



Centre for Monetary Economics

## **Norges Bank Watch 2001**

A review of inflation targeting, the Norwegian monetary regime and its institutional arrangements, and Norges Bank's actual monetary policy and communication

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## **Preface**

This is the second Norges Bank Watch by the Centre for Monetary Economics (CME) at the Norwegian School of Management. However, as last year's report was written in Norwegian, this is the first one accessible to a wider audience.

On 29 March 2001 Norges Bank was formally given an inflation target - as recommended in last year's Norges Bank Watch.

The present Norges Bank Watch discusses asset price developments and interest rate determination in general terms. More specifically, the report analyses the implementation of an inflation target in Norway.

The team responsible for the report consists of chief economist Harald Magnus Andreassen, professor Paul De Grauwe, doctoral student Haakon Solheim and associate professor Øystein Thøgersen. The group is solely responsible for the report and the views presented here.



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## 1. Summary

March 29 2001 the Norwegian government introduced a new regulation of monetary policy in Norway. The new regulation states that

“Norges Bank’s implementation of monetary policy shall [...] 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.”

This is a formalisation of an inflation target for Norges Bank.

In this report we will focus on the challenges of an inflation target. The first part of the report focuses on the possibilities and limitations in a flexible inflation targeting approach. The second part focuses on the implementation of an inflation target in Norway.

### **Flexible inflation targeting**

In the first section of the report we present the main arguments in favour of flexible inflation targeting as the optimal monetary regime. Flexible inflation targeting concentrates on stabilising inflation. However, as there usually is a close connection between the level of economic activity and the inflationary pressures this should also contribute to output stabilisation. If aggregate demand is too high compared to actual production capacity, both wage pressures and margin increases will usually lead to higher inflation. If demand is too low, recessions and deflation are the usual outcome. When central banks try to influence domestic demand by adjusting its interest rates in order to stabilise future inflation, its aim is to achieve a good balance between aggregate demand and supply in the economy. This demand smoothing will naturally lead to a stabilising of the real economy and keeping unemployment at the lowest possible level without igniting inflation. International experiences with this policy have been reasonably good.

However, economic imbalances might emerge without creating any consumer price inflation problems, at least in the short or medium term. Major economic boom and bust periods have been driven by inflation and deflation in stock and property markets, usually closely connected to credit growth. In boom periods, demand gets a boost due to increased optimism about future rates of return. The supply side responds by increasing investments and thereby capacity. As both consumption and investment growth are partly financed by increasing net debt, the economy becomes unstable. As debt levels become high the economy gets more vulnerable to

shocks. When the cycle turns both consumption and investments contracts. A boom turns into a bust.

As expected prices are not affected, a flexible inflation target does not imply any response to such fluctuations in output. Therefore the central bank also needs to take other factors into regard in order to assure that it gets a complete picture of the economic developments. Central banks can, and should in our opinion, take asset prices and debt accumulation into consideration when they conduct their monetary policy.

The “traditional” inflation targeting must be the main focus. However, the central bank should monitor debt developments and asset prices closely. Asset prices can and should not be targeted, as it is always difficult to judge how asset price inflation is transmitted into the real economy. But central banks can and should “lean against the wind” when asset prices and credit growth deviate substantially from their normal paths. In such situations, asset price or debt market considerations might overrule the policy indicated by a pure inflation targeting analysis. Central banks should prepare themselves for handling such mixed signal situations, even if they probably are rare.

#### **Are the Norwegian institutions up to date?**

The new policy guidelines formalise a new role for Norges Bank, but the institutional framework, given in the Central Bank law, was not changed. Internationally, the central bank’s formal and real independence from other authorities and the need for economic competence in the decision-making bodies have been stressed as important success criteria for an inflation target regime.

The current practice of monetary policy in Norway fulfils most of the criteria of a “best practice” inflation targeting bank. However, one should be aware that the Central Bank law was written with a fixed exchange rate regime in mind.

Three issues are discussed in more detail: the right of instruction included in the law, the composition of the decision making Executive Board, and the desirability of publishing the minutes of Board meetings. Neither of these implies an immediate threat to the credibility of the current regime. However, to assure the long-term stability of an inflation target institutional changes need to be made. As a first step, the report suggests certain adjustments in appointing members to the Executive Board. Today, candidates are nominated by political parties. In the future, it is important that candidates to the Board have the qualifications to make the Board a

demanding reference body for the Bank's administration. A well-qualified and representative Board can assure that the public remains confident in the Bank's analysis.

The Norwegian inflation target at 2.5 per cent is relatively high. As a comparison the inflation target in Euroland is currently 2 per cent (as a maximum), and the inflation target in Sweden is 2 per cent. However, according to the monetary policy regulation the nominal exchange rate is still expected to be stable. The expected increase in domestic spending of oil revenues will most likely lead to a need for a real appreciation of the Norwegian krone in order to reduce the production, employment and profitability in the sectors exposed to foreign competition. Norges Bank Watch believes that Norges Bank's assessment of the need for real appreciation would be of great interest. This assessment should include answering the question whether the current ½ per cent "automatic" real appreciation is appropriate given alternatives for fiscal policy.

#### **Has the bank been successful in conducting its monetary policy?**

A central bank's monetary policy within an inflation targeting regime can be evaluated by formulating three questions. First, have the analysis of the economic development and inflation forecasts been reasonable, given the information available when the forecasts were made? Second, has the bank set its interest rates in accordance to the analysis? And third, has the bank reached its inflation targets?

Even if the formal inflation target was not implemented before March 2001, the bank's interpretation of its mandate from early 1999 as an inflation target regime gives us the ability to evaluate Norges Bank according to these three questions.

Norwegian interest rates have been very high compared to interest rates in most other countries. However, during this period the Norwegian economy has operated close to, and in some periods above, its long term production potential due to a high level of domestic demand. At the same time, the level of activity has stayed below potential output in parts of Euroland. According to Norges Bank's assessment there has been no room for lower rates without increasing the risk for inflation. By and large, other observers of the Norwegian economy have shared this analysis, and Norges Bank Watch agrees. However, there is currently a substantial uncertainty tied to the international economic outlook. An international downturn should also affect Norway. We therefore do not believe that Norges Bank will allow the interest differential to increase much more. Nevertheless, a still tight labour market, and the outlook for a more expansionary fiscal policy should imply

that short-term Norwegian interest rates will remain above other European rates for a long time.

If domestic demand is boosted by increased spending of oil revenues there are arguments in favour of expecting Norwegian real interest rates to remain higher than abroad on a permanent basis. A tight monetary policy is a necessary ingredient in the structural transformation process. High interest rates dampen interest sensitive domestic demand. However, in such a scenario the exchange rate appreciation might come quite rapidly. If so, inflation pressure will be dampened.

In the recent months we have seen an increasing interest rate differential for long-term government bonds. This might reflect uncertainty about future Norwegian inflation. However, we find that there are several alternative (and in our view more credible) explanations; including the cost of hedging in the Norwegian market, and higher expected real interest rates in Norway.

### **Communication**

The report concludes that Norges Bank has a firm and credible commitment to fulfilling the inflation target. The Bank enjoys a good communication with both the public and the financial markets. The Inflation Report, currently published three times a year, is a clear and well-written exposition of the Banks expectations and judgements and Norges Bank has demonstrated the ability to clarify its policy through articles and speech

## 2. Flexible inflation targeting

### 2.1 Flexible inflation targeting: the emerging new consensus

A new consensus has emerged about the optimal design of monetary policy. This new consensus can be summarised in four points (see box 1 for more detail).

- **The primary objective of the central bank is to maintain price stability.** The central bank should not aim at permanently increasing economic growth or reducing unemployment. Such ambitions cannot be realised by the central bank. Instead if pursued, they will lead to accelerating inflation. Conversely by maintaining price stability the central bank does the best it can to maximise long run economic growth. The underlying reason is that economic growth (and employment) in the long run depends solely on real factors.
- **The objective of price stability applies to the medium run** (say over a period of 2 years). Thus when inflation exceeds the target, the central bank should be allowed to bring inflation back to target in a *gradual* manner. Such a gradual adjustment adds *flexibility* to inflation targeting giving room for the central bank to stabilise output. It has been shown by Svensson (1997) that flexible inflation targeting is broadly speaking the same as explicit output stabilisation.
- **With flexible inflation targeting there is no need for the central bank to pursue active stabilisation of output per se.** Stabilising the rate of inflation around its target in a gradual manner has the happy effect of also stabilising output around its capacity level (see Alesina, et al. (2001) for a recent statement of this view). We note that the term gradual is important in this respect.
- **In a regime of flexible inflation targeting, the central bank should react to shocks** (e.g. shocks in output, shocks in the exchange rate, etc.) **only to the extent these shocks affect the rate of inflation.**

The new consensus about how monetary policies should be conducted goes further than the four points mentioned here. It extends to the political and institutional environment in which the central bank should operate. In this new consensus flexible inflation targeting can only be successful in the long run if three institutional conditions are met:

1. **The central bank should operate in an environment of political independence.** Independence has two dimensions, *instrument* independence and *goal* independence. There is a general consensus that

instrument independence is a necessary condition for a successful inflation targeting. It can be said to belong to best practice inflation targeting. That is, a central bank must be able to set its instrument for conducting its policies independently from political interference. There is less consensus about goal independence.

2. **The policy regime should be transparent.** The publication of the inflation report is one element in this transparency. Transparency can be enhanced by the publication of the minutes of the meetings of the body that decides about the interest rate. It is still a matter of controversy whether or not such a publication improves the quality of policy making.
3. **Inflation targeting necessitates a framework allowing central banks to be made *accountable* for their policies.** The way the accountability is organised differs from one country to the other. It consists of two elements. The first one is to require that the President (Governor) of the central bank explains policies and possibly failures in these policies to the parliament or to the government. The second component consists in a sanctioning procedure when the Central Bank consistently fails to achieve the target for inflation. Few countries have an explicit sanctioning procedure.

There is an interaction between flexible inflation targeting and political independence. Flexible inflation targeting is a simple policy rule that allows for an easy implementation. The ease of implementation has the effect that society has to worry less that the independence granted to the central bank will be misused. The simple rule makes it possible to control the performance of the central bank, and thus to make it accountable.

Flexible inflation targeting is on its way to becoming the new conventional wisdom in monetary policy-making, not the least because it has turned out to be quite successful in many countries.<sup>1</sup> Can we consider this to be a new and permanent improvement in the way monetary policy is conducted, or is flexible inflation targeting a passing fad, much like money stock targeting has been? We analyse this issue in the next sections. In order to do so we first study the central claim made by the proponents of flexible inflation targeting, i.e. that this strategy if properly applied keeps inflation low and contributes to output stabilisation.

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<sup>1</sup> For recent empirical evidence, see Mishkin and Schmidt-Hebbel (2001).

## Box 1- More on inflation targeting

### Best practice inflation targeting

A new monetary policy regime has emerged that is slowly making its way as the new model for the conduct of monetary policy. This model has been called “flexible inflation targeting”. It has emerged as the result of new theoretical insights together with practical experimentation by an increasing number of central banks. We analyse the main ingredients of this model stressing those features that can be called “best practice”.

The central feature of flexible inflation targeting can be described as follows (figure B.1 for a concise representation).

