

# Inflation targeting - some theory with main focus on practice

Speech by Governor Svein Gjedrem, Centre for Monetary Economics/Norwegian School of Management 8 June 2004

*The speech does not contain assessments of the economic situation or of current interest rate setting.*

Norway has had an inflation target for monetary policy since March 2001. In my speech today, I will attempt to explain why and how an inflation targeting regime was introduced.

In a number of countries, including Norway, short-term interest rates are now the lowest for generations. Let us look back to the views on monetary policy in Norway the last time interest rates were very low, in the post-war period up to the mid-1950s. As part of the measures taken in February 1955, Norges Bank increased the discount rate, which had remained unchanged since the war, from 2.5 per cent to 3.5 per cent. In his annual address, central bank governor Erik Brofoss discussed this change<sup>1</sup>:

*"In the longer run, the aim must be to bring interest rates down again. The outlook for achieving this is promising. Saving is high and can be supplemented by foreign capital. This provides the basis for a low interest rate if moderation is shown in relation to an expansionary urge."*

In retrospect, we can safely say that the expansionary urge proved to be too strong. It took 50 years before the interest rate returned to this level, which we now regard as abnormally low.

However, prevailing views on monetary policy at that time is probably of more interest. Brofoss said the following:

*"Increasing the discount rate will probably be widely regarded as the most important monetary policy measure. The interest rate is, however, a controversial instrument, both in Norway and in other countries. Nonetheless, an increasing number of countries use it. Whether the purported good results can be ascribed solely to interest rate policy is another question. The effects in Norway may differ somewhat from the effects in other countries. Countries with major currencies can influence short-term capital movements via the interest rate. This is only possible to a limited extent in Norway. A substantial share of business investment is self-financed and is not affected by the interest rate. The same applies to shipowners that finance new ships built in other countries with their foreign exchange earnings. As a cost factor, the interest rate will probably curb debt-financed investment. The question is whether this will eliminate the lowest priority investments. In the long run, we are dependent on long-term investment. Interest rate changes may therefore have adverse effects in Norway that do not occur in other countries."*

This stands in contrast to the current view, as expressed by Norges Bank's delegating authority, the Ministry of Finance<sup>2</sup>:

*"The new guidelines for economic policy also imply that monetary policy has been given a clear role in stabilising economic developments. This means that the scope for manoeuvre in monetary policy should be used if the outlook for the economy changes."*

In the 1950s and 1960s, a strong belief evolved that the economy could be controlled and steered in the desired direction. This optimistic view gradually lost favour in the face of developments. The way in which economic policy is oriented today reflects the experience gained and the lessons learned in the 1970s and 1980s.<sup>3</sup> Economic policy at that time was marked by coordination, control and regulation. Important elements were:

- fiscal policy oriented towards full employment
- credit regulation within limits specified in a separate credit budget
- channelling of loans through the state banks
- regulation of capital movements
- low nominal interest rates stipulated by the government authorities
- a fixed, though adjustable, krone exchange rate
- use of price regulation
- an active business policy through state ownership and state grants and subsidies

The use of price regulation was particular to Norway. The following description is by Petter Jakob Bjerve<sup>4</sup>:

*"A characteristic of post-war Norwegian economic policy, compared with policies in other countries in the west, is that prices have largely been directly set by the authorities, while wages and other income have been determined by the market and by market organisations. With the high level of employment that the government sought to achieve in the 1970s, inflation was probably lower with price regulation than it would have been without it. Nonetheless, there was repeated evidence that freezing prices without freezing wages could not prevent a fairly sharp rise in prices. In 1978-1979, we witnessed a demonstration of the extent to which the rise in prices can be slowed, at least temporarily, when a price freeze is combined with a wage freeze. But even this combination, which can only be temporary, cannot in the long run prevent a sharp rise in prices if the gap between demand and supply is too wide - as demonstrated by the rise in prices after 1980."*

In Norway, the efforts to develop an economy under strong centralised coordination and control culminated in the 1973 proposal to establish an incomes policy council.<sup>5</sup> According to the proposal, the social partners would undertake a commitment through the council to keep negotiated wage increases within specific limits. It was also stipulated that demand management policy should be included as part of incomes policy.

