Collateral for loans from Norges Bank – consequences of changes in the rules

Bjørn Bakke, adviser, Interbank Settlement Department, Knut Sandal, assistant director, Payment Systems Department, and Ingrid Solberg, adviser, Payment Systems Department [1]

Norges Bank requires collateral for all lending to banks. Collateral is provided in the form of securities which are pledged to Norges Bank. The list of eligible securities was changed in 2005. The aim of the changes has been to reduce Norges Bank's risk while ensuring that the borrowing facilities available to banks remain sufficient for payments to be settled and monetary policy to be implemented effectively. This article presents the changes that have been made and analyses the effects on Norges Bank's risk and banks' borrowing facilities. We conclude that the changes in the rules have indeed reduced Norges Bank's risk, and that the rules still provide for adequate borrowing facilities.

1 Introduction

Banks can raise loans from Norges Bank against collateral in the form of securities. These loans are to help ensure that banks have sufficient liquidity for payments to be settled and monetary policy to be implemented effectively (see Box 1). Norges Bank seeks to avoid losses on its loans to banks and therefore requires that they are collateralised.[2] The collateral must meet various requirements. The collateral may be realised if a bank defaults on its obligations to Norges Bank or is placed under public administration. A bank's borrowing facilities correspond to the market value of the securities pledged less haircuts for various types of risk.

When the requirement of full collateralisation of loans from Norges Bank was introduced in 1999, Norges Bank accepted a wider range of securities than is usual for a central bank. This was due, in part, to few government bonds being issued in Norway. Internationally, government bonds are the most common form of collateral for loans from central banks. Relatively liberal rules on eligible collateral were necessary to ensure that banks had sufficient borrowing facilities. Parts of this eligible collateral entailed a degree of risk for Norges Bank.

In 2005, Norges Bank found that conditions were right for the rules to be amended so that this risk could be reduced. There were several reasons for this. First, banks' borrowing facilities had grown relative to their borrowing requirements. Second, the Financial Collateral Act of 2004 provided for immediate realisation of collateral, allowing banks' borrowing facilities to be calculated on the basis of market value rather than nominal value. The use of market value to calculate borrowing facilities reduced Norges Bank's risk and paved the way for lower haircut rates. For a given volume of pledged securities, reduced haircuts mean increased borrowing facilities. Third, there was reason to believe that banks would gradually begin to use new covered bonds as collateral at Norges Bank.

Box 1. Norges Bank's lending facilities

Norges Bank's lending facilities are important instruments in the implementation of its liquidity policy. First, they are to help adjust the supply of liquidity so that Norges Bank's interest rate decisions influence market interest rates. Through auctions of fixed-rate loans (F-loans), Norges Bank ensures that banks have sufficient liquidity to maintain suitably large deposits in the central bank. This means that short-term money market rates remain just above the key policy rate (the sight deposit rate), which is the interest on banks' deposits at Norges Bank. Second, the lending facilities are to help ensure that banks have sufficient liquidity for smooth settlement of payments. Banks settle their dues by transferring funds between their accounts at Norges Bank. If a bank has insufficient deposits in its account to settle a payment, it can use Norges Bank's D-loan facility.[1] This serves as an overdraft facility. Intraday loans are interest-free, while overnight loans attract a rate of interest which is 1 percentage point higher than the key policy rate. As a result, banks normally make sure that they repay D-loans before the end of the day, often with funds borrowed from other banks.

F-loans and D-loans are Norges Bank's ordinary lending facilities. The central bank can also issue loans on special terms (S-loans) to a bank running into acute liquidity problems. No such loans have been issued since the banking crisis of the early 1990s.[2]

[1] For further information on F-loans and D-loans, see Fidjestøl, A.: "The central bank's liquidity policy in an oil economy", Economic Bulletin 4/07, Norges Bank, and "Norske finansmarkeder – pengepolitikk og finansiell stabilitet" [Norwegian financial markets – monetary policy and financial stability], Occasional Papers 34, Norges Bank, 2004.

[2] For further information on S-loans, see pp. 36–37 of Financial Stability 2/04, Norges Bank.

[1] We would like to thank Asbjørn Enge, Andreas Sand and Pål Winje for useful comments. This is a translation of an article published in Penger og Kreditt 4/07, with a few minor updates due to recent market and regulatory developments.

[2] This fundamental principle was established in connection with the banking crisis of the early 1990s. For example, Report to the Storting No. 24 (1989–90) states that "the writing down of the central bank's loans may […] constitute active use of government funds which should be considered by the Storting in advance."

Some of the changes adopted in 2005 did not enter into force until 1 November 2007. We now have a basis for analysing the consequences of the changes in the rules for banks' borrowing facilities and Norges Bank's risk.

