

Executive Board

Strategy document 3/2002

Implementation of monetary policy in the period to March 2003

Background

Norges Bank shall orient monetary policy towards low and stable inflation. The inflation target is set at 2½ per cent. Monetary policy influences the economy with considerable and variable lags, and the Bank must be forward-looking in interest rate setting. The key rate is set on the basis of an overall assessment of the outlook for inflation, normally a couple of years ahead in time. A medium-term horizon also contributes to dampening fluctuations in the real economy. The key rate will normally be changed gradually so that we can assess the effects of an interest rate change and other new information about economic developments.

In the discussion on monetary policy strategy on 3 June, the Executive Board considered a sight deposit rate between 7-8 per cent to be appropriate at the end of September this year. The sight deposit rate was increased by 0.5 percentage points to 7 per cent at the monetary policy meeting of 3 July 2002. The key rate was left unchanged at the monetary policy meetings of 7 August and 18 September. In the press release on the monetary policy meeting of 18 September, the Bank stated: "It is Norges Bank's assessment that, with an unchanged interest rate, the probability that inflation two years ahead will be higher than 2½ per cent is the same as the probability that it will be lower." The krone has appreciated by about 2 per cent since the previous strategy discussion and is slightly stronger than the average for June.

Economic developments and the inflation outlook

Important developments since the previous strategy discussion are:

- Inflation was somewhat higher than projected this summer, but fell in August and September.
- Growth prospects for several of our most important trading partners are weaker.
- Oil prices have increased.
- Equity prices have decline markedly.
- Growth in credit to households is very high.
- The national accounts for the Norwegian economy have been revised and show that growth over the last three years has been considerably stronger than previously assumed.

In the previous *Inflation Report*, inflation two years head was projected at 2¾ per cent with an interest rate of 6½ per cent and a krone exchange rate equal to the average for the second quarter. The inflation forecast has now been revised downwards, partly as a result of a change in the assumptions for the krone exchange rate and the interest rate. The key rate is 0.5 percentage point higher and the krone 4 per cent stronger than in the baseline scenario in the previous *Inflation Report*. The projections are shown in table 1.

Table 1. Provisional projections for Inflation Report 3/02 based on constant interest rate and exchange rate. Changes from previous report in brackets

	2001	2002	2003	2004
Consumer price inflation (CPI)	3,0	1¼ (¼)	2 (-¼)	2¼ (-½)
Inflation adjusted for tax changes and excl. energy products (CPI-ATE)	2,6	2¼ (0)	2 (-¼)	2¼ (-½)
Rise in prices for imported consumer goods	0,6	- 1¼ (-½)	-2½ (-1¾)	-½ (-1)
Rise in labour costs	5	5¾ (0)	5½ (-¼)	5¼ (-½)
Mainland GDP growth	1,0	1½ (-½)	1¾ (-½)	2¼ (-¼)
Employment growth	0,4	½ (0)	0 (-¼)	½ (0)
Unemployment	3,6	4 (¼)	4¼ (¼)	4¼ (¼)

Inflation, as measured by the CPI-ATE, was somewhat higher than expected this summer, but fell in August and September. The krone is stronger than it was last summer. Combined with low inflation abroad, this will contribute to a fall in prices for imported consumer goods this year and next. These effects will then gradually unwind. Because of the high oil price level, import prices may rebound faster than expected. The subdued rise in import prices is countering the high rise in prices for domestically produced goods and services. Based on the average exchange rate for the past three months and today's interest rate, inflation is projected at 2¼ per cent in 2002, 2 per cent in 2003 and 2¼ per cent in 2004 (see chart 1). Inflation is projected to reach 2½ per cent at the beginning of 2005.

The high rate of increase in prices for domestically produced goods and services reflects the strong growth in labour costs over recent years. It appears that unemployment will edge up, which may in turn have a dampening impact on wage growth. On the other hand, high pay increases with effect from 2003 have already been awarded in this year's wage settlements. This will contribute to maintaining overall wage growth at a high level next year and create tensions between groups covered in the main settlement (main employer and employee organisations) in 2004. The risk of wage-wage spirals is thus considerable. Wage growth is projected at 5¾ per cent in 2002 and 5¼-5½ per cent in 2003 and 2004.

Household income is rising sharply as a result of high wage growth and tax cuts. In addition, household borrowing is high. The growth in credit is accompanied by rising house prices and reflects household expectations of high future income. So far, households do not appear to be increasing the share of income spent on housing investment or financial investment. Against this background, we expect strong growth in private consumption in the period ahead. Consumption abroad may, however, account for a share of the growth in consumption.

Several years of high wage growth combined with the appreciation of the krone will probably result in a decline in manufacturing employment next year. This is the reason for the slow growth in employment and the rise in unemployment that we expect next year.

Weak corporate earnings over several years, partly as a result of the strong growth in costs in Norway relative to other countries, will result in sluggish growth in mainland business investment in the period ahead. The fall in equity prices will also have a dampening impact. On the other hand, the removal of the investment tax as from 1 October may have led to a postponement of investments. Petroleum investment will

show sharp growth next year. The development of the Snøhvit field has a considerable import component. Other petroleum investments will boost activity in parts of the shipping and engineering industries and other sectors of the mainland economy.

In addition to private consumption and petroleum investment, growth in public expenditure will fuel demand for labour in the years ahead. The projections for public sector demand for the coming years are based on the guidelines for fiscal policy as set out in the Fiscal Budget. The stock market decline and the appreciation of the krone have considerably reduced the value of the Government Petroleum Fund measured in NOK. However, the Government has proposed that particularly substantial changes in the Fund's capital should not be allowed to affect the use of petroleum revenues in one single year, but should be spread to give a more even effect over several years. The proposal calls for a structural budget deficit that is higher in 2003 and lower in 2004 than implied by the four-per-cent-rule in isolation. Financing public investment and expenditure using sources other than the central government budget will have the same effect.

Equity prices have shown a marked decline since the previous strategy discussion. This can partly be explained by a loss of confidence in the wake of the accounting scandals, and partly by a bleaker outlook for the US economy. The effects have spread to stock markets in most countries, including Norway. Even though shareholdings account for a very small share of household wealth in Norway, saving behaviour among the most heavily exposed groups may be affected. For the local government sector and some enterprises, requirements to add capital to top up pension funds may lead to higher costs. Moreover, the fall in share prices will make it more difficult for companies to raise fresh equity capital. This may have a dampening impact on fixed investment.

The global economy is expanding at a moderate pace. Developments in the US economy have a substantial impact on global growth. The outlook for the US economy deteriorated over the summer. The slide in share prices will probably reduce the strength of the recovery in the latter half of this year and next year. Furthermore, the record-high current account deficit in the US and a strong element of uncertainty may lead to further corrections in foreign exchange and stock markets. This may restrain growth in the period ahead. The prospects for the euro area are also weaker than they were before the summer. Important trading partners such as Sweden and the UK show somewhat stronger growth than the euro area. Key rates are expected to remain unchanged or to be lowered in several countries. As a result, the interest rate differential between Norway and other countries is wide and the krone has remained strong. Foreign producer prices will continue to be moderate in an environment of sluggish economic growth.

Oil prices rose during the summer, and the market has factored in a higher oil price than assumed in our previous strategy document. A considerable risk premium has been priced into oil prices as a result of the situation in the Persian Gulf. If the situation is not resolved in the near future, oil prices are likely to stay at a high level for a somewhat longer period. On the other hand, the relatively weak outlook for the world economy may reduce demand for oil, with downward pressures on oil prices. We expect oil prices to edge down from the current level, and to near USD 20 per barrel about two years ahead. Oil prices are discussed further in Annex 3. Persistently high oil prices will have a negative impact on growth among our trading partners, and push up international

producer prices. In Norway, on the other hand, a continued high oil price will fuel domestic activity and inflation.

Risks to the inflation projection for a given krone exchange rate

It is our assessment that, with an unchanged interest rate and an unchanged krone exchange rate, the probability that inflation two years ahead will be lower than 2½ per cent is the same as the probability that it will be higher. The risks to the projections for wage growth, the world economy, oil prices, public demand, private domestic demand and output are considered to be balanced.

Monetary policy ahead

Since the end of the 1990s, the domestic economy has been marked by pressures on real economic resources and high cost inflation. Labour costs have increased at a rate that is inconsistent with achieving the inflation target in the long term. Monetary policy is thus oriented with a view to gradually restoring balance in the real economy.¹

The fiscal guideline implies a steady increase in the use of petroleum revenues over the central government budget, which will generate positive demand impulses to the Norwegian economy over many years ahead. This may entail a persistent shortage of real economic resources, which increases the demands on monetary policy to curb demand for domestically produced goods and services so that balance in the real economy, once restored, can be maintained.

The cyclical downturn in the world economy has, however, led to low demand growth abroad, even though the effects of this on the Norwegian economy have been relatively modest so far thanks to high oil prices. The appreciation of the krone will also have a negative impact on activity in the Norwegian economy and keep inflation at a subdued level in the period ahead.

With a sight deposit rate of 7 per cent and a credible inflation target of 2½ per cent, the real interest rate is 4½ per cent. This is ½ - 1½ percentage points higher than what we previously estimated to be a neutral real interest rate.² Our analyses indicate that inflation will be 2½ per cent two years ahead with today's interest rate and krone exchange rate. This would imply that the current monetary stance is appropriate. We have estimated two variants of the Taylor rule. The estimates do not justify a change in the current monetary policy stance (see Annex 2).

Financial market confidence in the inflation target provides Norges Bank with greater scope for promoting stability in the real economy. Developments in forward rates and the krone exchange rate indicate that such confidence exists. However, the previous wage settlements may imply that wage growth is adrift. As long as this uncertainty persists, we have limited scope for allowing aggregate demand to rise further and accommodate the high rate of wage growth.