The proposal to establish an incomes policy council did not receive support. There was ultimately too much control and coordination. Now, only 30 years later, virtually nothing of this system remains. The structure was not solid enough. We know from experience that fiscal policy alone cannot ensure a high level of employment. The structure of the labour market and wage formation are probably of greater importance. The direct regulation of

credit, interest rates and capital movements collapsed and was phased out in the 1980s. The krone is floating. Price regulation no longer plays a role as a macroeconomic instrument. The scope of business policy has become more general. State ownership in the Norwegian business sector remains extensive, but ownership management has been reorganised following the negative experience of companies in Kongsberg, Mo i Rana and Syd-Varanger.

The economic policy of the 1970s and 1980s contributed to wide fluctuations in the Norwegian economy. Economic developments were marked by high and variable inflation. Inflation rose gradually and it took a long time before it fell. The absence of a nominal anchor was one of the main reasons behind the pronounced swings in the Norwegian economy. With a policy of low interest rates and devaluations, inflation took root. Nominal interest rates were kept at a low level even though inflation and the value of tax-deductible interest expenses rose. Frequent devaluations from 1976 were unable in the long term to prevent a decline in the manufacturing sector. On the contrary, they proved to be self-reinforcing. The wide fluctuations culminated in a credit boom in the mid-1980s. A pronounced downturn and high unemployment followed at the end of the 1980s.

I would like to highlight three factors that have taken on particular importance for economic policy in general, and monetary policy in particular.

- First, economic agents look to the future when they make decisions about consumption and investments, wages and prices, and take account of not only current economic policy, but also their expectations of future economic policy. This is particularly evident in foreign exchange and financial markets, where exchange rates and interest rates are influenced when participants shift large amounts partly on the basis of their expectations concerning economic policy and economic developments. Financial market expectations concerning economic policy are entirely different today from what they were 20-30 years ago. Behaviour can change from being very rational to herd behaviour. The issues that receive attention, and that govern movements in exchange rates and interest rates, change. It is thus important that the authorities do not sow doubt, but on the contrary act in a predictable manner within a long-term framework. The authorities must be credible and inspire confidence. There must be consistency between the stated objectives of economic policy and what is actually done to achieve them. This is the most important reason why the implementation of monetary policy has been delegated to the central bank in Norway, as has been the case in other comparable countries. In Norway, the responsibility for interest rate decisions was delegated to Norges Bank through the 1985 Norges Bank Act and through the application of the Act in 1986.

Developments in economic theory have also had considerable influence in this context. Seminal studies on economic policy guidelines were conducted by Finn Kydland and Edward Prescott at the end of the 1970s.<sup>6</sup> These studies are based on the assumption that economic agents do not make systematic errors in their assessments of what the authorities are planning for the future. The insights gained from these studies provide arguments in favour of ensuring the independence of the central bank vis-à-vis the political authorities, and of defining binding monetary policy objectives. Former governor of Norges Bank Hermod Skånland was particularly interested in this issue. Skånland stated the following as early as 1979<sup>7</sup>:

*"What the central bank can do, on the other hand, is to use its professional judgment to conduct a policy for demand management that is in line with the more long-term objectives and guiding principles that have been drawn up by the political authorities. This presupposes, however, that the central bank also has the possibility of objecting to requests from the same authorities when their efforts to solve more short-term problems bring them into conflict with more long-term objectives."*

- The other lesson drawn from the experience of the 1970s and 1980s was that it was not possible to reduce unemployment in the medium and long term by merely accepting somewhat higher inflation. Faced with the question of whether an increase in inflation from say 10 to 12 per cent was acceptable if stimulating the economy could at the same time reduce unemployment from say 2 to 1½ per cent, the decision-making authorities would most likely have been inclined to answer yes. But experience showed that this was not an available option. An attempt to increase output beyond the level that is consistent with stable inflation will over time lead to steadily rising inflation. Economic agents will eventually incorporate higher inflation into their inflation expectations. In the long run, the result will only be higher inflation, not higher employment. Output and employment will return to their potential level.