**1.** *The primary objective of the central bank is the maintenance of price stability.* This leads to the formulation of a numerical target. There is a consensus that the numerical value of this target should be between 2 and 3 per cent. The best practice view is that there should be some symmetric error band around this numerical target, say 1per cent. This is what most central banks that apply inflation targeting do. Thus Norges Bank has set a target of 2.5 per cent with an error of + and - 1per cent. A major exception to this approach is the ECB, which has defined the target as a maximum inflation rate (2 per cent). The latter approach has been criticised for its asymmetric nature (see Svensson(1998)).

**2.** *It is desirable that the inflation targeting procedure should not react to movements in the price index that are temporary or the result of special factors.* Therefore, many central banks use a concept of core inflation.

**3.** *The central bank makes a forecast of the future inflation over the medium run, typically 2 years.* This forecast is based on a model of the economy and is made public. This usually takes the form of the publication of an inflation report, typically issued three or four times a year. The inflation report contains an analysis of the forces that determine future inflation. In addition, it presents the forecast of inflation together with an estimate of a confidence band. The latter allows the public to evaluate the uncertainty surrounding this forecast. In a way, it can be said that the inflation forecast plays the same role of the intermediate target in a money stock targeting strategy.

**4.** *The instrument used by the central bank is the short-term interest rate.* The procedure to adjust the interest rate starts from a comparison of the inflation forecast with the inflation target. When the inflation forecast exceeds the target the central bank raises the interest rate; when it is below the target the central bank is supposed to lower the interest rate. *cont.*

5. A distinction has been made between strict and flexible inflation targeting. In the former the central bank has only one objective, i.e. inflation. In the latter the central bank also gives some weight to other objectives, typically the output gap or some measure of unemployment. It has been shown by Svensson(1997) that a strategy consisting in only targeting inflation but allowing for a gradual adjustment of the observed inflation towards its target is equivalent to a strategy in which the central bank explicitly targets the output gap. There is a growing consensus that such a flexible inflation targeting procedure constitutes best practice (see Alesina et al. (2001). Most central banks have not been very explicit about the length of time allowed for the gradual adjustment. There is some consensus that this can be anything between one and two years.

Figure B.1

Instrument	information used (intermediate target)	objective (numerical target)
short-term interest rate	inflation forecast	inflation

6. Inflation targeting as described in the previous section can only be successful in an institutional environment of **political independence** of the central bank. Independence has two dimensions, *instrument* independence and *goal* independence. There is a general consensus that instrument independence is a necessary condition for a successful inflation targeting. It can be said to belong to best practice inflation targeting. That is, a central bank must be able to set its instrument for conducting its policies independently from political interference. The practical implication of this instrument independence is that the minister of finance (or other representatives of the government) has no say in the decisions to change the interest rate. There is less consensus about goal independence. In some countries the government sets the numerical objective for inflation (the UK), so that the central bank has no goal independence. In other countries the numerical objective for inflation is decided by the central bank itself (Euroland). There is no consensus about which of the two regimes for setting the numerical objective is to be preferred. *cont.*



*7. The success of inflation targeting also depends on the degree of transparency of the policy regime.* The publication of the inflation report is one element in this transparency. Transparency can be enhanced by the publication of the minutes of the meetings of the body that decides about the interest rate. It is still a matter of controversy whether or not such a publication improves the quality of policy making, so that it would be premature to label such a publication best practice.

*8. Inflation targeting requires independent central banks.* It also necessitates a framework allowing central banks to be made *accountable* for their policies. The way the accountability is organised differs from one country to the other. It consists of two elements. The first one is to require that the President (Governor) of the central bank appears before the parliament (ECB) to explain policies and possibly failures in these policies. In some countries the explaining is done differently in the form of a communication with the government (Bank of England). The second component consists in a sanctioning procedure when the Central Bank consistently fails to achieve the target for inflation. The Bank of New Zealand has gone the farthest in this, by making it possible to sack the President of the Bank. Most of the other countries do not have an explicit sanctioning procedure.

## **2.2 Flexible inflation targeting: The theory**

The central claim made by the theory of flexible inflation targeting is that this policy regime makes it possible for the central bank not only to stabilise the price level, but also to do the best possible job in stabilising output around its capacity (“natural”) level. The claim that flexible inflation targeting also stabilises output is quite obvious when shocks originate from the demand side. This is illustrated in figure 2.1, which represents the aggregate demand and supply curves in the inflation-output space<sup>3</sup>. It is assumed that there are positive and negative shocks in aggregate demand. This represented by the  $AD_U$  and  $AD_L$  curves. Capacity output (the “natural” output level),  $y^*$ , is represented by a vertical line. The central bank cannot and does not try to influence this “natural” output level, which is determined

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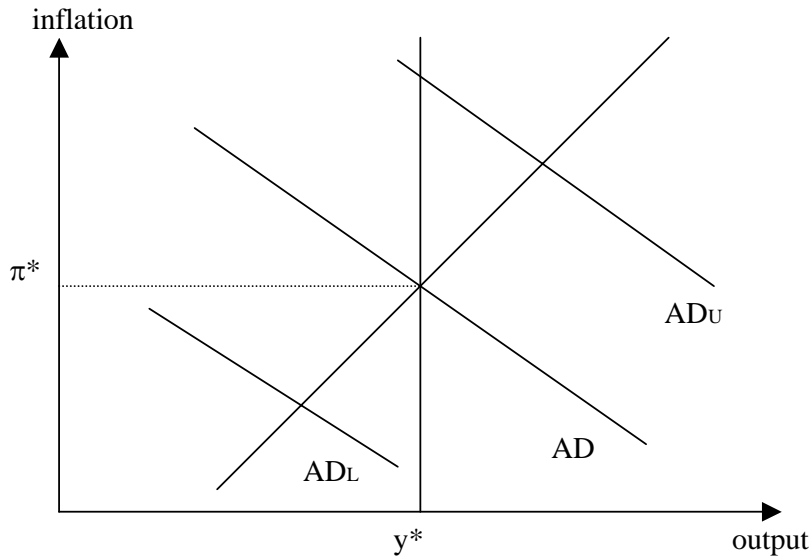
<sup>2</sup> For recent empirical evidence, see Mishkin and Schmidt-Hebbel (2001).

<sup>3</sup> The analysis can also be done in the price-output space with essentially the same results.

by productivity growth, labour supply and the size of the real capital stock (i.e.  $y^*$  is influenced by structural policies, but not by monetary policy).<sup>4</sup>

-Flexible inflation targeting now implies that the central bank sets a target inflation rate,  $\pi^*$ . In a boom ( $AD_U$ ) the central bank raises the interest rate so as to lower the AD curve. In a recession it does the opposite. Because prices are sticky the central bank allows for a gradual adjustment of inflation and output. It can immediately be seen that this strategy of stabilising inflation around  $\pi^*$  also stabilises output around  $y^*$ . In other words when the central bank follows a flexible inflation targeting strategy there is no need to explicitly target the output gap. This is good news because output gap statistics tend to be very unreliable (see Orphanides(2000)).

Figure 2.1: Flexible inflation targeting and demand shocks



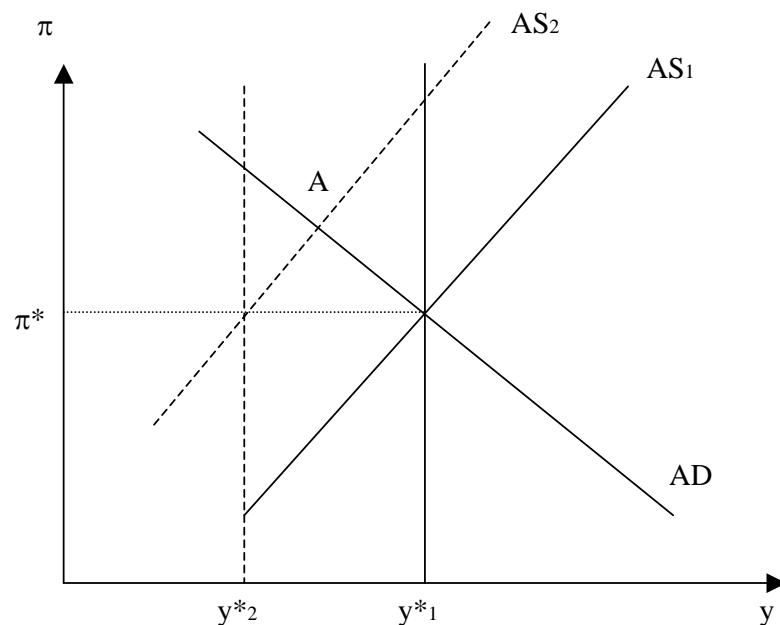
Does this analysis also carry over to supply shocks? The answer is positive. We show this in figure 2.2. We assume that, due to a wage cost increase or an increase in energy prices, the supply curve shifts upwards from  $AS_1$  to  $AS_2$ . We assume this to be a permanent shock so that capacity output is also lowered, from  $y^*_1$  to  $y^*_2$ . After this supply shock, the short-term equilibrium

<sup>4</sup> As is well-known there is a large literature based on the Barro-Gordon model analysing time inconsistency problems that arise when central banks attempt to increase the natural output level (reduce the natural unemployment rate).

position is in point A. Output exceeds capacity output (the output gap is positive) and inflationary pressure is generated. Because it targets inflation (at the level given by  $\pi^*$ ) the central bank reacts in the correct way, i.e. it raises the interest rate so as to gradually bring aggregate demand to the level consistent with a reduced level of capacity output. Put differently, inflation targeting is equivalent to stabilising output around its new “natural” level.

We conclude that in the case of a permanent supply shock, focusing on the inflation rate is the correct policy. There is no trade-off for the central bank between stabilising output and stabilising inflation in the intermediate and long run. At least for a central bank that takes the view that it can do nothing to change the natural level of output (or the natural unemployment rate).

Figure 2.2: Flexible inflation targeting and supply shocks



A distinction should be made between permanent supply shocks (analysed in figure 2) and temporary supply shocks. The latter only involve shifts in the short-term aggregate supply curve. According to the proponents of inflation targeting the correct response of the central bank is to formulate its targeting strategy in terms of “core inflation” – as in the Norwegian case but not in the case of the ECB. This allows disregarding the effects of temporary supply shocks on inflation. The issue that remains here is whether the central bank

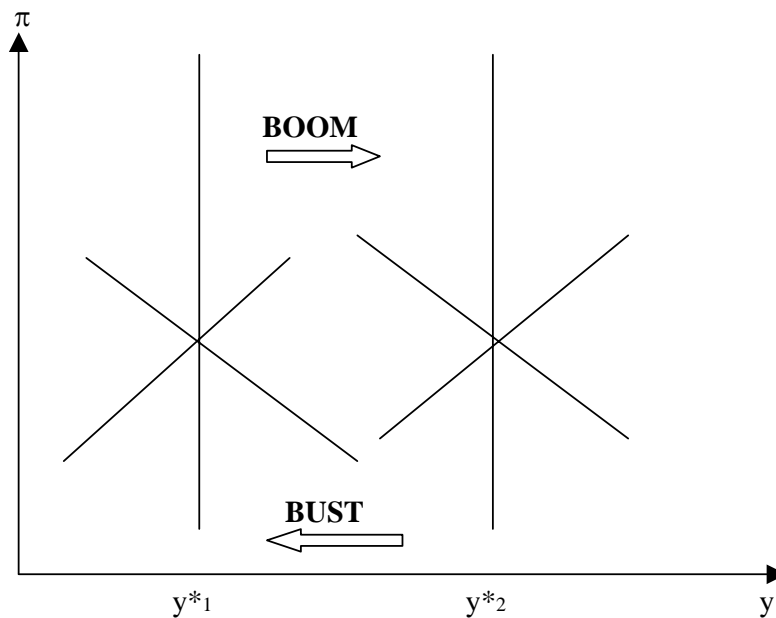
is always able to distinguish between permanent and temporary supply shocks. In practice this may sometimes be difficult. As a result, inflation targeting will not prevent central banks from making major policy errors.