¹ Different concepts of balance or equilibrium in the economy are discussed in an annex to this paper.

² The concept neutral interest rate is discussed further in an article in *Penger og Kreditt* 2/2000 by Grete Hammerstrøm and Ingunn Lønning: "Kan vi tallfeste den nøytrale renten?" (Can we quantify the neutral interest rate?)

An interest rate change affects inflation gradually. A considerable share of the effects occurs in the course of the first two years. This is why Norges Bank has chosen a forecast horizon of two years. A shorter horizon for attaining the inflation target would have resulted in greater interest rate variations and wider swings in the real economy. Promoting stability in inflation, output and interest rates are therefore important considerations when the Bank decides how fast inflation should be brought back to the target.

When inflation drifts away from the inflation target, the features of the disturbance will also determine how fast inflation should be brought back to the target. Factors that influence the choice of horizon are discussed further in Annex 1. In Annex 2, using model-based interest rate rules, we illustrate that placing weight solely on the inflation target may entail costs in the form of wider variations in output.

Alternative paths for the key interest rate – with an endogenous krone exchange rate

The fall in prices for imported consumer goods is restraining the strong growth in domestic costs. This will not continue to be the case. With a more normal price rise for imported goods, wage growth will eventually have to be brought down to a level that is consistent with the inflation target. A faster reduction in wage growth would have required a more aggressive monetary policy. Alternative A in chart 2 shows a path where the key rate is kept 1½ percentage points higher through 2003, and thereafter gradually reduced towards 7 per cent. The associated inflation path is shown in chart 3, and the changes in GDP in relation to the baseline scenario are shown in chart 4. The activity level, as measured by GDP, falls rapidly in relation to the baseline scenario and wage growth is brought down at a faster pace. Compared with the baseline scenario, balance in the real economy is achieved faster. Changes in the key rate influence the krone exchange rate. In line with uncovered interest rate parity, the krone promptly appreciates, and then gradually depreciates. The effect on the exchange rate contributes to a further fall in prices for imported consumer goods. Inflation remains below the level in the baseline scenario and does not approach the inflation target of 2½ per cent until the end of 2005. With this interest rate path, output stability is given such high priority that it is achieved at the cost of stability in inflation and interest rates.

Our projections show that inflation will be lower than 2½ per cent this year and next (see chart 1). This is because the effects of a stronger krone on inflation are strongest after 1-2 years. A sharp cut in the key rate could bring inflation up to 2½ per cent as early as next year. This interest rate path is illustrated in alternative B in chart 2. We assume that an interest rate reduction of 2½ percentage points will be immediately followed by a depreciation, which will gradually be reversed in accordance with the theory of uncovered interest parity. The effects of the exchange rate change will push inflation up to 2½ per cent at the end of 2003. If the effects are milder than assumed, the key rate must be reduced further. The interest rate reduction will intensify the pressures on real economic resources and deepen the imbalance between domestic demand and output. Strong growth in domestic activity implies that the key rate must be increased relatively rapidly to a level that is higher than in the baseline scenario. This has a substantial impact on the activity level. The interest rate increase towards the end of 2003 results in a comparable appreciation. With this interest rate path, the costs

associated with the attendant swings in the real economy and sharp variations in interest rates are considerable in relation to the benefits in the form of stable inflation.

Alternative paths for the krone exchange rate - with unchanged interest rates

Developments in the nominal exchange rate are uncertain. The krone exchange is likely to fluctuate at least as widely ahead as it has over the past few years. Chart 5 illustrates three possible paths for the krone exchange rate. In the baseline scenario, the krone remains constant at the average for the past three months. Forward rates imply that the krone will depreciate by about 7 per cent two years ahead. In an alternative path, the krone appreciates by 3 per cent in the course of the first quarter of 2003.

In the baseline scenario, inflation is projected at 2½ per cent two years ahead. The effects on inflation of the alternative paths are illustrated in chart 6. Only the exchange rate assumption has been changed in relation to the baseline scenario. If the forward exchange rate materialises, inflation may rise to almost 3 per cent two years ahead. In the scenario with a stronger exchange rate, inflation may be about 2¼ per cent two years ahead. The key rate will have to be changed to attain the target of 2½ per cent. The changes in the key rate will have an impact on the krone exchange rate. The illustrated paths for exchange rate developments will therefore not materialise.

A further appreciation of the krone from the current level will in isolation imply that inflation will be lower than projected at the end of 2004. The inflation path through 2003 will be very low. If the krone's appreciation is perceived as sustained, this would in isolation imply a lower interest rate. If the krone weakens, the monetary stance must be tightened accordingly by raising the interest rate. However, it is important to assess the reasons behind a change in the exchange rate before the interest rate is changed.

Other considerations – financial stability

International share prices, as measured by the JP Morgan Global Index, have dropped by about 25 per cent over the last six months. There is a risk of a further decline. Bank losses have increased somewhat. However, banks' capital adequacy ratios rose in 2001. Against this background, supply-side conditions are not likely to restrain credit growth.

In spite of continued strong growth in household indebtedness, strong growth in real disposable income implies that credit risk in this sector has not increased noticeably. Housing wealth is still on the rise. However, this trend could pose a threat to financial stability in the long run, and will in isolation imply higher interest rates if it is not rapidly restrained. For a large portion of the household sector (the 8 lowest-income deciles) the ratio of gross debt to income is now higher than prior to the banking crisis. The stock market decline has primarily affected households in the highest income brackets. These households are less exposed to debt than in the period preceding the banking crisis. Credit risk linked to loans to enterprises has increased somewhat since the previous strategy document. The outlook for enterprises' earnings capacity is now more uncertain and the financing situation more difficult. The number of bankruptcies has increased.

Financial markets both internationally and in Norway have been characterised by growing pessimism and risk aversion in recent months. It is difficult to point to conditions in the financial sector that in the short term would place particular demands

on interest rate setting. Over the summer, life insurance companies reduced their holdings of both Norwegian and foreign shares, and have thereby substantially reduced their exposure to a further fall in equity prices. Given the unstable situation in the financial sector, the likelihood of a situation arising where Norges Bank would have to supply liquidity and cut interest rates to ensure the smooth functioning of the financial market has increased slightly, but the risk of this occurring remains low. Annex 5 provides a more detailed discussion of developments that have a bearing on financial stability.

Assessment

The growth forecasts for the world economy have been revised downwards since the previous strategy discussion. Oil prices are higher. The krone has remained strong. With an unchanged interest rate and krone exchange rate, inflation is projected at 2½ per cent two years ahead. The probability that inflation two years ahead will be lower than 2½ per cent is the same as the probability that it will be higher.

This may imply that the monetary policy stance is now appropriate given the present economic situation. With a krone exchange rate equal to the average for the past three months, an interest rate of about 7 per cent is a sufficiently tight monetary policy stance given our current assessment of economic developments and the balance of risks. The sight deposit rate should therefore be set in the interval 6.5-7.5 per cent at the end of February 2003. If the krone appreciates and the appreciation is perceived as sustained, this would in isolation justify a lower interest rate. Similarly, a higher interest rate level may be appropriate if the krone depreciates. A substantial change in the exchange rate may imply that the interest rate is set outside the interval. It is important to assess the reasons behind changes in the krone. If the krone depreciates in response to a less expansionary fiscal stance or other negative demand shocks, the shock itself will counter the effect of a weaker krone on inflation. The need for an interest rate increase would then be reduced.

Strategy

- Monetary policy shall be oriented towards low and stable inflation. The operational objective is an annual rate of increase in consumer prices of 2½ per cent.
- The key rate is set on the basis of an overall assessment of the inflation outlook, normally two years ahead.
- Financial market confidence in the inflation target provides Norges Bank with greater scope for promoting stability in the real economy. The scope will also be increased as the inflation target is adopted as the anchor for wage formation.
- Our projections for economic developments and assessment of the balance of risks imply that the sight deposit rate should be set in the interval 6.5-7.5 per cent at the end of February 2003.
- There is substantial uncertainty surrounding developments in the krone exchange rate and the effects of the appreciation of the krone on inflation and output. This implies a measured approach to interest rate setting. If the krone depreciates, an interest rate in the upper end of the interval may be appropriate. If the krone appreciates, an interest rate in the lower end of the interval may be appropriate. A substantial change in the exchange rate may imply that the interest rate is set outside the interval. Any interest rate responses must be based

on an analysis of the reasons behind exchange rate movements and an assessment of the duration of a change in the exchange rate.

Recommendation

The Executive Board endorses the conclusions above.

