed interest-rate expectations pretty well, although it has not been a complete success. It will be good when we have a few more years of data to better evaluate the Riksbank's management of expectations.

The big surprise in February 2008, when the Riksbank kept the previous path and increased the repo rate, is notable. On this occasion, according to surveys, the market was absolutely sure that the Riksbank would not increase the repo rate and would adjust its previous repo-rate path downwards. I remember thinking at the time that it was strange that the market was so sure about the majority vote in the Executive Board, when

I was not quite so sure myself what was the best decision. This incident raises the question of whether some independent weight should be put on not surprising the market. Everything else being equal, it is of course positive if the market can predict accurately, and the less it is surprised by policy actions the better. But should there be some independent weight on not surprising the market that would justify some policy adjustment? Should the period loss function include a term consisting of a weight times the squared gap between the repo rate and the expected repo rate? In this particular case, should the Riksbank have deviated from the path it thought would best stabilize inflation and the real economy just to avoid too large a surprise for the market?

I thought then, and I still think, that the Riksbank should always choose the best repo rate and repo-rate path regardless of any surprise to the market. Accommodating market expectations could lead to instability and less predictability in the medium run. Woodford (1994) gives an example of how monetary policy that actively tries to satisfy private-sector expectations of monetary policy may lead to instability and nonuniqueness of equilibria. As expressed by Geraats (2008):

Although the predictability of monetary policy actions certainly has merits, it should not be considered an end in itself. In particular, it is important not to distort monetary policy actions to achieve predictability, but rather to use central bank communications to this effect. For instance, by delaying policy decisions to avoid market surprises it becomes harder for the public to understand the central bank's monetary policy reaction. As a result, a focus on short-term predictability could actually undermine monetary policy transparency, harm credibility and reduce predictability in the medium and long run.

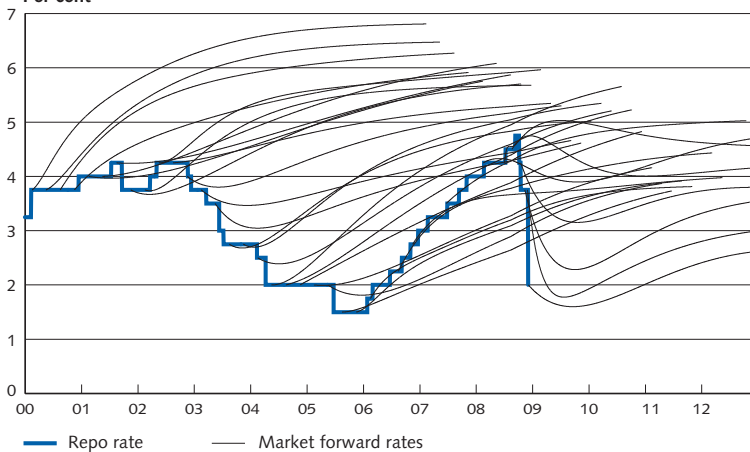
One might think that an obvious way to reduce the surprise at the policy announcement would be to signal or leak the policy decision on an earlier occasion. There are at least two problems with this approach. First, it would require a decision by the Executive Board on what to signal. This would in practice move the policy decision to a point in time earlier than the final policy meeting. Second, it would move the surprise to an earlier date. Evaluating the predictability of monetary policy in terms of the degree of surprise at the official policy announcement would then be misleading, and the "true" predictability might not have improved.

Particularly after the February 2008 surprise, the market was quite insistent about receiving more information about future decisions. In previous years, the market had become used to receiving some hints about the forthcoming decision, and the Riksbank had developed a prac-

tice of signaling the forthcoming decision. During 2007, the Riksbank instituted changes in its Rules of Procedure and Instructions that, among other things, reinforce the principle that all Board members should have an equal influence on monetary-policy decisions, thus strengthening the individualistic character of the Board and the individual accountability of its members. Since the majority decision is not made until the final policy meeting, any signaling might pre-commit some members and distort the final decision, and since the published repo-rate path should provide a fair amount of forward-looking information, the Riksbank decided in May 2007 not to signal future decisions between policy meetings unless there are exceptional changes in the economic situation. However, in order to accommodate the persistent demands from the market and other interested parties, in the new communication policy of May 2008, Board members have agreed that they may comment on new developments in relation to previous Riksbank forecasts and the relevant tradeoffs, still without anticipating the member's or Board's position on upcoming decisions unless there are exceptional circumstances.