### 2.3. Flexible inflation targeting: Some challenges to the consensus view

The model underlying the emerging consensus in favour of flexible inflation targeting is simple and quite attractive. It has also become the standard macro-economic model used in classrooms and has gained a wide acceptability (see Clarida, Gali and Gertler (1999) for its use by neo-Keynesian economists). Its main feature is that demand and supply decisions are only influenced by present and expected goods prices and wages. This may be a serious shortcoming. In this section we show that if demand and supply decisions also depend on assets and on their valuation, volatility in output can be generated that does not show up in volatility of inflation, so that the close link between inflation variability and output gap variability breaks down.

In order to analyse this problem we develop a scenario of boom and bust generated by movements in asset prices. We show the analysis in figure 2.3.

Figure 2.3: Inflation targeting in boom-and-bust scenario



Suppose a bubble arises in the stock market (or alternatively in the real estate market). This could be due to a perception that new technologies will lead to higher growth in the future (Japan in the 1980s, the US in the 1990s), but it can also be due to other factors (e.g. Scandinavian countries during the second half of the 1980s). As a result of these positive expectations about future growth, consumers have an incentive to spend more. The only way they can do this is by increasing their debt position. Similarly firms, gripped by the same “animal spirits”, evaluate the future optimistically. This has the effect of raising the present value of future expected rates of return on investment. As a result, investment activity increases, which raises capacity output.

The effect of all this is to create a boom characterised by increases in aggregate demand and supply. We show this in figure 3. Thus, during the boom phase, the output gap is unaffected, and there are no inflationary pressures<sup>5</sup>. The central bank, which follows an inflation targeting strategy, does not react. It has no reason to do so because its inflation forecasting exercise tells it that because of the simultaneous increase in demand and supply (productivity and/or excess capital formation) no inflation is to be expected in the future.

After the boom comes the bust. The latter is typically produced by excessive debt accumulation of both consumers and firms. Debt deflation is set in motion and this results in a decline of aggregate demand. At the same time, however, producers find themselves with excess capacity, which leads them to disinvest. Capacity output declines.

Like in the boom phase, during the bust phase the output gap is unaffected, and so is inflation. As a result, the inflation targeting central bank does not intervene. Yet there will be great volatility of output. We conclude that the one-to-one correspondence between inflation variability and output variability breaks down in a world where demand and supply decisions are influenced by assets and asset prices.

Another way to formulate the problem is as follows. Demand and supply decisions are influenced not only by flow variables (goods prices and wages) but also by assets and their valuation. Both the wealth of the consumers and the present value of the investment projects depend on the expectations of future rates of return of capital. This leads to the possibility of self-fulfilling

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<sup>5</sup> This should not be interpreted literally. The point is that an asset driven boom raises demand and supply, so that its effect on inflation is of second order.

expectations. When agents are optimistic about the future they will forecast large rates of return. As a result, the value of assets increase, i.e. wealth of consumers increase because the stock prices reflecting these positive expectations increase. Similarly investors will calculate higher present values of the investment projects, so that the value of the firm increases. This then raises today's demand for consumption, and it stimulates investment activity. The latter increases potential output. Thus demand and supply increase with little effect on inflation.

It also follows that when the central bank targets the rate of inflation, this is consistent with infinitely many paths for output of goods and services. Inflation targeting is insufficient to tie down a unique output path. The output paths will be determined by the path taken by asset values, which in turn are determined by expectations. In order to determine a unique output path the central bank must also tie down asset values. How can this be done? We analyse this question in the next section where we suggest that the Central Bank should present an explicit strategy for how it intends to deal with asset price inflation.

## 2.5. A two-stage strategy for the central bank

Because of cycles in asset valuations (notably in real estate prices in the Norwegian case), cycles in output are generated that do not lead to changes in inflation. Therefore, a central bank that gives some weight to output stabilisation cannot be content of just following a flexible inflation targeting strategy, which only reacts to those shocks that affect current and future inflation. It must also have an eye on other variables *even if these variables do not affect current and future inflation*. What are these variables?

In order to answer this question it is important to realise that consumers and investors who react to increasing asset values can only increase their spending by borrowing, domestically or abroad. Thus the natural asset variable to be monitored by the central bank is total credit to the private sector. This leads to the formulation of a "two-stage" strategy. This strategy can be described as follows:

- The ***first and main stage*** is flexible inflation targeting which has been described earlier, and which is now used by an increasing number of central banks. It must remain in place. It is the pillar that has to be used in normal times.
- The ***additional stage*** consists in monitoring credit aggregates. It requires the central bank to monitor a number of credit aggregates, and to

intervene and possibly to overrule the signals given by the first stage. One would expect that this would not happen frequently. In normal times it will remain unused. At the same time one can say with certainty (and with reference to the experience from the U.S. lately) that central banks will at some point in the future be confronted with the need to use the second stage. Note that the money stock can also have a useful role in this context.

Several readers will note that the ECB has formulated a two-pillar strategy with similarities to our two-stage strategy. Ours, however, is quite different in nature. In contrast to the ECB strategy, ours gives a privileged role to inflation targeting (first stage) and complements it with a second stage that aims at checking unsustainable developments in the value of financial stocks (credit aggregates, money stock).

Several points should be stressed about this strategy. First, in addition to credit aggregates, useful information for the implementation of the second stage can be obtained from asset prices (e.g. real estate prices and stock prices). This has been recommended by a number of influential economists recently (see Goodhart(2000), Checchetti, et al. (2000)). Second, the practical implementation of the two-stages must be quite different. Inflation targeting can be implemented in a very precise way, i.e. by specifying a precise numerical target and by monitoring how close inflation has stayed to this target. No such precision is possible when monitoring assets and asset prices. More judgement is necessary. This lack of precision is due to our lack of knowledge of how asset inflation is transmitted to the real economy. It is also hard, ex-ante, to assess whether given asset price levels are sustainable or not. The lack of precision also calls for using “leaning against the wind” rules when monitoring assets and asset prices, rather than targeting particular numbers.

We conclude that central banks will have to use a two-stage strategy, i.e. a strategy consisting of flexible inflation targeting complemented by a strategy aimed at tying down asset values. Failure to do so, will sooner or later confront the central banks with the problem of large disturbances in output that they did not see arriving on their “inflation targeting radar screens”.





### **3. Norges Bank and the conduct of monetary policy in Norway**

When the regulation of monetary policy was changed earlier this year the institutional framework of Norges Bank was not adjusted. We will give a short description of how the Norwegian system works, and then discuss whether this system needs to be attuned in light of the recent changes in monetary policy.

#### **3.1 The institutional framework of Norges Bank**

The law governing central banking in Norway was issued in 1985. Section 2 describes the relationship between the bank and the government.

- “The Bank shall conduct its operations in accordance with the economic policy guidelines drawn up by the government authorities and with the country's international commitments.
- Before the Bank makes any decision of special importance, the matter shall be submitted to the ministry.
- The Council of State may adopt resolutions regarding the operations of the Bank. Such resolutions may take the form of general rules or instructions in individual cases. The Bank shall be given the opportunity to state its opinion before such resolutions are passed. The Storting shall be notified of resolutions as soon as possible. [...]”<sup>6</sup>

The obligation for the Bank to “conduct its operations in accordance with the economic policy guidelines drawn up by the government authorities” is in line with the rules governing e.g. Sveriges Riksbank. In countries with an inflation targeting regime the economic policy guidelines for the bank is a statement about a specific inflation target. We will return to the Norwegian economic policy guidelines below.

The obligation to inform the government of important matters in advance is standard in inflation targeting regimes. The right of instruction can however be seen as a Norwegian “anomaly” when compared with current “best practice”.

The right of instruction must be understood in terms of the fixed exchange rate regime at the time the Central Bank law was written, and a Norwegian

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<sup>6</sup> All translations are from Norges Bank.

tradition of a close contact between the Ministry of Finance and Norges Bank imposed by central bank governors after the Second World War.<sup>7</sup> It is important to notice that the right of instruction comes with two checks: the Storting must be informed as soon as possible, and Norges Bank is obliged to state its opinion on the matter.<sup>8</sup> These checks are imposed to guarantee a public discussion if the right to instruct is used. There has been an argument of how this law was supposed to be applied (see Carsten Smith, 1994, for a discussion). However, the understanding today seems to be that if the Government instructs Norges Bank to act in opposition to the best judgement of the Bank, the Governor of Norges Bank will leave office. It is therefore reasonable to see the right of instruction as nothing more than a formal statement of the government's final say in all economic policy questions. The right of instruction has never been formally used.<sup>9</sup>

Section 5 –7 discusses the organisation of the bank. Section 5:

- “Supreme authority in the Bank is vested in an executive board and a supervisory council.
- Under this Act, executive and advisory authority is vested in the Executive Board. The Board is in charge of the Bank's operations and manages its funds.
- The Supervisory Council ensures that the rules governing the operations of the Bank are observed. [...]

Section 6:

- “The Executive Board consists of seven members, appointed by the government (formally the King) . The Governor and Deputy Governor shall be the chairman and deputy chairman of the Executive Board. They are appointed to full-time positions for terms of six years. Reappointment to the same position may take place for one period of a

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<sup>7</sup> This was partly a response to the “back to gold parity” policy followed by a very independent central bank policy in 1920's and 30's.

<sup>8</sup> Norges Bank's obligations are made clear in section 3:

- “The Bank shall state its opinion on matters that are put before it by the Government or the ministry.
- The Bank shall inform the ministry when, in the opinion of the Bank, there is a need for measures to be taken by others than the Bank in the field of monetary, credit or foreign exchange policy.
- The Bank shall inform the public about the monetary, credit and foreign exchange situation.”

<sup>9</sup> Christiansen (2001) argues that the change from an exchange rate target to an inflation target was an instruction of Norges Bank. It is however more natural to see this as a change in the economic policy guidelines of the government than as an instruction.

further six years. The other five members are appointed for four-year terms. Every other year, two - alternately three - members retire. These members may be re-appointed for a total period of twelve years. [...]"

Section 7:

- "The Supervisory Council: The Supervisory Council consists of fifteen members elected by the Storting for four-year terms. Every other year, seven - alternately eight - members retire. From the members the Storting elects the chairman and deputy chairman for terms of two years. By re-election, members may serve for a total period of twelve years. [...]"

Like Norges Bank, Sveriges Riksbank has a Supervisory Council and an Executive Board. The Supervisory Council is as in Norway elected by Parliament. However in Sweden it is the Supervisory Council that names the Executive Board. In Norway the government names the Executive Board of Norges Bank. The political parties represented in the Storting nominate candidates for the Executive Board. The Government has only on rare occasions opposed these nominations.

