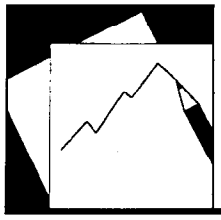
WP/02/184



IMF Working Paper

The Inflation Targeting Framework in Norway

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INTERNATIONAL MONETARY FUND

 WP/02/184

IMF Working Paper

European I Department

The Inflation Targeting Framework in Norway

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November 2002

Abstract

Norway adopted an inflation targeting framework in early 2001, thus concluding its gradual but consistent move toward greater exchange rate flexibility. This paper assesses the institutional and technical design of the framework, as well as its potential implications for the practical implementation of monetary policy against the experience from selected industrial countries that had adopted inflation targeting frameworks prior to Norway. Norway's role as a commodity exporter exposed to large terms of trade shocks, and the possible consequences of newly introduced fiscal guidelines are also discussed.

JEL Classification Numbers: E42, E52, E58

Keywords: inflation targeting, monetary policy, exchange rates

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[1] The author would like to thank Valerie Cerra, Sharmini Coorey, Balàzs Horvath, Anne Sofie Jore (Norges Bank), and Subhash Thakur for very useful comments on an earlier draft of this paper.

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I. INTRODUCTION

The central bank of Norway (Norges Bank) adopted an inflation targeting framework in March 2001. This change was based on a March 29, 2001 white paper to parliament (Report 29 to the Storting), which established a new regulation on monetary policy. The new guidelines state that monetary policy shall be aimed at stability in the internal and external value of the krone, contributing to stable expectations concerning exchange rate developments. In contrast, the previous mandate for Norges Bank was to maintain a stable exchange rate against European currencies. In accordance with the new regulation, Norges Bank's implementation of monetary policy shall be oriented toward low and stable inflation. The operation target is defined as an annual increase in consumer prices close to 2.5 percent over time. It is expected that consumer price inflation, as a general rule, will be within 1 percentage point of the target on either side. Norges Bank has defined the horizon for achieving the target to be two years.

Norway has a long tradition of emphasis on exchange rate stability. Similar to many small open economies in Europe, Norway has a long history of exchange rate targeting dating back to the silver standard in the mid-1800s. Under the Bretton Woods system (1947–72), Norway fixed its exchange rate against the U.S. dollar, whose value, in turn, was linked to gold. After the collapse of the Bretton Woods regime, Norway experienced almost one and a half decades (1972–86) of high inflation. After a temporary peak in inflation following persistent downward pressure on the krone and finally a devaluation of the krone in 1986, inflation was brought to a declining trend under a system in which the krone exchange rate was fixed against a trade-weighted basket of currencies (1986–90). This arrangement was followed by a short experiment of fixing the exchange against the European currency unit (ECU) (1990–92). Following the strains on the European Monetary System (EMS), the krone floated from December 1992 to May 1994. In May 1994 Norway shifted to a managed-float system that aimed at stability against European currencies (1992–2001). This arrangement did not explicitly define a quantitative target for the krone exchange rate, although until 1998, the central bank behaved as if it had a narrow implicit target range of 103–105 on the inverted ECU index.

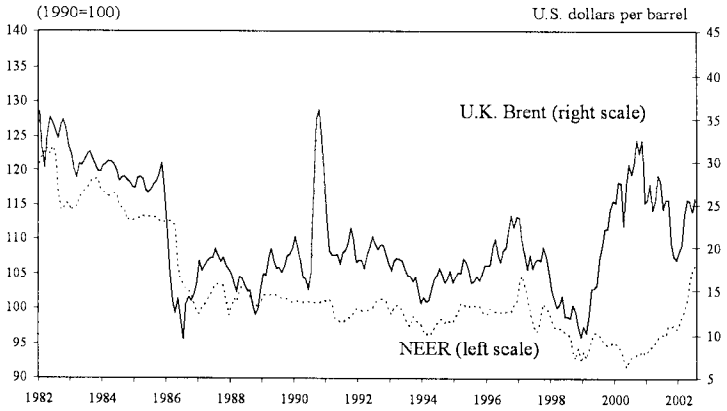
Table 1: Nominal Anchors for the Norwegian Economy Since 1947

1947—1972:	Fixed exchange rate against the U.S. dollar and hence gold (Bretton Woods)
1972—1986:	Weak nominal anchor and high inflation The "snake" 1972—1978 Trade-weighted basket 1978—1986
1986—1990:	Fixed exchange rate against trade-weighted basket
1990—1992:	Fixed exchange rate against ECU
1992—2001:	Stability against European currencies (interpreted as the euro since 1999). Increased emphasis on low and stable inflation.
Since March 2001:	Inflation target

Source: Norges Bank

Attempts to maintain short-term exchange rate stability became increasingly untenable. The implied constraints, of using monetary policy in achieving both the exchange rate and inflation objectives and the quick transmission of external shocks, stirred up a debate on whether the country should move toward a more flexible exchange rate system instead of using an exchange rate target as a nominal anchor to guide inflation expectations.[2] Furthermore, owing to the strong commodity base of Norway's trade,[3] the exchange rate of the krone was sensitive to the large swings in the price of oil and other raw materials, making it hard to maintain a stable exchange rate (Figure 1). The reinterpretation of the monetary policy guidelines since 1999 recognized these developments, and the practical implementation of monetary policy in the period preceding the change in the regime in March 2001 was very close to de facto inflation targeting.

Figure 1. Nominal Effective Exchange Rate of the Norwegian Krone (NEER) and the Price per Barrel of U.K. Brent



Source: IMF, International Financial Statistics (Washington).

The shift to inflation targeting has typically followed a period of high inflation and taken place in economic downturns. Many countries that had adopted an inflation targeting framework in the early 1990s were either in the midst of an economic downturn or recovering from one. Moreover, in many cases the shift to inflation targeting occurred either in an environment of high and volatile inflation (for example, in Canada, New Zealand, Spain, and Sweden) or during heightened pressure on the exchange rate (for example, in Finland, Spain, Sweden, and the United Kingdom)— that is, in situations where establishing a new, credible nominal anchor was likely to be received positively by the general public. While it is not clear to what extent the newly introduced inflation targeting frameworks contributed to the economic successes that often followed,[4] the experiences of declining inflation and solid growth helped to create political support for the regimes, and, in turn, supported the move toward central bank independence during the early years of inflation targeting.

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[2] For an assessment of the pros and cons of these two alternative regimes in the Norwegian context, see IMF Country Report No. 99/11. (http://www.imf.org/external/pubs/cat/longres.cfm?sk=2922.0)

[3] Since Norway's emergence as an oil producer in the 1970s, it has become a major oil exporter. Exports of crude oil, natural gas, and condensates represented almost 57 percent of Norway's total exports of goods and services in 2001.

[4] See Cecchetti and Ehrmann (1999), and Nadal De Simone (2001) for discussion.

