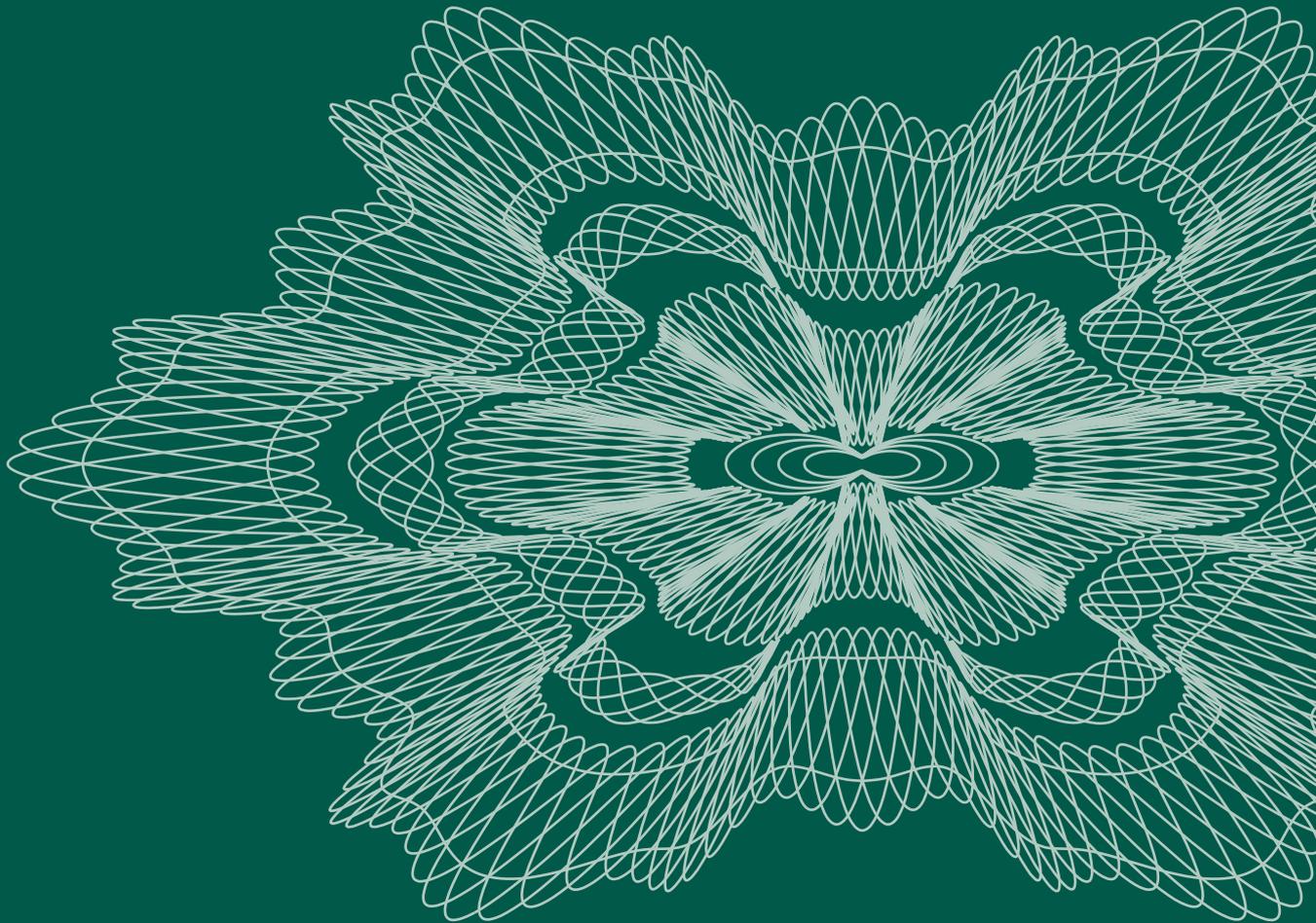




# Economic Bulletin

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August



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The Economic Bulletin is published quarterly by Norges Bank

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Printed at: Reclamo AS, Oslo

ISSN 0029-1676

*Standard signs used in the tables:*

.	Category not applicable
..	Data not available
...	Data not yet available
-	Nil
0	} Less than half the final digit shown
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# Monetary policy, forecasts and market communication

Speech given by Central Bank Governor Svein Gjedrem at the Norwegian School of Management's Centre for Monetary Economics, 7 June 2001

The long-term objective of monetary policy is to contribute to low and stable inflation. Price stability is the best contribution monetary policy can make to economic growth and prosperity. A nominal anchor is also a necessary precondition for stable financial markets and property markets. We cannot achieve higher employment in the long run by accepting higher inflation. On the contrary, the experience of our country and that of others in the 1970s, 1980s and 1990s is that periods of high inflation are followed by downturns with high unemployment. High and variable inflation also leads to an arbitrary redistribution of wealth and income.

This spring, the Government assigned a new operational mandate for monetary policy to Norges Bank. Norges Bank shall set the key rate with a view to maintaining low and stable inflation. The inflation target is set at 2½ per cent. I will use this occasion to elaborate on our interpretation of the mandate and to discuss how it will affect the conduct of monetary policy.

The inflation outlook is presented three times a year in Norges Bank's Inflation Reports, and forms a basis for the Bank's interest rate decisions. Further assessments are presented every six weeks in connection with the Executive Board's monetary policy meetings.

## Mandate, interpretation and implementation

New Zealand was the first country to introduce an inflation target in 1989.<sup>1)</sup> Chile followed in 1990, Canada in 1991, the UK in 1992, Sweden, Finland and Australia in 1993 (Finland until 1998), Spain in 1994 (until 1998) and Iceland and Norway in 2001. A number of emerging market economies like the Czech Republic and Poland, as well as Israel, South Africa and Brazil, have introduced inflation targets in the last few years.<sup>2)</sup> The ECB shall direct its monetary policy instruments towards price stability, which the bank has defined as inflation of less than 2 per cent. The target of the Swiss central bank has a similar formulation. In the US, price and employment stability are equally important. Experience with inflation targets has generally been good. Low and stable inflation has underpinned economic growth and employment. The fact that conditions were favourable for low inflation and renewed growth in many countries following the downturn and high unemployment in the early 1990s may also have contributed positively.

Norway introduced an inflation target during a different phase of the economic cycle. We have experienced a prolonged upturn. The labour market is tight. High labour force participation and demographic conditions indicate that the possibility for further growth in the

labour supply is limited. In addition, reforms that reduce the supply of labour were implemented. At the same time, because of our large petroleum revenues, the Norwegian authorities do not face the same budget constraints on their fiscal policy as other countries faced when they introduced inflation targets. Several of the OECD countries have substantial budget surpluses now, however. Finland expects a budget surplus of 5.3 per cent of GDP this year.<sup>3)</sup> New Zealand and Ireland have introduced fund schemes where they invest their budget surpluses in anticipation of higher pension disbursements later in this century.

The new Regulation on Monetary Policy was adopted on 29 March 2001. Section 1 reads as follows:

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

*Norges Bank is responsible for the implementation of monetary policy. Norges Bank's implementation of monetary policy shall, in accordance with the first paragraph, be oriented towards low and stable inflation. The operational target of monetary policy shall be annual consumer price inflation of approximately 2½ per cent over time.*

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

Storting Report no. 29 of 2001, "Guidelines for economic policy" states:

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

The inflation target of 2½ per cent over time is slightly higher than the targets in Sweden, Canada and the euro area, but corresponds to targets in the United Kingdom and Australia. In the US, consumer price inflation has been somewhat higher the last ten years. The target is approximately in line with the average inflation rate in Norway in the 1990s.

In our view, with its change in monetary policy, the Government has recognised low inflation as a benefit in

<sup>1)</sup> From 1931-1933 Sweden had a regime defined as "and with all existing means to preserve the domestic purchasing power of the Swedish krona" (my translation). This must be interpreted as an inflation target.

<sup>2)</sup> A. Schaechter, M. R. Stone og M. Zelmer: "Adopting Inflation Targeting: Practical Issues for Emerging Market Countries". IMF Occasional Paper 202. Washington 2000.

<sup>3)</sup> OECD Economic Outlook no. 69 - table "General government financial balances"

itself. History has shown that high inflation does not result in either sustained economic growth or lower unemployment rates. A track record of low inflation since 1990 has provided Norges Bank with a good basis for implementing monetary policy even though, as I mentioned, the inflation target was introduced during an upturn.

Higher interest rates curb demand for goods and services and reduce inflation. Lower interest rates have the opposite effect. If evidence suggests that inflation will be higher than 2½ per cent with unchanged interest rates, the interest rate will be increased. If it appears that inflation will be lower than 2½ per cent with unchanged interest rates, the interest rate will be reduced. There is symmetry here. It is equally important to avoid an inflation rate that is too low, or deflation, as it is to avoid an inflation rate that is too high. When the annual use of petroleum revenues is managed according to a long-term action plan, a policy for which there is currently fairly general political consensus, we should normally be able to use the interest rate as a policy instrument to prevent high inflation. Normally, monetary policy should also be a fairly effective means of countering a deflationary recession. Stagflation, ie stagnating output and rising unemployment combined with rapid inflation, which characterised economic developments in many countries in the 1970s and 1980s, originates in the supply and output side of the economy or in income determination. If the Norwegian economy should ever be threatened by stagflation tendencies, monetary policy must be directed towards maintaining low and stable inflation. At the same time, structural policy and incomes policy should contribute to improving the functioning of the economy, allowing economic growth and employment to pick up.

A change in interest rates is not expected to have an immediate effect on inflation. Our analyses indicate that a substantial share of the effects of an interest rate change occurs within two years. Two years is thus a reasonable time horizon for achieving the inflation target of 2½ per cent. Therefore, the inflation outlook in two years may be viewed as a derived objective in monetary policy.

In some situations, where unexpected events lead to an inflation rate that is too high, it may be appropriate to apply a longer time horizon than two years. For example, reducing inflation to 2½ per cent within this time horizon may be associated with unnecessary real economic costs. A precondition for applying a longer time horizon is that there is clear evidence of strong confidence in low and stable inflation over time on the part of economic agents. Gradually, as we gain experience with setting interest rates according to an inflation target, the possibilities for placing emphasis on stability in the real economy will probably increase.

Low and stable inflation is a necessary precondition for stability in the foreign exchange and financial market and the property market. However, there have also been episodes where bubbles have accumulated in these markets, in the form of sharp increases in asset prices, while inflation has been low. Price increases in property and financial markets may have a considerable impact on wage growth and consumer price inflation after a period.

When the bubbles burst, the result may be an economic downturn. In this way, developments in financial and property markets may be a source of a more unstable inflation environment. In principle, it would be appropriate to use the interest rate to counter this. In practice, however, it is difficult to assess whether price trends in property and financial markets are sustainable.

When Norges Bank concludes that the key rate should be changed, the change will in most cases be made gradually. This is because there is normally uncertainty about the situation in the economy, potential disturbances to the economy and how fast an interest rate change will affect price inflation. But we will not always take a gradualist approach. A rapid and pronounced change in the interest rate is appropriate if, for example, heightening turbulence in financial markets or a cost-push shock resulting from negotiations indicates that confidence in monetary policy is in jeopardy. And should there be prospects of a deflationary recession, it would be appropriate to apply our instruments more firmly.

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

In the long run, inflation is determined by developments in domestic costs, productivity growth and imported inflation. A special feature of wage formation in Norway has been that conditions for exposed industries have received considerable emphasis in the wage negotiations, including the negotiations for industries that do not face international competition. During the last few years, the sheltered sector has had greater influence on overall wage developments. The centralised income settlements in Norway have been an arena of coordination, where macroeconomic considerations have at times received considerable emphasis. This has contributed to maintaining low unemployment. But we have also experienced that the income settlements may be a source of economic disturbances. The income settlements in the mid-1970s and 1986 had the strongest negative impact. The settlements in 1998 and 2000 also fuelled high cost inflation.

## Retrospective evaluation of monetary policy

Today's inflation rate is partly the result of the interest rate that was set one to two years ago. Therefore, today's consumer price index figures provide a basis for assessing the results of the monetary policy conducted some years ago.

Monthly figures for the consumer price index are influenced by random or temporary factors that have little impact on developments in inflation over time. Electricity prices are affected by precipitation levels. Changes in indirect taxes have an immediate impact on the consumer price index. The direct effects of these factors on inflation will be non-existent after a year. Hence, they will not have any significance for the interest rate, which is normally set with a view to maintaining inflation at 2½ per cent two years ahead.

However, it is still interesting to adjust monthly inflation figures for temporary effects to determine whether developments are broadly in line with our projections. Norges Bank analyses and presents figures for consumer price inflation where the effects of some temporary factors are excluded. In April, the year-on-year rise in the consumer price index was 3.8 per cent. Figures were affected by sharp increases in both electricity and petrol prices and by higher indirect taxes. Excluding electricity and petrol prices and adjusting for changes in indirect taxes, price inflation was approximately 2½ per cent, which is in line with the current inflation target.

It should be pointed out, however, that our adjustment of the figures may overestimate these effects. We assume, for example, that increases in indirect taxes are passed on in their entirety to the consumer. In practice, changes in indirect taxes are often shared by manufacturers and consumers based on the intensity of the supply-and-demand reaction to price increases. In addition, increases in electricity prices are not only the result of last year's low precipitation levels in Western Norway and higher electricity taxes. Other, more permanent conditions may also have contributed. The increase in petrol prices leads to higher prices for other goods such as transport services and we have not adjusted for this. However, adjusting inflation figures for direct effects of one-off factors can also be associated with pitfalls. Higher indirect taxes and an increase in petrol and electricity prices may be a source of accelerating inflation, via spillover effects on other prices and wages.

Other countries with inflation targets adjust the consumer price index for temporary and random factors in a variety of ways. In the UK, changes in interest rates have a strong, direct impact on the consumer price index. The Bank of England aims at an inflation target that is adjusted for such effects.

In New Zealand, the inflation target is formulated as the rate of increase in the consumer price index, but the mandate specifies factors for which adjustments may be made. These factors include price changes due to substantial changes in commodity prices, changes in excised duties, considerable changes in economic policy that directly impact prices, as well as natural disasters. There are no fixed current indicators that make adjustments for these factors, but adjustments are made if the effects are substantial.

In Sweden and Canada, the inflation target is formulated as the rate of increase in the consumer price index without special exclusions. However, in practice, indices for underlying inflation are used in the implementation and assessment of monetary policy. Sweden's Riksbank often refers to an indicator that adjusts for the direct effects of interest rates and net indirect taxes. The Bank of Canada has now defined a new indicator as the operational target of monetary policy. This indicator is the consumer price index excluding the eight most volatile components: fruit, vegetables, petrol, heating

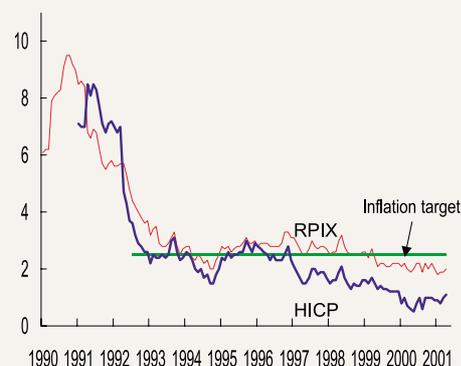
oil, natural gas, domestic air travel, tobacco products and interest costs. Adjustments are also made for the effect of indirect taxes.

The consumer price index is compiled to show developments in the cost of living. To some degree, the index overestimates developments in the cost of living. This is partly related to the fact that the measurement method does not adequately capture quality changes in the service industry. The Boskin Report (1996) discovered that the US CPI overestimated the actual cost of living increase by 0.8-1.6 percentage points annually. Statistics Norway has assessed the measurement error for the Norwegian consumer price index.<sup>4)</sup> The conclusion is that the Norwegian index also overestimates developments in the cost of living but that the deviation is probably well below one percentage point annually.

National consumer price indices are constructed in various ways. For example, there are differences in the goods and services included, the relative weights assigned to the goods and services included and the frequency with which the weights are adjusted. In addition, the method of weighting the various sub-indices – ie whether the arithmetic or geometric mean is used – may also affect the growth rate. Eurostat's Harmonised Index of Consumer Prices (HICP) represents a standard that facilitates the comparison of countries.

The national index in the UK is calculated by using arithmetic means, whereas geometric means are used for the harmonised index. Several items in the national index are not included in the harmonised index, for example costs related to housing (house depreciation, council tax and building insurance). In contrast, air fares, university accommodation fees, foreign students' university tuition fees and payments by residents for nursing and retirement homes are excluded from the national index but included in the harmonised index. Year-on-year figures in April showed a difference of nearly one percentage point between the Bank of

**Chart 1.** Consumer price inflation in the UK measured by the RIPX and HICP. Annual rate



Sources: Office for National Statistics and Eurostat (Datastream)

<sup>4)</sup>B. Koth and L. Sandberg: "Kilder til målefeil i konsumprisindeksen" (Sources of measurement errors in the consumer price index) Økonomiske analyser 5/97. Statistics Norway Oslo 1997

England's index (RIPX) and the HICP. This index, which is tied to the inflation target, showed an increase of 2 per cent in the last 12 months, whereas the harmonised index showed an increase of 1.1 percentage points. Different treatment of housing costs pushed the national index up by more than ½ percentage point compared with the harmonised index. Different weighting methods accounted for a similar proportion of the increase. Different weights reduced the rise in the national index by nearly ¼ percentage point compared with the harmonised index.<sup>5)</sup>

## Predictability, transparency and communication

Central banks control the volume of central bank liquidity or the interest rate on this liquidity. Most central banks use the interest rate on intra-day liquidity. In Norway, this is the interest rate on banks' sight deposits with Norges Bank, the sight deposit rate. Banks' net position vis-à-vis Norges Bank fluctuates around zero. By comparison, household and private sector domestic gross debt amounts to roughly NOK 1500 billion, whereas the total money supply is approximately NOK 750 billion. Our key rate has a direct influence on a very small portion of the overall money and credit market. Monetary policy would not affect price inflation if our key rate only influenced the interest rate on the amount outstanding between the central bank and the banks. We are dependent on a spillover effect on interest rates on debt in the household and enterprise sectors.

The link between these variables and the key rate runs through market expectations and the yield curve. Long-term interest rates that are determined by the market reflect expected future short-term rates, uncertainty and risk premiums. Interest rates on money market instruments with maturities of more than one day will be influenced by expectations about changes in Norges Bank's key rate in the future. The interest rate on instruments that mature in one week will be a weighted average of expected interest on one-day instruments in the days up to maturity. Similarly, three-month rates reflect both prevailing and expected future overnight rates. If economic agents believe that Norges Bank will reduce interest rates in the next few weeks, three-month rates will be lower than the interest rate on krone-denominated assets with shorter maturities. Similarly, if economic agents believe that Norges Bank will raise interest rates in the next few weeks, three-month rates will be higher than interest rates on krone-denominated assets with shorter maturities.

If there is confidence in monetary policy, changes in Norges Bank's key rate will have little effect on long-term interest rates. These rates will then primarily be determined by the required rate of return on capital

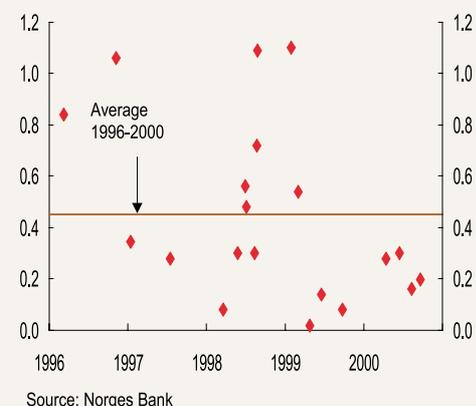
raised in the international capital market. If confidence in economic policy deteriorates, for example because Norges Bank sets interest rates so low that inflation and unstable exchange rates are expected, long-term interest rates will rise. The cost of low confidence is thus high risk premiums and unnecessarily high long-term interest rates.

Transparency in our intentions, strategies and implementation of monetary policy may contribute to reducing uncertainty among economic agents. If monetary policy is predictable, an important source of risk is diminished. Thus, all else being equal, the interest rate that is necessary to achieve the inflation target will be lower. There will then be a better chance of achieving the inflation target without frequent and abrupt changes in the key rate. Predictability may contribute to ensuring more stable developments in demand and output.

Thus, a predictable monetary policy may contribute to improving the efficiency and impact of monetary policy. Predictability and transparency are often equated. However, increased transparency does not necessarily imply a higher degree of predictability. Many observers regard the Bank of England as a very transparent central bank because it presents its assessment of the economic outlook in its inflation reports and publishes the minutes of the Monetary Policy Committee meetings. A report<sup>6)</sup> prepared by Dr. Sushil Wadhvani, a member of the MPC, indicates, however, that the Bank of England's interest rate changes in the period 3 June 1997 – 18 April 2001 have come as more of a surprise to market participants than interest rate changes in continental Europe and the US during the same period. The same study indicates that the element of surprise has waned over time.

In Norway, it appears that transparency in Norges Bank's interpretation of the mandate and in the implementation of monetary policy has contributed to making monetary policy somewhat more predictable. Chart 2

**Chart 2.** Predictability in monetary policy. Change in 3-month money market rate divided by change in the deposit rate (absolute value)



<sup>5)</sup> <http://www.statistics.gov.uk/pdfdir/cpi0501.pdf>

<sup>6)</sup> Wadhvani, S.B: "Some Reflections on the MPC". Speech to the National Association for Business Economics. Washington 21 May 2001

shows that Norges Bank's changes in the key rate have less impact on money market rates now than earlier.