The law states the following about the official reports from Norges Bank to the government (section 28):

- "The Executive Board shall each year prepare an annual report and accounts for the year. [...]"
- The annual report and the audited annual accounts, as well as the statement of the Supervisory Council on the minutes of meetings of the Executive Board, are sent to the ministry for submission to the government and communication to the Storting. A communication from the ministry to the Storting concerning activities in Norges Bank shall be made at least once during each Storting session, and more frequently if special circumstances dictate. [...]"

Norges Bank is supposed to file a yearly statement. In Sweden the Board is expected to present reports on monetary policy twice a year. Like e.g. Bank of England Norges Bank is responsible to report to the government, not to Parliament. However, the reports shall be made available to the Storting. The Storting shall also receive a report from the government on the work of the Bank. The government's duty to inform the Storting is not limited to the yearly statements if special circumstances occur.

According to section 6 the Executive Board is obliged to keep minutes from their meetings. These are at the time being not made available to the public.

It has been seen as standard practice to publish board minutes in a number of inflation targeting regimes, including the UK and Sweden.

### **3.2 The monetary policy guidelines**

The Norwegian government 29 March 2001 adopted a new regulation of monetary policy. Section 1 reads:

- “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.”

In addition the Storting Report no. 29 of 2001 states:

- “Consumer price inflation is expected to remain within an interval of +/- 1 percentage point around the target.”

Through a number of speeches and articles the Norges Bank Governor, Svein Gjedrem, has made clear how Norges Bank will implement this new regulation. These comments should give a fairly good insight in how Norges Bank will proceed when conducting monetary policy.<sup>10</sup>

- “If evidence suggests that inflation with unchanged interest rates will be higher than 2.5 per cent, the interest rates will be increased. If it appears that inflation with unchanged interest rates will be lower than 2.5 per cent, the interest rates will be reduced. There is symmetry here.”
- “Our analyses indicate that a substantial share of the effects of an interest rate change occurs within two years. Two years is thus a reasonable time horizon for achieving the inflation target of 2.5 per cent. This means that interest rates are set with a view to achieving an inflation rate of 2.5 per cent two years ahead.”

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<sup>10</sup> All citations from Aftenposten, 29 May, 2001, except number 5 that is from Dagens Næringsliv, 6 July, 2001.

- “In some situations where unexpected events lead to an inflation that is too high, it may be appropriate to apply a longer time horizon than two years. For example, reducing inflation to 2.5 per cent within this time horizon may be associated with unnecessary real economic costs. A precondition for applying a longer time horizon is that there is clear evidence of strong confidence in low and stable inflation over time on part of the economic agents.”
- “Developments in financial and property markets can be a source of a more unstable inflation environment. In principle, it would be appropriate to use the interest rate to counter this. In practice, however, it is difficult to assess whether property and financial asset prices are sustainable.”
- “[...] Norges Bank will normally proceed with caution in connection with any interest changes in response to fluctuations in the exchange rate. A special situation arises if strong turbulence in the foreign exchange market indicates that confidence in monetary policy is in jeopardy. A rapid and pronounced change in the interest rate may then be appropriate.”
- “When Norges Bank concludes that a change in the key rate is appropriate, the change will in most cases be made gradually.”
- “Norges Bank analyses the inflation prospects in its *Inflation Report*, which is published three times a year.”
- “The Government has assigned a task to Norges Bank. Norges Bank uses its professional judgement in a delimited area. The results of our decisions can be measured. Hence the government authorities can evaluate our performance.”

It should be noticed that the regulation of monetary policy in Norway probably puts more weight on the medium and long-term stability of the nominal exchange rate than what is usual in most inflation targeting regimes. One can also point out that the Norwegian inflation target of 2.5 per cent is slightly higher than in Canada, New Zealand, Sweden and the Euro area. It is however in line with the target in the United Kingdom and Australia.

### **3.3 The Norwegian system compared with best practice**

There are three important differences between the Norwegian system and the “best practice” described in section 2.

1. The Norwegian government has an explicit right to instruct Norges Bank. This might reduce the accountability of the Bank.

2. Political parties nominate candidates to the Executive Board of Norges Bank. This can affect the political independence of the Bank.
3. There is a special focus on nominal exchange rates in the economic policy statements made by the government. Further the Norwegian inflation target is somewhat higher than in many other inflation targeting regimes.

Do these “anomalies” have potentially negative effects for the stability and effectiveness of the Norwegian inflation-targeting regime? Do they come with a real economic cost?

### **The right to instruct the bank**

As pointed out above the standard interpretation of this clause is that it is only to be used in the most extreme situations. One can argue that a legal opportunity to instruct the central bank makes the central bank more vulnerable for meddling than a regime where the independence of the central bank can only be threatened by changing the law. However, in practice no country would allow a central bank to act in opposition to the government over time, so some right of instruction will always exist.

The current text might be interpreted as a division of responsibility for monetary policy between Norges Bank and the Government. The Government can not look back and criticise the stance of Norges Bank as wrong, since the Government, if it actually believed Norges Bank to be wrong, should have instructed the Bank to change course. A strength of the system is that the Government must commit to stand behind how monetary policy is conducted. But there are also problems. On one hand it might be easier for the Government to influence the positions of the Bank through informal channels using the right of instruction as “a threat”. On the other hand the Government might lose some of its force when evaluating the conduct of Norges Bank ex post. The right of instruction can become a liability for the government if it is supposed to hold Norges Bank accountable for monetary policy.

There exist rights of instruction in other inflation targeting regimes. UK legislation provides that if, in extreme circumstances, the national interest demands it, the Government will have the power to give instructions to the Bank on interest rates for a limited period. The right can be exercised only through subordinate legislation approved by Parliament. However, the Norwegian right of instruction is more general. It might seem especially strange to keep the right to instruct the Executive Board in specific cases if the process of choosing members to the Board is changed, as we suggest below. That would imply that the Government does not trust its own experts.

However, given the present non-use of this clause, a change would probably not make much of a difference for the actual independence of the Bank.

### **The Executive Board**

In an inflation targeting regime the interest rate should be based on a sound understanding of how to reach the long-term goals of the central bank. Interest rate decisions must therefore be based on two important criteria:

- competence in understanding the long-term impact of central bank instrument, and
- independence from influence that is not in accordance with the goals of the bank.

Most inflation targeting regimes have chosen a system where the interest rate decisions are taken by a board to secure a broad discussion of monetary policy before instrument use is decided.

Two questions need to be discussed:

- Should the board consist of experts or non-experts?
- How should the board be appointed?

An argument used by Svensson (2001) is that experts could easily dominate non-experts. A consequence could be that a board consisting of non-experts would not be sufficiently able to question the central bank's professional assessments. On the other hand we might imagine that a board consisting only of experts could be too focused on "mainstream economic theory" to understand the real economic consequences of their actions.

Another argument for a board of experts is central bank independence. Politicians will appoint every board. But members of a board of experts will be appointed as experts, and will be held responsible if they do not act as such. If a board consists of people with mainly political experience, such members might be criticised if they do not follow a political line in their voting on the board. Both Sweden and the United Kingdom have only experts at their Executive Boards.

In Norges Bank the five members of the Board who are not part of the Bank's leadership are in all but name the appointees of political parties. It is, at the present time, difficult to give a fair assessment of how the current system of nominations will work under the new monetary regime. Until the end of 1998 Norwegian monetary policy was concentrated on stabilising the nominal exchange rate. Under that regime the Board had little influence on actual monetary policy. This might have affected the choice of candidates to the Board. A reasonable assumption is that the political parties in the future

will pick their candidates with care so as to provide a strong and able Executive Board of Norges Bank. However, unlike a government or a parliament a political party has a narrow scope. This might create uncertainty around some nominees. It is also possible that political appointments might be the target of political pressure if minutes from board meetings are published.

The current system seems to have given the Governor a strong position at Board meetings. It is the Bank's Governor, not the Board, who is held accountable for monetary policy to the public. However, it is difficult to believe that any board would suggest a monetary policy that is not in line with the Inflation Reports of the Bank. Even a board consisting of only highly skilled economists would not have the resources to effectively present an alternative analysis to that of the Economics Department in the Bank. But it is important that the Board is able to ask critical questions to the analysis made by the Bank. Over time an effective board would be a board that forced the staff of Norges Bank to continuously make fresh reflections on how the economy works and how monetary instruments should be applied. It is also important that the questions asked reflect the real concerns among the Norwegian population. A well-qualified and representative Board can assure that the public remains confident in the Bank's analysis.

We believe that the current practice of appointing members to the Executive Board is sub-optimal. If political parties in everything but name appoint candidates to the Board this can increase the risk of factors other than competence being important when electing Board members.

Should this imply that the government instead names a Board consisting of only trained economists? People with the right experience do not need a degree in economics to have informed opinions about monetary policy. The only formal requirement should be that a Board member has the skills necessary to understand the work of Norges Bank. Effort should probably be made to assure that the Board does reflect a broad sample of backgrounds. Given the small number of academic economists in Norway and the close connection between academic circles and Norges Bank, we would argue that Board membership should not be limited to academic economists.

It might well be that political parties should continue to nominate candidates. It is however important that the parties take care to find persons who fulfil the above criteria. The parties should also nominate a number of qualified candidates, giving the government a real choice when choosing members to the Executive Board. We would like to add that if a Board were to be



appointed purely on the basis of skill it would be natural to publish the minutes from Board meetings.

### **3.4 The focus on nominal exchange rates and the inflation targets – is the economic policy guidelines consistent in the long term?**

In the new regulation of the Norwegian monetary policy, the two first sections read:

“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’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.

Does this imply a possible inconsistency in the Norwegian monetary regime? As we know, most of our trading partners have inflation targets below 2.5 per cent. The Norwegian regulation of monetary policy seems to imply an expectation of a real appreciation of the Norwegian exchange rate through prices instead of nominal exchange rate adjustments.

The planned increased domestic usage of oil revenues should be expected to cause a real appreciation of the exchange rate. Production resources need to be reallocated, as the demand for domestic services rise. This creates a demand for change in relative prices. Such a change can come either through a nominal exchange rate appreciation or a relative shift in the Norwegian price level compared with our main trading partners. Our main trading partner, Euroland, seems (in effect) to have an inflation target between 1.5 and 2 per cent. Sweden has an inflation target of 2 per cent. Given a stable exchange rate, the Norwegian inflation target has a ½ per cent (or somewhat above) implied real appreciation built into the mandate.

Norges Bank has stated that it will not allow high domestic inflation to facilitate the real appreciation of the Norwegian krone. It is possible that a real appreciation of a ½ per cent is exactly what is needed in order to

accommodate the increased spending of oil revenues. But there are considerable uncertainties here.

Domestic spending of oil revenues is a very important political topic. The bank's assessment of the impact of a more expansionary policy is vital, both for the fiscal authorities and for the market participants. The Bank should not be expected to publish precise exchange rate forecasts. However, the Bank should attempt to illustrate the combined impacts of changes in fiscal policy and interest rate responses given different exchange rate profiles. Such a clarification can help stabilise long-term expectations for the nominal exchange rate. That might reduce the short-term volatility in exchange rate.