How good is the market at predicting the future repo rate? Will the published repo-rate path improve the precision of the market expectations? We will need more data to assess this. Figure 11 shows the repo rate (black stepwise curve) and implied market forward rates (thin gray curves) from 1995 until now.¹⁵ The figure gives the strong impression that the market has not been particularly good at forecasting the future repo rate, so there does seem to be room for some improvement.

Figure 11. Repo rate and market expectations
Per cent



¹⁵ The inflation target of 2% for the CPI was announced in January 1993 with the proviso that it would apply from 1995.

7. Publishing attributed minutes, not only attributed votes

In May 2007, shortly before my term started, my colleagues to be on the Executive Board decided that the minutes published two weeks after each monetary-policy meeting would be attributed. Before, the votes had been named, but the various points raised and statements made during the discussion were not named. Now they would be. I must admit that, when I learned about this, I had some doubts. I had previously thought and written that non-attributed minutes would be best, since attributed minutes might restrict the discussion and make it more scripted.

Attributed minutes are unique to the Riksbank among major and inflation-targeting central banks, as far as I know. How has it worked? Again, I do not have any experience of being a member of the Executive Board during the previous setup with non-attributed minutes, so I cannot make a direct comparison.¹⁶

A good thing with attributed minutes is that they might induce more individual preparation and consistency by each Board member and discourage free-riding, what has been called social loafing (Blinder 2008a). I myself think through in advance what I think about the decision, and I bring talking points that summarize the policy tradeoffs and my reasons for my decision. Then I make pencil revisions of these talking points during the meeting and may add to or subtract from them when speaking. I certainly would not feel good if the minutes gave the impression that I am not well prepared for the decision.

I believe the attributed minutes improve the individual accountability of Board members. They provide more detailed information about individual committee members' views, and they allow external observers to evaluate the depth of each member's analysis and reasoning and their consistency over time, for instance. They should contribute to greater predictability regarding each member's future vote.

It is also said that full-time professional Riksbank observers could still with a high degree of precision infer who the speakers were when minutes were not attributed. Certainly, when I have read the minutes in previous years, I have often been pretty sure who said what (although I was of course rarely able to check the accuracy of my guesses). If this is true, the attributed minutes provides less of an information advantage for full-time professional observers, and indeed less need for full-time observ-

¹⁶ Gersbach and Hahn (2008a) show that transparency may induce committee members to invest more effort in information acquisition and thereby lead to better decision-making.

ers. More evenly spread information about Board members' views should be a good thing.¹⁷

Do attributed minutes reduce the risk of group-think, that is, that the Board gets inefficiently stuck in particular narrow-minded analysis approaches or views of the world? I would think that the risk of group-think is larger with collegial committees, and particularly large with autocratically collegial committees (Blinder 2008a), and smaller with individualistic committees with individual accountability. To the extent that attributed minutes contribute to individual accountability, I would think that they reduce the risk of group-think. Furthermore, attributed minutes would reveal to external observers which members develop group-think.

Is there less free discussion and less of a genuine interchange of views because of the attributed minutes? This is what I was nervous about before I was appointed to the Riksbank. Again, I do not have any direct experience of the discussions before the attributed minutes were introduced. However, several staff members who have observed the Executive Board meetings for many years have assured me that the current discussion is actually better and more thorough than ever before and have suggested that increased preparation by the Board members has indeed generated a better discussion and interchange, not worse. I also believe that I have noticed an increase in the amount of free, more spontaneous discussion and a more relaxed atmosphere at the policy meetings I have attended, perhaps reflecting the fact that we Board members feel more experienced and more comfortable over time. There have been quite a few changes in procedures, methods of analysis and communication that may take some time to get used to.