The academic literature on transparency and monetary policy is extensive and growing. "How Do Central Banks Talk?"<sup>7)</sup>, a report prepared by a number of well-known academics and presented recently at the Center for Economic Policy Research, specifies the objectives that central banks should bear in mind when developing their strategy on transparency. The report says the following: "Transparency should allow the public to understand, and possibly anticipate, the central bank's decisions, to see each of them as the logical conclusion of a chain of past and future decisions aimed at a clear set of targets..."

This view of transparency and predictability contrasts sharply with the earlier practice of playing on the element of surprise. In monetary policy, this was associated especially with steering the exchange rate. Gradually, economic policy met distrust and high premiums for uncertainty. The effects of changes in monetary policy instruments became increasingly uncertain. Nevertheless, a desire for predictability must not precede the demand for an interest rate setting that the central bank deems to be correct. The expectations of other economic agents must not control the setting of interest rates. There are a number of examples from countries with "transparent" monetary policies where interest rate changes have come as a surprise. This may be partly due to the fact that the central bank had a different view of the outlook for economic developments. The inflation outlook may also change rapidly and prompt rapid and possibly pronounced interest-rate adjustments.

Transparency may be discussed in relation to:

- objective function
- reaction function
- analyses
- views on how interest rates affect price inflation
- assessment of the inflation outlook and the balance of risks

Norges Bank has sought to contribute to transparency by presenting its interpretation of the mandate and by explaining the implementation of monetary policy. In *Inflation Report 4/2000*, we presented our view of how interest rates affect price inflation in Norway.

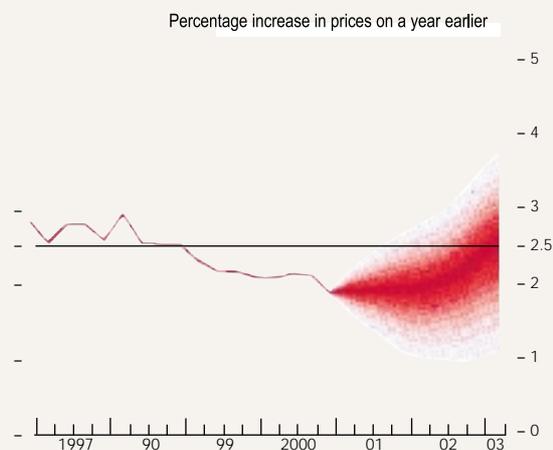
In principle, the more discretion and flexibility the monetary policy objective implies, the more complex and subtle communication must be. Monetary policy requires the continuous exercise of discretion. The exercise of this discretion is limited, however, by Norges Bank's mandate and our interpretation of it. Furthermore, we have contributed to restricting the exercise of judgement by being transparent in our response pattern, our analyses of economic developments and our assessment of the results of the monetary policy that has been conducted.

Central bank communication varies from one country to another. The various solutions reflect different objectives and institutional parameters as well as different histories and cultures. Therefore, in my view, we should be cautious about recommending a specific country's choices and solutions as a norm.

The Reserve Bank of New Zealand is required by law to submit a Monetary Policy Statement at least twice a year, and these reports are published quarterly in the form of inflation reports. The reports include an account of an interest rate path that will contribute to keeping inflation consistent with the target. The official Cash Rate, New Zealand's key interest rate, is reviewed once between reports, at a pre-announced time. Decisions regarding the Cash Rate are published immediately, accompanied by a commentary. The Reserve Bank Governor is responsible for achieving the target, and for making decisions.

In the Bank of England, interest rate decisions are made by the Monetary Policy Committee, which has nine members. Four of the members are external economists appointed by the Chancellor of the Exchequer. In practice, they work full time for the central bank, but they are not part of line management. The Bank of England presents an inflation report four times a year. The report is prepared by the Bank's administration, but the work is directed by the Committee. The report provides projections of economic growth and inflation. The Bank of England has developed a method that illustrates the Committee's subjective view of the uncertainty associated with forecasts for GDP growth and inflation. Uncertainty increases with the time horizon, so that the illustration of uncertainty takes the form of a fan. (See Chart 3) The fan chart has gradually acquired a central role. The introduction to the report states: "Although not every member will agree with every assumption on which our projections are based, the fan charts represent the MPC's best collective judgement about the most likely paths for

**Chart 3.** The Bank of England's fan chart: Projections at constant rates of 5.25%. May 2001 RPIX fan chart.



Source: Bank of England

<sup>7)</sup> Blinder, A., C. Goodhart, P. Hildebrand, D. Lipton, C. Wyplosz: "How Do Central Banks Talk?" Report to be presented at the Third Geneva Conference on the World Economy on May 4, 2001

**Table 1.** Overview of projections and communication from various central banks

	Inflation outlook/ inflation report	Future policy bias?	Collective or individ. resp. decision-making body?	Minutes of meetings published?
New Zealand	Inflation report	Optimal interest rate path	One decision-maker	–
UK	Inflation report	Implicit – fan charts	Individual	After 2 weeks
Sweden	Inflation report	Implicit – fan charts	Individual	After 2-4 weeks
Euro area /ECB	Staff projections	–	Collective	No
US	Inflation outlook	Implicit, assessment of balance of risks	Collective, but voting disclosed	After 6 weeks, transcript after 5 years
Australia	Inflation report	After assessment	Collective	No
Canada	Inflation report	–	One decision-maker, but council	No
Norway	Inflation report	Through probability of interest rate change	Collective	No

inflation and output and the uncertainties surrounding those central projections." The Bank's view of the outlook for the interest rate is not stated directly, but is implicit in the discussion of the fan around the inflation projection and an associated table. Twelve monetary policy meetings are held each year. Decisions are made public immediately, but without an explanation, and meetings are not followed by press conferences. Two weeks after each meeting, the Bank publishes minutes, which make it clear whether there was a lack of consensus in the Committee. Publication of the minutes is required by law. An account of the implementation of monetary policy is provided in the Annual Report. All committee members are free to express their personal views on economic issues and monetary policy.

In Sweden interest rate decisions are also made by a board of experts – the Executive Board. The members work full time, and participate in the daily operations of the central bank. An inflation report expressing the Executive Board's collective view of the inflation outlook is published four times a year. As in the UK, special emphasis is placed on the individual responsibility of the Executive Board members. The individual members' voting and assessments are disclosed. Any lack of consensus regarding the inflation outlook and setting of interest rates emerges from the minutes that are published from two to four weeks after each monetary policy meeting. Grounds are given for decisions on interest rates, but no press conference is held immediately after monetary policy meetings. The Executive Board does not directly announce its stance regarding interest rate movements in the period ahead, but this is implicit from the uncertainty associated with the projection, which Sweden's Riksbank also illustrates by means of a fan surrounding the inflation projection. The Executive Board reports twice a year to the Swedish parliament, the Riksdagen. Sweden's Riksbank has chosen to use two of its four quarterly inflation reports for this purpose. Members of the Executive Board give lectures and express their personal views on economic questions and monetary policy.

In its December 2000 *Bulletin*, the ECB presented for the first time price inflation projections in the form of a broad range. Bank staff prepare the projections. In the ECB's two-pillar system, developments in the first pillar, the money supply (M3), and the second pillar, which comprises other factors that may influence price inflation, are equally important. According to the Maastricht Treaty, the Governing Council shall meet at least ten times a year. Since the implementation of a single monetary policy in January 1999, monetary policy meetings have been held fortnightly. Press conferences are held after every second meeting, but no explicit expression is given of the Bank's stance regarding interest rate movements in the future and the minutes of monetary policy meetings are not published. Members of the Governing Council make individual statements about monetary policy, but the actual interest rate decision is presented as a collective one.

In the US, the Federal Open Market Committee (FOMC) determines the interest rate. The FOMC holds eight pre-announced meetings a year, but has also occasionally changed the interest rate between meetings. Decisions are announced after FOMC meetings. The future policy bias is expressed implicitly through the discussion of the balance of risks with respect to the economic outlook. In a separate press release, the FOMC explains how the formulations may be interpreted. The Federal Reserve does not publish a traditional inflation report like the Bank of England with projections of future developments. However, in connection with the Chairman's semi-annual testimony to Congress, estimates are given of probable ranges for GDP growth, consumer price inflation and unemployment. The minutes of Committee meetings are published after six weeks, and disclose the way individual members have voted. A complete transcript of proceedings is released after five years. Members express individual views on monetary policy.

Norges Bank analyses the inflation outlook in separate inflation reports, which are published three times a year. Further assessments regarding the inflation outlook are

presented every six weeks in connection with the monetary policy meetings at which the Executive Board sets interest rates. Central aspects of the modelling tools and our view of the functioning of the economy are examined in detail in the Inflation Report and in articles in the journal *Penger og Kreditt* and its English counterpart *Economic Bulletin*. The minutes of monetary policy meetings are not published. The Executive Board functions as a unified group in relation to the public.

In Canada and New Zealand, responsibility lies with the central bank governor, and therefore only one view is expressed. In the ECB, Australia, Switzerland and Norway, the decision-making body speaks to the public with one voice. Like Norway, Australia includes external members in the body that makes interest rate decisions.

## Forecasts as communication

Section 2 of the Monetary Policy Regulation states: "Norges Bank shall regularly publish the assessments that form the basis for the implementation of monetary policy." The projections and analyses in the Inflation Report, together with a continuous assessment of the outlook for price and cost inflation and conditions in money and foreign exchange markets, provide a basis for interest rate decisions.

The *Inflation Report* contains analyses and projections for a number of macroeconomic variables. This has been the practice since the first report was published in December 1994. Most other central banks restrict themselves to forecasting price inflation and the output trend. Some also provide estimates of the main components of demand and the labour market. Different practices reflect different histories and cultures. Some central banks place emphasis on the uncertainty of economic estimates, pointing out that this may make them more misleading than instructive. Institutional framework conditions also influence the forecasts at a detailed level. In countries where a decision-making body presents forecasts, each member may have his/her own individual forecast for both developments in the real economy and inflation. At the same time, the body must present a single estimate for price inflation - and developments in the real economy - based on the members' best collective evaluation. Such is the case with the Bank of England. If the members have very different views regarding economic developments, projections for economic variables will lose much of their informational content. Under framework conditions of this nature, it will not be very fruitful to provide detailed estimates of the various demand components in the economy. In some cases, the inflation projection itself may lose some of its informational value. In the UK, there is at times greater interest in the uncertainty surrounding the projection, illustrated by the fan charts, and on the minutes of the monetary policy meetings, than on the inflation report and the actual inflation projection.

Detailed projections may increase the possibility of

checking the consistency of projections over time. They also provide a basis for evaluating whether short-term indicators are in line with the developments expected by the central bank. On the other hand, very detailed projections may suggest that the central bank is more certain about developments than there is actually reason to be. Norway has a long tradition of making detailed forecasts. Economic agents know from experience that point forecasts are very uncertain and presumably regard them with a healthy scepticism.

The analysis and projections in the *Inflation Report* are conditional on a number of economic variables such as fiscal policy, exchange rates and the interest rate. A different trend in these variables could also result in a different course for both the real economy and nominal developments. The assumptions on which the inflation forecast is based must be reasonable and fairly realistic if the forecasts are to function as a basis for decision-making.

The central bank directly influences the sight deposit rate, and thus faces an important question already at the stage of making projections: what interest rate scenario should provide the basis for inflation projections? Practice varies. Generally, more than one interest rate scenario may result in the same inflation projection. The Central Bank of New Zealand is the only central bank that presents its assessment of the optimal interest rate path and uses this as the basis for its inflation projections. The central banks of other countries base their projections on a stylised assumption about the interest rate. Thus, these interest rate scenarios are not necessarily consistent with the interest rate trend envisaged by the central bank. The Bank of England and Sweden's Riksbank base their estimates in the baseline scenario on the assumption that interest rates remain unchanged. Alternative projections based on market expectations regarding future interest rates are also shown.

A number of academics<sup>8)</sup> have argued for using the optimal interest rate scenario as the basis for inflation projections. Their argument is as follows: If the central bank itself does not regard an unchanged interest rate during the forecast period as the most probable scenario, the price inflation projection will not be the most probable one either. Thus, the projection does not provide guidance as to the inflation rate the central bank actually expects.

The projections in Norges Bank's *Inflation Report* are based on the assumption of both an unchanged interest rate and an interest rate scenario based on market expectations. If Norges Bank's projection for price inflation is higher or lower than 2½ per cent, it is an indication that the Bank envisages an interest rate path that is higher or lower than the path on which the projection is based.

There is uncertainty associated with all forecasts. This very uncertainty and the central bank's assessment of the various risk factors constitute important supplementary information. In the *Inflation Report*, the uncertainty associated with the projections is discussed explicitly. We provide an account of the variables that Norges

<sup>8)</sup> See e.g. Alesina, A., O. Blanchard, J. Garli, F. Giavazzi and H. Uhlig: "Defining a macroeconomic Framework for the Euro Area. Monitoring the European Central Bank 3". CEPR London 2001 and Lars E. O. Svensson: Independent Review of the Operation of Monetary Policy in New Zealand: Report to the Minister of Finance. February 2001.

**Table 2.** Overview of degree of detail in projections and interest rate assumptions from various central banks

	Inflation forecast	Forecast GDP growth	Forecast labour market	Interest rate assumption
New Zealand	✓	Output gap		Optimal interest-rate path
UK	✓	✓	–	Unchanged interest rate. Forward rate
Sweden	✓	✓	✓	Unchanged interest rate. Forward rate
Euro area / ECB	Staff projections	–	–	Unchanged interest rate
US	✓	✓	✓	Not communicated
Australia	✓			Not communicated
Canada	✓	✓		Not communicated
Norway	✓	✓	✓	Unchanged interest rate. Forward rate

Bank regards as particularly uncertain, the direction in which this uncertainty points, and how a different scenario could influence the inflation projection. In addition, a fan chart illustrating the uncertainty surrounding the projections is presented (see Chart 4).

Calculations based on alternative assumptions are presented regularly, illustrating the isolated effect on price inflation of changes in assumptions. It provides insight into the effect on price inflation of potential disturbances to the economy.

Our analyses and assessments of the inflation outlook and balance of risks are based on models. The macroeconomic model RIMINI developed in Norges Bank's Research Department has been an important tool for the Bank's analyses since 1994. The model seeks to take account of many of the important relationships in the Norwegian economy. The model combines and takes account of empirical and theoretical knowledge of these relationships as they have functioned in the past, and contributes to a more consistent analysis of the interaction between them. It takes time for structural changes to be captured in the model. It may therefore be useful to

analyse the effects of any structural changes in previously existing relationships. For example, it may be useful to ask whether the effects on consumer prices of changes in the exchange rate are different now that the exchange rate fluctuates more widely than it did in the past.

In our experience it is not possible to make forecasts that prove to be accurate in all respects. By revealing errors, we provide a basis for improving the analysis. Our projections are therefore evaluated regularly. Analyses of forecast errors have been presented four times in the journal *Economic Bulletin*. Excerpts from these evaluation articles are also presented in the *Inflation Report* once a year.

## Concluding remarks

In all countries comparable to Norway, the setting of interest rates, which is the most important monetary policy instrument, is delegated to the central bank. A number of factors help to explain why the exercise of this authority is delegated.

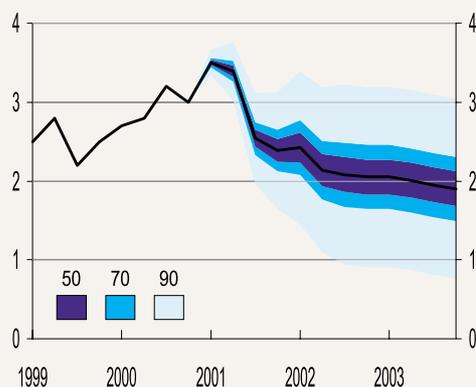
First, monetary policy can well be delegated, because over time there is no real conflict between the objectives of price stability, on the one hand, and economic growth and equitable distribution, on the other. The formulation of objectives and subsequent evaluation of practice make adequate provision for the more short-term considerations.

Second, it is possible to formulate fairly precise objectives for monetary policy and establish reporting routines that ensure that those who delegate authority can subsequently evaluate the implementation. Norges Bank provides an account of its actions in the Bank's Annual Report, and the evaluation of the Ministry of Finance, the Government and the Storting appears in and is based on annual reports to the Storting.

Finally, the need for transparency and communication argue in favour of delegation. As previously mentioned, each monetary policy decision must be consistent with previous and future decisions, and be oriented towards a clearly defined target.

Thank you for your attention.

**Chart 4.** Uncertainty in the inflation projection in *Inflation Report 1/01*. Various probabilities for developments in underlying consumer price inflation, based on historical deviations in the projections



Source: Norges Bank

# The role of assessments and judgement in the use of the macroeconomic model RIMINI

By Kjetil Olsen, Senior Economist, Economics Department and Fredrik Wulfsberg, Senior Advisor, Research Department<sup>1</sup>

**The *Inflation Report's* projections for economic developments are important for Norges Bank's conduct of monetary policy. The macroeconomic model RIMINI is used as a tool in developing these projections. This article provides insight into key aspects of the model's description of the inflation mechanism and how the model is used to make economic forecasts. Assessments and judgement play an important role in this work. The assessments are partly based on systematic analysis of current statistics and information from other models that shed light on temporary factors. Historical forecast errors also provide insight into the use of the model. Knowledge of this kind provides the basis for steering the model in the forecast period. The article also illustrates how the model may be used to study effects of interest rate changes.**

## 1 Introduction

Norges Bank's projections are based on analyses of the most significant relationships in the economy and on key assumptions about economic policy and international conditions. The projections reflect an overall assessment of economic developments. Norges Bank also analyses the effects of monetary policy and the impact of various shocks on the Norwegian economy. Such shift analyses are published regularly in the *Inflation Report*.

The macroeconomic model RIMINI is an important forecasting tool in this work. Smaller models that have been developed to study special issues are also used. The results from this type of analysis are incorporated in the RIMINI model. Thus, the projections published in the *Inflation Report* express an overall assessment of the results from different models and current developments in the Norwegian economy. This article looks more closely at our use of the RIMINI model for projections and analysis, with special emphasis on price and cost inflation and the effects of monetary policy.

RIMINI is a macroeconomic model that has been developed by the Research Department of Norges Bank. The model takes account of many of the most important relationships in the Norwegian economy and explains both real and nominal variables. It combines and takes account of empirical and theoretical knowledge about these relationships as they have functioned in the past and contributes to a consistent analysis of the interaction between them. Using a set of assumptions about future economic policy, among other things, the model provides quarterly projections for developments in the Norwegian economy.

The RIMINI model does not necessarily reflect Norges Bank's view of the economy. However, the model and our use of it provide the basis for the projections and especially for assessing how changes in the assumptions may affect the projections. The model attempts to explain the main systematic features, but not every detail of economic developments. Therefore, as we work on the *Inflation Report*, the model is changed regularly. In addition, we frequently use information from other

models or from current economic developments. Thus, the projections in the *Inflation Report* are not merely a result of the RIMINI model's properties. The assessments of model users are equally important.<sup>2</sup>

Section 2 presents a brief overview of the RIMINI model's scope, structure and background data. Section 3 looks more closely at price and wage formation in the model and how the model is used. Section 4 discusses how we use the model to study the effects of interest rate changes. Section 5 provides a summary.

## 2 General information about the RIMINI model

The RIMINI model is designed to make short and medium-term projections for the Norwegian economy as well as for policy analyses. Within a one-year time horizon, current developments in the Norwegian economy as they are presented in monthly statistics play a prominent role in preparing the projections. For medium-term projections, ie from 2 to 5 years, the model's results are used to a larger extent as guidance in making the projections.

Developments in economic variables depend on a number of mutually dependent mechanisms that are often complex and difficult to quantify. Overall demand, for example, affects both activity level and employment, which in turn determines income levels, which again affect overall demand. Changes in real variables affect nominal prices for goods, services and labour. Therefore, in the RIMINI model, the endogenous variables are determined in a simultaneous system of equations.

The interest rate functions as a monetary policy instrument and is therefore a key exogenous variable in the model. A technical assumption underlying the *Inflation Report's* baseline scenario is that interest rates follow expectations in the money and bond markets as reflected in forward rates. Projections are also made on the basis of unchanged interest rates. The exchange rate is also an exogenous variable in the RIMINI model and the baseline scenario assumes that exchange rates remain unchanged. When the model is used to calculate the effect of changes in different variables such as the interest

<sup>1</sup>We are grateful to colleagues at Norges Bank for their comments and suggestions.

<sup>2</sup> See, for example, Turner (1990) which illustrates the significance of assessments and judgement for economic projections.

rate, the exchange rate is endogenised by, for example, assuming uncovered interest parity. This will be discussed in further detail later in the article. The RIMINI model contains a good 100 exogenous variables that are not determined by the model and which must therefore be estimated outside the model when making projections. In addition to the monetary policy stance, the exogenous variables primarily describe developments among our trading partners, main world market prices and policy variables that describe fiscal policy.

Expectations about future inflation, demand and other economic variables may affect household and corporate behaviour. Expectations formation is not explicitly modelled in RIMINI, but the model contains a number of explanatory variables that may capture economic agents' expectations. To take account of adjustment lags in the economy, the model has been given a dynamic specification where lagged variables play an important role. Forward-dated variables are not included. This does not imply, however, that the model is inconsistent with forward-looking behaviour.