The regime shift in Norway in March 2001 occurred toward the end of a prolonged upturn.[5] The economy was in a late stage of a prolonged upturn, and the labor market was tight. Both high labor force participation and the demographic situation indicated that prospects for further growth in labor supply were limited, suggesting that promoting economic growth without increasing inflationary pressures was difficult. Furthermore, as the central bank had been relatively successful in keeping inflation low for a prolonged period, substantial improvement in performance over the old regime was unlikely. In contrast, the headline inflation rate was edging up on the back of higher international inflation, and intensified domestic resource utilization. At the same time, however, there was no significant pressure on the krone, and the central bank had already acquired relatively strong credibility, which allowed a smooth and orderly regime shift without any excessive monetary policy tightening, which could have eroded the support for the framework.

The switch to the inflation targeting framework was well prepared and smooth. Prior to the introduction of the new monetary policy regulation in March 2001, the practical implementation of monetary policy closely approximated that under inflation targeting. Although the primary target for monetary policy in the prior regime was exchange rate stability,[6] the central bank conducted its monetary policy in practice to ensure that the fundamental preconditions for achieving medium-term exchange rate stability were in place rather than trying to stabilize the short-run exchange rate. Since 1999, this had implied that price and cost inflation should not exceed the corresponding level aimed at in the euro area (i.e., less than 2 percent). The reference in the previous regulation to *significant changes* in the exchange rate to which the central bank was supposed to react by exercising discretion was interpreted to mean exchange rate movements

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[5] Many successful inflation targeting countries share several characteristics with Norway, including, (i) a small and open economy (for example, Australia, Finland, Iceland, New Zealand and Sweden) (ii) a strong commodity share in exports (for example, Australia, Canada, Chile, Iceland and New Zealand), and (iii) a centralized wage bargaining framework (for example, Finland and Sweden).

[6] The regulation issued in 1994 stated that the central bank should aim at a stable exchange rate against European currencies (interpreted as against the euro since January 1, 1999) based on the range of the exchange rate that had prevailed since the krone was floated on December 10, 1992. If significant changes in the exchange rate were to occur, the central bank was to use its policy instruments with a view to returning the exchange rate back to its initial range over time, that is, Norges Bank was operating a managed float. No fluctuation margins were established, nor was there an obligation to intervene in the foreign exchange market. The central bank interpreted the non-existence of margins to indicate that the initial range was a broad indication of a central rate around which the krone could fluctuate.

that influence price and cost inflation expectations to such an extent that changes in the exchange rate become self-reinforcing.[7]

The government's decision to adopt the inflation targeting regime was linked to the decision to increase the non-oil fiscal deficits over this decade.[8] A fundamental change in the fiscal policy framework, which limited the scope for using public finances to manage aggregate demand, obliged the government to give monetary policy more leeway for stabilization. Moreover, the new framework implies a sustained fiscal expansion, which, everything else equal, is expected to result in an appreciation of the real exchange rate. This sustained fiscal stimulus would put additional pressure on already scarce resources, and as a response, require a relatively tight monetary stance to contain inflation. Therefore, implementation of the former monetary framework would have been very difficult, as the restrictive monetary policy required to combat domestic cost pressures and keep inflation in line with the euro area would likely have led to nominal appreciation of the currency, thus conflicting with the primary objective of that regime. By setting the inflation target at 2½ percent, a level slightly higher than that of Norway's trading partners, the government indicated its preference for the expected real appreciation taking the form of a higher inflation differential rather than nominal appreciation.

Against this background, this paper presents an early assessment of Norway's inflation targeting framework. It is structured as follows: Section II describes the institutional framework. Section III reviews accountability and transparency of the central bank, as well as its communication with the public. Section IV discusses the design of the framework, while Section V focuses on monetary transmission. Section VI provides a summary and some concluding remarks.

II. Institutional Framework

Independence of the central bank is crucial for successful operation of an inflation targeting framework. The independence of the central bank does not need to extend to the freedom to choose its own goals. The political establishment rightfully takes responsibility for setting the target that is considered to best represent society's preferences. The institutional framework in support of inflation targeting, however, should include a legal framework for the central bank that allows it to use its instruments of monetary policy in the manner it believes will

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[7] See "Monetary Policy Challenges" by the governor, Svein Gjedrem, published in *Aftenposten* on May 3, 1999. The article is posted on the central bank's web-site (*www.norges-bank.no*).

[8] The Long-Term Programme (LTP) specifies an increase in the structural non-oil central government deficit to the level implied by an expected real return of 4 percent on the market value of Government Petroleum Fund assets at the beginning of the year. According to the national budget proposal for 2003, this rule would amount to raising the structural non-oil deficit by an additional 0.2 percent of mainland GDP on average per year to around 4 percent in 2010.

best achieve the objective of low inflation. Successful implementation of the inflation targeting regime also requires a monetary policy instrument that has a stable and predictable relationship with inflation, as well as a decision-making body that functions smoothly. While the institutional design of the Norwegian framework broadly complies with these preconditions of a well-functioning regime, it would benefit from a thorough revision of the central bank legislation formalizing Norges Bank's mandate for price stability and full instrument independence.

A. Goal Independence

The move to inflation targeting was announced by the Norwegian government. The announcement indicated the government's commitment to a fiscal policy supportive of the achievement of the inflation target. At the same time, Norges Bank expressed its view on the draft legislation by sending an opinion to the Ministry of Finance, and posting it on its web-site after the announcement of the regime shift. The opinion stressed the fundamental task of monetary policy of providing the economy a nominal anchor, and stated that implementing the new guidelines would not result in a significant change in the practical conduct of monetary policy. In addition, the central bank emphasized the need to continue the strong interaction between fiscal and monetary policy to ensure stable economic development.

The level of the inflation target was set by the government against the backdrop of a planned long-term fiscal expansion that could result in real appreciation. To strengthen political ownership and public support for the new policy regime, it was natural for the government to set the target reflecting society's preferences, in contrast to the central bank, which the public would assume to prefer a more stringent target (see Debelle and Fischer, 1994). By setting the level of the target, the government also clearly signaled its preferred mix between inflation and nominal exchange rate movements that would bring about the real appreciation that is expected to result from the more expansionary fiscal policy.[9] At the same time, Norges Bank played an active role in the public debate by discussing the consequences of inflation and signaling its views on an appropriate level of the target. This was useful to minimize the potential risk stemming from the government's possible short-term political incentives to announce a target implying an above-optimal long-term rate of inflation. Norges Bank officials have continued to contribute to this discussion through speeches and articles on inflation targeting and the role of fiscal policy in the economic policy mix.

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[9] The real exchange rate, q, can be defined as the real price of foreign currency, such that $q \equiv \frac{s\,p^*}{p}$, where s is the spot nominal exchange rate, and p and p^* are the domestic and foreign price levels, respectively. Taking log differentials, $\dot{q} = \dot{s} + (\pi^* - \pi)$, where π and π^* are the domestic and foreign inflation rates and a dot represents the growth rate. This equation implies that if the inflation differential is kept in line with trend real appreciation, there will not be a tendency for the nominal exchange rate to depreciate or appreciate over the medium-term.