During the turmoil in global financial markets in 2007–08, banks in many countries borrowed more than usual from central banks. Demand for central bank liquidity increased because the markets for interbank lending functioned poorly. The turmoil was triggered by uncertainty about which banks might be hit by losses and liquidity problems as a result of difficulties in the US sub-prime mortgage market. Banks were uncertain about both their own and other banks' future liquidity. To reduce the risk, they therefore sought to limit their lending to other banks. It became harder than usual for banks to raise loans, and interest rates in these markets rose sharply. Many central banks therefore injected additional liquidity into the banking system through market operations and secured loans. Some central banks also extended the range of eligible collateral. Norges Bank ensured a sufficient supply of liquidity to the banking system through a slightly larger allotment of F-loans than usual.[3]

This article is organised as follows. Section 2 summarises the rules on collateral for loans from Norges Bank and compares them with the rules at other central banks. Section 3 looks at the size and composition of banks' borrowing facilities and how these have evolved over time. We also analyse the consequences for banks' borrowing facilities of the changes in the rules adopted two years ago, and the size of banks' borrowing facil-

Box 2. Main features of the rules[1]

Norges Bank accepts securities issued by public and private issuers in Norway and abroad. Norges Bank also accepts units in funds registered with the Norwegian Central Securities Depository (VPS).

Requirements for all securities
Securities must not be subordinate to other debt or be linked to credit derivatives. They must have prices available and be registered with an approved securities depository. Securities must not be convertible, be linked to an index, or have a capped floating rate. A bank may not pledge securities issued by a company in the same group (excludes covered bonds).

Requirements for securities issued by private Norwegian issuers
Securities issued by private Norwegian issuers must have a minimum volume outstanding of NOK 300 million and be registered with an exchange or other approved marketplace. Securities issued by companies must also have a minimum credit rating of BBB– from Standard & Poor's or Baa3 from Moody's. An equivalent credit rating for the issuer may be accepted if the security itself is not rated.

The proportion of securities issued by banks and bank-owned mortgage companies (bank quota) must be no more than 35 per cent of a bank's overall collateral. The bank quota does not include covered bonds.

Requirements for securities funds
Securities funds must be registered with VPS or be confined by their rules to investing in securities which are eligible under Norges Bank's rules. A fund may nevertheless invest in unlisted securities if there is a binding commitment to list the securities on an exchange within 14 days. Fund units are included in the quota of bonds issued by banks and bank-owned mortgage companies if the fund's rules allow it to invest in such bonds.

Requirements for securities from foreign issuers
Securities from foreign issuers must have a minimum credit rating of A from Standard & Poor's or A2 from Moody's. Securities must be denominated in USD, EUR, GBP, SEK, DKK, JPY, CHF, NZD or AUD. The issuer must be domiciled in a country approved by Norges Bank. Securities from private issuers must also have a minimum volume outstanding of EUR 100 million. A maximum of 20 per cent of a loan's outstanding volume may be pledged by the same bank. Private securities must be listed on an exchange or other marketplace approved by Norges Bank.

Contingency clause
In special cases, Norges Bank may approve other collateral or depart from the requirement for collateral, cf. Section 3 of the Regulation on Banks' Access to Loans and Deposits in Norges Bank etc. (FOR 2001-04-25 No. 473).

[1] A more detailed presentation of the rules can be found on Norges Bank's website.

[3] For further information on liquidity management at Norges Bank and the response of other central banks during the turmoil, see *Monetary Policy Report* 3/07, Norges Bank.

Table 1 Changes in the rules in recent years

Change	Motivation[1]	Adopted	Effective
Tightening			
Credit rating required for foreign government bonds and Norwegian corporate bonds	Reduced credit risk	24 Oct 2005	1 Nov 2007[2]
Collateral must not be subordinate to other debt	Reduced credit risk	24 Oct 2005	1 Nov 2007[2]
Bank quota lowered from 50 to 35 per cent	Reduced credit risk	24 Oct 2005	1 Nov 2006[3]
Increase in the minimum volume outstanding for private issuers	Reduced liquidity risk	24 Oct 2005	1 Nov 2007[2]
Securities from Norwegian private issuers must be listed	Reduced liquidity risk	24 Oct 2005	1 Nov 2007[2]
Maximum 20 per cent of private foreign loans pledged by the same bank	Reduced liquidity risk	24 Oct 2005	1 Nov 2005
Foreign-registered securities must have information in FTID[4]	Operational considerations	24 Oct 2005	1 Nov 2005
Collateral must not be linked to credit derivatives	Operational considerations	24 Oct 2005	1 Nov 2007[2]
Relaxation			
Reduction in haircut rates – from nominal to market value	Increased borrowing facilities	24 Oct 2005	1 Nov 2005
Acceptance of covered bonds[5] issued by companies in the same group	Increased borrowing facilities	24 Oct 2005	1 Nov 2005
Acceptance of funds with unlisted assets if there is a binding commitment to listing	Increased borrowing facilities	2 Oct 2007	1 Nov 2007
Securities funds with full currency hedging exempted from foreign exchange haircut	Increased borrowing facilities	2 Oct 2007	1 Nov 2007

1 A change may have been motivated by more than one consideration. Only the most important is stated in the table.

2 These requirements entered into force on 1 November 2005 for securities not previously pledged.

3 The quota for how much of a bank's pledged portfolio may consist of Norwegian bank bonds was reduced gradually. It was lowered from 50 to 45 per cent on 24 October 2005, to 40 per cent on 2 May 2006, and to 35 per cent on 1 November 2006.

4 Financial Times Interactive Data (FTID) supplies market prices from international exchanges and from transactions directly between counterparties. FTID may also supply synthetic prices produced by the company's analysts.

5 Covered bonds are issued by mortgage companies and have preferential rights to the collateral for specific loans, such as mortgages. The issuers of such bonds are subject to regulation and supervision.