- The third factor is the special challenges to stabilisation policy posed by petroleum revenues. Norway's export revenues and government revenues can be expected to be very high as long as production remains high and as long as the global market allows producing countries to extract substantial economic rent. At the same time, we know from experience that revenues may vary sharply from year to year. As a result of the high level of earnings and fluctuations in these revenues, the most important contribution fiscal policy can make to stabilising the Norwegian economy is to provide a sound, long-term strategy for the use of petroleum revenues. Attempts to use the central government budget to fine-tune economic activity may have a destabilising effect if these attempts are perceived as a breach in the long-term strategy for the phasing in of petroleum revenues. It is necessary to show that fiscal policy is applied symmetrically in periods of economic expansion and contraction.

From the mid-1980s, during and after the credit bubble, it was recognised that a substantial revision of economic policy would be necessary and that the problems created by inflation had to be taken seriously. The exchange rate was chosen as the nominal anchor. Deteriorating competitiveness due to high wage growth would no longer be remedied by means of devaluations. Substantial emphasis was placed on the importance of wage formation for developments in employment. Only when wage growth dropped below the level of our trading partners did unemployment begin to fall and the manufacturing sector began to pick up. Thus, the fixed exchange rate policy was not introduced in order to strengthen the internationally exposed business sector in the short term. On the contrary, it was a *breach* in the approach whereby monetary policy and "exchange rate policy" had been oriented towards safeguarding these sectors. A fixed exchange rate was an intermediate target for achieving low and stable inflation.

The alternative of inflation targeting was not developed in 1986, and adhering to the fixed exchange rate regime was probably the best available option. The report from the publicly appointed Steigum Commission, submitted in 1988, contains a very thorough discussion of

the need for a credible long-term policy, but also of the challenges involved in providing the economy with a nominal anchor after such a long period of high inflation<sup>8</sup>:

*"Such a consistent exchange rate policy can yield better results in the long run than a strategy that is based on frequent devaluations or downward adjustments of the krone. This applies even if a devaluation, in isolation, has a favourable short-term impact on the real economy. The disadvantage is that devaluations tend to fuel expectations of further devaluations, which makes it difficult to break with this form of policy. As a result, inflation will be higher than in other countries while neither employment nor economic growth will be systematically higher. On the contrary, higher inflation will most likely have considerable negative effects on the real economy, partly because this will amplify the adverse effects of the tax regime.*

However, there may be considerable real economic costs associated with the transition to a consistent fixed exchange rate regime. It may take time for devaluation expectations to fade and for wage, price and interest rate developments to adapt fully to the exchange rate regime. The less credible a fixed exchange rate policy is at the outset, the longer it takes for devaluation expectations to fade, and the greater the transitional costs will be in connection with a regime change to a consistent fixed exchange rate policy."

This analysis shows that at the time there was a realistic understanding of the transitional costs associated with bringing down inflation.

Inflation fell gradually, down to 2-3 per cent in 1991-1992. If inflation targeting had been an available option in 1986, we might indeed have chosen to aim for just such a gradual fall in inflation.

Economic policy had to be anchored more firmly after 15 years of short-term fine-tuning. We had not established a sufficiently clear institutional framework for a more discretionary monetary policy. We could not then assume that a floating krone exchange rate regime and the exercise of our professional judgment when setting interest rates would inspire confidence.

We had to abandon the fixed exchange rate policy in 1992. An important reason was the weakness inherent in the fixed exchange rate regime in a world with free capital flows and deep financial markets<sup>9</sup>. When the fixed exchange rate policy was formally abolished, the Norwegian economy again risked losing its nominal anchor. But the krone exchange rate showed little change to begin with and rapidly found a new range.

The exchange rate remained stable up to autumn 1996, partly because wage growth was low and overall demand did not generate pressures in the economy. Gradually, the krone began to show wider fluctuations. The experience of the last half of the 1990s demonstrated that monetary policy cannot fine-tune the exchange rate. Developments in international financial markets led to more pronounced fluctuations. And more fundamentally, exchange rate developments no longer provided signals to wage formation and fiscal policy when labour market pressures mounted and incomes policy failed. High petroleum revenues, fiscal slippage and expectations of increased use of petroleum revenues contributed to this. Hence, the exchange rate was no longer appropriate as a nominal anchor.