Annexes

- 1 Choice of time horizon for monetary policy
- 2 Interest rate strategies
- 3 Oil prices
- 4 Different concepts for balance or equilibrium in the economy
- 5 Financial stability

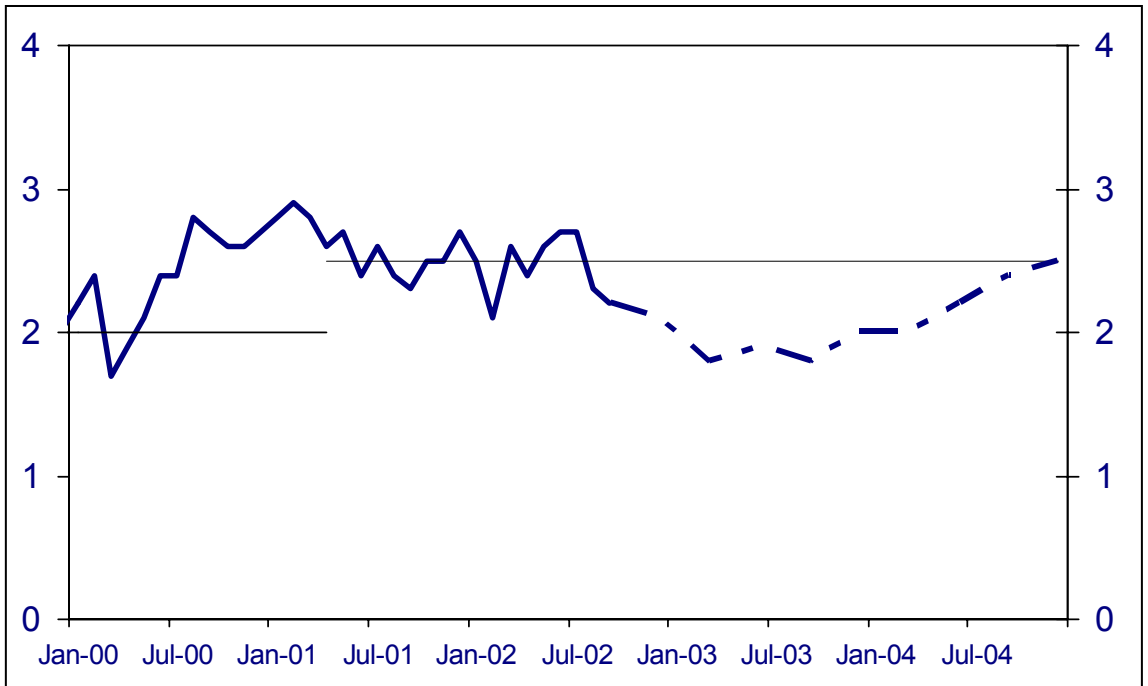


Chart 1: Inflation (CPI-ATE). Actual and predicted. 12-month rise in per cent.
Source: Statistics Norway and Norges Bank

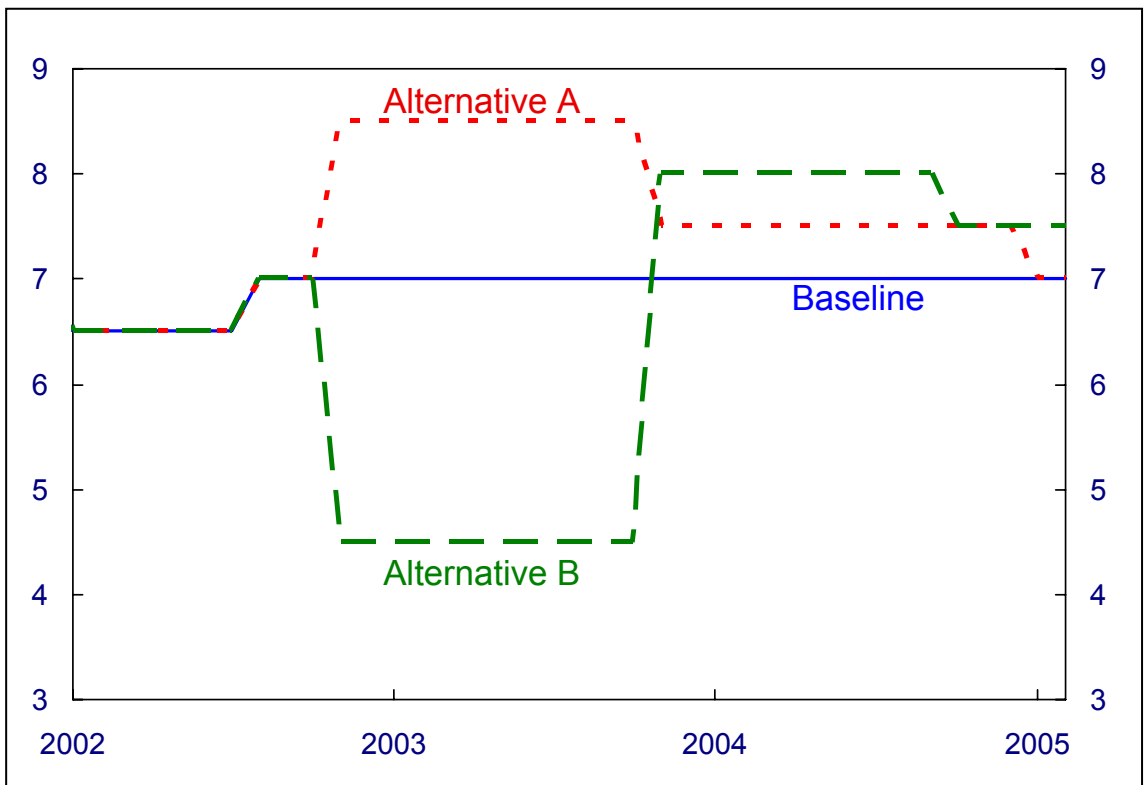


Chart 2: Alternative scenarios for the interest rate.
Source: Norges Bank

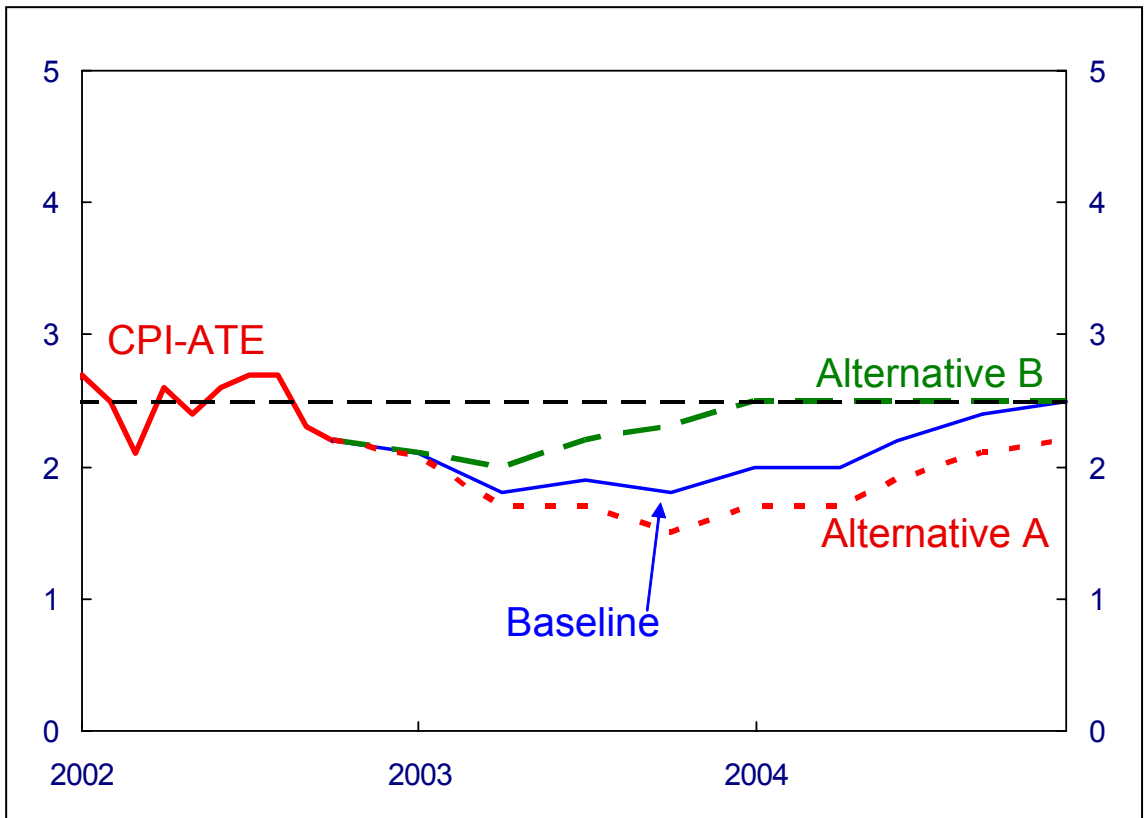


Chart 3: Inflation with alternative scenarios for the interest rate. Actual and predicted. 12-month rise in per cent.
 Source: Statistics Norway and Norges Bank.

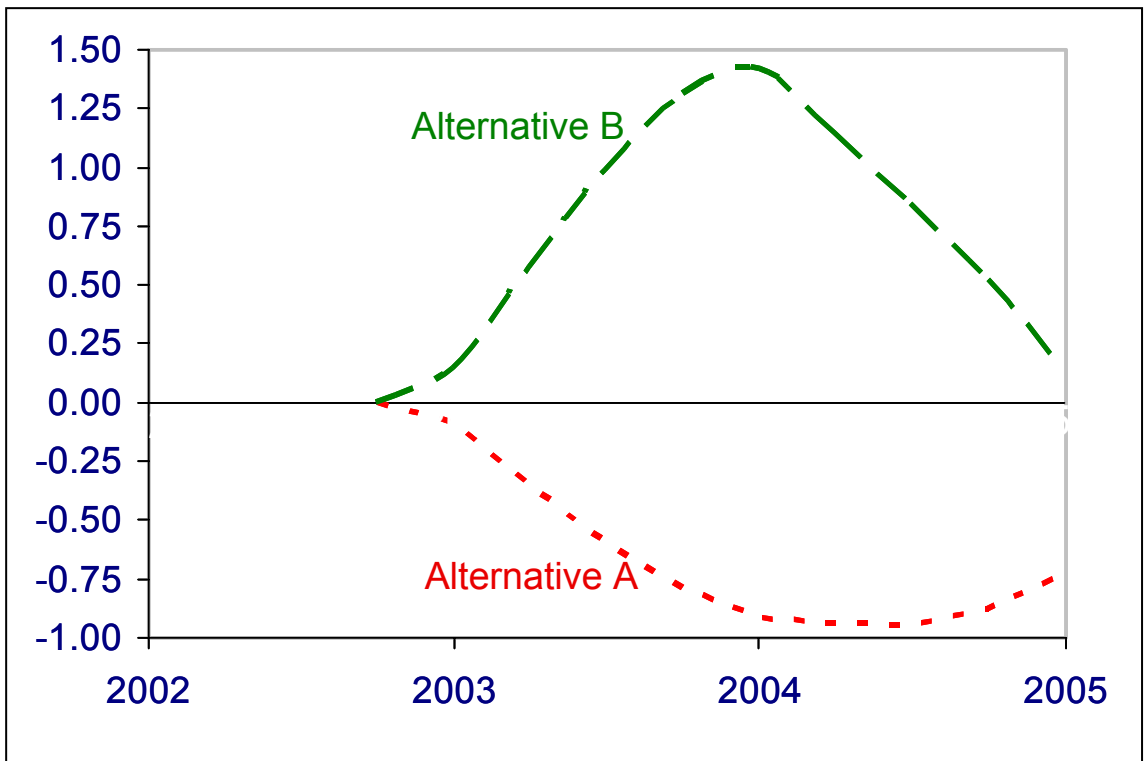


Chart 4: GDP with alternative scenarios for the interest rate. Deviations from baseline GDP in per cent.
 Source: Norges Bank.

