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Long-term benchmark rates in the Norwegian bond market

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Government securities have traditionally been used as benchmarks for long-term interest rates. Today the market for interest rate swaps is also used. The difference between yields on government bonds and swap market rates - the swap spread - can provide information about the properties of these markets as reference markets. This article considers factors that may influence variations in the swap spread in Norway. An econometric analysis shows that in the period 1997-2003, the swap spread varied with developments in the spread between short-term money market rates and government bond yields, price developments in equity markets and the issuance of Eurobonds denominated in NOK. The results provide support for the use of the swap market as a benchmark market when pricing corporate bonds.

1. Introduction

In financial markets it is usual to price financial instruments relative to comparable investment alternatives (relative pricing). When pricing a bond, one can use the market rate of comparable bonds as the basis, and price components that are specific to the individual bond. For example, the yield on a corporate bond could be priced as the yield on a government bond of the same duration[1] with a premium corresponding to the credit and liquidity risk associated with the corporate bond. The yield on the government bond can then be regarded as the benchmark for the corporate bond.

Pricing relative to a benchmark contributes to consistent pricing of underlying factors that are common to different bonds, and at the same time simplifies pricing. Relative pricing also makes it easier to compare prices for different bonds. However, smoothly functioning and effective pricing is contingent on the existence of suitable benchmarks. In Norway, the government bond market and interest rate swap market are the most relevant reference markets for long-term rates and hence for the pricing of corporate bonds.[2] In the article we consider various factors that influence the choice of whether to use government bond yields or swap rates as long-term benchmark rates in Norway. The assessment is based partly on a theoretical discussion, and partly on an econometric model of developments in the spread between the rates in the two markets – the swap spread.

2. The role of a benchmark instrument

The basic premise for the choice of a benchmark instrument is that the value of the instrument is fundamentally similar to that of the instrument that is to be priced. The reference instrument should contain few value components that are specific to the instrument. In other words, an appropriate benchmark instrument should reflect as "purely" as possible components that are relevant to the value of the instrument that is to be priced. If we assume that the yield on a corporate bond consists of a required risk-free real rate of return, inflation expectations and compensation for credit risk[3], the requirement for an appropriate benchmark rate for the bond will be that it covaries as closely as possible with these components. The yield on the corporate bond must be adjusted for factors that are specific to the corporate bond and any components of the benchmark rate that are not relevant to the corporate bond.

Government bonds as benchmarks

Government bond yields have traditionally been used, both internationally and in Norway, as fundamental benchmarks for the pricing of corporate bonds. A large outstanding volume, long and spread maturity profile and the absence of credit risk have made government bonds appropriate for reflecting the market's required real rate of return and inflation expectations.[4] Moreover, government bonds are homogeneous instruments that are available to all investor groups, and they are sold in transparent markets. When government bond yields are used as benchmarks for pricing corporate bonds, a premium must be estimated for the credit risk associated with the corporate bond, since there is no credit risk associated with the yield on government bonds.[5]

The Norwegian government bond market is small by international standards. It is also small relative to macro-

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[1] The duration of a fixed yield bond is the average time it takes for all cash flows (yield coupons and principal) to fall due for payment.

[2] An alternative could be corporate bonds with low credit risk, such as asset-backed securities or securitised loans. However, the issuance of these securities has only recently been allowed in Norway, and there is no liquid market for these bonds today.

[3] Here we disregard other premia due to liquidity risk, etc.

[4] For a discussion of the government bond market as a benchmark for required real rate of return and inflation expectations, see for example Hein (2003).

[5] In addition adjustments must be made for any differences in the liquidity premia of the bonds.

Interest rate swaps and the market for interest rate swaps

An interest rate swap is a contract between two parties to exchange interest payments. Normally such an agreement involves the exchange of a fixed rate (the swap rate) for a short-term money-market rate (3- or 6-month NIBOR). The swap rate is fixed such that the value of the contract is zero when the agreement is made. The net present value of the fixed rate payments is therefore equal to the net present value of the expected interest rate payments based on the short-term rate. Once the contract has been signed, the market value of the contract will vary with changes in market rates.

The cash flows in an interest rate swap contract are based on an underlying principal, but the principal is not exchanged between the parties to the contract. The credit risk associated with the contract is therefore limited to the exposure resulting from developments in the market value of the contract. Credit risk may be further reduced through the use of collateral, netting in the event of bankruptcy, rating triggers[2] and cross default clauses[3]. As banks are the principal participants in the interest rate swap market, swap rates will to some extent reflect credit risk in the banking sector. This risk accounts for some of the difference between government bond yields and swap rates (see Chart).

Since the market for interest rate swaps is a derivatives market which does not involve the purchase and sale of the underlying assets, interest rates in the swap market are usually less influenced by supply and demand than yields in the bond market, where the outstanding volume is limited. Nevertheless, variations in supply and demand are not without importance for pricing in the swap market. Transaction flows in the swap market influence market-makers' expectations regarding interest rate developments. If, for example, many participants want to receive a fixed rate in the swap market, this may indicate that many participants consider the swap rate to be too high compared with their expectations of developments in short rates. As a reaction to such transaction flows, the market-maker will therefore revise his own expectations, and adjust down the fixed rate.

In a well-functioning swap market, equilibrium will be reached, so that market participants' aggregate information and expectations will be embodied in interest rates. At the same time, various factors may result in prices not reflecting these expectations and hence not aggregating information perfectly in the short term. For example, market-makers' risk limits may influence interest rates. If a market-maker enters into many agreements for payment of a fixed swap rate, and this results in an overrun of the market-maker's risk limits, he may be forced to revise rates downwards in order to balance the risk. This may be the outcome even if the market-maker's expectations are unchanged.

[1] In the event of bankruptcy, the net position is settled among the counterparties.

[2] Swap agreements are settled at market value in the event of changes in counterparties' ratings.

[3] Swap agreements are settled at market value in the event of counterparty's default in relation to a third party.

Chart 1 Yield curves in the government securities and swap markets, 30 December 2003. Yield in per cent and maturity in years.
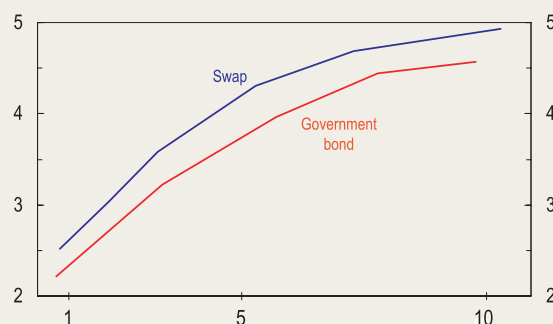
Sources: Norges Bank and Reuters

economic aggregates for Norway such as GDP.[6] This is because the public sector borrowing requirement is limited. For the same reason, the Norwegian government bond market is less liquid[7] than most other bond markets. Because of the poor liquidity and low outstanding volume, Norwegian government bond yields may be considerably influenced by variations in supply and demand that do not reflect changes in the required real rate of return or inflation expectations. This reduces the suitability of Norwegian government bonds as benchmarks for long-term rates and corporate bonds.