Importantly, given the way things work at the Riksbank, the final policy meeting is the culmination and summary of a long series of meetings, as detailed in Rosenberg (2008). During these previous meetings, the state of the economy, the nature and the size of the estimated shocks, the policy tradeoffs and the alternative interest-rate paths have been discussed and debated in a lively and robust way. During these meetings, there is a lot of spontaneous discussion and a genuine exchange of views, and minds are also gradually made up or changed. The discussion and exchange at the final policy meeting with the attributed minutes do not start from scratch but are the culmination and summary of these meetings. Therefore, one would not expect too much spontaneity but rather the presentation of the essential summaries and the reasons for the decision by each member.

¹⁷ Of course, the trend towards more transparency about monetary policy does in general reduce the usefulness of and demand for central-bank watching and leads to structural adjustments in that industry.

Finally, the attributed minutes are edited. They are not transcripts. Having transcripts (and more extreme alternatives such as televised meetings) would be a very bad idea. To have edited minutes is a good idea, I believe. The way it works at the Riksbank is that two staff members make notes and prepare a draft that is sent to the Board and to senior staff. I go through and revise my part of the draft, improve the grammar, sometimes shorten statements to avoid redundancy and repetition, sometimes clarify a statement a bit more, and return the draft to the two staff members. Adding a point that was not made, or deleting an essential point that is not made elsewhere in the minutes, would be wrong. Then the two staff members provide a new draft, the Board and senior staff members go through the minutes at a special meeting and the minutes are published two weeks after the policy meeting. Making the delay shorter than two weeks without reducing the quality of the minutes would be difficult, I believe.

8. Desirable future developments and improvements

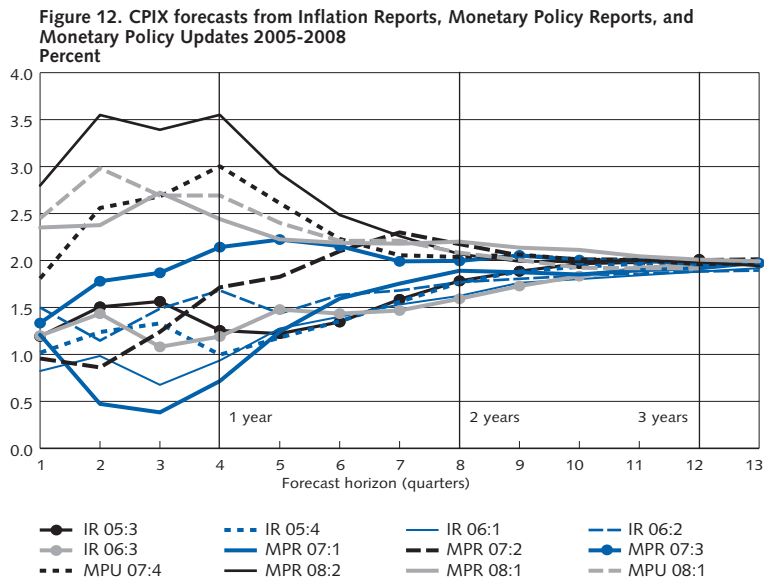
Even though the Riksbank's transparency ranking is high, there is of course some room for improvement. For instance, there is room for increased transparency about the flexibility of the Riksbank's inflation targeting. In Giavazzi and Mishkin's (2006) evaluation of monetary policy in Sweden for the Committee on Finance of Sweden's Parliament, the first recommendation is (p. 77):

Recommendation 1: The Riksbank should more clearly explain that flexibility in its inflation targeting regime implies that the conduct of monetary policy should try to reduce both inflation and employment (output) fluctuations. Focusing on an inflation target in a flexible manner is a means to stabilize not only inflation fluctuations but also employment fluctuations. At the outset of the Riksbank's Inflation Report, there should be a statement and explanation that the Riksbank is operating a flexible inflation targeting regime which seeks to reduce employment (and output) as well as inflation fluctuations. [Boldface in original. I believe that the references to employment and output should be understood as to refer to employment and output *gaps*.]