B. Instrument Independence and Decision Making

Norges Bank has the instrument independence to conduct monetary policy in order to achieve the target. The new mandate for conducting monetary policy established on March 29, 2001 allows Norges Bank to implement monetary policy to achieve its primary objective of low and stable inflation. In practice, Norges Bank will achieve this goal by setting its key short-term rates on the basis of an overall assessment of the inflation outlook. Norway did not, however, change its central bank legislation relating to the government's right to instruct the central bank[10] and the possibility of having to grant loans to the government within specific limits.[11] The Norwegian approach is in line with the practices of other inflation-targeting central banks in industrial countries, that did not see a pressing need to immediately revise their central bank legislation after the adoption of the inflation targeting framework. Moreover, eliminating the risk of monetization is an even smaller priority in the case of Norway where the overall fiscal situation is projected to remain strong. However, the credibility of the framework—following a successful and smooth adoption of the new regime—would benefit from a thorough revision of the central bank legislation which would formalize both the Norges Bank mandate for price stability and its operational independence.

Norway has chosen to use the short-term interest rate as its instrument for monetary control. Research by Norges Bank suggests that changes in short-term interest rates tend to have a considerable effect on inflation, though the lags involved in the transmission process are fairly long. The key monetary policy instrument is the interest rate on banks' deposits with Norges Bank, that is, the sight deposit rate. The Executive Board sets the sight deposit rate and the overnight lending rate, which normally form a corridor for short-term money market rates. Both deposit and lending rates are standing facilities, while liquidity is supplied and withdrawn through a multi-price auction of fixed-rate deposits and loans provided against collateral. Since Norges Bank ensures that the banking system has aggregate deposits in the central bank, the deposit rate has become the banks' marginal investment rate, whereas the overnight lending rate has only limited monetary policy significance. The interest rates on Norges Bank's market operations and short-term money market rates normally remain fairly close to the deposit rate at the floor of the corridor.

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[10] Under the legislation, the Norwegian government continues to have a right to instruct the central bank, which, in principle, could undermine the independence and accountability of Norges Bank. However, Andreassen and others (2001) argue that the right of instruction should be interpreted only as a formal statement of the government's final say in all economic policy questions. The right of instruction has never been used to influence specific monetary policy decisions.

[11] The legislation is stricter in relation to long-term credit, which is allowed only in special circumstances. In practice, all of the government borrowing takes place in private markets. For further details, see Norges Bank Act of May 24, 1985.

The Executive Board of the central bank is responsible for the implementation of monetary policy. The Board is appointed by the government (formally the King), and consists of seven members. The governor and deputy governor serve as the chairman and deputy chairman of the Executive Board, respectively, and they are appointed for six-year terms. The other five members, who are from outside the bank, are chosen by the government for four-year terms from a group of candidates presented by parties that have representation in parliament. The Executive Board works as a unified group and the members of the Board share collective responsibility for Norges Bank's decisions.

Appointing an Executive Board consisting of members with their primary expertise lying in finance and economics could strengthen the central bank's independence. The current system of nominating appointees selected by political parties involves a risk that members might be criticized if they do not follow a political line represented by their party. Indeed, this would argue in favor of the current practice to refrain from publishing the Executive Board meeting minutes. Moreover, if the members of the Board are not chosen on the basis of their professional qualities, the ability of the Board to question the central bank's professional assessment could—especially in complex economic circumstances—be limited, increasing the possibility that the Executive Board's views could be dominated by the bank officials. On the other hand, if the members of the Executive Board were appointed as professionals, they could more readily be held responsible for the successful conduct of monetary policy. This would not only enhance the independence of the board from political influence, but also reinforce its credibility in the eyes of the general public.[12]

The inflation outlook presented three times a year in the *Inflation Report* serves as a benchmark for monetary policy decisions. The assessment presented in the *Inflation Report* constitutes an important reference point for the Executive Board. The Executive Board meets regularly every three weeks, and a brief update of the economic situation is presented. Every other meeting is a monetary policy meeting,[13] in which the Executive Board assesses the most recent economic developments and their possible implications for monetary policy. Special emphasis is placed on substantial deviations from the analysis presented in the *Inflation Report*

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[12] This would not necessarily imply that political parties could not continue to nominate candidates nor that all the candidates should be distinguished economists. The system should, however, ensure that the government has a sufficient number of qualified candidates representing a wide range of skills when it chooses the members to the Executive Board. For further discussion, see Andreassen and others (2001).

[13] Monetary policy decisions can also be made between monetary policy meetings, if required by the economic situation.

which may require changes in either interest rates or in the monetary policy bias.[14] At a separate meeting, the Minister of Finance is informed of the proposed decision of the Executive Board.[15]

III. Accountability, Transparency, and Communication with the Public

Accountability, transparency, and communication are often mutually reinforcing attributes of an inflation-targeting regime. While central banks operating successful inflation-targeting regimes have often been granted a considerable amount of independence, the framework should also ensure that the central bank is held accountable for achieving the targets. Similarly, the design of the framework should make sure that the policy decisions are made transparently, making it easy for the public to understand how the central bank operates and to assess its performance. Transparency is enhanced by clear, timely, and adequate communication with the public. The *Inflation Report* presenting the inflation forecast constitutes the single most important communication vehicle of Norges Bank in this regard.

A. Accountability

Norges Bank provides an account of its implementation of monetary policy to the government in its *Annual Report*, which is also made available to parliament. If actual inflation deviates significantly from its target (with particular emphasis placed on deviations outside the ± 1 percentage point range), the central bank will provide a thorough assessment of this in its Annual Report. Similarly, if the central bank is not—for some reason—able or willing to bring the inflation rate back to its target within the target horizon, it would need to provide an explanation. Norges Bank also provides an evaluation of its forecast errors in the journal *Economic Bulletin*, and a summary of it is presented in the *Inflation Report* once a year. Moreover, the Ministry of Finance provides a report regarding activities in the central bank to parliament at least once a year.

The accountability of the framework could, however, be strengthened if there would be regular hearings on monetary policy in parliament. Such testimonies—given by the governor and other senior officials—would establish a useful channel for parliament to question how successful the central bank has been in pursuing its goals. At the same time, testimonies would provide an opportunity for Norges Bank's management to explain how it has conducted monetary policy and why the goals for policy may not have been achieved.

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[14] According to Norges Bank's definition, monetary policy bias, assuming unchanged interest rates, is defined in terms of the probability of inflation being higher or lower than projected in the *Inflation Report*.

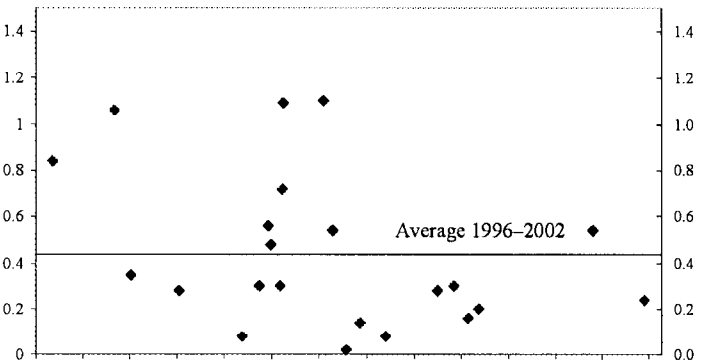
[15] Although the Council of State may adopt a resolution challenging the decision of the Board, that would require that parliament also be informed about this instruction; while the central bank would also be given the opportunity to express its opinion of the instruction. As mentioned earlier, this procedure has never been used.