In the RIMINI model, a main distinction is made between production sectors including manufacturing and construction on the one hand and private services on the other. The former may be characterised as internationally exposed sectors, while the latter is largely sheltered from international competition. The public sector, primary industries and the oil and shipping industries are also represented in the model. Economic developments in these sectors are treated exogenously, in contrast to private services and manufacturing and construction. The model not only reflects conditions in the real economy but also financial and monetary conditions. It also includes an income account for different sectors.

The RIMINI model is based on quarterly data. The quarterly national accounts are the most important data source together with other statistics from the national accounting system and from Norges Bank's database for financial sector balance sheets (FINDATR). Other statistical sources also provide important data for the model. The most recent version of the model (RIMINI 3.14) has been calculated on the basis of national accounts figures in accordance with the European National Accounting System (ENS95).

Like other econometric models, the RIMINI model is changing constantly. New knowledge about methods or economic theory will improve the properties of a model based on research. New observations, evaluation of projections and experience in using the model also provide new insight. Computer tools are under constant development as well, making calculations and simulations more precise and effective. The RIMINI model currently comprises 375 equations, 74 of which are estimated behavioural relationships. These equations will contain add factors that capture the unexplained variation in the left-hand-side variables. Later in the article, we will

explain how these add factors may be used when simulating the model to make projections.

The mechanisms and relationships between the model's variables may be regarded as a representation of a large simultaneous probability distribution. However, the number of relationships are too numerous and complex to model simultaneously.<sup>3</sup> Instead, we primarily model single equations separately from the rest. Modelling consists of developing clearly specified single equations where residuals do not contain systematic information that can give the equation increased explanatory power. Further, emphasis is placed on accurate estimation of the parameters and identification of parameters that are likely to be constant over the model's horizon for projections or policy assessments. Finally, the single equations are combined into a complete system.

It is important to use several criteria in evaluating the system's (model's) properties in addition to the properties of the individual equations. First, the individual equations and the model as a whole must be capable of explaining the key features of the data, eg systematic developments and trends in the medium term. The objective is to explain systematic changes in the data and not random variations. Second, the model's long-term equilibrium relationships should be supported by generally accepted economic theory. As the economy is constantly exposed to disturbances, it will seldom be in equilibrium, but there will always be mechanisms that set the economy in motion towards equilibrium. This is taken into account in the modelling of empirical relationships in the model. Third, the dynamic effects of various shocks should be reasonable, and finally, the model should contain acceptable forecast properties.<sup>4</sup> Occasionally, some of the criteria will conflict and must be counterbalanced against each other.

### *Using the RIMINI model*

Some economic relationships are easier to quantify than others. Many of the equations in the model may explain historical trends effectively, while the explanatory power of other equations is poorer. This makes it necessary to correct the model where it clearly shows an unlikely development in the model's variables. Corrections of this kind must of necessity be discretionary. This may be accomplished by steering the add factors in the model's behavioural equations. In the projections, the add factors are used to make the necessary corrections in the model. In the literature, this practice is called intercept correction (see Hendry and Clements (1999)).

For the observed history, an add factor constitutes the unexplained deviation in an equation and is thus an important indicator of the equation's explanatory power. If the equation effectively captures actual developments, the add factor will have an average value of zero. Thus, the add factor does not systematically contribute to

<sup>3</sup> See Jansen (2000) for a detailed discussion of the methodology underlying the work on RIMINI.

<sup>4</sup> Eitheim, Husebø and Nymoen (1999) compare the RIMINI model's forecasting features with alternative model specifications.

explaining the development in the economic variable that is to be explained.

The term "neutral add factor" usually means that the add factor is valued at zero when simulating the model. One interpretation of this is that the add factor does not make an independent contribution to growth in the variable. However, setting an add factor at zero in connection with projections may generate unreasonable results if the latest historical observations of an add factor deviate systematically from zero. If this is the case, a neutral use of the add factor will instead contribute to maintaining this deviation so that the add factor does not make an independent contribution to changes in growth in the variable during the forecast period.

The add factors may also be given a value other than zero in the projections if we have transient or permanent information that we believe is not taken into account by the model's equations. This is exemplified and discussed in further detail in connection with the assessment of the price and wage equations below.

### 3 Wage and price formation

This section discusses how the core of the inflation process is modelled in RIMINI. We also assess the model's features for price and wage determination and comment on our use of the model in this area.

In the model, consumer prices rise in proportion to domestic producer prices and import prices in the long run. Import prices are primarily determined abroad and by the exchange rate, while domestic producer prices are determined in product markets, which are characterised by imperfect competition. The producers have a certain degree of market power such that producer prices are determined by a mark-up on unit labour costs. This means that producers have the possibility of passing on higher costs to prices. As a result, inflation depends both on imported price inflation and the interaction between wage and price formation. Therefore, wage formation is important for price inflation.

#### *Wage determination*

In the RIMINI model, wage determination is based on negotiations between companies and trade unions. The exposed sector is assumed to be a wage leader, as this has traditionally been the case in Norway. Consequently, wage growth in the private, sheltered sector and in the public sector is generally determined by developments in manufacturing industry.

In the long term, unit labour costs (ULC) are determined by consumer prices (CPI), producer prices (PY) and the unemployment level (U). Somewhat simplified, the estimated long-term solution of the wage equation in level terms may be written as follows:

$$ulc = wc - zy = k_1 + 0.58cpi + 0.42py - 0.10u \quad (1)$$

where *WC* is wage costs, *ZY* is productivity and  $k_1$  is a constant. Small letters indicate logarithmic form, eg  $cpi = \ln(CPI)$ . With this function, the coefficients may be interpreted as elasticities. Thus, the equation implies that a 1% increase in consumer prices contributes to increasing unit labour costs by 0.58%, while a 1% increase in producer prices contributes to increasing unit labour costs by 0.42% in the long run. Thus, unit labour costs increase proportionally to consumer and producer prices. At the same time, a 1% increase in unemployment (eg from 5% to 5.05%) contributes to reducing unit labour costs by 0.1% in the long run.

The long-term relationship between labour costs, productivity, prices and unemployment may be interpreted as an expression of the social partners' compromise between wage demands (consumer real wage) and profitability requirements (product real wage). Historically, an increase in consumer prices has triggered wage compensation. Thus, by way of wage negotiations, higher consumer prices contribute to increasing wages. The relationship between unit labour costs and producer prices provides an indication of profitability and thus the business sector's capacity to pay. High profitability in companies will contribute over time to increasing the wage level.<sup>5</sup>

The compromise between wage demands and profitability requirements is influenced by labour market developments. The unemployment level may be interpreted as an expression of the bargaining position between the social partners. The non-linear relationship implies that the situation in the labour market has a somewhat stronger effect on wages when unemployment is low than when it is high. This means that a reduction in the unemployment rate of 1 percentage point will have a more significant impact on wage growth if unemployment falls from 4% to 3% (a reduction of 25%) than if it declines from 10% to 9% (a reduction of 10%).

The long-term relationship (1) indicates the wage level approached by the model in equilibrium. If we move all the variables in (1) to the left-hand side of the equation, we can write the long-term relationship as:

$$ulc - k_1 - 0.58cpi - 0.42py + 0.10u = 0 \quad (1')$$

Since the economy is seldom in equilibrium, the long-term relationship (1') will not be satisfied at all times. This will influence short-term wage growth. If the left-hand side of the equation is greater than zero, the cost level is higher than what is compatible with equilibrium. Thus, wage growth will be reduced in the short run. Similarly, wage growth will increase if the cost level is lower than indicated by the long-term relationship. This represents a self-correcting mechanism in the wage equation which ensures that the wage level moves toward an equilibrium level.

<sup>5</sup> In the December 2000 *Inflation Report*, we discussed the effects of moderating the wage-curling impact of low profitability in the business sector.

However, the movement toward equilibrium will take time. Nominal and real inertia in the economy slow the adjustment towards equilibrium which is modelled in a dynamic wage relationship. According to this wage equation, wage growth ( $\Delta wc_t$ ) is affected in the short run by previous changes in wages ( $\Delta wc_{t-1}$ ) and prices ( $\Delta kpi_{t-1}$ ). This reflects the fact that in general, changing the growth rate in nominal variables takes time. In addition, wage growth varies in relation to productivity growth in the short run ( $\Delta zy_{t-1}$ ). Wage growth also depends on changes in unemployment ( $\Delta u_{t-1}$ ) in addition to the level of unemployment ( $u$ ) as it is included in the long-term relationship. Somewhat simplified, the dynamic wage equation is as follows:

$$\Delta wc_t = a + b_1 \Delta wc_{t-1} + b_2 \Delta cpi_{t-1} + b_3 \Delta zy_{t-1} - b_4 \Delta u_{t-1} - c[ulc - k_1 - 0.58cpi - 0.42pp + 0.1u]_{t-1} + add\ factor \quad (2)$$

where  $a$ ,  $b_1$ ,  $b_2$ ,  $b_3$ ,  $b_4$  and  $c$  are positive variables and the add factor captures the variation in data that is not explained by the other variables on the right-hand side of the equation. The estimated relationship is presented in the appendix. The long-term relationship is in brackets. If the value in brackets is positive, the wage level is higher than indicated by the equilibrium relationship and this contributes to reducing wage growth.

In order to serve as a forecasting tool, RIMINI must be able to explain general developments in data over time.<sup>6</sup> As mentioned in section 2, each equation is evaluated according to a number of criteria. The appendix includes various statistical measures for the wage equation's features evaluated independently of the other equations in the model. Each equation must also be evaluated in relation to how it functions with the other equations in the model's simultaneous equation system. Although the wage equation in isolation has good predictive properties, the model's ability to predict wage growth also depends on the model's ability to explain developments in the endogenous explanatory variables in the wage equation. Only by simulating the entire model is it possible to assess the model's overall predictive properties. This may be done by simulating the model over an historic period when both exogenous and endogenous variables are known. Any deviations between wage projections and actual wage growth may be partly due to the wage equation itself, but may also be due to deviations in important endogenous explanatory variables in the wage equation. These deviations may come from other equations in the model, eg the employment and unemployment equations or the equation for productivity growth. Expressed in another way, poor predictive properties in a single equation may be the source of forecast errors in many of the model's variables. A large part of the assessments made in working with the projections in the

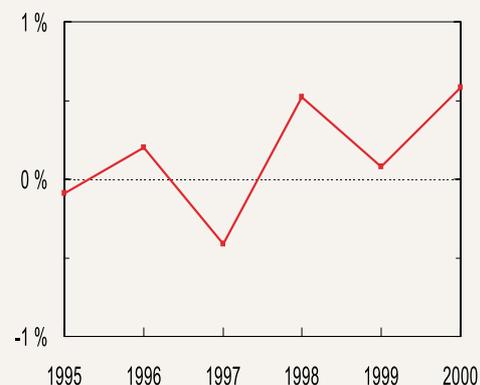
*Inflation Report* consists of explaining these kinds of systematic deviations in equations and adjusting for this in the forecast period. Therefore, projections in the *Inflation Report* are not only based on the model's properties, but also on a systematic assessment of all the estimated equations in the model and their historical contribution to forecast errors. On the basis of this work, we arrive at a set of adjustment factors for the forecast period. Next, we will look more closely at the wage equation's contribution to deviations between the actual, observed values and the simulated values for wage growth and comment on the use of add factors in the wage equation.

### Assessment

Although forecast errors for wage growth may be due to many factors that are not necessarily related to the actual wage equation, the error may also be due to the inability of the wage equation to capture all systematic factors that affect wage growth. While working with our projections, the RIMINI model's simulated add factor values are studied in order to expose such failures, if possible. Chart 1 illustrates the simulated historical add factor values for the wage equation for the years 1995-2000. These add factors illustrate the wage equation's contribution to explaining historical deviations between the model's simulated values and the actual observed values for wage growth.

We see that the add factor in the wage equation has been positive in recent years. This means that the wage equation has generally contributed to underpredicting wage growth in the last half of the 1990s. The positive add factor values may be related to the inability of the wage equation to fully capture the effects of pressures in the labour market when unemployment is low. Chart 1 shows a positive add factor in the wage equation in the years with a main wage settlement, ie in 1996, 1998 and 2000. The add factor was more or less zero in the inter-

Chart 1. Simulated annual add factor values for the wage equation



<sup>6</sup> This is illustrated by a number of examples in Eitheim and Gulbrandsen (2001).

vening years with interim wage settlements, with the exception of 1997, when an expansion of the contractual pension scheme probably contributed to curbing wage growth measured in NOK.

An evaluation of the projections in the *Inflation Report* shows that we also underpredicted wage growth somewhat in 1996, 1998 and 2000. An important reason for this underprediction was that the add factor was set at zero in the projections for these years. Therefore, in the December 2000 *Inflation Report*, we adjusted the add factor in the wage equation. For the years with a main wage settlement (2002 and 2004), we included a positive contribution from the add factor in the projections, whereas the add factor was set at zero in the years with an interim wage settlement (2001 and 2003). The positive add factor contribution was set slightly below the average add factor correction for the last three main wage settlements (1996, 1998 and 2000) and must be assessed on the basis of the tightness of the labour market.

### The consumer price equation

In the consumer price equation, consumer prices (*CPI*) increase in the long run proportionally to unit labour costs (*ULC*) and import prices (*PB*). This means that long-term domestic inflation is a weighted sum of the rise in labour costs and import price inflation. Somewhat simplified, the estimated long-term solution of the equation in level terms may be written:

$$cpi = k_2 + 0.60ulc + 0.40pb \quad (3)$$

Lower case letters indicate logarithmic form as in the wage equation. Thus, equation (3) says that in the long term a 1% increase in *ulc* will translate into a 0.6% rise in the level of consumer prices, while a similar increase in the level of import prices will result in a 0.4% rise in consumer prices.

As with wages, achieving the long-term solution will take time. In the short run, the consumer price equation allows for real and nominal inertia in price formation (see equation 4). First, consumer price inflation today ( $\Delta cpi_t$ ) depends on consumer price inflation in previous periods ( $\Delta cpi_{t-1}$ ). This effect is relatively strong and means that it will normally take time before inflation returns to the starting point after a shock. Earlier import price inflation ( $\Delta pb_{t-1}$ ) and wage growth ( $\Delta wc_{t-1}$ ) also affect consumer price inflation. At the same time, when there are pressures in the economy and the output gap ( $gap_{t-1}$ ) is positive, companies can more easily pass on cost increases to prices than when there are idle resources and the output gap is negative. On the other hand, increased international trade ( $uei_{t-1}$ ) will intensify competition and squeeze profit margins. Somewhat simplified, the dynamic price equation is as follows:

$$\Delta cpi_t = \alpha + \beta_1 \Delta cpi_{t-1} + \beta_2 \Delta wc_{t-1} + \beta_3 \Delta uei_t + \beta_4 gap_{t-1} + \beta_5 \Delta pb_{t-1} - \gamma [cpi - k_2 - 0.6ulc - 0.4ip]_{t-1} + add\ factor_t \quad (4)$$

where  $\alpha$ ,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ ,  $\beta_5$  and  $\gamma$  are positive variables and the add factor captures variation in data that is not explained by the other variables on the right-hand side of the equation. The estimated relationship is presented in the appendix. We recognise the long-term relationship (3), which represents the relationship between consumer prices, labour costs and import prices in equilibrium, in brackets in (4). The long-term relationship contributes to reducing consumer price inflation if the level of consumer prices is higher at the outset than indicated by the long-term solution.

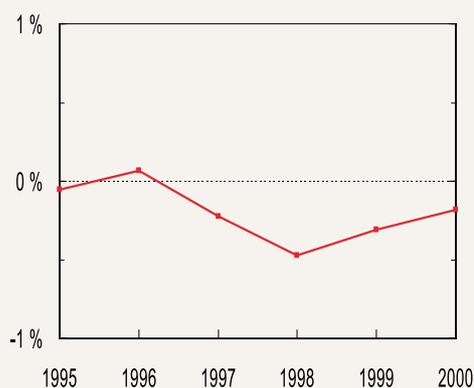
Because the Norwegian economy is open, external inflationary pressures play an important role. In the RIMINI model, import prices are endogenously determined in a relationship where import prices follow foreign export prices in NOK in the long term. It is assumed that foreign export prices are set as a mark-up on producers' costs. This means that import prices in the short term also depend on domestic conditions, such as competition from Norwegian producers and cyclical factors such as demand and unemployment. The estimated consumer price relationship is shown in the appendix together with the equation's statistical properties which have been assessed independently of the others.

### Assessment

We base our assessment of the consumer price equation's contribution to explaining the development on historically simulated add factor values for the years 1995-2000 (see Chart 2). The chart shows that in the last half of the 1990s, the equation's add factor has on average been slightly below zero. This means that the consumer price equation has contributed to overpredicting consumer price inflation in recent years.

This may imply that the constant in the consumer price equation has been overestimated. There may be several reasons for this. One explanation may be that consumer price inflation in the simulation period has in general been considerably lower than the observations on which the estimation of the model's coefficients are based. Another explanation that can probably contribute to explaining the deviations is that a number of factors, such as market deregulation, the liberalisation of trade and increased international competition, are not captured in the equation. Since the mid-1990s, prices for imported clothing have shown a downward trend. This may be seen in the light of intensified competition in the textile industry, a reduction of tariff rates and removal of quota regulations, for example in connection with the 1995 WTO Agreement. Price trends for telecommunication services

**Chart 2.** Simulated annual add factor values for the consumer price equation



and equipment have also been falling the last few years. Intensified competition among an increasing number of market participants and rapid technological developments have triggered the price decline. At the same time, deregulation of the telecommunication services market has probably fuelled the fall in prices for these types of services. The electricity market has also been deregulated, making it easier for companies and private households to change electricity supplier. Increased competition in the electricity market has probably led to lower electricity prices than would otherwise have been the case.

The effects of deregulation and trade liberalisation are difficult to capture in an aggregated price equation such as the one in the RIMINI model. Therefore, these factors may be the cause of the overprediction. However, errors in the historical values that are components on the right-hand side of the price equation cannot be ruled out. If a revision of the national accounts leads to an upward revision of productivity growth the last few years, the model's price forecast will be brought more in line with actual developments.

In view of recent years' experience, with stable negative values in the consumer price equation's add factors, a negative value for the add factor equal to the average over the last few years was used when we prepared the baseline scenario for the December 2000 *Inflation Report*. Such an adjustment may be interpreted as a change in the equation's constant with the result that consumer price inflation for a given development in the right-hand variables will be lower than otherwise. We also adjusted for estimated first-round effects of changes in oil prices, for example, changes in petrol prices. In addition, we adjusted for estimated first-round effects of the indirect tax programme for 2001.

As indicated above, a number of conditions are not captured by the aggregated price equation (4). Therefore, we have developed a set of equations that

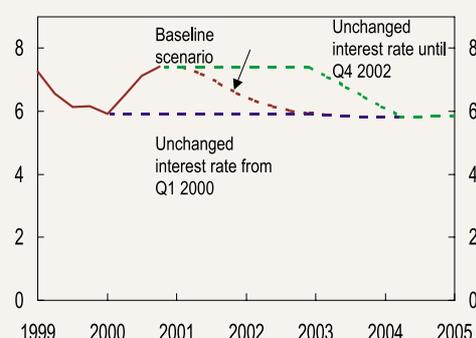
provide a picture of the contributions of the sub-indices in the CPI. This may improve the basis for estimating short-term consumer price inflation and at the same time provide a better basis for analysing current developments in consumer prices. This detailed information will also be useful in adjusting the aggregated consumer price equation.

## 4 Shift analysis

In addition to providing a basis for our assessment of the projections, calculations performed on the RIMINI model are regularly used to analyse the effects of policy changes and various shocks on the Norwegian economy. Norges Bank places particular emphasis on analysing the effect of interest rate changes on the Norwegian economy.

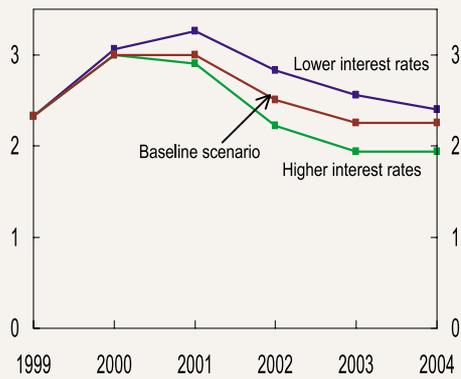
In the December 2000 *Inflation Report*, the RIMINI model was used to illustrate possible effects on the projections of two interest rate scenarios that differed from the baseline scenario (see Chart 3). The projections in the baseline scenario were based on the assumption that interest rates developed in line with market expectations as reflected in forward rates in December 2000. At that time, the market expected a relatively marked decline in money market rates the next two years. In one alternative, we studied the effects of unchanged interest rates the next two years. In the other alternative, we showed what the effects would have been if Norges Bank had kept the key rates unchanged from the beginning of 2000. The projections in the baseline scenario pointed to 2¼% price inflation in 2003. If the interest rate remains high for an additional two years, we suggested that price inflation could be somewhat below 2% in 2003 (see Chart 4). In the alternative where the interest rate was unchanged from the first quarter of 2000, we indicated that price inflation could reach 2½% in 2003. Below we will discuss how the RIMINI model was used in calculating these effects.

**Chart 3.** Different forward rates paths



Source: Norges Bank

**Chart 4.** Annual consumer price inflation with different interest rate scenarios. Percentage



Source: Statistics Norway and Norges Bank

### Transmission mechanism in RIMINI

Chart 5 illustrates the most important aspects of the transmission mechanism for a given exchange rate as it is modelled in RIMINI. The chart indicates that monetary policy affects consumer price inflation indirectly through a number of channels.