Swap rates as an alternative to government bond yields

In the late 1990s, government borrowing in many countries was reduced because of government budget surpluses.[8] The result was reduced liquidity in the countries' government bond markets and market participants looked around for alternative benchmark instruments. Among the alternatives to government bonds are semi-government bonds and government-guaranteed bonds, interest rate swaps, investment grade corporate bonds and bonds issued by supranational organisations.[9] In

[6] In Norway, the volume of outstanding government bonds was equivalent to 11 per cent of GDP in 2001. The average for the OECD countries was just over 40 per cent.

[7] In a highly liquid market, large transactions can be carried out without influencing prices to any particular extent, and the bid-ask spread is small.

[8] This is true of the US, Canada, the UK, Belgium, Spain and Italy, among others.
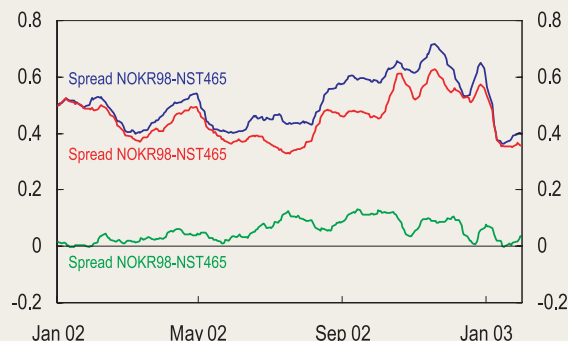
[9] Such as the World Bank and the European Investment Bank.

Chart 2 Developments in swap spreads with different maturities and in the BRIX spread. Percentage points. Monthly figures. 1997-2004.

BRIX spread

5-year swap spread

10-year swap spread
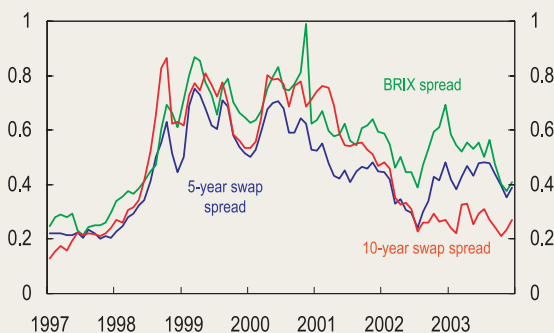
Sources: Norges Bank, Oslo Stock Exchange and Reuters

Chart 3 Developments in the spread between corporate bond NOKR98 and government bond NST465, the corresponding spread against the swap rate with the same maturity and the spread between the swap rate and NST 465. Percentage points. 10-day moving average. January 2002 – January 2003.

Spread NOKR98-NST465

Spread NOKR98-NST465

Spread NOKR98-NST465

Jan 02   May 02   Sep 02   Jan 03

Sources: Norges Bank and Oslo Stock Exchange

most countries, interest rate swaps have emerged as the most appropriate alternative.

Information from market participants indicates that interest rate swaps are used extensively as a reference for long-term rates and pricing of corporate bonds. This applies both internationally and in Norway. Interest rate swap markets have grown strongly in recent years, and in a number of countries the liquidity of these markets is greater than that of government bond markets.

Pricing of corporate bonds

The Norwegian market for corporate bonds is small. Few companies issue bonds compared with other countries, and the amount outstanding is usually relatively low. Moreover, turnover of most bonds is very low. Thus, few indices for corporate bonds can provide a continuous and satisfactory picture of developments in the corporate segment of the Norwegian bond market. This makes it difficult to determine which references are used in the corporate bond market.

Banks are the largest borrowers in the corporate bond market. Since banks are also the largest participants in the swap market, the credit risk component of the yield on bonds issued by banks is closely linked to the credit risk component of swap rates. Covariation between swap rates and yields on corporate bonds can therefore be explained in terms of both variations in the required real rate of return and inflation expectations and variation in the credit risk associated with market participants' risk profile.

Chart 2 shows developments in spreads for swaps with maturities of 5 and 10 years and the spread between the yield on bonds in the BRIX index and in the ST4X[10] government bond index on the Oslo Stock Exchange (the BRIX spread) in the period 1997 to end-2003.

The chart indicates a high degree of covariation between these spreads through the period. The BRIX index is based on a selection of listed bank, insurance, mortgage company and industrial bonds, and has a duration of 3 years. Since 2002, the index has contained almost exclusively bank bonds. All else being equal, one would expect the BRIX spread to be wider than the swap spread, because credit risk components are larger in the bond market, where also the principal is exchanged between seller and buyer.

Chart 3 presents an example of how the yield on a corporate bond (NOKR98) develops relative to government bond NST 465[11] and the swap rate with the same maturity as NST 465.[12] The chart also shows the swap spread with the same maturity in the same period. We see that NOKR98[13] follows the swap rate more closely than the government bond yield for most of the period. This is reflected by the fact that that the spread between NOKR98 and the swap rate changes relatively little through the period, and similarly that the spreads between government bond yield and NOKR98 and the swap rate, respectively, are very largely parallel. This was also the case in the period in autumn 2002 when the swap spread widened appreciably, partly due to extensive demand for short bonds in NOK. This effect on the pricing of NST 465 in autumn 2002 is an example of the varying quality of the government bond market as a benchmark. The yield on bond NOKR98 shadowed swap rates closely during this period, and did not appear to reflect the strong demand for interest-bearing investments in NOK[14] that was expressed in the government bond market.

Whereas the yield on a bond issued by a bank can be assumed to shadow swap market rates because of underlying similarities in credit risk, there is no direct connection with the credit risk in the swap market for an

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[10] ST4X is an index composed of government bonds. The duration of the index is 3 years.

[11] NST 465 has a coupon of 5.75 per cent and matures on 30 November 2004. The outstanding volume is NOK 38 750 million.

[12] If a swap rate with the same maturity as NST 465 is used, the swap rate's term structure works in the same way on both spreads with NOKR98.

[13] NOKR98 has a coupon of 5.85 per cent and matured on 16 June 2004. The outstanding volume is NOK 5 244 million. The bond was issued by Norgeskreditt AS, which is part of the Nordea group.