In the Committee on Finance's (2007) own report in June 2007 on the evaluation and the comments by the Riksbank and other interested parties, the Committee states that (p. 47):

... there is still some uncertainty about what the Riksbank's regime of flexible inflation targeting in practice means. In the Committee's view there are therefore reasons for the Riksbank to further clarify that the bank pursues a flexible monetary policy that takes into account both inflation and employment and in a clear way set forth the account of what the flexibility means for the monetary policy framework. [My translation from Swedish.]

The Riksbank is working on a clarification of what flexible inflation targeting is, but this work has not yet been completed. In the summary of the monetary-policy framework at the outset of each *Monetary Policy Report*, there is still an emphasis on a fixed horizon, with the statement "Monetary policy is normally focused on achieving the inflation target within two years." This statement I consider dated and undesirable, since imposing such a fixed-horizon constraint is inefficient, given the discussion above on the problems of a fixed horizon in flexible inflation targeting. Furthermore, in practice, during the last few years the horizon at which the Riksbank's inflation forecast has been close to the inflation target has varied quite a lot and often been longer than two years. Figure 12 shows CPIX forecasts as functions of the forecast horizon at policy decisions during 2005-2008 (before 2007 they were conditional on market expectations as given by implied forward rates).¹⁸ The forecast has



¹⁸ The CPIX is a core inflation price index that excludes mortgage costs and effects of indirect taxes and subsidies. After June 2008, the Riksbank has downgraded the role of the CPIX and increased the emphasis on CPI (see Wickman-Parak 2008).

normally differed from 2 percent at an 8-quarter horizon but been very close to 2 percent at a 12-quarter horizon.

Thus, as I have mentioned several times, flexible inflation targeting involves not only stabilizing inflation around the inflation target but also stabilizing the real economy (stabilizing measures of resource utilization). Unfortunately, the measures of resource utilization are very imperfect and improvements are much needed. The Riksbank reports several measures of resource utilization in the *Monetary Policy Report*, including Hodrick-Prescott (HP) gaps for output, hours worked, and employment. That is, the gaps are computed as the actual time series less a "potential" time series defined as an HP-filtered time series. These are very imperfect measures of resource utilization. In practice, HP output gaps in Ramses are similar to the so-called trend output gaps in Ramses, where the trend output gap is computed relative to the stochastic trend of output (the stochastic steady state of output). A major problem with defining potential output as trend output is that it does not incorporate persistent but stationary productivity shocks, only non-stationary productivity shocks.

My view is that it would be practical and transparent to combine all the different measures of resource utilization into a one-dimensional measure, say an output gap between output and potential output, where the gap and potential output combine all the relevant information about resource utilization. From an efficiency and welfare point of view, potential output should incorporate all persistent productivity shocks and be related to the hypothetical output level that would arise if the economy did not have the distortions associated with nominal price and wage stickiness and nominal prices and wages were completely flexible. This potential output level should be equal to a constant (proportion) of the Pareto-efficient output level (where the constant is chosen such that potential output equals the unconditional mean of output and potential output normally is less than Pareto-efficient output due to existing real distortions). Adolfson, Laséen, Lindé, and Svensson (ALLS) (2008) report possible alternative output gaps and potential outputs in Ramses.¹⁹ Much more work is needed to provide better and more reliable measures of potential output and resource allocation that can be used in monetary policy and published in the *Monetary Policy Report*. Transparent flexible inflation targeting requires that a central bank can make and publish forecasts of potential output and the gap between output and potential output, that the trade-off between stabilizing inflation and stabilizing the real economy can be correctly shown and that the best compromise between stabilizing inflation and the real economy can be found and explained.

¹⁹ Justiniano and Primiceri (2008) provide some recent discussion of potential output concepts.