Norges Bank therefore placed increasing emphasis on low and stable inflation. A formal inflation target for monetary policy was introduced in the spring of 2001. The mandate for the conduct of monetary policy is provided for in the Regulation on Monetary Policy, issued by the Ministry of Finance on 29 March 2001. The operational target of monetary policy as defined by the Government is inflation of close to 2.5 per cent over time. The idea of an inflation target for monetary policy was not new. This alternative for Norway was discussed in 1997 at the initiative of Norges Bank<sup>10</sup>. Many countries had already gained many years' experience in operating such a system. New Zealand was the first in line towards the end of the 1980s. Canada followed shortly thereafter.

In New Zealand, the switch to inflation targeting was one component of a comprehensive public sector reform aimed at addressing incentive problems associated with economic policy.

Canada, which is one of the industrial countries with the most experience of floating exchange rates, had been seeking a nominal anchor for some time. Towards the end of the 1980s, the central bank's communication increasingly emphasised price stability as a monetary policy objective. An inflation target was officially introduced at the initiative of the finance ministry and in a joint statement issued by the central bank and the finance ministry<sup>11</sup>.

Sweden introduced an inflation target in December 1992, inspired to some extent by the experience of Canada and New Zealand. After the deep economic crisis at the beginning of the 1990s, reverting to a fixed exchange rate policy was no longer deemed realistic. In this context, it must be added that the central bank of Sweden, when it was seeking to motivate and firmly establish inflation targeting during the 1990s, was able to draw on its own experience from the 1930s. Admittedly, Sweden did not have an inflation target but a price target for monetary policy in the period 1931-1937. At that time, the concept was inspired by the work of Knut Wicksell 30 years earlier. As early as in 1898, Wicksell argued that price stability should be the central bank's objective<sup>12</sup>.

After the collapse of the ERM in 1992, a gradual shift towards today's system began in the UK, which translated into Chancellor Gordon Brown's decision to transfer the authority to set interest rates from the Chancellor to a monetary policy committee at the Bank of England in 1997.

Inflation targeting is now the norm in small and medium-sized open economies. Denmark is an important exception. Since the mid- 1980s, Denmark has conducted a very disciplined fiscal and wage policy. Combined with ERM II membership, this has enabled Denmark to maintain a credible and successful fixed exchange rate regime.

The new monetary policy system that has gained international support has essentially been developed in concert by finance ministries and central banks, and through experience and practical application. Inflation targeting is not a static system, but a system that is challenged by both reality and academia. Subsequent economic literature has followed up where Knut Wicksell left off, and partly supports and partly questions central bank policy.

More recent monetary policy theory is frequently based on a loss function, or a preference function, which includes explicit targets for both inflation and output. Stabilising output is taken into account, thus recognising that monetary policy has an impact on the real economy in the short to medium term. It is the central bank's task to choose an interest rate path that strikes the best possible balance between low and stable inflation and stable developments in the real economy over time.

Ragnar Frisch was pursuing a similar line of thinking. Frisch wanted to construct a quantitative form of a preference function that could be applied in practical policy. Frisch delved into the matter. For example, he devoted considerable time to interviewing politicians to identify the "true" welfare function. His approach involved three phases. As to the first phase, Frisch stated<sup>13</sup>:

*"...the econometrician uses his general knowledge of the political atmosphere in the country ... He will then be able to form a temporary perception of the quantitative form of the preference function".*

In the next phase, the preferences are identified by means of a system for interviewing politicians:

*"This interview system must be designed so that the results, without the politicians necessarily having to understand this, can draw certain conclusions as to the numerical nature of the preference function."*

In the third and last phase, the information derived from the interviews is combined with the data on the structure of the economy and the formulated preference function.

*"This will yield a solution in the form of an optimal path for economic and social development."*

Professor Lars Svensson, one of the most prominent contemporary academics in the field of monetary policy, expresses thoughts similar to those of Frisch. Svensson recommends the following<sup>14</sup>:

*"..inflation targeting central banks should announce (an) explicit loss function with numerical weights on output-gap stabilization... Simple voting procedures for forming the Monetary Policy Committee's aggregate loss function... are suggested."*

A practical approach, which is probably pursued by most central banks, is to produce projections for the economy based on different, possible interest rate paths. Decision-makers can then strike a balance between the various considerations and make decisions based on these projections<sup>15</sup>.