[14] Variations in the credit rating of Norgeskreditt may also have contributed to variations in the yield on NOK98.

industrial bond. However, credit risk in the banking sector depends on banks' loss risk, which depends in turn on the risk in the banks' loans to the corporate and household sector. Increased risk in, for example, industrial companies, will therefore normally feed through to the banking sector. It is therefore reasonable to expect covariation between swap spreads and industrial bond spreads, even though industrial bonds are not priced relative to swap rates. The market pricing of bank or industrial bonds therefore does not provide an adequate basis for deciding which market is used as a reference for inflation expectations and required real rate of return in the pricing of corporate bonds. According to market participants, however, swap rates are the preferred reference. This raises the question of which factors determine the difference between the swap rate and the sum of required real rate of return and inflation expectations. The swap spread provides an expression of this difference, as government bond yields are assumed to reflect the required real rate of return and inflation expectations. If swap rates are used as a reference, it is desirable to know whether the factors that determine the swap spread are also of relevance for the pricing of corporate bonds. In the following sections we will focus on the question of which factors determine developments in the swap spread.

3. Components of the swap spread

From an arbitrage perspective, the swap spread can be determined analytically by considering the following portfolio:

- Short sale of 10-year government bonds
- Investment of the income from the sale in 6-month Treasury bills which are continuously rolled over.
- Entry into a 10-year interest rate swap contract to receive a fixed swap rate and pay a floating 6-month money market rate (NIBOR) on a principal equivalent to the income from the sale of the government bonds.

The value of this portfolio is zero at the time of establishment, and the payment flows in the next 10 years are as follows: a 10-year government bond rate is paid annually, and a 10-year swap rate received, while 6-month Treasury bill interest is received and 6-month NIBOR is paid. In other words, the 10-year swap spread is received annually against semi-annual payment of the NIBOR spread. Since the portfolio initially has a value of zero, a theoretical relationship can be established between the size of the swap spread and expectations regarding the size of the NIBOR spreads through the term to maturity of the swap contract. The swap spread can thus be regarded as a series of NIBOR spreads. It is therefore reasonable to expect that changes in the

NIBOR spread will covary with changes in the swap spread.

The NIBOR spread depends on the difference in credit risk associated with investment in short-term government paper (Treasury bills) and in the interbank market. In other words, the credit risk involved in the swap spread also depends on the credit risk in the interbank market.

Other factors that may influence the swap spread

In the following we list factors that may influence the swap spread. Some relate to transaction flows in swap and government bond markets via various market mechanisms, as described in the box above. The discussion is primarily an assessment of how the various factors may influence the swap spread.

The stock market
Developments in stock markets may influence yields on government bonds and swap rates and thereby the swap spread through several channels.

Portfolio allocation between the asset classes equities and fixed income instruments is influenced by developments in the stock market. A fall in stock markets will normally result in increased demand for interest-bearing assets and hence a fall in yields. Similarly, an upturn in stock markets may motivate capital flows from the fixed income to the equity markets, and result in a rise in interest rates. In periods, a high degree of covariation is therefore observed between developments in the equity market and long-term interest rates. Since the swap market is not an investment market, it is reasonable to expect developments in equity markets to have only a limited effect on swap rates through the portfolio allocation effect. An upturn in equity markets can therefore be expected to result in a narrowing of the swap spread, and vice versa.

Rising equity prices will often be a result of an improved economic outlook. An upturn in equity markets may therefore indicate that the prospects for corporate earnings have improved and that the credit risk is reduced. It is therefore possible that the credit risk component in the swap rates may decline in pace with an upturn in equity markets, which may contribute to a narrowing of the swap spread.

Developments in equity markets may also influence the willingness or ability of investors to bear risk. An upturn in equity markets may accordingly result in an outflow of capital from government bond markets, and thereby in an increase in government bond yields. Since such effects can be expected to influence swap rates to a lesser degree, the swap spread will narrow. In government bond markets with a low degree of liquidity, such as the Norwegian market, such transaction flows may

conceivably be of particular importance to government bond yields and hence to the swap spread.

The slope of the yield curve

The difference between short and long rates can be expected to be important to supply and demand in the interest rate swap market. A yield curve with a positive slope (long-term rates are higher than short rates) means that the fixed swap rate over time is expected to be lower than the floating rate - since the value of the swap contract is zero at the time when the contract is made. When a borrower's expectations do not differ from the market rates, borrowers should therefore be indifferent as to whether they prefer long- or short-term fixed interest rates. However, when the yield curve becomes steeper, one often sees a greater desire to receive a fixed interest rate in the swap market. A steeper yield curve may therefore contribute to lower swap rates, and a narrower swap spread.[15]

If the slope of the yield curve is positive, net payment flows in the first part of the term of the swap contract will go from the recipient of the floating interest rate to the recipient of the fixed rate, and can be expected to go the opposite way towards the end of the contract period.[16] In a market with a positively sloping yield curve, the recipient of a floating interest rate will therefore normally expect to incur credit risk early in the swap term. Because compensation is required for this risk, it may result in a lower fixed interest rate in the swap market and hence a narrower swap spread.[17]

At the same time, the slope of the curve provides information about economic developments. A declining (inverted) yield curve will normally indicate expectations of weaker economic developments. This will contribute to a general increase in credit risk and hence a widening of the swap spread. Similarly, a steeper yield curve is normally an expression of a better growth outlook and a lower credit risk, and hence narrower swap spreads.

The yield differential between Norway and other countries

Demand for bonds denominated in Norwegian krone depends partly on the yield differential between Norway and other countries. A wide yield differential normally increases demand for bonds denominated in NOK. In isolation, this will contribute to lower yields on bonds. Because of a possible scarcity of government bonds, the decline in yields may be sharper than the decline that would reflect changes in the required real rate of return and inflation expectations. Swap rates are expected to be less strongly influenced by the yield differential, since this is a market for changes in interest rate exposure and not for investment of liquidity. An increased interest rate

differential is therefore expected to contribute to an increase in the swap spread.

Market uncertainty /volatility

An increase in market rate volatility often reflects increased uncertainty regarding interest rate movements. A change in uncertainty among market participants may change the balance between supply and demand for fixed interest rates. Greater uncertainty may be expressed through more borrowers wanting to pay a fixed interest rate, to hedge against disadvantageous interest rate increases. Increased demand for fixed rates in the swap market contributes to swap rates rising and to the swap spread increasing.

Issuance of government bonds

The outstanding volume in the Norwegian government bond market is relatively low, and the liquidity in the market is limited. A limited supply of government bonds may lead to lower yields than required real rates of return and inflation expectations would indicate. There is therefore reason to believe that, in the short term, issues of government bonds contribute to higher government bond yields, and thereby reduce the swap spread.

Issues of Eurobonds in NOK

Through 2001 and 2002 there was substantial issuance of Eurobonds denominated in NOK, which are bonds denominated in NOK issued outside Norway. High demand for investment in NOK, partly because of the wide yield differential, made it profitable to issue Eurobonds rather than to borrow directly in the issuers' domestic markets. In most cases the issuers had no need for liquidity or exposure in NOK. They therefore used interest rate swaps to change their exposure from fixed to floating interest rate payments. They then entered into currency swap contracts to receive USD or EUR against payment of NOK. The issuers thereby converted fixed rate loans in NOK into floating rate loans in USD or EUR. This contributed to a substantial, one-sided demand for fixed interest rates in the interest rate swap market. It is therefore reasonable to expect that issues of Eurobonds will contribute to a widening of the swap spread.