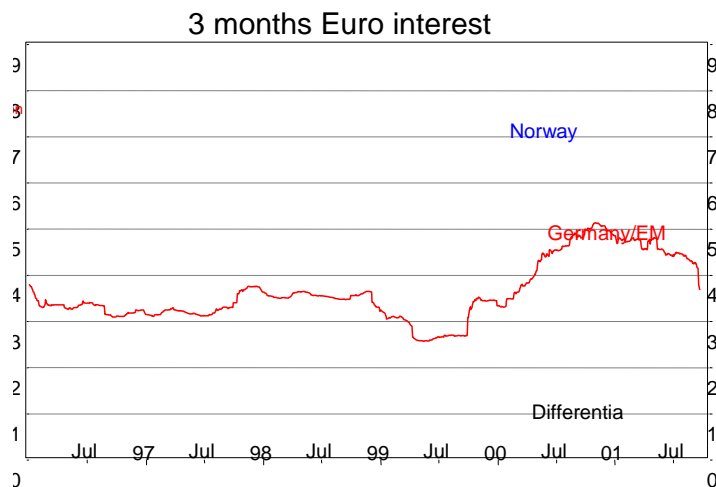
## 4. Can the high Norwegian interest rates be justified?

### 4.1 Norwegian nominal and real rates are higher than in Euroland

The most striking aspect of the Norwegian monetary policy in the past year is that interest rates have been far above interest rates in almost all other industrialised countries. We start the discussion on the monetary policy from this position.

In fact, Norwegian interest rates have remained far above Euroland level for a long period of time, see figure 4.1. The key sight deposit rate of the Norwegian Central Bank has been maintained at a high 7 per cent rate since September 2000, while ECB has cut its signal rate from 4.75 per cent to 3.75 per cent. Currently (September 21), the 3-month Nibor interest rate is 6.94 per cent, the 3-month Nibor interest rate is 6.94 per cent, while the yield on long term (10 years) government bonds is 6.4 per cent. This implies that the interest differentials versus Euroland amount to almost 3.5 percentage points for corresponding 3-month interest rates and 1.5 percentage points for 10 years government bonds, see figure 4.2 How can these high Norwegian interest rate levels and interest rate differentials versus Euroland be justified?

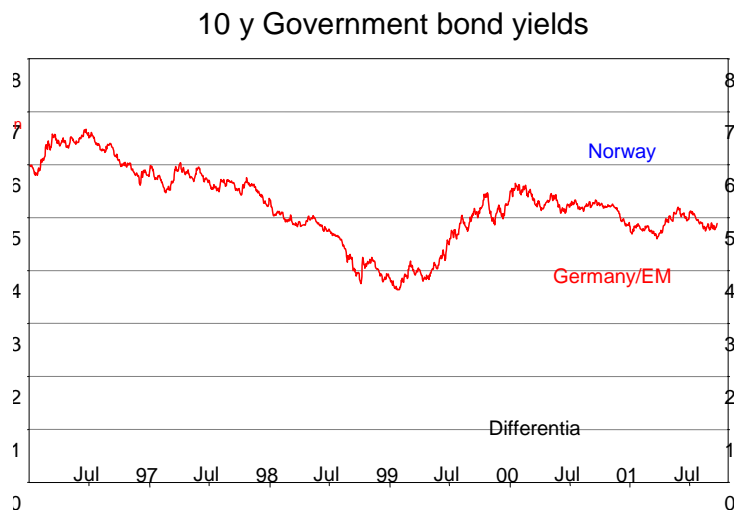
Figure 4.1



It is useful to adopt a rather broad perspective and consider this issue in the present chapter, before we turn to a more detailed discussion of the interest rate setting and communication of the Norwegian Central Bank in the next chapter. As a point of departure, we note that Norwegian core inflation is running at or somewhat below 2.5 per cent y/y rate for the moment. The corresponding headline rate is 2.7 per cent y/y. The equivalent annual inflation rates in Euroland are 2 per cent and 2.6 per cent respectively. Thus, inflation is not much higher than in Euroland. The difference between nominal rates are almost entirely due to difference in real interest rates.

According to projections in the latest inflation report of the Norwegian Central Bank, maintenance of the current level at 7 per cent of the key interest rates is consistent with 2.5 per cent annual inflation in 2003 – just as targeted.

Figure 4.2

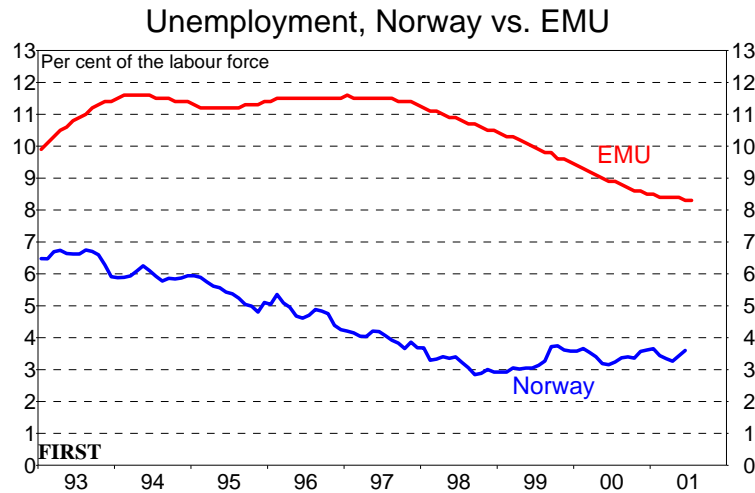


## 4.2 The short-run macroeconomic picture - Binding capacity constraints

The Norwegian economy is working very close to full capacity. This is most clearly illustrated by the developments in the labour market. The unemployment rate has been stable at levels between 2.5 and 3 per cent of the labour force according to figures from the public labour market office or

somewhat above 3 per cent measured by the Labour market survey (Arbeidskraftundersøkelsen, see figure 4.3).

Figure 4.3



Comparing with unemployment rates around 9 per cent in the largest Euroland economies, we conclude that such a huge difference must matter for differences in the underlying inflationary pressure. Hence, we believe that this accounts for stronger wage-costs impulses in Norway than in Euroland – even if we take into account that the NAIRU (The Non-Accelerating-Inflation-Rate-of-Unemployment) is much lower in Norway than in Euroland and that the highly co-ordinated wage-setting in Norway has (so far) been fairly successful in terms of avoiding excessive nominal wage increases.

The actual and potential strength of aggregate demand in the Norwegian economy is strong compared to many other OECD countries for the moment. This is mainly due to the financial position of the oil-rich Norwegian public sector. In Norway, the government collects in effect approximately 90 per cent of the net cash flow from the petroleum sector due to taxation and direct involvement in the sector. According to the petroleum fund strategy of the government, the income from the petroleum sector is allocated to a well-diversified portfolio of foreign financial assets. Currently, the petroleum fund amounts to more than 500 billions NOK, or approximately 45 per cent of mainland GDP, and the size of the fund is increasing fast. The petroleum

fund strategy is accompanied by a brand new explicit “spending rule”, which states that an estimated 4 per cent real return on the financial assets should be spent every year – on average.<sup>16</sup> This fairly conservative spending rule, which implies increasing consumption of petroleum-income over time, means that:

- Fiscal policy will give a constant demand-stimulation in many years to come. Moreover, it is not hard to imagine situations where the outcome of the political negotiations about the fiscal budget will lead to more fiscal stimulus than implied by the spending rule.
- The fiscal strategy is consistent with a real appreciation involving transfers of resources from sectors producing tradeables to sectors producing non-tradeables.

The potential strength of Norwegian private demand is also more impressive than in most other OECD economies even though recent figures on, for example, retail sales volume and car sales indicate that the high interest rate level curbs the spending level somewhat. We observe that the financial position of the total household sector is excellent, the household saving rate is at a fairly high 6.5 per cent level, workers are enjoying a very high degree of job market security, the wage growth has been satisfactory and the prospects for (minor) tax cuts seem good. Thus, it is very hard to imagine any significant downward adjustment of consumer demand in the short and intermediate run.

The overall short-run macroeconomic picture in Norway is characterised by strong domestic demand impulses and binding capacity constraints on the supply side. In addition to the very tight labour market, productivity growth has been very low in the last couple of years as well. The current fairly favourable inflationary picture reflects that fiscal discipline has been satisfactory, while the fairly high nominal interest rates contribute to keep private demand growth in check. Looking ahead, our assessment is that interest rates must remain significantly above the Euroland level in the next couple of years because

- i) the domestic demand pressure is likely to remain stronger in Norway than in Euroland and ii)
- ii) the capacity level on the supply side is not likely to improve much over such a horizon.

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<sup>16</sup> The government stresses that business cycle conditions may lead to temporary deviations from this strategy.

We can, however, imagine potential small downward adjustments of the key interest rates in response to for example weaker international impulses, but this does not alter our basic statement: The macroeconomic characteristics of the Norwegian mainland economy calls for a maintained high interest rate differential versus Euroland, at least as long as the Norwegian krone exchange rate does not appreciate substantially.

### **Supply side policies**

We will also argue that the binding capacity constraints should lead to an intensified focus on the supply-side of the economy. We note that the growth of the Norwegian mainland economy has been weak recently. According to the “Revised National Budget” for 2001 of The Ministry of Finance, the actual and estimated annual GDP growth rates of the mainland economy amount to respectively 1.0 per cent, 1.8 per cent, 1.5 per cent and 1.8 per cent in the years from 1999 to 2002. These figures reflect to a large extent low growth in labour supply and very modest productivity growth. While we recognise that productivity is volatile due to cyclical factors (among other things) and the period 1999-2002 is short, we will still highlight the need for structural policy measures (for example reforms of the tax-transfer system), which contribute to improvements in productivity and increases in labour supply. This will benefit growth in general and reduce the need for high interest rates in particular.

### **4.3 The long run interest rate differential – Is the inflation target credible?**

As mentioned in the introduction to this chapter, the interest rate differential between Norway and Euroland for 10 year government bonds amounts to 1.5 percentage point. The implied differential is lower at the half of the yield curve, but are still quite high at 0.75 – 1 percentage point. And nobody can claim that high bond yields are due to worries for the present or future financial position of the Kingdom of Norway.

The obvious explanation could be that the 2.5 per cent inflation target of the Norwegian Central Bank is not credible. However, the latest consensus forecast (from September) shows an average expected 2.0 per cent inflation rate in 2002 and recent model calculations from Statistics Norway show an inflation rate as low as 1.7 per cent in 2002 (and 2.3 per cent in 2003). It might therefore be worth considering other evidence that can account for at least parts of the differential.

Some technical explanations might be worth pointing out:

- The gap between the 2.5 per cent inflation target in Norway and the 2 per cent target or rather inflation ceiling of the European Central Bank may account for approximately 0.5 percentage point of this differential. Just in order to keep real interest rates at the same level, Norwegian rates must be higher than European rates.
- If the market participants do not expect a depreciation of the Norwegian krone exchange rate vs. the Euro equivalent to the differential in inflation, the theory of uncovered interest rate parity implies that Norwegian interest rates should be equal to European rates. However, most bond market investors hedge their currency positions. As Norwegian short-term rates are high, the hedging cost for covering the currency risk is high and as the yield curve is sloping downwards a long bond position in Norway has a substantial cost of carry. Hence, if the investor has a quite short term investment horizon and he is not convinced that the case for bond yield narrowing is to be realised short term, it's not an attractive case, even if its judged to be a fair bet long term. Among traditional money market or bond market institutional investors, there are not many who are able or willing to take such long-term uncovered positions, betting that the long bond yield differential will not be accommodated by an equivalent weakening of the Norwegian krone, say the next 10 years.
- It is also likely that the fact that the Norwegian bond market is fairly small and that it has become very illiquid in periods influences the risk perception of the investors and leads to a certain risk premium.