In the RIMINI model, a change in the deposit rate causes an immediate equivalent change in money market rates. Banks' deposit and lending rates are fully adjusted to the change in the following quarter. However, most of the adjustment occurs in the same quarter. A change in interest rates influences household and corporate investment decisions. Chart 5 shows that a change in the decisions of households and businesses will be reflected in aggregate supply factors such as output, productivity and employment as well as in demand factors such as investment and private consumption.

Although there is a strong interaction between supply

and demand in the model, all markets will not be in long-term equilibrium at all times due to nominal and real price inertia. This results in an output gap and unemployment. High unemployment indicates low utilisation of resources and implies a low or negative output gap. This contributes to curbing price inflation and wage growth. Similarly, low unemployment and a positive output gap will be inflationary. Productivity trends are also decisive for price formation. Strong productivity growth will contribute to reducing inflation. In addition, in the RIMINI model, both the interaction between price and wage formation and the repercussions on supply and demand factors are strong.

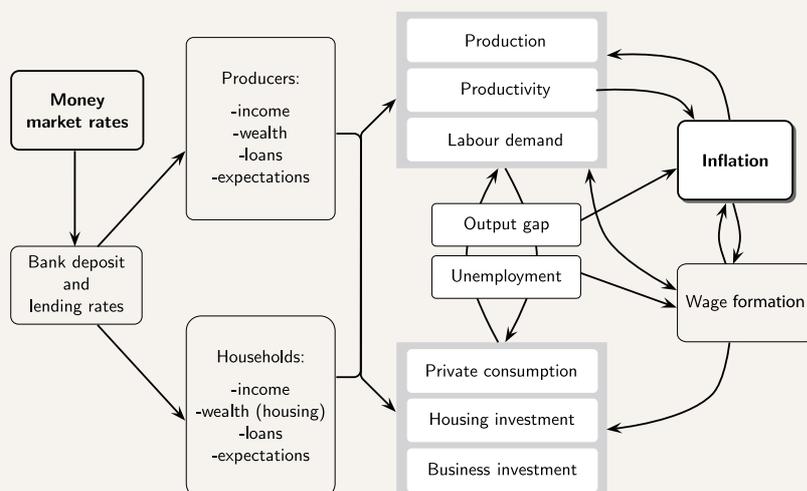
Private consumption accounts for about half of mainland demand. The effect of a change in interest rates on household decisions is therefore of substantial importance for the overall impact on the economy. In the basic version of the RIMINI model, consumption depends primarily on disposable income and then on household wealth. A change in interest rates will affect consumer demand through household disposable income (income effect) and wealth (wealth effect). When the household sector as a whole is in a net debt position, an increase in interest rates will reduce total disposable income and thereby contribute to reducing consumption. Higher interest rates will also contribute, through a lower activity level, to reducing total household wage income. An increase in interest rates will also curb house price inflation, leading to a weaker development in household wealth. Experience shows that the wealth effect will induce households to increase saving as a percentage of income in order to compensate for the wealth loss (see Brodin and Nymoene (1992)).

Developments in house prices are difficult to project, however, and this increases the uncertainty of the consumption projections. Experience in recent years may also indicate that changes in interest rates affect private consumption more rapidly than the wealth effect is capable of capturing. To reduce the dependence of private consumption estimates on projections

for developments in house prices, we have used an alternative equation for private consumption since the June 2000 *Inflation Report*. In this equation, after-tax real interest rates have a direct effect in addition to the income and wealth effects. Thus, the value of housing wealth plays a less significant role than in the basic version of the RIMINI model. Such a relationship is supported by data for the period from 1988.

A possible explanation for the direct effect of interest rates on private consumption is that a rise in interest rates makes saving

**Chart 5.**



more profitable (substitution effect). It could also be argued that the interest rate level is an indicator of household expectations concerning their own financial situation and domestic economic developments. This possible relationship was discussed in a separate box on the consumer confidence indicator in the June 2000 *Inflation Report*. Experience shows that an increase in interest rates coincided with lower expectations, heightened caution and lower consumption. How stable this relationship will be over time is still an open question, however.

A change in the interest rate will usually have an attendant effect on the exchange rate. This effect will generally depend on the situation, and the formation of expectations will probably have a significant impact on the result. The exchange rate is an exogenous variable in the RIMINI model, which means that it must be determined by the model user when he/she makes the projections. When we conduct shift analyses, we normally assume that the exchange rate changes in line with uncovered interest rate parity. A higher interest rate on NOK denominated instruments is then offset by an immediate appreciation and thereafter a steady depreciation so that the expected return on NOK investments is unchanged.

Through the exchange rate effect, the interest rate affects price inflation more directly than indicated in Chart 5 by influencing imported price inflation. In addition, changes in export and import prices also have an effect on import and export volume and thus aggregate supply and demand. This will in turn affect price and wage formation, as mentioned above. Thus, changes in the exchange rate affect prices both directly and indirectly.

### Assessment

The way the RIMINI model is estimated, demand reacts quickly to a change in interest rates. There is, however, a time lag before the supply side (output, employment) responds to the changes in demand. In the short term, most of the adjustment to changes in demand will come in the form of changes in imports and inventories. Even after 2-3 years, output has not adjusted to demand. When we use the RIMINI model, we do not consider this to be a completely reasonable mechanism. We assume that changes in forward-looking behaviour may contribute to hastening the effects of interest rate changes, also on the supply side, compared with the basic version of the RIMINI model. When we employ the alternative consumption function in the model, we advance the effects of interest rate changes on employment and output by one year in relation to what is indicated by the basic version of the RIMINI model.

In the discussion of wage formation, we indicated that the wage equation in the RIMINI model probably does not fully capture the effects of pressures in the labour

market when unemployment is low. Therefore, we correct the add factors in the wage equation so that the simulated wage growth is more in line with wage developments in the last five years. In addition, we adjust the add factor in the wage equation somewhat in those cases where unemployment changes as a result of interest rate changes. Based on our assessment, the wage curve is somewhat steeper for unemployment levels similar to today's level than implied by the estimated relationship.

As mentioned earlier, the exchange rate is an exogenous variable in the RIMINI model. When we use the model to analyse policy, we must make assumptions about how the interest rate affects the exchange rate. If an increase in interest rates is primarily due to domestic factors, a temporary appreciation of the krone exchange rate may be expected. If interest rates are increased to counteract a depreciation of the exchange rate, the effects may be the same, but the relationship will be difficult to identify in retrospect. Due to Norway's long history of a fixed exchange rate regime, it is difficult to estimate how interest rates have affected the krone exchange rate over time.

When our calculations are based on the technical assumption that the exchange rate changes in accordance with the theory of uncovered interest rate parity, the effect on price inflation will come more quickly than if the interest rate only operates through the real economy. As the effects via the exchange rate recede, the effect via the real economy will dominate.

In practice, the exchange rate is influenced by many factors. Evidence supports the validity of purchasing power parity in the long term.<sup>7</sup> This implies that a particularly high level of price inflation in Norway over time will result in a depreciation of the krone. However, in the short term, factors such as international risk assessments<sup>8</sup>, economic policy credibility, oil prices and terms of trade may affect the exchange rate. When we use the RIMINI model in our work to make a baseline scenario for the *Inflation Report*, we normally assume that the exchange rate is unchanged compared with the level of the last few months. Nevertheless, we can capture the effect of interest rate changes on the exchange rate in retrospect. This is because a change in interest rates that affects the exchange rate will be reflected in a change in exchange rate assumptions from one *Inflation Report* to the next.

## 5 Summary

Norges Bank uses a number of different tools in making projections for developments in the economy. In this article, we have provided insight into some of the key mechanisms in the macroeconomic model RIMINI and commented on our use of this model in connection with economic analyses. Norges Bank's economic projections are based on the model's relationships supplemented by assessments and judgement. Therefore, projections in the *Inflation Report* are not only based on the

<sup>7</sup> See, for example, Akram (2000).

<sup>8</sup> See Bernhardsen and Røisland (2000).



## Consumer price equation

$$\Delta cpi_t = 0.014 + 0.058 \Delta cpi_{t-2} + 0.064 \Delta 3wc_t + 0.153 \Delta wc_{t-3}$$

(10.01)    (1.30)                    (4.66)                    (7.09)

- $0.024 \Delta ip_t - 0.060 \Delta_2 T3_{t-3} - 0.266 \Delta uei + 0.049 gap_{t-1}$   
(2.39)                    (3.06)                    (4.54)                    (2.83)
- $0.069[cpi_{t-3} - 0.6(wc - zy)_{t-1} - 0.4ip_{t-1} - 0.5T3_{t-5}] + dummies + J.cpi$   
(9.69)

Estimation period: 1969Q2–1998Q4	T = 119
R <sup>2</sup> = 0.89	Standard deviation in per cent = 0.37
Durbin-Watson = 1.69	AR 1–5: F(5.103) = 2.1531 [0.0651]
ARCH 4: F(4.99) = 1.9136 [0.1141]	Normality: $\chi^2(2) = 2.5119$ [0.2848]
F(21.85) = 1.0433 [0.4237]	RESET: F(1.106) = 1.4641 [0.2290]

Note: The figures in parentheses are significance probabilities.

## List of variables

<p><i>ALMP</i> Scope of labour market programmes</p> <p><i>GAP</i> Output gap for mainland Norway. Observed value added as a percentage of potential output</p> <p><i>CPI</i> Consumer price index</p> <p><i>NH</i> Normal working hours per week</p> <p><i>PB</i> Import price index in NOK</p> <p><i>PY</i> Value added deflator in manufacturing, building and construction</p> <p><i>T3</i> Indirect tax rate</p>	<p><i>U</i> Unemployment rate including participants in ordinary labour market programmes</p> <p><i>UEI</i> World trade index</p> <p><i>WC</i> Labour cost per hour in manufacturing, building and construction</p> <p><i>ZY</i> Person-hour productivity in manufacturing, building and construction</p> <p><i>J.WC</i> Add factors in the wage equation</p> <p><i>J.CPI</i> Add factors in the consumer price equation</p>
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# Norges Bank's system for managing interest rates

Lars-Christian Kran, economist in the Market Operations Department, and Grete Øwre, Head of Division in the Financial Infrastructure and Payments Department<sup>1)</sup>

**The article provides an account of Norges Bank's practical implementation of monetary policy in the money market through liquidity policy. Liquidity policy consists of Norges Bank's operations in the money market to influence the banking system's liquidity. Liquidity policy shall be consistent with the interest rate signals given by Norges Bank through monetary policy, and ensure that changes in the key rates have a broad impact on short-term money market rates. Liquidity policy shall also facilitate efficient execution of banks' payment settlements in the central bank. Liquidity operations shall not have an effect on money market rates that may result in a lack of clarity regarding Norges Bank's interest rate signals.**

## Main features of liquidity policy in Norway

All banks established in Norway may have deposit accounts in Norges Bank. The liquidity of the banking system is banks' aggregate sight deposits in accounts in Norges Bank from one business day to the next. The banking system's structural liquidity is banks' sight deposits with Norges Bank as they would have been without the Bank supplying or withdrawing liquidity by means of liquidity instruments. In the course of a year, banks' structural liquidity varies between substantial borrowing needs and substantial deposits in Norges Bank (see Chart 1).

Structural liquidity is influenced by a number of autonomous factors. The central government has its NOK account in Norges Bank. This means that payments in NOK to and from the central government, including central government loan transactions (but not payments between the central government and Norges Bank) directly influence banks' liquidity. There is often considerable uncertainty regarding the net liquidity effect of central government incoming and outgoing payments from day to day. Norges Bank's transactions in the foreign exchange market and government securities market and

**Chart 1** Banks' structural liquidity position in Norges Bank in 2000 before Norges Bank's transactions to influence liquidity. In billions of NOK



Source: Norges Bank

### Some key concepts

- The key rate: the interest rate the central bank wishes to have a broad impact on short money market rates.
- Standing facility: lending and deposit facility available in a central bank. Can be used by banks on their own initiative.
- Deposit rate: Interest rate on intraday deposits in Norges Bank. The deposit rate is Norges Bank's key rate, and forms the floor for short money market rates.
- Overnight lending rate: Interest rate on overnight loans from Norges Bank.
- Fixed-rate loans: Loans (against collateral in the form of securities) at a fixed interest rate and with a given maturity. The interest rate on fixed-rate loans is normally fixed through multi-price auction. The maturity of fixed-rate loans varies and depends on the liquidity situation.
- Fixed-rate deposits: Deposits at a fixed interest rate and with a given maturity. The interest rate on fixed-rate deposits is normally fixed through multi-price auction. The maturity of fixed-rate deposits varies and depends on the liquidity situation.
- Repurchase agreements (repos): Agreements on sale and repurchase of securities at preagreed prices.
- Currency swaps: Exchange of NOK for foreign currency for an agreed period.

changes in volumes of notes and coins in circulation also influence banks' liquidity.

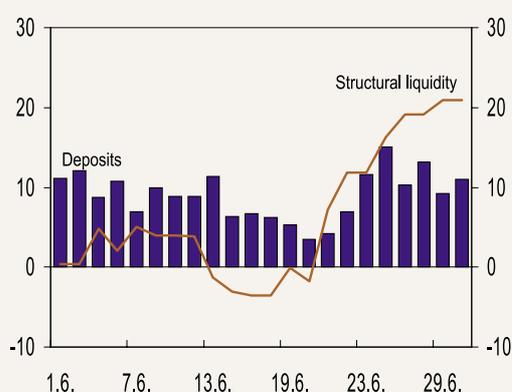
In some periods, the central government has issued Treasury bills to reduce structural surplus liquidity. Apart from this, no special measures have been implemented to influence banks' structural liquidity situation.

By providing and absorbing liquidity by means of fixed-rate loans and deposits (see separate box for definition), Norges Bank ensures that at the end of each day the banking system has sight deposits of the order of NOK 5-12 billion in Norges Bank. Chart 2 shows structural

<sup>1)</sup>The article is based on work done while Grete Øwre was adviser in the Market Operations Department. We should like to thank Marianne Isaachsen and Morten Jonassen for valuable contributions to the article, and Øyvind Eitheim and Pål Winje for useful comments.

liquidity and sight deposits after Norges Bank's liquidity operations in June 2000. Norges Bank supplied liquidity in the form of fixed-rate loans in the period 5-21 June and withdrew liquidity in the form of fixed-rate deposits from 27 June to the beginning of July. Auctions of fixed-rate loans and deposits contribute to making the use of the standing facilities (sight deposits and overnight loans) independent of structural liquidity (see Chart 2). Liquidity policy contributes to ensuring that money market rates are normally only slightly higher than the deposit rate and makes them independent of banks' structural liquidity (see Chart 3, which shows money market rates in 1999 and 2000). The high tomorrow/next rate after the end of 2000 shown in the chart is due to special conditions in the interbank market.

**Chart 2** Banks' structural liquidity and deposits in June 2000

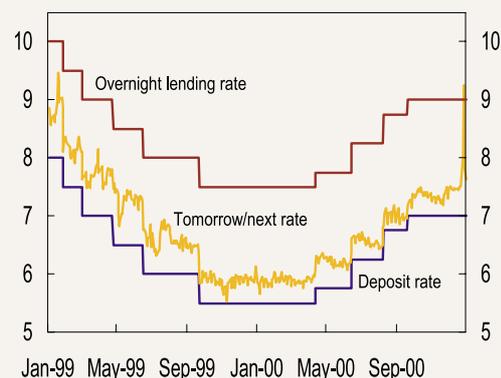


Source: Norges Bank

Norges Bank's Executive Board sets the interest rates on the Bank's automatic deposit and lending facilities, which normally form a corridor for the shortest money-market rates. Interest rates on Norges Bank's fixed-rate loans and deposits are normally established in the market through multi-price auction. Because Norges Bank ensures that the banking system has aggregate deposits in Norges Bank, the deposit rate is banks' marginal investment rate. The deposit rate is thus Norges Bank's key rate. The overnight lending rate has limited monetary policy significance. The interest rate on Norges Bank's market operations and short-term money market rates remain fairly close to the deposit rate at the floor of the corridor, while there is a fairly large distance upwards to the Bank's lending rate (see Chart 3).

The number of participants in the Norwegian interbank market has gradually diminished. When liquidity is unevenly distributed among banks, some banks may acquire considerable power in the market. However this possibility is limited by Norges Bank ensuring that there is substantial surplus liquidity in the banking system,

**Chart 3** Money market rates in Norway in 1999 and 2000



Source: Norges Bank

and that all banks can take part in auctions of fixed-rate loans and deposits. Auctions of fixed-rate loans and deposits are cleared at an interest rate slightly higher than the deposit rate.

## Liquidity policy in other countries

### *European Central Bank*

Banks in the euro area are subject to reserve requirements. Over a period of a month, banks are required to hold an average of 2% of a basis of measurement as deposits in the European Central Bank. The basis of measurement is defined so broadly that in practice it is difficult to circumvent. In order to fulfil the reserve requirement, the banking system on aggregate must raise loans in the ECB. The banking system is thus in a structural borrowing position.

Each week, the ECB supplies liquidity by issuing repurchase agreements (loans with securities as collateral) with a two-week maturity.<sup>2)</sup> Originally, the fixed rate on repurchase agreements was the ECB's key rate. Since 28 June 2000, the interest rate on repurchase agreements has been fixed through multi-price auctions, with a minimum interest rate. This minimum rate is now the ECB's key rate.

The deposit and lending rates on the ECB's standing facilities form a symmetrical corridor of +/- 1 percentage point around the key rate. Until 28 June 2000, the repo rate (key rate) was paid on amounts deposited to meet the reserve requirement. Following the introduction of multi-rate auctions of repos, the interest paid on the required reserves is the average of the lowest interest rates allotted at the auctions held during the period. The deposit rate is paid on deposits that exceed the reserve requirement.

<sup>2)</sup> The ECB can also use fine-tuning operations with shorter maturities.

The liquidity supply is adjusted so that the aggregate liquidity in the banking system during the calculation period approximately corresponds to the minimum reserve requirement for banks. The target of the ECB's liquidity policy is that overnight interest rates in the interbank market should remain stable and close to the key rate.

### *Federal Reserve*

The Federal Reserve (the Fed) requires that banks have average reserves over a two-week period of 10% of their average transaction deposits. However, banks have to a large extent moved deposits from accounts subject to reserve requirements to accounts that are not subject to these requirements. The reserve requirement in the US is therefore of little practical significance. The Fed largely manages money market rates by announcing a target for the federal funds rate, which is the overnight interbank rate between the most creditworthy US banks. The federal funds rate is the Fed's key rate.

The Fed offers daily liquidity to banks in the form of overnight repos, so that the tightness of the money market underpins the announced target for the federal funds rate. At times where there is a need for a supply or withdrawal of liquidity over long periods, they offer repos with longer maturities or buy/sell government paper. The interest rate is fixed through multi-price auction. The Fed is legally precluded from paying interest on deposits from banks (this also applies to the required reserves). Overdrawing shall in principle not take place, and in the event interest is charged at a rate 4 percentage points higher than the federal funds rate.

### *Danmarks Nationalbank*

Danmarks Nationalbank offers weekly certificates of deposit and loans with maturities of two weeks (14-day transactions) at a single fixed interest rate known as the lending rate, which is the key rate. Banks decide themselves the amounts they wish to purchase of the two instruments, and thus determine the surplus liquidity in the banking system. The banking system does not have access to a standing overnight lending facility. Interest on sight deposits is paid at the current account interest rate, which is always lower than the key rate and forms the floor of the corridor in the money market. The difference between the current account interest rate and the key rate varies. On 15 January 2001 it was 65 basis points. This limits banks' demand for loans from the central bank. The overnight interbank rate is very close to the lending and current account interest rates. Danmarks Nationalbank publishes reliable forecasts in which the net supply or withdrawal of liquidity from the state is estimated for two months ahead.

### *Sweden's Riksbank*

Sweden's Riksbank aims at maintaining stable overnight interbank rates and zero surplus liquidity in the banking system every day. The Swedish banking system has had a structural liquidity deficit since 1997. The Riksbank supplies liquidity in the form of one-week repos once a week, and in the form of overnight repos at the end of each day. The Riksbank's key rate is the one-week repo rate. Overnight repos have the same interest rate. The Riksbank operates with a corridor of 150 basis points between the deposit rate and the overnight lending rate, and the corridor is symmetrical about the key rate.

### *Bank of England*

Like the Riksbank, the Bank of England aims for stable overnight interbank rates and zero surplus liquidity in the banking system at macro level every day. Twice a day, the Bank of England offers liquidity through two-week repurchase agreements at the key rate, or repo rate. In addition, if there has not been sufficient bidding early in the day, the Bank of England may offer overnight repos twice towards the end of the day at rates 100-150 basis points higher than the key rate. This will thus be the ceiling for money market rates. No interest is paid on sight deposits in the Bank of England.