Chart 4 shows the volume of Eurobonds issued in the period 1997 to 2003. The bulk of the Eurobonds had a maturity of 4-6 years, and the effects on the swap spread are expected to have been greatest in this maturity segment. While pressures in the swap market contributed to lower swap rates, issuance activity may also have reduced demand for Norwegian government bonds. This may have resulted in higher government bond yields and thereby contributed to further reducing the swap spread.

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[15] The steeper the yield curve, the stronger this effect will be.

[16] Here we are disregarding accruals of interest payments through the year.

[17] If the yield curve is inverted (long-term rates lower than short-term) a recipient of a fixed interest rate will incur the credit risk early in the contract period. Compensation will take the form of a higher required fixed interest rate in the swap, thereby contributing to higher swap rates and a broadening of the swap spread.

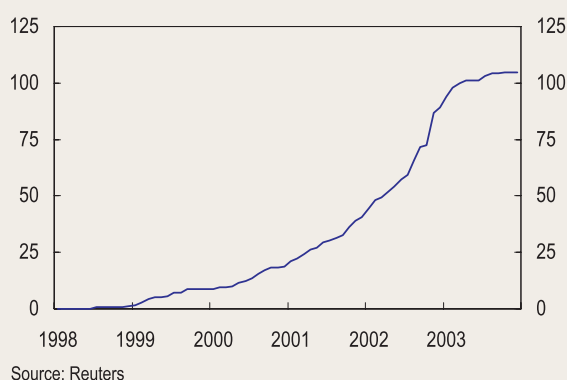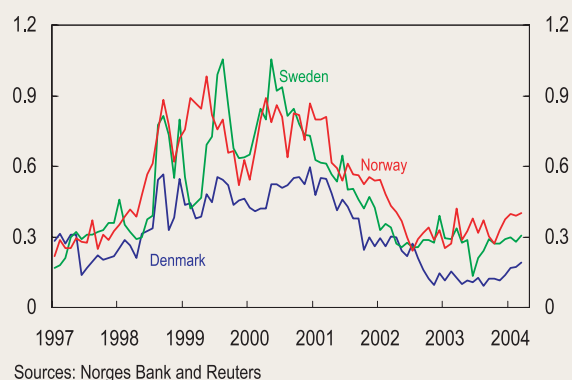**Chart 4** Cumulative gross issue of Eurobonds denominated in NOK in the period 1997–2003. In billions of NOK.

Source: Reuters

Chart 5 10-year swap spreads in 3 Nordic countries. Percentage points. Monthly figures. January 1997 - March 2004

Sources: Norges Bank and Reuters

4. Econometric model of the swap spread

The importance of each of the factors for changes in the swap spread can be estimated by means of an econometric model of the swap spread.

Since corporate bonds, according to market participants, are priced using swap rates as a benchmark, we do not include the credit spread as an explanatory factor in the model. This means that developments in credit risk are mainly included in the model via the NIBOR spread, and more indirectly through stock market developments (see discussion above).

We include two dummy variables[18] related to the financial market turbulence in autumn 1998, since these can be regarded as exogenous shocks to the market. To reduce the effects of any autocorrelated explanatory variables, we have also included the lagged value of changes in the swap spread.

Other countries are only included indirectly in the model through the yield differential. This probably reduces the explanatory power of the model, since the swap spreads in the Norwegian market show a clear correlation with swap spreads in other countries (see Chart 5). If the correlation is caused by international swap rates serving as reference rates for Norwegian swap rates, factors abroad will influence the Norwegian swap spread. For example, changes in the slope of the yield curve in other countries may influence the swap spreads in these countries, and thereby influence swap spreads in the Norwegian market.

There is probably also a direct relationship between swap spreads in different countries because financial markets are strongly integrated. Many banks are involved in determining the floating rate on interest rate swaps in a number of countries. Nordea, for example, is involved in fixing interest rates in all the Nordic countries. It is therefore reasonable to expect high covariation between the swap spread in the Norwegian market and in the other Nordic markets (see Chart 5).

As Table 1 shows, the explanatory variables are either flow variables or stock variables in the form of difference terms. We estimate two different models. Both are simple linear regression models which satisfy ordinary statistical criteria. In the first (Model 1) we include all ex-ante relevant explanatory variables, without lagged values. This model provides a basic impression of the explanatory value of the variables, and a priori might apply if a swift market adjustment takes place. We then present a reduced model (Model 2) produced by means of a "general-to-specific" reduction method. After each estimation of Model 2, insignificant explanatory variables are excluded until only significant explanatory variables remain. In our estimation of Model 2 we have included three lagged values of the explanatory vari-

Table 1. Summary of factors expected to influence changes in the swap spread.

Variablel	Explanation	Expected effect
Government bonds issue 1OY	Value of monthly volume issued of 10-year Norwegian government bonds	–
Government bonds issue 5Y	Value of monthly volume issued of 5-year Norwegian government bonds	–
ΔSlope 2-l0Y	Change in spread between 10-year and 2-year swap rates from interest rate swap contracts quoted on Reuters	–
ΔYield differential with German 10Y	Change in yield differential between 10-year Norwegian and German government bonds	+
ΔOSEBX	Monthly return on the Oslo Stock Exchange Benchmark Index	–
Volatility 2Y	Equally weighted moving monthly standard deviation of 2-year swap rates	+
Eurobonds issues	Volume in Eurobonds issued in NOK. Eurobonds are defined here as bonds issued outside Norway in NOK	–
ΔNibor6m-ST2X	Change in the spread between 6-month money market rates (NIBOR) and the yield on government paper in the ST2X index on the Oslo Stock Exchange. The ST2X index has a duration of 6 months	+

[18] The steeper the yield curve, the stronger this effect will be.

ables. The regression performed is the ordinary least squares method. The variables in the model are defined in Table 1.

Data

We use average monthly data from the Oslo Stock Exchange, Reuters, Bloomberg, EcoWin and Norges Bank in the estimation. The data cover the period from January 1997 to December 2003, i.e. a total of 84 months. This period includes periods with substantial variations in swap spreads, for example in connection with the turbulence in financial markets in 1998. Developments in the period resulted in a considerable increase in swap spreads in most countries. In autumn 1998, Norwegian 5- and 10-year swap spreads increased in the course of a few months from 30 basis points to 60 and 85 basis points, respectively. The spread remained wide for a number of years afterwards. Since summer 2002 the swap spread has been wider in the 5-year than in the 10-year segment (see Chart 2).