B. Transparency and Communication with the Public

Active communication by the central bank strengthens the public's understanding of the inflation-targeting framework. The ex post success of the central bank in achieving its ultimate monetary policy goal, that is, low and stable inflation, is relatively straightforward to assess in the current framework, thereby facilitating the transparency of the framework. Norges Bank has been publishing an *Inflation Report* since December 1994. Each report provides a comprehensive assessment of the overall macroeconomic situation and illustrates the Bank's judgment on the risks surrounding the inflation outlook (for assumptions underlying the central bank's inflation forecast, see Box 1). In addition to the *Inflation Report,* the central bank also employs other supplementary information channels, such as speeches by the governor and newspaper articles, to communicate its view on the economic outlook and to explain how it conducts monetary policy.

Further assessments of the inflation outlook are provided every six weeks in connection with the Executive Board's monetary policy meetings. The central bank issues a press release with the Board's decision after every monetary policy meeting. A press conference is held, where the governor or the deputy governor analyzes the Executive Board's updated view on the inflation outlook and explains the Board's decision. In public, the Executive Board speaks with a unanimous voice, and no minutes of monetary policy meetings are published. While there are different views on whether the framework would benefit from the publication of voting records and/or minutes of the meetings, such a step could send an additional signal of the central bank's policy bias to the markets, and thus reduce the potential for surprise. Moreover, the publication of the minutes would be all the more warranted, if the members of the Executive Board were appointed as professionals who could easily be held accountable for their decisions and would be less prone to potential political pressure.

Figure 2. Predictability of Monetary Policy: Change in Three-Month Money Market Rate Divided by Change in Deposit Rate (absolute value)



Source: Norges Bank.

Norges Bank also uses other supporting information channels to strengthen the transparency of its monetary policy framework. In addition to the publication of the *Inflation Report* and regular press releases, Norges Bank has published several articles, and delivered various speeches and lectures explaining the role of monetary policy and discussing its view on recent economic developments. This has contributed to the public's understanding of what monetary policy can and cannot do. It has also clarified the range of issues that the central bank should be held responsible for, thus strengthening the accountability of the regime. Furthermore, additional analysis is provided in both the *Inflation Report* and the quarterly *Economic Bulletin*, where the use of modeling tools and the assessment of the Norwegian economy are discussed in more detail. The market reactions to changes in Norges Bank's key policy rate suggest that monetary policy may have become somewhat more predictable in recent years (Figure 2). However, according to a recent survey by

Box 1. Norges Bank's Inflation Forecast

Reliable forecasts of inflation are essential for the effective conduct of monetary policy because of the lags between monetary actions and their impact on inflation. Inflation targeting is necessarily a forward-looking regime, and the inflation targeting central banks of industrial countries usually rely on large-scale macroeconomic models to form their inflation forecasts. Additional models that simulate the monetary transmission channel or the impact of various shocks on the economy are often used to support the analysis. Norges Bank's inflation projections are based on analyses of the most significant relationships in the economy, and on key assumptions about economic policy and international conditions. The central bank's macroeconomic model, RIMINI, is an important forecasting tool in this work. Results from supporting models that have been developed to study special issues are incorporated in the model, and it provides the basis for the projections published in the *Inflation Report*.

The central bank's inflation forecast employs several technical assumptions underlying the baseline scenario. First, interest rates are expected to remain unchanged at the present level over the next two years.[1] Second, the exchange rate is assumed to remain unchanged at the average level that prevailed for the last three months over the forecast period. Third, Norges Bank has its own forecast for oil prices, which is constantly compared with the market's assessment based on the pricing of futures and options in the oil market. Fourth, the central bank uses its own assessment of the fiscal stance.

The central bank also uses survey data and long-term interest rates to acquire supplementary information on inflation expectations. Norges Bank uses survey data such as *Consensus Forecast* to obtain information about financial market observers' inflation expectations. Since September 2002, the central bank also has used data from a quarterly expectations survey that is conducted among financial experts and academics in Norway. The survey is conducted by Norsk Gallup on the central bank's initiative and Norges Bank is planning to expand the survey to include households and enterprizes in 2003. In the absence of inflation indexed bonds, Norges Bank also observes developments in the ten-year forward rate, which can be interpreted as a sum of expected long-term money market rates and any maturity premiums, to measure changes in inflation expectations, although limited liquidity in Norwegian money and bond markets may distort this information. Moreover, the central bank monitors the long-term forward rate differential against Germany to estimate the impact that developments in international money and bond markets have on Norwegian forward rates.

The forecast presented in the *Inflation Report* is a result of the central bank's overall macroeconomic assessment including qualitative judgment of the risks to the economic outlook. The uncertainty surrounding the baseline inflation forecast and the central bank's assessment of the various risk factors represent essential additional information for judging how the central bank's view on inflation outlook may develop. The central bank's baseline forecast is presented as the mode of a probability distribution assuming unchanged interest rates, and the distribution surrounding the forecast signals the central bank's view about the balance of risks. If the risks are not perceived as being balanced around the baseline forecast, this results in a asymmetrical, skewed distribution, which can be interpreted as the bank's view of interest rate developments ahead, i.e., its monetary policy bias.

As the central bank gains more experience in operating the framework, it could consider making its inflation forecasts conditional on an optimal time-varying interest rate path. The current system of assuming constant interest rates creates some problems for inflation forecasts. As presented in Svensson (2001a), these include (i) non-optimal interest rate paths that are unlikely to materialize,

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[1] For possible problems associated with the use of constant interest rate assumption, see the *Selected Issues* paper volume for the 2000 Article IV consultations with the United Kingdom, "Issues Relating to Inflation Targeting and the Bank of England's Framework," (IMF Country Report No. 00/106).

Box 1 (*concluded*). Norges Bank's Inflation Forecast

(ii) tendency of inflation to deviate from its target in backward-looking models, and indeterminacy of forecasts using forward-looking models, and (iii) sub-optimal forecasts for inflation and other macroeconomic variables. As shown in IMF Country Report No. 00/106, if the central bank assumes a constant interest rate path in formulating its inflation forecasts and policy decisions, it could actually take much longer than the target horizon to bring inflation back to target following a shock. Moreover, a constant interest rate assumption combined with the use of markets expectations for exchange rates and other asset prices would lead to a systematic internal inconsistency of forecasts. As an alternative, the central bank could consider constructing inflation and macroeconomic forecasts based on an optimal time-varying interest rate path that incorporates all of the available relevant information. This would produce better and internally-consistent forecasts. Moreover, as the central bank's policy intentions become credible, the difference between the central bank's forecasts and market expectations for inflation and interest rates should diminish. Ultimately, this would mean that the central bank could use market values of exchange rates and asset prices as inputs for its forecasts.