Source: Norges Bank

ities is compared with their need for credit when settling payments. Section 4 analyses changes in Norges Bank's risk, while Section 5 draws conclusions and looks to the future.

2 The rules and the changes in the rules

Norges Bank accepts many types of securities as collateral. When deciding which assets are eligible, importance is attached to three considerations. First, Norges Bank's risk is to be as small as possible. Even if a loan is collateralised, there will be a risk if the issuer of the pledged securities cannot fulfil his obligations, or if the securities are difficult to sell. Second, the rules should be designed in such a way that banks have sufficient borrowing facilities at Norges Bank. Third, there are operational considerations: the collateral should not necessitate a disproportionate amount of manual follow-up at Norges Bank. Box 2 presents the key features of the current rules.

2.1 Changes in the rules in recent years

In autumn 2005, Norges Bank decided to make changes in the rules. Most of the changes tightened the collateral requirements. This was done to increase the credit quality and marketability of the pledged securities (in other words, reduce credit risk and liquidity risk). Changes were also made to avoid the borrower and the issuer of the collateral belonging to the same sector and therefore potentially running into financial problems at the same time. Some minor changes were motivated by operational considerations at Norges Bank. It was also decided to reduce the haircut rates, which, in isolation, served to increase banks' borrowing facilities. To make it easier for banks to adjust to the changes in the rules, it was decided that some of the changes would

Table 2 Rules on eligible collateral at selected central banks

	Norges Bank	Euro-system	Bank of England	Sveriges Riksbank	Danmarks Nationalbank	Federal Reserve
Bank bonds and notes	Yes	Yes	No	Yes	No	Yes
Corporate bonds and notes	Yes	Yes	No	Yes	No	Yes
Covered bonds	Yes	Yes	No	Yes	Yes	Yes
Asset-backed securities[1]	Yes	Yes	No	Yes	No	Yes
Credit rating required[2]	BBB–/A	A– [3]	–	A	–	BBB–/AAA
Foreign currencies	8	0	1	7	1	8
Bank loans	No	Yes	No	No	No	Yes
Bank quota	Yes	No	–	Yes	–	No
Minimum volume outstanding	NOK 300/800m	No	No	SEK 100m	No	No
Requirement for government account at central bank	Yes	No	No	No	No	No

1 Securities issued by special-purpose vehicles. These vehicles purchase mortgages and other types of debt, often from banks and other financial institutions, and fund these purchases by issuing bonds secured against the portfolio acquired.

2 Where two ratings are given, the first is for domestic securities, and the second for foreign securities.

3 Rating or estimated bankruptcy probability corresponding to such a rating.

Sources: Norges Bank, ECB, Bank of England, Sveriges Riksbank, Danmarks Nationalbank and Federal Reserve.

not enter into force until 1 November 2007. A number of additional changes relaxing the rules were adopted in autumn 2007, and these also entered into force on 1 November 2007.

Table 1 shows the most important changes which Norges Bank has made in the rules over the last couple of years. The table shows when the changes were adopted, when they entered into force, and what was the reasoning behind them.[4]

Norges Bank accepts securities issued by public and private issuers in Norway and abroad. Norges Bank also accepts units in funds registered with the Norwegian Central Securities Depository (VPS).

2.2 Rules on collateral at different central banks[5]

Different central banks accept different types of asset as collateral. Table 2 summarises the rules on the provision of collateral for a selection of central banks. Of these selected banks, the Federal Reserve in the US seems to have the most liberal rules, while the Bank of England has the most stringent.[6] Sveriges Riksbank in Sweden and the Eurosystem have fairly similar rules to Norges Bank. Some central banks, including the Bank of England, widened the range of eligible collateral during the market turmoil in 2007–08. Table 2 is based on current regulation and not ad hoc crisis measures.

Norges Bank, the Eurosystem, Sveriges Riksbank and the Federal Reserve accept securities issued by banks. Norges Bank and Sveriges Riksbank set a limit on the proportion of the total collateral for which such securities may account. The same four central banks accept corporate securities, covered bonds and asset-backed securities. Danmarks Nationalbank in Denmark does not accept bonds issued by banks or asset-backed securities, but does accept covered bonds. The Eurosystem and the Federal Reserve are the only central banks in the selection which accept bank loans (that is, loans to customers) as collateral.

The rules on eligible collateral need to be seen in the light of the size of the bond market in local currency. Countries with a relatively small local bond market, such as Norway and Sweden, accept securities issued in a variety of currencies. Countries and regions with large bond markets, such as the euro area, the UK and Denmark, accept few currencies other than the local one. The exception is the Federal Reserve, which generally has liberal rules on collateral in connection with the settlement of payments. The size of the bond markets also helps to explain why Norges Bank and Sveriges Riksbank are the only banks in the selection to have a minimum volume requirement to ensure that the collateral is sufficiently liquid.

The rules must also be seen in the light of the size of the banking system's liquidity requirements. In Norway,

4 The changes adopted in 2005 are described in more detail in Bakke, B. and H. Tretvoll: "Collateral for loans from Norges Bank – new rules", *Economic Bulletin* 4/05, Norges Bank.

5 This description is based on available information about the various central banks' rules on collateral for loans and has not been quality-assured by the central banks in question.