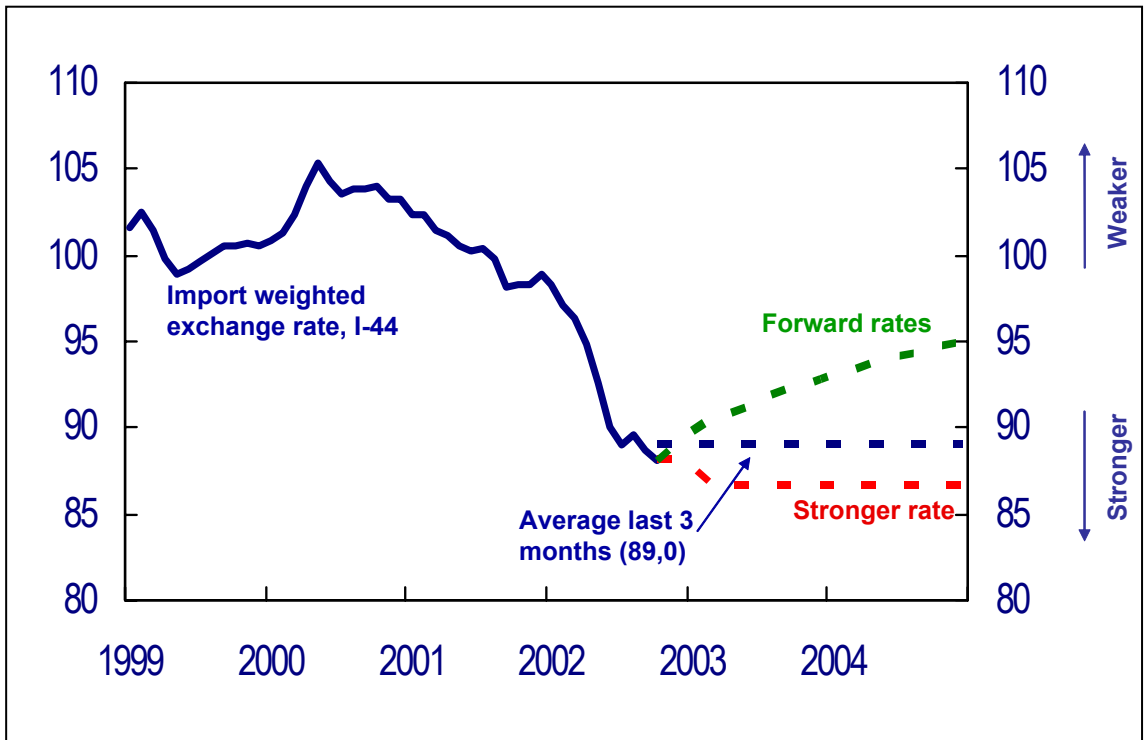


Chart 5: Alternative scenarios for the import weighted exchange rate (I-44).
 Source: Norges Bank

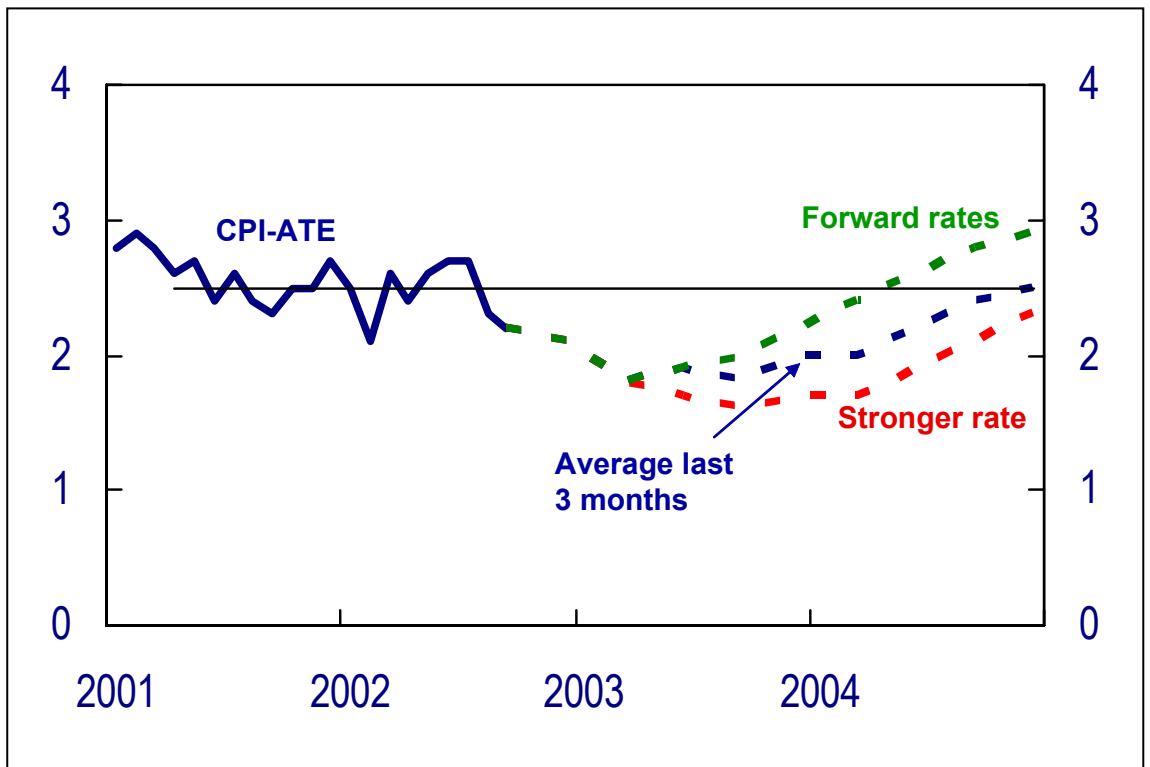


Chart 6: Inflation with alternative scenarios for the import weighted exchange rate. Actual and predicted. 12-month rise in per cent.
 Source: Statistics Norway and Norges Bank

Choice of time horizon for monetary policy

Under an inflation targeting regime, monetary policy shall counter the effects of events that cause inflation to move away from the target. There will be several possible paths for the interest rate that can bring inflation back to the target. In choosing a path, the central bank must among other things decide on a time horizon for monetary policy.

According to the Regulation on Monetary Policy, inflation shall be around 2½ per cent over time. There is some degree of flexibility as to how fast inflation should be brought back to the target in the event of a gap. In this annex, we discuss the factors that should be emphasised in choosing a time horizon. The discussion is partly based on the outlook for the Norwegian economy over the next few years as presented in the October 2002 *Inflation Report*.

Which factors determine the choice of time horizon?

In the long run, monetary policy determines the average level of inflation. Output is determined by the supply of labour, capital, technology and productivity growth. Monetary policy cannot influence overall output and employment in the long term. Attempts to increase output beyond the level implied by the capacity in the economy will lead to higher inflation over time. What monetary policy can do is to contribute to optimal stability, without unnecessary fluctuations in output and employment. Inflation targeting provides an anchor for inflation expectations.

Within the framework of a disciplined, but flexible inflation targeting regime, competing considerations regarding inflation, output and the interest rate will nevertheless be taken into account.³ Monetary policy influences the economy with a lag. A rapid return to the target will normally require a more substantial change in interest rates and output than a more gradual return to the target. Chart 1 illustrates possible combinations of variations in inflation and output that can be achieved.⁴ The three points in the chart reflect several variants of inflation targeting. Under a flexible inflation targeting regime, weight will be placed on achieving stability in both inflation and output.

Wide variations in activity are accompanied by wide variations in unemployment. Wide variations in interest rates can have adverse effects on saving and investment. Moreover, the uncertainty associated with the economic outlook warrants a gradual change in the interest rate level. This enables the central bank to assess the impact of an interest rate change.

³ In the literature, this is often presented as a loss function that should be minimised. Included in the loss function are variations in inflation and output, and any variations in the interest rate, for all future periods. One can place different weights on variations in inflation, output and the interest rate. The central bank minimises the weighted average.

⁴ This chart is also discussed in Deputy Governor Jarle Berge's lecture at the Economics Seminar at the Norwegian Association of Economists on 5 September 2002, "Monetary policy, cyclical fluctuations and competitiveness". The lecture essentially follows the approach in Svensson, Lars E. O. (2002): "Monetary Policy and Real Stabilization", mimeo, Princeton University.