Norges Bank has a long tradition of making detailed inflation forecasts, and it has developed sophisticated forecasting capabilities. The macroeconomic projections underpinning the inflation forecast in the *Inflation Report* are based on the central bank's macroeconomic model, complemented by smaller models and all relevant information available. These projections and analyses—supported by continuous assessment of new information affecting the inflation outlook—provide a basis for the central bank's interest rate decisions. Norges Bank's inflation forecasts have been fairly accurate, and the projections have not shown any significant systematic errors. The forecasts for the following year have been particularly reliable with the main reason for the forecast errors in recent years being unpredictable international price developments. Average absolute error (AAE) and average relative error percentage (RRMSE) presented in the table below sum up the accuracy of the forecasts for the period. AAE indicates the size of the average forecast errors in percentage points, while RRMSE penalizes large forecast errors more heavily than small ones, and indicates the size of the error relative to actual change. This permits a comparison of the size of forecast errors between the variables. In 1994-2000, Norges Bank's estimates were relatively accurate compared with the other two institutions, although the differences especially regarding inflation forecasts were rather small.

Average Forecast Errors by the Ministry of Finance (MoF), Norges Bank (NB) and Statistics Norway (SN) for 1994-2000.

		MoF	NB	SN
Mainland GDP	AAE 1/	1.09	0.91	1.20
	RRMSE 1/	0.39	0.37	0.58
Consumer prices	AAE	0.49	0.41	0.43
	RRMSE	0.30	0.29	0.23

1/ Absolute average error (AAE) is defined as $(1/N)\sum_{n=1}^{N}|y_n - \hat{y}_n|$, where y_n represents the actual growth rate and $\hat{y}_n$ is the projected growth rate. Relative root mean square error (RRMSE), in turn, is defined as $\sqrt{1/N\sum_{n=1}^{N}((y_n - \hat{y}_n)/y_n)^2}$.

Source: Norges Bank, *Economic Bulletin* 1/2002.

Norges Bank (*Inflation Report* 1/2002), it still appears that interest rate decisions in Norway have been somewhat less predictable than in comparable European countries.

IV. Design of Framework

The Norwegian inflation-targeting framework has several characteristics similar to those adopted in other industrial countries. Although no uniform design of an inflation targeting framework exists that would be appropriate for all countries, the Norwegian regime has many of the properties that are considered essential for the efficient conduct of monetary policy. These relate to (i) the level and horizon of the target, (ii) the formulation of the target and the central bank's objective function, (iii) the relevance of a chosen target index, and (iv) the trade off between a point target and a target range.

A. Level and Horizon of Target

The principal long-term objective of monetary policy is to achieve low and stable inflation with an operational target for annual consumer price inflation set at 2½ percent. This inflation target is slightly higher than the targets in Canada, the euro area, and Sweden, for example, but equivalent to targets in Australia and the United Kingdom (Table 2). The current inflation target is also somewhat above the level Norges Bank was aiming at during recent years.[16] The choice of the target level must, however, be seen in relation to the introduction of the new fiscal framework, which is likely to lead to higher cost and wage inflation (see Section II above). At the same time, the target is still consistent with the aim of low inflation, given the possibility that the consumer price index could overestimate the actual increase in the cost of living,[17] and the somewhat higher target is expected to alleviate real wage flexibility in the presence of downward nominal wage rigidities. The inflation target is approximately in line with the average inflation rate in Norway in the 1990s.

Norges Bank set a two-year time horizon for achieving its inflation target to allow for lags in monetary transmission. The two-year horizon limits the need for excessive changes in interest rates and thus, in output. Furthermore, if unexpected shocks occur that would push the inflation rate away from the target, the bank has reserved the option to extend the time horizon

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[16] Although the difference between 2 percent (at maximum) and 2½ percent appears small, the resulting cumulative real appreciation over time can be substantial and difficult to reverse.

[17] For an assessment of the potential overestimation of actual cost of living in the United States by the use of the CPI, see The Boskin Report (1996). An assessment by Statistics Norway (Koht and Sandberg, 1997) suggests that the Norwegian consumer price index also overestimates annual inflation somewhat, although the study does not provide an exact quantification of this bias.

Table 2. Comparison of Inflation Targeting Frameworks

	Australia	Canada	Iceland	New Zealand	Norway	Sweden	The United Kingdom
			Institutional Framework				
Full instrument independence	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Primary objective of monetary policy	Price stability plus other objectives	Price stability	Price stability	Price stability	Price stability	Price stability	Price stability
Target set by	Jointly by government and central bank.	Jointly by government and central bank	Jointly by government and central bank	Jointly by government and central bank	Government	Central bank	Government
Commitment period and target horizon 1/	Indefinite; on average over the economic cycle	Multi-year target reviewed periodically; 18-24 months	Annual intermediate targets before committing to the long-term target; 2 years	Indefinite; 18-24 months	Indefinite; 2 years	Indefinite; 2 years	Indefinite; 2 years
Price index	CPI (excludes interest charges)	CPI	CPI (excludes mortgage interest charges)	CPI (excludes interest charges and section prices)	Underlying CPI (analysis, policy decicions and evaluation based on CPI excluding changes in energy prices and indirect taxes)	CPI (analysis and policy decisions based on underlying index excluding changes in mortgag interest costs and indirect taxes)	All items retail price index, excluding mortgage interest charges (RPIX)
Point target or target range	Target range of 2-3 percent	Target range of 1-3 percent	Point target of 2.5 percent with +/-1.5 percentage point range by 2004	Target range of 0-3 percent	Point target of 2.5 percent	Point target of 2 percent with +/- 1 percentage point range	Point target of 2.5 percent
			Accountability and Transparency				
Main communication vehichle	Statement on monetary policy	Monetary Policy Report	Monetary Bulletin	Inflation report	Inflation report	Inflation report	Inflation report
Policymaking body	Reserve Bank Board	Governing Council	Board of Governors	Governor	Executive Board	Monetary Policy Committee	Monetary Policy Committee
Minutes of meetings published	No	No	No	No	No	After 2 weeks	After 2 weeks
			Operational Issues				
Operating target	Overnight interest rate	Overnight interest rate	Two-week repo rate	Overnight cash rate	Sight deposit rate	Weekly repo rate	Short-term repo rate (approximately two weeks)
Inflation forecasting	Macroeconomic model	Macroeconomic model, various indicators	Time-series models, various indicators, assessment of inflation expectations	Macroeconomic model, survey on inflation expectations	Macroconomic model, various indicators, private sector surveys	Macroeconomic and supporting models, economic and financial market indicators, private sector surveys	Macroeconomic and supporting models, economic and financial market indicators, surveys on inflation expectations
Interest rate assumption	Not communicated	Not communicated	Not communicated	Optimal interest rate path	Unchanged interest rate and forward rate	Unchanged interest rate and forward rate	Unchanged interest rate and forward rate

1/ In this context commitment period refers to the time over which the central bank commits to achieving the targeted inflation rate, whereas target horizon applies to the policy horizon within which inflation target is expected to be achieved.

beyond two years in order to avoid an unnecessarily high real economic cost in returning inflation back to the 2½ percent target.[18] A prerequisite for this would, however, be that there is strong confidence in low and stable inflation. Norges Bank would provide an assessment of any special circumstances that prompts it to apply a time horizon different from two years.