Most popular discussions of monetary policy refer to the nominal instrument rate and the path of future nominal instrument rates. However, standard macro theory shows that it is the real instrument rate and the expected future real instrument rates that matter for the effect of monetary policy on the real economy and inflation. For instance, in a situation where, everything else equal, inflation and inflation expectations have shifted up, a given path for the nominal instrument rate implies that the path for the real instrument rate has shifted down. Unless the path for the neutral real instrument rate has shifted down to the same extent (which depends on what shocks have hit the economy), monetary policy has then become more expansionary. This basic insight from conventional theory is hardly universal and part of the conventional wisdom, but it should be, I believe. Furthermore, the translation of a nominal instrument-rate path into a real instrument-rate path requires consideration of what path of inflation expectations to use to deduct from the nominal instrument rate path. This is normally obvious in theoretical models. In the real world, there are numerous measures of inflation expectations and these measures vary across different categories of economic agents. Which ones should we use?

Even though changes in the real repo rate and the real repo-rate path provide a better measure of changes in the monetary-policy stance, they are still imperfect measures. The most adequate measure of monetary-policy stance would be the gap between the real repo rate and a state-contingent neutral real interest rate and, in particular, the forecast path of that gap. State-contingent neutral real interest rates are related to expected potential-output growth and estimating such neutral interest rates is closely related to estimating and forecasting potential output. Estimates and forecasts of neutral interest rates may be a very useful by-product of estimating potential output and could be used to improve the discussion and explanation of the monetary-policy stance. ALLS (2008) show how to construct and project neutral real interest rates in Ramses.

The instrument-rate paths considered by the Riksbank's staff and Executive Board have so far been constructed mostly from estimated historical reaction functions with considerable judgmental adjustments. It would be very useful to have alternative instrument-rate paths be generated from optimal policy projections that minimize a given intertemporal loss function. Paths generated by such optimization for different parameters in the loss function have the advantage that they are efficient, in the sense that it would not be possible to stabilize inflation more without stabilizing resource utilization less. In contrast, policy projections generated by different empirical reaction functions would not normally be optimal

and hence not efficient. ALLS (2008) show how optimal policy projection can be constructed in Ramses.

Choosing the path for the repo rate among paths generated by different parameters in intertemporal loss functions would allow for checks that the Executive Board and its members show some consistency over time and assist in making the Executive Board's implicit loss function more explicit and identified. In this context, there are some challenges that optimization under commitment in a timeless perspective pose which are too technical to discuss here (see Svensson and Woodford (2005) and ALLS (2008) for such discussion). However, then Deputy Governor Jarle Berge (2007) provides a fascinating non-technical discussion of a practical example from Norway. To judge from this speech and presentations by Norges Bank staff that I have attended, Norges Bank seems quite a bit ahead of other central banks, including the Riksbank, in applying optimal-policy considerations in practical monetary policy. For instance, some policy projections are generated as optimal projections for different loss-function parameters, and the consistency of decisions over time is monitored by examining whether the loss-function parameters revealed by the decisions are stable over time. Needless to say, I hope the Riksbank will catch up, and I will try to contribute to this.

The evolving financial crisis over the last year has made the role of the financial sector and financial factors in the transmission mechanism for monetary policy more conspicuous. There have been many conferences devoted to this role and much recent work that can be applied in practical policy. Christiano, Trabandt, and Walentin (2007) have developed a variant of Ramses with an elaborate financial sector. More work is needed before this model can be used for analysis of the role of financial factors in practical policy simulations.

In Ramses, as in most central-bank DSGE models, private-sector expectations are modeled as rational expectations. I believe it is uncontroversial that there are many situations in which rational expectations are a very unrealistic assumption and that policy projections under the assumption of rational expectations may be misleading. From introspection I have noticed that I often tend to think of real-world Swedish inflation expectations as a weighted average of rational expectations, adaptive expectations and the Riksbank's inflation target. The recent large literature on learning and rational inattention might be helpful in developing a deeper and more realistic view of the formation of private-sector expectations. It is certainly possible and may be useful to policy simulations under alternative assumptions of expectations formation.

From this perspective, we can think of increased transparency in monetary policy also as an attempt to provide the private sector with a

better understanding of monetary policy and to assist the private sector in forming better and more rational expectations, hence making the assumption of rational expectations more realistic.

From the above discussion, it is obvious that I see no shortage of possible improvements in the Riksbank's flexible inflation targeting, in spite of the many advances already made. But do all these possible improvements have to do with transparency, the main focus of this paper? Yes, I believe that in order to be transparent about monetary policy, one must also have clear and consistent analyses and measures to be transparent about.