Variation in output

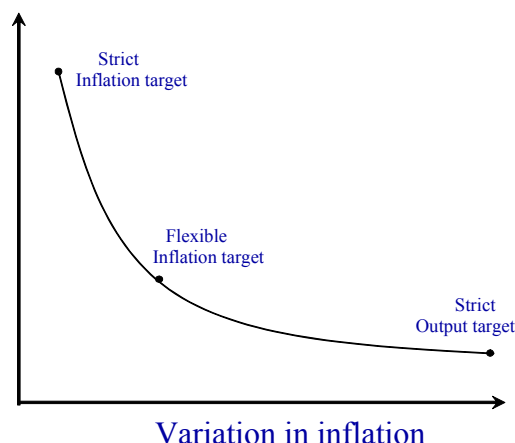


Chart 1: Possible combinations of variations in inflation and output that can be achieved in the short run.

Most central banks that operate using an inflation target have chosen a fixed time horizon. The interest rate is set on the basis of the projected rate of inflation at the end of this horizon.

Deviations from the inflation target may be caused by unexpected disturbances – or shocks – to the economy. The nature of the disturbance may determine how fast inflation should be returned to the target. If, for example, inflationary pressures stem from high domestic activity, an increase in the interest rate will return both inflation and output to the desired level. However, if the cause is a cost disturbance, stabilising inflation will require that output temporarily remain below potential output (see annex 4). In the event of severe cost disturbances, a somewhat longer period for stabilising inflation may be necessary in order to avoid an excessive impact on the level of activity. However, a precondition for this is that the inflation target is the anchor in wage formation, so that inflation does not rise further. If the target is not the anchor in wage formation, it may be necessary to reinforce the inflation target by means of a clear monetary policy response.

If the central bank deviates from the normal time horizon in certain cases, the deviation should be justified by the features of the current economic situation. For example, one feature may be the intensity of the disturbance. Others may be concerns about financial stability or particular aspects of the path followed by inflation and output.

How short can the horizon be?

The conduct of monetary policy must take account of how fast, and how far, various disturbances will push inflation away from the target. The appreciation of the krone over the past year will, for example, result in lower inflation in the short run. The subdued rise in prices for imported goods is countering the effect of the sharp rise in domestic costs. The effects of the appreciation will unwind in the course of a few years. Unless domestic cost inflation slows, price inflation will move up again.

Experience indicates that it takes more than four quarters for an interest rate change to have a significant impact on inflation. A shorter time horizon would therefore not be appropriate. Similarly, it would not be appropriate to counter disturbances whose effects unwind within one year. If the effect of a change in the exchange rate unwinds before

monetary policy is capable of having a significant impact on inflation, it may be appropriate to react mildly to exchange rate fluctuations in the interest of output stability.

Exchange rate movements are often reversed fairly quickly. The consequence of using monetary policy actively to counter the impact of short-term exchange rate variations could be wide variations in interest rates and economic activity. Stability in output and interest rates warrants restraint in countering the potential effects of exchange rate changes on inflation until it can be established that the change is of a somewhat more sustained nature.

Our knowledge about the Norwegian economy indicates that an interest rate reduction of 1 percentage point over two years increases activity, in terms of mainland GDP, by $\frac{3}{4}$ - 1 percentage point after two years, and inflation by 0.2 – 0.35 percentage point after two years and 0.3-0.4 percentage point after three years.⁵

Since it takes time for an interest rate change to have a significant impact on inflation, short-term stabilisation of inflation requires a sharp interest rate reduction. This would provide a strong impetus to domestic demand, and probably lead to a depreciation of the krone. A sharp interest rate cut would then be necessary in order to attain the target in the next round.

The costs associated with a short time horizon are wide swings in activity and interest rates. This monetary policy approach (see “strict inflation target” in chart 1) could be appropriate if the overriding concern is inflation stability. Flexible inflation targeting implies a longer time horizon and greater weight on output stability.

How long can the horizon be?

A central bank that puts strong weight on avoiding output variations (see “strict output target” in chart 1) will apply a relatively long time horizon for bringing inflation back to the inflation target. With a longer time horizon, the central bank will also be able to place greater weight on financial imbalances that could threaten financial stability in the long term. When bubbles burst, the effects on the real economy and inflation may be substantial. However, there are also arguments that do not favour a long time horizon.

Normally, the effects of a disturbance will by and large unwind in the course of 2 to 3 years. If the time horizon is longer than this, monetary policy will seldom react to such disturbances. This would result in wider variations in inflation that would make it difficult to establish the inflation target as an anchor. This could erode monetary policy credibility and reduce the scope for holding the central bank accountable for deviations from the target. With low credibility, the costs of bringing inflation back to the target will increase as a result of variations in both output and interest rates.⁶

Conclusion

Our experience and analyses indicate that a considerable share of the effects of an interest rate change occurs within two years. Two years is thus a reasonable time horizon for attaining the inflation target.

⁵ See box in Norges Bank’s *Inflation Report* 4/2000.

⁶ This is often illustrated in the literature by an outward shift in the curve in the chart.

It is nevertheless conceivable that we would apply a somewhat longer time horizon than two years for attaining a rate of inflation of 2½ per cent if price inflation were to be very high and economic activity low. Nor does inflation have to be pushed up rapidly in a situation where inflation is very low and economic activity high. By influencing inflation over time, monetary policy itself will not cause unnecessary disturbances to the economy. A precondition for choosing a longer time horizon is that there is strong confidence in financial markets that inflation will be low and stable over time and that wage formation has a nominal anchor.

Interest rate strategies

Conclusion

This annex discusses the sight deposit rate using different interest rate rules. We find that the current sight deposit rate is 0.3-0.6 percentage point higher than the two different versions implied by the so-called Taylor rule. In the section that discusses the model-based interest rate rule, we show that focusing solely on the inflation target may result in substantial costs in that output may fall well below potential output. Wide variations in interest rates can have a negative impact on saving and investment. We demonstrate that in the absence of weight on this consideration, interest rate setting leads to marked interest rate changes even if there is focus on output stability. A strategy that also puts weight on a gradual change in interest rates is just as effective in terms of bringing inflation back to the target as a strategy that does not put weight on this.

Interest rate strategies

The key rate is set on the basis of an overall assessment of the inflation outlook, normally two years ahead. This implies that interest rate setting is based on extensive information as to the economic outlook and an assessment of the attendant effects on inflation. Since policy is to a large extent based on subjective assessments, it may be useful to “cross-mirror” interest rate setting using simpler interest rate rules.

The literature on monetary policy rules distinguishes between two types of rules, targeting rules and instrument rules. A targeting rule applies a loss function for the central bank. The loss function describes a relationship between the non-observable loss and variables that the central bank seeks to influence through interest rate setting. For a central bank with an inflation target, the gap between actual inflation and a target will be an argument in the function. The gap between actual and potential output will typically be another of the factors in this function. The targeting rule is the interest rate strategy that minimises the loss for a given description of the state of the economy and a model for economic relationships. This is why such rules are also called optimal or model-based rules.

Instrument rules express the instrument, for example the sight deposit rate, as a function of a limited amount of information available at the time a decision is made. The rules are normally a simple function of a few variables and are therefore also called simple rules. The most widely known rule is the Taylor rule, where the sight deposit rate is changed in line with the gap between actual inflation and the inflation target, and the gap between actual output and potential output.

The literature on the two types of rules has gradually become extensive. There are two central findings in particular. First, the model simulations show that the simple rules are capable of producing almost as small variations in inflation and output as the more advanced targeting rules. The simple rules are also clearly more robust than the targeting rules. Robustness means that the rules provide satisfactory results using different models for the functioning of the economy. Targeting rules can function well in a given model, but when they are applied in other models, the result is often wide variations in inflation and output. In the discussion below on both instrument and target-

based interest rate strategies, some reference points for today's sight deposit rate are provided. The target-based interest rate strategy also shows developments ahead.

Instrument rules

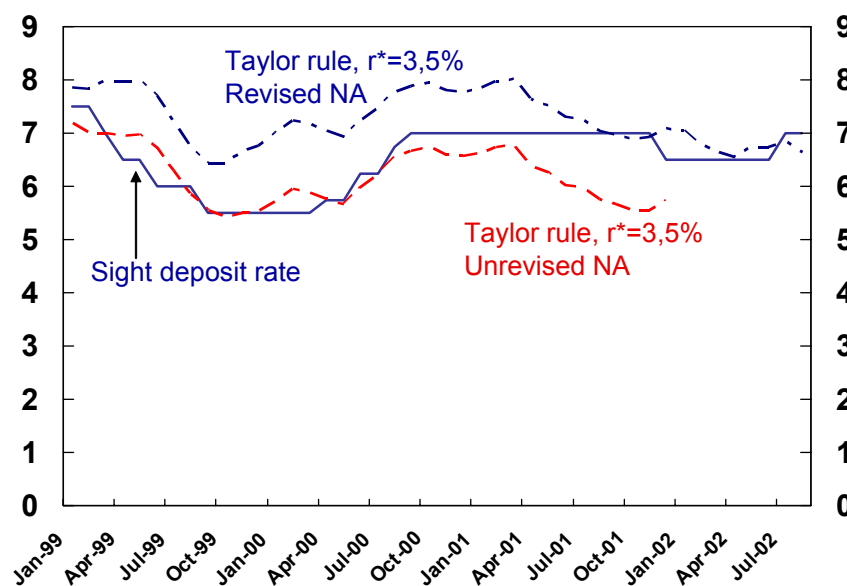
The Taylor rule

The Taylor rule is a simple monetary policy rule. It expresses how high the interest rate should be as a function of the gap between actual inflation and the inflation target, the gap between actual GDP and potential GDP and an estimate of the neutral real interest rate.