The chosen target horizon allows flexibility in the conduct of monetary policy. The choice of a relatively long target horizon is viewed as beneficial in providing the central bank with more room to react to shocks and prevent excessive interest rate instability. Moreover, the longer target horizon is likely to have a positive side effect of limiting fluctuations in output and employment compared with a more stringent alternative, in which potential deviations from the inflation target would need to be counteracted with aggressive discretionary measures in order to bring inflation promptly back to the targeted level.[19] The resulting positive trade-off between inflation and output variability is likely to increase as the credibility of the framework builds up, since short-term deviations from the target will not result in shocks to inflation expectations, which would, in turn, have an impact on future inflation and output.

B. Central Bank's Objective Function: Role of Exchange Rate and Output Gap

The exchange rate plays an important role in the conduct of monetary policy in small open economies. First, it provides additional transmission channels for monetary policy by affecting the relative prices between domestic and foreign goods, and thus influencing aggregate demand for domestic goods. A change in aggregate demand, in turn, is likely to have a lagged impact on inflation. Moreover, the exchange rate also has an effect on consumer price inflation both directly via imported consumer goods and indirectly via imported intermediate inputs (see Section V for further discussion). Second, the exchange rate is an asset price determined by expectations, underlining the forward-looking nature of monetary policy. This means that the authorities need to consider how changes in monetary policy will influence market expectations since they are likely to have an immediate impact on the current exchange rate, which, in turn, would have an effect on future inflation. Third, foreign disturbances may be transmitted to the domestic economy, and thereby to inflation, through the exchange rate, which will have implications for the conduct of monetary policy.

Operating a "flexible" inflation targeting framework may help to stabilize the real exchange rate. Although exchange rates are by nature volatile asset prices and subject to various shocks other than inflation expectations or interest rates, research on open-economy inflation targeting supports the view that an approach that gives some consideration to real economic variables ("flexible inflation targeting") may contribute to smaller fluctuations in the nominal

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[18] The nature of the shock, however, has not been defined. For example, New Zealand has an escape clause that only allows a breach of the target when a well-specified supply shock hits the economy.

[19] The use of longer horizon does not imply, however, that the Norges Bank should restrain from decisive and timely action if its forecast for inflation two years ahead deviates from its target.

exchange rate compared with an approach focusing solely on inflation ("strict inflation targeting"). The rationale is the following: The inclusion of output gap stabilization in the central bank's objective function is likely to lead to less activist policy—in most circumstances—and thereby, smaller changes in interest rates, which, everything else equal, would also reduce exchange rate variability. Moreover, as the framework gains more credibility and thereby stabilizes inflation expectations, this would help to control a major source of shocks to both interest rates and exchange rates. Indeed, simulations presented in Svensson (2000) suggest that a flexible CPI-inflation-targeting framework helps stabilize the nominal and real exchange rates, as well as the output gap, without a considerable increase in inflation compared with the alternative of strict inflation targeting. In practice, flexible inflation targeting would involve applying a somewhat longer target horizon for bringing inflation back to its target and allowing relatively large short-term deviations from the target when major shocks hit the economy.

Gains from including the exchange rate in the central bank's objective function are not apparent and there is an ongoing debate over whether an inflation-targeting central bank in a small open economy should include the exchange rate in its objective function.[20] Indeed, although excessive exchange rate variability is often considered detrimental, an exchange rate movement can be an effective shock absorber, helping to stabilize the economy either through changes in trade volumes or in the profitability of producers. Moreover, since the pass-through from exchange rates to final consumer goods prices has often been rather limited in mature industrial economies, exchange rate movements may help stabilize output without a considerable impact on consumer price inflation. This suggests that as long as medium-term price stability is not in doubt, monetary policy should not be concerned with the exchange rate per se (Clinton, 2001).[21] [22]

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[20] Sutherland (2001) argues that in the case of complete pass-through, the variance of the exchange rate in the central bank's objective function should be given a weight of zero. However, with incomplete pass-through, the weight can be negative or positive, depending on the openness of the economy, the elasticity of labor supply, and the relative degree of pass-through in import and export prices. A negative weight implies that increasing the variance of the exchange rate would improve welfare.

[21] Batini, Harrison, and Millard (2001), in contrast, argue that a modification of the inflation-forecast-based rule à la Batini and Haldane (1999) which includes an explicit response to the real exchange rate increases welfare marginally. Inclusion of the real exchange rate in the objective function reduces slightly its volatility, as well as the disparity between volatility of the output gap in the traded and non-traded sectors.

[22] In practice, a direct concern about the exchange rate for an inflation-targeting central bank has fallen out of favor. One way to take account of the exchange rate while setting monetary policy is to use a Monetary Conditions Index (MCI), which combines a short-term interest rate with an exchange rate index. Stevens (1998) discusses potential problems associated with use of MCIs in implementing monetary policy. For an assessment of the Federal Bank of New Zealand's experience in using MCIs, see Svensson (2001).

Norges Bank views low and stable inflation as a fundamental precondition for the medium-term stability of the Norwegian krone. Such stability is expected to be achieved by establishing a predictable anchor for inflation and exchange rate expectations. The exchange rate is allowed to float freely in the foreign exchange rate markets, and the central bank is not targeting any specific krone exchange rate. Norges Bank's interpretation of its mandate suggests that the bank will react to changes in the exchange rate only to the extent that these changes are expected to influence inflation. While foreign exchange interventions are, in special circumstances, potential instruments—should the exchange rate move to a level not considered reasonable on the basis of economic fundamentals—Norges Bank would consider intervening only if this would help stabilize inflation.

However, continued emphasis on the goal of exchange rate stability could compromise the credibility and transparency of the framework. Given Norway's long history of targeting the exchange rate, the New Regulation on Monetary Policy may have added uncertainty about the ultimate goal of monetary policy by stating the importance of maintaining a stable currency on par with domestic price stability in the first sentence of the regulation. This could prove to be harmful if markets decide to test whether the monetary authorities are willing to promote the stability of the krone even when the change in the value of the krone exchange rate is not likely to threaten the goal of price stability. As achieving exchange rate and inflation stability may be conflicting goals under certain circumstances, stabilizing inflation should be the overriding objective for monetary policy to ensure the success and credibility of the framework. Indeed, the potentially limited welfare gains resulting from the inclusion of the exchange rate in the central bank's objective function (see footnote 20), the fact that exchange rate stability may be very difficult to deliver[23], both in the short and medium term, and the potential to undermine credibility argue against committing to nominal exchange rate stability. Moreover, continued focus on exchange rate stability could also interfere with the aim of anchoring the public's inflation expectations to Norges Bank's target level, particularly in the wage setting process. In practice, however, Norges Bank has emphasized that stable expectations concerning the exchange rate are to be achieved by implementing a monetary policy aimed at low and stable inflation, not by targeting a certain level of the exchange rate. Moreover, Norges Bank has underlined that it will react to a change in exchange rate only to the extent that the change is likely to have an impact on inflation.