But is it not so that these improvements refer to concepts that are difficult to estimate and forecast and whose estimates and forecasts will be subject to considerable uncertainty? This may be the case, but I do not think that this is a valid argument against these improvements. The same argument could be and was used against making inflation forecasts in the first place, since making inflation forecasts is difficult and the result is uncertain. I think we all agree that starting to make and apply inflation forecasts in inflation targeting was a good thing, even though they are still difficult to make and uncertain. But they are necessary. In the same way, finding the best compromise between stabilizing inflation and the real economy requires the best available measures of resource utilization. Such measures and forecasts of resource utilization are also necessary, even if constructing and making them is difficult and the result is uncertain.

Furthermore, in practical monetary policy, so-called certainty equivalence is often a good approximation or at least a good starting point. Certainty equivalence (see, for instance, Svensson and Woodford 2003) means that only the mean forecast is needed for policy decisions. This implies that the uncertainty of the forecast does not affect the policy decision. Certainty equivalence holds for optimal policy with a linear model of the transmission mechanism and a quadratic loss function when the only source of uncertainty is additive shocks. These conditions are not fulfilled exactly, but in most cases certainty equivalence is still an acceptable approximation, I believe. Then the uncertainty of estimates and forecasts is not an argument against the usefulness of these estimates and forecasts.

Appendix 1: Major Events in Riksbank Communication

January 1993. The Riksbank announces the inflation target of 2 percent, to be applied from 1995.

October 1993. The Riksbank starts to publish the report *Inflation and Inflation Expectations in Sweden*, which includes a discussion of the inflation pressures.

June 1995. The Riksbank starts to publish approximate inflation forecasts under the assumption of a constant repo rate in *Inflation and Inflation Expectations in Sweden*.

March 1996. The report *Inflation and Inflation Expectations in Sweden* is renamed *Inflation Report*.

December 1997. The Riksbank starts to publish more precise inflation forecasts in the *Inflation Report*.

January 1999. The new Executive Board announces that the minutes from the monetary-policy meetings shall be published.

February 1999. The Riksbank publishes a clarification of the monetary-policy framework.

March 2005. The Riksbank starts to publish an alternative forecast under the assumption of a repo-rate path given by implied market forward interest rates. The horizon for this forecast is lengthened to three years.

October 2005. The Riksbank starts to publish a main scenario in the *Inflation Report* under the assumption of implied forward rates and a horizon of three years.

May 2006. The Executive Board publishes the document *Monetary Policy in Sweden*, which describes the monetary-policy objectives and strategy and replaces the clarification of February 1999.

February 2007. The Riksbank starts to publish a repo-rate path. The *Inflation Report* is renamed *Monetary Policy Report* and includes an extensive explanation of the monetary-policy decision.

May 2007. The Riksbank announces that press conferences will be held after each monetary-policy meeting, that normally no information about the repo-rate decision will be conveyed before monetary-policy meetings and that minutes from monetary policy meetings will be attributed.

September 2007. The Riksbank announces that it will, from December 2007, publish a repo-rate path at each of the six monetary-policy meetings, not only after the three meetings at which a *Monetary Policy Report* is published.

May 2008. The Riksbank announces an updated communication policy for all Riksbank activities, including monetary policy. Before monetary-policy meetings, some public comments on data and outcomes relative to previous Riksbank forecasts and on policy trade-offs may be now given but no indication of the coming repo-rate decision.

Appendix 2: The Riksbank's communication policy

1. OBJECTIVES OF THE RIKSBANK'S COMMUNICATION

The purpose of the Riksbank's communication is to:

- contribute to fulfilling the Riksbank's objectives and vision,
- enable scrutiny and evaluation and
- contribute to internal quality and efficiency.

The Riksbank's communication shall contribute to achieving the Riksbank's objective and vision. The objective of the Riksbank's operations is to ensure that inflation remains low and stable. One of our main tasks is also to ensure safe and efficient payments in the economy. The Riksbank's vision is to be among the best as regards quality, efficiency and confidence.