### *The Swiss National Bank*

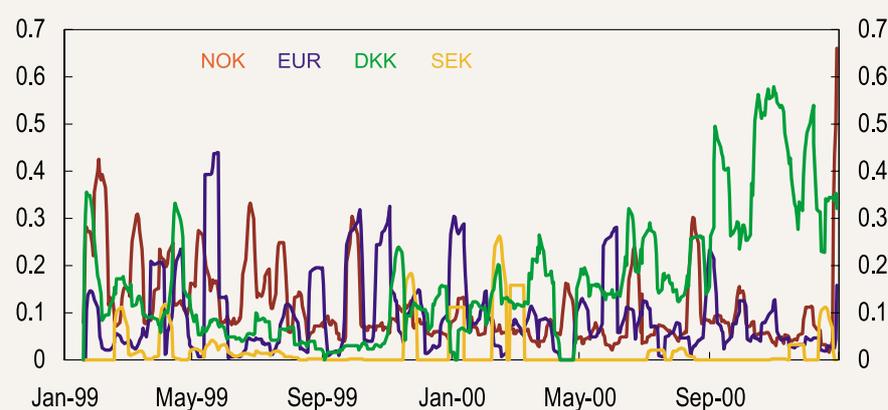
The central bank of Switzerland uses 3-month CHF LIBOR as its reference rate/key rate. The SNB announces a target range of 100 basis points for 3-month CHF LIBOR and its expectation of where in this corridor the reference rate will lie. This rate is steered indirectly by supplying or withdrawing liquidity. The SNB carries out daily repo transactions with a variable interest rate which is determined by auction. However, the SNB is not active in the 3-month CHF LIBOR market.

## Comparison of interest rate volatilities

A number of central banks have an explicit target of low volatility for the shortest money market rates. Chart 4 illustrates how the volatility of the tomorrow/next interest rate in Sweden, Denmark, the euro area countries and Norway developed through 1999 and up to December 2000. In this context, volatility is measured as the standard deviation over the past 10 days.

Chart 4 shows that Sweden had a volatility of close to zero for the tomorrow/next rate during the period except for in February, March and November 1999 and February 2000, when Sweden's Riksbank changed the repo rate. In the euro area, the tomorrow/next rate is highly volatile towards the end of each calculation period for the reserve requirement. The volatility is partly due to uncertainty among banks as to whether the ECB has

**Chart 4** Standard deviation of the tomorrow/next rate in the past 10 days



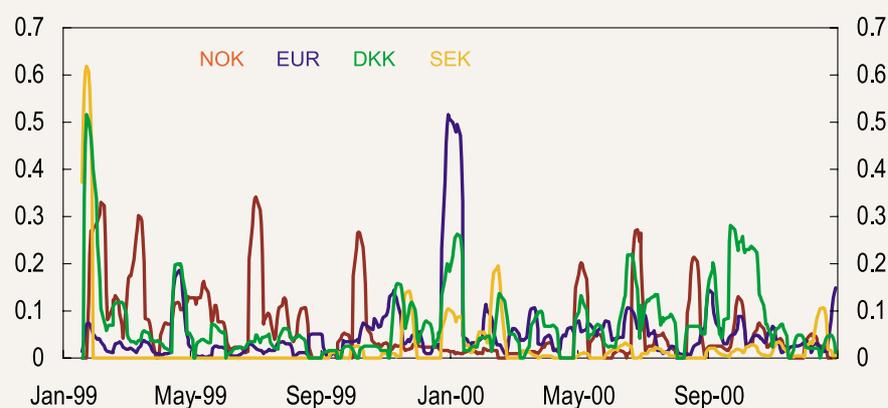
Source: Norges Bank and Datastream

supplied too much liquidity, or too little liquidity to allow banks to meet the reserve requirement. This uncertainty means that banks have had to use the standing facilities in the last few days of the calculation period for the reserve requirement. A comparison with the tomorrow/next rate in Norway in 1999 shows that volatility was somewhat higher in Norway than in the euro area, Sweden and Denmark, but Norges Bank's five interest rate reductions made a particular contribution to higher volatility. If the effect of these interest rate reductions is excluded, volatility in Norway was not appreciably greater than in the euro area and Denmark in 1999. Volatility was very low in 2000, if the period around Norges Bank's interest rate increases is disregarded. Provision of fixed-rate loans against collateral was introduced on 1 September 1999, and at the same time it was made possible for banks to use a wider selection of securities as collateral for loans in Norges Bank. This facilitated banks' participation in Norges Bank's market

operations, and probably contributed to a decline in volatility in 2000. There was relatively high volatility in Denmark in the last quarter of 2000. This was partly due to frequent changes in the interest rate, interventions in the foreign exchange market and uncertainty associated with the outcome of the EMU referendum.

The volatility of the one-week interest rate (see Chart 5), shows approximately the same trend as that of the tomorrow/next interest rate. It appears that the volatility of the Norwegian one-week rate may have been somewhat higher in 1999, even if the periods around Norges Bank's interest rate changes are disregarded. In 2000 volatility appears to have been in line with volatility in Denmark and the euro area. The Swedish system, with fine-tuning towards zero surplus liquidity in the money market, and in which fine-tuning operations have an interest rate equal to the key rate, appears to result in somewhat lower volatility for short money market rates than other liquidity management systems.

**Chart 5** Standard deviation of the one-week rate in the past 10 days



Source: Norges Bank and Datastream

## The Norwegian system compared with other systems

Norges Bank's interest rate management system has important similarities with systems in other countries. The deposit and overnight interest rates function as a corridor for the money market overnight rate, and liquidity is supplied and withdrawn through multi-price auction of deposits and loans provided against collateral. However, Norges Bank's liquidity policy differs in a number of other respects from common international practice.

As the article illustrates, many central banks use the interest rate on market operations or a market rate target as their key rate. Norges Bank's key rate is the deposit rate, which is a standing facility, and the Bank does not engage in regular market operations. The Bank's use of an interest rate corridor is distinctive in that market operations take place at rates near the floor of the corridor. The effect of an asymmetrical corridor, such as we find in Norway, is to reduce the incentive to redistribute liquidity in the interbank market, because the deposit rate is normally so close to the market rate that banks earn little by investing surplus liquidity in the money market. Another potential problem of liquidity management in Norway is the considerable uncertainty regarding the time and size of government payments. Norges Bank's internal liquidity forecasts are therefore relatively uncertain, and there are days when liquidity may be unexpectedly tight or ample. It may be appropriate to consider alternative systems with more automatic liquidity adjustment in the banking system.

### *Calculation of average deposit balances or average reserve requirements*

Calculation of an average deposit balance or average reserve requirement may reduce the potential instability of short money market rates resulting from liquidity fluctuations.

Calculation of an average deposit balance means that if the average balance over a period is negative, the overnight lending rate is charged on that average. If the average balance over the period is positive, the deposit rate applies. Banks may borrow on a particular day on the basis of a surplus in their own account earlier or later in the period. As long as banks have a positive balance on average during the period, they can in reality borrow overnight at the deposit rate. Overnight loans for one or more days will therefore not have an effect on the shortest rates. If the Bank ensures that the banking system has a liquidity surplus during the period, banks' marginal investment will be a sight deposit in Norges Bank. The deposit rate will thus be Norges Bank's key rate. Banks' daily borrowing facility against their own positive balance will be limited by the collateral they provide. With a

structural liquidity that fluctuates between positive and negative, the average calculation can only be applied in conjunction with ad hoc market operations of the type undertaken by Norges Bank today.

A system with calculation of the average deposit would weaken the interbank market, and would not bring interest rate management more into line with international practice. In order to maintain activity in the interbank market, calculation of the average deposit balance could be combined with a limit on banks' automatic borrowing facility. However, the tighter the borrowing limits are made, the less effective liquidity policy will be with respect to stabilising short rates.

If the reserve requirement is large enough, the banking system will constantly be reliant on liquidity loans in Norges Bank. Norges Bank could then supply liquidity through regular market operations. The interest rate on market operations could be fixed by the Bank, and could be the Bank's key rate. The interest rate on the required reserves could be made the same as the key rate. The regular market operations could be performed at an interest rate in the middle of the corridor, so that banks had an incentive to distribute liquidity among themselves before applying to Norges Bank. This would bring practice closer to that of other central banks.

An average reserve requirement would limit the short term liquidity fluctuations in the calculation period on the shortest money market rates. Such a system could nevertheless lead to a substantial impact on interest rates at the end of the calculation period (cf. the ECB's experience). The central bank can to a certain extent avoid such impacts on the interest rate by performing fine-tuning operations aimed at correcting the surplus or deficit liquidity of the banking system during the calculation period.

A reserve requirement would only apply to banks, which might lead to competitive disadvantages compared with other types of financial institution. A broad basis of measurement and required reserves with an interest rate close to the market rate would reduce these disadvantages.

### *Fine-tuning operations with same-day effect, so that the banking system's liquidity is zero every day*

A system with fine-tuning operations would entail Norges Bank supplying or withdrawing liquidity such that surplus liquidity, ie the amount in the deposit account over night, was around zero every day. In addition to daily fine-tuning operations, Norges Bank could supply or withdraw structural liquidity through market operations with a longer maturity. The key rate could be applied to both instruments with a longer maturity and fine-tuning operations. If market operations are carried out at an interest rate in the middle of the corridor, the shortest money market rates will also remain roughly in the middle of the central bank's interest rate corridor.

Banks will then have a strong incentive to redistribute liquidity among themselves, and this will contribute to the interest rate on market operations having a broader impact in the money market.

Countries that base themselves on fine-tuning operations and a banking system macroliquidity of around zero at the end of each day have in common that the government either does not have an account in the central bank, or that fine-tuning operations take place after government transactions have been completed. In the Norwegian situation, where the government does have a liquidity account in Norges Bank, one alternative is that transactions over the central government account have an earlier deadline than other transactions, so that Norges Bank's fine-tuning operations and banks' distribution of liquidity among themselves can take place before the market closes. Alternatively, Norges Bank must have completely reliable forecasts for net movements over the government account, so that fine-tuning operations can be carried out before the account is closed for the day.

In view of the uncertainty regarding the dates of government incoming and outgoing payments, it is not very realistic to introduce fine-tuning operations to maintain banks' liquidity each day at about zero. Moreover, it is not desirable to reduce the government's freedom of manoeuvre in the payment system by placing time constraints on settlement. Norges Bank can therefore not use a system with extensive use of fine-tuning operations. It is not a given that the shortest money-market rates would be less volatile if the government had its account in one or more Norwegian banks. Such a solution would give some agents greater power in the interbank market, and might thereby increase the volatility of the shortest money market rates.

## Summary

A review of other countries' interest rate management systems reveals that no single model predominates. By comparison with other countries, interest rate volatility in Norway does not seem to be particularly high. Although the system Norges Bank uses and has used in recent years to manage the interest rate has some weaknesses, it functions well in practice. Market participants are familiar with it, and there does not appear to be any uncertainty in the market or among other observers as to Norges Bank's interest rate policy.

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# New 1000-krone banknote

On 19 June Norges Bank issued a new 1000-krone banknote, the final denomination in the new banknote series. The first note in Series VII was the 200-krone note issued in 1994. The 50 and 100-krone notes followed in 1997 and the 500-krone note was issued in 1999.

The individuals portrayed on Norwegian banknotes are women and men who have made their mark on history in the sciences or the arts. The collector of Norwegian folk tales, Peter Christen Asbjørnsen, is portrayed on the 50-krone note. Norway's great opera singer Kirsten Flagstad was selected for the 100-krone note. The scientist and northern lights researcher Kristian Birkeland decorates the 200-krone note, while author and Nobel prize winner Sigrid Undset was chosen for the 500-krone note.

Edvard Munch (1863-1944) was chosen for the portrait on the obverse of the new 1000-krone banknote. The background illustration was inspired by Munch's painting "Melancholy", a cardinal work among Munch's "Frieze of Life" paintings. The motif on the reverse is a

rendering of one of Munch's studies for his painting "The Sun", which is among the decorations adorning the University of Oslo's Aula.

Norges Bank's Chief Graphic Designer, Sverre Morken, designed the obverse of the note while the Deputy Graphic Designer, Arild Yttri designed the reverse.

Each note in the new series is different in size so that they may be distinguished easily by the blind and visually impaired. The notes are also different in colour.

The new 500 and 1000-krone notes have new security features that make them difficult to counterfeit. The obverse features a wide metallic strip with a Norse horse and the figure 1000. When the note is held at different angles against the light, parts of the horse illuminate in a variety of colours.

The Series VI 1000-note will be withdrawn from circulation by means of a public announcement in the *Norwegian Legal Gazette*. The note will be legal tender for one year after the announcement of withdrawal, and Norges Bank will redeem the note for an additional ten years.



*The new 1000-krone note, 70% of the original width/height*

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# Financial institution balance sheets

**Table 1. Norges Bank. Balance sheet. In millions of NOK**

	31/12 1999	31/12 2000	28/2 2001	31/3 2001	30/4 2001
<b>FINANCIAL ASSETS</b>					
<b>Foreign assets</b>	<b>427 452</b>	<b>646 120</b>	<b>647 561</b>	<b>658 380</b>	<b>706 768</b>
International reserves <sup>1) 2)</sup>	193 589	245 863	245 705	246 581	255 084
Investment of Government Petroleum Fund	222 277	386 126	388 005	424 747	437 873
Other foreign assets	11 586	14 131	13 851	14 052	13 811
<b>Claims on Norwegian financial institutions</b>	<b>25 658</b>	<b>22 194</b>	<b>44</b>	<b>1 157</b>	<b>44 408</b>
Loans to private banks	25 574	21 158	6	0	43 923
Other assets in the form of deposits, securities, loans and overdrafts	84	1 036	38	1 157	485
<b>Claims on central government</b>	<b>11 099</b>	<b>13 909</b>	<b>13 988</b>	<b>15 578</b>	<b>20 387</b>
Bearer bonds	9 180	10 743	10 823	11 936	14 637
Other securities	1 592	2 776	2 647	3 228	5 083
Other claims	327	390	518	414	667
<b>Claims on other Norwegian sectors</b>	<b>961</b>	<b>1 306</b>	<b>1 164</b>	<b>1 301</b>	<b>904</b>
Securities and loans	567	576	581	585	579
Other claims	394	730	583	716	325
<b>Stock, production units</b>	<b>43</b>	<b>26</b>	<b>34</b>	<b>38</b>	<b>38</b>
<b>Fixed assets</b>	<b>2 010</b>	<b>1 939</b>	<b>1 920</b>	<b>1 920</b>	<b>1 915</b>
<b>Valuation adjustments</b>	<b>-</b>	<b>0</b>	<b>12 243</b>	<b>24 373</b>	<b>12 191</b>
<b>Expenses</b>	<b>-</b>	<b>0</b>	<b>2 368</b>	<b>3 777</b>	<b>5 261</b>
<b>Total assets</b>	<b>467 223</b>	<b>685 494</b>	<b>679 322</b>	<b>733 524</b>	<b>791 872</b>
<b>LIABILITIES AND CAPITAL</b>					
<b>Foreign liabilities</b>	<b>38 925</b>	<b>74 998</b>	<b>60 742</b>	<b>61 647</b>	<b>78 200</b>
IMF debt in NOK	11 561	14 107	13 826	14 028	13 787
Other foreign liabilities	27 364	60 891	46 916	47 619	64 413
<b>Notes and coins in circulation</b>	<b>48 020</b>	<b>46 952</b>	<b>42 381</b>	<b>42 034</b>	<b>42 107</b>
<b>Domestic deposits</b>	<b>326 109</b>	<b>505 837</b>	<b>504 947</b>	<b>518 683</b>	<b>597 138</b>
Treasury	67 686	96 083	107 497	81 113	139 155
Government Petroleum Fund	222 277	386 126	388 005	424 747	437 873
Other public administration (excl. municipalities)	216	293	121	118	4 367
Private banks	33 344	21 647	7 711	11 051	14 177
Other financial institutions	2 484	1 591	1 513	1 545	1 478
Other Norwegian sectors	102	97	100	109	88
<b>Accrued interest to the Treasury</b>	<b>-</b>	<b>0</b>	<b>776</b>	<b>1 260</b>	<b>1 796</b>
<b>Other domestic debt <sup>3)</sup></b>	<b>21 226</b>	<b>10 955</b>	<b>10 296</b>	<b>37 719</b>	<b>10 543</b>
<b>Calculated value of SDRs in IMF</b>	<b>1 847</b>	<b>1 934</b>	<b>1 942</b>	<b>1 970</b>	<b>1 936</b>
<b>Capital</b>	<b>31 096</b>	<b>44 818</b>	<b>44 818</b>	<b>44 818</b>	<b>44 818</b>
<b>Valuation adjustments</b>	<b>-</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Revenues</b>	<b>-</b>	<b>0</b>	<b>13 420</b>	<b>25 393</b>	<b>15 334</b>
<b>Total liabilities and capital</b>	<b>467 223</b>	<b>685 494</b>	<b>679 322</b>	<b>733 524</b>	<b>791 872</b>
<b>Off balance-sheet items :</b>					
Foreign currency sold forward	7 777	32 595	32 976	69 121	51 094
Foreign currency purchased forward	40	25 699	35 381	71 236	53 095
Derivatives sold	-	77 743	112 222	134 485	190 584
Derivatives purchased	13 285	83 094	154 784	193 285	214 497
Allotted, unpaid shares in the BIS	304	314	314	314	314

<sup>1)</sup> International reserves include bonds subject to repurchase agreements.

<sup>2)</sup> Securities and gold are valued at fair value as from December 1999.

<sup>3)</sup> The Transfer Fund is classified as "Other domestic debt".

**Table 2. Norges Bank. Specification of international reserves<sup>1)</sup>. In millions of NOK**

	31/12 1999	31/12 2000	28/2 2001	31/3 2001	30/4 2001
Gold	2 207	2 275	2 258	2 221	2 269
Special Drawing Rights in the IMF	3 279	2 713	2 503	2 490	2 404
Reserve position in the IMF	6 837	5 166	5 522	5 602	5 506
Loans to the IMF	1 338	1 269	1 265	1 342	1 310
Banks deposits abroad	48 255	73 397	75 868	87 001	92 749
Foreign Treasury bills	155	1	79	315	-
Foreign bearer bonds <sup>2)</sup>	128 461	157 893	155 185	143 787	147 679
Loans, foreign banks	-	-	-	-	-
Accrued interest	3 056	3 190	3 091	3 897	3 189
Short-term assets	-	-40	-64	-75	-24
<b>Total</b>	<b>193 588</b>	<b>245 863</b>	<b>245 705</b>	<b>246 581</b>	<b>255 084</b>

1) Securities are valued at fair value as from December 1999.

2) Includes bonds subject to repurchase agreements.

Source: Norges Bank

**Table 3. State lending institutions. Balance sheet. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000	31/3 2001
Cash holdings and bank deposits	2 683	2 672	2 602	3 007	3 000
Total loans	164 151	165 927	168 556	169 868	173 625
Of which:					
To the private sector and municipalities	162 323	164 086	166 698	167 853	171 582
Other claims on the Treasury	806	-	-	-	-
Other assets	8 353	7 107	8 352	7 009	8 658
<b>Total assets</b>	<b>175 993</b>	<b>175 706</b>	<b>179 510</b>	<b>179 884</b>	<b>185 283</b>
Bearer bond issues	84	79	61	57	55
Of which:					
In Norwegian kroner	84	79	61	57	55
In foreign currency	-	-	-	-	-
Other loans	165 548	165 707	168 212	168 870	173 288
Of which:					
Treasury	165 462	165 707	168 212	168 870	173 288
Other liabilities, etc.	4 225	4 571	5 799	5 502	6 317
Share capital, reserves	6 136	5 349	5 438	5 455	5 623
<b>Total liabilities and capital</b>	<b>175 993</b>	<b>175 706</b>	<b>179 510</b>	<b>179 884</b>	<b>185 283</b>

Sources: Statistics Norway and Norges Bank

**Table 4. Commercial and savings banks.<sup>1)</sup> Balance sheet. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000	31/3 2001
Cash	4 036	4 538	4 269	4 879	4 255
Deposits with Norges Bank	14 296	21 809	36 561	22 654	27 533
Deposits with commercial and savings banks	18 596	19 411	18 913	16 524	24 642
Deposits with foreign banks	38 007	46 908	34 797	49 487	52 540
Treasury bills	9 939	9 784	6 530	7 892	6 548
Other short-term paper	19 694	16 432	11 306	15 047	20 081
Bonds issued by govt. and by state lending inst.	11 532	9 978	6 990	9 476	9 398
Other bearer bonds	49 451	53 358	64 043	66 615	76 608
Loans to foreign countries	54 103	51 620	52 602	48 895	54 268
Loans to the private sector and municipalities	845 197	886 541	924 547	938 076	962 614
Of which:					
In foreign currency	67 254	71 484	87 961	80 361	78 522
Loans to pvt. mortgage and fin. cos., insurance etc. <sup>2)</sup>	60 051	61 769	67 795	69 587	71 693
Loans to central government and social security admin.	46 928	19 653	39 304	21 780	47 120
Other assets <sup>3)</sup>	90 475	86 631	97 587	81 818	79 152
<b>Total assets</b>	<b>1 262 305</b>	<b>1 288 432</b>	<b>1 365 244</b>	<b>1 352 730</b>	<b>1 436 452</b>
Deposits from the private sector and municipalities	594 326	626 993	634 566	646 066	657 159
Of which:					
In foreign currency	19 222	22 099	23 621	22 594	26 479
Deposits from commercial and savings banks	17 621	19 395	20 176	18 107	26 635
Deposits from mortgage and fin. comp. and ins. etc. <sup>2)</sup>	34 143	35 922	34 156	32 254	35 160
Deposits from central government social security admin. and state lending inst.	51 504	23 676	46 687	26 160	52 163
Funds from CDs	72 606	66 040	82 897	79 644	86 926
Loans and deposits from Norges Bank	439	2 549	1 260	24 446	4 494
Loans and deposits from abroad	155 796	165 524	170 514	158 304	170 876
Other liabilities	246 713	254 731	277 896	266 481	303 341
Share capital/primary capital	23 948	24 274	24 300	24 821	25 339
Allocations, reserves etc.	62 459	62 297	62 526	63 928	71 657
Net income	2 750	7 181	10 246	12 519	2 702
<b>Total liabilities and capital</b>	<b>1 262 305</b>	<b>1 288 432</b>	<b>1 365 244</b>	<b>1 352 730</b>	<b>1 436 452</b>
Specifications:					
Foreign assets	120 391	130 722	125 769	136 823	153 235
Foreign debt	297 631	309 170	337 555	327 489	352 616

<sup>1)</sup> Postbanken is included.

