

Norges Bank Watch 2004

An Independent Review of Monetary Policymaking
in Norway

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Preface

This report marks the 5th anniversary of Norges Bank Watch. In this short time span, Norges Bank Watch has quickly gained prominence in the public debate about monetary policy in Norway. The yearly reports of Norges Bank Watch provide an external evaluation of the monetary policy decisions of Norges Bank in the preceding year. In addition, each report addresses some specific issues that are pertinent to the Norwegian monetary policy framework. The continued ability of monetary policy to provoke controversies underscores the importance of preserving the annual tradition of independent reviews by Norges Bank Watch.

We hope that Norges Bank Watch 2004 fulfils its aim of contributing to improvements to monetary policy in Norway.

Oslo, 22 April 2004
Norges Bank Watch 2004

Executive summary

The Centre for Monetary Economics (CME) at the BI Norwegian School of Management has for the fifth time invited a committee of economists for *Norges Bank Watch* with the objective of evaluating monetary policy in Norway. The committee for *Norges Bank Watch 2004* consists of Hilde C. Bjørnland (University of Oslo), Thomas Ekeli (Pareto Securities), Petra M. Geraats (University of Cambridge) and Kai Leitemo (BI Norwegian School of Management). *Norges Bank Watch 2004* is funded by the Ministry of Finance. However, *Norges Bank Watch 2004* is fully independent and the views and recommendations in this report may not correspond to those of the Ministry of Finance.

The main task of the committee has been to evaluate how well Norges Bank has fulfilled its monetary policy mandate given by the Norwegian Government on 29 March 2001. In particular, the committee has reviewed Norges Bank's interpretation of the mandate and finds that its interpretation is insufficiently flexible. In addition, the committee has assessed Norges Bank's monetary policy strategy and decision making process and considers them suboptimal and inefficient. Furthermore, the committee has evaluated Norges Bank's forecasts and interest rate decisions in 2003 and has detected persistent forecast errors as well as policy mistakes that kept monetary policy too tight at the end of 2002 and early in 2003 and perhaps too loose at the end of 2003. The committee has also assessed Norges Bank's use of indicators for underlying inflation and the output gap, and concludes that its measures are poor and need improvement. Finally, the committee has evaluated Norges Bank's public communication and transparency and finds that despite increased public communication, there is still a notable lack of transparency.

MONETARY POLICY IN 2003

Difficult economic environment

The economic environment in recent years has been challenging for monetary policymakers worldwide. The bursting in 2000 of an historic investment and equity market bubble has driven cyclical developments. In addition, inflationary pressures have been dampened by globalisation, illustrated by the profound consequences of China's increased involvement in the global economy and intense competitive pressures. There has also been heightened geo-political uncertainty, clouding the outlook for the world economy and the oil price. Furthermore, Norwegian policymakers have had to cope with unusually high wage growth and large exchange rate fluctuations.

Massive forecast failures

In the forward-looking framework of flexible inflation targeting that Norges Bank subscribes to, economic forecasts are the cornerstone for designing monetary policy because they indicate the need to adjust policy in light of economic developments. The experiences of the past two years are in this respect disturbing. Norges Bank's forecasts in the autumn of 2002 painted a picture of robust economic growth and inflation

near its 2.5 per cent target, apparently justifying a high interest rate of 7 per cent. However, the national accounts today show that the mainland economy was then sliding into recession. In addition, annual core inflation plunged far below its expected path, ending up at only 1.1 per cent in 2003, using Norges Bank's preferred measure of the CPI adjusted for taxes and energy prices (CPI-ATE). This is far outside the 90 per cent confidence intervals for the Bank's forecasts as well as the +/- 1 percentage-point range around the inflation target stipulated by the government. It is also disconcerting that the forecast errors during the past 18 months appear to be persistent.

These forecast failures raise important questions with regard to the robustness of the Bank's policy decisions. Since the central bank forecasts are crucial in setting the optimal interest rate, it is essential to conduct a timely and thorough search for the sources of forecast failures in order to improve future forecasts and reduce the chance of policy errors. In that respect, we find that Norges Bank's efforts should be strengthened by implementing more frequent, relevant and rigorous evaluations of its forecasts.

Monetary policy too tight in early 2003

With the benefit of hindsight, one may easily draw the conclusion that monetary policy in late 2002 and early 2003 ought to have been less restrictive. But to conclude whether Norges Bank's interest rate decisions were appropriate, the assessment of the conduct of monetary policy should primarily be based on the information available to the central bank at the time (i.e. an *ex-ante* rather than an *ex-post* perspective).

This committee shares the assessment of Norges Bank Watch 2003 that by not correcting the policy errors made in the second half of 2002 quickly, monetary policy at the start of 2003 ended up being too tight. We also find evidence that the Bank ignored the signals provided by its own forecasts and paid insufficient attention to other forecasters. In cases where Norges Bank's projections differ significantly from other independent forecasts (e.g. by Statistics Norway), the Bank should conduct a closer scrutiny of the causes and construct alternative risk scenarios to render its monetary policy strategy more robust.

Dramatic easing as economy is recovering

2003 was an effervescent year for Norges Bank, starting off with the sight deposit rate at 6.5 per cent, an economy in recession and inflation sliding far below the target. An historic easing of policy took the key rate to 2.25 per cent by the end of the year (and down to 1.75 per cent in March 2004).

In an effort to correct the forecast and policy errors made in the second half of 2002, Norges Bank found itself in the unusual situation of lowering interest rates by a 100 basis points both in June and August 2003, and another 50 basis points to 2.5 per cent in September, at the same time as the economy was recovering. Norges Bank deserves credit for an easing of policy in 2003 that has bolstered confidence in an economic expansion and a return of inflation towards its target. However, the decisions in the spring and summer of 2003 highlight what we see as structural weaknesses in the Bank's forecasting and decision making procedure.

The substantial interest rate reductions in August and September 2003 were based on a strategy discussion that took place in early June, which in turn was based on preliminary forecasts for the June

Inflation Report (probably conducted in the second half of May). Norges Bank's tradition of only publishing three Inflation Reports a year meant that the forecasts in the June Inflation Report were based on GDP-data published in March 2003, covering the end of 2002 only. Thus, these big interest rate cuts were not based on up-to-date forecasts, using the most recent quarterly data. Instead, the Executive Board should discuss strategy and forecasts closer to the implementation of policy, and the monetary policy decisions and publications of the Inflation Reports should be better synchronized with releases of new and updated national accounts figures. In addition, the Inflation Report should be issued four times a year and include a quarterly estimate of the output gap, for which the Bank should employ more sophisticated methods to get a better grip on where the economy is in the cycle.

Insufficient flexibility

Norges Bank's interest rate setting in the second half of 2003 and early 2004 was increasingly responding to large, persistent downward surprises in current (CPI-ATE) inflation instead of relying on its forecasts. The risk of deflation needs to be taken seriously by a central bank and a declining trend in core inflation below the target justifies prompt central bank action. However, we are concerned that the Bank's focus on CPI-ATE may have resulted in an overreaction in policy.

Although underlying inflation has clearly decelerated, there are a number of factors that suggest that the CPI-ATE measure exaggerates this development. In our investigation of other measures of underlying inflation, we find support for the argument that underlying price pressures are probably not as weak as suggested by CPI-ATE. Alternative statistical measures indicate that inflation has fallen to a lesser extent. While the annual average for CPI-ATE inflation was 1.1 per cent in 2003, the other measures we considered actually range from 1.9 to 2.8 per cent.

In addition, one should not exaggerate fears of a deflationary spiral in the Norwegian economy, considering the fact that the real economy has continued to improve, income growth for households and the corporate sector has been robust, and housing and equity prices have risen briskly. We therefore think that with the continued lowering of interest rates at the end of 2003 and early 2004, Norges Bank runs the risk of making monetary policy too loose.

We also find that Norges Bank is not availing itself of the flexibility provided for in the monetary policy mandate. By exploring alternative measures of underlying inflation and by implementing an optimal monetary policy strategy with a flexible horizon, the interest rate setting would be more robust and less prone to policy mistakes. Norges Bank could then also attain a lower volatility in interest rates, softening the impression that the Bank ranks among the most aggressive central banks.

MANDATE, STRATEGY AND TRANSPARENCY

Flexibility of mandate

The flexibility of inflation targeting depends on a number of factors, namely the target range, the target horizon, the presence of escape clauses and the extent to which other objectives (like output and exchange rate stabilisation) are emphasised explicitly in the mandate.

Norges Bank has decided to adopt a horizon of two years in which the inflation target shall be reached. The motivation for a target horizon of two years (in contrast to a shorter horizon) is that by returning inflation more slowly to its target, the variability of output is reduced. However, new analysis from Norges Bank suggests that the full effect of monetary policy actions on inflation takes longer than the two to three years previously anticipated. When the full effect of a monetary policy action exceeds the target horizon, interest rates need to be adjusted excessively, creating interest rate volatility. The two-year horizon therefore works as an unnecessary constraint on monetary policy, producing more volatility in macroeconomic variables.

The monetary policy mandate states that Norges Bank should ignore the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary circumstances when setting interest rates. However, in its interpretation of the mandate, Norges Bank has decided that it shall target a core measure of inflation called CPI-ATE, which only disregards the direct effect of changes in energy prices and taxes. In that sense, Norges Bank is not fully utilising the flexibility provided by the escape clauses in the mandate. Given the limitations of measures of core inflation, Norges Bank should also pay attention to other measures than CPI-ATE when deciding on its monetary policy stance.

The mandate of Norges Bank states that in addition to the operational target for inflation, monetary policy should contribute to stable expectations concerning exchange rate developments. Norges Bank has interpreted this as referring to the long run only. Generally, exchange rate and inflation stability are not compatible in the medium term, so a clarification of the mandate is desirable in this respect to ensure that it is in accordance with the government's intentions.

Suboptimal monetary policy strategy

Norges Bank has a monetary policy strategy of inflation forecast targeting that involves adjusting the interest rate so that the two-year ahead forecast for inflation equals the inflation target. There are three problems with this strategy.

First, the inflation forecast targeting strategy induces so-called time inconsistency in the sense that the desired interest rate path adjusts as the end point of the two-year target horizon changes over time. As a result, inflation reaches the target too slowly, which could be prevented by focusing on a projected interest rate path and only updating it in response to new information.

Second, the strategy ignores that a fixed two-year horizon is not optimal in response to all shocks. Some shocks may be easily stabilized without inducing output volatility, whereas others may be more pernicious. So, it would be desirable to adopt a flexible target horizon.

Third, the monetary policy strategy only focuses on the end of the target horizon, thereby ignoring potentially large fluctuations in inflation and output over the horizon. Instead, Norges Bank should set interest rates that stabilize the path of inflation and output continuously over time, not just at the end of the target horizon.

In line with Norges Bank Watch 2002 and 2003, we recommend that Norges Bank abandons its current strategy and publishes the optimal interest-rate path that is projected to produce the greatest stabilization of inflation and output over time. The Bank should also systematically address the role of uncertainty in monetary policymaking.

Lack of transparency

Norges Bank significantly increased its public communication in 2003. Although the Bank is releasing more and more material, it has not yet succeeded in making monetary policy in Norway fully transparent.

First of all, there is some murkiness about the institutional framework for monetary policy. In particular, it would be desirable to strengthen the formal independence of Norges Bank in interest rate setting and its accountability. Moreover, the current practice that the Governor has to submit the anticipated interest rate decision to the Ministry of Finance the day before the monetary policy meeting of the Executive Board should be discontinued. Instead, Norges Bank should only inform the Ministry of Finance immediately after the Executive Board has made the interest rate decision, before the public announcement and implementation of the decision.

There is also a notable lack of transparency about the economic information relevant for monetary policy decisions. We recommend that Norges Bank issues its Inflation Report at quarterly frequency and incorporates the current Strategy Document as well as some additional data, projections and evaluations. Furthermore, it should be endorsed by the Executive Board, describe its view at the monetary policy meeting, and be published within a week of the interest rate decision.

There is even less detailed information about the Executive Board's discussion and assessments on which the monetary policy decision is based. To remedy this, Norges Bank should release attributed voting records at the policy announcement, and publish non-verbatim, unattributed minutes of the monetary policy meetings of the Executive Board within three weeks of the interest rate decision.

To provide clarity about its policy stance, Norges Bank should release an explicit policy inclination together with the interest rate decision, preferably in the form of a projected path for the policy rate over several quarters.

Implementation of these recommendations would improve both the efficiency of external communication and the quality of the internal decision process at Norges Bank.

OVERALL ASSESSMENT

The monetary policy mandate in Norway specifies an inflation target of 2.5 per cent annual inflation, with a tolerance margin of +/- 1 percentage point. Using the inflation measure that the Bank has decided to focus on, Norges Bank failed to meet its objectives as the annual rate of CPI-ATE inflation was 1.1 per cent in 2003.

However, our analysis shows that other measures of underlying inflation, which might even be closer to the specifications provided by the Bank's mandate, ranged from 1.9 to 2.8 per cent in 2003. Although this is consistent with the inflation target, our evaluation shows that there is much scope for improvements to monetary policy making in Norway.

1 Introduction

The Center for Monetary Economics (CME) at BI Norwegian School of Management has organized Norges Bank Watch since 2000 by every year inviting a group of experts on monetary policy. On 26 October 2003, CME, formulated the following mandate for Norges Bank Watch 2004:

“The main task of the committee is to provide an evaluation of how well Norges Bank (NB) has fulfilled its mandate given by the Norwegian Government on March 29, 2001. The evaluation should also pay attention to more recent government policy documents concerning monetary policy.

The committee should primarily evaluate whether the objectives stated in the monetary policy mandate concur with those expressed and acknowledged by NB, evaluate whether the strategy of NB in using its policy instruments is efficient in achieving the objectives, and evaluate how reasonable the use and production of indicators (such as forecasts) have been. The evaluation period should cover the year 2003 as a minimum.

The committee should also evaluate whether the public communication and transparency of NB is sufficient and appropriate for policy objectives and accountability.

The group should also make efforts to provide advice on how NB can improve its monetary policy and related tasks.

The report should be presented on a press conference no later than end of June 2004.”

Norges Bank Watch 2004 is funded by the Ministry of Finance. However, Norges Bank Watch 2004 is fully independent and the views and recommendations in this report may not correspond to those of the Ministry of Finance.

In line with our mandate, we discuss Norges Bank's interpretation of the monetary policy mandate in Chapter 2. This is followed by an evaluation of Norges Bank's monetary policy strategy and decision-making process in Chapter 3. Norges Bank's forecasts and interest rate decisions in 2003 are assessed in Chapter 4. Subsequently, we address the use of appropriate indicators, focusing on underlying inflation and the output gap in Chapter 5. Finally, we review the public communication and transparency of Norges Bank in Chapter 6. Our key recommendations are summarized at the end of each Chapter.

In preparation for this report, the committee met on 15-17 March 2004 and 14-16 April 2004. In addition, the committee has communicated extensively via email.

The committee has met with representatives of Statistics Norway and the Ministry of Finance, and also had a day-long meeting with representatives from Norges Bank, including Governor Svein Gjedrem and Deputy Governor Jarle Berge. We want to point out that the Governor has been generous with his time and extraordinarily open and forthcoming to all our questions.

Although the Bank has generally been cooperative, it was not willing to let us meet separately with external members of the Executive Board. We greatly regret this and it has impeded our efforts to fully assess the monetary policy decision process and the role of the external Executive Board members therein. We hope that the Bank will allow Norges Bank Watch to investigate this important issue in the future.

In addition there are a few other topics that deserve closer scrutiny that we have not addressed in this report, namely

- a review of the legal framework of monetary policy with respect to independence and accountability,
- an evaluation of the models used by the Bank, and
- a comprehensive assessment of the use of information by the Board.

We leave these issues for Norges Bank Watch in the future.

2 Interpretation of the monetary policy mandate

On 29 March 2001, the Government assigned a new operational mandate for the implementation of monetary policy to Norges Bank. The regulation states (§1, first paragraph):

“Monetary policy shall be aimed at stability in the Norwegian krone’s national and international value, contributing to stable expectations concerning exchange rate developments. At the same time, monetary policy shall underpin fiscal policy by contributing to stable developments in output and employment.

Norges Bank is responsible for the implementation of monetary policy.

Norges Bank’s implementation of monetary policy shall, in accordance with the first paragraph, be oriented towards low and stable inflation. The operational target of monetary policy shall be annual consumer price inflation of approximately 2.5 per cent over time.

In general, the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary disturbances shall not be taken into account.”

By announcing an explicit inflation target, the mandate is well in line with the best practice of central banking. This consists of defining a point target for inflation with a symmetric range around it. Due to lags in the effect of monetary policy, the procedure requires the central bank to construct inflation forecasts which are published in inflation reports. This makes it easier for the private sector to understand the policy actions of the central bank, thereby promoting transparency.

In the following we discuss the degree of flexibility that the mandate allows for, and investigate whether the objectives of the mandate concur with those expressed and acknowledged by Norges Bank. The flexibility of inflation targeting depends on a number of factors, namely the target range, length of the forecast horizon, presence of escape clauses and the extent to which other objectives (like output and exchange rate stabilisation) are emphasized explicitly in the mandate (see also Mishkin and Schmidt-Hebbel 2001 for a comparison of inflation targets).

2.1 Point target versus range

With an inflation target of 2.5 per cent, Norway has a target that is slightly higher than the target of 2 per cent chosen by the majority of inflation targeting countries (e.g. Sweden, Canada and the U.K.).¹ Australia has defined a target range of 2 to 3 per cent, whereas New Zealand has a target range of 1 to 3 per cent.

An explicit target range allows deviations of inflation from the target midpoint in order to put greater emphasis on other variables as well. With a range of 1 to 3 per cent, New Zealand thus appears to be among the most flexible inflation targeters. However, target ranges may not necessarily add more flexibility to the inflation target, as the central bank is likely to aim at the mid point in its range when deciding on a monetary policy stance. Nevertheless, a target range better acknowledges that inflation cannot be controlled perfectly due to forecast errors and uncertainty about the transmission mechanism.

At present, the guidelines for monetary policy (letter submitted by the Ministry of Finance to Norges Bank on 26 March 2001), suggests that deviations between actual and projected target inflation will normally be in the interval +/- 1 percentage point.

“As a main rule, consumer price inflation is to remain within an interval of +/- 1 percentage point around the target.”

However, this is quite distinct from having a target range, as the +/- 1 percentage point deviation from the point target is only allowed for ex post.

By making full use of the flexibility in the mandate of targeting inflation at “approximately 2.5 per cent” rather than 2.5 per cent exactly, the Bank need not respond aggressively to small discrepancies between the target and the forecasts. The interest rate decision on 3 July 2002 is a case in point. Interest rates were then increased by a full 0.5 percentage points since Norges Bank predicted that without such a change, the two-year inflation forecast would be slightly higher than 2.5 per cent, namely $2\frac{3}{4}$ per cent, as pointed out in the “Introduction to press conference”. Given large uncertainties regarding the appropriate model assumptions, it also pays well to not respond eagerly to small discrepancies (see chapter three for a further discussion on uncertainties).²

2.2 Horizon

The operational target of Norwegian monetary policy is an annual consumer price inflation of approximately 2.5 per cent over time. For most countries, the inflation targets are for annual inflation like in Norway. Australia is unique in the sense that the inflation target is defined broadly to be over the business cycle. The choice of measuring inflation on average over the business cycle gives an additional flexibility

¹ The U.K. had until recently a target of 2.5 per cent defined in terms of RPIX, but redefined their measure in terms of CPI when the target was changed to 2 per cent.

² The interest rate decision is based on the assumption that the krone exchange rate is equal to its average the last three months. However, during this period the exchange rate had appreciated significantly. Using instead the assumption that the exchange rate is equal to its average of the last month (June), Norges Bank predicts the inflation rate to be spot on target after two years.

compared to the annual target in the Norwegian mandate. It implies that inflation could be above target in one year, and below target in another, so that on average it is on target. In its “Guidelines for economic policy” (Report no. 29 to the Storting, 2000-2001), the Government clearly rules out such an interpretation:

“The provision [of having an interval of +/-1 percentage point around the inflation target] is to be construed to mean that deviations between actual inflation and the target in a period shall not be compensated for in a later period. If inflation deviates significantly from the target over a period, Norges Bank shall set the interest rate with a view to returning gradually consumer price inflation to the target to avoid unnecessary fluctuations in output and employment.”

Norges Bank has chosen a horizon of two years in which the inflation target shall be reached. The idea of assigning a two-year horizon (in contrast to a shorter horizon of say a year), is that by returning inflation slowly to its target, there will be less variability in output. The economic literature describes moderate monetary policy that pays attention to both the inflation target as well as output stabilisation (around potential output) in this way, as “flexible inflation targeting”, in contrast to “strict inflation targeting” which completely disregards the real effects of monetary policy in the short and medium run.

To what extent does the two-year time horizon provide Norges Bank with the required flexibility to respond to shocks so that it avoids unnecessary swings in the real economy? Usually, it takes 2 years for monetary policy actions to fully affect inflation in Norway. However, Norges Bank writes in the Inflation Report 1/04 that new analysis suggests that the effect of exchange rate changes on inflation takes longer than previously anticipated. In particular, previously most of the effect of an exchange rate change on inflation was seen within two years, whereas now the full impact of the effect is not felt before the third and even fourth year. When the full effect of monetary policy actions exceeds the target horizon, interest rates need to be adjusted excessively, creating interest-rate instability. This is discussed more extensively in Chapter 3, where we explain that the two-year horizon works as an unnecessary constraint on monetary policy, producing more volatility in the objective variables. This may be a concern in the present economic environment, as discussed in Chapter 4.

Norges Bank has argued that in some exceptional situations, it may be appropriate to apply a longer time horizon than two years. For instance in the Inflation Report 1/04, it is emphasized that:

“If extraordinary conditions prompt Norges Bank to apply a different time horizon than two years, the Bank will provide an assessment of this. The same applies if special emphasis is placed on developments in financial markets”.

So far this option has never been executed, although in our view it would have been advisable on several occasions (again, see the discussion in Chapter 4).

2.3 Escape clauses and measures of underlying inflation

The monetary policy mandate states that Norges Bank should ignore the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary circumstances when setting interest rates. The idea is that the Central Bank can appeal to these shocks when inflation misses the target.

Rather than using escape clauses, an alternative way of coping with short lasting shocks is to target a measure of underlying (core) inflation, which excludes particular volatile items from the price index. This involves no discretion after the shocks have occurred, as the decision to exclude items is taken *ex ante*. In interpreting the mandate, Norges Bank has argued (see Inflation Report 2/01) that it will focus on a core measure of inflation, calculated from CPI inflation but adjusted for tax changes and excluding energy products (CPI-ATE).³ In that sense, the degree of flexibility is not exhausted. Norges Bank has provided no justification for why it has limited the number of escape clauses to the extent that is done. In contrast, a country like New Zealand provides a non-exhaustive list of specific disturbances in which breaches of the inflation target may be ignored.

It is important that monetary policy focuses on a measure of inflation that has the greatest relevance for the behaviour of economic agents. Furthermore, shocks that have short lasting effects on inflation should be ignored when setting interest rates. However, if Norges Bank were to take advantage of the high degree of flexibility provided by the escape clauses in the mandate, then the degree of discretionary adjustment to inflationary measures would also increase. In order to calculate such an indicator for underlying inflation, it is essential to first put forward a set of criteria that this indicator should satisfy. Without these criteria, we do not know whether we have captured a realistic picture of underlying inflationary pressure in the economy (see the discussion in Chapter 5).