6 Several central banks have different rules on eligible collateral in connection with market operations and lending facilities relating to the settlement of payments. In this comparison, we look at the rules for the equivalent of intraday and overnight D-loans at Norges Bank.

large incoming payments are made to the government on certain days of the year. These are paid via the banks to the government's account at Norges Bank. The banks need a great deal of liquidity to execute these payments. Banks' liquidity requirements are therefore greater in countries where the government has an account at the central bank and also has large incoming payments.[7]

3 Banks' collateral at Norges Bank

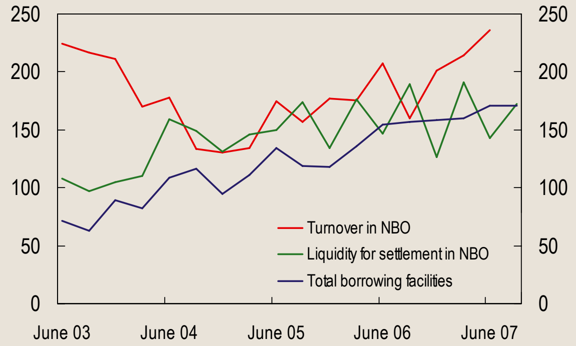
Banks' available liquidity at Norges Bank comprises their deposits in sight deposit accounts and unused borrowing facilities at the Bank. The limit on these borrowing facilities applies to F-loans and D-loans combined: borrowing rights used for F-loans cannot also be used for D-loans, and vice versa. Banks have pledged more securities to Norges Bank in recent years, which has increased their aggregate borrowing facilities (Chart 1).

Banks' liquidity requirements are related to the size of the positions they settle through Norges Bank's Settlement System (NBO). Developments in average turnover in NBO are an indicator of developments in liquidity requirements.[8]

The fluctuations in turnover illustrate that liquidity requirements vary. Aggregate liquidity comes under most pressure on days when large payments are made to the government. Petroleum taxes have a particular impact when they fall due twice a year.[9] In the period immediately after petroleum taxes fall due, the liquidity available for the settlement of payments is reduced. This is because large parts of banks' borrowing facilities are used to raise F-loans, with the increased deposits that result then being used to pay the petroleum taxes.

The changes in the rules adopted in 2005 have affected banks' borrowing facilities. The following discusses the changes in borrowing facilities for different categories of banks. We also look at different banks' utilisation of available liquidity in NBO on days when liquidity is scarce due to payments to the government.

Chart 1 Banks' aggregate borrowing facilities. Liquidity for and turnover in settlement at Norges Bank. Billions of NOK



Source: Norges Bank

3.1 Categories of banks

Both borrowing requirements and borrowing facilities normally vary with the size of a bank. To simplify the analysis, we distinguish between small, medium-sized and large banks (see Table 3).

The small banks rarely, if ever, participate directly in settlement in NBO. They therefore have little or no need to borrow from Norges Bank, and so little or no need to pledge securities to Norges Bank. Many small banks have nevertheless retained their borrowing facili-

Table 3 Classification of banks with an account at Norges Bank

	Large	Medium	Small
Number	4	18	104
Participation in settlement of NICS retail clearing in NBO[1]	Direct	Direct	Indirect
Participation in gross settlements at Norges Bank[2]	Frequent	Daily	Rare
Account at foreign securities depository	All	Half	Very few
Credit lines to other banks	Significant	Limited	Limited
Share of total assets (2006)	Approx. 60%	Approx. 25%	Approx. 15%
Share of F-loans (Jan–Oct 2007)	93%	6%	<1%
Share of total borrowing facilities (1 Nov 2007)	80%	16%	4%
Proportion of category's collateral registered abroad	87%	57%	20%

1 Retail payments to be settled between the banks are cleared in the Norwegian Interbank Clearing System (NICS). Clearing results in a net position for each bank. Banks classified as large and medium-sized settle their positions directly at Norges Bank. Small banks have an agreement with a large or medium-sized bank whereby the latter includes the small bank's position in its own position when settling at Norges Bank. NICS is a clearing house and transaction channel for payments.

2 Transactions which are settled individually are referred to as gross transactions and are settled continuously at Norges Bank.

7 Other factors also affect banks' liquidity requirements. See, for example, Fidjestøl, A.: "The central bank's liquidity policy in an oil economy", *Economic Bulletin* 4/07, Norges Bank.

8 Banks' liquidity requirements depend not only on how much they send and receive, but also on the order in which this happens (see Section 3.3).

9 The Norwegian Ministry of Finance has recently proposed that petroleum taxes fall due six times rather than twice a year, starting on 1. August 2008. If implemented, this would reduce liquidity requirements on extreme days.

ties, probably in order to meet the quantitative liquidity requirement which previously applied.[10] To meet this requirement, banks needed to hold 6 per cent of their balance sheet as liquid assets, and unused borrowing facilities at Norges Bank counted as liquid assets. Since the quantitative liquidity requirement was replaced by a qualitative requirement in 2006, several small banks have terminated their accounts and borrowing facilities at Norges Bank.

In an emergency, small banks too may need to borrow from Norges Bank. This might suggest that they should have access to securities which are eligible as collateral for loans from Norges Bank. Banks which settle through a private bank must have an alternative settlement bank which will be used if the settlement bank normally used cannot continue to operate. Banks which wish to use Norges Bank as their alternative settlement bank should own or quickly be able to obtain securities which can be used as collateral for loans from the central bank. Such securities can also be used to raise F-loans from Norges Bank in periods when it is difficult to borrow elsewhere.