<sup>2)</sup> Includes mortgage companies, finance companies, life and non-life insurance companies and other financial institutions.

<sup>3)</sup> Incl. unspecified loss provisions (negative figures) and loans and other claims not specified above.

Sources: Statistics Norway and Norges Bank

**Table 5. Commercial and savings banks.<sup>1)</sup> Loans and deposits distributed by private sector and municipalities. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000	31/3 2001
Loans to:					
Local government (incl. municipal enterprises)	12 827	14 021	13 588	14 421	12 514
Enterprises <sup>2)</sup>	294 013	314 187	333 175	331 323	346 510
Households <sup>3)</sup>	538 357	558 333	577 784	592 332	603 590
<b>Total loans to the private sector and municipalities</b>	<b>845 197</b>	<b>886 541</b>	<b>924 547</b>	<b>938 076</b>	<b>962 614</b>
Deposits from:					
Local government (incl. municipal enterprises)	30 001	37 778	36 149	42 741	38 893
Enterprises <sup>2)</sup>	186 498	189 424	199 872	203 199	206 068
Households <sup>3)</sup>	377 827	399 791	398 545	400 126	412 198
<b>Total deposits from the private sector and municipalities</b>	<b>594 326</b>	<b>626 993</b>	<b>634 566</b>	<b>646 066</b>	<b>657 159</b>

<sup>1)</sup> Postbanken is included.

<sup>2)</sup> Incl. private enterprises with limited liability etc., and state enterprises.

<sup>3)</sup> Incl. unincorporated enterprises, the self-employed and wage earners, etc.

Sources: Statistics Norway and Norges Bank

**Table 6. Private mortgage companies. Balance sheet. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000	31/3 2001
Cash and bank deposits	2 959	5 460	8 137	3 606	3 927
Notes and certificates	6 748	4 891	13 686	6 114	14 236
Bonds issued by govt. and by state lending inst.	1 341	1 311	1 063	1 006	1 566
Other bearer bonds	30 785	31 465	31 216	26 861	38 673
Loans to:					
Financial enterprises	10 788	12 583	14 403	17 668	19 858
Private sector and municipalities	128 241	132 217	133 858	143 948	144 543
Other sectors	16 707	15 670	13 010	13 839	13 028
Other assets	3 866	2 613	751	-1 325	-2 593
<b>Total assets</b>	<b>201 435</b>	<b>206 210</b>	<b>216 124</b>	<b>211 717</b>	<b>233 238</b>
Notes and certificates	37 433	28 562	33 145	21 453	42 397
Bearer bond issues in NOK <sup>1)</sup>	60 284	60 612	59 269	59 870	60 042
Bearer bond issues in foreign currency <sup>1)</sup>	57 843	63 396	58 490	67 861	65 081
Other funding	32 034	38 038	50 062	46 253	50 504
Equity capital	9 873	10 673	10 678	11 036	11 319
Other liabilities	3 968	4 929	4 480	5 244	3 895
<b>Total liabilities and capital</b>	<b>201 435</b>	<b>206 210</b>	<b>216 124</b>	<b>211 717</b>	<b>233 238</b>

<sup>1)</sup> Purchases of own bearer bonds deducted.

Sources: Statistics Norway and Norges Bank

**Table 7. Private finance companies. Balance sheet. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000	31/3 2001
Cash and bank deposits	1 424	1 462	1 519	1 173	1 757
Notes and certificates	-	-	-	101	97
Bearer bonds	64	58	58	54	54
Loans <sup>1)</sup> (gross) to:	63 030	64 901	67 587	70 230	75 551
Private sector and municipalities (net)	60 554	62 163	64 487	66 813	72 080
Other sectors (net)	2 333	2 614	2 940	3 256	3 334
Other assets <sup>2)</sup>	2 094	2 003	2 414	1 936	2 601
<b>Total assets</b>	<b>66 612</b>	<b>68 424</b>	<b>71 578</b>	<b>73 494</b>	<b>80 060</b>
Notes and certificates	642	502	187	57	425
Bearer bonds	323	323	323	133	115
Loans from non-banks	8 726	8 128	8 054	9 517	10 403
Loans from banks	45 424	48 420	50 803	51 830	56 415
Other liabilities	5 681	5 188	6 389	5 957	6 293
Capital, reserves	5 816	5 863	5 822	6 000	6 406
<b>Total liabilities and capital</b>	<b>66 612</b>	<b>68 424</b>	<b>71 578</b>	<b>73 494</b>	<b>80 060</b>

<sup>1)</sup> Includes subordinated loan capital and leasing finance.

<sup>2)</sup> Includes specified and unspecified loan loss provisions (negative figures).

Source: Norges Bank

**Table 8. Life insurance companies. Main assets. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Cash and bank deposits	7 376	5 689	8 978	7 828	9 841
Norwegian notes and certificates	11 983	11 680	10 544	14 515	13 950
Foreign Treasury bills and notes	337	194	170	-	200
Norwegian bearer bonds	96 446	94 100	89 732	88 347	86 433
Foreign bearer bonds	61 222	68 163	68 195	72 397	74 702
Norwegian shares and units	43 741	45 207	46 699	47 654	42 625
Foreign shares and units	76 162	83 917	82 826	83 060	80 887
Interests in group or associated companies	5 178	6 271	6 358	6 985	7 067
Loans to the private sector and municipalities	25 063	24 479	23 860	23 473	23 047
Loans to other sectors	885	921	916	941	867
Other specified assets	38 219	38 578	40 814	40 622	41 877
<b>Total assets</b>	<b>366 612</b>	<b>379 199</b>	<b>379 092</b>	<b>385 822</b>	<b>381 496</b>

Source: Statistics Norway

**Table 9. Private and municipal pension funds.<sup>1)</sup> Main assets. In millions of NOK.** *This table will not be updated hereafter, and after a period will cease to be published.*

	30/6 1999	30/9 1999	31/12 1999	31/3 2000	30/6 2000
Cash and bank deposits	6 043	5 872	5 533	3 797	4 909
Norwegian bearer bonds	47 077	47 553	47 253	44 770	45 510
Loans to the private sector and municipalities	5 270	5 340	5 350	6 010	4 970
Other specified assets	26 213	26 792	30 472	33 661	35 700
<b>Total assets</b>	<b>84 603</b>	<b>85 557</b>	<b>88 608</b>	<b>88 238</b>	<b>91 089</b>

<sup>1)</sup> Estimates based on a selection of institutions representing about 50% of aggregate total assets.

Source: Norges Bank

**Table 10. Non-life insurance companies. Main assets. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Cash and bank deposits	7 978	7 171	6 159	6 513	6 233
Norwegian notes and certificates	5 297	5 058	4 065	3 992	4 075
Foreign notes and certificates	223	246	238	293	225
Norwegian bearer bonds	11 352	13 555	13 985	13 923	13 402
Foreign bearer bonds	10 437	11 577	13 109	14 600	14 072
Norwegian shares	7 258	7 146	6 966	6 838	6 598
Foreign shares	10 084	10 420	9 469	9 014	8 074
Interests in group or associated companies	7 298	7 842	6 586	6 654	6 326
Loans to the private sector and municipalities	1 320	1 328	1 305	1 187	1 649
Loans to other sectors	130	144	145	110	100
Other specified sectors	35 781	38 532	38 781	38 485	34 749
<b>Total assets</b>	<b>97 156</b>	<b>103 017</b>	<b>100 805</b>	<b>101 607</b>	<b>95 503</b>

Source: Statistics Norway

**Table 11a. Mutual funds' assets. Market value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Bank deposits	4 761	5 015	5 186	6 019	124
Short-term securities issued by central government and state lending institutions	1 402	1 561	1 604	2 158	1 820
Short-term securities issued by other domestic sectors	12 345	12 443	15 498	18 024	18 728
Short-term securities issued by the rest of the world	-	-	-	-	-
Bonds issued by central government and state lending institutions	4 156	2 858	3 027	2 953	3 772
Bonds issued by other domestic sectors	15 735	15 969	13 706	14 087	17 871
Bonds issued by the rest of the world	1 623	1 942	1 995	2 167	2 305
Shares issued by other domestic sectors	46 174	48 421	48 248	49 187	43 706
Shares issued by the rest of the world	34 707	43 980	46 505	52 037	53 342
Other assets	1 297	1 354	1 423	1 692	1 657
<b>Total assets</b>	<b>122 198</b>	<b>133 542</b>	<b>137 151</b>	<b>148 325</b>	<b>143 325</b>

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 11b. Stocks of mutual funds shares by holding sector. Market value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Central government and social security administration	307	330	355	390	399
Commercial and savings banks	1 927	2 170	1 835	3 110	3 389
Other financial corporations	10 951	10 892	11 710	11 613	11 690
Local government corporations and municipal enterprises	5 035	5 078	5 046	5 038	5 425
Other corporations	25 366	28 346	28 230	30 680	30 232
Households	75 412	83 182	86 516	93 791	88 545
Rest of the world	2 096	2 444	2 357	2 603	2 543
<b>Mutual funds shares in total</b>	<b>121 094</b>	<b>132 441</b>	<b>136 049</b>	<b>147 224</b>	<b>142 224</b>

Sources: Norwegian Central Securities Depository and Norges Bank + The Norwegian Mutual Fund Association

## Securities statistics

**Table 12. Stocks of shares registered with the Norwegian Central Securities Depository (VPS) by holding sectors. Estimated market value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Central government and social security administration	89 383	86 572	95 110	100 479	144 983
State lending institutions	18	18	18	17	17
Commercial and savings banks <sup>1)</sup>	12 222	13 094	14 406	15 376	12 273
Insurance companies, etc.	57 778	55 090	53 587	54 559	47 616
Finance institutions and mortgage companies	185	185	176	198	174
Local government incl. municipal enterprises	3 447	3 570	3 408	3 449	2 944
State enterprises	25 972	28 375	29 669	27 403	29 111
Mutual funds	46 918	47 387	48 371	50 009	43 782
Other corporations	185 989	186 649	197 949	210 979	180 297
Households	55 401	61 357	63 041	69 118	61 761
Rest of the world	183 310	198 671	210 026	243 594	259 156
Unspecified sector	987	1 940	1 298	1 540	1 832
<b>Total</b>	<b>661 609</b>	<b>683 268</b>	<b>717 059</b>	<b>776 722</b>	<b>783 946</b>

<sup>1)</sup> The banks' guarantee funds are included in this sector.

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 13. Stocks of shares and primary capital certificates registered with the Norwegian Central Securities Depository by issuing sectors. Nominal value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Savings banks	8 905	8 905	8 965	8 981	8 986
Commercial banks	14 636	14 636	14 703	14 708	15 229
Insurance companies	1 215	1 215	1 215	1 215	1 255
Finance institutions and mortgage companies	2 018	2 018	2 018	2 018	2 018
State enterprises	7 090	7 090	7 090	7 091	18 279
Other enterprises	47 927	48 671	50 455	51 365	55 887
Rest of the world	4 692	5 318	5 909	6 427	6 210
Unspecified sector	0	0	0	0	2
<b>Total</b>	<b>86 854</b>	<b>87 648</b>	<b>90 356</b>	<b>91 805</b>	<b>107 867</b>

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 14. Net purchase and net sales (-) in the primary and secondary markets of shares registered with the Norwegian Central Securities Depository, by purchasing, selling and issuing sector<sup>1)</sup>. Estimated market value. In millions of NOK**

Q1-Q4 2000	Purchasing/ selling sector										
	Cent. gov't and social security	Norges Bank and state len- ding institutions	Com. and savings banks <sup>2)</sup>	Insurance companies	Other financial corporations	Local governm. and municip. enterpr.	Other corpora- tions <sup>3)</sup>	House- holds	Rest of the world	Unspeci- fied	Total <sup>4)</sup>
Commercial banks	-10 251	0	-407	-1 874	-12	-17	-2 176	-1 490	16 875	12	659
Insurance companies	0	0	-0	9	0	-1	-1	-5	-1	-0	-0
Finance institutions and mortgage companies	0	0	0	0	0	0	1	-1	0	-0	0
State enterprises	-1 642	0	-381	-518	8	-27	2 028	740	16 255	42	16 504
Other corporations	-345	-0	-712	-9 222	-27	-38	7 383	-1 067	31 123	1 254	28 350
Rest of the world	201	0	12 801	-390	7	42	-3 782	1 334	-6 752	176	3 636
Unspecified sector	0	0	-1 075	44	0	0	375	87	569	2	2
<b>Total</b>	<b>-12 037</b>	<b>-0</b>	<b>10 226</b>	<b>-11 951</b>	<b>-24</b>	<b>-42</b>	<b>3 829</b>	<b>-403</b>	<b>58 069</b>	<b>1 485</b>	<b>49 151</b>

<sup>1)</sup> Issues at issue price + purchases at market value - sales at market value - redemption value.

<sup>2)</sup> The banks' guarantee funds are included in this sector.

<sup>3)</sup> Including mutual funds and state enterprises.

<sup>4)</sup> Total shows net issues in the primary market. Purchases and sales in the secondary market result in redistribution between owner sectors, but add up to 0.

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 15. Stocks of NOK-denominated bonds registered with the Norwegian Central Securities Depository by holding sectors. Market value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Central government administration and social security sector	33 436	32 552	30 063	28 200	29 283
Norges Bank	7 849	7 292	7 586	8 015	8 297
State lending institutions	1 568	291	275	282	266
Commercial and savings banks <sup>1)</sup>	54 433	58 399	55 152	57 450	62 745
Insurance companies etc.	158 109	158 297	156 451	154 775	150 773
Finance institutions and mortgage companies	14 597	15 162	14 942	14 487	15 281
Local government and municipal enterprises	8 255	10 096	10 420	10 030	10 668
State enterprises	2 642	2 709	2 777	2 729	2 923
Mutual funds	18 713	19 226	17 139	17 479	22 262
Other corporations	26 044	25 987	24 935	25 685	24 010
Households	10 003	10 144	11 513	12 786	17 078
Rest of the world	46 985	43 848	51 795	59 871	69 674
Unspecified sector	693	721	714	853	957
<b>Total</b>	<b>383 326</b>	<b>384 724</b>	<b>383 762</b>	<b>392 660</b>	<b>414 216</b>

1) The banks' guarantee funds are included.

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 16. Stocks of NOK-denominated bonds registered with the Norwegian Central Securities Depository by issuing sectors. Nominal value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Central government administration and social security sector	130 495	134 072	139 635	141 511	144 163
State lending institutions	29 584	379	358	347	326
Commercial and savings banks	91 976	93 063	88 388	95 576	105 425
Mortgage companies	42 684	69 960	69 337	67 327	67 847
Other financial enterprises	1 426	1 371	1 371	1 302	912
Local government incl. municipal enterprises	42 001	41 888	41 149	41 189	47 225
State enterprises	15 478	15 208	15 911	17 607	18 509
Other corporations	23 254	23 567	24 211	25 337	24 807
Households	30	30	30	30	27
Rest of the world	4 898	4 993	6 355	7 122	6 892
Unspecified sector	0	90	0	0	0
<b>Total</b>	<b>381 826</b>	<b>384 622</b>	<b>386 747</b>	<b>397 349</b>	<b>416 132</b>

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 17. Net purchases and net sales (-) in the primary and secondary markets of NOK-denominated bonds registered with the Norwegian Central Securities Depository by purchasing, selling and issuing sectors<sup>1)</sup>. Estimated market value. In millions of NOK**

Q1-Q4 2000	Purchasing/selling sector										Total <sup>4)</sup>
	Cent. gov't and social security	Norges Bank and state lending institutions	Com. and savings banks <sup>2)</sup>	Insurance companies	Other financial corporations	Local governm. and municip. enterpr.	Other corporations <sup>3)</sup>	Households	Rest of the world	Unspeci-fied	
Cent. gov. and soc. sec. adm.	-1 771	531	870	-341	-83	648	-1 717	-404	15 967	-17	13 683
State lending institutions	0	-35	-29	-0	0	0	0	0	0	0	-64
Comm. and savings banks	-1 733	0	4 668	-4 169	1 580	364	2 657	7 529	602	636	12 135
Private mortgage companies	348	0	-828	-2 461	-2 196	51	95	77	491	58	-4 366
Other financial corporations	0	0	-93	-134	-5	-60	-181	4	-49	4	-514
Local government and municipal enterprises	-330	0	1 113	2 171	41	859	1 060	58	327	-8	5 291
State enterprises	-108	0	85	1 518	-4	227	350	-33	-15	13	2 032
Other corporations	60	0	2 561	116	101	552	1 345	456	1 725	26	6 944
Households	0	0	10	-13	-1	0	0	0	0	0	-3
Rest of the world	0	0	15	2 202	15	-45	-31	2	-98	1	2 062
Unspecified sector	0	0	0	-3	0	0	-2	0	0	0	-5
<b>Total</b>	<b>-3 534</b>	<b>496</b>	<b>8 372</b>	<b>-1 114</b>	<b>-552</b>	<b>2 596</b>	<b>3 576</b>	<b>7 690</b>	<b>18 950</b>	<b>713</b>	<b>37 193</b>

1) Issues at issue price + purchases at market value - sales at market value - redemption value.

2) The banks' guarantee funds are included in this sector.

3) Including mutual funds and state enterprises.

4) Total shows net issues in the primary market. Purchases and sales in the secondary market result in redistribution between owner sectors, but add up to 0.

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 18. Stocks of NOK-denominated short-term securities registered with the Norwegian Central Securities Depository by holding sectors. Market value. In millions of NOK**

	31/12 1999	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Central government and social security admin.	5 393	7 034	8 456	7 307	7 354
Norges Bank	1 532	2 995	2 246	2 626	2 816
State lending institutions	1 545	0	0	0	0
Commercial and savings banks <sup>1)</sup>	41 573	29 994	28 007	19 059	23 378
Insurance companies, etc.	26 862	20 467	18 441	21 868	24 261
Finance institutions and mortgage companies	1 385	4 781	2 397	2 433	1 907
Local government and municipal enterprises	1 913	2 362	1 899	3 167	3 665
State enterprises	3 924	11 939	4 027	12 411	4 596
Mutual funds	13 764	14 104	17 575	20 616	21 157
Other corporations	11 876	8 431	11 312	9 631	9 846
Households	777	669	779	901	941
Rest of the world	3 812	6 806	5 876	3 648	7 632
Unspecified sector	592	760	635	641	233
<b>Total</b>	<b>114 948</b>	<b>110 341</b>	<b>101 651</b>	<b>104 308</b>	<b>107 786</b>

<sup>1)</sup> The banks' guarantee funds are included in this sector.

Sources: Norwegian Central Securities Depository and Norges Bank

**Table 19 Stocks of short-term securities by issuing sectors<sup>1)</sup> Nominal value. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000
Central government and social security sector	31 000	27 045	24 000	31 000
Counties	1 402	1 307	699	603
Municipalities	6 485	4 267	3 752	5 074
State lending institutions	0	0	0	0
Commercial banks	15 726	14 407	15 334	10 364
Savings banks	30 685	31 360	32 670	36 812
Mortgage companies	9 481	5 542	5 086	4 704
Finance companies	662	501	187	557
Other financial corporations	0	0	0	0
State-owned enterprises	1 800	1 850	5 095	1 965
Municipal enterprises	5 683	5 797	7 085	8 243
Private enterprises	6 909	9 042	8 355	9 124
Rest of the world	400	500	650	1 000
<b>Total</b>	<b>110 233</b>	<b>101 618</b>	<b>102 912</b>	<b>109 446</b>

<sup>1)</sup> Comprises stocks of short-term securities in NOK issued in Norway by domestic sectors and foreigners and stocks of short-term securities in foreign currency issued in Norway by domestic sectors.