The Riksbank is a public authority under the Riksdag (the Swedish Parliament) and accordingly, communication must enable scrutiny and evaluation. Both the general public and the principal, the Riksdag, must be able to follow and scrutinise the work of the Riksbank easily.

Communication must also contribute to internal efficiency. Each employee must have the information required to be able to do their job and to feel job satisfaction and that they belong. All employees should be able to be "ambassadors" for the Riksbank.

The Riksbank's communication must be an integrated part of its activities. This means, for example, that communication planning must be part of operational planning.

2. TARGET GROUPS AND COMMUNICATION CHANNELS

Target groups

There are several target groups for the Riksbank's communication and these include members of the Riksdag, companies, households, banks and other participants in the financial markets, government agencies, organisations, media and the Riksbank's employees.

Communication channels

The Riksbank's own most important channel for external information to the various target groups is www.riksbank.se. Other important channels are reports on monetary policy and financial stability, speeches, press releases and ongoing dialogue in various forms and forums with prioritised target groups.

The various levels of management of the Riksbank are responsible for informing their employees about their own operations and about the Riksbank's overall activities. The intranet is also an important internal information channel.

3. THE RIKSBANK'S COMMUNICATION – APPROACH

The Riksbank's communication must be open, comprehensible, objective and up to date:

- All information must be accessible both internally and externally with the exception of the restrictions that follow from secrecy rules.
- For the Riksbank's operations to be comprehensible they must be described in simple and clear language. Information from the Riksbank is to be adapted to the needs and wishes of the target group in order to get the message across effectively.
- The information provided must be relevant and objective.
- Information that is assessed to have an impact on financial markets must be published as quickly as possible.

The Riksbank also has a statutory obligation if an individual so requests, to supply data from a public document unless that data is classified as confidential. The Riksbank is also obliged to provide information concerning the Bank's area of operations.

All employees of the Riksbank must attach great importance to being open and comprehensible concerning all the Bank's activities, both internal and external. All target groups must be able to understand what the Riksbank does and why. There are several reasons why this is important.

Popular support for the Riksbank is a basic premise for a high level of confidence. This makes it easier for the Riksbank to achieve the objective of price stability and to promote a safe and efficient payment system. Consequently, the Riksbank publishes forecasts and analyses that form the basis for decisions in all the Bank's operations.

The Riksbank's independent position makes considerable demands in terms of openness, comprehensibility, objectivity and being up to date. It facilitates external scrutiny and evaluation of the Riksbank's operations and makes democratic control possible. It is then easier to discuss and evaluate the Riksbank's operations internally as well. This contributes to quality and efficiency in the organisation.

4. RESPONSIBILITY FOR INFORMATION AND COMMUNICATION

The responsibility for information and communications is decentralised at the Riksbank. This means that each head of department makes statements on questions dealt with in that department and that factual data is provided by the person dealing with the matter. The Bank is represented by the Governor or another member of the Executive Board in relation to overall matters. The Director of Communications, the Chief Press Officer and the Head of the General Secretariat may also make statements. Only the members of the Executive Board issue independent statements on monetary policy and financial stability.

To ensure that external communications are well-coordinated all media contacts must be reported to the Riksbank press service.

In crisis situations communications are coordinated by the Communications Secretariat together with the Riksbank's Management Group.

Information and communication is a managerial responsibility. Managers must give their employees the information they need in their daily work and ensure that they are well informed about the Riksbank's operations. Information on the Riksbank's vision, objectives, strategies and values is formulated and spread by the Executive Board and the managers.

All employees have a responsibility for keeping themselves sufficiently informed to be able to perform and develop their work. Sharing knowledge, ideas and viewpoints is important for internal quality and efficiency. It is also important for a good working climate.

The Communications Secretariat:

- provides support in the work of communication as internal consultants,
- guides, coordinates and develops information and communication and

- is responsible for ensuring that messages, target groups, choice of channel and timing of communication are planned in consultation with the members of the Executive Board, Department Heads and relevant experts.