According to the rule, the sight deposit rate should be increased if actual inflation exceeds the inflation target and/or actual GDP exceeds potential GDP. Greater weight is normally put on the first condition than the latter. The weight on the inflation gap is 1.5 here, and the weight on the output gap is 0.5. Inflation is measured by the CPI-ATE. The neutral real interest rate is a measure of the real interest rate that neither stimulates nor dampens growth in demand and output. It is assumed to be 3½ per cent here. The inflation target is 2½ per cent. Potential output can be estimated using different methods. The calculations in this paper are based on a method where potential GDP is determined by all available resources in the form of capital and labour.

The chart below shows Norges Bank's sight deposit rate and the interest rate implied by the Taylor rule. There are two interest rates implied by the Taylor rule in the chart. One is based on the new, revised national accounts that were published last summer. The other is based on the unrevised figures that were used as a basis for the previous inflation reports. The revision showed that GDP growth in recent years was markedly higher than previously assumed. The interest rate implied by the Taylor rule is therefore highest when applying the revised national accounts. The calculations show that the current sight deposit rate is 0.3 percentage point higher than the interest rate implied by the Taylor rule.

Chart 1. Sight deposit rate and the interest rate implied by the Taylor rule using revised and unrevised national accounts.

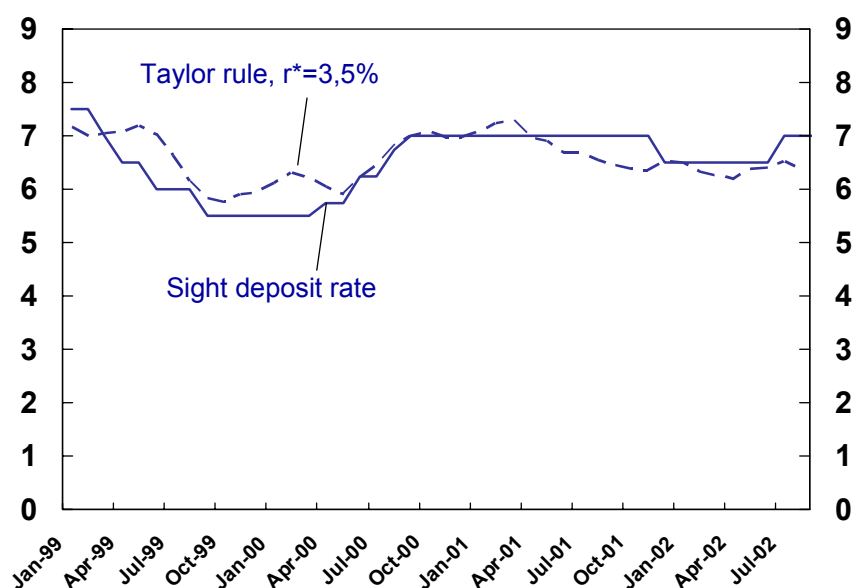


Equilibrium unemployment rule

An alternative rule can be formulated by substituting the output gap in the Taylor rule with the gap between equilibrium unemployment and actual unemployment. The figures from Aetat (public employment service) for registered unemployment are used as a measure of unemployment. One advantage of this measure is that there is probably less uncertainty linked to the level of equilibrium unemployment than to the output gap. Unemployment is easier to measure, and updated data are more frequently published. Moreover, far fewer and smaller revisions are made for these figures.

Chart 2 below illustrates this rule using the same weights as in the Taylor rule. In the technical calculations, equilibrium unemployment is assumed to be 4¼ per cent, which is the average for registered unemployment in the 1990s. Wage growth averaged 4½ per cent and productivity growth 2 per cent in the same period. This resulted in an inflation rate of 2½ per cent with a stable krone exchange rate. A shift in wage formation in relation to the 1990s will give a different level of equilibrium unemployment. On the other hand, the average for unemployment over a given period is not a very robust estimate of equilibrium unemployment. The assumption of a neutral real interest rate is the same as in chart 1. The calculations show that the sight deposit rate is 0.6 percentage point higher than implied by the alternative Taylor rule with unemployment.

Chart 2. Sight deposit rate and the interest rate implied by an alternative to the Taylor rule where the output gap is replaced by the deviation between equilibrium unemployment and actual unemployment measured by seasonally-adjusted unemployment.



Targeting rules

This section shows different interest rate strategies by looking at three alternative loss functions. The model-based interest rate paths are simulated using the loss function and rough description of the state of the Norwegian economy. The paths are optimal in that they minimise, within the model used, the central bank's loss as specified in the loss function. We calculated the paths for three alternative loss functions using the weights shown in the table below. It is only the relative relationship between the weights that is of significance.

	Alternative 1	Alternative 2	Alternative 3
Inflation	1	1	1
Output	0	0.25	0.25
Interest rate smoothing	0	0	0.25

In alternative 1, weight is placed on inflation only. In alternative 2, the central bank also takes some account of developments in total output. If output deviates from equilibrium, the central bank will take this into account in its interest rate setting by lowering the interest rate with a view to bringing it back. Alternative 3 is the same as alternative 2 except that the central bank seeks in addition to avoid an abrupt shift in the interest rate. This loss function implies a more gradual approach to interest rate setting. Relatively speaking, least weight is placed on inflation in alternative 3.

The model used is a calibrated theoretical model developed by Norges Bank. It has previously been used as a tool in calculating various monetary policy strategies in response to the phasing in of petroleum revenues into the Norwegian economy. The model is used to simulate developments in a number of key macroeconomic variables. Both the interest rate and the exchange rate are determined endogenously in the model. Uncovered interest rate parity is applied to the exchange rate. This means that the real exchange rate is determined by the difference between domestic and foreign real interest rates. It is the overall difference over the entire period that is of significance. The simulated paths are calculated as the deviation from a given equilibrium level. The equilibrium level must be described outside the model. The model is calibrated so that an interest rate change has approximately the same effect as described in the box in *Inflation Report 4/2000*.

For inflation, the equilibrium rate can be interpreted as the inflation target of 2½ per cent. Output equilibrium implies that the output gap is equal to zero, i.e. actual output is equal to potential output. As an illustration, we have set the equilibrium rate for the real interest rate equal to 3.5 per cent in the charts below. With an inflation target of 2½ per cent, the nominal equilibrium interest rate is 6.0 per cent.

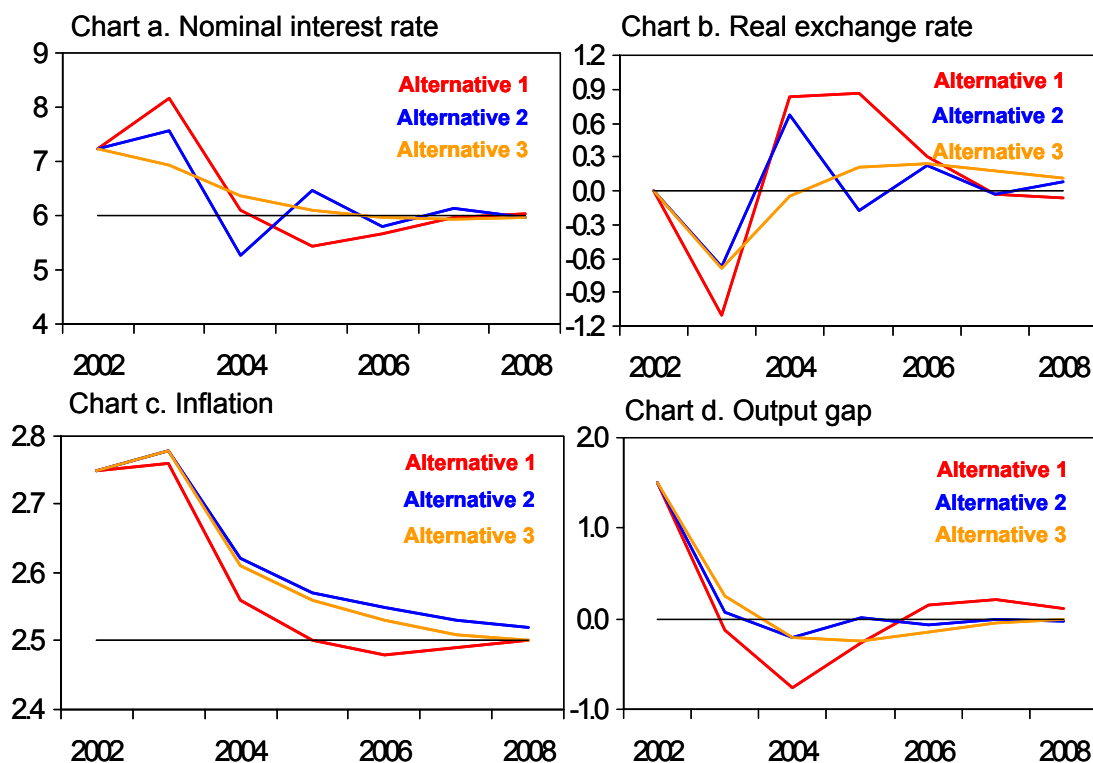
The description of the state of the economy at the start of the simulations is a scenario where the real interest rate, output and inflation are somewhat higher than their equilibrium levels. At the starting point, the real interest rate is 1 percentage point higher than the equilibrium level. The level of total output is about 1.5 percentage points higher than the equilibrium level, with a weak negative output gap in the exposed sector and an output level in the sheltered sector that is 2 percentage points higher than potential output. Inflation is 0.25 percentage points higher than the equilibrium level.

Alternative 1. Loss function with full weight on inflation

In this simulation, the interest rate increases by about 1 percentage point between 2002 and 2003 (see chart 3.a). The marked increase in the interest rate signifies that the central bank, with this loss function, is seeking to return inflation fairly rapidly to the target. In the model, the higher interest rate results in a relatively sharp fall in output (see chart 3.d). The output gap is slightly negative already in 2003, and more negative in 2004. Lower activity in the economy pushes down inflation (see chart 3.c). However, the decline does not start until 2003, which reflects the lagged effect of an interest rate change on inflation. Inflation is also reduced by the exchange rate appreciation between

2002 and 2003. This is shown in chart 3.b by the fall in the red line between these two years.