Source: Norges Bank

## Credit and liquidity trends

**Table 20. Inter-company loans. Amounts outstanding. In billions of NOK.** *This table will not be updated hereafter, and after a period will cease to be published.*

	30/9 1999	31/12 1999	31/3 2000	30/6 2000	30/9 2000
Guaranteed by:					
Private finance companies	0.1	0.1	0.1	0.1	0.1
Non-life/credit insurance companies	0.1	0.1	0.1	0.1	0.1
Commercial banks	1.4	1.4	1.4	1.4	1.4
Savings banks	1.4	1.4	1.4	1.4	1.4
<b>Loans with guarantee</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>
Loans without guarantee arranged by:					
Broker	0.1	0.1	0.1	0.1	0.1
Bank	0.0	0.0	0.0	0.0	0.0
<b>Total inter-company loans</b>	<b>3.2</b>	<b>3.1</b>	<b>3.1</b>	<b>3.1</b>	<b>3.1</b>

Source: Norges Bank

**Table 21. Credit indicator and money supply**

	Volume figures at end of period NOKbn			Percentage growth				
				Over past 12 months			Over past 3 months annualised rate	
	C2	C3 <sup>1)</sup>	M2 <sup>2)</sup>	C2	C3 <sup>1)</sup>	M2 <sup>2)</sup>	C2	M2 <sup>2)</sup>
1992								
December	886.7	1 069.5	479.5	-3.3	-1.7	..	-2.2	..
1993								
December	875.5	1 074.1	475.7	-1.8	-1.7	-0.9	0.0	2.1
1994								
December	891.6	1 075.8	500.4	2.3	1.3	5.1	2.8	2.6
1995								
December	934.5	1 123.6	529.1	4.9	5.2	5.7	5.4	2.3
1996								
December	993.6	1 215.4	563.4	6.2	5.4	6.4	7.8	5.4
1997								
December	1 101.0	1 362.9	577.7	10.2	10.0	2.5	10.1	4.0
1998								
December	1 195.3	1 542.0	604.6	8.3	12.2	4.6	6.7	6.6
1999								
July	1 248.6	1 629.1	647.2	7.1	10.1	7.8	8.6	14.5
August	1 255.6	1 636.6	648.2	6.9	9.8	8.1	8.5	12.5
September	1 265.0	1 642.6	643.4	8.0	10.1	7.2	8.5	10.1
October	1 278.5	1 669.2	661.8	8.2	10.5	10.0	9.2	7.1
November	1 287.1	1 672.3	659.7	8.3	9.3	9.1	9.9	11.5
December	1 297.7	1 674.1	670.8	8.3	7.8	10.5	10.0	10.3
2000								
January	1 309.5	1 690.6	671.6	8.9	7.6	8.0	10.6	11.7
February	1 321.8	1 697.7	677.6	8.9	7.3	9.5	11.1	8.6
March	1 334.9	1 723.6	684.6	9.5	7.7	10.0	11.8	10.7
April	1 354.6	1 760.0	691.3	10.5	8.0	10.8	11.9	10.9
May	1 366.0	1 764.3	697.2	10.2	7.4	11.8	12.0	12.2
June	1 375.9	1 772.8	704.6	10.5	8.0	10.9	12.1	11.6
July	1 394.9	1 801.1	708.7	11.1	8.5	9.6	12.6	10.8
August	1 410.4	1 848.2	713.5	11.6	10.6	10.2	13.3	10.9
September	1 428.5	1 875.0	725.6	12.1	11.6	12.7	12.8	9.3
October	1 437.1	1 897.1	718.6	11.5	11.1	8.5	13.0	9.1
November	1 459.0	1 906.9	729.3	12.6	11.8	10.7	11.9	6.0
December	1 463.6	1 892.6	731.4	12.3	11.4	9.0	12.6	9.3
2001								
January	1 481.3	1 890.8	745.6	12.2	10.6	10.9	11.7	10.3
February	1 497.7	1 902.6	750.6	12.4	10.7	10.7	11.5	13.5
March	1 508.2	...	753.2	12.0	...	10.0	10.3	9.0
April	1 517.3	...	750.6	11.5	...	8.7	...	...

C2 = Credit indicator. Credit from domestic sources; seasonally adjusted figures.

C3 = Total credit from domestic and foreign sources; actual figures.

M2 = Money supply; seasonally adjusted figures.

1) C3 has not been adjusted for revised C2 figures.

2) With effect from November 2000, new definitions were introduced for money supply statistics, including the exclusion of "Unutilised overdrafts and building loans" which was previously included in M2.

Source: Norges Bank

**Table 22. Domestic credit supply to the private sector and municipalities, by source. In millions of NOK. 12-month growth as a percentage.**

	31/12/1998		31/12/1999		31/12/2000		30/04/2001	
	Amount	%	Amount	%	Amount	%	Amount	%
Private banks	747 061	8.7	819 535	9.5	938 076	13.8	973 972	12.4
State lending institutions	180 020	4.4	189 651	5.3	167 921	3.9	172 110	4.0
Norges Bank	532	3.9	566	6.4	575	1.6	579	1.9
Mortgage companies	94 964	31.5	93 270	-2.5	143 947	19.4	145 712	11.7
Finance companies	45 770	22.8	58 806	28.4	66 809	12.1	73 049	12.1
Life insurance companies	28 253	-15.4	25 062	-11.3	23 047	-8.0	23 050	-5.0
Pension funds	4 616	-0.9	4 968	7.6	4 780	-3.8	4 780	-12.1
Non-life insurance companies	3 272	-16.9	1 321	-59.6	1 648	24.8	1 650	25.0
Bond debt <sup>1)</sup>	75 231	4.0	77 413	2.9	85 113	9.9	87 963	14.3
Certificate debt	10 580	-31.5	19 335	82.8	25 009	29.3	29 464	31.8
Other sources	4 729	22.7	7 175	51.7	6 038	27.4	7 542	51.8
Total domestic credit (C2) <sup>2)</sup>	1 195 028	8.3	1 297 102	8.4	1 462 963	12.3	1 519 871	11.5

1) Adjusted for non-resident holdings of Norwegian private and municipal bonds in Norway.

2) Corresponds to Norges Bank's credit indicator (C2).

Source: Norges Bank

**Table 23. Composition of money supply. In millions of NOK <sup>1)</sup>**

Actual figures at end of period	Notes and coins	Transaction account deposits	M1 <sup>2)</sup>	Other deposits <sup>3)</sup>	CDs	M2 <sup>4)</sup>	Change last 12 months total M2
1992	32 452	157 852	190 304	290 667	828	481 799	..
1993	35 741	151 128	186 869	288 447	2 260	477 576	-4 223
1994	37 945	172 639	210 584	286 228	5 116	501 928	24 352
1995	39 092	178 690	217 782	296 778	15 731	530 291	28 363
1996	40 110	207 682	247 792	294 926	21 686	564 404	34 113
1997	42 262	227 440	269 702	278 889	30 200	578 791	14 387
1998	42 143	237 046	279 789	293 085	33 308	605 583	26 792
1999	43 376	300 559	343 935	296 238	31 392	671 564	65 981
2000							
April	38 846	312 976	351 822	301 731	28 594	682 147	67 839
May	38 777	318 693	357 470	300 798	29 805	688 073	73 829
June	39 996	340 037	380 033	303 401	31 115	714 549	68 737
July	39 366	334 384	373 750	309 085	29 539	712 375	61 841
August	38 836	325 228	364 064	318 563	31 437	714 065	65 865
September	38 635	338 968	377 603	313 425	37 196	728 225	82 270
October	38 130	330 628	368 758	322 120	30 370	721 249	56 559
November	39 008	331 516	370 524	318 192	29 935	718 652	69 348
December	42 524	330 724	373 248	324 507	34 338	732 094	60 530
2001							
January	39 399	336 194	375 593	340 759	33 354	749 707	73 821
February	38 689	339 800	378 489	343 531	33 920	755 941	72 973
March	38 252	334 396	372 648	339 894	39 661	752 204	68 666
April	38 433	328 323	366 756	339 998	34 618	741 373	59 226

1) With effect from November 2000, new definitions were introduced for money supply statistics. The most important change is the exclusion of "Unutilised overdrafts and building loans" which was previously included in both M1 and M2. In addition, the former definitions of M1 and M2 have been reclassified.

2) The narrow money concept M1 constitutes the money-holding sector's stock of Norwegian notes and coins plus the sector's transaction accounts deposits in Norges Bank, commercial banks and savings banks (in NOK and foreign currency).

3) Excluding restricted bank deposits (BSU, IPA, withholding tax accounts, etc).

4) The broad money concept M2 constitutes the sum of M1 and the money-holding sector's other bank deposits (in NOK and foreign currency) excluding restricted bank deposits (BSU, IPA, withholding tax accounts, etc) and CDs.

Source: Norges Bank

**Table 24. Household financial balance. Financial investments and holdings, by financial instrument. In billions of NOK**

	Financial investments				Holdings			
	Year				Year			
	1997	1998	1999	2000	1997	1998	1999	2000
Bank deposits, etc. <sup>1)</sup>	6.6	23.4	33.1	34.7	349.9	373.6	406.8	441.8
Bonds, etc. <sup>2)</sup>	0.2	0.5	2.2	7.8	8.9	8.4	10.9	18.2
Shares, etc. <sup>3)</sup>	18.1	22.2	2.3	10.8	135.5	144.6	168.2	182.5
Units in securities funds	14.0	-0.2	8.8	11.5	59.9	50.0	77.9	93.3
Insurance claims	25.2	20.7	20.1	20.1	347.1	369.1	428.5	445.6
Loans and other assets <sup>4)</sup>	6.4	10.2	6.7	2.9	90.6	100.7	107.5	110.2
<b>Total assets</b>	<b>70.5</b>	<b>76.8</b>	<b>73.2</b>	<b>87.8</b>	<b>991.9</b>	<b>1 046.4</b>	<b>1 199.8</b>	<b>1 291.6</b>
Loans from commercial and savings banks + Postbanken	54.5	34.2	49.9	66.9	440.7	475.2	525.3	592.3
Loans from state banks and Norges Bank	-1.2	6.7	6.1	5.9	122.2	128.6	134.3	139.9
Loans from private mortgage companies and finance companies	3.3	9.6	0.5	6.3	37.0	46.7	47.1	53.5
Loans from insurance companies	-13.3	-5.5	-3.9	-2.2	28.6	23.0	19.2	17.0
Other liabilities <sup>5)</sup>	0.4	8.7	-0.2	-0.8	72.9	81.1	80.4	79.2
<b>Total liabilities</b>	<b>43.7</b>	<b>53.7</b>	<b>52.8</b>	<b>76.1</b>	<b>701.4</b>	<b>754.6</b>	<b>806.3</b>	<b>881.9</b>
<b>Net</b>	<b>26.8</b>	<b>23.1</b>	<b>20.4</b>	<b>11.7</b>	<b>290.5</b>	<b>291.8</b>	<b>393.5</b>	<b>409.7</b>

1) Notes and coins, bank deposits and deposits with finance companies.

2) Bearer bonds, savings bonds, premium bonds, notes and short-term Treasury notes.

3) VPS-registered (registered with the Norwegian Central Securities Depository) and non-registered shares.

4) Loans, accrued interest, holiday pay claims and tax claims.

5) Other loans, bonds and notes, tax liabilities, and accrued interest.

Sources: Statistics Norway and Norges Bank

**Table 25. Money market liquidity. Liquidity effect from 1 January to end period. In millions of NOK**

Supply+/withdrawal-	1/1-31/12		1/1-31/5	
	1999	2000	2000	2001
Central govt. and other public accounts (excl. paper issued by state lending inst. and govt.)	4 870	-50 855	-21 995	-71 062
Paper issued by state lending inst. and govt.	-2 702	-11 103	-114	16 022
Purchase of foreign exchange for Gov't Petroleum Fund	11 321	53 010	16 330	40 570
Other foreign exchange transactions	-88	368	0	30
Holdings of banknotes and coins <sup>1)</sup> (estimate)	-1 800	775	5 160	3 772
Norges Bank's other transactions <sup>1)</sup> (estimate)	...	...	...	...
Overnight loans	-110	245	233	146
Fixed-rate loans	13 499	-4 425	-13 952	3 849
Other central bank financing	648	340	-7 795	-8 135
<b>Total reserves</b>	<b>25 638</b>	<b>-11 645</b>	<b>-22 133</b>	<b>-14 808</b>
Of which:				
Sight deposits with Norges Bank	25 638	-11 645	-22 133	-14 808
Short-term Treasury notes	0	0	0	0
Other reserves (estimate)	0	0	0	0

<sup>1)</sup> The figures are based mainly on Norges Bank's accounts. Discrepancies may arise between the bank's own statements and banking statistics due to different accruals.

Source: Norges Bank

## Interest rate statistics

**Table 26. Nominal interest rates for NOK. Average. Per cent per annum**

	1-month		3-month		12-month		Interest rate on banks' over- night loans in Norges Bank	Interest rate on banks' sight deposits with Norges Bank
	NIDR	NIBOR	NIDR	NIBOR	NIDR	NIBOR		
2000								
May	6.4	6.3	6.7	6.5	7.1	7.0	7.8	5.8
June	6.7	6.5	6.9	6.7	7.3	7.2	8.1	6.1
July	6.7	6.6	7.1	6.9	7.6	7.5	8.3	6.3
August	7.0	6.9	7.3	7.1	7.6	7.5	8.6	6.6
September	7.3	7.1	7.5	7.3	7.8	7.7	8.8	6.8
October	7.5	7.4	7.7	7.5	7.9	7.8	9.0	7.0
November	7.4	7.3	7.6	7.4	7.7	7.5	9.0	7.0
December	7.6	7.5	7.6	7.4	7.5	7.3	9.0	7.0
2001								
January	7.5	7.4	7.6	7.4	7.4	7.2	9.0	7.0
February	7.4	7.2	7.5	7.3	7.4	7.2	9.0	7.0
March	7.5	7.3	7.5	7.4	7.5	7.4	9.0	7.0
April	7.6	7.5	7.6	7.5	7.5	7.4	9.0	7.0
May	7.6	7.4	7.6	7.4	7.6	7.5	9.0	7.0

Note: NIDR = Norwegian Interbank Deposit Rate, a pure krone interest rate  
NIBOR = Norwegian Interbank Offered Rate, constructed on the basis of currency swaps

Source: Norges Bank

**Table 27. Short-term interest rates<sup>1)</sup> for key currencies in the Euro-market. Per cent per annum**

	DEM	DKK	FIM	FRF	GBP	JPY	SEK	USD	EURO	Interest rate differential
										NOK/EURO
200										
May	..	4.6	..	..	6.2	0.1	4.0	6.7	4.3	2.1
June	..	5.1	..	..	6.1	0.1	4.0	6.8	4.5	2.1
July	..	5.7	..	..	6.1	0.2	4.1	6.7	4.6	2.2
August	..	5.6	..	..	6.1	0.3	4.1	6.7	4.8	2.2
September	..	6.0	..	..	6.1	0.4	4.0	6.6	4.8	2.4
October	..	5.5	..	..	6.1	0.5	4.0	6.7	5.0	2.4
November	..	5.4	..	..	6.0	0.6	3.9	6.7	5.1	2.3
December	..	5.3	..	..	5.9	0.6	4.1	6.5	4.9	2.4
2001										
January	..	5.3	..	..	5.7	0.5	4.1	5.7	4.7	2.6
February	..	5.2	..	..	5.7	0.4	4.0	5.3	4.7	2.5
March	..	5.1	..	..	5.5	0.2	4.0	4.9	4.7	2.6
April	..	5.0	..	..	5.3	0.1	4.0	4.6	4.7	2.7
May	..	5.0	..	..	5.2	0.1	4.0	4.0	4.6	2.7

<sup>1)</sup> Three-month rates, monthly average of daily quotations.

Sources: OECD and Norges Bank

**Table 28. Yields on Norwegian bonds<sup>1)</sup>. Per cent per annum**

	3-year		5-year		10-year	
	Govt.	Private	Govt.	Private	Govt.	Private
2000						
May	6.6	7.3	6.4	7.3	6.2	7.3
June	6.6	7.4	6.3	7.3	6.1	7.2
July	6.9	7.5	6.5	7.5	6.2	7.3
August	6.9	7.4	6.5	7.4	6.2	7.2
September	7.1	7.7	6.7	7.7	6.3	7.4
October	7.0	7.7	6.6	7.7	6.4	7.5
November	6.7	7.4	6.4	7.5	6.2	7.3
December	6.4	6.9	6.1	7.0	6.0	7.0
2001						
January	6.4	6.9	6.1	6.9	5.9	6.9
February	6.4	7.0	6.2	6.9	6.0	7.0
March	6.6	7.1	6.3	7.0	6.0	7.0
April	6.7	7.1	6.4	7.1	6.2	7.1
May	6.8	7.3	6.6	7.3	6.5	7.3

<sup>1)</sup> Whole-year interest rate paid in arrears. monthly average. As of 1 January 1993 based on interest rate on representative bonds weighted by residual maturity.

Source: Norges Bank

**Table 29. Yields on government bonds<sup>1)</sup> in key currencies. Per cent per annum**

	DEM	DKK	FIM	FFR	GBP	JPY	SEK	USD	Interest rate differential
									NOK/DEM <sup>2)</sup>
2000									
May	5.4	5.9	5.6	5.5	5.3	1.7	5.4	6.4	0.8
June	5.2	5.8	5.5	5.3	5.2	1.7	5.2	6.2	0.9
July	5.3	5.9	5.5	5.4	5.2	1.7	5.4	6.1	0.9
August	5.3	5.7	5.5	5.4	5.3	1.8	5.4	5.9	0.9
September	5.3	5.7	5.6	5.4	5.3	1.9	5.3	6.0	1.0
October	5.3	5.7	5.5	5.4	5.2	1.8	5.3	6.0	1.1
November	5.2	5.6	5.5	5.3	5.1	1.8	5.2	5.9	1.0
December	5.0	5.3	5.2	5.1	4.9	1.6	5.0	5.6	1.0
2001									
January	4.9	5.2	5.1	4.9	4.9	1.5	5.0	5.7	1.1
February	4.9	5.1	5.1	4.9	4.9	1.4	4.7	5.6	1.1
March	4.8	5.0	5.0	4.8	4.8	1.2	4.8	5.2	1.3
April	4.9	5.2	5.2	5.0	4.9	1.4	5.0	5.2	1.3
May	5.1	5.4	5.4	5.2	5.1	1.3	5.3	5.4	1.4

<sup>1)</sup> Government bonds with 10 years to maturity. Monthly average of daily quotations.

<sup>2)</sup> Differential between yields on Norwegian and German government bonds with 10 years to maturity.

Source: Norges Bank

**Table 30. Commercial and savings banks. Average interest rates and commissions on utilised loans in NOK to the private and municipal sector at end of quarter. Per cent per annum**

	All loans				Loans, excl. non-accrual loans <sup>1)</sup>			
	Credit lines	Repayment loans		Total loans	Credit lines	Repayment loans		Total loans
	Overdrafts and building loans	Housing loans	Other loans		Overdrafts and building loans	Housing loans	Other loans	
<b>Q1 2000</b>								
Commercial banks	9.37	7.02	7.33	7.39	9.45	7.03	7.41	7.43
Savings banks	10.54	7.13	7.94	7.65	10.66	7.14	7.97	7.67
All banks	9.86	7.08	7.61	7.52	9.96	7.09	7.67	7.55
<b>Q2 2000</b>								
Commercial banks	9.49	7.21	7.68	7.65	9.59	7.22	7.74	7.68
Savings banks	10.94	7.49	8.30	8.00	11.06	7.49	8.33	8.02
All banks	10.08	7.36	7.96	7.83	10.20	7.37	8.01	7.85
<b>Q3 2000</b>								
Commercial banks	10.08	7.95	8.32	8.34	10.18	7.96	8.37	8.38
Savings banks	11.30	8.22	8.99	8.70	11.44	8.22	9.03	8.72
All banks	10.58	8.10	8.62	8.52	10.70	8.10	8.67	8.55
<b>Q4 2000</b>								
Commercial banks	10.71	8.36	8.57	8.72	10.80	8.37	8.64	8.75
Savings banks	11.77	8.60	9.30	9.06	11.96	8.61	9.37	9.09
All banks	11.16	8.50	8.90	8.89	11.28	8.51	8.97	8.93
<b>Q1 2001</b>								
Commercial banks	10.42	8.35	8.53	8.68	10.46	8.35	8.61	8.71
Savings banks	11.68	8.62	9.33	9.08	11.87	8.62	9.39	9.11
All banks	10.93	8.50	8.89	8.88	11.03	8.51	8.96	8.92

<sup>1)</sup> Non-accrual loans in which interest accruals, commissions and charges have been suspended.

Source: Norges Bank

**Table 31. Commercial and savings banks. Average interest rates on deposits in NOK from the private and municipal sector at end of quarter. Per cent per annum**

	Ordinary terms	Special terms	Total deposits	Sight deposits	Time deposits
<b>Q1 2000</b>					
Commercial banks	4.21	5.41	4.48	4.16	5.36
Savings banks	4.06	5.47	4.37	3.94	5.30
All banks	4.14	5.45	4.43	4.06	5.32
<b>Q2 2000</b>					
Commercial banks	4.38	5.88	4.66	4.34	5.77
Savings banks	4.24	5.84	4.59	4.13	5.63
All banks	4.32	5.85	4.62	4.24	5.67
<b>Q3 2000</b>					
Commercial banks	5.14	6.66	5.46	5.09	6.54
Savings banks	4.96	6.53	5.32	4.85	6.30
All banks	5.05	6.57	5.39	4.98	6.38
<b>Q4 2000</b>					
Commercial banks	5.58	6.91	5.83	5.53	6.84
Savings banks	5.44	6.91	5.78	5.34	6.67
All banks	5.52	6.91	5.81	5.44	6.73
<b>Q1 2001</b>					
Commercial banks	5.65	6.91	5.88	5.59	6.86
Savings banks	5.47	6.92	5.82	5.36	6.73
All banks	5.56	6.92	5.85	5.48	6.77

Source: Norges Bank

**Table 32. Life insurance companies. Average interest rates by type of loan at end of quarter. Per cent per annum**

	Housing loans	Other loans	Total loans
Q1 2000	6.9	6.3	6.6
Q2 "	7.0	6.5	6.8
Q3 "	8.0	6.8	7.4
Q4 "	8.1	7.0	7.6
Q1 2001	8.1	7.0	7.6

Source: Norges Bank

**Table 33. Mortgage companies. Average interest rates, incl. commissions on loans to private sector at end of quarter. Per cent per annum**

	Housing loans	Loans to private enterprises	Total loans
Q1 2000	6.8	6.9	6.5
Q2 "	7.0	7.2	6.7
Q3 "	7.4	7.6	7.1
Q4 "	7.5	7.7	7.2
Q1 2001	7.5	7.7	7.3

Source: Norges Bank

## Profit/loss and capital adequacy data

**Table 34. Profit/loss and capital adequacy: commercial banks<sup>1)</sup>. Percentage of average total assets**

	1999 <sup>3)</sup>	2000	QI	
			2000	2001
Interest income	7.2	7.4	6.8	7.9
Interest expenses	5.2	5.5	5.0	6.1
Net interest income	2.0	1.8	1.8	1.8
Total other operating income	1.2	1.3	1.1	1.0
Other operating expenses	2.0	1.9	1.9	1.9
Operating profit before losses	1.2	1.2	1.1	1.0
Recorded losses on loans and guarantees	0.0	0.1	-0.0	0.1
Ordinary operating profit before taxes	1.2	1.1	1.1	0.9
Capital adequacy ratio <sup>2)</sup>	10.9	11.0	10.5	10.9
Of which:				
Core capital	8.0	7.8	7.7	7.7

<sup>1)</sup> Parent banks (excluding branches abroad) including Postbanken and foreign-owned branches. Excluding Gjensidige Bank from 1 January 1999.