However, given the limited information content in each core measure, Norges Bank should pay attention to other constructed measures of underlying inflation in addition to CPI-ATE when deciding on its monetary policy stance. In particular, if all other measures indicate that there is a risk that CPI-ATE consistently under- or over estimates core inflation, Norges Bank should pay special attention to this information content and try to disentangle the different sources of inflation pressure before deciding on policy. Another alternative that would add more flexibility to the practice of inflation targeting while justifying the amount of discretionary adjustment, would be to develop a reference indicator by using economic theory to identify underlying inflation in an econometric model. Although this kind of measure would be difficult to convey to the general public, such a model-based measure could nevertheless provide Norges Bank with an economic rationale for its discretionary adjustments (again see Chapter 5 for further discussion).

³ In IR 2/01 Norges Bank argued that it would focus on developments in a measure of CPI adjusted for excise duties and excluding energy products. Statistics Norway has since then published such a measure (CPI-ATE) but refer to it as CPI adjusted for tax changes and excluding energy products (the Norwegian translation being the same; “KPI justert for avgiftsendringer og uten energivarer”). In the following we will therefore stick to Statistics Norway’s official definition.

2.4 Other objectives

In addition to an explicit inflation target, many countries have set appropriate goals for monetary policy. These goals are often regarded as subordinate to the inflation target. The mandate of Norges Bank states that in addition to the operational target of inflation stability, monetary policy should also underpin fiscal policy to pursue stable developments in output and employment. Similar goals apply, for instance, to the mandate in the UK. However, Norway and New Zealand have included additional goals concerning stable exchange rate developments.

Economic theory suggests that in the long run, monetary policy can only control nominal variables, such as inflation. It cannot increase the average level of growth rates of output and employment. Consistent with this, Norges Bank along with other central banks have therefore narrowed down the objective and placed their target in context by stating that (letter submitted to the Ministry of Finance by Norges Bank on 27 March 2001):

“Nominal stability is the best contribution monetary policy can make to economic growth and prosperity. A nominal anchor is also a necessary precondition for stability in financial markets and property markets”.

Despite this clarification there remains some confusion surrounding the interpretation of the multiple goals of the mandate in Norway, as evident from the many comments, arguments and articles written in the press the last two years. We believe that Norges Bank could be even clearer on the role of output stabilisation. A flexible inflation target provides flexibility for the central bank to select a point along the trade off between inflation and output gap variability that matches the public's preference. Although we would not suggest that Norges Bank explicitly announce the weight it places on inflation and output stabilisation, it could nevertheless be clearer in pointing out situations where it has paid particular attention to output stabilisation relative to the inflation target.⁴

In addition to discussion over the role of output stabilisation, it is not clear how it is generally possible to stabilise the exchange rate while achieving the inflation target. So far there has been clear evidence of a conflict between these two goals. For instance, the interest rate differential seen in the years 2001-2002 (required to tie down inflation expectations), led to a prolonged and substantial appreciation of the krone exchange rate.⁵

However, Norway is not unique in experiencing inconsistencies between stabilising inflation and the exchange rate. In New Zealand, another resource rich country, the export sector was placed under immense pressure by a sharp increase in the value of its currency following an interest rate setting in New Zealand in the mid 1990s. As a consequence the government renegotiated the mandate in 2001 to place

⁴ The following quote from the press release following the interest rate decision on 21 April 2004 is a step in the right direction. Explaining the decision to keep the interest rate unchanged at 1.75 per cent instead of lowering it, Norges Bank emphasised: *“In reaching its decision, the Executive Board has weighed the objective of bringing inflation back to target and stabilising inflation expectations against the risk that output growth may eventually be too high.”*

⁵ In Inflation Report 1/2003 Norges Bank argues that from May 2000 to January 2003, 40 per cent of the exchange rate appreciation can be explained by a widening interest rate differential (see also Bjørnland and Hungnes (2003) for similar findings and discussion).

more emphasis on the exchange rate, so as to avoid such unnecessary instability in output, interest rates and the exchange rate.

The mandate is not clear on specifying whether exchange rate stability is a concern for the long run only, or whether Norges Bank should pay attention to the exchange rate in the short run as well (see also NBW 2002). Norges Bank has interpreted the stabilisation to refer to the long run only, as the following quote from IR 1/04 (p. 46) highlights:

“Although economic disturbances and the monetary policy response may result in wide fluctuations in the exchange rate for the krone and short term expectations, monetary policy may also contribute to stabilising exchange rate expectations in the long term.”

Generally, exchange rate stability and an inflation target are not compatible in the medium term, so a clarification of the mandate is desirable in this respect to ensure that it is in accordance with the government’s intentions. In any case, Norges Bank should be more explicit and clarify to what extent it aims to achieve both the inflation target and exchange rate stability.

2.5 Government evaluation of monetary policy mandate

Changing the mandate would involve several complications. It might be difficult to explain to the general public, and it could reduce the credibility of the target. However, after a certain time period the experience of the inflation target should be evaluated, so as to seek to inject more stability into the system. All countries are different, Norway in particular due to its wealth of natural resources. The good practices of one country may not be desirable in another. In addition, the clarity and precision of the mandate are important for the credibility of central bank objectives, by convincing people that the interpretation of the mandate will remain constant as governors come and go (see the discussion in chapter 6). Changing the mandate with an aim to clarifying the objectives would therefore only contribute to increased credibility.

2.6 Key recommendations

The following recommendations would enhance the flexibility of the present monetary policy mandate, thereby reducing instrument instability and enhancing credibility:

- Target the whole business cycle *horizon*, not a fixed time horizon (two years).
- Take advantage of the whole range of *escape clauses* in constructing an inflation measure. Use a broader measure of *underlying inflation* by examining different aspects of inflation pressure.
- Given the *flexibility* provided by the mandate, Norges Bank should not respond aggressively to small discrepancies in the inflation forecasts from the 2.5 per cent target.
- Clarify the interpretation of multiple objectives. In particular, clarify the role of exchange rates in stabilisation.

3 Strategy and decision-making process

In this Chapter we take Norges Bank interpretations of its mandate as given and assume accordingly that the monetary policy objectives are to stabilize inflation around the inflation target and output around potential production. We first discuss whether the current monetary-policy strategy of the Bank is contributing to stabilizing inflation and output in the most efficient manner. Norges Bank has implemented a strategy that is very similar to the one used at the Bank of England and Sveriges Riksbank, two prominent inflation-targeting central banks. Despite its wide usage, we argue that the strategy deviates from the optimal monetary-policy strategy, i.e., it does not achieve the best trade-off between inflation and output stability and is hampered by time inconsistency issues that reduce the credibility of the Bank forecasts. We therefore describe and recommend changes to the strategy. In the last section, we discuss the framework in which decisions are made at Norges Bank and the Executive Board's involvement in the decision-making process. With the Executive Board responsible for monetary policymaking, we argue that there is a large potential for greater involvement of the Executive Board in the decision-making process, making the Board members more accountable for their decisions. We also argue in favour of synchronising the decision-making process in such a way that it allows each decision to be systematically based upon a wider range of up-to-date information.

3.1 The current monetary-policy strategy

One of the features of the forecasts presented in the Inflation Reports from the start of inflation targeting in 2001 and throughout 2003 is that Norges Bank's two-year ahead inflation forecast is on target. We interpret this *simple inflation forecast-targeting procedure* as the key element of the monetary-policy strategy of the Bank. Indeed, Governor Svein Gjedrem has stated several times that this principle guides Norges Bank's interest-rate setting. The following quote from Gjedrem (2002) is representative:

“If it appears that inflation will be higher than 2½ per cent with unchanged interest rates, the interest rate will be increased. If it appears that inflation will be lower than 2½ per cent with unchanged interest rates, the interest rate will be reduced.”

In addition, Gjedrem (2003) stated at a hearing before the Standing Committee on Finance and Economic Affairs of the Storting, that

“Norges Bank sets the interest rate with a view to achieving inflation of 2½ per cent at the two-year horizon.”

Simple forecast-targeting is convenient from a practical point of view when making decisions about the interest rate. By either the use of market expectations about interest rates or a constant-interest-rate assumption, the policymaker need only decide what the current interest rate should be in order to keep Norges Bank’s two-year ahead inflation forecast on target.

However, if we take the objectives of Norges Bank seriously and aim to stabilize inflation and output in the most efficient manner, the simple inflation-forecast targeting strategy is normally dominated by other strategies. The simple forecast targeting using constant-interest-rate assumption (an assumption made for the inflation forecasts in most of 2003) is, however, only efficient in stabilizing the policy objectives under the following two conditions: (i) the central bank only cares about stabilizing inflation and not about stabilizing output fluctuations, and (ii) the central bank policy has no effect on inflation before the end of the two-year horizon (see Leitemo, 2004). From our experience with Norges Bank, it seems that neither of these conditions is satisfied. Norges Bank is indeed concerned about stabilizing both output and inflation fluctuations. Moreover, the interest rate is widely regarded as having some effect on inflation in less than two years, in particular, through its effect on the exchange rate and the prices of imported goods. There are therefore benefits in changing the strategy in the direction described below.

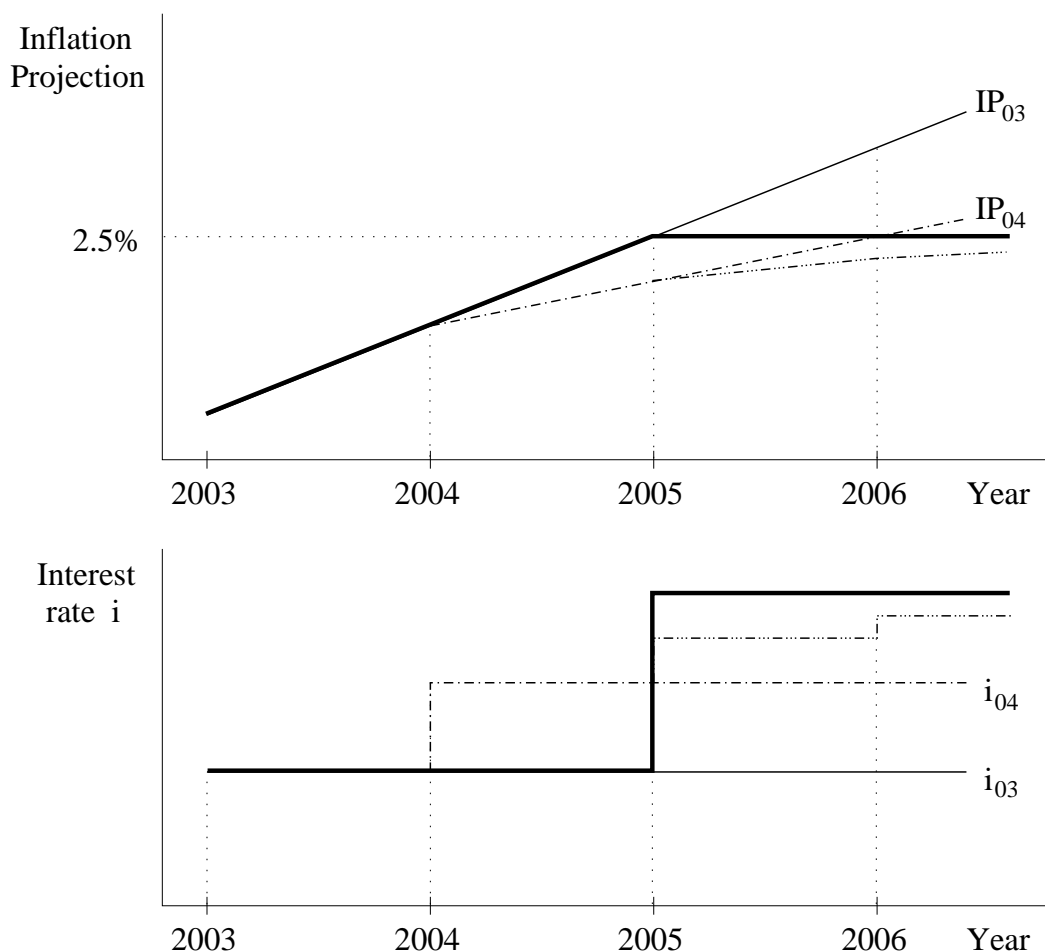
In both the first and second Inflation Report of 2003, inflation forecasts were based on the assumption of a constant interest rate. In the Inflation Report of October 2003, Norges Bank switched to using “market” interest rate expectations, derived from the market for interest rate futures. We believe that this switch to using “market expectations” is an improvement to the monetary-policy strategy. The reason is that the Bank’s projections are more accurate since market expectations regarding interest rate development will be closer to the actual interest rate setting. We believe, however, that it is important for the Bank to announce and make explicit comments on any changes it makes to the implementation of its monetary-policy strategy. The Bank should have made the motivation and the reasons behind the change in October 2003 more explicit. If Norges Bank chooses to continue using the simple forecast-targeting procedure, we recommend that Norges Bank either maintains the market interest rate assumption or, even better, bases its forecasts on its own expectations about the future path of the interest rate. In any case, we recommend against switching back to the constant-interest-rate assumption. The Bank has previously switched back and forth between interest-rate assumptions without making the motivation for this clear. Such unpredictable changes decrease predictability and hence the credibility of the strategy, making policy less effective in its use of the expectations channels of monetary policy, leading potentially to a worsening of the policy outcome.

Time inconsistency

Norges Bank has argued that the forecast-targeting approach is suitable for gaining credibility for the inflation target. Its reasoning is arguably that the policy procedure ensures that private-sector expectations of inflation two years ahead and beyond are equal to the target level. However, although the forecast of inflation presented by the Bank shows that inflation will be back on target after two years, these forecasts do not take into account the fact that consecutive interest-rate setting contributes to postponing the return of inflation to target as the two-year horizon moves across time. Measures taken in 2004 by Norges Bank to bring inflation back to target by 2006 may be undermined by efforts in 2005 to bring inflation back to target by 2007. In the same manner, measures taken in 2004 may undermine those taken in 2003. In the economics literature this problem is denoted as *time inconsistency*. The plan for policy for 2004 and 2005 that was suitable from the perspective of policymaking in 2003 may no longer be suitable from the perspective of policymaking in 2004. Therefore, inflation forecasts presented by Norges Bank showing that inflation will be back on target after two years, can be highly misleading. It will in general take (possibly much) longer time before inflation is brought back to target. See the illustration in Box 3.1.

Currently, the inflation rate is well below the inflation target, yet Norges Bank's forecasts show that inflation is expected to be back on target in 2006. We believe that the forecast will be steadily pushed forward in time, implying that the return to the inflation target could be expected to take longer than the stated 2 years. Time inconsistency can only be avoided if the Bank deviates from its projected interest-rate path in response to new information in the future. For instance, the Reserve Bank of New Zealand publishes such interest-rate projections.

Box 3.1. Illustration of the time inconsistency of simple inflation-forecast targeting.



The figures above provide an illustration of the time inconsistency of simple inflation forecast targeting for a central bank with an inflation target of 2.5 per cent and a target horizon of two years. Suppose that the inflation projection made in 2003 based on the constant interest rate i_{03} follows the path IP_{03} above. From the perspective of 2003, the interest rate i_{03} is the desired rate for 2003 and 2004 because it takes the inflation projection back to the inflation target in two years time. The interest rate should then be increased in 2005 to keep inflation equal to the target. The desired interest rate path and inflation path from the perspective of 2003 are indicated by the bold solid lines in the figures above.

However, in 2004, the central bank reconsiders its interest rate. It checks out the inflation projection two years ahead (2006) and notices that it is above target. Following a simple inflation forecast targeting strategy, it decides to increase the interest rate to i_{04} because at a constant rate of i_{04} the inflation projection IP_{04} (indicated by the dash-dotted line) is equal to the inflation target in 2006. So, the interest rate path that was desired in 2003 is no longer followed in 2004. In subsequent years, the central bank further increases its

interest rate gradually, leading to the interest rate path and inflation path indicated by the dash-triple-dotted profiles.

It is clear that the central bank suffers from time inconsistency; it deviates from the interest rate path desired in 2003, even though no new information has arrived. The result of time inconsistency is that inflation reaches the inflation target too slowly. This problem could be avoided by following (in the absence of new information) the interest rate path constructed in 2003.

It is noteworthy that Statistics Norway throughout 2003 has not expected inflation to be back on target by 2005/2006, which is fully consistent with the problem of time inconsistency inherent to Norges Bank's strategy.

Due to time inconsistency, the argument that forecast-targeting contributes to increased credibility about the inflation target is weak. Indeed, it can be argued that due to the time inconsistency involved, the strategy does not work as intended. Credibility of the inflation target depends on the Bank's ability to keep inflation close to target over time, and not only at some (moving) point of time in the future. If agents cannot fully rely on the inflation forecasts presented by the Bank in forming efficient inflation expectations about the future, Norges Bank may lose one valuable channel to influence private-sector expectations, as agents find it more advantageous to base their inflation expectations on other sources of information. Time inconsistency is the most important reason behind our recommendation that the Bank should leave the simple inflation-forecast targeting strategy in favour of a more optimal strategy that includes publishing the Bank's projection for the interest rate path.

The fixed two-year targeting horizon

The economy is constantly hit by shocks that change the state of the economy. Some of these shocks require strong responses by Norges Bank to achieve stable inflation and output over time, whereas other shocks incur a worse trade-off between inflation and output stabilizing objectives and require only mild responses. Accordingly, the optimal aggressiveness of the Bank to bring inflation quickly back to target depends on the degree to which such aggressiveness has adverse effects on output. Thus the expected time it will take for inflation to be back on target should depend on the particular shock and state of the economy. Always responding so that the two-year inflation forecast is on target is a restriction on policymaking that is likely to increase inflation and output gap fluctuations, which is not in accordance with the monetary-policy objectives. Although Norges Bank seems to acknowledge this problem, the forecast-targeting horizon has remained fixed at two years since the adoption of inflation targeting in 2001, despite a variety of shocks to the economy, both in kind and magnitude. In Chapter 4 we argue that policy at the start of 2003 provides a case where a change in the forecast-targeting horizon clearly was needed in order to achieve an interest rate setting in line with the *ex ante* optimal stabilization of policy objectives.

By focusing on two-year ahead forecasts, Norges Bank runs the risk of not responding to all shocks in a desirable way. For instance, it may not adjust interest rates appropriately in response to a shock whose effects on inflation and output are pronounced and can be mitigated by policy, but disappears within two years. Exchange rate shocks were considered to be mainly short-lasting. However, recent evidence suggests that they may have a more persistent effect on inflation than previously believed (see Inflation Report 1/2004). Still, it is an example of a shock that affects inflation mainly in the shorter term, but occurs frequently and with great magnitude in the Norwegian economy.

Since the exchange rate has such a profound influence on the objectives of monetary policy, the lack of understanding of the exchange rate channel should remind us that the control of inflation and output cannot be achieved with any high precision in an economy like the Norwegian.

3.2 The optimal strategy

We recommend that Norges Bank should abandon the current strategy of setting the two-year ahead inflation forecast equal to the inflation target, and should instead focus on achieving an outcome of inflation and the output gap that are more consistent with the monetary-policy objectives of stabilizing inflation and output *over time*. In the wording of Lars Svensson, the forecasts should simply “look good” (Svensson, 2004). That is, they should be in accordance with the Executive Board’s interpretation of monetary-policy objectives, i.e., stabilizing inflation and output, and view of how the economy works. The time-inconsistency inherent in simple forecast-targeting can therefore be avoided. Moreover, the efficiency of monetary policy will be improved if the Bank responds to shocks in such a way that keep inflation and output closer to their target values over the whole forecast period and not only the forecast of inflation two years ahead. This recommendation is in line with what was suggested by Norges Bank Watch 2002.

The Bank should produce projections of inflation and the output gap based upon market expectations of the interest rate. If the Bank deems these projections as being in accordance with the policy objectives, the Bank should adopt these projections, as their policy-consistent forecasts and interest rates should be set in accordance with market expectations. However, if the Bank’s assessment is that these projections are not in line with their policy objectives, Norges Bank should produce forecasts of inflation, output and interest rates that are consistent with policy objectives. The reason is that policy-consistent forecasts provide the most accurate description of the likely outcomes, thereby leading to greater predictability of monetary policy. The Bank should inform the public that these interest-rate forecasts represent the Bank’s expectations about interest-rate developments conditional on the Bank’s current assessment of the state of the economy, stressing the non-commitment nature of these forecasts. The forecasts should preferably be presented in the form of fan-charts, illustrating the uncertainty involved. The forecast horizon should be equal to the policy horizon, namely, the time period until expectations of inflation and output gap are back to their target values, corresponding to about 3-4 years.

In order to reduce the probability of deflation, the Bank should avoid considering expected interest-rate paths and forecasts that imply that inflation is expected to be persistently close to (or even below) zero,

especially in combination with weak output gap forecasts, which seriously reduces the ability of monetary policy to stabilize the objectives' variables.

Judgment and uncertainty

Norges Bank is currently in the process of developing models that will prove helpful in the processing of information into policy-consistent forecasts of inflation and output. We believe that in order for models to be helpful, they must reflect the policymakers' views about the economy. It is only then that the output from the model is useful for them in designing monetary policy. It may be desirable to involve policymakers in formulating the objectives for the models.

The core model will never become a perfect representation of the economy and never incorporate all available information. So it may be necessary to use output from other sub-models and surveys as input to the core model. As a "last resort", policymakers should use judgment in forming their forecasts and expectations. It is important to stress that the psychological literature on human judgment is not at all flattering. People tend in general to be overconfident about their judgments, and human judgment is seldom based on more than a few factors, representing a strongly simplified view of the world. If models are not convincing, there is a real danger that decisions will be excessively based on human judgment. An important decision-making principle is therefore to substantiate and document as many of the Bank's views as possible in terms of rigorous economic analysis, and use judgment with great caution.

Monetary policymaking occurs in an environment of uncertainty. The optimal response to different forms of uncertainty is discussed in Box 3.2. One of the many advantages of switching to the strategy suggested above is that considerations of uncertainty may be more straightforwardly introduced into policymaking, building on standard theories of optimal policy explored in the economic literature.

Currently the Bank's approach towards uncertainty is illustrated by a quotation normally featured in the Strategy Document: "The key rate will normally be changed *gradually* so that we can assess the effects of an interest rate change and other new information about economic developments" (our emphasis). As we argue in Box 3.2, this approach may or may not be in line with the most efficient response to uncertainty. Gradual adjustment of the interest rate may indeed be an optimal interest rate response due to information arriving gradually. However, gradual adjustment of the interest rate is clearly not optimal in every situation. In a situation where the interest rate is clearly out of line with the state of the economy (e.g., due to previous policy mistakes), the immediate adjustment of the interest rate is optimal irrespective of the data uncertainty involved. The intuition for this is as follows: since the amount of uncertainty involved is independent of the interest rate level, the policymaker does best in adjusting the interest rate immediately to the level that is expected to be in line with the optimal stabilization of inflation and output. Although gradual interest rate adjustment in many cases is suboptimal, it can be argued, however, that the optimal response to some forms of uncertainty (model parameter uncertainty) requires a less aggressive interest rate response to the shocks, implying less variability in the *level* of the interest rate. This result is, however, dependent on the particular description of the transmission mechanism of monetary policy adhered to, and the result of less aggressiveness can easily be turned around.