Chart 3.a-d.



After the initial increase, the interest rate is lowered relatively rapidly in the following years. In 2004, the interest rate is back at the equilibrium level, and in 2005 the interest is lowered to a level slightly below the equilibrium level. The objective here is to prevent the negative output gap from pushing down inflation too far. At the same time, the depreciation in the exchange rate when the interest rate is lowered affects inflation. The exchange rate depreciation is strongest from 2003 to 2004. In the following years, output moves back to equilibrium, while inflation is near the target. The interest rate gradually converges with the equilibrium level.

Alternative 2. Loss function with weight on both inflation and output

In this alternative, the interest rate is also increased between 2002 and 2003, but by a considerably smaller margin than in alternative 1. This is because the central is seeking to prevent wide swings in output in this case. The high interest rate level still has the effect of rapidly pushing down output to the equilibrium level, with the output gap turning slightly negative in 2004. The swings in output are, however, considerably less pronounced than in alternative 1. Inflation falls towards the target, but not as early as in alternative 1. Even though the gaps are fairly small, it takes a long time for inflation to return to the target. This is also related to the wide variations in the exchange rate that occur when interest rate movements are pronounced. This is particularly evident in connection with the sharp depreciation between 2003 and 2004.

Chart 3.a shows that interest rates are highly variable with this loss function. Marked and frequent interest rate changes do not entail any costs for the central bank with this loss function. After the interest rate increase in 2003, the interest rate is reduced sharply to a level below the equilibrium rate in 2004. The aim here is to prevent output from falling too far. In 2004, the output gap is still slightly negative, while inflation remains

higher than the target. In order to counter this, the interest rate is raised sharply again in 2005. In the following years, the interest rate continues to vary around the equilibrium level, but the variations gradually subside as output stabilises around equilibrium and inflation moves down towards the target.

Alternative 3. Loss function with weight on inflation, output and interest rate smoothing

In this alternative, the interest rate is gradually reduced to the equilibrium level. In contrast to alternatives 1 and 2, the interest rate does not increase in 2003. This is because the central bank is now putting some weight on preventing frequent interest rate changes. But this means that it takes longer for the interest rate to move down to the equilibrium level than in alternatives 1 and 2. The more gradual change in the interest rate entails a slower fall in output to equilibrium than in the two other alternatives. In this alternative, the output gap also turns negative in 2003. As a result of the gradual approach to interest rate setting, the output gap remains negative several years more than in the two other alternatives.

Inflation moves on a path similar to that in alternative 2. This is partly because the exchange rate movements are smaller when the interest rate changes are smaller. This applies in particular to the depreciation from 2003 to 2004, which is considerable smaller in this alternative than in alternative 2. As a result, the fall in inflation is marginally greater in this alternative. It takes many years for inflation to return to the target. The gaps are fairly narrow, however.

Summary of the simulations of target-based interest rate rules

All the alternatives indicate that the interest rate is kept higher than the equilibrium level in 2003. In alternative 1, the interest rate moves back to the equilibrium level in 2004. In alternative 3, the high interest rate level persists. The unsteady interest rate path in alternative 2 seems to be fairly unrealistic. It should be noted that the calculations are based on subjective assumptions concerning the loss function and a rough description of both the state and functioning of the Norwegian economy. The calculations nevertheless illustrate important conditions that have a bearing on interest rate setting.

Oil prices

Oil prices have risen sharply this year and have been higher than USD 28 per barrel so far in September. Since the beginning of the year, oil prices have increased by more than 40 per cent. Since the previous *Inflation Report* was presented at the end of June, oil prices have risen by a good 15 per cent. So far in the third quarter, oil prices have been USD 2.2 higher than assumed in the June *Inflation Report*.⁷

Three factors have contributed to the increase in oil prices:

- OPEC and non-OPEC countries have cut production. OPEC cut production quotas by 1.5 million barrels per day at the beginning of the year, while five non-OPEC countries combined cut production by a little less than 0.5 million barrels per day. With the exception of Mexico and Oman, non-OPEC countries discontinued application of the production quotas on 1 July. OPEC's surplus production has been substantial in recent months, but this has to a large extent been offset by the production decline in Iraq.⁸
- Unrest in the Middle East and in other parts of the world has fuelled fears of a further fall in oil production. Even though a possible invasion of Iraq has dominated lately, the unstable situation in Kashmir, Venezuela and relations between Israel and Palestinians have also periodically been in focus.
- Private sector oil reserves have fallen. Stocks of crude oil in the US and the OECD are now at the lowest level recorded in the last five years. On the other hand, the US has increased strategic oil reserves.

Despite weak demand for oil as a result of the downturn in the world economy, supply side conditions have exerted upward pressure on prices.⁹ The "war premium" on oil prices became clear when prices fell markedly, but temporarily after Iraq accepted the return of UN weapons inspectors. War premium estimates vary widely (between USD 0 and 8 per barrel). Recent developments in oil stocks nevertheless point to a fairly tight market at the beginning of winter. This applies in particular to crude oil stocks, while stocks of refined products are relatively ample.

Three factors are important for oil prices ahead:

- OPEC decided to leave quotas unchanged at its meeting of 19 September. OPEC production is considerably higher than the quotas, and OPEC has affirmed that OPEC countries will contribute to stabilising the oil market. An extraordinary meeting will be held in December, at which the market situation will be re-assessed.
- The situation in Iraq has not been resolved. Even though the risk of an imminent war subsided when Iraq announced that it would allow the return of UN arms inspectors, the US and the UK have maintained pressures. Iraq has dropped the

⁷ The technical assumption in the *Inflation Report* is that oil prices will reach USD 20 per barrel two years ahead. So far in the third quarter, oil prices have been USD 26.6 against our assumption of NOK USD 24.4.

⁸ Iraq is a member of OPEC, but is not subject to the production quotas. Iraq's oil exports are limited under the UN oil-for-food programme.

⁹ In the year to mid-2002, global oil demand fell by 0.3 million barrels per day. Global oil supply fell by 0.9 million barrels per day.

requirement relating to illegal price premiums on oil exports. This may entail a renewed rise in oil exports after the pronounced fall this year.

- The outlook for the world economy is uncertain. If the projected recovery takes place at a later stage and at a slower pace than assumed, growth in oil demand may be lower than expected. This may be particularly noticeable into 2003 when oil demand will also show a seasonal decline.

Oil futures prices indicate that oil prices will remain high during winter. Contracts that mature in December 2002 and in March 2003 are priced at USD 28.3 and 26.9 per barrel, respectively, as at 19 September. This is almost USD 4 per barrel higher than the technical assumption in the previous *Inflation Report*. For longer maturities, the difference is smaller - only USD 2 in December 2004. With the updated technical assumption in the next *Inflation Report*, the difference against futures prices for the shorter maturities will narrow considerably. The remaining difference can to some extent be said to reflect the downside risk to oil prices, as implied by options prices for somewhat longer maturities.

Different equilibrium concepts in monetary policy analysis

Introduction

The annex provides a condensed description of the most commonly used concepts in monetary policy analysis. Several concepts are based on theoretical studies in monetary policy and are not observable. Nor are they constant over time. If the concepts are used in actual interest rate setting, they must be estimated applying fairly strict assumptions. The concepts are nevertheless useful in describing economic developments and how monetary policy influences them.

In a situation with balance in the real economy, aggregate demand and output will be in equilibrium, and inflation stable. In this situation, output growth, unemployment, wage growth and the real exchange rate will be at their equilibrium levels. The interest rate will then also be set so that it has a neutral effect on inflation.

The output gap

Total output in the economy will increase over time in pace with the supply of real economic resources, i.e. labour and real capital. Another important factor is productivity growth stemming from technological advances. Potential output expresses the level of output that is consistent with optimal use of resources without boosting cost pressures. Potential output is thus not observable, but must be estimated. The output gap is the difference between actual output and potential output. A positive output gap means that actual output is higher than potential output. This implies a high level of capacity utilisation in the economy, combined with rising inflation. If actual output is lower than potential output, inflation will subside. If the output gap is closed, the output level is consistent with stable inflation. There are different methods for estimating the output gap, and the results will vary according to the method applied. All the methods are based on national accounts figures that are periodically subject to extensive revisions. For example, the recent revision of the national accounts entailed a substantial change in the output gap for the Norwegian economy for the past three years. See Frøyland and Nymoén (2000) for a detailed analysis of the output gap.

Equilibrium unemployment

Equilibrium unemployment is the level of unemployment that is consistent with stable inflation. When actual unemployment is equal to equilibrium unemployment, there is balance between supply and demand for labour. The difference between equilibrium unemployment and actual unemployment is thus a measure of price and wage pressures in the economy. Equilibrium unemployment is determined by structural conditions in the labour market. This implies that there is no trade-off between unemployment and inflation in the long run. In the short term, however, monetary policy can influence the gap between actual unemployment and equilibrium unemployment. The average rate of unemployment measured over a longer period is one way of estimating equilibrium unemployment, but this method does not capture possible changes in the level of equilibrium unemployment over time. See Frøyland and Nymoén (2000) for a discussion on methods for estimating equilibrium unemployment.

The wage gap

Since estimates of both the output gap and equilibrium unemployment are uncertain, it may be appropriate to consider indicators that are even more closely related to inflationary pressures. An indicator of this type could be the gap between actual wage growth and a measure of the level of wage growth that is consistent with the inflation target. Over time, real wage growth must be on a par with the growth in labour productivity. With an inflation target of 2½ per cent and trend growth in the economy of 2 per cent, there is room for annual wage growth of around 4½ per cent. These figures are in line with developments in the 1990s. Wage growth averaged 4½ per cent and productivity growth 2 per cent in the 1990s. This resulted in an inflation rate of 2½ per cent, combined with a stable exchange rate.