Formal theoretical analyses of an economy's dynamic adjustment process to a windfall gain shows that the optimal adjustment path involves a real exchange rate appreciation (and possibly overshooting) and a presumably long period with high interest rates.<sup>17</sup> If this is true, parts of the interest rate differential on long term bonds simply reflects that the real interest rate level will remain higher in Norway than in Euroland for a fairly long time span. This makes sense if one believes that individuals are stimulated by an intertemporal substitution effect to postpone spending at the initial stages. Moreover, this also supports the view that the optimal policy mix for Norway involves a combination of contractionary monetary policy in combination with a somewhat more relaxed fiscal policy stance.

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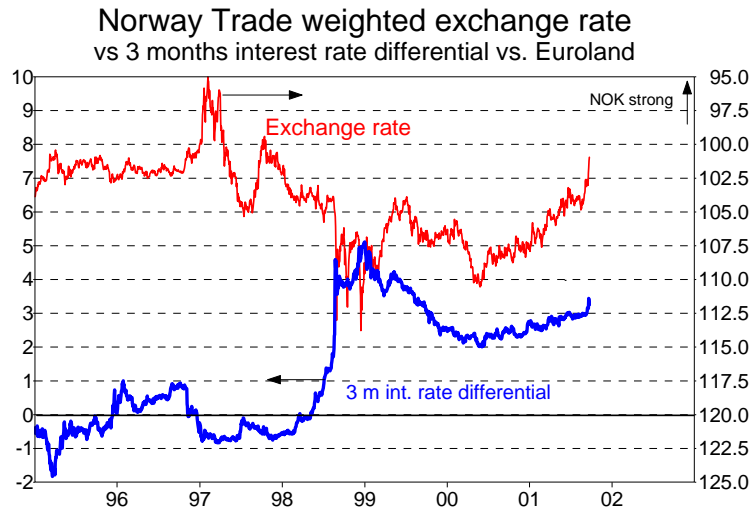
<sup>17</sup> Recent theoretical analyses along these lines are provided by Mork (2000), who considers a theoretical framework which capture the main characteristics of the Norwegian oil-economy in a very explicit way, and Steigum and Thøgersen (2001) who considers a slightly more generalized framework.



The Norwegian exchange rate poses a challenge to these views. If Norwegian interest rates stay substantially above international rates for a long period and its becoming widely expected that a nominal appreciation of the NOK is the most likely mechanism for adjusting the economy to a higher level of spending of oil revenues, we assume that both the corporate sector and the household sector would increase their demand for foreign currency borrowing, either through Norwegian banks or directly abroad. The reason is that many of these “end-users” have the risk capacity to take a long-term uncovered currency position. Without intervention in the foreign exchange market by the Norges Bank, this capital import would lead to the desired appreciation of the Norwegian krone, but with a lesser impact on the intertemporal substitution. In addition, a stronger currency will reduce the need for a high Norwegian interest rate in order to stabilise the inflation since a strong currency reduces prices on imported goods and dampens the pressure in the labour market through the loss of competitiveness and employment in the exposed sectors. If so, the currency will “do most of the job”, and really high Norwegian rates are not sustainable.

Recently, the Norwegian krone exchange rate has appreciated substantially, albeit from lower levels than before the 1998 currency and interest rate turmoil, and the krone is not yet “strong”, see figure 4.4. However, this appreciation could be a first signal that the policy mix is not sustainable.

Figure 4.4



We can conclude that there are still substantial uncertainties about the path of Norwegian interest rates compared with our main trading partners and the path of the nominal Norwegian exchange rate. These are questions that warrant more research.

## **5. Evaluating the forecasts and instrument/policy changes of Norges Bank from June 2000 to August 2001**

### **5.1 The bank's objectives**

According to the new regulation of monetary policy Norges Bank should keep inflation at a target of 2.5 per cent within a band of +/-1 percentage point. In the period between January 1999 and February 2001 the goal was to keep nominal exchange rates stable over time. Norges Bank interpreted this as a need to keep inflation in line with the Euro zone. As the EBC's target was interpreted as 2 per cent or below, the implied inflation target was 2 per cent or below in Norway too.

These goals are quite clear, and it should be possible to assess whether Norges Bank has fulfilled its duties in a proper manner. However, two things make the connection between implemented policy and actual outcome very difficult to evaluate. First, the only instrument actively used by the Bank today is the overnight deposit rate in the Norwegian money market. Theory does not give any clear picture of exactly how future inflation responds to changes in this interest rate. Adding to this, some of the probably most important transmission channels for monetary policy in a small open economy, like the exchange rate channel, have especially ambivalent empirical records.

Second, Norges Bank makes its policy decisions based on forecasts. As is shown by Hendry (1997) the most important cause of forecast errors in econometric models are structural shifts. The problem with structural shifts is that they by definition are unpredictable. A good forecaster will not attempt to foretell structural shifts, only to adjust the model when the shifts are identified.

The implication is that Norges Bank can hardly be held strictly responsible for actual outcomes of inflation. If transmission channels change or if structural shifts occur, inflation will certainly differ from the goal set by the Bank without the Bank being able to influence this very much.

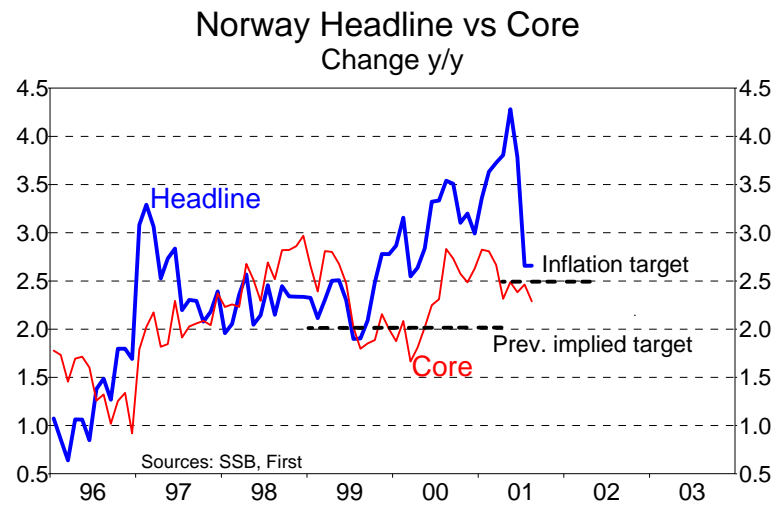
Rather than evaluating the effects of interest rate policy for inflation two years hence we need to concentrate on whether interest rates are reasonably based on current available information. Are there reasons to question the forecasts made? Does the use of instruments seem fair given the goal of the

Bank? Over time we need to evaluate the learning curve of the Bank. If the interest setting made two years ago seems to have failed with regard to inflation or output volatility, why is it so? Has the Bank taken this experience into account when making new decisions?

**Has the inflation targets been reached?**

Before we discuss Norges Bank’s economic assessments and its policy, its however useful to assess whether the Bank has met its targets.

Figure 5.1

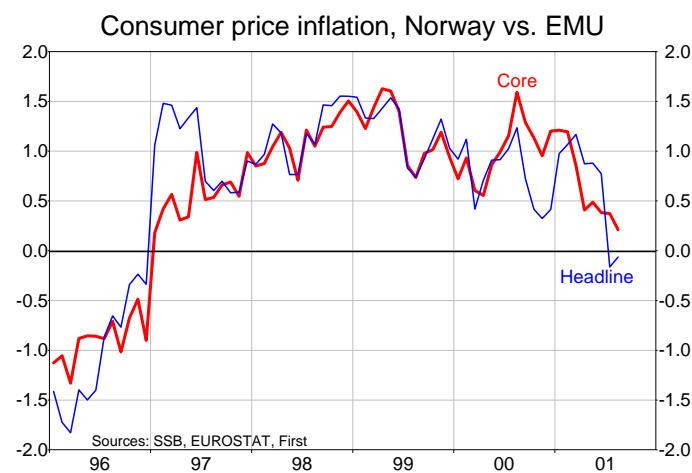


Since the introduction of the implied inflation target of 2 per cent or below in early 1999, the average headline consumer price inflation has been 2.9 per cent (figure 5.1). However, a substantial part of this inflation has been due to special factors like higher energy cost (both electricity and gasoline) and increased indirect taxes. A core inflation rate, calculated by taking out the impact from energy and indirect taxes, here measured by the method applied by First Securities, has averaged 2.3 per cent. Thus, the actual rate of consumer price inflation has been markedly or somewhat above the implied target, depending on the choice of inflation measure.

Even if Norges Bank was not explicit on the headline/core concept in 1999, our understanding is that the Bank has emphasised core inflation as the most relevant target for monetary policy. Specifically, in its inflation forecasts, the Bank has accounted for impacts of special factors like energy prices or taxes. (See our comment on the CPIXE later in this chapter).

The rate of inflation in Norway has been averaging app. 1 percentage point above the inflation rate in Euroland, both measured by the headline and core inflation. The differential has narrowed substantially during recent months, and the headline inflation in Norway has fallen below the Euroland rate of inflation, partly due to a cut in VAT on food. (Se figure 5.2).

Figure 5.2



## 5.2 Forecasts of mainland GDP and inflation for 2001 and 2002

A forecast is the best prediction of future outcomes at a given point of time. To make a wrong forecast might be unfortunate, but is not necessarily a reason for critique if the forecast was based on the best current knowledge at the time when made.

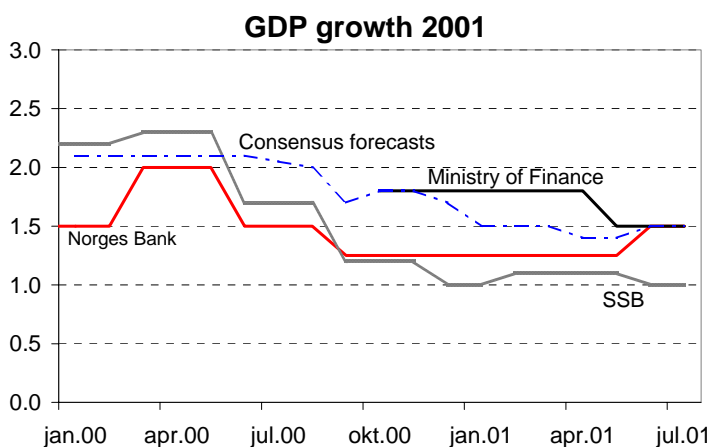
### GDP forecasts

In figure 5.3 and 5.4 we have plotted the forecast of mainland GDP and 12 month change in the CPI for 2001 made by Norges Bank, Statistics Norway

(SSB), the Ministry of Finance and Consensus Forecasts.<sup>19</sup> As we see there are trends in both forecasts: the estimate of GDP has tended downwards, and the estimate of CPI has tended upwards as time has passed. In figure 3 and 4 we have the same presentation of the forecast for 2002. With the exception of a substantial downward revision of expected GDP growth early in 2000 these forecasts have not been adjusted much over the last year.

