

Norges Bank's system for managing interest rates

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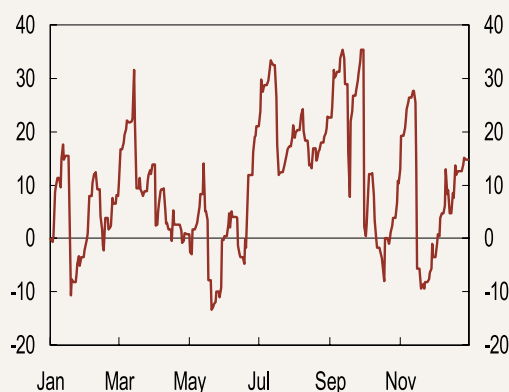
The article provides an account of Norges Bank's practical implementation of monetary policy in the money market through liquidity policy. Liquidity policy consists of Norges Bank's operations in the money market to influence the banking system's liquidity. Liquidity policy shall be consistent with the 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.

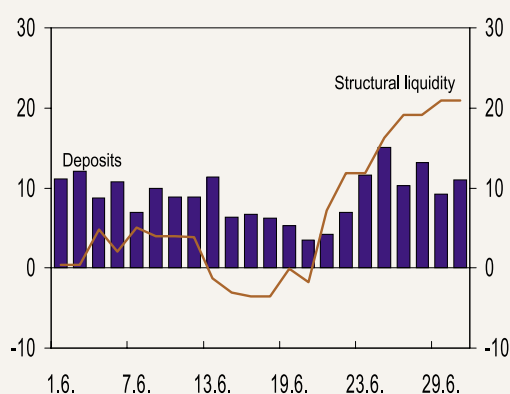
In some periods, the central government has issued Treasury bills to reduce structural surplus liquidity. Apart from this, no special measures have been implemented to influence banks' structural liquidity situation.

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

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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

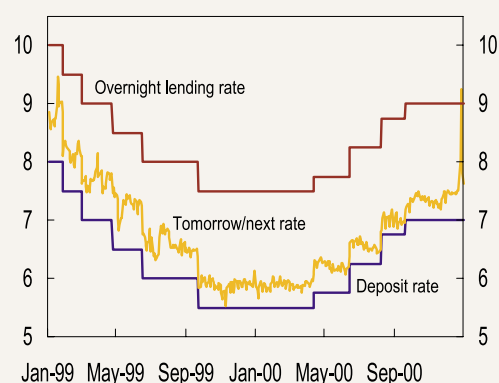


Source: Norges Bank

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.²⁾ 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.

²⁾ 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

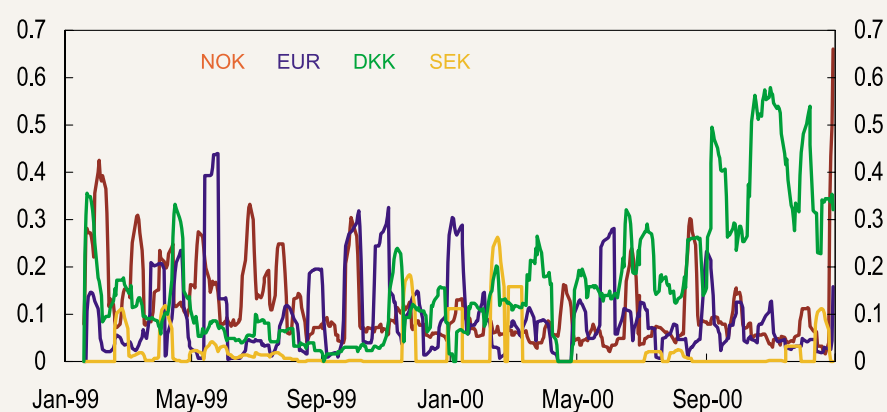
The central bank of Switzerland uses 3-month CHF LIBOR as its reference rate/key rate. The SNB announces a target range of 100 basis points for 3-month CHF LIBOR and its expectation of where in this corridor the reference rate will lie. This rate is steered indirectly by supplying or withdrawing liquidity. 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



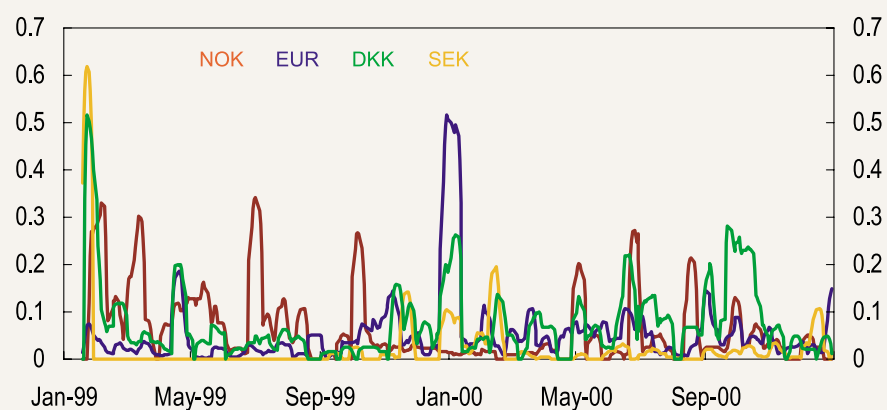
Source: Norges Bank and Datastream

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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