The Director of Communications is responsible for communication policy compliance.

Appendix 3: Monetary Policy Communication: A separate appendix to the Riksbank's Communication Policy

1. OPEN AND CLEAR COMMUNICATION

The Riksbank aims to be as open and clear as possible in its monetary policy communication. There are several reasons for this:

- It should be easy for all the Riksbank's target groups to understand the background to the monetary policy decisions that are made. For that reason the Riksbank publishes the forecasts and analyses on which the decisions are based. By clarifying its reasoning in this way, the Riksbank increases the possibilities of our target groups not only to understand but also to predict monetary policy. This strengthens the credibility of the inflation target and makes it easier to establish expectations around an inflation rate of two per cent.
- The Riksbank is subject to the principle of public access to official documents. The Bank's independent position also imposes considerable demands for it to be open, comprehensible, objective and up to date. This is essential to enable both the general public and the Bank's principal, the Riksdag (the Swedish parliament), to scrutinise and assess monetary policy.
- Communication that promotes discussion and examination of monetary policy also contributes to raising the quality and effectiveness of internal analyses.

2. TARGET GROUPS AND THE COMMUNICATION PROCESS

There are several target groups for the Riksbank's communication and they include members of the Riksdag, companies, households, banks and other participants in the financial markets, government agencies, organisations, media and employees of the Riksbank.

Information on monetary policy decisions and intentions is important to all of the target groups and it is market sensitive. The Riksbank must therefore have a clear procedure for how these issues are communicated. As the Riksbank specifies when, where and how information is to be given, all target groups have equal opportunities to obtain information about monetary policy.

Market-sensitive information about the Riksbank's actions must be published as soon as it is deemed possible, via one or more of the channels that are normally used. The communication must fulfil the simultaneous publication requirement.

3. MEETINGS AND REPORTS

The Executive Board normally holds six monetary policy meetings a year, when the members decide on the repo rate. In connection with three of these meetings the Riksbank publishes a monetary policy report with complete forecasts for the economy and inflation, alternative scenarios and risks. In connection with the three other monetary policy meetings a monetary policy update is published, with forecasts of a number of important macroeconomic variables. At each monetary policy meeting the Riksbank presents a new three-year repo rate forecast.

4. INFORMATION IN CONNECTION WITH MONETARY POLICY DECISIONS

The day after each monetary policy meeting the Riksbank publishes the Executive Board's decision in a press release and holds a press conference. Up to the time until the minutes of the monetary policy meeting are published it is the majority decision that is published. In the press release the Bank gives an account of the decision and the deliberations behind it. The report or the update is published at the same time on the Riksbank's external website. Internally, a presentation is given to employees.

On the same day the Riksbank invites analysts and financial market participants to a presentation of the Monetary Policy Report, which is also presented to participants in the foreign financial markets at various meetings. Monetary policy roadshows are arranged throughout the country aimed at spreading knowledge to various target groups and regions.

About two weeks after each monetary policy meeting the Riksbank publishes minutes which reflect the discussion at the meeting. Since the members of the Executive Board are named it is possible to follow their reasoning and how they finally voted on various issues.

The Riksbank must submit a written report on monetary policy at least twice a year to the Riksdag Committee on Finance. During the spring special material for assessing monetary policy is submitted and in the autumn this material is the Monetary Policy Report.

5. MONETARY POLICY COMMUNICATION BETWEEN MEETINGS

The monetary policy decisions are followed by concentrated information work. Even between the decisions there is a need to communicate relevant information; via speeches, press releases and economic commentaries on the Riksbank's external website.

Members of the Executive Board can give an account of important monetary policy issues. They can also, after the minutes are published, give an account of their own personal deliberations in connection with decisions and forecasts made or comment on new statistics and relate them to the previous forecast. The members can also report on the decision-making material, that is to say which variables are always important and which may be particularly important at the time in question. Common to communication between the monetary policy meetings is that the information given does not anticipate the member's or the Executive Board's position on coming monetary policy decisions.

To avoid disrupting the monetary policy process, the Riksbank is restrictive with information close to a monetary policy meeting.

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