Results

When the 5- and 10-year swap spreads are estimated according to Model 1, there are few significant explanatory variables. The bulk of the explanatory power stems from the dummy variables, which have a relatively high partial R^2. There may be several reasons why the explanatory power of the variables is low; for example, there may be omitted variables. Moreover, the model is static, hence it does not capture changes in the relations between the explanatory variables and the swap spread. The manner in which the swap market functions has undergone substantial changes in the period we are looking at. This may be a reason why the relationships the model is supposed to explain have not been static.

Moreover, the effect of international developments is only included indirectly in the model's explanatory variables.

There are also probably lag effects in the relationships between the explanatory variables and the swap spreads. This may be due to the fact that it takes time from when market participants identify arbitrage possibilities until they are exhausted, or possibly to other frictions in the markets. This might for example apply to the activity in the Eurobond market. In order to capture such relationships, we include lagged variables in the reduced model (Model 2).

Table 2 shows which explanatory variables and coefficients are included in the reduced model of changes in 5- and 10-year swap spreads, respectively (Model 2).

The reduced models contain far fewer explanatory variables than we included initially. They omit issues of government bonds, changes in the slope of the yield curve, changes in the yield differential against Germany and the volatility of the interest rate market. The model for changes in 5-year swap spreads only gives significant explanatory power to returns in equity markets, the lagged variable for changes in swap spreads and the dummy variables. In the model for changes in the 10-year spread, changes in the NIBOR spread and issues of Eurobonds are also significant explanatory variables.

With the exception of equity market returns in the 10-year model, the variables in the models that prove to be significant are in lagged form. This may be due to chance, but may also indicate that it takes time for the various factors that influence swap spreads to feed through. These dynamics may also vary with different swap market maturities. The lag structure in the model may also be influenced by our use of monthly averages for the explanatory variables. All the explanatory variables have the same sign in the model as expected.

Table 2. Test results for Model 2

	Δ5YSwapspread		Δ10YSwapspread	
	Coefficient (t-value)	Partial R^2	Coefficient (t-value)	Partial R^2
Constant	0.0011 (0.24)	0.0007	0.0142 (2.06)	0.0528
Δ5YSwapspread $_{t-1}$	0.2176 (2.23)	0.0607		
Δ10YSwapspread $_{t-1}$			0.1951 (2.17)	0.0586
ΔOSEBX			-0.2356 (2.58)	0.0806
ΔOSEBX $_{t-1}$	-0.1622 (-2.02)	0.0501		
ΔNibor6m-ST2X $_{t-1}$			0.2272 (2.62)	0.0830
Eurobond $_{t-1}$			-0.0009 (-2.41)	0.0713
Dummy1	-0.1434 (-3.18)	0.1163	-0.2261 (-4.55)	0.2144
Dummy 2	0.1886 (4.16)	0.1836		
N	82		82	
R^2/Adj. R^2	0.3151 / 0.2795		0.4116 / 0.3729	
Σ	0.0440		0.0483	
DW	2.06		1.96	

5. The importance of the components of the swap spread for choice of benchmark

The qualitative difference between using government bonds and interest rate swaps as a benchmark for long-term rates depends on whether the factors that determine developments in swap spreads are relevant to the application of the reference rate in question here. In theory, variations in required real rates of return and inflation expectations should affect the government bond and interest rate swap markets in the same way. Differing developments in these rates must therefore be attributable either to variation in other components of the swap rate or to imperfections in price formation in one or both of the markets.

The model indicates that for the period 1997 to 2003 the factors that determine the swap spread are developments in equity markets, the NIBOR spread and issues of Eurobonds. The explanatory variables may affect the swap spread both through variations in components of the swap spread and through market imperfections. In the reduced models, there is a negative relationship between developments in the equity market and changes in the swap spread. It is difficult to determine whether it is the effect of portfolio allocation between the equity market and the fixed income market, or the effect of changes in expected and actual credit risk which contributes most to the change in the swap spread, as both influence the swap spread in the same direction. If the changes in the swap spread are due to imperfections in the government bond market, swap rates will be a better benchmark for real interest rates and inflation expectations than government bond yields. Changes in the swap spread as a result of changes in credit risk are more problematic. A widening of the swap spread as a result of increased credit risk in the banking sector will not necessary be relevant to the pricing of a corporate bond. Overall, the estimated relationship between developments in the equity market and changes in the swap spread contribute to strengthening the swap market as a benchmark for the pricing of corporate bonds.

As expected, issues of Eurobonds have a negative effect on the swap spread. Contrary to expectations, however, the explanatory power is significant in the 10-year segment, but not in the 5-year segment.[19] This may indicate that liquidity in the government bond market was lower in the 10-year than in the 5-year segment. As mentioned above, Eurobond issues affected the swap spread through two channels: partly through participants' increased desire to receive a fixed interest rate in the swap contract, partly through the reduction of any scarcity components in the pricing of government bonds. Lower swap rates as a result of one-sided flow in the swap market reduce the suitability of swap rates as a benchmark for the pricing of corporate bonds. The component that concerns less scarcity of government bonds should in principle not be relevant to the pricing of corporate bonds.

The NIBOR spread is a significant explanatory variable in the model for changes in the 10-year swap spread. Since the NIBOR spread can be taken as an expression of the risk in the banking sector/system, it is relevant to the pricing of bonds whose risk profile is related to the risk in this sector. This component of the swap spread may be irrelevant to the pricing of other bonds.

6. Conclusion

In Norway the swap market is the most relevant alternative to the government bond market as a benchmark market. The purpose of this article is to illustrate differences between using these two markets as a benchmark in the Norwegian bond market. The differential between the interest rates in the swap market and yields in the government bond market, the swap spread, can provide some indication of the qualitative difference between the use of these two markets as a reference for developments in long-term rates. In the period 1997 to 2003, our model indicates that the differential between government bond yields and swap rates varied with developments in the NIBOR spread, equity markets and issues of Eurobonds. The results show that the swap market may be suitable as a benchmark for corporate bonds, even though some of the components that explain changes in the swap spread and of limited relevance to the pricing of some types of corporate bond.

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[19] We expected that the swap spread would be more strongly affected in the 5-year than in the 10-year maturity segment,

How accurate are credit risk models in their predictions concerning Norwegian enterprises?

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Historically, banks' solvency problems are often due to losses on loans to enterprises. Credit risk associated with loans to enterprises is therefore an important aspect when Norges Bank assesses financial stability. Two different credit risk models are used in the analyses, Norges Bank's SEBRA model and the Moody's KMV Private Firm model. This article compares the quality of predictions made by the two models. The analysis shows that both models are good at selecting bankruptcy candidates among unlisted Norwegian enterprises and that the SEBRA model is somewhat better than the Moody's KMV Private Firm model.