The medium-sized banks participate directly in settlement at Norges Bank, and some of them take out F-loans. Around half of the medium-sized banks have an account at a foreign securities depository. Those which do not have, or do not wish to have, such an account must limit themselves to investing in securities registered with VPS.

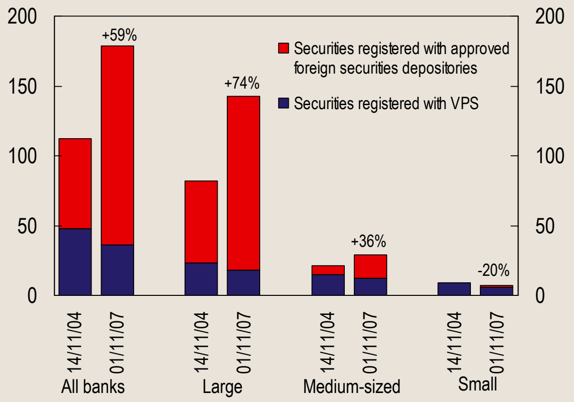
The large banks participate actively in NBO, raise the largest volumes of F-loans, and extend lines of credit to Norwegian and foreign banks. This means that they have large liquidity requirements. On the other hand, they normally have good access to funding in the securities markets, and they invest in a wide range of foreign-registered securities.

3.2 Banks' borrowing facilities and the impact of the new rules

Banks' aggregate borrowing facilities have increased in recent years (see Charts 1 and 2). However, there have been major differences between the different categories of banks. While the large banks have generally increased their borrowing facilities substantially, small banks as a whole have reduced theirs. There are also big differences between individual banks (see Chart 3).

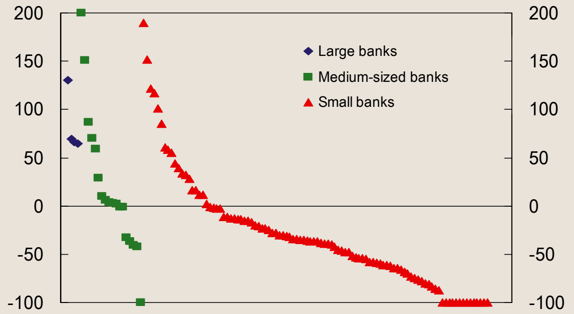
The composition of the pledged portfolio has changed. The proportion of foreign-registered securities has risen from 56 to 80 per cent in the last three years (see Chart 2). It is primarily the largest banks which have contributed to this. The proportion and value of Norwegian-registered securities in the pledged portfolio have fallen. This reflects the fact that the tightening of the collateral requirements has had a particular effect on the pledging of Norwegian-registered securities.

Chart 2 Banks' borrowing facilities at Norges Bank, 14 November 2004 and 1 November 2007. Billions of NOK



Source: Norges Bank

Chart 3 Percentage change in borrowing facilities from 16 November 2004 to 1 November 2007. Banks with collateral agreement on 1 November 2007, ranked by change



Source: Norges Bank

It is difficult to gauge the impact of the changes in the rules. First, there is reason to believe that the composition of the collateral would have changed even if the rules had not. The large banks have needed to increase their borrowing facilities[11], and banks of this kind typically invest in bonds registered abroad. Second, banks gradually adapted to the new rules before they entered into force.

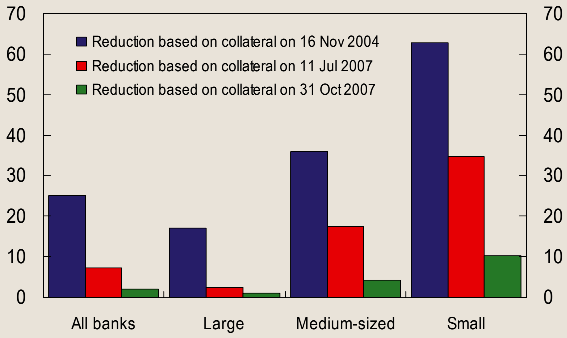
Banks' gradual adjustment is illustrated in Chart 4, which shows the estimated change in the value of eligible collateral assuming that the new rules had been introduced on three selected days prior to 1 November 2007. In other words, the chart shows how much of the collateral would no longer have been eligible. The impact of reduced haircuts has been ignored here. This comparison gives rise to three points:

- The first observation (16 November 2004) is from before the changes in the rules were announced. This shows that the three categories of banks had different needs to modify their collateral in order to maintain it at the same level.

[10] For information on the new and old liquidity requirements, see Section 4 of Proposition to the Odelsting No. 44 (2005–06), "Nye likviditetskrav for banker" [New liquidity requirements for banks], http://www.regjeringen.no/nb/dep/fin/dok/regpubl/otprp/.