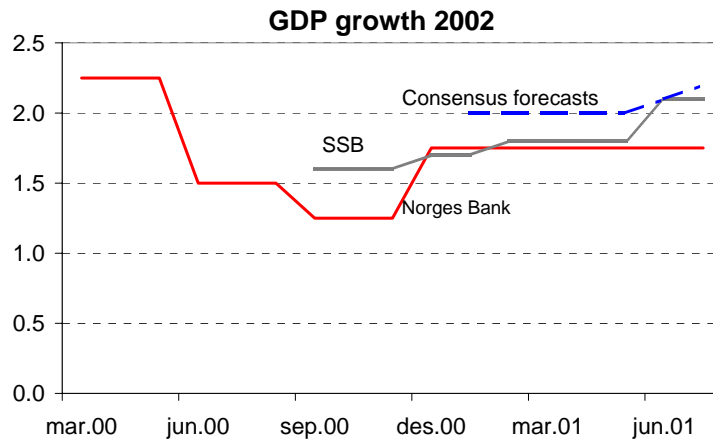
With regard to projections of inflation for 2002 there seems to be a considerable discrepancy between Norges Bank and Statistics Norway (currently 0.75 percentage points). This is mainly due to the fact that Norges Bank factors out the effect of a change in the VAT on food, effective in July 2001.

Figure 5.3



<sup>19</sup> Norges Bank forecasts are published in the Inflation Report, previously four times a year (at present three times). Statistics Norway publishes forecasts four times a year. The Ministry of Finance publishes forecasts for one year ahead in the National Budget, issued in October, and the Revised National Budget, issued in May. Consensus Forecast is a monthly report containing the views of a number of private sector economists. We report the average values. Note that the forecasts of Statistics Norway are also included as one of the forecasts in the Consensus Report.

Figure 5.4

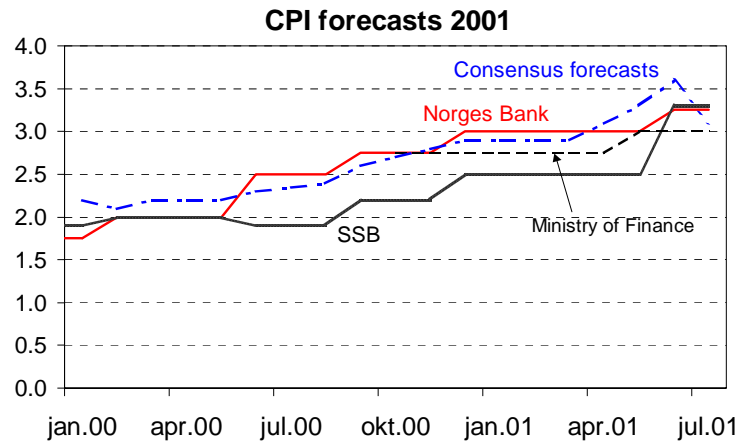


For GDP in 2001 Norges Bank made the same forecast in June 2001 as it made in December 1999: an expected GDP growth of 1.5 per cent. The development between these two points of time does however show how forecasts change as information changes. In a short period in the spring of 2000 Norges Bank adjusted its forecast upwards to 2 per cent. The Bank then adjusted it down to a low of 1.25 per cent. Over all the adjustments have been fairly minor, and no substantial revision has been made of expected growth in 2001 over this period. We see that Norges Bank, while in periods slightly more pessimistic than the other three, is generally well in line with other forecasters in the market. The international downturn so far in 2001 has not been reflected in the Banks expectations for the Norwegian economy.

#### **Inflation forecasts**

The predictions of inflation for 2001 have changed more markedly. Norges Bank has increased their forecast with 1.5 percentage points over this period, see figure 5.5. Why have the forecasts of inflation changed from the end of 1999?

Figure 5.5



In the Inflation Report 2/00 expected inflation is adjusted up by 0.5 percentage points. In a press statement Norges Bank argues that

“[t]he upward revision primarily reflects higher labour costs and a weaker krone exchange rate, but a slightly stronger external inflationary impetus is also a contributing factor.”

The downward revision in expected GDP growth at the same time is explained by reduced supply of labour due to additional vacation days. The Bank further states that

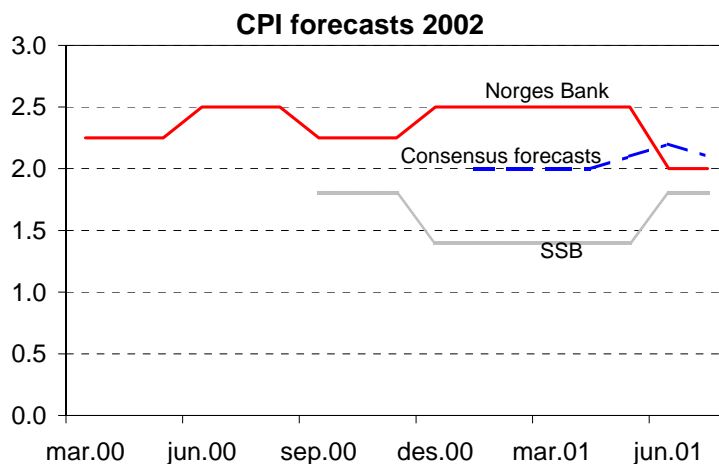
“[t]he risk of a pronounced downturn over the next two years is limited.”

Expected inflation for 2001 is further revised up by 0.25 percentage points in Inflation Report 3/00, mainly due to effects of the surge in oil prices.

Expected inflation for 2002 is revised downwards by 0.25 percentage points, as the effect of increasing oil prices is expected to fade over time. See figure 5.6



Figure 5.6



**Which interest rates, exchange rates should be used when inflation is forecasted?**

In Inflation Report 4/00 expected inflation for 2001 is further adjusted up by 0.25 percentage point because of the interest rates used in the projection were lowered. At that time Norges Bank used the implied forward rates, which had experienced a pronounced fall. This shows the problem of using forward rates in central bank forecasting when the market and Bank do not share the expectations of future monetary policy.

In Inflation Report 2/01 Norges Bank changed the technical assumptions of the future interest rate. The Bank now assumes current rates to be unchanged for two years before the rates fall gradually to the forward curve. This change in the projection of interest rates had little effect for the 2001 inflation forecast, which is adjusted up by 0.25 percentage points from Inflation Report 1/01. This time it is due to an increase in the cost of electricity. Forecasts of core inflation for 2002 and 2003 is set to 2.5 per cent, slightly higher than in the previous report. This is due to “somewhat higher cost inflation than previously anticipated.” (Inflation Report 2/01)

In their forecasts Norges Bank uses as a technical assumption that the exchange rate will remain at the average level of the last three months. In the current situation, with a high (and increasing) differential between Norwegian and other European interest rates the exchange rate might add an extra uncertainty to the projections of future inflation. Norges Bank should discuss implications of different assumptions of the nominal exchange rate.

### 5.3 Assessing changes in monetary policy instruments

#### Problems to be accounted for

During the last five years Norway has battled a combination of forces:

- High credit growth. However, financial stability has so far been good
- Low unemployment and a limited supply of new labour
- Some asset price instability (especially in the housing market)
- Slightly expansionary fiscal policy
- Large current account surpluses and a substantial accumulation in the Norwegian Petroleum Fund
- Somewhat higher wage growth than in main trading partners
- Lower productivity growth than in main trading partners
- Slowing growth in real mainland GDP
- Stable inflation about one percentage point above the rate in the Euro zone
- Cost push through high energy prices
- Considerable international uncertainty

The essence has probably been a better life for most Norwegians, a considerably better life for some Norwegians, and a nightmare for all responsible economic decision-makers. Many questions need to be answered:

- To which degree should the Norwegian government allow the flow of oil money to increase public and private consumption today?
- How will such an increase affect Norwegian productivity growth over time?
- Is pressure in the labour supply putting a pressure on wages that might undermine Norwegian competitiveness?
- Should the real appreciation made necessary by increased public spending be reflected in price inflation or nominal exchange rate appreciation?
- Is the high credit growth a danger to economic stability over time?
- Will an international downturn affect the Norwegian economy, or will lower demand for traded products be compensated by fiscal stimulus and increased demand for labour in the public sector?

In short, Norway is attempting to avoid “Dutch disease” without restricting the consumption increase made possible by the oil income too much. That is not a simple job.

Throughout the last three years Norges Bank has stated its priorities. The goal of the Bank is to keep inflation low and stable. One can, ex post,

question the position of the Bank during the spring of 1999 when the emphasis was on *deflation*. Uncertainty about international developments does however explain that stance. Since then Norges Bank has tended to focus on the three main threats to stable inflation over time:

- the pressure in the labour market
- the credit growth
- the risk of a sharp increase in public spending undermining the long-term growth prospects in the Norwegian economy.

#### **The period of interest rate change**

From June 14 till September 20 2000 Norges Bank raised its interest rates three times with a total of 1.25 percentage points. Over the period the deposit rate moved from 5.75 per cent to 7 per cent. The increases in 2000 came on June 14 with 0.5 percentage, on August 9 with 0.5 percentage points, and on September 20 with 0.25 percentage points. On the first two instances the increase was followed with a warning of expected future interest rate increases. After the third increase the expectations were characterised as neutral.

The increase on June 14 came one week ahead of the new Inflation Report. The main reasons for the increase in inflationary expectations in this report are wage pressure, a weak exchange rate and some international price pressure. Overall the wage pressure is probably the main factor contributing to a sustained interest rate increase. However, an increase in interest rates internationally might have contributed to the weak exchange rate. The ECB increased its interest rates by about 1 percentage point over the same period. There are reasons to believe that if Norges Bank had not conducted interest rate increases, and the interest rate differential had fallen, the exchange rate could have weakened further.

The only good way to explain the gradual increase in interest rates, made over three Board meetings, is as a result of interest rate smoothing. In figure 5.7 we graph the deposit rate, the three-month money market rate, and the implied three-month forward rate. As we see the money market rates increase by 0.5 per cent after the Bank made its announcement of an interest rate hike and declared that it expect future adjustments of the interest rate to be upward. When the Bank declares that it expects the probability of an upward change to equal the probability of a downward change, the market stays put. This reveals substantial confidence in the Banks policy statements.

Due to market reactions on the statements about future policy, the effects of an interest rate hike in this period came in advance of the actual hike. A hike of more than 0.5 per cent at one time would however be beyond market

expectations, and could have had destabilising effects. As the Bank has now exchanged their policy of giving statements about future expected changes in the interest rates with statements of future expected inflation it will be interesting to see how the markets react to the new procedures.

Figure 5.7



Explanation to figure 5.7: If there are not any expectations of changes in Norges Banks signal rates, the spread between Norges Bank's deposit rate and 3 months money market rates normally equals 0.3 - 0.4 percentage points. On the figure above we have deducted this spread from the actual 3 months money market interest rate. In addition we have added a calculated 3 months money market rate, 3 months forward (and added a small risk premium). Thus, we show which deposit rate the market participants expect in three to four months time. If the market always was right, the market's expectations would lead Norges Bank deposit rate by three to four months. The "mistakes" have not been dramatic, and changes in the policy stance have been usually been well understood by the market, and in some instances anticipated. During the last year, the deviation between the expected deposit rate three months and the actual rate has stayed within a band of +/- 0.5 percentage points. The shaded areas represent periods of easing (January 99 - 4<sup>th</sup> quarter 99) and tightening (April 2000 - September 2000).