1.   Introduction

There are clear methodological differences between the two credit risk models used by Norges Bank. The SEBRA model, which has been developed by Norges Bank, predicts bankruptcy probabilities on the basis of figures from the annual accounts of Norwegian limited companies. The Moody's KMV Private Firm model predicts the probability of default for large unlisted enterprises, based primarily on market information. SEBRA is thus an accounting-based model whereas the Moody's KMV Private Firm model may be characterised as a market-based model. This article compares the quality of the predictions made by these two models on the basis of predictions for Norwegian enterprises made after the financial years 1998 - 2001 and actual bankruptcies in the period 1998 - 2003.

The structure of this article is as follows: Section 2 briefly presents the two models and comments on some methodological differences. Section 3 presents the data underlying the analysis, while Section 4 presents the results. Differences in the two models' treatment of different industries are discussed in Section 5, and a summary follows in Section 6.

2.   Credit risk models

2.1 Norges Bank's SEBRA model

The SEBRA model predicts the risk of bankruptcy using 12 explanatory variables connected to figures from the annual accounts and some other enterprise characteristics. The model includes variables for earnings, liquidity, financial strength, industry, size and age.[1] The SEBRA model is based on a database containing annual accounts for all Norwegian limited companies. For the 2002 financial year, the database contains data concerning approximately 140 000 enterprises. The large majority of these enterprises are small. The SEBRA version of 2001 ("SEBRA 01"), which was estimated on the basis of annual accounts for the period 1990-1996, and the

SEBRA version of 2003 ("SEBRA 03"), which was estimated on the basis of annual accounts for the period 1990-2000, were estimated on the basis of all enterprises in the database. A SEBRA version ("SEBRA Large") based on enterprises with annual turnover in excess of NOK 40 million was developed in connection with a previous comparison of SEBRA and KMV. The three SEBRA versions are fairly similar since there are only minor differences in the coefficient values of the various variables.

The disadvantage of the SEBRA model is that new information comes in only once a year and that there is a time lag of nine months between the end of the financial year and the time most accounts are available in the database. For example, the bankruptcy predictions in June 2004 were based on annual accounts from 2002.

2.2 The Moody's KMV Private Firm model

The Moody's KMV Private Firm model, a model for unlisted enterprises, is an offshoot of the Moody's KMV Public Firm model, a model for listed enterprises. Whenever the models are discussed in the rest of this article, KMV is used as an abbreviation for Moody's KMV. The fundamental idea in the KMV Public Firm model is that an enterprise will default on its debt obligations if the market value of its assets becomes too low compared with the value of its debt. The level at which an enterprise is assumed to default on its debt obligations is called the default point. On the basis of studies of default statistics, KMV chooses to calculate this level as the value of the enterprise's short-term debt plus a portion of its long-term debt. The default point is thus assumed to be somewhat lower than the value of total debt. The calculation of the default point is based on information from the financial accounts concerning the enterprise's financial position. Market data are used to estimate the market value of the enterprise's assets. On the basis of the share price of the enterprise in question and the volatility of the share price, option pricing the-

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[1] The SEBRA model is described in more detail in Eklund, Larsen and Bernhardsen (2001).

ory is used to estimate the market value of the enterprise's assets. A key variable in the KMV model is the distance to default, which is defined as the difference between the market value of the assets and the default point expressed in standard deviations. Using KMV's database of actual defaults, the distance to default is then converted to expected default probability (EDF). The greater the distance to default, the lower the expected default probability. As standard, the KMV model states the probability of default in the next 12 months for the enterprise in question.[2]

Quoted share prices do not exist for unlisted enterprises. This means that the market value of an enterprise's assets must be determined in some other way. KMV's Private Firm model estimates the market value of an enterprise's assets as the enterprise's EBITDA[3] multiplied by a factor that is a function of share price movements for listed enterprises in the same industry, share price movements for listed enterprises in the same country and the size of the enterprise in question. The methodology used in the KMV Public Firm model is then used to calculate the expected default probability.

One would expect the KMV Public Firm model, which is based on the market's continuous pricing of equity in each enterprise, to be more accurate in predicting default than the KMV Private Firm model. The drawback of the latter model is that the estimated market value of the enterprise's assets is based on average figures for somewhat similar enterprises and not on the market's continuous pricing of enterprise-specific risk factors. The SEBRA model predictions are compared with the predictions of the KMV Private Firm model because there are so few listed enterprises in Norway that it is not meaningful to make a comparison with the KMV Public Firm model.

Moody's KMV has also developed an accounting-based credit risk model for unlisted enterprises called Moody's KMV RiskCalc. We have not tested SEBRA's predictions against this model since one important purpose of the test is to compare SEBRA with a market-based credit risk model.

2.3 Differences between SEBRA and KMV

One important difference between SEBRA and KMV is that SEBRA predicts the probability of bankruptcy during the next three financial years[4] while KMV predicts the probability of default during the next 12 months. These probabilities are somewhat different since an enterprise that defaults on its debt obligations will not necessarily go bankrupt. For example, in the event of default, a creditor may agree to a new repayment plan or to convert debt to equity instead of forcing the enterprise into bankruptcy. Therefore, given the same time horizon

for the respective probabilities, the default probability for an enterprise will never be lower than the bankruptcy probability. In practice, the default probability from the KMV model is considerably higher than the bankruptcy probability from the SEBRA model. Both bankruptcy and default probabilities are indicators of the risk exposure associated with credit to enterprises. Thus, there is reason to assume that rankings of enterprises, based on bankruptcy and default probabilities, respectively, are approximately the same. In the comparisons of credit risk models in this article, the ranking of enterprises on the basis of risk exposure plays an important role.

One weakness of rankings is that they only take into account a portion of the information inherent in the magnitude of the predicted bankruptcy and default probabilities. With the SEBRA model, the bankruptcy probability is low for a very large portion of the enterprises.[5] The rankings of these enterprises can therefore easily become quite arbitrary since the bankruptcy probabilities for many enterprises are almost similar. Bankruptcy probabilities for the enterprises with the highest risk exposure normally vary widely, so the ranking of these enterprises should provide a useful picture of the difference in risk. The KMV model truncates the probabilities since default probabilities higher than 20 per cent are set to 20 per cent while all default probabilities lower than 0.02 per cent are set to 0.02 per cent. Thus, the predicted default probabilities are spread over the interval from 0.02 per cent to 20 per cent. In most cases, the difference between default probabilities of different enterprises is larger than the difference between bankruptcy probabilities.

In addition to market data, the KMV model uses a limited selection of accounting data. Whereas SEBRA bases its predictions on data from the company accounts, the KMV model uses data from the consolidated accounts. This difference between the two models is probably not so important in practice since the KMV model uses so few data from the accounts.

3. Underlying data

The SEBRA and KMV models' predictions at various times are used as the basis for the comparison of the two models. The accuracy of these predictions is measured against actual bankruptcies. The reason that bankruptcies are used as the only measure of comparison is that Norges Bank does not have information about defaults. Using bankruptcies as the measure of comparison in spite of the fact that the KMV model predicts default probabilities contributes to a bias in favour of the SEBRA model.