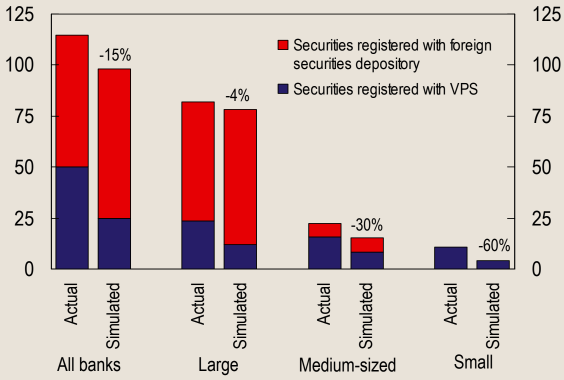
[11] The large banks' borrowing requirements have increased partly as a result of increased petroleum taxes, which have necessitated the raising of larger F-loans than before.

Chart 4 Percentage reduction in collateral due to rule changes on 1 November 2007 based on collateral on 16 November 2004, 11 July 2007 and 31 October 2007



Source: Norges Bank

Chart 5 Banks' borrowing facilities on 16 November 2004, actual and simulated after rule changes.[1] Billions of NOK



[1] The simulated figures exclude securities no longer eligible after 1 November 2007. Allowance has been made for the new bank quota and haircut rates.

Source: Norges Bank

- The second observation (11 July 2007) shows the situation four months before the new rules actually entered into force. The large banks were well prepared, while the smaller banks still had a substantial proportion of securities pledged which would soon no longer be eligible as collateral.
- The third observation (31 October 2007) shows what the banks actually lost in terms of eligible collateral when the rules entered into force the following day. One reason why the reduction was not larger is that Norges Bank actively encouraged the smaller banks to adjust their collateral in the months leading up to November.

When parts of the new rules entered into force in 2005, banks' borrowing facilities increased considerably. This was a result of haircut rates being reduced immediately following the transition to market value, while the changes tightening the collateral requirements were introduced over a two-year period.

The positive effect of the reduced haircut rates meant that the net reduction in borrowing facilities was smaller than the reduction in collateral as a result of the tightening of the rules (illustrated in Chart 4). If all of the changes in the rules (both the tighter collateral requirements and the reduced haircut rates) had entered into force in November 2004, the banks' aggregate borrowing facilities would have been cut by 15 per cent (see Chart 5). This figure assumes no adjustments by either banks or issuers.

As mentioned above, the rule changes have impacted differently on the different categories of banks. Smaller banks have been affected more than larger banks. This is because small and medium-sized banks pledge more Norwegian-registered securities than large banks do, and the rule changes have had the greatest effect on Norwegian-registered collateral. Norwegian-registered collateral has been affected particularly by the requirement for minimum volume outstanding. In addition, some Norwegian securities are no longer eligible because they are not listed on an exchange or do not have a sufficiently high credit rating.

3.3 Actual use of borrowing facilities

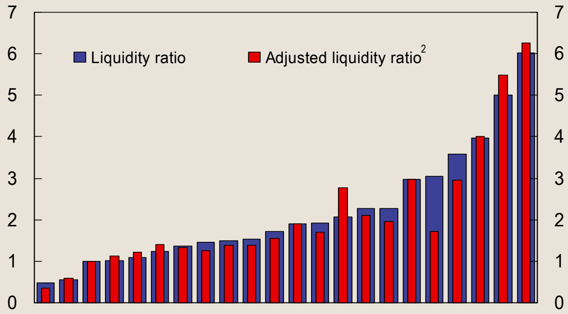
Some banks' borrowing facilities have been reduced as a result of the rule changes. To see whether this has led to an increased risk of disruption in the settlement of payments in NBO, we have compared banks' liquidity requirements with their access to central bank liquidity (deposits and borrowing facilities at Norges Bank).

We have calculated how much liquidity each bank needs during the day for the settlement of payments (see Box 3). It is assumed that all transactions are settled immediately. Thus we have not taken account of banks being able to reduce their liquidity requirements by waiting for incoming transactions from other banks.

Box 3. Liquidity requirements in the settlement of payments

Banks send and receive transactions in NBO throughout the day. A bank's liquidity requirements will be greatest at the time when the value of transactions sent (outgoing payments) is highest relative to the value of transactions received (incoming payments). Banks' liquidity requirements therefore depend on the size and order of the transactions they send and receive. If a bank does not have sufficient liquidity, its transactions are queued. The transactions in the queue are settled once the bank receives new transactions or pledges more collateral to Norges Bank.

Chart 6 Access to liquidity divided by maximum liquidity requirement during the day. Day with the lowest ratio out of days with large incoming payments to the government[1]



[1] Simulation performed for eight days in 2007 featuring large incoming payments to the government.
[2] Banks' borrowing facilities on the days in question adjusted for percentage change in borrowing facilities from 11 July 2007 to 1 November 2007.

Source: Norges Bank

On days with no large incoming payments to the government, all of the banks have ample access to central bank liquidity. On one such day chosen at random (11 July 2007), 17 of the 22 large and medium-sized banks had more than three times more liquidity than they needed at any time during the day. On days when large tax payments fall due, their liquidity requirements are substantially larger, and the margins smaller.

We have also calculated the large and medium-sized banks' liquidity requirements on the days in 2007 with the largest incoming payments to the government. For these days, we have looked at the ratio between actual access to liquidity and the maximum need for liquidity during the day. This "liquidity ratio" shows how many times more liquidity the banks have than they actually need. If supply is equal to demand, the ratio will be 1. We have then chosen the lowest liquidity ratio for each of the banks – in other words, the liquidity ratio on the day with the smallest margin between a bank's access to and need for liquidity (see Chart 6). There is one column for each bank, with the liquidity ratio on the y-axis.