According to the new guidelines, monetary policy also aims at contributing to stable developments in output and employment. In the presence of demand shocks, inflation is likely to deviate from its target in the same direction as the output gap, and therefore, monetary policy would need to react in the same direction to stabilize both inflation and the output gap. Moreover, since the output gap is often a useful predictor of future inflation under these circumstances, a forward-looking inflation targeter, such as Norges Bank, already implicitly bases its policy

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[23] Using monetary policy to offset the expected real appreciation of the krone resulting from the prolonged fiscal expansion would be particularly difficult and increase the risk of serious overheating and probably, a deep recession.

decisions on information about output and employment. However, supply shocks, such as movements in terms of trade—which are very common for small open economies such as Norway—or changes in indirect taxes, tend to shift inflation and output in opposite directions. These shocks pose a dilemma for policymakers, since stabilizing inflation and output require conflicting monetary policy actions in the short term. Indeed, bringing inflation rapidly back to the target could be very costly in terms of lost output.

There are several ways to accommodate supply shocks in an inflation-targeting framework, even if output stability is not explicitly included in a central bank's objective function. These include: (i) choosing a target that excludes the first round effects arising from probable supply shocks (see Section C below for discussion), (ii) allowing a greater variation of inflation around its target by the use of inflation target bands (see Section D below), and (iii) adopting a somewhat longer target horizon that permits bringing inflation back to its target more gradually, as well as including explicit escape clauses in central bank legislation that make it possible to extend the target horizon in case that a severe shock hits the economy. As shown in Svensson (1997), the rate at which inflation is adjusted toward the inflation target is directly related to the weight on output stabilization in the central bank's objective function. Thus, bringing inflation back to its target gradually is likely to reduce output fluctuations.

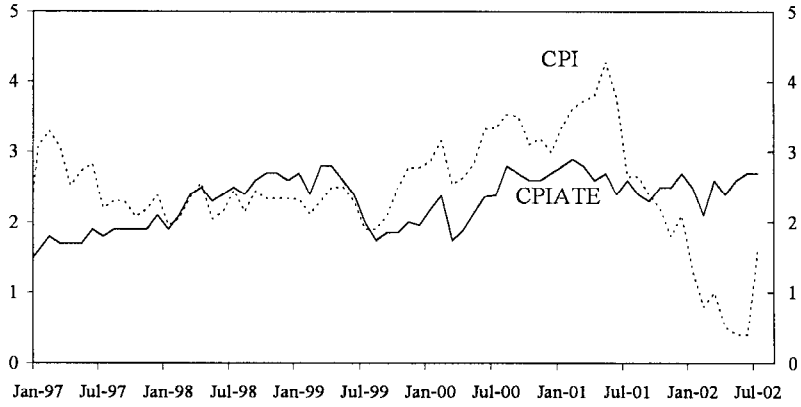
C. Relevance of Chosen Target Price Index

According to the New Regulation on Monetary Policy, its operational target "shall be annual consumer price inflation of approximately 2.5 percent over time." However, since substantial changes in the inflation rate may at times occur as a result of extraordinary fluctuations in certain product markets or changes in direct and indirect taxes, the new regulation also states: "the direct effects on consumer prices resulting from changes in interest rates, real taxes, and excise duties, and extraordinary temporary disturbances, shall not be taken into account." Therefore, in assessing its monetary policy and presenting its inflation forecast together with the associated uncertainty, Norges Bank uses the consumer price index adjusted for the direct effects of changes in real taxes and energy prices (CPIATE). By the two-year horizon the CPI and CPIATE are expected to converge.

In recent years, changes in energy prices and indirect taxes have caused increased volatility in the consumer price index. Electricity and fuel prices represent a large share of the overall CPI, and substantial fluctuations in these components have made it more difficult to

gauge general inflation tendencies simply by focusing on changes in the headline CPI (Figure 3). Also, changes in indirect taxation and excise duties have been a source of temporary fluctuations in price inflation, thus arguing for the exclusion of these items when assessing monetary policy. At the same time, however, no adjustments are needed to eliminate the effects of interest rate changes since the housing component of the headline measure of consumer price index (CPI) excludes direct interest costs.[24] Furthermore, interest expenses are not directly included in other components of the CPI either, and thus, the direct effects of interest expenses on the CPI appear negligible.

Figure 3. Headline CPI and CPI Adjusted for Changes in Real Taxes 1/
(percent change, year-on-year)



1/ CPIATE: Norges Bank's estimates up to July 2000, thereafter figures published by Statistics Norway.
Sources: Statistics Norway and Norges Bank.

The publication of the underlying index by an independent agency strengthens the credibility of the framework. In October 2001, the country's statistical agency (Statistics Norway) began publishing information on CPI adjusted for changes in real taxes and energy prices (CPIATE).[25] Norges Bank had previously published charts of a corresponding series (CPIXE) dating back to 1995, but it is currently making use of the CPIATE index to assess consumer price inflation adjusted for temporary disturbances. Historical series for the CPIATE are available from August 1999 onward, but the publication of a combined history of CPIXE and CPIATE would be helpful for analytical purposes.

D. Target Range Versus Point Target

The guidelines state that consumer price inflation is expected, as a general rule, to be within a 1 percentage point deviation from either side of the target. This formulation of the inflation target avoids several potential pitfalls. First, a margin provides the central bank with more flexibility to respond to shocks, and makes target breaches less likely than in a framework

[24] In contrast to those of Sweden and the United Kingdom, the Norwegian CPI measures housing costs by a survey-based house rent index instead of estimating mortgage costs.

[25] This was accompanied by a publication of CPI adjusted for changes only in real taxes (CPIAT) and continued publication of CPI adjusted for changes in the prices of energy prices (CPIAE). For further information on how these indices have been constructed see a press release published by Statistics Norway on October 10, 2001 (www.ssb.no).

with a pure point target. Second, the range of the margin signals in advance the central bank's tolerance for deviations from the target's midpoint, with a relatively narrow range providing a clearer anchor for inflation expectations. Third, using a point target with a margin avoids the risk that the top of the range, rather than the midpoint, is viewed as the target. Fourth, although the relatively narrow margin could increase the risk of limited controllability over target breaches, this potential threat is substantially reduced by the adoption of a relatively long target horizon, the use of a measure of underlying inflation when assessing monetary policy performance, and the escape clause that allows the central bank to apply a longer horizon for achieving the target if a large unexpected shock hits the economy.

V. Monetary Policy Transmission Mechanism

In a small open economy, the policy transmission between changes in the main monetary policy instrument and inflation operate through various direct and indirect channels. The impact of an interest change operates mainly through the (i) interest-rate, (ii) credit, and (iii) exchange-rate channels. The efficiency of the channels depends both on the situation prevailing at the time of the change and on the way the policy change is perceived. Moreover, the structure and the health of the financial system define how effectively the changes in the policy rate will be transmitted to market rates and whether the monetary policy tools can be applied efficiently without a concern about their implications for the stability of financial institutions.