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[2] This default probability can be converted fairly easily to a period of more than one year.

[3] EBITDA = Earnings before interest, taxes, depreciation and amortisation.

[4] More precisely, the estimated bankruptcy probability after year t is the probability that the annual accounts for year t are the last ones that the enterprise will deliver and that the enterprise will file for bankruptcy within the next three years.

[5] For example, the bankruptcy probability for 86 per cent of the enterprises in the survey was 1 per cent or less after the 2001 financial year.

Table 1. Number of enterprises present in the databases of both the SEBRA and KMV models after different financial years, and the number of these enterprises that went bankrupt in subsequent years

Financial year	Number of enterprises		Number of bankrupt enterprises (KMV March in brackets if different)				
	SEBRA and KMV (September)	KMV (March)	1999	2000	2001	2002	2003
1998	3 414	3 399	3	12	18	37	30
1999	3 482	3 439	0	6	18	39	31
2000	3 502	3 055	0	0	8 (6)	44 (39)	32 (26)
2001	3 182	2 931	0	0	0	20 (16)	26 (24)

3.1 Basis of comparison

The comparison of the SEBRA and KMV models is based on Norwegian non-financial enterprises, excluding enterprises in the oil and gas industry, that are present in the databases for both the Moody's KMV Private Firm model and the SEBRA model. KMV's database is limited to enterprises with annual turnover of more than NOK 70 million. The KMV database contains monthly observations of expected default probabilities for a period of up to 5 years (60 months), whereas the SEBRA database contains annual accounts data and estimated bankruptcy probabilities for virtually all Norwegian limited companies since the 1988 financial year.

Predictions made by all three SEBRA versions are included in the comparison with the KMV model. While there is only one prediction (bankruptcy probability) per enterprise per financial year for each SEBRA version, the KMV model provides 12 predictions (default probabilities) per enterprise per year. Therefore, one must decide which KMV predictions to include in the comparison. Since the SEBRA predictions for most enterprises are not available until September, nine months after the end of the financial year, the KMV default predictions as per September have been selected for use in the comparison. At this time, the KMV model also includes accounting data for the last financial year.[6] In order to assess the KMV model's ability to extract information from market data, the KMV predictions as per March are also included in the comparison. KMV's September prediction (9 months after the end of the financial year) and March prediction (15 months after the end of the financial year) are based on the same accounting data, but the March prediction is based on newer market data.

The SEBRA and KMV models are compared on the basis of predictions made after the financial years 1998-2001 and actual bankruptcies in the three subsequent years.[7] For example, bankruptcies in the years 1999-2001 are used to assess the quality of the predictions made after the 1998 financial year. For each of the financial years in question, the combined database for the SEBRA and the KMV models include somewhat more than 3000 non-financial enterprises excluding enterpris-

es in the oil and gas industry (see Table 1). March predictions do not exist for all enterprises for which KMV had September predictions. The number of enterprises that have disappeared is highest following the 2000 financial year, i.e. from September 2001 to March 2002 (see Table 1). When calculating the key figures for KMV's March predictions, adjustments have been made for the effect of the enterprises that have disappeared from the database.

Table 1 also shows how many of the enterprises went bankrupt in subsequent years. Due to a cyclical downturn, the number of bankruptcies in 2002 and 2003 were considerably higher than in the previous years. The decline in the number of bankruptcies in 2002 from the row for the 2000 financial year to the row for the 2001 financial year means that many of the enterprises that went bankrupt in 2002 and were included in both databases in September 2001 had disappeared from one or both of the databases in the period to September 2002.

4. Comparison of the quality of the predictions

We base our comparison of the quality of the predictions on power curves and accuracy ratios. Power curves and accuracy ratios are frequently used when comparing the accuracy of credit risk models (see Sobehart, Keenan and Stein (2000) and Engelmann, Hayden and Tasche (2003)). These two methods are closely related and are based on ranking enterprises by risk exposure.

4.1 Power curves and accuracy ratio

A power curve is constructed as follows: Enterprises are ranked from the one with the highest risk exposure to the one with the lowest risk exposure based on the risk exposure measure being used. The power curve for the selection of bankruptcy candidates is obtained by presenting the share of accurately picked bankrupt enterprises as a function of the share of enterprises (in ranked order) (see Chart 1). For example, point A in the chart shows that 23 per cent of the enterprises that subsequently went bankrupt were among the 10 per cent of

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[6] Bureau Van Dijk provides accounts data to KMV. KMV states that these data are available in June of the year after the financial year.

[7] Only in the two subsequent years after the 2001 financial year.

Chart 1 Illustration of power curves and accuracy ratio
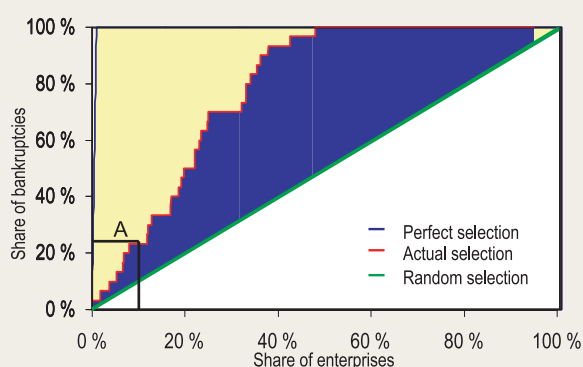
the enterprises with highest risk according to the model. The expected power curve for a random selection will be the 45 degree line, whereas the perfect selection is that all bankrupt enterprises were ranked ahead of all other enterprises. This means that if 1 per cent of the enterprises go bankrupt, the power curve for the perfect selection includes 100 per cent of the bankruptcies after having gone through the top 1 per cent of the ranking list of all enterprises.

$$\text{Accuracy ratio} = \frac{\begin{array}{l}\text{Area below the power curve} - \text{Area below the power curve}\\ \text{for the actual selection} \qquad \text{for the random selection}\end{array}}{\begin{array}{l}\text{Area below the power curve} - \text{Area below the power curve}\\ \text{for the perfect selection} \qquad \text{for the random selection}\end{array}}$$

The accuracy ratio is a quantitative measure of how accurate the model is at selecting bankruptcy candidates. The accuracy ratio is defined as:

By definition, a perfect selection has an accuracy ratio of 100 per cent, while a selection whose quality is in line with a random selection has an accuracy ratio of 0 per cent. Although this is not the case in Chart 1, the power curve for the actual selection may be entirely or partly below the power curve for the random selection. In the case where the accuracy ratio is negative, the accuracy of the prediction method is lower than what one would have expected with a random selection. One should expect that any method that is called a credit risk model is considerably better in its selection than a random selection.