On the optimal monetary policy response to uncertainty

Uncertainty about the economy comes in different forms. Expressed in terms of a mathematical model of the economy, there are at least four forms of uncertainty:

- (I) the size of shocks influencing the behavioural equations of the model (additive uncertainty),
- (II) the state of the economy (data uncertainty),
- (III) the parameters of the model (multiplicative uncertainty), and
- (IV) the structure of the model, including lags, leads and variables used (model uncertainty)

The degree of uncertainty is extensive. Indeed, we believe that one of the main challenges facing the Bank is to reduce the negative effects of uncertainty. The strategy recommended above allows for the incorporation of remedies that will reduce the impact of uncertainty. These remedies vary depending on the type of uncertainty involved.

(I) *Additive uncertainty* is perhaps the easiest form of uncertainty to handle if we assume that Norges Bank aims to reduce inflation and output gap fluctuations measured in terms of their variances, and that Norges Bank's view of the transmission mechanism is fairly linear and policy not severely restricted by the zero-bound on interest rates. Under these assumptions, only the expected value (usually 0) of shocks to the economy is relevant for the conduct of monetary policy. You may hence design policy that ignores uncertainty about the residuals and react to their expected value as if you were in a state of no uncertainty. Policy is *certainty equivalent*. The distribution, however, of these shocks does have an effect on the outcome of policy in terms of fluctuations in policy objectives.

(II) *Data uncertainty* is a kind of additive uncertainty. As the economy is hit by additive shocks over time, the state of the economy gradually changes. It is uncertainty with respect to the current state of the economy, measured by the different economic indicators, that constitutes data uncertainty. Using the same assumptions as above, if the indicators have been measured so that there are no systematic deviations from their true value, the optimal response is still that of certainty equivalence, namely to respond to the indicators as if there were no uncertainty. If there are systematic deviations (biases), however, then establishing the form of the systematic bias may be important for Norges Bank in establishing expectations about the indicator. Policy must respond accordingly. However, the identification of the systematic bias will in most cases be difficult, which introduces *model uncertainty* (see below) which perhaps is the most difficult form of uncertainty to deal with effectively.

Some indicators and indeed objectives of monetary policy, like the output gap, may not be observable, yet still be important for the conduct of monetary policy. In such cases it is useful to extract information about such variables from other indicators using optimal filters (see Chapter 5).

Irrespective of the optimal use of information, data about the state of the economy arrives slowly and gradually. The slow arrival of information implies that Norges Bank should adjust its expectations about the current state of the economy gradually, implying a slow adjustment of the real interest rate. Note, however, that data uncertainty does not imply that the interest rate should move in small steps towards the appropriate policy stance once expectations about the current state have been formed; policy should be adjusted in one (possibly large) step onto the interest rate path that brings the most stability in inflation and the output gap.

(III) *Multiplicative* (or Brainard) *uncertainty* is uncertainty with respect to the magnitude of the coefficients used in the model. There are no general rules of thumb in dealing with such uncertainty. However, optimal policy is affected by the amount of uncertainty about particular coefficients. Depending on the amount of uncertainty with respect to particular coefficients, the response to shocks and state variables is affected. With respect to some types of shocks, the real interest rate needs to be more responsive and deviate more from its steady-state real interest rate level compared to a situation with no multiplicative uncertainty, while multiplicative uncertainty may induce policy to be less responsive with respect to other types of shocks. Brainard showed that in a simple Keynesian model, optimal monetary policy will in general be less responsive to shocks. However, Söderström (2002) has pointed out that uncertainty with respect to the effects of inflation on inflation expectations suggests that monetary policy should be more responsive to cost-push shocks. We recommend that Norges Bank should use its core model in order to quantify the level of multiplicative uncertainty, and derive optimal interest-rate paths that take account of this uncertainty.

(IV) *Model uncertainty* is perhaps the most severe form of uncertainty. It pertains to uncertainty about how monetary policy affects the economy in general. The most effective strategy towards such uncertainty is to try to minimize it by putting more effort into understanding how the Norwegian economy works. Such an effort should be at the very centre of economic research at Norges Bank. There is, however, an additional remedy. The academic monetary-policy literature has focused on designing monetary policy strategies that are robust to model uncertainty by simulating the candidate strategy in several models and checking whether the outcome is good in most of the models. If so, policy is said to be robust to model uncertainty.

It is in general difficult to give advice on appropriate responses to uncertainty connected to how the Norwegian economy works in general. However, cross-checking forecasts with those of other structural forecasters is likely to provide some form of robustness against such uncertainty. If the Bank's view about the future is shared by others, it is more likely that the Bank's view is closer to reality. In particular, we believe that analyses and forecasts made at Statistics Norway represent an important source of information which may be useful in setting the appropriate monetary policy stance. If Statistics Norway's forecasts of key determinants of inflation like wage costs differ significantly from those forecast by the Bank, it would be beneficial for the Bank to assess risk by producing projections of inflation and output, conditional on the projections of the key determinants made by Statistics Norway. If these projections imply widely different interest rate conclusions compared to those of Norges Bank's projections, Norges Bank should adopt a cautious approach that takes into account this risk assessment. Such an approach would most likely have reduced some of the monetary policy errors made in 2002, in particular those driven by Norges Bank's wage forecasts (see also Chapter 4).

3.3 The decision-making process

The interest rate is set by the Executive Board which meets on average every third week, with interest rate decisions taking place at every other such meeting. Table 3.1 shows the schedule for a typical Inflation Report cycle, namely the one between 4 February and 19 May, 2003.

Table 3.1. Executive Board meetings over an Inflation Report cycle

Date	Extensive discussion on monetary policy	A brief update on monetary policy in ordinary meetings
04 Feb	Seminar on draft IR 1/03	
05 Feb	Ordinary meeting and discussion of Strategy Document 1/03	
05 Mar	Interest rate decision, approval of Strategy Document 1/03 and publication of IR 1/03, which includes SD 3/02.	
19 Mar		Ordinary meeting
30 Apr	Interest rate decision	
19 May		Ordinary meeting (briefing was postponed)

During 2003, and as illustrated by Table 3.1, strategy was normally discussed as early as 3-4 weeks before the approval and implementation of the strategy in the consecutive Executive Board meeting. An important principle for good conduct of monetary policy requires that interest-rate decisions should be based on a comprehensive analysis using all relevant and updated information. To give a bad example, the background material submitted to the Executive Board suggests that it reviewed recent economic indicators but still based its interest-rate decision of 17 September 2003 on inflation projections in IR 2/03 which were constructed before 3 June 2003, almost four months earlier. We find such a lag unnecessarily long and

recommend that a comprehensive discussion of the economic situation and strategy should be carried out much closer to of the monetary policy decision.

We propose that the Executive Board meet over a two-day period every sixth week to make an interest-rate decision. During the first day, the Board should discuss the state of the economy and be presented with different projections of inflation and output made under different assumptions about the state of the economy and policy. We believe it is important for the staff to provide projections based on market expectations regarding interest rates. These projections serve well as a starting point for policy discussions. A great deal of attention should also be directed towards analyzing and decomposing possible deviations between earlier forecasts and the actual outcomes of central macroeconomic variables, in order to improve the Bank's understanding of the economy. The second day should be devoted to policy issues and generating the Executive Board forecasts of inflation, output gap and interest rates in the form of fan-charts that display the uncertainty inherent in their forecasts. The interest-rate decision should be announced the same day and be explained at a press conference. The Executive Board's forecasts should be published in the Inflation Report within a week.

The frequency of Inflation Reports should be increased to four times a year, so that every other interest-rate decision meeting is synchronized with the publication of an Inflation Report (see discussion in Chapter 6). The Executive Board's meeting schedule should also be synchronised with the publication of the recent national accounts figures, which would allow the Board to base its decisions on the most recent information, including forecasts from Statistics Norway.

We are concerned about the current practice that the Governor submits his recommended interest rate decision to the Ministry of Finance the day *before* the monetary policy meeting of the Executive Board. This practice is likely to distort the discussion at the Board. The Governor and the Deputy Governor may not be as receptive to different views about interest-rate decisions. Moreover, external members of the Board may be reluctant to suggest an interest rate setting that puts the Governor at risk of having to inform the Ministry of Finance that the original proposal did not find a majority consent. Hence, group dynamics and processes may impede open discussion at the Board meetings, and thereby affect the quality of decision-making. See also discussion in Chapter 6.

Committee decision-making

The good thing about committee decisions is that they tend to average out strong views about the economy and make policy decisions more robust to particular individual members having extreme views about the economy. In committee work, each person's view on the economy and forecasts are challenged by other members' views, leading to better use of information and decision-making than under a single-body decision-making process.

Committees can, however, be subject to "group think" if there are particular members that are more informed or more competent than the others, leading to domination of the group. The Governor and the Deputy Governor act as chairman and vice-chairman of the Executive Board, respectively, and they presumably have co-ordinated their views on most matters. They also have a strong informational

advantage, so their views are likely to dominate the discussion at the Board. This reduces the quality of decision-making since there are benefits of having a broader spectrum of views discussed at the Board. There may therefore be benefits to be gained by involving other Board members more extensively in the process leading up to the actual policy decision meeting.

The current practice does not exploit the full advantages of committee decision-making. In fact, the Governor has informed us that the external members of the Executive Board primarily *overlook* the work of internal members, acting much like the board of a company. We believe that the reasons for involving the Executive Board more actively in the decision-making process are strong, especially since the Government has abandoned political appointments, focusing instead on expertise as a requirement for Board membership.

3.4 Key recommendations

- Norges Bank should abandon the current two-year targeting horizon and announce the interest-rate path that is anticipated to produce the most stability in inflation and output over time.
- Norges Bank should pay more attention to the presence of model and parameter uncertainty in its policy design by doing studies on their core model and also cross-checking forecasts with other structural forecasters such as Statistics Norway.
- The Executive Board should discuss strategy and forecasts closer to the implementation of policy, avoiding possible information lags.
- Executive Board meetings and publications of the Inflation Report should be better synchronized with releases of new and updated national accounts figures, increasing the informational content of decisions and forecasts.

4 Forecasts and interest rate decisions

2003 proved to be a dramatic year for Norges Bank, starting off with the sight deposit rate at 6.5 per cent, an economy in recession and inflation sliding far below the 2.5 per cent target. An historic easing of policy took the key rate to 2.25 per cent by the end of the year (and down to 1.75 per cent in March 2004). This bolstered confidence in economic expansion and inflation approaching the target, but also raised some concern as to whether the strong reaction to the low inflation data meant stimulus would be excessive and policy pro-cyclical.

These developments give rise to a number of issues, including the Bank's interpretation of the mandate, choice of strategy, assessment of the economic situation, quality of the forecasts and the actual interest rate decisions. After having discussed the mandate and strategy for monetary policy in Chapters 2 and 3, we now turn to Norges Bank's forecasts and interest rate decisions during the course of 2003.

In its Annual Report of March 2004 Norges Bank has provided an elaborate description of its monetary policy decisions during 2003. Norges Bank emphasizes that the large downside surprises on growth and inflation mainly stem from factors beyond its control, leading to the conclusion that policy has done as well as can be expected. While our overall assessment is that Norges Bank's conduct of monetary policy holds a high standard, we also believe there are instances where the Bank could have done better.

With the benefit of hindsight, one may easily draw the conclusion that monetary policy in late 2002 and early 2003 ought to have been less restrictive. The stalling of economic activity and slump in inflation far below its target will provide important lessons for future policy. But this development does not in itself represent proof that Norges Bank did a poor job. An assessment of the conduct of monetary policy also needs to be based on the information available to the central bank at the time, so that the review should primarily be based on an *ex ante* rather than an *ex post* perspective.

In this Chapter we review the decisions that led up to Norges Bank's monetary policy stance at the start of 2003, and take a closer look at key features of the Bank's forecasts, before going on to discuss central aspects of the Bank's policy decisions. At the end of the Chapter there is some background information in the form of charts with key economic and financial indicators and a table showing Norges Bank's monetary policy meetings and interest rate decisions.

4.1 Too tight policy in early 2003

The economic environment in recent years has been challenging for policy makers worldwide. Cyclical developments have been driven by the bursting in 2000 of an historic investment and equity market bubble.

Inflationary pressures have in addition been dampened by globalisation, illustrated by the profound consequences of China's increased involvement in the global economy and intense competitive pressures.

Norwegian policy makers were in 2002 at the same time faced with signs that capacity utilisation remained high. In fact, the wage settlement in the spring of 2002, which resulted in wage inflation jumping to 5.7 per cent, is key to understanding why monetary policy at the start of 2003 was inappropriately tight. Before we consider Norges Bank's conduct of monetary policy in 2003, it may therefore be useful to take stock of the key assessments for 2002 made by Norges Bank Watch 2003 (NBW-03, published in September 2003).

NBW-03 found that monetary policy was an important factor behind the strong real appreciation of the krone in 2002, which again caused a deceleration in output and inflation in 2002 and 2003. From an *ex ante* perspective, the committee found that the Bank in the summer of 2002 should have sensed the deterioration in the global economic outlook, and also ought to have paid more attention to the appreciation of the krone. However, the excessive wage settlements raised serious questions about the wage formation process, and the committee did not find it appropriate to put forward strong criticism of Norges Bank's decision to raise the deposit rate by 50 basis points to 7 per cent in July 2002.

NBW-03 was, however, critical of the Bank's decision to retain a "neutral bias" as late as end-October 2002 and not reverse course and lower interest rates before December 2002. The committee pointed out that Norges Bank's economic outlook from the summer of 2002 stood out as being at odds with the view of other central banks, forecasters and market participants. The krone had appreciated significantly, there were clear signs of setbacks in several sectors in the economy, the outlook for the world economy was deteriorating, and stock markets were severely depressed.

NBW-03 noted that the single most important factor explaining why monetary policy ended up too tight from the summer of 2002 was Norges Bank's view that wage growth would remain high in 2003 and 2004. The committee questioned whether the Bank's forecasting tools captured in a satisfactory manner the transmission effects of the global economic slowdown, the sharp appreciation of the krone, increased margin pressure and the corresponding pass-through on wages.

This committee shares the overall assessment of monetary policy in 2002 made by NBW-03. Policy errors made in the second half of 2002 resulted in policy at the start of 2003 being too tight. When it comes to the interest rate setting in 2003, key questions are whether the pace of monetary easing and the policy setting at the end of 2003 are appropriate.

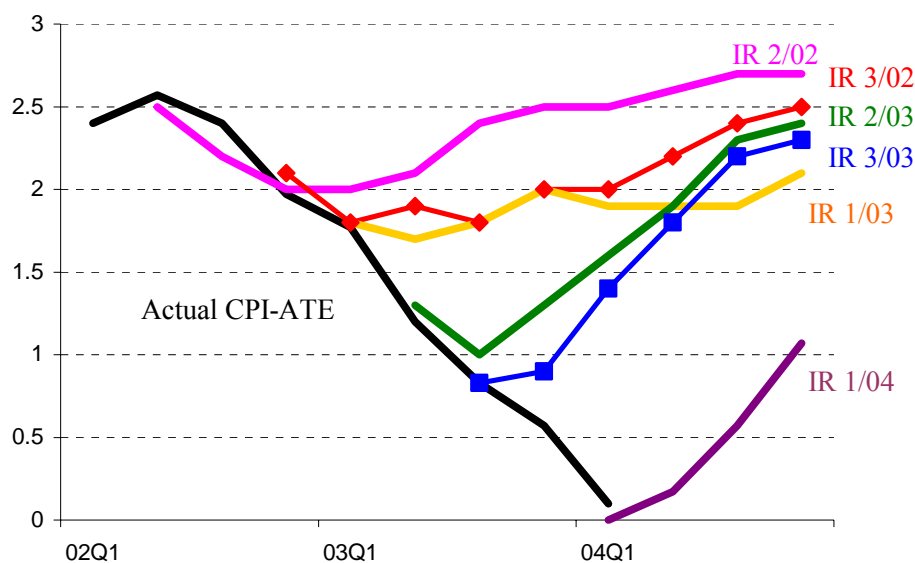
4.2 Norges Bank's forecasting

In the framework of flexible inflation targeting, economic forecasts represent the cornerstone for designing a credible and forward-looking policy. Not only do the forecasts suggest a desired interest rate path, but they also represent a reference to which one can assess the need to adjust policy in light of new economic data.

4.2.1 The forecasts during 2003

2003 was a challenging year for forecasters in Norges Bank, perhaps best illustrated by the development of actual and forecast core inflation (CPI-ATE, see figure 4.1).

Figure 4.1 Core inflation and Norges Bank's forecasts in the Inflation Reports



Source: Norges Bank Inflation Reports. In IR 1/03 the forecast shown is based on unchanged interest rate. In IR 2/03 the forecast shown is based on market expectations.

There were continuous downward revisions to growth and inflation for 2003 (see figures 4.2 and 4.3), as the Bank's forecasts progressively took into account evidence of an economic slowdown and falling inflation. However, from July 2003, the growth forecasts further out in time turned gradually more optimistic and the inflation forecasts were stabilised (until they were revised downwards substantially in March 2004).

Figure 4.2 Norges Bank's forecasts for CPI-ATE in different Inflation Reports

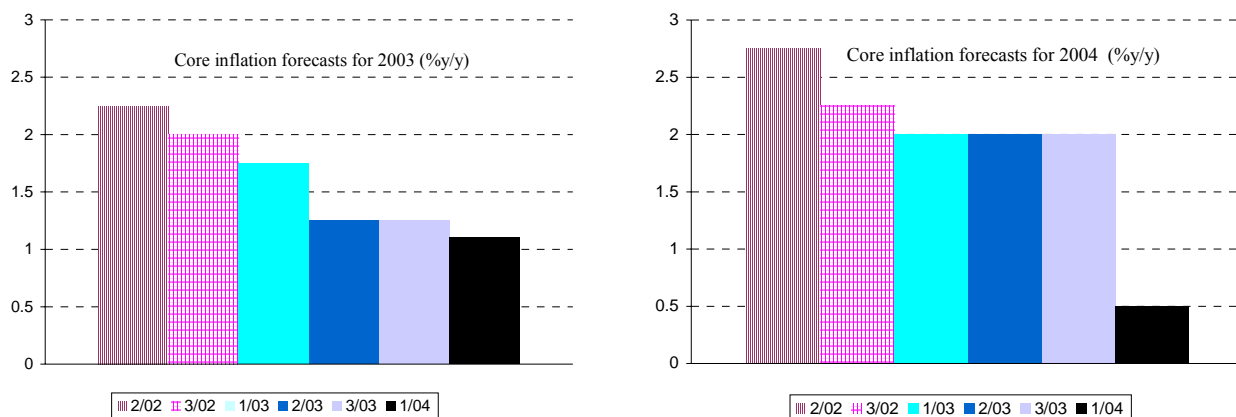
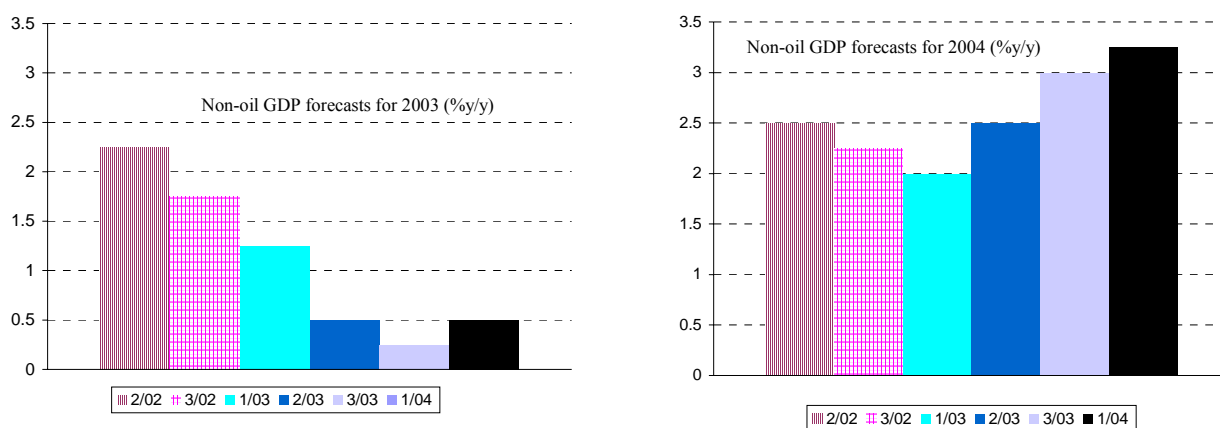


Figure 4.3 Norges Bank's forecasts for non-oil GDP in different Inflation Reports

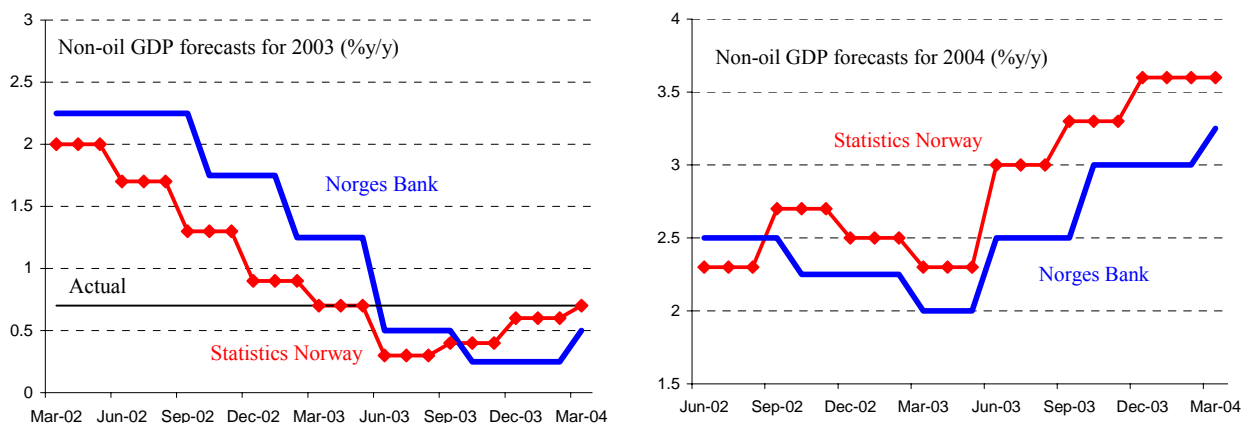


Source: Statistics Norway and Norges Bank. In IR 1/03 the forecast shown is based on unchanged interest rate. In IR 2/03 the forecast shown is based on market expectations. The non-oil GDP forecasts include the effects of fluctuations in the production of hydropower.

4.2.2 A comparison with another major forecaster

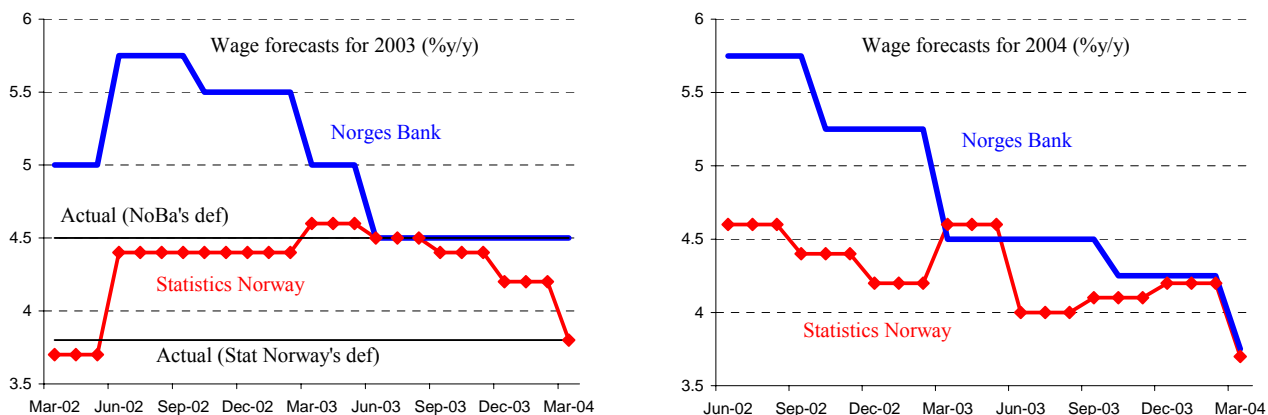
A quick way to get a feel for interesting aspects of the central bank's forecasts is to line them up next to those of other major forecasters. As we can see from figure 4.4, Statistics Norway had until the summer of 2003 a significantly more gloomy view on economic growth in 2003 than Norges Bank, and predicted a sharper recovery in 2004. This large discrepancy in the forecasts for economic activity correspondingly led Statistics Norway to forecast a negative output gap in 2003 as early as the summer of 2002 (see Chapter 5, figure 5.5).