*Following the terror attack against the U.S, concerted interest rate cuts abroad and the melt down on the stock markets, the market expected Norges Bank to follow suite at September 19, at least that the Bank signalled the possibility of lower rates. However, Norges Bank did not decide to do any policy changes, at money market rates rose substantially. As the stock markets world wide imploded the following days, short term rates again fell markedly. Today, the market expects a sharp reduction in Norges Bank's deposit rate within just some few months.*

### **The period of no change**

From October 2000 the interest rates have been kept unchanged. However, a fall in interest rates abroad has affected the interest spread compared with major trading partners. Over the last eight months many central banks have adjusted their target rates down. Norges Bank has thus far argued that the signs of an international downturn will not affect the Norwegian economy sufficiently to warrant a change in interest rates. Instead the Bank seems to be of the opinion that structural aspects of the Norwegian economy, especially the pressure in the labour market, has made necessary a slightly more restrictive monetary policy. The Bank has attained this by letting the interest rate differential increase in the short end.

A question, not fully answered by the Bank, is whether Norway is insulated from the international cycle by the public sector or by a counter-cyclical private industry. Both factors probably play a part. It is however of some importance whether the one or the other is most important. The government surplus in Norway makes public employment more flexible than in most other European countries. One should therefore be careful to concentrate too much on the unemployment rate as an indicator of pressure in the Norwegian economy. If the need for labour in the private sector shrinks, wage pressure might well abate. Currently no signs of a private downfall are clearly present, so Norges Bank is probably correct not to adjust its policy just yet.<sup>20</sup> The still strong growth in credit also makes a decrease in interest rates difficult to justify. However, there is now considerable uncertainty attached to international growth prospects. The effects of letting the interest rate differential increase further might be problematic. We are as yet uncertain as to how this will affect nominal exchange rates. Norges Bank might soon be in the same position as the Bank of England. It might have to cope with strong internal demand on the one hand and problems in the export sector at

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<sup>20</sup> According to Consensus Forecasts for July 2001 a 100 per cent of respondents among their panellists think that current monetary policy in Norway is "about right". 50 per cent do however feel that future monetary policy should be more stimulative.

the other hand. See also discussions on the exchange rate in chapter 3.4 and 4.4.

## **Box 2. International uncertainty**

### **International uncertainty**

In Inflation Report 4/00 Norges Bank evaluates their forecasts for 1999. The forecasts of 1999 changed radically from December 1997 to December 1998. Neither number was however correct. The main conclusion is that errors in forecasting Norwegian numbers for 1999 generally occurred because international conditions did not follow the assumed projections.

The problems of predicting international conditions becomes clear when comparing the leading comments by the deputy governor Jarle Berge in Inflation Report 1/01 and governor Svein Gjedrem in Inflation Report 2/01.

Inflation Report 1/01 (March):

“It is uncertain how deep and prolonged the [US] slowdown will be. [...] In Europe, on the other hand, there are prospects of an upturn.”

Inflation Report 2/01 (June):

“The slowdown in world economic growth has been substantial and there is a risk of slower growth and a longer downturn. [...] The slowdown in the US has had a rapid impact on economic developments in many Asian countries, and now growth is also slowing in the EU and other European countries.”

We expect Norges Bank to be even more downbeat in its assessment of the international environment in its October inflation report.

We must accept that a substantial part of the uncertainty in economic projections for Norway will be the projections of economic developments outside Norway. That is the necessary implication of globalisation, and it was so even before that word was invented.

Which implication should Norges Bank draw from this? The understanding of how the international economy interacts is clearly incomplete. But this is not a problem contained to Norges Bank. The ECB made a number of statements during the winter of this year arguing that a downturn in the US

had little effect on the European economy, statements they today probably regret.

Multinational organisations have of course worked with multinational models for a long time. It is however not clear that the work of OECD and IMF is on a form that answers to the needs of inflation targeting central banks. Maybe should more international effort should be put down into research on how to better understand the transmission channels in the global economy, and formalise these in a framework that can be applied in national decision- making? The uncertainty in international projections has probably been underestimated as a problem in the inflation targeting literature, and more work in this area must be in the interest of central banks all over the world.

Both Inflation Reports 1/01 and 2/01 include inserts that discuss international transmission channels. Norges Bank should take care to illustrate the impacts of different scenarios for international growth and inflation rate on the expected inflation development in Norway.

#### **5.4 Changes in interest rates, the level of interest rates and inflation**

Last year Norges Bank Watch 2000 argued that Norges Bank needed to clarify and present their views on the relationship between the interest rate and inflation. The background was that sensitivity analyses in a previous inflation report indicated that the link between interest rates and inflation was extremely weak. Not surprisingly, these somewhat depressing (from a monetary policy point of view) calculations attracted a lot of attention in the media.

The request for clarification was in effect answered by means of an informative insert in Inflation Report 4/00. Here Norges Bank points out aspects that are influenced by a change in interest rates, and aspects that influence the effect of a change in interest rates. Consideration is taken for the effect on the debt/income ratio for different levels of debt, for the effect on wage and profit formation under different assumptions of capacity utilisation, for the foreign exchange channel, and for different forms of expectations. Later in the report the Bank discuss the inflation forecast under various projections of the interest rate.

Several interesting observations are made. For example the Bank finds that a one per cent increase in interest rates over a two year period will reduce CPI inflation by about 0.1 percentage points in the first year – provided that the labour market is tight. The reduction in the second year would be 0.2 percentage points and in the third year 0.3 percentage points. In a labour market with considerable slack the effect would be about a third of this. If uncovered interest rate parity holds (that is, if nominal exchange rates react to the change in nominal interest rates according to the UIP hypothesis), the effect on the CPI would occur faster. Given a tight labour market, one could expect a change in CPI inflation of about 0.25 percentage points in the first year. The effect through the exchange rate channel would be even stronger if the markets believed the change in interest rates to have a duration of more than two years. The magnitude of the effects would also depend on the degree of forward-looking expectations. The presentation ends with a discussion of how these factors play a role when estimating uncertainty intervals for evaluating the effect of an interest rate change.

Some questions still remain unanswered, however. First, while the exposition in 4/00 focuses on interest rate changes, the Bank does not ask how a change in the use of an instrument affects the yield curve. As pointed out in chapter 4 there are reasons to believe that a change in the short-term rate can have rather odd effects in the long end of the yield curve. This might affect the real economic implications of an instrument adjustment.

Secondly, the discussion in 4/00 focuses only on the change in the interest rate. It is likely that the level of the interest rate might be crucial. We conjecture that the real interest rate level has non-linear effects on the real economy. From the Norwegian experience during the 1980s we learned that a period with very low real interest rates followed by a period with high real interest rates might have been one of the factors that led to problems in the banking sector. A given adjustment of the key interest rates should not be viewed independently from the level of interest rates, both real and nominal.

Finally, how the interest rate setting influences the economy depends not only on the size of the adjustment and the level, but also on the interest rate differential versus other countries. Norges Bank discusses the effect of a change in the interest rate provided that uncovered interest rate parity holds. But much of the same effect would occur as a result of a change in interest rates abroad, especially in Euroland. A change in the interest differential will also affect other variables, like foreign investments in Norway or Norwegian borrowing abroad.



In its various analyses Norges Bank considers the issues mentioned in this subsection explicitly or implicitly. Still, we believe that Norges Bank may benefit from presentations of additional explicit analyses of these issues in future Inflation Reports. We believe that Norges Bank should continue a public discussion of how monetary policy instruments affect the economy.

### **5.5 CPIXE – core inflation**

The regulation of monetary policy states that

”[i]n 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.”

Norges Bank has pointed out that one can not simply ignore temporary disturbances as these

“... can be a source of accelerating inflation via spillover effects on other prices and wages.”

However, temporary disturbances are outside the control of the Bank. It seems reasonable that the inflation target focuses on the part of inflation that is, at least to some degree, within the control of the Bank.

By temporary disturbances are normally understood fluctuations in energy prices, although the concept is not limited to energy (an other example could be an increase in food prices due to supply side problems). Norges Bank has therefore presented a new concept of Norwegian inflation, the CPIXE. This is a measure of the CPI when direct effects of excise duties and energy prices are excluded. Effects of interest rate changes are not excluded. However, Norges Bank expects these to be negligible.

The CPIXE is normally more stable than the CPI as energy prices is a volatile composite in the CPI. Whether the CPIXE inflation is higher or lower than CPI inflation does of course depend on a number of circumstances. For 2002, when the effect of a reduction in the value added tax on food will reduce the CPI, we must expect that the CPIXE inflation exceeds CPI inflation, confer the discussion in ch. 4, while it headline CPI has been far higher than the CPIXE in 2001.

Statistics Norway (SSB) has this far not adopted the concept of CPIXE, although they do publish a CPI index excluding energy prices. Given the role of the CPIXE in current Norges Bank policy it is a need for SSB to publish

monthly CPIXE. Norges Bank and the SSB should agree on the concept of how to define the CPIXE. There is also a need for historical series of the index.

Is the CPIXE the relevant measure of Norges Bank inflation target? It is clear that although this index does not answer the monetary policy regulation perfectly, it comes reasonably close to doing so. Norges Bank has on a number of occasions stated that they will take the steps required if they believe that temporary price changes might affect expectations of inflation in other sectors. One need also distinguish between energy prices. In principle, there is a difference between an increase in electricity prices due to an increase in demand, and a hike in electricity price due to lack of rain or high oil prices due to a supply cut decided by OPEC. However, almost every significant change in energy prices is due to supply changes.

Even so, how an inflation targeting central bank should respond to changes in energy prices is still an active research topic. As a first step the focus on the CPIXE seems like a sensible solution.

## 6. Communicating with the public

The official communication of Norges Bank seems to fulfil the expectations of a “best practice” inflation targeting central bank. The Inflation Report is now published three times a year. It is a clear, well-written and informative exposition. Speeches and articles are all published on a user-friendly homepage – “[www.norges-bank.no](http://www.norges-bank.no)”. All material is published in both Norwegian and English. The homepage would be even more user friendly if supplied with a search engine. The Bank’s leadership is available for comments on the press conference after Board meetings. The press conferences have an informative and open character.

Norges Bank has emphasised the importance of good communication with the markets. This does not imply that the markets should be able to predict every action taken by the Bank. But Norges Bank’s policy should be so well understood that the use of monetary instruments does not cause unnecessary volatility in the financial markets. In other words: instrument use shall be in accordance with stated policy. When policy is changed one shall, under normal circumstances, first inform the markets of the change, and then adjust instruments according to the new policy. As far as we can understand Norges Bank has fulfilled this requirement.

Some small comments could however be made:

- Norges Bank currently use a technical assumption of unchanged interest rates in their inflation forecasts. If the inflation target is not met under this technical assumption, it will be very useful if the Bank illustrates how alternative interest rates scenarios would make the target achievable in model.
- A question can be raised about whether to publish minutes from Board meetings. The premises for decisions about use of monetary instruments are presented in the press release. However, as we discuss in chapter 3, depending on how the Board is composed it might be in the interest of the public to obtain information about the work at the Board. This is at present usual practice in inflation targeting regimes where the Board members are chosen based on expertise. Publishing minutes from Board meetings might increase the understanding of how Norges Bank makes their decisions, thereby giving this process more transparency.

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