A change in the monetary policy stance is likely to affect aggregate demand through a change in real interest rates with a considerable lag. Changes in policy interest rates are transmitted into money market rates, and as most of the loans of the financial sector are linked to these rates, discretionary changes in the monetary policy stance tend to have a substantial, lagged impact on consumption and investment, as well as an immediate effect on house and securities prices. Furthermore, a change in the monetary policy stance affects inflation expectations which, in turn, have a lagged effect on inflation via wage and price setting behavior. Research by Norges Bank using historical data confirms that changes in interest rates affect aggregate demand with a considerable lag. Excluding transmission through the exchange rate and formation of expectations, an interest rate increase of 1 percentage point reduces mainland GDP growth by ¾–1 percentage points within two years, after which the effect is partly reversed. The inflation rate, in turn, is reduced by 0.2–0.35 percentage points after two years and by 0.3–0.4 percentage points after three years, respectively.[26]

The monetary transmission mechanism also operates through the credit channel. The supply of bank credit is affected by changes in monetary policy. If a tightening of monetary policy causes a substantial decline in banks' assets and the banks are unable to offset this fall, bank lending is likely to contract. Given the lack of substitutes for obtaining funds, especially among small firms, borrowers may find it difficult to obtain funding from non bank sources, thus forcing them to reduce their activities. Moreover, if balance sheets of firms and households are already

[26] Norges Bank, *Inflation Report* 4/2000.

vulnerable, a rise in interest rates may have a much stronger contractionary impact on the economy than if only the traditional interest-rate channel were operational.

In Norway, the financial system appears to be sound enough to allow an unconstrained use of monetary policy (see Norges Bank's Financial Stability Report 1/2002). While a prolonged period of rapid credit growth has increased the debt burdens in both the enterprise and household sectors, and enterprises have become more vulnerable to a possible economic downturn, the credit risk associated with the household sector is still considered to be relatively low (its net financial position has remained positive) and banks' financial strength still appears satisfactory. Moreover, although banks' strong lending growth has not been matched by corresponding accumulation of deposits, banks have been able to acquire funds through borrowing from both domestic and international capital markets. While this would imply that the effectiveness of domestic monetary policy may have diminished somewhat and that banks could have become more vulnerable in the event of a possible asymmetric shock hitting the Norwegian economy, the overall strength of the financial system indicates—as long as the economy was not facing a rapid and prolonged contraction—that monetary policy is likely to have its impact on aggregate demand mainly through its traditional impact on consumption via disposable incomes and wealth effects rather than through limited supply of credit.

In an open economy like Norway, the exchange rate provides an additional channel for the monetary policy transmission. However, assessing the historical relationship between monetary policy and the krone exchange rate is hampered by Norway's long history of a fixed exchange rate regime. Hence, the effect of changes in the key policy interest rate on the exchange rate is largely undocumented, and depends on the underlying causes of a change. If the key policy rate is raised in response to domestic developments—for example, to close a positive output gap to dampen inflationary pressures—the higher interest rates are likely to lead to nominal appreciation of the currency. Changes in the real exchange rate[27] contribute to the aggregate-demand channel for the transmission of monetary policy by affecting the relative prices between domestic and foreign goods, and, in turn, the demand for these goods. The exchange rate also affects the domestic currency prices of imported final goods and imported intermediate inputs, which have both direct and indirect implications for consumer price inflation. Simulations using Norges Bank's RIMINI-model, assuming that uncovered interest parity holds,[28] indicate that an appreciating nominal exchange rate accelerates the impact of an increase in interest rates on consumer price inflation compared with the situation where the interest rate operates only through the real economy.

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[27] In a low-inflation environment, short-term changes in real exchange rates mostly stem from changes in nominal exchange rates.

[28] Thus, when the interest rate is raised by 1 percentage point for two years, UIP implies an immediate 2 percent appreciation of the exchange rate, which is followed by a gradual depreciation to the initial level over the next two years.

A shift from a managed float exchange regime to the floating of the krone may also strengthen the transmission mechanism of interest rate changes through the credit channel. In the managed float system, where the expectations about the level of the medium-term exchange rate were more stable, a tightening of the monetary policy was likely to result in a positive interest rate spread, creating an incentive for domestic market participants to tap into foreign sources of funding, and thus, limiting the efficiency of monetary policy. In the current system of a floating krone, increased uncertainty concerning the future value of the krone exchange rate is likely to limit borrowers' appetite for foreign currency denominated loans due to increased exchange rate risk, which could contribute to increased monetary policy efficiency.

VI. Conclusions

The formal adoption of the inflation-targeting regime was a concluding step on Norway's gradual but consistent path toward greater exchange rate flexibility. At the same time, the new framework maintains and strengthens the authorities' commitment to low and stable inflation. The operation of the new regime, however, is not likely to fundamentally change the way monetary policy is conducted in practice, since in the past few years, the inflation rate aimed at in the euro area was serving as a de facto intermediate target for achieving medium-term exchange rate stability.

The institutional framework is broadly appropriate for successful implementation of monetary policy. By choosing an inflation target of 2½ percent, the government indicated its preference in terms of the composition of the real exchange rate appreciation, which is expected to result from the decision to use the expected real return of the Government Petroleum Fund to increase non-oil fiscal deficits. Norges Bank is responsible for the practical conduct of monetary policy in accordance with the chosen inflation target by setting its short-term key rates on the basis of an overall assessment of the inflation outlook. Norway did not, however, revise its legislation completely and the government in principle still has the right to instruct the central bank in special cases. While the decision to abstain from full revision of the central bank legislation is in line with the practices applied in most other industrial countries that have adopted inflation targeting, a comprehensive reform of the legislative framework formalizing the inflation target and the operational independence of the central bank would strengthen the credibility of the regime.

Norges Bank provides an account of the conduct of monetary policy in its *Annual Report* and the transparency of the framework is fostered by the easily intelligible anchor for monetary policy and adequate communication with the public. Moreover, the central bank has sophisticated inflation forecasting capabilities, and its projections are presented in the *Inflation Report* that is published three times a year. The accountability and transparency of the regime could, however, be strengthened by holding regular hearings on monetary policy in parliament, and publishing the minutes of monetary policy meetings.

The design of the framework acknowledges several special characteristics of the Norwegian economy. While the configuration of the regime seems compatible for Norway, it shares several institutional and operational practicalities that have already been applied successfully in industrial

countries operating inflation targets. The key practical characteristics of the framework are the following:

- The 2½ percent level of the inflation target recognizes the consequences of more expansionary fiscal policy, signals the desired mix of the expected real appreciation, and is broadly in line with the corresponding levels aimed at by Norway's main trading partners.

- The framework's focus on inflation two years ahead allows for substantial lags in monetary transmission, and is likely to contribute to greater instrument and output stability. Moreover, the central bank has an option to change the target horizon in special circumstances, which it would, however, need to explain publicly.

- The regulation includes the objective of internal and external stability of the krone. While this provides continuity with the previous monetary policy regime, the continued reference to the exchange rate could potentially compromise the credibility and the transparency of the framework and could interfere with the formation of the inflation expectations around Norges Bank's target.

- The range of the margin signals in advance the central bank's tolerance for deviations from the target's midpoint, while the relatively narrow, ±1 percentage point range provides a clear focus for inflation expectations.

The new framework provides a more flexible monetary regime that is consistent with Norway's overall economic policy framework. The experience from other industrial countries suggests that the institutional and operational features adopted in Norway establish a solid foundation for the successful implementation of monetary policy.

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