Figure 4.4 Forecasts for non-oil GDP at different times



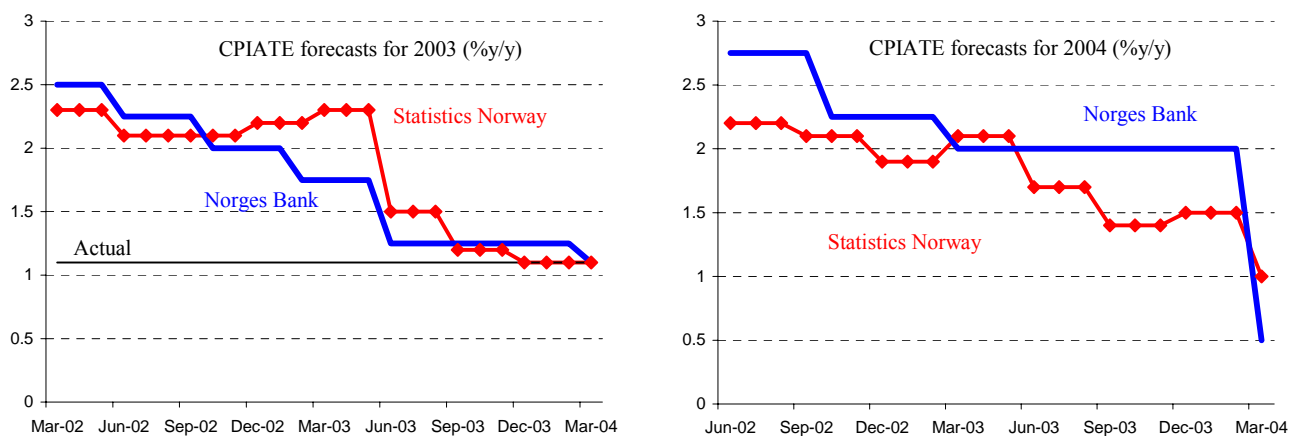
The non-oil GDP forecasts include the effects of fluctuations in the production of hydropower.

Figure 4.5 Forecasts for wages at different times



Note: The deviation of the 2003 wage forecasts towards the end, primarily reflect different definitions of wage growth.

Figure 4.6 Forecasts for core inflation (CPI-ATE) at different times



Source: Statistics Norway and Norges Bank. In IR 1/03 the forecast shown is based on unchanged interest rate. In IR 2/03 the forecast shown is based on market expectations.

Furthermore, we also see illustrated in figure 4.5 Statistics Norway's different view on wage formation, which manifests itself in significantly lower wage forecasts until the summer of 2003. This is noteworthy, particularly given the importance of wages in the transmission mechanism for monetary policy in Norway. The sharp differences between Norges Bank and Statistics Norway's forecasts gave rise to a heated debate at the time. In the event, Norges Bank's forecast for wage growth in 2004 was revised down from 5.75% in the summer of 2002 to 3.75% in March 2004.

Turning to the forecasts for core inflation in figure 4.6, however, there does not appear to be any major difference for 2003, while Statistics Norway's 2004 estimates tend to be lower.

These charts illustrate (the point made by NBW-03) that Norges Bank's policy decisions in 2002 were based on an assessment of the economy and an economic outlook that was not widely shared by others. As mentioned in Chapter 3, major differences in forecasts between the central bank and other forecasters may be a sign of heightened model uncertainty. In order for the Bank to design a monetary policy strategy that is robust to model uncertainty, the Bank may want to pay more attention to the information content inherent in other forecasts and construct alternative risk scenarios.

While Norges Bank's assessment of the economy during 2002 differed markedly from that of the consensus, thus leaving the Bank's stance exposed when developments did not go the way it expected, the conclusions for 2003 do not appear to be as clear-cut, as we discuss below.

4.3 The quality of the forecasts

Since the central bank forecasts are crucial in setting the optimal interest rate, it is essential to frequently evaluate where the forecasts fail in order to improve future forecasts and reduce the chance of policy error.

The events in 2003 provide a startling illustration that economic forecasting is far from being an exact science. The Inflation Report in the summer of 2002 envisaged both non-oil GDP and core inflation to grow by a robust 2.25 per cent in 2003. In October 2002, the forecasts were adjusted lower to 1.75 per cent growth and 2 per cent inflation (partly reflecting assumptions of a higher interest rate of 7 per cent and a stronger krone). The national accounts today instead show that the mainland economy started 2003 in recession and only registered a soft 0.7 per cent gain for the year as a whole. Core inflation plunged to near zero and the annual average came in at a low 1.1 per cent, far outside the 90 per cent confidence intervals in the Bank's forecasts as well as the +/- 1 percentage point range stipulated by the government at the time when the regulation on monetary policy was introduced.

These forecast failures raise important questions with regard to the robustness of the Bank's policy conclusions, and a rigorous and continuous search for the sources of forecast failures is necessary to ensure credibility in monetary policy. In that respect, we find that Norges Bank's efforts could well be strengthened.

The Bank's public contribution to explain why the forecasts for 2003 ended up far too low is a box in the Inflation Report 1/2004. However, the usefulness of this particular exercise is severely

hampered by the fact that it only uses the forecasts from the Inflation Report 3/2001 as a reference. The article thus gives the rather predictable result that the forecast error can primarily be attributed to soft international demand, an economic slowdown in the Norwegian economy and an appreciating krone. These factors to a great extent played out during 2002, and should not represent the main reasons why the forecasts and policy setting in late 2002 and early 2003 ended up off track.

The Bank's forecasts in the summer and autumn of 2002 of robust growth and inflation near its target, which were based on historically high interest rates and a strong krone, are of much greater relevance when trying to investigate forecast failures and corresponding policy errors at the end of 2002. We still do not know what caused the forecasts in October 2002 to overestimate growth and inflation in 2003 so massively, remembering also that these forecasts were based on an interest rate nearly 3 percentage points higher and a krone 5 per cent stronger than the 2003 average.

4.4 Was monetary policy optimal in 2003?

To judge whether monetary policy was optimal in 2003 from an *ex ante* perspective, we need to look at the quality of the forecasts, risk assessments and actual policy decisions made in relation to those parameters.

4.4.1 Optimal policy in relation to forecasts of inflation and output gaps

One way to get a quick feel for whether monetary policy was optimal, taking Norges Bank's forecasts as given, is to compare the forecasts for the inflation and output gap with the policy setting. (The inflation gap is defined as inflation minus the target, and the output gap is defined as actual Mainland-GDP minus potential Mainland-GDP in per cent of the latter.)

Table 4.1 Norges Bank's forecasts

		2003	2004	2005	2006
Mar-03	CPI-ATE gap	-0.75	-0.5	-0.25	
	Output gap	0.03	-0.3	-0.5	
Jun-03	CPI-ATE gap	-1.25	-0.5	0.0	
	Output gap	0.0	0.0	0.5	
Oct-03	CPI-ATE gap	-1.25	-0.5	-0.25	0.0
	Output gap	-0.25	0.25	0.25	0.25
Mar-04	CPI-ATE gap	-1.4	-2.0	-0.25	0.0
	Output gap	-0.5	-0.25	0.25	0.5

Source: Norges Bank Inflation Reports. In IR 1/03 the forecast shown is based on a constant interest rate of 5.5 per cent. In IR 2/03 the forecast shown is based on market expectations.

For the purposes of illustration, we assume that interest rates affect the real economy and the output gap with a one-year lag, which in turn affects inflation the following year. In addition, one has to take into account the effect from interest rates on inflation through the exchange rate, which is often assumed to act with a one to two year lag. Inspecting the expected inflation and output gaps for the next couple of years, perhaps giving more weight to large deviations over small, thus gives a rough feel for whether policy is appropriate.

As we see in table 4.1, Norges Bank's forecasts in the March 2003 Inflation Report showed both a negative output gap and a negative inflation gap in 2004 as well as in 2005. If we use the stylized view of the monetary policy transmission mechanism described above, these forecasts clearly conclude that the assumption of a constant deposit rate of 5.5 per cent would result in too tight policy. There was thus reason for the Bank to continue its strategy of lowering interest rates.

Judging from the size of the inflation and output gaps, and taking into account Norges Bank's estimates of the effects of interest rate changes on growth and inflation (see Inflation Report 4/2000), one may indeed argue that Norges Bank could have implemented a more rapid easing of policy. The Bank lowered the deposit rate by 50 basis points to 5.5 per cent on 5 March and 50 basis points to 5 per cent on 30 April, and then took a larger 100 basis points step on 25 June and 13 August in response to the June Inflation Report (see table 4.2 at the end of the Chapter).

Looking at the forecasts in June 2003 that were based on market expectations of the deposit rate being lowered towards 3 per cent over the summer, we see that the output gap and inflation gap in 2004 and 2005 in sum suggest a broadly suitable policy setting (assuming policy is in line with market expectations).

Turning to the Inflation Report in October 2003, where the assumptions underlying the forecasts were market expectations of a gentle rise in the deposit rate from 2.5 per cent, we see that the inflation gap is negative in both 2004 and 2005, and then closes in 2006, not providing a strong justification for adjusting interest rates. The output gap, on the other hand, is positive in all three years, and suggests a tighter policy stance than implied by market expectations.

The Bank decided not to adjust the interest rate, apparently attaching more weight to the large deviation in the inflation gap in the near term. This also fits the rhetoric the Bank used at the time: "The aim of monetary policy in the period ahead is higher inflation" was the conclusion of the editorial in the Inflation Report in October 2003. Such a stance can be supported by the fact that Norges Bank's overriding objective is inflation, and that large deviations from the target carry the risk of inflation expectations becoming entrenched at too low a level.

This committee's focus is a review of monetary policy in 2003, but developments in early 2004 represent a natural continuation of the events in the second half of 2003. In fact, the forecasts in the Inflation Report of March 2004 show a small negative inflation gap in 2005 closing in 2006, while there is a positive output gap in both 2005 and 2006. The forecasts are based on market expectations of interest rates, i.e. a deposit rate below 2 per cent in all of 2004. From this it is evident that the Bank puts a lot of

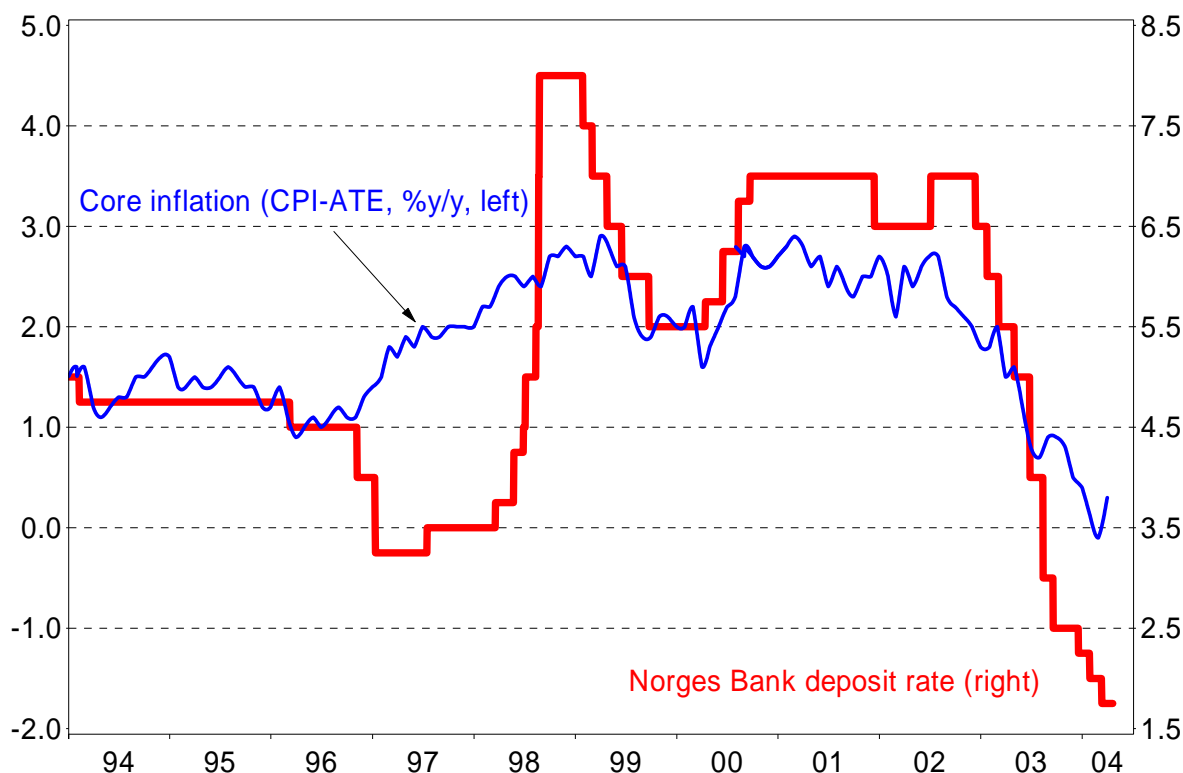
weight on the inflation gap in 2004 when concluding in March 2004 to lower the deposit rate to 1.75 per cent and signal an “easing bias”.

4.4.2 The importance of low inflation for policy

Norges Bank’s forecasting exercises took place against a backdrop of a very uncertain economic environment globally at the start of 2003, as economic agents were faced with the prospects of war in Iraq and weak financial markets. However, share prices recovered and interest rate spreads on corporate bonds tightened early in the year. Business surveys improved towards early summer, followed by a gradual firming of economic activity that could be seen in the data from the summer of 2003. Inflation, however, continued to slide to record lows, reflecting spare capacity worldwide and rapid productivity gains (which seems to have been noteworthy in countries like China, the US and Norway).

In NBW-03 Norges Bank was criticized for being slow to catch the deterioration in the economic outlook in the summer of 2002, a deterioration that was clearly visible in financial markets. In 2003 the Bank was correspondingly cautious to let the improvement in the world economic outlook from the second quarter of 2003 influence its thinking, focusing instead on the surprisingly weak development in observed inflation.

Figure 4.7 Norges Bank’s deposit rate and core inflation (CPI-ATE)



Source: EcoWin

To outside observers, the interest rate setting in 2003 bears more resemblance to a short-sighted focus on observed inflation rather than a forward-looking strategy. The literature on flexible inflation targeting prescribes that downside surprises on inflation should only influence policy to the extent that it alters the forecasts, not allowing temporary factors to drive policy. And there is indeed evidence that the sharp drop in inflation during 2003 led Norges Bank to revise down future inflation pressures as well.

It is in many respects easy to understand Norges Bank's preoccupation with surprisingly low inflation data and the decision to aggressively ease monetary policy to reduce the risk of policy being constrained by the zero nominal bound. One lesson of Japan's experience since 1990 is that since deflation is hard to detect in advance, an aggressive policy response is advisable once the risk is perceived to rise above a certain threshold.

Observers sceptical to the later stages of Norges Bank's policy easing raise two main objections. One is that the Bank's current inflation assessment is unduly influenced by developments that are of a more transitory nature, and the other is that the Bank pays too much attention to near-term inflation and too little attention to real economic stability. (The latter may be illustrated in section 4.4.1, where we highlighted evidence that suggests Norges Bank puts more weight on the inflation gap than the output gap.)

There is little doubt that inflation in Norway is low. But there is at the same time some concern that the core inflation rate of around zero in early 2004, as measured by the CPI-ATE, either understates the true underlying price pressures or does not today represent a suitable measure by which to judge the stance of monetary policy. In this respect it is worth noting that there are significant effects on core inflation from a number of special factors where it is not obvious that policy should react strongly.

As illustrated in the Inflation Report from March 2004, imported consumer prices are dragging core inflation down by nearly 1 percentage point, of which lagged effects of a strong krone a year ago is the most important (around $\frac{3}{4}$ percentage point). There is also a significant positive supply shock in the form of lower inflation from low-cost countries (around $\frac{1}{4}$ percentage point). There also appears to be a positive domestic supply shock in the form of higher productivity growth in the wake of more intense competitive pressures (perhaps lowering inflation by $\frac{1}{4}$ percentage point).

Norges Bank also points out that there are effects on inflation from the lowering of interest rates (through house rents, probably explaining around 0.2 percentage points of CPI-ATE inflation in early 2004) and effects from increased government subsidies of childcare (around 0.1 percentage point both in 2003 and 2004). There is broad agreement that such factors should not affect policy, and the monetary policy mandate explicitly stipulates that such effects should be ignored.

One may also note that there are some technical issues relating to how CPI-ATE adjusts for changes to indirect taxes, which may underestimate core inflation early in the year and overestimate it later in the year. There is also some debate as to whether the CPI gives a true picture of the short to medium-term development of housing costs (see Larsen 2004). This relates to the fact that housing costs for owner occupied housing is calculated on the basis of the house rent survey, which has shown a deceleration (partly as a result of lower interest rates). The calculation therefore does not capture the marked pick-up in house prices, which may contribute to boosting housing costs for owner occupied housing.

One should be careful not to count up all “special effects” and conclude that policy should not respond, but these issues do give some credence to arguments that the development in CPI-ATE exaggerates deflation fears. The discussion in Chapter 5 on appropriate indicators for underlying inflation gives further support to the argument that “true” underlying price pressures are probably not as weak as suggested by CPI-ATE. Alternative statistical measures of underlying inflation indicate that the trend in inflation has fallen by a lesser extent than the CPI-ATE. While the annual average for CPI-ATE inflation was 1.1 per cent in 2003, other measures presented in Chapter 5 actually range from 1.9 to 2.8 per cent.

A quick look at other indicators does not reveal an imminent deflation risk either. Asset prices (equities, housing) are rising smartly and income generation is brisk for both households and corporates. Monetary policy has to be wary of low inflation getting embedded in inflation expectations, but while expectations have been adjusted lower in the near term (1-2 years), they remain on target further out.

4.4.3 The stance of monetary policy

When judging whether the easing of monetary policy in 2003 was too timid, appropriate or excessive, it is necessary also to take into account some measure of the policy stance along the way. A common starting point is to look at the real interest rate, where a rough approximation is the nominal interest rate deflated by observed inflation (or core inflation). A rule of thumb in many countries is that a real rate around 2 per cent is broadly neutral, with variations of up to 2 percentage points as policy is tightened or loosened. At first glance, Norwegian monetary policy today thus seems only neutral, as a deposit rate of 1.75 per cent is deflated by core inflation near zero. However, three factors alter this conclusion.

(i) It is hard to know what the neutral real interest rate is in a country, and a long historical average is often used as an approximation. For Norway, however, the historical *ex-post* real rate is around 3.5-4.0 per cent, significantly higher than in many other countries. So when the real rate has been lowered from 5 per cent in late 2002 to below 2 per cent currently, this represents a massive change in policy to a level that is low by Norwegian standards (see figure 4.8).

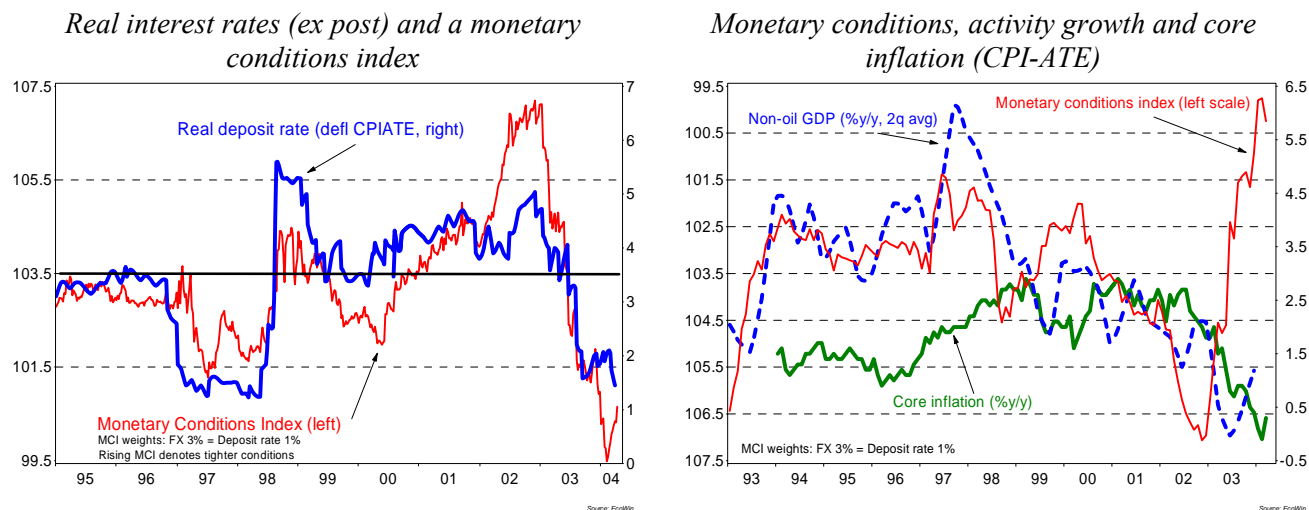
(ii) It is likely that economic agents employ expected inflation when they make their consumption and investment decisions. It is difficult to construct a long-run time series for an *ex-ante* real interest rate in Norway, since Gallup’s survey on inflation expectations only has a short history. The Norwegian government has not issued inflation linked bonds either, which would have made it possible to calculate implicit inflation expectations. If we look at implicit interest rate differentials versus other countries (from nominal government bonds), there is a risk of picking up variations in the real rate as well as inflation expectations. But if we assume that confidence in the 2.5 per cent inflation target was rock solid, one may argue that the *ex-ante* real rate dropped from 4.5 per cent in late 2002 to -0.75 per cent currently.

(iii) For a small, open economy like Norway, one should also try to include the effect of the exchange rate when assessing the monetary policy stance. Figure 4.8 shows one such monetary conditions index, where a 1 percentage point change in the deposit rate has the same weight in the index as a 3 percent change in the trade weighted exchange rate. The monetary conditions index has moved from an historically tight level in late 2002, to an unrivalled loose level in early 2004. Figure 4.8 in addition illustrates that tight

monetary policy in 2002 contributed to an economic slowdown and falling inflation in 2003, but also strongly hints that the sharp reversal of policy in 2003 will boost growth and inflation in 2004 and 2005.

So while the *ex post* real interest rate fell markedly, though remained within its historical range, the change of monetary policy during 2003 seems more aggressive when looking at a monetary conditions index that includes the movements in the exchange rate. This leads us to take a closer look at the aggressiveness of monetary policy in Norway in the next section.