<sup>2)</sup> As a percentage of the basis of measurement for capital adequacy.

<sup>3)</sup> New accounting rules from 1 January 1999.

Source: Norges Bank

**Table 35. Profit/loss and capital adequacy: savings banks<sup>1)</sup>. Percentage of average total assets**

	1999 <sup>3)</sup>	2000	QI	
			2000	2001
Interest income	7.7	7.6	7.0	8.1
Interest expenses	4.8	4.9	4.4	5.6
Net interest income	2.9	2.7	2.6	2.5
Total other operating income	1.0	0.8	0.8	0.6
Other operating expenses	2.1	2.0	1.9	1.8
Operating profit before losses	1.7	1.6	1.5	1.2
Recorded losses on loans and guarantees	0.2	0.2	0.1	0.1
Ordinary operating profit before taxes	1.6	1.8	1.4	1.2
Capital adequacy ratio <sup>2)</sup>	13.6	13.7	13.1	13.3
Of which:				
Core capital	11.2	10.9	10.7	10.6

<sup>1)</sup> Including Gjensidige Bank from 1 January 1999.

<sup>2)</sup> As a percentage of the basis of measurement for capital adequacy.

<sup>3)</sup> New accounting rules from 1 January 1999.

Source: Norges Bank

**Table 36. Profit/loss and capital adequacy: finance companies<sup>1)</sup>. Percentage of average total assets**

	1999 <sup>3)</sup>	2000	QI	
			2000	2001
Net interest income	5.4	5.0	4.9	3.9
Total other operating income	2.6	2.3	2.0	1.6
Other operating expenses	5.0	4.7	4.4	3.6
Operating profit before losses	2.9	2.5	2.5	1.9
Recorded losses on loans and guarantees	0.6	0.5	0.4	0.3
Ordinary operating profit before taxes	2.4	2.1	2.1	1.6
Capital adequacy ratio <sup>2)</sup>	12.1	12.4	12.1	12.2
Of which:				
Core capital	11.0	11.1	11.1	10.9

1) Norwegian parent and foreign-owned branches.

2) As a percentage of the basis of measurement for capital adequacy.

3) New accounting rules from 1 January 1999.

Source: Norges Bank

**Table 37. Profit/loss and capital adequacy: mortgage companies<sup>1)</sup>. Percentage of average total assets**

	1999 <sup>3)</sup>	2000 <sup>4)</sup>	QI	
			2000	2001
Interest income	6.3	6.9	6.7	7.0
Interest expenses	5.5	6.2	5.9	6.3
Net interest income	0.8	0.7	0.8	0.7
Total other operating income	0.1	0.0	0.1	-0.0
Other operating expenses	0.2	0.2	0.2	0.2
Operating profit before losses	0.7	0.6	0.7	0.6
Recorded losses on loans and guarantees	0.0	-0.0	0.0	0.0
Ordinary operating income before taxes	0.8	0.6	0.7	0.5
Capital adequacy <sup>2)</sup>	16.4	16.6	15.3	15.8
Of which:				
Core capital	13.4	13.0	12.2	12.6

1) All Norwegian parent companies.

2) As a percentage of the basis of measurement for capital adequacy.

3) New accounting rules from 1 January 1999.

4) Kommunalbanken reports as a mortgage company with effect from the first quarter of 2000.

Source: Norges Bank

## Exchange rates

**Table 38. The international value of the krone and exchange rates against selected currencies. Monthly average of representative market rates**

	Trade-weighted krone exchange rate <sup>1)</sup>	1 EURO	100 DEM	100 DKK	100 FIM	100 FRF	1 GBP	100 JPY	100 SEK	1 USD
2000										
May	109.96	8.2015	419.34	109.99	137.94	125.03	13.638	8.3616	99.49	9.0471
June	109.04	8.2426	421.43	110.49	138.63	125.66	13.095	8.1912	99.12	8.6788
July	108.19	8.1763	418.05	109.62	137.51	124.65	13.124	8.0651	97.26	8.7024
August	108.15	8.0959	413.94	108.56	136.16	123.42	13.336	8.2837	96.48	8.9556
September	107.80	8.0266	410.40	107.56	135.00	122.37	13.208	8.6235	95.39	9.2056
October	107.81	8.0032	409.20	107.47	134.60	122.01	13.582	8.6321	93.88	9.3613
November	107.10	7.9950	408.78	107.22	134.47	121.88	13.317	8.5737	92.66	9.3369
December	107.55	8.1334	415.86	109.06	136.79	123.99	13.260	8.0894	93.90	9.0662
2001										
January	106.81	8.2355	421.08	110.33	138.51	125.55	12.974	7.5176	92.48	8.7784
February	106.75	8.2125	419.90	110.04	138.12	125.20	12.956	7.6708	91.49	8.9117
March	105.73	8.1600	417.22	109.32	137.24	124.40	12.971	7.3962	89.42	8.9742
April	105.50	8.1183	415.08	108.78	136.54	123.76	13.052	7.3512	89.04	9.0942
May	104.70	8.9952	408.79	107.16	134.47	121.89	13.035	7.5058	88.24	9.1438

1) The nominal effective krone exchange rate is calculated on the basis of the NOK exchange rate against the currencies of Norway's 25 main trading partners, calculated as a chained index and trade-weighted using the OECD's weights. The weights, which are updated annually, are calculated on the basis of each country's competitive position in relation to Norwegian manufacturing. The index is set at 100 in 1990. A rising index value denotes a depreciating krone. Further information can be found on Norges Bank's website ([www.norges-bank.no](http://www.norges-bank.no)).

Source: Norges Bank

**Table 39. International parities. Monthly average of representative exchange rates**

	DEM/USD	DEM/GBP	FRF/DEM	JPY/DEM	JPY/USD
2000					
May	2.1577	3.2529	3.354	50.155	108.21
June	2.0594	3.1073	3.354	51.455	105.96
July	2.0817	3.1394	3.354	51.838	107.90
August	2.1636	3.2219	3.354	49.983	108.12
September	2.2432	3.2185	3.354	47.604	106.76
October	2.2880	3.3195	3.354	47.420	108.45
November	2.2841	3.2578	3.354	47.683	108.91
December	2.1804	3.1888	3.354	51.444	112.10
2001					
January	2.0848	3.0811	3.354	56.024	116.78
February	2.1223	3.0856	3.354	54.750	116.18
March	2.1513	3.1090	3.354	56.412	121.35
April	2.1911	3.1446	3.354	56.474	123.73
May	2.2371	3.1891	3.354	54.483	121.84

Source: Norges Bank

## Balance of payments

**Table 40. Balance of payments. In millions of NOK**

	1999	2000	January - March	
			2000	2001
Goods balance	79 585	226 568	44 753	60 599
Service balance	-6 265	3 517	1 526	5 071
Net interest and transfers	-26 012	-26 492	-6 273	-5 194
A. Current account balance	47 308	203 593	40 006	60 476
Of which:				
Petroleum activities <sup>1)</sup>	157 038	303 367	64 215	77 101
Shipping <sup>1)</sup>	24 278	33 877	7 145	11 310
Other sectors	-134 008	-133 651	-31 354	-27 935
B. Net capital transfers	-1 317	-492	307	-121
C. Capital outflow excl. Norges Bank <sup>2)</sup>	-21 542	36 446	21 333	6 948
Distributed among:				
Central government sector	-6 307	-19 339	1 446	-2 076
Local government sector	247	60	47	20
Commercial and savings banks	-18 450	-42 753	-17 496	-12 472
Insurance	15 057	18 433	9 646	6 993
Other financial institutions	1 755	-10 001	-11 295	-1 114
Shipping	-3 084	-7 709	-3 396	3 238
Petroleum activities	-409	9 837	6 986	-859
Other private and state enterprises	-12 504	21 014	2 593	2 861
Unallocated (incl. errors and omissions)	2 153	66 904	32 802	10 357
D. Norges Bank's net capital outflow (A + B - C)	67 533	166 655	18 980	53 407
E. Valuation changes in Norges Bank's net foreign assets	9 788	17 210	26 740	-25 310
Change in Norges Bank's net foreign assets (D+E)	77 321	183 865	45 720	28 097
Of which: <sup>2)</sup>				
International reserves	51 544	52 274	8 517	718
Investment of Government Petroleum Fund	54 633	163 849	41 848	38 621

<sup>1)</sup> Specified by Norges Bank on the basis of items from the balance of payments.<sup>2)</sup> Specifications from Norges Bank's balance sheet.

Sources: Statistics Norway and Norges Bank

**Table 41. Norway's foreign assets and debt. In billions of NOK**

	31/12/1999			31/12/2000			31/3/2001		
	Assets	Debt	Net	Assets	Debt	Net	Assets	Debt	Net
Central government admin. <sup>1)</sup>	13.0	48.1	-35.1	12.5	67.1	-54.6	11.7	71.6	-59.9
Norges Bank <sup>2)</sup>	462.6	78.5	384.1	767.6	199.9	567.7	791.9	192.9	599.1
State lending institutions	1.2	0.0	1.2	1.4	0.0	1.4	1.4	0.0	1.4
Commercial and savings banks <sup>3)</sup>	94.8	251.9	-157.1	131.1	339.2	-208.1	148.1	368.4	-220.3
Mortgage companies	27.1	67.6	-40.4	30.9	90.1	-59.2	51.0	108.2	-57.2
Finance companies	9.7	14.7	-5.1	12.8	16.9	-4.1	12.9	17.3	-4.4
Insurance companies	140.9	34.0	106.9	161.7	36.9	124.8	169.2	37.3	131.9
Local government	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.2
Municipal enterprises	0.2	4.9	-4.8	0.2	5.7	-5.5	0.2	5.6	-5.4
State enterprises	83.5	116.7	-33.2	79.3	119.3	-40.1	66.7	104.5	-37.8
Other Norwegian sectors	225.8	340.1	-114.2	345.3	442.6	-97.3	342.1	442.1	-99.9
Undistributed and errors and omissions <sup>4)</sup>	39.9	0.0	39.9	106.9	0.0	106.9	117.2	0.0	117.2
All sectors	1 098.8	956.5	142.4	1 649.8	1 317.6	332.2	1 712.7	1 347.9	364.8

Note:

Norges Bank calculates the holdings figures on the basis of Statistics Norway's annual census of foreign assets and liabilities and sectoral statistics for financial industries, which are combined with the figures on changes in the form of transactions and valuation changes from the balance of payments and sectoral statistics for insurance and mortgage companies.

- 1) Also includes foreign holdings of NOK debt instruments issued by central government administration.
- 2) Norges Bank's equity holdings are estimated at market value and may deviate from Norges Bank's official balance sheet. Norges Bank's purchases of derivatives are included in the balance of payments, but not in the official balance sheet, and may result in differences.
- 3) Including Postbanken.
- 4) Consists of net amounts which could not be sectorised at the time and statistical errors. For the sake of simplicity, the net amount is recorded under assets.

Sources: Statistics Norway and Norges Bank

## International capital markets

**Table 42. Changes in banks' international assets. In billions of USD<sup>1)</sup>**

	1997	1998	1999	2000	Outstanding 31 Dec. 2000
Total	1 286.2	280.1	276.1	1 171.8	10 764.4
Of which vis-à-vis:					
Non-banks	370.6	134.1	298.2	283.8	3 512.6
Banks (and undistributed)	915.6	146.0	-22.0	888.0	7 251.8

- 1) International assets (external positions) comprise
  - cross-border claims in all currencies
  - foreign currency loans to residents
  - equivalent assets, excluding lending

Source: Bank for International Settlements

**Table 43. Banks' international claims by currency. Percentage of total international assets**

	December			
	1997	1998	1999	2000
US dollar (USD)	35.1	34.3	39.4	41.3
Deutsche mark (DEM)	10.6	11.3	..	..
Swiss franc (CHF)	2.6	2.6	2.4	2.2
Japanese yen (JPY)	10.0	10.1	9.0	8.2
Pound sterling (GBP)	4.0	4.2	4.3	4.4
French franc (FRF)	3.3	3.5	..	..
Italian lire (ITL)	3.7	4.6	..	..
ECU/euro <sup>1)</sup>	1.0	1.4	27.7	27.7
Undistributed <sup>2)</sup>	29.7	28.0	17.2	16.2
Total in billions of USD	9 036.8	9 665.4	9 939.8	10 764.4

1) From January 1999.

2) Including other currencies not shown on the table, and assets in banks in countries other than the home countries of the seven currencies specified.

Source: Bank for International Settlements

**Table 44. Funds raised on international markets, by type of instrument. In billions of USD.** *This table will not be updated hereafter, and after a period will cease to be published.*

	1993	1994	1995	1996	1997
Issues of bonds	481.0	428.6	467.3	708.8	831.6
– of which floating-rate instruments	69.8	96.3	78.9	165.7	213.1
International and foreign bank loans	136.7	236.2	370.2	345.2	390.4
Other international facilities	8.2	4.9	3.8	4.5	2.7
<b>Total</b>	<b>625.8</b>	<b>669.7</b>	<b>841.3</b>	<b>1 058.5</b>	<b>1 224.7</b>

Source: OECD

**Table 45. Funds raised on international markets, by borrowing country/institution.**  
**Per cent of total borrowing.** *This table will not be updated hereafter, and after a period will cease to be published.*

	1993	1994	1995	1996	1997
OECD countries	86.3	87.7	90.1	88.3	85.8
Non-OECD countries	9.9	10.5	7.8	9.4	11.9
International institutions and other countries	3.8	1.8	2.1	2.3	2.3

Source: OECD

## Foreign currency trading

**Table 46. Foreign exchange banks. Foreign exchange purchased/sold forward with settlement in NOK<sup>1)</sup>.**  
**In billions of NOK at end of month**

		Purchased net from:				Total	Purchased gross from		Sold gross to		
		Central govt. <sup>2)</sup>	Other financial inst. <sup>3)</sup>	Non-financial sector	Foreign sector		Non-financial sector	Foreign sector	Non-financial sector	Foreign sector	
2000	April	0.1	28.9	50.9	-18.3	61.6	81.0	244.4	30.1	262.7	
	May	0.1	39.0	53.2	-21.2	71.1	82.1	280.1	28.9	301.3	
	June	0.1	-2.8	55.8	-12.2	40.9	86.4	328.6	30.6	340.8	
	July	0.1	27.0	61.0	-17.0	71.1	88.0	297.1	27.0	314.1	
	August	0.1	31.4	63.3	-6.6	88.2	92.4	308.8	29.2	315.4	
	September	0.1	26.8	62.5	-5.4	84.0	97.5	324.9	35.0	330.3	
	October	0.1	28.8	62.4	-30.5	60.8	96.6	339.1	34.2	369.6	
	November	0.1	30.1	66.2	-2.6	93.8	102.2	400.7	36.0	403.3	
	December	0.1	35.5	51.9	-21.9	65.6	105.1	386.7	53.2	408.6	
	2001	January	0.1	34.3	69.5	-23.5	80.4	101.7	458.2	32.2	481.6
		February	0.1	29.7	69.8	-13.4	86.2	99.9	497.3	30.1	510.7
		March	12.6	32.7	65.0	-16.4	93.9	99.2	555.7	34.2	572.2
April		0.1	43.5	61.4	-46.0	59.0	93.8	542.1	32.4	588.1	

<sup>1)</sup> Excl. exchange rate adjustments.

<sup>2)</sup> Central government administration, social security administration and Norges Bank.

<sup>3)</sup> Incl. possible discrepancies between forward assets and forward liabilities within the category of foreign exchange banks.

Source: Statements from commercial and savings banks (registered foreign exchange banks) to Norges Bank

**Table 47. Foreign exchange banks. Overall foreign currency position. In millions of NOK**

	31/3 2000	30/6 2000	30/9 2000	31/12 2000	31/3 2001
Foreign assets, spot	185 766	197 958	205 302	216 694	222 319
Foreign liabilities, spot	277 662	296 250	318 965	307 225	347 759
1. Spot balance, net	-91 896	-98 292	-113 663	-90 531	-125 440
2. Forward balance, net	45 288	43 612	44 226	21 119	-2 720

Source: Norges Bank

**Table 48. Transactions relating to Norges Bank's exchange market operations. In billions of NOK**

	1998	1999	Week in 2000													
	1-53	1-52	10	11	12	13	14	15	16	17	18	19	20	21	22	1-22
<b>A. Norges Bank's net sales of foreign exchange to banks</b>	-11	-53	-1.85	-1.85	-1.80	-1.90	-2.10	-0.83	-1.62	-1.90	-1.62	-2.10	-1.71	-1.66	-2.12	-37.75
1. Spot	-16	-48	-1.85	-1.85	-1.80	-28.41	-3.91	25.68	0.19	-1.90	-1.62	-2.10	-1.71	-1.66	-2.12	-37.75
2. Forward	5	-5	0.00	0.00	0.00	26.51	1.81	-26.51	-1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Used by banks to cover:</b>																
<b>B. Foreign<sup>1)</sup></b>	-1	-37	-5.90	-2.03	-10.87	15.52	1.38	17.52	-8.20	1.45	7.50	-13.92	-3.88	-6.37	5.20	-5.85
1. Spot	-4	-64	1.16	3.06	4.41	-11.08	-1.26	24.10	-13.12	-11.98	1.78	1.20	0.46	-9.28	0.82	-1.34
2. Forward	3	27	-7.06	-5.09	-15.28	26.60	2.64	-6.58	4.92	13.43	5.72	-15.12	-4.34	2.91	4.38	-4.51
<b>C. Norwegian sectors, non-bank<sup>1)</sup></b>	-26	-22	7.29	0.93	7.35	-18.03	-0.29	-14.82	0.56	-3.38	-10.61	11.89	-0.25	4.77	-8.82	-38.78
1. Spot	4	20	11.47	0.62	-1.70	-10.79	-3.89	-18.51	1.01	5.75	-23.72	10.38	-3.08	4.87	-5.72	-55.97
2. Forward	-24	-33	-5.63	3.53	8.23	-8.81	7.10	3.26	-2.46	11.52	9.54	2.30	3.96	0.18	3.61	13.30
3. Increase in customers' net currency claims on banks	-6	-10	1.45	-3.22	0.82	1.57	-3.50	0.43	2.01	2.39	3.57	-0.79	-1.13	-0.28	-6.71	3.89
<b>D. Other</b>	16	6	-3.23	-0.74	1.71	0.62	-3.19	-3.52	6.02	0.04	1.50	-0.06	2.43	-0.06	1.48	6.88
1. Banks' income deficit in foreign exchange, foreign	6	6	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	3.96
2. Losses on spot transactions, foreign	7	6	-0.32	3.87	-1.47	0.07	0.05	0.91	-0.16	-0.42	0.92	0.21	-1.24	2.32	3.52	7.54
3. Other losses, including adjustments	-1	-6	-0.77	-3.89	-0.11	0.94	-4.51	-3.11	4.90	-0.11	-0.67	-0.91	2.70	-1.15	-2.99	-8.80
4. Increase in banks' total position	4	-1	-2.32	-0.90	3.11	-0.57	1.09	-1.50	1.10	0.39	1.07	0.46	0.79	-1.41	0.77	4.18
<b>Specification:</b>																
Non-resident net sale of NOK-denominated assets related to:																
Net NOK claims on banks	-2	-5	3.00	4.26	4.18	-11.99	1.58	23.89	-13.30	-11.69	4.33	2.07	1.28	-9.25	-3.86	2.32
VPS-registrered shares	5	-40	-1.10	0.58	0.38	-0.32	-2.51	0.76	-0.22	-0.19	-2.85	-0.31	-1.25	-0.21	-3.32	-8.01
VPS-registrered bonds	-11	-16	0.50	-1.12	-0.77	0.81	-0.47	-0.47	0.32	0.07	0.65	-0.30	-0.82	0.23	7.95	6.13
VPS-registrered notes and certificates	3	-3	-1.24	-0.66	0.62	0.42	0.14	-0.08	0.08	-0.17	-0.35	-0.26	1.25	-0.05	0.05	-1.78
<b>Total (equal to NOK offset to B1 above)</b>	-4	-64	1.16	3.06	4.41	-11.08	-1.26	24.10	-13.12	-11.98	1.78	1.20	0.46	-9.28	0.82	-1.34
<b>Memorandum:</b>																
Increase in banks' foreign spot position (net) (Corresponds to A1-B1-C1-D1-D2)	-8	-29	-14.34	0.0	-3.22	-6.79	1.01	19.00	12.28	4.57	19.22	-14.07	1.97	0.25	-0.92	8.06

1) Positive figures denote foreign exchange sales from banks to the sectors mentioned. Negative figures denote purchases.

Source: Norges Bank