Equilibrium interest rate and neutral interest rate

The equilibrium interest rate and the neutral interest rate are closely related concepts. The equilibrium interest rate is the interest rate that balance saving and investment and that results in economic growth with stable inflation. Its level is determined by fundamental structural conditions in the economy. The neutral interest rate is the interest rate that neither causes a deceleration or acceleration in price and cost inflation in the short and medium term. The equilibrium interest rate is determined by long-term phenomena linked to the economy's structure, while the neutral interest rate is defined in terms of its impact on pressures in the economy, and thereby on inflation. In the long term, the neutral interest rate and the equilibrium interest rate will converge. Economic theory can provide insight into what determines the equilibrium interest rate, but attempts to quantify the equilibrium interest rate applying relevant theory produce a broad interval for one possible level. See Hammerstrøm and Lønning (2000) for a further analysis.

Equilibrium real exchange rate

The real exchange rate is an expression of a country's cost competitiveness relative to other countries. A measure of this could be the difference in prices for domestic and foreign goods and services measured in a common currency. The equilibrium exchange rate is the real exchange rate that is consistent with both internal and external balance. Internal balance implies that the output gap is closed. External balance implies that foreign trade is in balance. The theory of purchasing power parity includes a mechanism that contributes to this. If prices for domestic goods and services are higher than the level abroad, imports increase and domestic output declines. This has a dampening impact on prices and wages, which in turn restores balance. In the long run, the real exchange rate will thus return to its equilibrium rate. Factors such as trade barriers, transport costs and strategic pricing can, however, weaken this mechanism and that the same product has a different price in different countries. See annex 1 of previous strategy document for further details.

Illustrations

In the charts below, we have illustrated some of the concepts described above. Chart 1 shows two variants of the output gap, i.e. percentage gaps between actual output and potential output. The gaps are calculated using the hp filter and output function method. The output gap is positive using both methods and is estimated at 1½ per cent for 2002. The chart also shows the gap between equilibrium unemployment and actual unemployment as measured by registered unemployment. The gap between these two variables is measured in percentage points. The assumption concerning equilibrium

unemployment varies between 3 and 4¼ per cent¹⁰ between the two broken lines. Under these assumptions, unemployment is between 0 and 1 per cent lower than its equilibrium level.

Chart 1. Two different output gaps and the gap between equilibrium unemployment and actual unemployment as measured by registered unemployment.

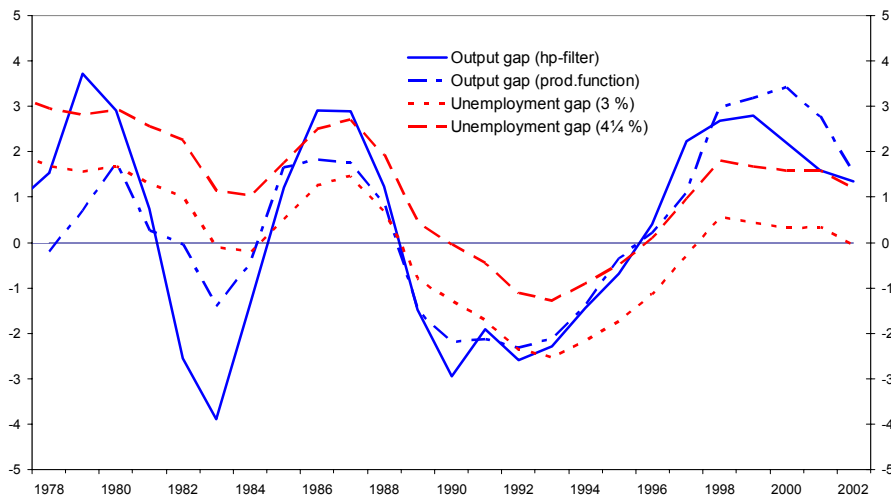
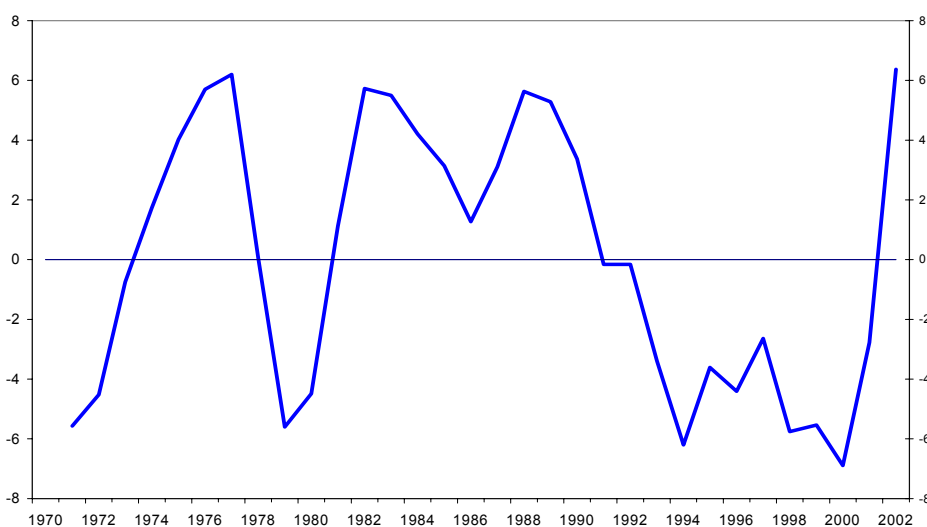


Chart 2 below shows the real exchange rate. It is measured as the deviation from its average over the past 30 years, which can also provide an estimate of the equilibrium real exchange rate. We have used the trade-weighted exchange rate index deflated by the relative CPI as a measure of the real exchange rate. The chart shows that the real exchange rate is a good 6 per cent stronger than the average for the past 30 years. The real exchange rate was nearly as strong twice in the 1980s and once in the 1970s. If purchasing power parity applies, the real exchange rate will depreciate, reaching equilibrium over time.

Chart 2. Real exchange rate as measured by the deviation from the average. Rising curve denotes real appreciation. The real exchange rate is measured in terms of the trade-weighted exchange rate index deflated by the relative CPI.



¹⁰ See Annex 2 for the basis for the estimate of 4¼ per cent for equilibrium unemployment. The Employment Commission, Report no. 26, 1992, also called the Kleppe Commission, used an estimate that corresponds to about 3 per cent when using registered unemployment.

References:

- Frøyland, Espen and Ragnar Nymoene (2000): "Output gap in the Norwegian economy – different methodologies, same result?", *Economic Bulletin* 2000/2, pp 46-52
- Hammerstrøm, Grete and Ingunn Lønning (2002): "Kan vi tallfest den nøytrale renten?" (Can we quantify the neutral interest rate?), *Penger og Kreditt* 2000/2, pp 115-124.
- Official Norwegian Report (NOU) 1992:26, "En nasjonal strategi for økt sysselsetting in 1990-årene" (A national strategy for higher employment in the 1990s).

Financial stability

Global share prices, as measured by the JP Morgan Global Index, have declined by 25 per cent since the previous strategy discussion. There has been a very high degree of correlation between stock markets in major economies. During this period, share prices fell by 24 per cent in the US, 30 per cent in Europe and 18 per cent in Japan. Share prices have also been highly volatile.

While stock markets have been declining, the value of bonds and housing has been rising. For example, the value of household shareholdings declined by about USD 1 126 billion (14.5 per cent of disposable income) in the third quarter, while the value of household bond holdings increased by about 1.9 per cent of disposable income because of a sharp fall in long-term rates.

Insurance companies have been hard hit by the fall in equity prices. In Europe, for example, the insurance index has declined by 51 per cent since end-May. Insurance companies have also sustained substantial losses as a result of the high level of defaults in international bond markets. In order to secure sufficient reserves, many companies have announced capital increases.

On the basis of analysts' expectations concerning corporate results in 2003, the current price level implies a P/E ratio of 22.6 for the US S&P 500 Index. The P/E ratio based on historical earnings was 15 for the period 1960-1995. This ratio was as low as 7 before the strong expansion started at the beginning of the 1980s. Analysts expected corporate earnings to grow by 22 per cent between 2002 and 2003. Since July, the estimate for 2003 has been revised down by 17 per cent. European stock markets have been overestimated to a much lesser extent than US markets.

The Oslo Stock Exchange's all-share index has decline by 33 per cent since end-May. It was particularly in the latter part of the period that the fall was steeper than in comparable countries. The market value of the companies was reduced by NOK 171 billion. Shareholder statistics from the Oslo Stock Exchange show that life insurance companies have reduced their share of total holdings, while the share of foreign and government holdings has increased somewhat. Life insurance companies have to a great extent shifted their investments to high-yield Eurokrone bonds. We do not know the extent to which they have hedged against further price falls by taking derivatives positions.

The value of personal investors' shareholdings on the Oslo Stock Exchange has declined by NOK 16 billion over the last six months. The hardest hit group is probably households in the highest income brackets. In the same period, the value of securities funds' shareholdings in companies listed on the Oslo Stock Exchange was reduced by NOK 15 billion. In the third quarter of 2001, banks' outstanding loans with collateral in shares came to a total of NOK 31 billion, or 3 per cent of total loans outstanding.

The credit risk linked to loans to enterprises has increased somewhat since the previous strategy discussion. Debt is still on the rise, albeit at a somewhat more moderate pace than in the household sector. As a result of the uncertainty associated with the

international and domestic economic outlook, enterprises' earnings prospects are also uncertain. The number of bankruptcies has increased.