Figure 4.8 The stance of monetary policy



4.4.4 The aggressiveness of monetary policy

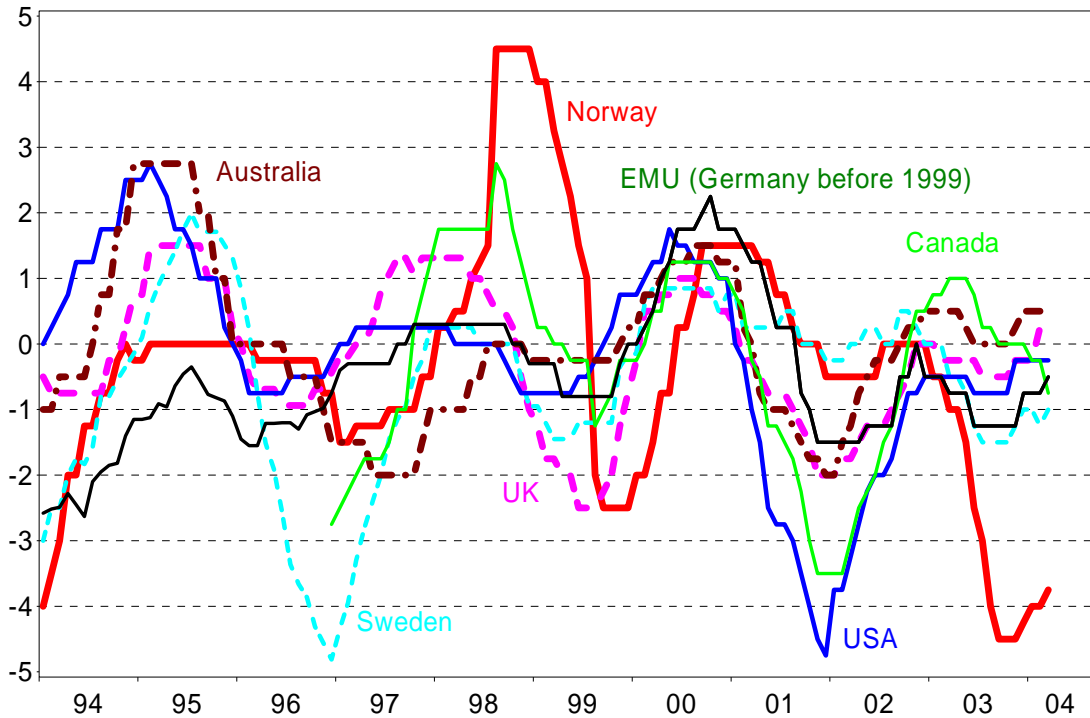
Central bankers looking to design a robust monetary policy strategy have to consider not only the most likely scenario, but also address uncertainty and risks surrounding the forecasts. As developments deviate from the main scenario, it is necessary to judge to what extent policy needs to be adjusted. In these deliberations, there is the fundamental question as to how frequently and by how much the central bank should alter interest rates. (See Chapter 3 for a discussion of the implications of various forms of uncertainty on the conduct of monetary policy.)

Large and frequent interest rate changes are a good thing if they bring about better economic performance, such as stable inflation and a lower inflation risk premium. On the other hand, large variations in interest rates increase the interest risk premium. The inherent risk of policy errors (and the associated risk to central bank credibility) is also worth remembering. Large changes to the central bank's signal rate are not always the most effective tool to influence the economy either. The impact monetary policy has on the economy comes from the whole yield curve, which crucially includes expectations and confidence in future policy as well.

Barring extraordinary circumstances, it is therefore common practice among central banks to preach gradualism in the way interest rates are adjusted. This is illustrated by the following sentence which normally features in the conclusion of Norges Bank's Strategy Documents: *"The key rate will normally be changed gradually so that we can assess the effects of an interest rate change and other new information about economic developments."*

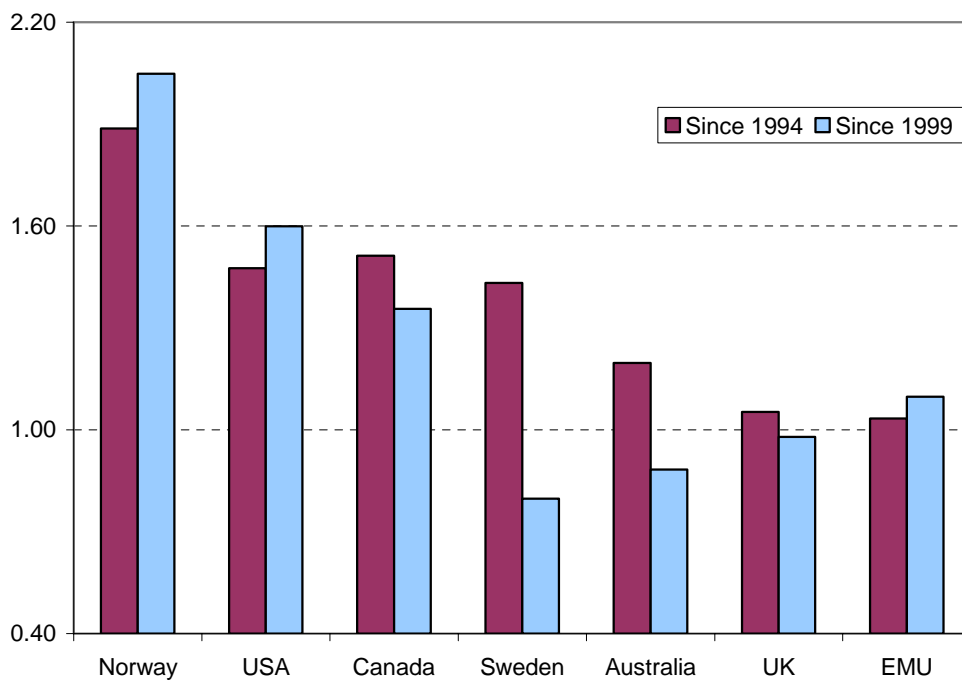
Central banks have different traditions and ambitions in this respect, as witnessed by how wide the range of central bank rates is over time.

Figure 4.9 The change in central bank policy rates compared with a year earlier



Source: EcoWin

Figure 4.10 The standard deviation of the change in central bank policy rates



In addition to the range of interest rates used by a central bank, one can also look at the frequency and size of interest rate changes as an indication of the aggressiveness of policy. Figure 4.9 shows the change in interest rates compared with a year earlier, and figure 4.10 shows the standard deviation of this series. This supports the impression that Norges Bank ranks among the most aggressive central banks.⁶

There are several potential explanations as to why the volatility in Norwegian interest rates appears to be significantly higher than in other countries. It could reflect that Norway is exposed to bigger shocks, has a different economic structure, has higher ambitions in policy, has less emphasis on gradualism, has a target horizon for monetary policy that is too short compared to the transmission lag; or it might also be a sign of more policy errors.

A lot of the volatility in Norway can be explained by large interest rate changes in 1998 and 2003, two periods where one could argue that policy errors played a role. If a central bank is too late in adjusting interest rates, the ensuing interest rate adjustment needs to be larger than the original optimal path. As pointed out in Chapter 3, the Bank may end up with a suboptimal and volatile interest rate setting if it utilizes a fixed target horizon that is shorter than the monetary policy transmission mechanism.

The sense of Norwegian monetary policy being more volatile and abrupt is also illustrated by some of the individual policy considerations:

- In the Strategy Document from October 2002, the Executive Board discussed as an exercise two alternative interest rate scenarios compared with keeping the deposit rate steady at 7 per cent. One included a 150 basis points rate hike, the other a 250 basis points rate cut. Both scenarios represent fairly dramatic policy changes to outside observers.
- The decisions to lower the key rate by 100 basis points both in June and August 2003 are generally considered very large policy changes. While the cut to 4 per cent in June made sense (getting ahead of the curve and narrowing the interest differential before the expected easing at the ensuing ECB rate meeting), the repeat in August did seem a bit heavy handed against the backdrop of an improved economic outlook.
- Easing policy by another 50 basis points in September 2003 and moving straight to a “neutral bias” was an abrupt move that effectively placed the Bank on the sidelines. This could be seen as a bold bet that the rate cycle had troughed and encouraged a stronger currency, potentially increasing the need for further rate cuts.
- In October 2003, the Bank explicitly tied future monetary policy to short-term developments in observed inflation, giving rise to an intense focus on the uncertain path of one variable (which eventually led to a new round of interest rate cuts).
- The decision in December 2003 to move directly from a “neutral bias” to a rate cut (in response to yet another downside surprise in inflation) seemed hasty.

⁶ Looking at the standard deviation of the *level* of interest rates, however, Norway does not have the most volatile rate setting.

Although monetary policy appears to be very aggressive, it is worth keeping in mind that Norway's dramatic easing of policy in 2003 is not unprecedented. Similar big rate cuts were experienced in Sweden in 1996 and the US and Canada in 2001.

4.5 Findings and recommendations

Monetary policy during 2003 was conducted against the following background: There had been an environment of gradually improving economic prospects since the summer. At the same time there were significant downside surprises on inflation, which appeared to warrant policy reaction. However, some of the drop in inflation reflects factors monetary policy in normal circumstances should not respond to. Nevertheless, the Bank appeared to put more emphasis on its forecasts for inflation than output when setting interest rates, particularly after the summer. The result was that Norges Bank's policy stance during 2003 moved from historically tight to historically loose, contributing to the Bank's reputation as one of the most aggressive central banks.

When it comes to evaluating interest rate decisions made in 2003, we think that Norges Bank deserves credit for an easing of policy that has bolstered confidence in economic expansion and inflation approaching the target.

We nonetheless find reason to criticize the Bank for entering 2003 with monetary policy that was too tight, due to what we deem to be a policy error in the second half of 2002. This suggests it would have been appropriate for Norges Bank to implement a more rapid easing of policy in early 2003, a view that also gets some support from the Bank's forecasts in March 2003.

The surprisingly weak development in core inflation during 2003 justified prompt central bank action. At the same time we think that the bank should be careful not to overreact to developments in CPI-ATE, and should consider various measures of underlying inflation like those discussed in chapter 5. This should render policy more robust and less prone to policy mistakes.

As recommendations for future policy, we would like to highlight:

- In cases where Norges Bank's forecasts differ significantly from other independent forecasters, the Bank should conduct a closer scrutiny of the causes and construct alternative risk scenarios to render its monetary policy strategy more robust.
- Norges Bank should implement frequent, relevant and rigorous evaluations of its forecasts.
- Norges Bank should explore and pay attention to other indicators of underlying inflation.
- By implementing an optimal monetary policy strategy, Norges Bank could attain a lower volatility in interest rates.

Figure 4.11 Key economic and financial indicators

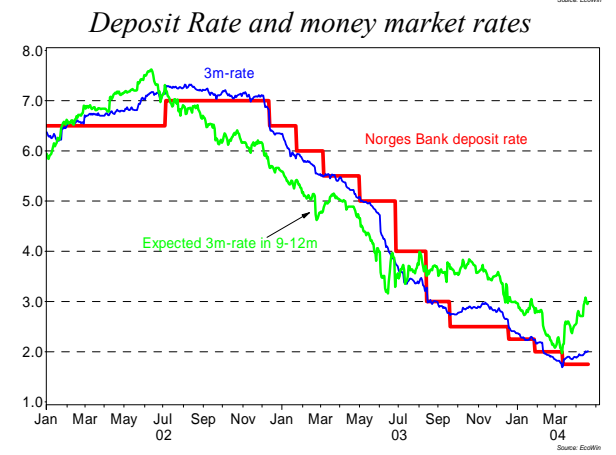
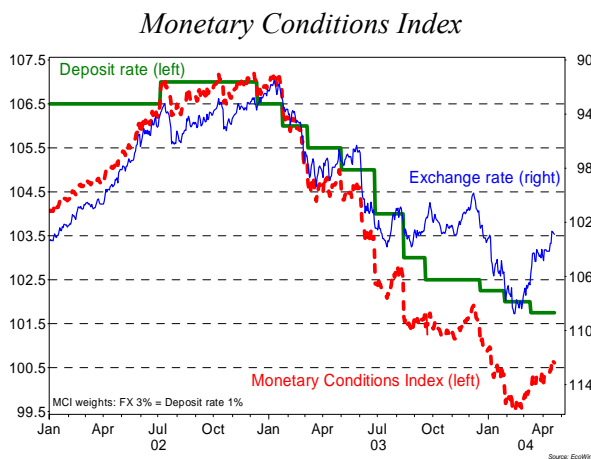
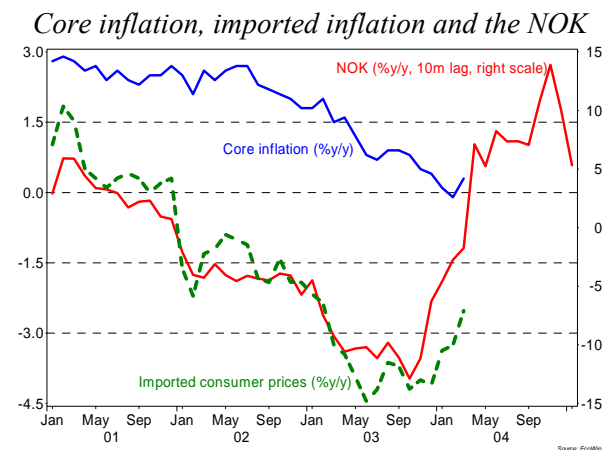
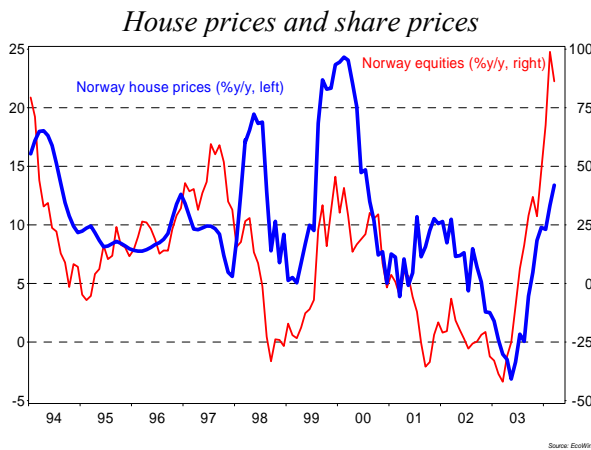
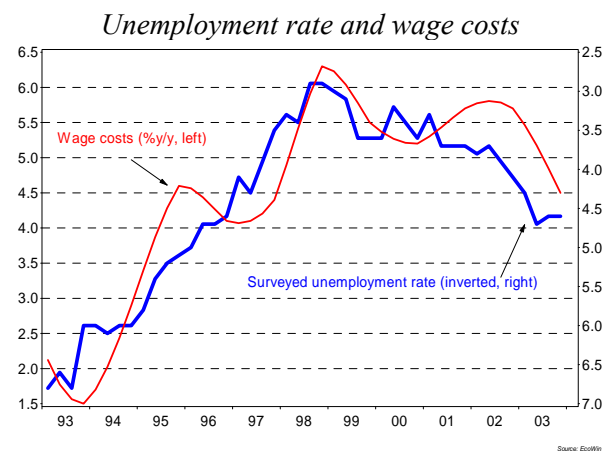
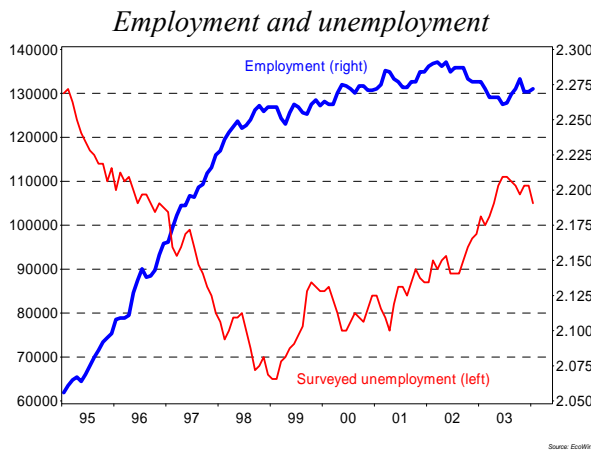
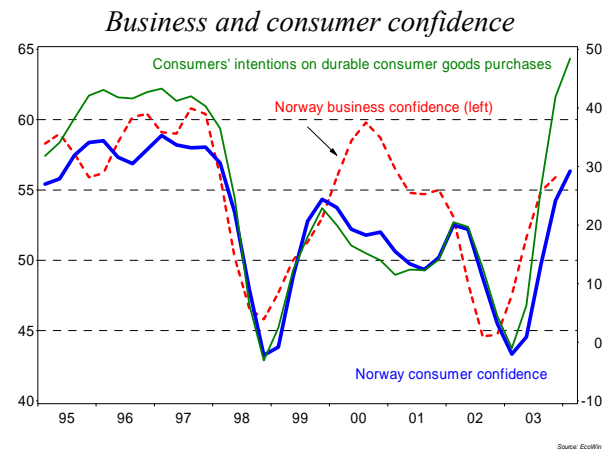
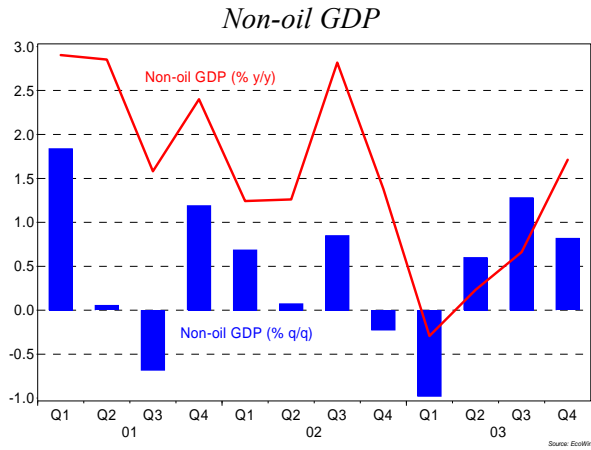


Table 4.2 Norges Bank monetary policy meetings and interest rate decisions

2002	
3 July	50 basis points rate hike to 7.0 per cent, continued "tightening bias"
7 August	Unchanged at 7.0 per cent, continued "tightening bias"
18 September	Unchanged at 7.0 per cent, change to "neutral bias"
30 October*	Unchanged at 7.0 per cent, continued "neutral bias"
11 December	50 basis points rate cut to 6.5 per cent, change to "easing bias"
2003	
22 January	50 basis point rate cut to 6.0 per cent, continued "easing bias"
5 March*	50 basis points rate cut to 5.5 per cent, continued "easing bias"
30 April	50 basis points rate cut to 5.0 per cent, continued "easing bias"
25 June*	100 basis points rate cut to 4.0 per cent, continued "easing bias".
13 August	100 basis points rate cut to 3.0 per cent, continued "easing bias"
17 September	50 basis points rate cut to 2.5 per cent, change to "neutral bias"
29 October*	Unchanged at 2.5 per cent, continued "neutral bias"
17 December	25 basis points rate cut to 2.25 per cent, change to "easing bias"
2004	
28 January	25 basis points rate cut to 2.0 per cent, continued "easing bias"
11 March*	25 basis points rate cut to 1.75 per cent, continued "easing bias"
21 April	Unchanged at 1.75 per cent, continued "easing bias"
*: with Inflation Report	

5 The use of appropriate indicators

Underlying inflation and the output gap

At the centre of inflation targeting lie two widely used terms by the academic profession. The terms are underlying (also referred to as core) inflation and the output gap. Although generally understood and widely used by the economic profession, there are no theoretically established definition of these concepts, nor an agreed method of measuring them. Nevertheless, as they remain the central targets in a monetary objective function, they should be critically evaluated by any inflation targeting central bank.

The standard objective for monetary policy involves stabilizing inflation around an inflation target and stabilizing output around an output target equal to potential output. This can be formulated as an intertemporal loss function to be minimized

$$(1) \quad E_t \sum_{\tau=0}^{\infty} (1-\delta)\delta^{\tau} L_{t+\tau}$$

with the quadratic period loss function

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

E_t denotes expectations conditional on information available in period t , δ is the discount factor and fulfils $0 < \delta < 1$, π_t is inflation, $\bar{\pi}$ is the inflation target, y_t is output, y_t^* is potential output, and $y_t - y_t^*$ is the output gap. Finally, λ is a given weight on output-gap stabilization relative to inflation stabilization.

As discussed in Chapter 2, the monetary policy mandate in Norway is flexible, so that emphasis is not only given to inflation stabilization, but also to output stabilization (around trend), i.e. the output gap. Hence, the weight on the output gap (λ) in equation (2) above will be positive.

However, although the theoretical framework for monetary policy can be used to derive an optimal strategy (see Chapter 3), monetary policy in practice may be far from optimal. There are two main obstacles. First, the output gap is not directly observable and estimates have to be inferred from

data. In particular, estimates of the output gap are very sensitive to the measurement of the trend in the data, i.e. potential output. Second, in deciding on the inflation target, it is important that monetary policy focus on a measure of inflation that has the greatest relevance for the behaviour of economic agents. The selection of the consumer price index (CPI) rather than a producer price index as a target index for many central banks has usually been motivated by the fact that CPI inflation approximates increases in the cost of living. However, many central banks that have adopted inflation targeting also attempt to differentiate between persistent and temporary causes of price changes, to determine which variation of a price index should be the focus of policy. In particular, shocks that have only very short lasting effects on inflation should be ignored when setting interest rates, as monetary policy cannot mitigate these shocks. The permanent component of inflation (i.e. underlying inflation) is therefore often used to define an explicit target for inflation, rather than CPI itself.

Calculating underlying inflation and the output gap therefore relies on information on the long run properties in time series and proper care should be taken when constructing these two concepts. In the following discussion we give a brief evaluation of the way Norges Bank set out to measure these components and suggest some improvements.

5.1 Escape clauses and underlying inflation in Norway

Some countries have formal exemptions (escape clauses) in the inflation target so that some specific shocks (usually exogenous supply shocks) can be ignored when inflation misses the target. These escape clauses provide increased flexibility. However, using escape clauses implies discretion from the central bank that might cause the public to question the central bank's credibility to achieve the inflation target.

An alternative way to cope with short lasting shocks is to target a measure of underlying inflation, which permanently excludes particularly volatile items from the price index. The use of a core inflation indicator has the advantage over escape clauses since it does not involve any discretion when choosing which shocks to adjust for. Instead, the central bank decides which items of CPI should be excluded *ex ante*. However, although this implies that the central bank excludes the first order effects of certain shocks permanently, for some impulses, like energy price changes, there may be substantial second order effects that the central bank should also have ignored.

The monetary policy mandate in Norway provides a list of escape clauses in which breaches of the inflation target may be ignored. In particular, the mandate states that Norges Bank should ignore the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary circumstances when setting interest rates (see chapter 2). This is similar in vein to New Zealand's mandate, where a list of non-exhaustive specific disturbances is put forward. However, in contrast to New Zealand, which until recently allowed for discretionary adjustments, Norges Bank has defined that it shall target a measure of *core inflation* where CPI inflation is adjusted

for tax changes and excluding energy products (CPI-ATE) (see Inflation Report 2/01). In that sense, the degree of flexibility is not exhausted compared to the mandate that provides a broad list of escape clauses that Norges Bank could have ignored.

Targeting a measure of core inflation (or even the CPI itself), should not, however, exclude Norges Bank from using judgment when trying to distinguish between more permanent inflation impulses and temporary shocks. Other central banks like the Bank of Canada and the Reserve Bank of Australia, have their mandates defined in terms of headline CPI, but choose to focus on different measures of underlying inflation in their monetary policy setting. In particular, the Reserve Bank of Australia investigates a variety of measures of underlying inflation to get a picture of the trend in inflation in its monetary policy setting, whereas the Bank of Canada focuses on CPI excluding food, energy and the effects of changes in indirect taxes.