There are major variations between banks. Chart 6 shows that some banks have a relatively small margin on extreme days. However, a liquidity ratio of less than 1 does not mean that a bank failed to settle its transactions on the day in question. When a bank lacks cover for a transaction at Norges Bank, the transaction is queued. The transaction is settled once the bank obtains cover, either through the provision of additional collateral or through transactions received.

While some banks increased their borrowing facilities in the months leading up to 1 November, others reduced theirs, due partly to the tightening of the rules. For most banks, the change in their borrowing facilities had little effect on the liquidity ratio. This is illustrated by the red columns in Chart 6. Here, banks' actual borrowing facilities on the days in question are adjusted for the percentage change in their borrowing facilities from 11 July to 1 November 2007. With the exception of the bank on the far left of the chart, the banks with the lowest ratios did not reduce their borrowing facilities. This lowers the risk of settlements being disrupted.

Box 4. Credit ratings

A rating from a credit rating agency is an assessment of the creditworthiness of an issuer or a security. It can be a help for investors who may otherwise have little such information. The rating is not a reflection of liquidity or market risk.

In the autumn of 2007, the rating agencies were criticised for their ratings of bonds issued by special-purpose vehicles (structured finance products). A number of bonds issued by these vehicles have been downgraded, and highly rated bonds have defaulted. This indicates that, in some cases, these securities were originally rated too highly.

The CESR[1] is currently conducting a study of how structured products are rated as part of its annual assessment of whether rating agencies active in Europe are adhering to IOSCO's Code of Conduct[2]. IOSCO is considering whether these recommendations need to be revised in the light of the problems that can arise in the rating of structured products. One example of such a problem is the way that the rating agencies first advise on the design of these products and then award them a rating.[3] Conflicts of interest may undermine the quality of these credit ratings.

[1] The Committee of European Securities Regulators (CESR) is an independent body which aims to promote cooperation between securities regulators, serve as an advisory body for the European Commission, and ensure that EU securities legislation is implemented by member states consistently and within the stipulated deadlines.

[2] The International Organisation of Securities Commissions (IOSCO) draws up recommendations for securities markets. Its members include the regulatory authorities in the countries with the world's most important securities markets. See "Code of Conduct Fundamentals for Credit Rating Agencies", IOSCO, 2005.

[3] This section is based on *Financial Stability Report* 22, Bank of England, October 2007.

4 Norges Bank's risk

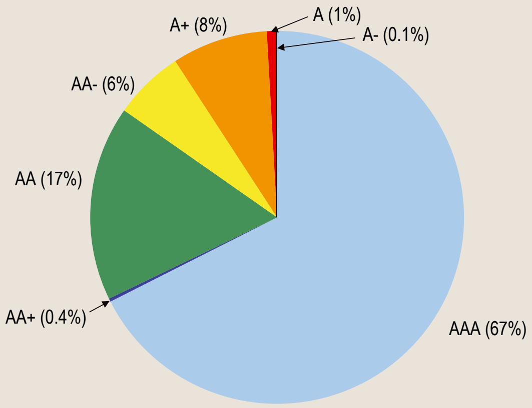
To limit Norges Bank's risk, the securities which banks pledge as collateral must be of high credit quality and highly marketable even in periods of financial turmoil. In the case of securities denominated in foreign currencies, it is also important that the currency does not depreciate significantly against the Norwegian krone in a short space of time.[12] Banks are increasingly pledging securities denominated in foreign currencies and registered with foreign securities depositories (see Chart 2).

4.1 Foreign-registered collateral

A security's credit quality can be gauged using a credit rating (see Box 4). All pledged securities from foreign

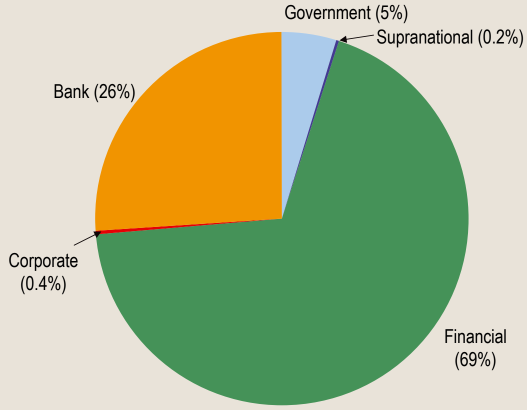
[12] Gradual exchange rate movements do not present any risk to Norges Bank because banks' borrowing facilities are based on daily updated exchange rates.

Chart 7 Collateral in the form of foreign-registered securities on 1 November 2007 by rating. Per cent



Source: Norges Bank

Chart 8 Collateral in the form of foreign-registered securities on 1 November 2007 by issuer. Per cent



Source: Norges Bank

issuers must have a rating of at least A from Standard & Poor's or A2 from Moody's. It has been estimated that the annual probability of default for a security rated A– by Standard & Poor's or A3 by Moody's (i.e. slightly below the required rating) is approximately 0.1 per cent.[13] The credit quality of securities pledged to Norges Bank is shown in Chart 7. Where securities are rated differently by the two rating agencies, the lower rating is shown.