Both the formulation of a precise inflation target and the aim of striking a balance between the objectives of stable output and inflation could invite a repeat of earlier attempts at fine-tuning. But here it is important to adhere to the lessons drawn from the 1970s and 1980s. The uncertainty underlying the decisions taken must not be underestimated. There is

uncertainty as to the current state of the economy, the underlying driving forces and the economy's functioning, including expectations formation and the impact of monetary policy.

Economic models are tools that help us address some of this uncertainty. Inflation targeting places new demands on our models and our use of models. In an uncertain world, risk analysis is a very important part of the work. The aim is as much to understand the economics of the forecast as to produce quantitative estimates. In central banks, dramatic developments in macroeconomic modelling have taken place over the past 10 years. At Norges Bank, we have started work on developing modelling tools for inflation targeting. We are inspired by and work closely with other central banks and the IMF and draw on our long experience of model building in Norway. We are working on several different models and we are assessing other building blocks that we need to support our work in setting interest rates under an inflation targeting regime.

Part of the work involves developing a fairly small model that can serve as a reference and a basis for discussions and deliberations within the Bank and the Executive Board. The thinking behind this is that this model will contribute to disciplining and structuring discussions and to consistent argumentation across issues and over time. Moreover, this model could serve as an aid in our external communication on monetary policy and our view of the functioning of the economy. The model must satisfy the following requirements:

**1. The model must have a well defined equilibrium**

The model must be predicated on the experience gained in the 1970s and 1980s, which showed that we cannot increase employment in the long run by accepting higher inflation. In the long run, inflation is a monetary phenomenon.

**2. Inflation expectations must be modelled explicitly**

We must have a line of reasoning and a model that takes account of the forward-looking behaviour of economic agents when making decisions. Agents take account not only of today's economy policy, but their expectations as to future economic policy. As mentioned, it may be difficult to form a perception of how expectations are formed. An advantage of modelling expectations explicitly is that we can analyse the effects of different views on how they are formed.

**3. Monetary policy must have a defined role in the model**

The model must address monetary policy's main task: providing a nominal anchor.

**4. The model must be transparent and manageable**

Norges Bank's administration, management and Executive Board must be able to interpret and understand the model. It must not be perceived as a black box. It must have a theoretical structure so that we can easily examine the effects of alternative views of the economy's functioning.

**5. The model must reflect the Bank's view**

As a result of the modelling work, the Bank's views on relationships in the economy will evolve. At the same time, we are developing a model with relationships that we have confidence in.



Models will never provide us with a definitive answer. A model will always represent a simplification of reality. We must be pragmatic and exercise a good measure of judgement in addition. In my view, the most important role of models is to provide a framework and structure for the decision-making process, and to ensure that we do not change our views on the functioning of the economy without thorough reflection.

The use of models must also be seen in connection with the uncertainty associated with the actual state of the economy and the driving forces that dominate at a given point in time. It can be a demanding task in itself to find the balance between incorporating new information on the one hand and making abstraction of pure noise on the other. Allow me to illustrate.

The chart shows quarterly changes in mainland GDP, adjusted for seasonal variations. The figures show wide quarterly variations. It is uncertain whether this reflects fundamental conditions or statistical noise. Norway is a small economy, and extraordinary events can have a substantial impact on aggregate figures.

These figures nonetheless fluctuate considerably less for Sweden and the UK. I will not comment on whether the differences are real or merely statistical. Let us now contrast these quarterly figures with our output-gap estimates using annualised figures<sup>16</sup>. This estimation may provide a basis for assessing the contours of cyclical developments.

The following chart shows a similar estimation using the quarterly figures that I just showed you.

We must not and cannot fine-tune economic developments. We must therefore exercise caution in our use of short-term statistics and quarterly figures. Changes in these figures may represent more noise than news. The challenge facing us is to identify the contours of cyclical developments.

Allow me to conclude.