In theory, the mandate allows Norges Bank to use discretion to disregard any extraordinary temporary shock. For instance, low import price impulses from low cost countries like China could be regarded as temporary and extraordinary and therefore be ignored. The effect of these low import prices account for approximately $\frac{1}{4}$ percentage points of inflation (see Chapter 4). So, if these shocks had been disregarded, underlying inflation would be 0.25 percentage points higher than the measure of underlying inflation that Norges Bank is currently using. Hence, it might not have been necessary to lower interest rates to the extent that they have been.

Although we argue that Norges Bank is not exhausting the full flexibility of the mandate by not exploiting all the escape clauses, using discretion to adjust from specific disturbances might not be the most optimal strategy to comply with the mandate either. As argued above, the use of discretionary adjustments reduces the credibility to achieve the inflation target.

Instead we believe that it is imperative that Norges Bank uses a measure of core inflation that is consistently measured and well understood by the general public. However, in constructing a measure of core inflation, certain criteria have to be put forward. In particular, as the core measure should reflect the long run component in inflation, one needs to know whether the core captures the persistent measure in inflation or if it is still very volatile. In addition, information from different indicators of underlying inflation may add valuable information on the long run inflation process to the central bank. See discussion below.

5.2 Alternative measures of underlying inflation

There are two common ways of obtaining a measure of underlying inflation. One approach is to exclude certain items from the price index (*exclusion approach*), usually because they are volatile or subject to administrative price setting. The other is to exclude all extreme individual price movements (*statistical approach*).

Exclusion measures exclude from the CPI the direct effect of volatile items (most commonly food and energy) on a permanent basis. They are widely used by central banks as measures of underlying inflation and share the advantage that once decided upon they involve no discretion and can be calculated outside the central bank. However, they also share several shortcomings. First, since the first order effects have already been removed, any effects that still remain could have a lagged effect on CPI. Second, by excluding specific components all the time, all information contained in those components, including information reflecting underlying tendencies, is lost.

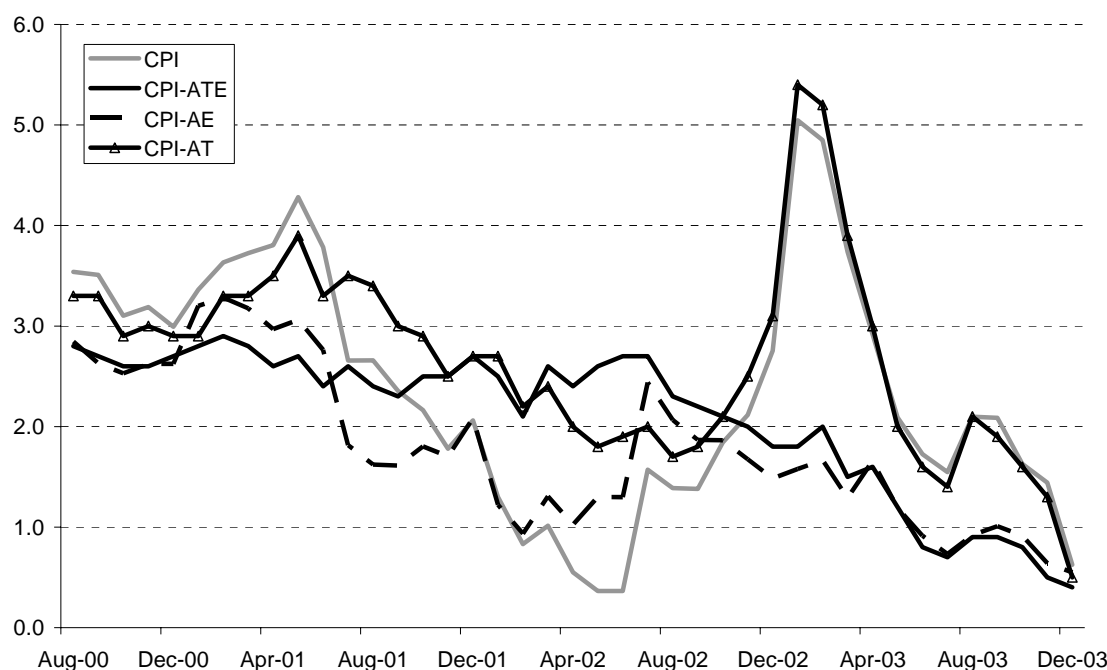
Statistical measures are calculated using the whole CPI. The two most common measures are the trimmed mean and weighted median. To calculate the trimmed mean, the CPI components and their weight in CPI are ranked by the size of their price movement in the month. A 10 per cent trimmed mean is then calculated as the weighted mean of the central 90 per cent of monthly price change distribution in that month. Hence, 5 per cent of the top and 5 per cent of the bottom distribution are removed. The weighted median is the inflation rate for the item which is in the middle of the total distribution of price changes. The median is also calculated for each month. In that sense, it trims away all but the midpoint of the distribution.

In practice, many of the volatile items removed in the exclusion procedure are also removed using the statistical procedure. However, the latter methodology is harder to interpret economically as it is not always clear what is being removed. Nevertheless, it might provide useful information on the inflation process as illustrated below.

Statistics Norway publishes monthly indexes of a variety of measures of underlying inflation (on a yearly basis since August 2000) based upon different exclusion restrictions. The main measures can be seen in figure 5.1, which compares CPI with CPI adjusted for energy products (CPI-AE), CPI adjusted for tax changes (CPI-AT) and CPI adjusted for tax changes and excluding energy products (CPI-ATE) of which the latter, CPI-ATE, is Norges Bank's operational target for inflation.

Figure 5.1 demonstrates that there may be major discrepancies between the different indexes in certain periods, most notably in 2003, when there were major discrepancies due to energy price changes (electricity). However, all indexes capture a downward trend in inflation during the last one and a half years, and by the end of 2003, inflation is consistently measured to be approximately 0.5 per cent on an annual basis.

Figure 5.1 Underlying inflation; Exclusion measures (annual percentage change)



Source: Statistics Norway

Statistics Norway does not calculate and publish statistical measures of underlying inflation on a regular basis, but has, upon our request⁷, calculated three new measures of underlying inflation; the 10 per cent trimmed mean (10TMEAN), 20 per cent trimmed mean (20TMEAN) and the weighted median (WMEDIAN).⁸ The reason for including both the 10 per cent and the 20 per cent trimmed means, is due the fact that there are uncertainties regarding the optimal trimming point. Hence we include both for illustrative purposes.

As a basis for these statistical adjustments, the CPI excluding tax changes (CPI-AT) is used, measured monthly and on an annual basis. The reason for using CPI-AT as the basis rather than CPI itself, is because the mandate defines tax changes as one of the components that should be ignored in the inflation measure. Tax changes are the result of administrative decisions, and as such are distinct from the other components excluded by the mandate, which are usually due to unexpected shocks.

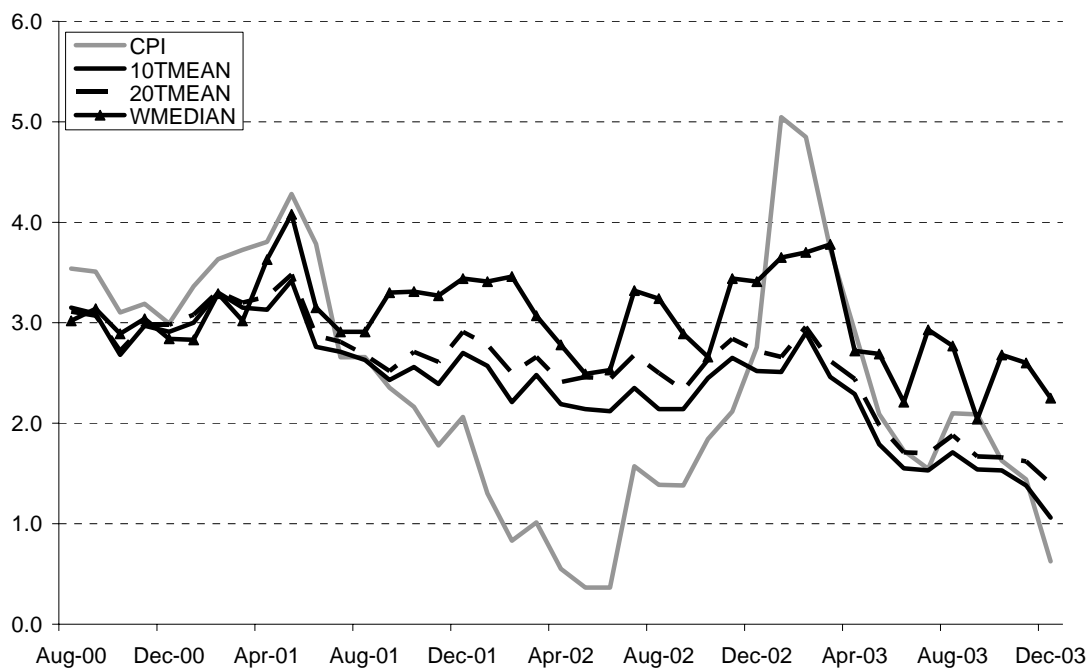
Figure 5.2 compares headline CPI with these new measures. The results are interesting and informative and suggest several conclusions. First, the figure shows that except for the start period, 10TMEAN lies systematically below 20TMEAN, which implies that large negative price signals dominate in the most volatile price indexes and are therefore removed first. The fact that the median (that essentially trims away 50 per cent) lies above the 10 and 20 per cent trimmed means throughout most of the period, emphasizes further that the price distribution is skewed to the left. Hence, there is a

⁷ A special thank to Lasse Sandberg and Joaquin Rodriguez in Statistics Norway, for taking the time to organize and calculate these measures.

⁸ For a discussion and previous application of these methods to Norway, see Bråten and Olsen (1997).

stronger downward pressure on prices than upward. This is useful information which Norges Bank could use in its assessment of underlying inflation pressures.

Figure 5.2 Underlying inflation; Statistical measures (annual percentage change)



Source: Statistics Norway

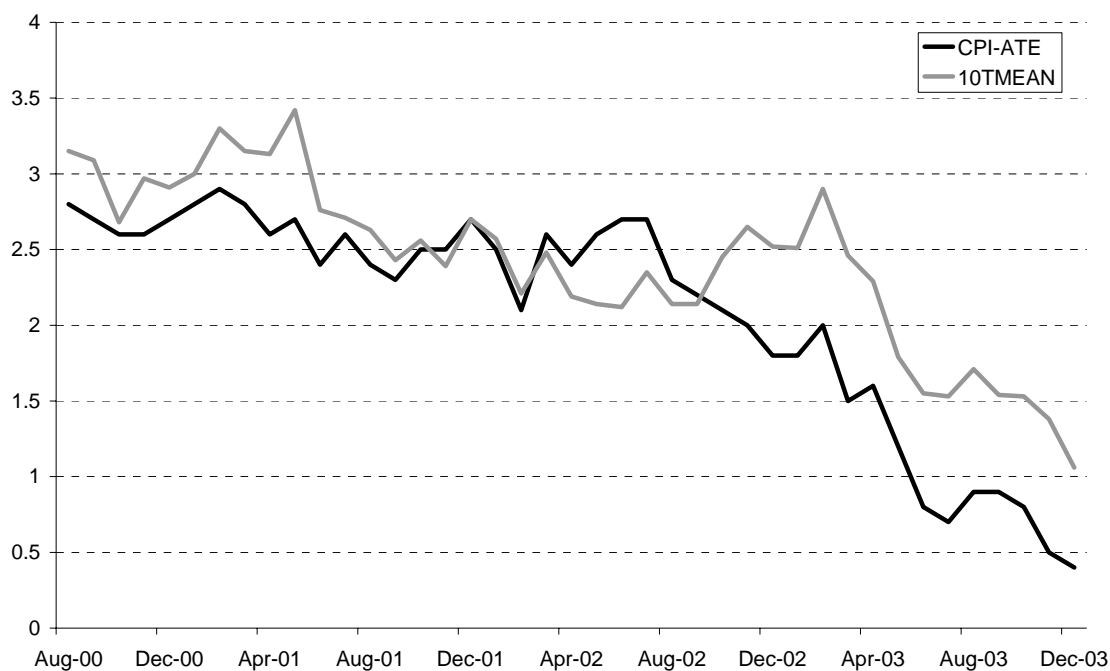
Second, these measures seem to capture the trend in CPI in a more consistent way, as they fluctuate less compared to CPI. For instance, neither of the measures falls below 1 per cent throughout the period, and the weighted median has even remained above 2 per cent over the period.

Third, all measures imply that the trend in inflation has fallen throughout 2003, but to a lesser extent than the exclusion measures indicate. By the end of 2003, the trimmed means imply that inflation is approximately 1-1.4 per cent on an annual basis, whereas the weighted median suggests that underlying inflation is just above 2 per cent.

Figure 5.3 compares CPI-ATE and the 10 per cent trimmed mean. The two measures seem to capture the same trend in inflation and the correlation coefficient between the two measures is as high as 0.85. However, when investigating 2003, it is clear that underlying inflation falls at a much faster rate based on CPI-ATE than 10TMEAN (and the difference is even more pronounced based on the other statistical measures). This further underscores the risk of narrowly focusing on CPI-ATE (or other exclusion measures). In particular, all the statistical measures suggest that underlying inflation is higher by the end of 2003 than CPI-ATE inflation suggests. So focusing narrowly on current estimates of CPI-ATE as a basis for its interest rate settings, which Norges Bank has been doing recently (see discussion in Chapter 4), may imply a risk of over responding to low inflation rates. The fact that CPI-ATE as an

estimate of underlying inflation may be measured with a downward bias, is also supported by our discussion in Chapter 4, where we suggest that by using discretion and taking out components of CPI that Norges Bank should not respond to according to its mandate, the measure of underlying inflation could be considerably higher.

Figure 5.3 Underlying inflation; CPI-ATE and trimmed mean (annual percentage change).



Source: Statistics Norway

So far we have only investigated the different measures of underlying inflation on a visual basis. However, to be able to distinguish them in more detail, we also briefly discuss to what extent the different measures capture the persistent component in inflation and whether they are still very volatile.

Table 5.1 compares some basic statistical properties of the different indicators. In particular, it shows that the standard deviation of underlying inflation compared to inflation measured by CPI is reduced using all measures, with the lowest variation observed by WMEDIAN and 20TMEAN where volatility is only 40 per cent of that observed in CPI. Norges Banks measure of core inflation (CPI-ATE) also observes a reduction in volatility; 60 per cent of that in CPI.

On the other hand, the correlation between CPI and the alternative measures (that is, the degree to which they move together) varies considerably. CPI-ATE observes the lowest correlation of only 0.3 with CPI, whereas the 10TMEAN has the highest correlation with CPI (0.7) of the statistical measures. Note that CPI-AT has a high correlation with CPI and only a weak reduction in volatility compared to CPI, so that it is the exclusion of the energy component in CPI that drives the main result in CPI-ATE.

Table 5.1. Properties of indicators of underlying inflation (2000M8-2003M12)

	CPI	CPI-ATE	CPI-AT	10TMEAN	20TMEAN	WMEDIAN
Average	2.4	2.1	2.7	2.4	2.6	3.0
Maximum	5.0	2.9	5.4	3.4	3.5	4.1
Minimum	0.4	0.4	0.5	1.1	1.4	2.0
Standard deviation relative to CPI	1.0	0.6	0.8	0.5	0.4	0.4
Correlation with CPI	1.0	0.3	0.9	0.7	0.6	0.5

It is a concern that the measure of core inflation used by Norges Bank (CPI-ATE), although low in variation, has a very weak correlation with CPI, implying that it is of little relevance to economic agents, who among others tie wage claims and contracts to CPI. In fact, it turns out that the component that is excluded from CPI (CPI minus CPI-ATE) correlates higher with CPI inflation (the correlation coefficient being as high as 0.8 in the sample), than the correlation between CPI-ATE and CPI inflation.

Despite the fact that CPI-ATE has low co-variation with CPI, it may nevertheless be a good predictor for the trend behaviour in CPI. However, in order to investigate the long run properties of CPI-ATE and compare them to other measures, one needs to expand the period under investigation. Preliminary investigation (using data from 1993 and cointegrating tests), does not give conclusive evidence that CPI-ATE can be identified as the permanent component of CPI, although the results vary somewhat depending on the estimation model used. However, to draw any further conclusion than that requires careful econometric analysis which we recommend that Norges Bank should carry out.

We believe that Norges Bank is right in focusing on a measure of core inflation, so as to avoid having monetary policy respond to temporary movements in inflation. However, given the limited information content in each core measure, Norges Bank should pay attention to other measures of underlying inflation like the statistical measures presented above, when deciding on its monetary policy stance. In particular, when these other measures indicate that there is a risk that CPI-ATE consistently under- or over estimates core inflation, Norges Bank should pay special attention to this information content and try to disentangle the different sources of inflation pressure before deciding on policy. This is consistent with the present monetary policy mandate, which allows for much more flexibility in measuring underlying inflation than what the Bank is presently doing (see Chapter 2).

Another alternative which would add more flexibility to the practice of inflation targeting and at the same time limit the number of discretionary adjustments, would be to develop a reference indicator by using economic theory to identify underlying inflation in a multivariate econometric model

like the structural VAR model.⁹ Although this kind of measure would be difficult to convey to the general public, such a model based measure could nevertheless provide the Bank with an economic rationale for its discretionary adjustments when necessary.

5.3 The output gap as a useful indicator of inflation

As emphasized in Chapter 2, the monetary policy mandate in Norway implies that inflation targeting must be flexible, so that emphasis is given to variability in both employment and inflation as suggested by equation (2) above. This has been referred to by Norges Bank on several occasions (see the speech by the Governor on 29 March 2004).

Norges Bank has chosen to focus on the output gap (the deviation between output and potential output) as an indicator of real activity and therefore also inflationary pressure. Hence, a precise understanding of the term output gap depends on the definition of potential output. According to Norges Bank, potential production is defined as the level of activity that ensures stable inflation. By maintaining output close to potential output, one also ascertains stable inflation expectations. Hence, the goal is to keep the output gap close to zero. This was emphasized in the speech by the Governor on 29 March 2004:

“The economy grows over time. Output moves in waves. Output will in some periods lie below trend growth and in others above trend. The difference between trend output and actual output is called the output gap. Stabilizing output growth means that one seeks to maintain actual output near trend.”

The output gap is not directly observable and estimates have to be inferred from data. Yet, different measures of the output gap imply competing interpretations of economic fluctuations and even more pronounced implications for the effectiveness of economic policy. In particular, if business cycles are thought of as recurrent fluctuations around a trend, then cycles return to trend independent of policy in the long run, as monetary policy cannot change the level of output permanently. The only role for monetary policy in this interpretation is to reduce the variation of output around the trend.

Norges Bank uses the Hodrick-Prescott (HP) filter for calculating trend output (see Inflation Report 1/03 for methodology and references). The filter derives a trend where the smoothness of the trend has to be decided on a priori. The HP-filter has been evaluated and criticized extensively in the literature, and has some severe shortcomings (some of which are also acknowledged by Norges Bank in IR 1/03).

⁹ Quah and Vahey (1995) suggest identifying a measure of core inflation in a model of real output and inflation, by assuming that core inflation is defined as that component of measured inflation that has no (medium- to) long-run impact on real output; a notion that is consistent with the vertical long-run Phillips curve interpretation of the comovements in inflation and output. Bjørnland (2001) extends that model by distinguishing between domestic and imported core inflation, and applies the model to Norwegian data.

First, the filter is a purely mechanical filter, with no relevance to economic theory. Hence, there is nothing to ascertain that the trend provided by the HP-filter corresponds to the level of potential output that stabilizes inflation.

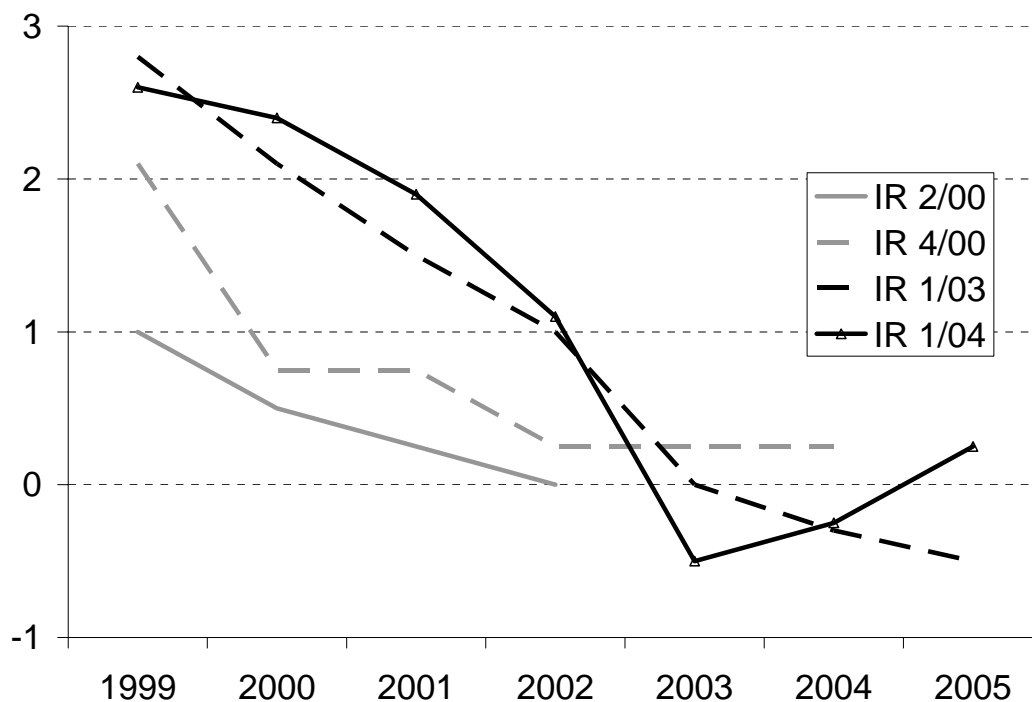
Second, the smoothness of the trend is arbitrary as it has to be decided on when it is calculated. However, different smoothness parameters give very different results for the turning points and persistence of the economic cycles.

Third, Norges Bank chooses a rather smooth trend (see IR 1/03) which implies that the cycles are long lasting. However, they need not correspond to the actual economic business cycles which the central bank should try to stabilize.

Fourth, there is an end of sample problem with the HP-filter, as the estimated trend is (by construction) very close to the actual series by the end of the estimation period. To avoid this problem, standard practice has been to extend the sample with 2-3 years by making forecasts. Hence, the estimated output gap today depends on projections of output into the future. If the projections eventually turn out to be incorrect, the historically estimated output gap (measured in real time) will also turn out to be incorrect and has to be revised. This revision of data in real time can turn out to be quite substantial (see Orphanides 2001). In fact, Smets (2000) has argued that due to these uncertainties, the optimal response for monetary policy makers (in a Taylor-rule model) is to pay more attention to inflation and less to the output gap. However Svensson and Woodford (2003) among others argue that these results could also be explained by the fact that the central bank does not use its best estimate of the output gap, hence there is scope for improvement.

Figure 5.4 graphs the annual output gap, calculated and presented in four different Inflation Reports over time. The figure illustrates the uncertainty in the estimation of the output gap over even a short span of time. In particular, the Inflation Reports in early and late 2000 (IR2/00 and IR4/00), suggest a small output gap for the year 2000, with projections of a reduced gap the next couple of years. However, by the year 2003, the output gap for 2000 is substantially revised upwards, as well as the output gap for the years 2001 and 2002. The IR 1/04 suggests an even further revision upward for the period 2000-2002, as well as a downward revision for the year 2003.