Approximately 90 per cent of the securities pledged have a credit rating of AA– or higher (see Chart 7). AAA and AA are the highest rating categories. Of the remaining foreign bonds pledged, almost all have a rating of A+. The likelihood of a credit event in the pledged portfolio can therefore be considered very small.

Almost two-thirds of foreign securities pledged as collateral are issued by financial undertakings (see Chart 8). Issuers in this category are often special-purpose vehicles, and a substantial proportion of these bonds are backed by mortgages. As a result of the turmoil associated with US sub-prime mortgages, there has been some uncertainty about special-purpose vehicles as issuers of such bonds. However, a review has shown that only a small number of asset-backed securities pledged to Norges Bank have been downgraded by the rating agencies in connection with the market turmoil since last summer. Though prices of many pledged bonds have fallen during the turmoil, only a small share of pledged bonds have experienced that prices have dropped to below 90 per cent of the issued price.[14] Banks have not changed their collateral during the market turmoil in such a way as to reduce the quality of the pledged portfolios.

Even if the issuer of a bond has a high credit rating, Norges Bank may incur a loss if the bond is denominated in a currency which weakens against the Norwegian krone. Norges Bank has therefore set an additional haircut of 3 percentage points for securities which are not denominated in NOK. A review of exchange-rate movements between the krone and eligible foreign currencies in the period from 1994 to 2007 shows that this haircut was sufficient in the vast majority of cases. For the most widely used currency (EUR), the decline in value over a period of one week[15] was less than the haircut in 99.7 per cent of cases. The equivalent figure for the currency with the widest fluctuations against the krone (JPY) was 98.3 per cent.

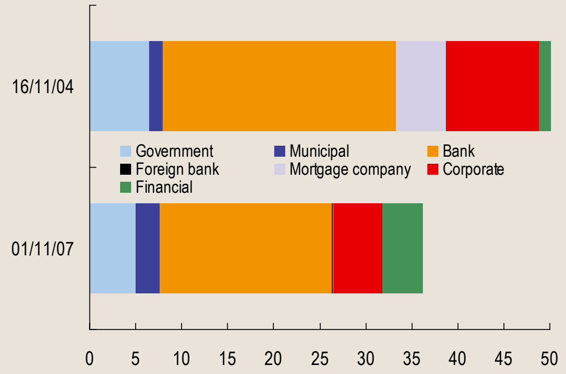
4.2 Norwegian-registered collateral

Securities issued or guaranteed by a government or municipality feature very low credit risk and are highly marketable. Securities from the banking and corporate sectors often feature higher credit risk and are traded less frequently. The low turnover of these securities is due partly to Norwegian securities often having a low volume outstanding.

The requirements adopted in 2005 have improved the quality of Norwegian-registered collateral at Norges Bank. A substantial proportion of the securities issued by the banking and corporate sectors are no longer eligible as collateral. In the case of securities from the banking sector, this is because they do not meet the volume requirement; in the case of securities from the corporate sector, this is because they do not meet the requirement of having a credit rating. This has led to reduced pledging of Norwegian-registered securities issued by banks and companies (see Chart 9). The gradual reduction in the bank quota from 50 to 35 per cent has also contributed to this. On 1 November 2007, less than 30 per cent of Norwegian collateral was from private issuers with a credit rating of BBB+ or below (see Chart 10). The proportion of low-rated collateral fell after the remainder of the new rules entered into force on 1 November 2007.

[13] "The single list in the collateral framework of the Eurosystem", *Monthly Bulletin* 5/06, ECB.
[14] Borrowing facilities are based on daily updated market values, which reduces Norges Bank's risk.
[15] This is a relevant time frame because the realisation of collateral can take a few days.

Chart 9 Borrowing facilities backed by securities registered with VPS and pledged to Norges Bank on 16 November 2004 and 1 November 2007 by issuer. Billions of NOK



Source: Norges Bank

Chart 10 Borrowing facilities backed by securities registered with VPS and pledged to Norges Bank on 11 July 2007 and 1 November 2007 by rating. Billions of NOK

Source: Norges Bank

5 Conclusion

The rules on collateral at Norges Bank have been revised in recent years. The main motivation for the changes was to reduce Norges Bank's risk. This has been achieved. Borrowing facilities are now based on market values which are updated daily. The proportion of securities issued by banks has fallen, while the proportion of securities of high credit quality has risen, and the volume requirement has increased the collateral's liquidity.

The rule changes adopted in 2005 would have led to a slight decrease in banks' borrowing facilities if they had chosen to retain their original portfolio of pledged securities after the new rules came into force (based on securities pledged in autumn 2004).

Aggregate borrowing facilities have increased in recent years. Calculations indicate that banks have sufficient liquidity for the settlement of payments. A number of small and medium-sized banks' borrowing facilities have been reduced. As small banks nearly always settle with the help of another private bank, they have less of a need to borrow from Norges Bank. Small banks which wish to have a contingency account at Norges Bank should hold securities which Norges Bank can accept as collateral.

The market for covered bonds in Norway is in its infancy. If the markets for these bonds in neighbouring countries are anything to go by, this could also become a large market in Norway. If so, it will provide a new source of eligible collateral for Norges Bank in the years ahead.

It was decided in 2005 to lower the quota of bank securities from 50 to 35 per cent, and it was announced that further reductions would follow. Norges Bank will present a schedule for these reductions in 2008.