Today's monetary policy is based on the experience gained by Norway and other countries, over the past 30 years in particular, and on the results of extensive macroeconomic research. Important lessons are:

- Inflation is a monetary phenomenon. A country with a national currency can choose the level of its own inflation. Inflation in a country is not something that drifts in with the wind from abroad.
- If monetary policy is to function effectively, an institutional framework is required to reinforce confidence that overriding weight is assigned to long-term objectives.

The institutional framework and guidelines for monetary policy in Norway reflect developments in other countries. This is of particular importance for a small country because of the considerable influence international operators have on developments in our country. Rules can anchor expectations, but they must be credible and robust to disturbances to international and domestic economic developments. Inflation targeting is in practice a

flexible rule that can stabilise expectations and at the same time provide room for adapting to the abrupt shifts our economy is exposed to.

Thank you for your attention.

### Footnotes

<sup>1</sup>See Jahn, Gunnar, Alf Eriksen and Preben Munthe (1966): *Norges Bank gjennom 150 år* (A history of Norges Bank). In Norwegian only. Norges Bank's Printing Works, Oslo

<sup>2</sup>Cf. Report No. 1 (2003-2004) to the Storting, *National Budget for 2004*. Ministry of Finance, Oslo.

<sup>3</sup>Hermod Skånland is in the process of completing "Doktriner og økonomisk politikk" (Doctrines and economic policy), which provides a very interesting discussion of post-war economic policy.

<sup>4</sup>Bjerve, Petter Jakob (1981): "Kva hendte i Norge i 1970-åra - konjunkturpolitisk?" (What happened in Norway in the 1970s - in terms of counter-cyclical policy?) , *Sosialøkonomen* No. 5, 1981

<sup>5</sup>Official Norwegian Report (NOU)1973:36 *Om prisproblemene* (price problems)

<sup>6</sup>Kydland, Finn and Edward Prescott (1977): "Rules Rather Than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy* 85, 473-91, June 1977.

<sup>7</sup>Skånland, Hermod (1979): "Strategier for 1980-årenes politikk" (Policy strategies for the 1980s), *Sosialøkonomen* No. 10, 1979

<sup>8</sup>Official Norwegian Report (NOU) 1988:21: *Norsk økonomi i forandring* (A changing Norwegian economy). Ministry of Finance, Oslo.

<sup>9</sup>For important academic contributions on inherent weaknesses in fixed rate systems, see Krugman, P. (1979) "A Model of Balance of Payments Crises", *Journal of Money Credit and Banking* 11, 311-325, Krugman, P. (1988) "Exchange rate instability". MIT Press, Cambridge, MA and Obstfeld, M. (1986) "Rational and Self-fulfilling Balance of Payments Crises", *American Economic Review* 76, 72-81. For a simplified presentation of Krugman og Obstfeld's works, see De Grauwe, P. (1996) "International Money", Oxford University Press, Oxford.

<sup>10</sup>See Christiansen, Anne Berit and Jan F. Qvigstad (ed.) (1997): *Choosing a Monetary Policy Target*. Scandinavian University Press, Oslo.

<sup>11</sup>See Crow, John (2002): *Making Money. An Insider's Perspective on Finance, Politics, and Canada's Central Bank*. Wiley, Canada.

<sup>12</sup>See Berg, Clas and Lars Jonung (1998): "Pioneering Price Level Targeting: the Swedish Experience 1931-37". Conference on Monetary Policy Rules, Stockholm, 12-13 June 1998

<sup>13</sup>Frisch, Ragnar (1971): "Samarbeid mellom politikere og økonometrikere om formuleringen av politiske preferanser" (Cooperation between politicians and econometricians on the formulation of policy preferences). *Sosialøkonomen* No. 6, 1971

<sup>14</sup>Cf. Svensson, Lars (2003): "The Inflation Forecast and the Loss Function" in Paul Mizen (ed.), *Central Banking, Monetary Theory and Practice: Essays in Honour of Charles Goodhart*, Edward Elgar.

<sup>15</sup>For a description of principles for inflation targeting, see Lars Svensson's presentation ["What is inflation targeting?"](#)

<sup>16</sup>See *Inflation Report* 1/2003 for further discussion on the method of calculation.