Figure 5.4 Projections for the output gap by Norges Bank, given in various Inflation Reports (IR) over time.



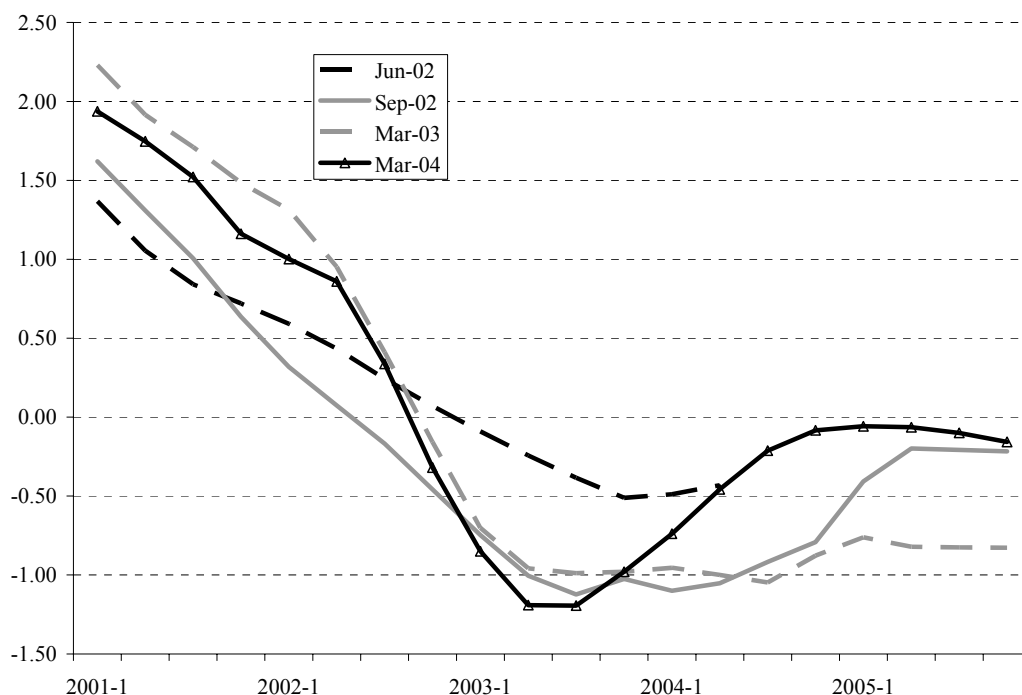
Source: Norges Bank

Figure 5.5 graphs the output gap calculated and presented at different times by Statistics Norway, using the same HP-filter but quarterly data. The figure suggests that already from June 2002, Statistics Norway predicted a negative output gap for 2003, whereas it was only late in 2003 that Norges Bank predicted a negative output gap for 2003. Note however again the feature discussed above, namely that the historical figures (2001 and 2002) change when the forecasts for the output gap are revised with each new projection.

Figure 5.6 graphs the output gap together with CPI inflation from 1980-2003. The data are taken from Statistics Norway, as they calculate the output gap using quarterly data.¹⁰ There are at least two points that should be noted. First, the output gap estimated by the HP-filter suggests that the cycles are long lasting, approximately 15 years (the full length of a boom and a recession). This is much longer than the typical business cycle as defined in the economic literature, which last between 3 and 8 years. Stabilizing these long wave cycles would prove to be almost impossible. Second, the figure suggests that as early as June 2002, Statistics Norway predicted a negative output gap for 2003, whereas Norges Bank did not until October 2003.

¹⁰ Statistics Norway and Norges Bank both calculate the output gap using the Hodrick Prescott filter. Annualizing the quarterly data on the output gap presented by Statistics Norway and comparing the annual estimate to the most recent estimate given by Norges Bank, give very similar results (with the exception of the last year 2003, where the output gap calculated by Statistics Norway is more negative).

Figure 5.5 Projections for the output gap by Statistics Norway, given at different times.



Source: Statistics Norway

Although the output gap may prove very difficult to stabilize, it may nevertheless contain information content with regard to inflation. In a speech by the Governor on 29 March 2004, he emphasizes:

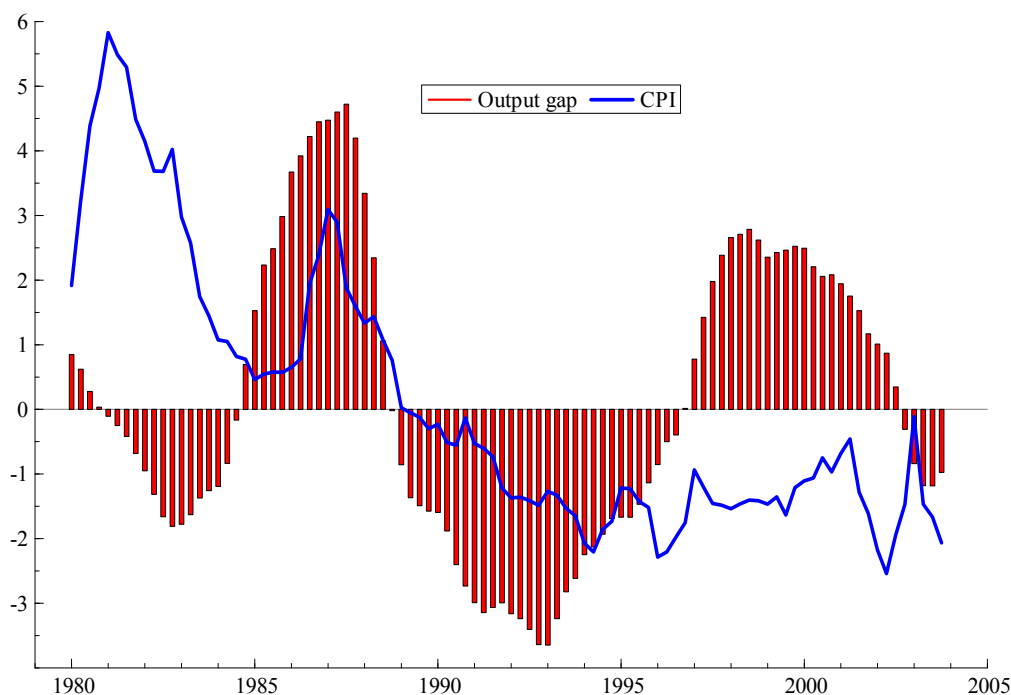
“The output gap provides an indication of pressures in the real economy. Developments in the output gap provide a basis for assessing output stability and can thus also shed light on domestic inflationary pressures in the economy. When the economy is booming, the output gap is positive. When the economy is at a low ebb, the output gap is negative”

However, from figure 5.6 there is little evidence to suggest that the output gap and inflation move together.¹¹ The correlation between the output gap and inflation is also very low over the sample (0.13). However, given that the interest rate first affects output and thereafter inflation with a lag (of say a year) it is also useful to investigate the correlation between the output gap in time t and inflation one year ahead ($t+4$). Doing so the correlation increases somewhat, but is still significantly low (0.2). However, figure 5.6 does suggest that in certain periods, CPI and the output gap move together. In

¹¹ Ideally we would have used CPI-ATE in the figure, but it is not available for the whole period of investigation. Instead we tried estimating a three quarter moving average (as Norges Bank has done in figure 4.15 in IR 1/04 for illustrative purposes) but the overall results do not turn out to be any different from using the headline CPI itself.

particular, eliminating the first and the last cycle, i.e. focusing on the period 1985-1996, we get a correlation close to 0.8.

Figure 5.6 Inflation and the output gap (CPI-inflation scaled by the mean and range of the output gap)



Source: Statistics Norway

A simple inflation equation, regressing the change in inflation on the lags of the change in inflation and the current output gap and the lags of the output gap, suggest that we cannot reject the hypothesis that the coefficients on the lags of the output gap are zero. However, focusing again on a shorter sample, 1985-1996, provides some evidence that we can reject the hypothesis. Hence, there is information content with respect to inflation in the output gap series, but it depends on the sample period investigated. This is not surprising, as there is a continuous flow of different shocks with different effects on output and inflation that hit the economy all the time. For instance, the period 1985-1996 could have been dominated by demand shocks moving the output gap and inflation in the same direction, whereas the period before and after could have been dominated by supply type shocks that move output and inflation in different directions.

It should be noted that although we question whether the present output gap provides little information content on future inflation rates, it is still useful to investigate the output gap so as to decide where the economy is in the business cycle. However, proper care should be taken when measuring the gap, by specifying potential output in a more theory consistent way. There are a battery of methods that can be used to estimate the output gap, which are superior to the HP-filter in identifying trends and

cycles. In fact, many central banks that calculate a measure of the output gap use more sophisticated techniques than the Hodrick-Prescott filter in their estimation. These methodologies do not suffer the major drawbacks discussed above, and some are also more theory consistent in the way they identify potential output.

We suggest that Norges Bank switches to some of these filters, which is also consistent with the recommendation in Longworth and Rødseth (2003). By obtaining more theory consistent and robust estimates of the output gap, Norges Bank will reduce its uncertainty and thereby improve its monetary policy. Methods that could be used are multivariate econometric models (that pay attention to inflation as well), Kalman filters and band-pass filters.

Finally, Norges Bank should also publish quarterly estimates of the output gap (as Statistics Norway is already doing). Only by investigating quarterly data can one properly assess the timing and turning points of cycles. Norges Bank should use more indicators to investigate real activity. Norges Bank already investigates a number of indicators that together with the output gap indicate whether levels of activity in the economy are high or low in relation to trends. The wage gap is one of the indicators used in addition to the output gap. Unemployment series could also be investigated more fully, as they are often good indicators of the cycle, and Norges Bank has had a good track record in predicting the unemployment rate.

5.4 Key recommendations

We have pointed out some weaknesses of using CPI-ATE as the measure of core inflation and discussed the use of the output gap as a useful indicator of inflation.

- Norges Bank should find a measure of core inflation that more consistently satisfies the exclusion measures explicitly mentioned in the mandate.
- Norges Bank should pay attention to a set of diverse indicators of core inflation when deciding on monetary policy. Proper care should be taken in disentangling sources of shocks when the other indicators of core inflation deviate from CPI-ATE.
- The output gap should be measured so that proper care is taken with respect to the time series properties. More sophisticated methods should be used in the estimation of the output gap than what Norges Bank is presently doing.
- Norges Bank should seek to publish quarterly estimates of the output gap. Only by investigating quarterly data can one properly assess the timing and turning points of cycles.

6 Public Communication and Transparency

Norges Bank significantly increased its public communication in 2003. The most notable improvement is the release of the Bank's Strategy Document, which provides the Executive Board's views about the economic outlook and monetary policy options. In addition, the Inflation Report has been expanded, and more charts prepared for the Executive Board's monetary policy meetings are made available on the Bank's web site.

However, as we argue in this Chapter, the greater openness displayed by Norges Bank has not yet succeeded in making monetary policy in Norway fully transparent. Although the Bank is releasing more and more material, it would benefit from having a more effective communication strategy that focuses on providing the private sector with the information that is relevant for understanding monetary policymaking in Norway.

In this Chapter, we first provide an evaluation of the communication instruments that Norges Bank currently uses for monetary policy. Then, we investigate the extent to which the Bank's public communication is effective and achieves full transparency of monetary policy. Subsequently, we assess the accountability of Norges Bank. The concluding section summarizes our key recommendations for Norges Bank's communication policy.

6.1 Public Communication

The main communication instruments that Norges Bank uses for monetary policy are press releases, press conferences, the Inflation Report, the Strategy Document and the Annual Report. Other relevant communication tools include speeches, charts and background material for monetary policy meetings, summary reports based on Norges Bank's recently established regional network, the Economic Bulletin, the Financial Stability report, and submissions from Norges Bank to the Government. All this information is available from Norges Bank's extensive web site (<http://www.norgesbank.no>), and nearly all of it is both in Norwegian and in English.

A *press release* is used to make a prompt announcement of policy decisions at 14:00 on days when the Executive Board holds a monetary policy meeting, the schedule of which is released well in advance. Initially, there was only a terse announcement of the interest rate decision, accompanied by a one-sentence statement on the balance of risk to inflation two years ahead. A more extensive explanation was provided in a prepared statement at a 14:45 press conference. But in October 2003,

Norges Bank's policy announcement greatly improved. The press release now provides an elaborate explanation. It lists the factors that the Executive Board focused on in its assessment of interest rates and identifies factors that are considered particularly uncertain. In this way, the policy announcement provides financial markets with a timely summary of the Executive Board's views.

A *press conference* is held at 14:45 on the day of the monetary policy meeting. It is webcast live and conducted in Norwegian. There is an introductory statement at the press conference with an explanation of the interest rate decision. But, since October 2003 when the more extensive monetary policy announcement was introduced, this statement is no longer available in English. The press conference provides domestic media ample opportunity to ask the Governor questions about the monetary policy decision, but a webcast in Norwegian does little to cater to international financial markets.

Norges Bank's key instrument in the public communication of monetary policy is the *Inflation Report*. It also plays a central role in the Bank's internal decision process. The Inflation Report is published three times per year, normally in February/March, June and October, on dates that coincide with monetary policy meetings. Three weeks before publication, the Executive Board has an extensive discussion based on the draft Inflation Report. However, the Inflation Report is edited by the Governor and does not necessarily reflect the views of the Executive Board.

The Inflation Report is available on Norges Bank's web site at 14:00, the same time that the Bank's interest rate decision is announced, and it is presented at the press conference (in Norwegian). The Inflation Report provides an extensive discussion of economic developments, both domestic and international. Furthermore, it presents Norges Bank's projections for several macroeconomic variables over a two-year horizon. The technical assumptions behind the projections are explicitly stated. The inflation projection receives special attention and the underlying uncertainty is illustrated in a 'fan chart' based on historical forecast errors. The Inflation Report also contains informative 'boxes' that investigate specific issues of particular interest, and a statistics annex with recent data on key macroeconomic variables.

In March 2003, the Inflation Report was improved significantly. It now includes a nice one-page overview of the monetary policy framework in Norway and a useful two-page summary of the Report. In addition, it provides a discussion of recent monetary policy decisions. A summary report based on Norges Bank's recently established regional network and the Strategy Document pertaining to the preceding four months are included in an annex. Nevertheless, the more elaborate Inflation Report still provides no timely information about the Executive Board's assessment of monetary policy.

The release of the *Strategy Document* was first announced on 30 October 2002 and is meant to bring greater transparency about the Executive Board's reasoning behind interest rate decisions. The Strategy Document is produced three times a year, on the same cycle as the Inflation Report. It is first discussed after the seminar on the draft Inflation Report, three weeks prior to publication of the Report,

and the Document is approved by the Executive Board at the subsequent monetary policy meeting. The Strategy Document is not published until four months later, at the end of the strategy horizon.

Although there is some overlap with the Inflation Report, the much shorter Strategy Document distinguishes itself because it expresses the Executive Board's views on the economic outlook and monetary policy options. Furthermore, it specifies an interval for the sight deposit rate in four months that is implied by current economic projections and the balance of risks. The projected range for the interest rate at the end of the four-month strategy horizon is typically 100 basis points. Such a forward looking approach to monetary policy decisions is commendable. It would be even better to provide a projection of the interest rate path for the next few years (see Chapter 3). Unfortunately, the Strategy Document describes the views of the Executive Board three weeks prior to the interest rate decision and it is released after a long lag. So, it is a detailed but stale assessment of monetary policy.

The *Annual Report* is published once a year, first in Norwegian and with a delay of more than a month, also in English. It provides a summary report by the Executive Board. Furthermore, it contains a more detailed overview of Norges Bank's key activities, namely monetary policy, financial stability and investment management, and it includes the financial accounts for Norges Bank. The overview of monetary policy in the Report provides a description of monetary policy assessments and decisions made during the year. In addition, it evaluates whether monetary policy objectives were met. In the 2003 Annual Report, the monetary policy chapter is substantially more elaborate. This is a positive development considering the formal role that the Annual Report plays in the accountability of Norges Bank.

Although press releases, press conferences, the Inflation Report, Strategy Document and Annual Report are the main communication instruments for monetary policy, Norges Bank has several other means to convey information relevant to monetary policy and express its views.

The Governor and Deputy Governor give many *speeches*, which tend to be published on the Bank's website at the same time they are given. Often, these speeches discuss recent economic developments and explain the monetary policy framework. They are also used to address other issues, such as the detrimental effects of excessive wage growth. Occasionally, a speech is utilized to signal an upcoming monetary policy decision. For instance, on 3 June 2003 the Governor indicated in a speech, which was clearly marked to contain new information, that the Executive Board would consider reducing interest rates in larger steps. This proved very effective in preparing financial markets for the interest rate cut by 1 percentage point on 25 June 2003.

A recent development is the release of *charts and background material for the Executive Board's monetary policy meetings*. Since December 2002, background material consisting of dozens of graphs has been published at 14:00 on the day after the monetary policy meeting, covering the international economy, financial markets, demand and output, the labour market, and prices. Some additional charts have been provided since October 2003. Such graphs are helpful because only three out of the eight monetary policy meetings every year are accompanied by the publication of an Inflation

Report. Although all these graphs show a wealth of data, they are poor at conveying information about the Executive Board's interpretation of the economic outlook, which is critical for understanding monetary policy decisions.

Also new are the *summary reports based on Norges Bank's regional network*, which was established in the fall of 2002 and consists of firms, organizations and local authorities throughout Norway. Every year, there are six rounds of discussions; the first one was held in January-February 2003. For every contact round, a summary for each of the seven regions is provided on Norges Bank's website. In addition, an annex in the Inflation Report summarizes every two contact rounds. This regional network could prove a valuable tool for gaining a more sophisticated and timely understanding of economic developments in Norway.

Another regular publication useful for monetary policy is the *Economic Bulletin*, which is published at quarterly frequency and contains articles about a wide range of central bank topics (e.g. the evaluation of Norges Bank's projections in the Economic Bulletin 1/2003). Also relevant is the *Financial Stability* report which is published twice a year. It provides a description of the situation in and outlook for the financial sector.

Less regular are *submissions from Norges Bank to the Government*. A good example is the "Report on Monetary Policy 2003 - the first eight months" in which the Bank provides a detailed description and evaluation of monetary policy from January to August 2003, at the specific request of the Ministry of Finance.

Finally, *external evaluations* also contribute to the public debate on monetary policy in Norway. Fracasso, Genberg and Wyplosz (2003) compared the inflation reports of 20 inflation targeting central banks and found that Norway ranks just above average, but this was before the significant improvements Norges Bank implemented in 2003. Longworth and Rødseth (2003) provide a useful review of Norges Bank's decision-making process and the Strategy Document. Such reports by external experts are valuable because they highlight strengths and expose potential weaknesses in the Norwegian monetary policy framework, which is important for accountability.¹²

6.2 Transparency

Our description of Norges Bank's instruments for the public communication of monetary policy shows that the quantity of information released has significantly increased. However, such greater openness need not imply that Norges Bank has also become more transparent. Perfect transparency refers to an ideal situation in which there is symmetric information between monetary policymakers and the private

¹² Considering the usefulness of external evaluations, we hope that Norges Bank will also add links on its web site to the reports from Norges Bank Watch!

sector.¹³ Simply releasing more data may not improve transparency since it is costly for the public to process information. In fact, greater disclosure could even reduce transparency if it obscures the central message. So it is not really the quantity but foremost the quality of publications that counts. The appropriate criterion is to what extent Norges Bank's public communication succeeds in reducing asymmetric information between the Bank and the private sector.

The monetary policymaking process is very elaborate. Conceptually, the institutional arrangements and monetary policy objectives shape the motives, economic information is a key input, and the monetary policy strategy describes how these are combined to produce the monetary policy stance. In this section, we investigate to what extent Norges Bank manages to be transparent about each of these aspects of the monetary policymaking process.

Institutional arrangements and objectives

Institutional arrangements determine what drives monetary policy decisions. An independent central bank is more transparent as it is safeguarded from fickle political influences. Explicit objectives and a numeric inflation target further contribute to transparency. They provide an anchor for inflation expectations in wage and price setting, which leads to greater stability in the real economy as well as financial markets.

Regarding the institutional arrangements for monetary policy in Norway, the Norges Bank Act of 1985 states that Norges Bank "*shall be an executive and advisory body for monetary, credit and foreign exchange policy*" (§ 1, first paragraph) and that the "*executive and advisory authority is vested in the Executive Board*" (§ 5, second paragraph). The political independence of the Executive Board has recently been strengthened by the 2003 amendment to the Norges Bank Act, which entered into force on 1 January 2004. This amendment considerably extends the list of people excluded from serving on the Executive Board due to close connections to the government or the Storting (§ 6, fifth and sixth paragraph).

Nevertheless, monetary policy in Norway is not free from government influence. According to the Norges Bank Act, the Bank is bound by "*the economic policy guidelines drawn up by the government authorities*" (§ 2, first paragraph). In addition, the "*King in Council may adopt resolutions regarding the operations of the Bank. Such resolutions may take the form of general rules or instructions in individual cases*" (§ 2, third paragraph). This could include instructions about interest rate decisions, which is disturbing because it legitimizes political meddling with monetary policy. Although the Storting must be notified of resolutions and the Bank is given the opportunity to state its opinion before such resolutions are passed, the mere threat of a resolution could potentially be (ab)used to exert undue political pressure on Norges Bank. We do not believe that this is currently an urgent

¹³ See Geraats (2002) for a survey of the academic literature on central bank transparency. Also see Winkler (2002) for a discussion of public communication in monetary policy.

concern in Norway, but it points to a serious weakness in the institutional framework for monetary policy.

Allowing for the possibility of government intervention enhances the democratic accountability of monetary policy. However, it would be highly desirable to have a more explicit and stricter override mechanism with respect to interest rate decisions. In particular, its application should be confined to extraordinary circumstances and it should force the King in Council to submit such resolutions to the Storting for approval. The override mechanism that applies to the Bank of England, which is accountable to the Chancellor of the Exchequer, could serve as a model. In this way, the transparency and political independence of monetary policy would not be significantly compromised.

The most serious problem with the institutional arrangements, however, is that Norges Bank currently lacks independence over its monetary policy decisions. The Norges Bank Act states that "[b]efore the Bank makes any decision of special importance, the matter shall be submitted to the Ministry [of Finance]" (§ 2, second paragraph) and it appears that interest rate decisions are considered "of special importance". To be precise, the Governor submits to the Ministry of Finance the advice he intends to give to the Executive Board the following day regarding the interest rate decision. As mentioned in Chapter 3, this effectively sidelines the external members of the Executive Board. It also raises questions about transparency, but foremost about independence and accountability.

We strongly recommend that this practice be discontinued. Although regular interactions between the Ministry of Finance and Norges Bank are desirable, they should not preempt the discussion and interest rate decision by the Executive Board. The Ministry of Finance and Norges Bank should reach an understanding that interest rate decisions are routine and not "of special importance" in the sense of the Norges Bank Act, § 2, second paragraph.¹⁴ Norges Bank should inform the Ministry of Finance of the interest rate decision immediately after the meeting of the Executive Board, before the public announcement and implementation of the decision. In this way, the monetary policy decision truly becomes the sole responsibility of the Executive Board and it would be impossible to directly implicate the Ministry of Finance in interest rate setting, although the Ministry retains the possibility of overriding, thereby safeguarding democratic accountability. It would also be in line with the recent move towards greater expertise in the Executive Board. In addition, it would strengthen both the transparency and independence of monetary policy in Norway.

Although the Regulation on Monetary Policy of March 2001 stipulates that "*Norges Bank is responsible for the implementation of monetary policy*" (§ 1, second paragraph), it would be desirable to clarify that this also includes responsibility for interest rate decisions, about which we have just shown there is much murkiness. Ideally, these institutional weaknesses should be addressed in an amendment to the Norges Bank Act. However, this key issue could already be rectified by adjusting the Regulation on Monetary Policy to affirm that Norges Bank is fully independent with respect to monetary policy

¹⁴ A reasonable exception is an interest rate decision made at an emergency meeting of the Executive Board, outside the preannounced schedule of monetary policy meetings.

decisions (so called instrument independence). In this way, Norway would adopt the best practice in inflation targeting.

The *objectives* of monetary policy are stated in the March 2001 Regulation on Monetary Policy (§ 1, first paragraph) and include stability in the Norwegian krone's national and international value, contributing to stable expectations concerning exchange rate developments, and contributing to stable developments in output and employment. Furthermore, the Regulation specifies an explicit operational target, namely "*annual consumer price inflation of approximately 2.5 per cent over time*" (§ 1, third paragraph). The Regulation also provides escape clauses as "*in general, the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary disturbances shall not be taken into account.*" (§ 1, fourth paragraph). Such a specification is not out of line with the best practice in inflation targeting, and it provides a useful anchor for inflation expectations. However, as we explained in Chapter 2, Norges Bank's mandate leaves much ambiguity.

Economic information

Transparency about economic information involves the publication of data, models, forecasts and unanticipated disturbances. The latter two serve different purposes. The publication of Norges Bank's projections helps the private sector to infer the Bank's intentions from its policy actions. For instance, the fact that the sharp reduction in the interest rate in 2003 was supported by low projected inflation and output has helped to keep the Bank's inflation target credible. The disclosure of unanticipated disturbances (e.g. through an evaluation of the Bank's economic projections) facilitates the inference of the Bank's intentions from policy outcomes. For instance, the fact that a significant part of the undershooting of the inflation target of 2.5 per cent can be attributed to the persistently lower (foreign currency) prices of imports helps to uphold the Bank's credibility. Thus, transparency about economic information enhances the credibility and reputation of Norges Bank and gives it greater flexibility to stabilize economic shocks.

The best source for economic information relevant to monetary policy is the Inflation Report, which is only published three times a year. This is rather unusual; most inflation targeting central banks issue inflation reports at quarterly frequency.¹⁵ Interestingly, Norges Bank used to have quarterly Inflation Reports until it suddenly started issuing only three per year in 2001. The reason they gave us is that it takes more than three months to produce an Inflation Report, causing production cycles of quarterly Reports to overlap. But we wonder why Norges Bank finds it so difficult to produce an Inflation Report at quarterly frequency while most other central banks appear to have no problem doing so.

¹⁵ Out of the 21 inflation targeters covered by Fracasso, Genberg and Wyplosz (2003, Table 1.1), only 7 publish inflation reports at less than quarterly frequency: Chile, Colombia, Israel, Norway, Peru, South Africa and South Korea.

There are two pertinent reasons to have quarterly inflation reports for a country with quarterly national accounts. First, every quarter an entirely fresh set of data becomes available, which is likely to affect Norges Bank's view of the economy. So, transparency requires that Norges Bank publish its updated projections every quarter. Moreover, the current frequency of three times per year complicates the decision-making process. The reason is that each Inflation Report is published at a different stage in the quarterly cycle of statistical releases, so it is based on a different combination of updated statistics, which makes comparisons more difficult. For Norges Bank it would be particularly desirable to choose the timing of Inflation Reports such that they can systematically incorporate the latest forecasts of Statistics Norway, as explained in Chapter 3. As a result, adopting the international best practice of quarterly Inflation Reports would improve both transparency and the internal decision process at Norges Bank.

The Inflation Report provides a good update of the economic data relevant to monetary policy, with two exceptions. First, Norges Bank does not publish quarterly data on the output gap. The Bank claims that its quarterly estimates are not well-behaved. However, Statistics Norway appears to have no difficulty constructing quarterly output gap data. Since the concept of the output gap is central to understanding inflationary pressures from goods markets, the Bank should incorporate quarterly measures of the output gap in its economic assessments (also see Chapter 5).

In addition, Norges Bank focuses on CPI-ATE as a measure for underlying inflation without considering alternatives, such as those discussed in Chapter 5, which may more closely allow for the escape clauses specified by the Bank's mandate. Given the importance of underlying inflation for the evaluation of monetary policy, Norges Bank should analyze various measures in its Inflation Report.

Regarding the economic model(s) used by Norges Bank, there is a disturbing lack of transparency. The RIMINI model is referred to frequently in the Bank's publications, but detailed information about it is scarce. The Bank also uses a few other models about which little is known. It is important to publish these models because they are employed in the construction of economic projections that are used for monetary policy decisions. Although Norges Bank is currently developing a new modelling framework, they should still be explicit about which models are being used at any point in time. In the end, Norges Bank should aim to follow the example of the Bank of England, which provides extensive documentation about its policy models, including the computer code of its macroeconomic model.

The macroeconomic projections of Norges Bank are published in the Inflation Report, with most attention devoted to the inflation projection. However, output projections are equally important to reap the benefits of transparency. The reason is that market participants attempt to infer the central bank's intentions from its policy actions. This is complicated by the fact that the interest rate is adjusted in response to at least two types of anticipated disturbances, aggregate demand and supply shocks. So, forecasts of at least two variables are needed to identify these shocks and achieve transparency.

Projections for output and inflation serve this purpose. Hence, Norges Bank should put greater emphasis on its output projections in the Inflation Report and display them more prominently, for instance by including a fan chart for both; the Bank of England (again) provides an inspiring example. Another reason for greater focus on output projections is that output stability is an explicit objective according to Norges Bank's mandate.

To achieve transparency about economic information, Norges Bank should not only communicate anticipated shocks that it responds to, for instance by publishing inflation and output projections, but it should also be open about unanticipated disturbances that it is unable to offset. A description of new macroeconomic developments goes some way towards the latter. A much more sophisticated method is to show and explain how the projections for inflation and output change as they are updated. It would also provide an insightful way to summarize relevant recent developments in the Inflation Report.

Furthermore, it is important to regularly evaluate projections, not only to assess how good (or bad) they are, but also to explain ex post why intended outcomes were not achieved. Norges Bank already conducts an evaluation of its macroeconomic projections every year. For instance, the evaluation of Norges Bank's projections for 2003 appears in the Inflation Report 1/2004. However, we think that this process needs improvement, especially in the face of blatant, short run forecast errors such as those experienced in 2003 (see figure 4.1). A salient feature of Norges Bank's inflation projections made in 2003 was that they greatly overestimated inflation, even a few quarters ahead. Such a systematic bias in short term forecasts suggests that there are persistent mistakes in the technical assumptions underlying the projections, or problems with (the judgment applied to) the RIMINI model that Norges Bank uses to generate the projections.¹⁶ Norges Bank needs to urgently investigate the causes for these forecast errors because the inflation projections are critical for monetary policy decisions. A useful approach would be to rerun the inflation projection (with and without judgment) based on actual realizations instead of technical assumptions for the interest rate, exchange rate and wage growth, and compare it to actual inflation. In this way, the sources of the forecast error could be easily traced.

It should be emphasized that openness about economic information enhances the transparency of monetary policy to the extent that it reflects the views of the monetary policymakers. Its benefits derive from the fact that it helps the private sector to infer the policymakers' intentions from their interest rate decisions. So, we recommend that the Executive Board not only discusses but also endorses the Inflation Report, including the projections.

Currently, the only detailed monetary policy assessment of the Executive Board is available in the Strategy Document. However, this does not suffice for transparency about interest rate decisions because it pertains to the four-month strategy period and not individual monetary policy meetings.

¹⁶ See Olsen and Wulfsberg (2001) for an overview of the key features of the RIMINI model and the role of judgment in the construction of projections.

Moreover, the information in the Strategy Document need not even provide transparency about the monetary policy meeting at which the Document was approved. A good illustration is Strategy Document 3/2002. The inflation projections based on a constant interest rate and exchange rate were 2 and 2¼ per cent for 2003 and 2004, respectively. In addition, all the projections for prices, wages and output in 2003 and 2004 were revised downward. Nevertheless, the concluding assessment is: "*With an unchanged interest rate and krone exchange rate, inflation is projected at 2½ per cent two years ahead. The probability that inflation two years ahead will be lower than 2½ per cent is the same as the probability that it will be higher.*" This judgment is difficult to justify based on the information provided in the Strategy Document.

Another problem with the Strategy Document is that it is only published after the four-month strategy period. It should also be noted that simply releasing a bunch of charts the day after the monetary policy meeting is no substitute for publishing the Executive Board's interpretation of the data, which is what ultimately matters for the monetary policy decision.

To overcome these deficiencies in transparency about economic information, we recommend that Norges Bank consolidate its communication efforts. In particular, we suggest that the Strategy Document be integrated with the Inflation Report and be published at quarterly frequency. The expanded Inflation Report should include quarterly data on the output gap and alternative measures for underlying inflation (also see Chapter 5), put more emphasis on the output projections, and conduct more thorough and timely evaluations of its projections to identify the source(s) of persistent forecast errors. Furthermore, the Inflation Report should be endorsed by the Executive Board, it should identify the information that the Board considers most relevant and describe its assessment at the time of the monetary policy meeting. This means that it would be published with a delay of a few days to at most a week, similar to the current practice at the Bank of England.

Strategy and decision-making process

Transparency about the strategy and decision-making process is important to increase public understanding of monetary policy. It leads to greater predictability of monetary policy actions and outcomes, and thereby to greater economic stability.

The monetary policy strategy of Norges Bank, which we discussed in Chapter 3, is nowadays conveniently summarized in a box at the start of each Inflation Report. Norges Bank's website provides a more elaborate account in "Monetary policy in Norway" which also provides links to more detailed information.¹⁷ In general, information about the monetary policy framework of the Bank is easy to find and accessible.

Considering the implementation of the monetary policy strategy in the form of the actual decision process, the transparency of Norges Bank leaves much to be desired. The problem is that there

¹⁷ See http://www.norgesbank.no/english/monetary_policy/in_norway.html

is no detailed information about how the Executive Board reaches its interest rate decision. In particular, neither the minutes of the monetary policy meetings of the Executive Board nor the voting records are disclosed. The only, admittedly poor substitutes that are available are the Strategy Document, which provides the Executive Board's assessment over a four-month horizon and does not cover individual monetary policy decisions, and the summary explanation of the interest rate decision provided in the press release. However, neither of these gives us insight into what issues were addressed and what arguments were raised at the monetary policy meeting. Without having access to such an account of the discussions by the Executive Board, it is difficult to gauge the quality of decision-making at Norges Bank. Furthermore, minutes and voting records are informative about the (diversity of) views held by the Executive Board and could thereby contribute to greater predictability of monetary policy actions. Voting records also allow individual Executive Board members to be held accountable.

As a result, we recommend that Norges Bank follow the best practice in central banking and fully inform the public of the assessments on which monetary policy decisions are based by releasing non-verbatim, unattributed minutes and the attributed voting records of the monetary policy meetings of the Executive Board. The voting record should be announced together with the policy decision (as is the practice of the Federal Reserve); the minutes should be released as soon as they are approved by the Executive Board (which in the case of the Bank of England and Sveriges Riksbank leads to a delay of 2-3 weeks).

Policy stance

Transparency about the policy stance is important to achieve predictability of monetary policy actions in the short run, thereby promoting stability of financial markets.

Norges Bank already promptly announces its interest rate decision on the day of the monetary policy meeting. In addition, it provides an explanation of the decision, also when interest rates are not adjusted. As pointed out in Section 6.1, the explanation provided in the press release has greatly improved recently. In addition, the Norwegian press has the opportunity to ask clarifying questions at the press conference that takes place after the monetary policy announcement.

Nevertheless, Norges Bank is not fully transparent about its policy stance because it no longer publishes a policy inclination. A policy inclination is relevant since interest rates are generally adjusted in discrete increments. For instance, monetary policymakers could be inclined to change the interest rate in a particular direction, but decide not to adjust the rate because the circumstances do not warrant adjusting it by a full step. Then, the policy action (no change) is not fully informative about the policy stance. The purpose of a policy inclination is to convey this useful information.

Norges Bank used to include an explicit probability statement in the policy announcement about the likely next change in the interest rate, but replaced it in June 2001 by an assessment on the balance of risk to inflation two years ahead. The latter statement tends to be that “*with an interest rate of [new level], Norges Bank's assessment is that the probability that inflation two years ahead will be*

[lower/higher] than 2.5 per cent is [greater than/the same as] the probability that it will be [higher/lower]."¹⁸ However, such a statement about the balance of risk to the inflation projection is not equivalent to an inclination for the policy rate. The reason is that by virtue of its mandate, Norges Bank also cares about output. Suppose that the balance of risk is upward for the inflation projection but downward for the output projection. Then, it is not clear what the policy inclination would be. So, even if the balance of risks to both inflation and output projections are released, they are generally no substitute for the publication of a policy inclination.

As a result, we recommend that Norges Bank resumes the disclosure of an explicit policy inclination. This could be done in several ways. It could be a probability statement like it had before. Or, it could be in the form of a likely range for the policy rate at a specified horizon, similar to the interval provided in the Strategy Document but then for every monetary policy decision. A more sophisticated way to convey the policy inclination is to provide the projected path for the policy rate over several quarters. The associated uncertainties could be nicely illustrated in a fan chart for the policy rate. We prefer this specification because it has the additional advantage that it encourages good decision-making. It puts the focus on how new information affects the initially projected interest rate path, thereby reducing the likelihood of succumbing to the time-inconsistency problem of inflation forecast targeting described in Chapter 3. In either case, no matter how the specific communication of the policy inclination takes place, its introduction should be accompanied by a short note that explains how to correctly interpret the information provided, so that the risk of misunderstanding by financial markets is reduced.

One way to measure the degree of transparency is to look at the predictability of monetary policy decisions by financial markets. The evaluation in the Annual Report 2003 (Figure 24) suggests that most interest rate decisions in 2003 were anticipated by financial markets, although there was considerable surprise about the 13 August and 17 December decisions. However, this measure of transparency only concerns the policy action. It does not take into account the many other ways in which central bank communication matters for economic decisions.¹⁹ Furthermore, it ignores the critical role that other aspects of transparency play for the purpose of accountability.

To summarize the main finding of this section, the communication policy of Norges Bank fails to achieve transparency in important respects. Although the Bank shows the right intention by considerably expanding its public communication, it has not sufficiently enhanced the transparency of monetary policy in Norway. We therefore recommend that Norges Bank adopt a communication strategy that specifically aims to fill the gaps in transparency we have identified.

¹⁸ Note that on 5 March and 30 April 2003, the statement was "according to Norges Bank's overall assessment of the balance of risks, the probability that inflation two years ahead will be lower than 2 per cent is greater than the probability that it will be higher", which is confusing as it is not clear whether it refers to the Bank's assessment at the initial or new (lower) interest rate level. The usual expression is also imprecise as it does not specify the technical assumptions on which it is based.

¹⁹ For a more comprehensive measure of central bank transparency, see Eijffinger and Geraats (2004).

6.3 Accountability

Accountability means bearing responsibility for one's actions. For accountability to be effective, there should be clarity about (a) the delegation of authority, (b) the objective, and (c) the appropriateness of actions taken to reach the objective.²⁰

The *delegation of authority* concerning monetary policy is ruled by the Norges Bank Act of 1985, but as explained in section 6.2, the legal framework leaves scope for undesirable political pressures and ambiguity about the responsibility for monetary policy decisions. In practice, Norges Bank enjoys a large degree of operational independence in the setting of interest rates, but weakness in the formal delegation of responsibility is a serious issue for accountability. To alleviate these problems, it would be desirable to adopt a more explicit, stricter override mechanism. Furthermore, we strongly recommend that Norges Bank submits the interest rate decision to the Ministry of Finance only after the monetary policy meeting.

The *objective* of monetary policy is specified in the March 2001 Regulation on Monetary Policy in the form of an explicit target for annual consumer price inflation of approximately 2.5 per cent over time (§ 1, third paragraph), excluding the direct effects on consumer prices resulting from changes in interest rates, taxes, excise duties and extraordinary temporary disturbances (§ 1, fourth paragraph). Based on these escape clauses, Norges Bank has decided to focus on CPI-ATE rather than CPI inflation, but as Chapter 5 indicates, it may not be an ideal measure for this purpose. Although the escape clauses give the Bank the flexibility to choose the optimal inflation measure, the lack of an explicit inflation measure for the target in the Regulation is problematic for accountability.

The meaning of 'approximately' in the inflation target is clarified in the letter from the Ministry of Finance to Norges Bank of 26 March 2001: "*As a main rule, consumer price inflation is to remain within an interval of +/-1 percentage point around the inflation target.*" In addition, in its Guidelines for Economic Policy (Report no. 29 to the Storting, 2000-2001), the Ministry of Finance explains that "*[t]he provision is to be construed to mean that deviations between actual inflation and the target in a period shall not be compensated for in a later period.*" So, annual inflation every year is a more suitable measure than average inflation over a few years.

Together, these statements suggest that a criterion for the evaluation of monetary policy would be a level of annual CPI-ATE inflation between 1.5 and 3.5 per cent every year. Judging by this benchmark, Norges Bank failed to meet its objectives in 2003 as the annual rate of CPI-ATE inflation was 1.1 per cent. However, using the measures for underlying inflation discussed in chapter 5 gives a very different picture. To be precise, the annual rates of the 10 per cent trimmed mean, the 20 per cent trimmed mean and the weighted median of CPI-AT inflation in 2003 were 1.9 per cent, 2.0 per cent and 2.8 per cent, respectively, which is fully consistent with the target specified in the mandate.

²⁰ See De Haan, Amtenbrink and Eijffinger (1999) for a central bank accountability index.

An assessment of the *appropriateness of actions* is critical for the accountability of monetary policy, because there are many unforeseeable circumstances that may cause the Bank to miss its target despite its best intentions. To gauge whether monetary policy actions are appropriate requires a considerable degree of transparency. Unfortunately, as we explained in section 6.2, the transparency of Norges Bank is far from perfect.

To enable accountability it is useful to have formal disclosure requirements. Norges Bank is subject to the following four:

(i) "*The Bank shall inform the public about the monetary, credit and foreign exchange situation*" (Norges Bank Act, § 3, third paragraph). The publication of Norges Bank's Inflation Report, which provides a discussion of economic developments, meets this requirement, although a Report at quarterly frequency would be desirable to adequately inform the public.

(ii) "*The Bank shall inform the public of the assessments on which monetary policy decisions are based*" (Norges Bank Act, § 3, fourth paragraph). This is a 2003 amendment which entered into force on 1 January 2004. Monetary policy decisions are taken by the Executive Board at monetary policy meetings and a summary of their views is now provided in the expanded press release that announces the interest rate decision. A more extensive assessment is provided in the Strategy Document, but it only pertains to a four month horizon and not to individual monetary policy decisions. To fully meet this information requirement, Norges Bank should publish minutes of the monetary policy meetings held by the Executive Board.

(iii) "*The Executive Board shall each year prepare an annual report [which is] sent to the Ministry [of Finance] for submission to the King and communication to the Storting*" (Norges Bank Act, § 30, first and second paragraph). Clearly, the Bank complies with this requirement.

(iv) "*Norges Bank shall regularly publish the assessments that form the basis for the implementation of monetary policy*" (Regulation on Monetary Policy, 2001, § 2). It is not entirely clear what is meant here, but in the accompanying Guidelines for Economic Policy (Report no. 29 to the Storting, 2000-2001), it seems that the Ministry of Finance has in mind the Inflation Reports that are published three times a year, which the Ministry considers to be adequate for this purpose.

These formal disclosure requirements are very vague and insufficient to guarantee that the appropriateness of monetary policy actions can be properly assessed. In fact, based on the information published by the Bank we found it difficult to evaluate Norges Bank's monetary policy actions in 2003, as made clear in Chapter 4. It would have been particularly useful to have had access to inflation projections under alternative scenarios, especially for the exchange rate and wage growth, and to an

evaluation of the errors in the Bank's economic projections. Nevertheless, our analysis has made clear that there is scope for considerable improvement in the internal decision-making process at Norges Bank. A better monetary policymaking process would likely have been more effective in reaching the Bank's inflation target.

This leaves us with a final accountability question. What consequences does Norges Bank face when its performance is left wanting?

Neither the Norges Bank Act nor the Regulation on Monetary Policy stipulate any procedures to hold Norges Bank accountable. Only the 2001 Guidelines for Economic Policy make any mention of what should happen if the inflation target is missed: *"If inflation deviates significantly from the target over a period, Norges Bank shall set the interest rate with a view to returning gradually consumer price inflation to the target to avoid unnecessary fluctuations in output and employment"*.

Furthermore, in connection with the reporting requirement in the 2001 Regulation on Monetary Policy (§ 2), the Guidelines for Economic Policy state: *"The Ministry expects Norges Bank to provide an assessment of any failure to reach the target established."* The Bank had already indicated that *"[i]f there are significant deviations between actual price inflation and the target, the Bank will provide a thorough assessment in its annual report. Particular emphasis will be placed on any deviations outside the interval +/- 1 percentage point."* The Ministry added to this in its Guidelines that *"[o]ther circumstances may also require such an assessment on occasions other than the annual report."* The Ministry of Finance referred to this in its letter to Norges Bank of 13 June 2003, which led to "Norges Bank's Report on Monetary Policy in 2003 - the first eight months."²¹

A new development in accountability is that Norges Bank was invited for the first time to appear at a hearing before the Standing Committee on Finance and Economic Affairs of the Storting, which was held on 1 December 2003. Regular parliamentary hearings could be a good way of holding Norges Bank accountable, but this recent practice is not based on any legal requirement.

All in all, the legal accountability requirements of Norges Bank are very limited. In future Regulations on Monetary Policy or amendments to the Norges Bank Act, it would be desirable to strengthen the accountability of Norges Bank together with its independence. Regardless of the lack of formal accountability procedures, Norges Bank shall continue to be held accountable by Norges Bank Watch!

²¹ Interestingly, in its letter the Ministry also requests a more detailed account of the conduct of monetary policy for 2002, although the Annual Report 2002 was already published. We agree that the justification and evaluation of monetary policy in the 2002 Annual Report is not convincing.

6.4 Key Recommendations

In this Chapter we have explained how Norges Bank should consolidate its communication instruments and use them more effectively based on a communication strategy that aims to fill specific gaps in transparency. In particular, we emphasize the following recommendations:

- It would be desirable to reform the institutional framework in Norway to strengthen the formal independence and accountability of Norges Bank.
- The current practice that the Governor submits his recommended decision on interest rates to the Ministry of Finance the day before the monetary policy meeting of the Executive Board should be discontinued. Instead, Norges Bank should inform the Ministry of Finance of the interest rate decision immediately after the meeting of the Executive Board, before the public announcement and implementation of the decision.
- The Inflation Report should be issued at quarterly frequency and incorporate the current Strategy Document as well as some additional data, projections and evaluations. Furthermore, it should be endorsed by the Executive Board, describe its assessment at the monetary policy meeting, and be published within a week of the interest rate decision.
- Norges Bank should release attributed voting records at the policy announcement, and publish non-verbatim, unattributed minutes of the monetary policy meetings of the Executive Board within three weeks of the interest rate decision.
- Norges Bank should release an explicit policy inclination together with the interest rate decision, preferably in the form of a projected path for the policy rate over several quarters.

Implementation of these recommendations would improve the efficiency of both external communication and the internal decision-making process at Norges Bank.

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