4.2 Results

After each financial year, five predictions are made, three with different versions of SEBRA (SEBRA 01, SEBRA 03 and SEBRA Large) and two with KMV (September and March predictions). The accuracy ratios are calculated on the basis of the power curves after the different financial years (see Table 2).

The table shows that both credit risk models' predic-

Table 2. Accuracy ratios for the credit risk models after the different financial years

Financial-year	SEBRA 01	SEBRA 03	SEBRA large	KMV September	KMV March
1998	55.2 %	55.8 %	50.9 %	53.2 %	51.8 %
1999	57.2 %	58.5 %	55.2 %	50.2 %	49.4 %
2000	54.1 %	54.6 %	54.6 %	40.7 %	49.1 %
2001	74.7 %	75.3 %	78.3 %	40.9 %	46.2 %

tions are considerably better than a random selection. Since SEBRA Large was developed for large enterprises, one would expect that this model was more accurate than the other SEBRA versions for the enterprises in this comparison. Surprisingly, the quality of the SEBRA Large predictions is poorer than the quality of the other two SEBRA versions' predictions in both 1998 and 1999. The accuracy ratios for all SEBRA versions are particularly high after the 2001 financial year. This indicates that the key figures on which the SEBRA model's predictions are based are more informative when the economy is facing a cyclical downturn than at other times.

On the basis of the accuracy ratios, SEBRA 01's predictions are better than the September predictions from KMV every year. The difference is small in 1998, but in 2001 the difference is substantial. This is also reflected in the power curves from these two years (see Charts 2 and 3). When evaluating these results, one must bear in mind that the measure of comparison is bankruptcies, which is advantageous for the SEBRA model since the KMV model predicts defaults.

Due to more recent market information, and given the same accounting information, one would expect that KMV's March predictions are better than the September predictions. This is the case for the predictions after the 2000 and 2001 financial years, whereas the March predictions are actually somewhat worse than the September predictions after the 1998 and 1999 financial years.[8]

Chart 2 Power curves for the SEBRA and KMV predictions after the 1998 financial year based on bankruptcies in the period 1999–2001
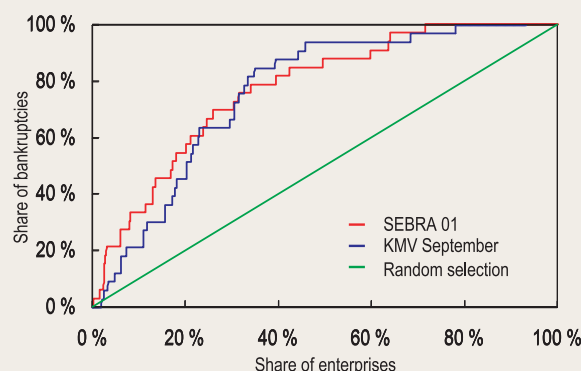
[8] Stock price movements are important for developments in expected default probabilities. In the periods October 1999 to March 2000 and October 2001 to March 2002, the stock market picked up markedly, while it declined in the period October 2000 to March 2001.

Chart 3 Power curves for the SEBRA and KMV predictions after the 2001 financial year based on bankruptcies in the period 2002–2003

Table 3. Share of enterprises classified as outliers

Financial year	South-east corner KMV: Low risk SEBRA: High risk	North-west corner KMV: High risk SEBRA: Low risk	Total
1998	2.5 %	2.3 %	4.8 %
1999	3.8 %	3.9 %	7.8 %
2000	3.8 %	4.6 %	8.4 %
2001	3.9 %	4.0 %	7.9 %

5. Industry differences between the models

Since the SEBRA and KMV accuracy ratios are different, it is of interest to study differences in the models' assessments of industry risk exposure. Industry differences between KMV's September predictions and the SEBRA 01 predictions are analysed below. We divide the enterprises into 18 industries. Retail trade, with roughly 39 per cent of the enterprises, and manufacturing, with approximately 26 per cent of the enterprises, are clearly the largest industries. Five of the industries each have less than 1 per cent of the enterprises. The analyses are limited to industries with a minimum number of selected enterprises over the period 1998-2001. Approximately 10 industries fill this requirement in each of the analyses below.

The analyses of industry differences are based on the same enterprise rankings that were used in the calculation of the power curves. The KMV and SEBRA rankings for each enterprise are juxtaposed as a value pair.

Chart 4 Ranking of all enterprises on the basis of risk exposure after the 2000 financial year. Delimitation of outliers

The value pairs for all enterprises are then set down as points in a two-dimensional diagram (see Chart 4). If the two models had been completely in agreement in their risk assessments, the value pairs would have formed a straight line from the southwest corner to the northeast corner, like the yellow line in the chart. The further the value pair is from the yellow line, the greater the divergence between the two model's assessments. The largest density of value pairs is in the southwest corner. This means that the two models more or less concur in their assessments of which enterprises represent the highest risk.

5.1 Analyses of enterprises for which the models disagree strongly

One way to utilise the rankings in Chart 4 is to study the enterprises that have been ranked very differently by the two models. These are the enterprises for which the absolute value of the difference between the SEBRA and KMV rankings is greater than a predefined limit. We choose to set this limit at the number that corresponds to 50 per cent of the total number of enterprises. Enterprises are considered to be outliers if the difference is higher than this limit. Disagreements between SEBRA and KMV may be manifested in two ways. KMV may consider an enterprise to be considerably more high-risk than SEBRA, or the opposite may be the case. These two cases are represented by observations in the northwest corner (above the red line) and the southeast corner (below the green line) respectively in Chart 4. The share of enterprises that are classified as outliers, given the chosen limit, is lowest in 1998 and relatively stable the other years (see Table 3). The share of outliers in the two corners is fairly similar.

What is most interesting about the outliers is to study whether there are any industry differences between the two corners. Therefore, we have calculated each industry's share of outliers in one corner in relation to the total number of outliers for the industry. In the southeast corner, the share of outliers from the hotel and restaurant industry, construction and tourism is very high (79 per cent or higher). This indicates that KMV regards enterprises in these industries to be less risky than SEBRA does. In the northwest corner, the share of outliers from the property management industry is very high (77 per cent). This indicates that SEBRA regards enterprises in

this industry to be less risky than KMV does. The comparison for property management enterprises is not very meaningful, however, since the number of such enterprises in the joint database is very limited.[9]

5.2 Analyses of the 10 per cent of enterprises classified as very high-risk

The analyses in this section are based on the two models' selections of the 10 per cent of enterprises with the highest risk. These enterprises are classified as very high-risk.[10] These selections consist of all value pairs that are located below the yellow line and/or to the left of the green line in Chart 5. Both models concur that the enterprises represented by value pairs that are both below the yellow line and to the left of the green line are very high-risk. Only one of the models regards the enterprises represented by value pairs that are either below the yellow line or to the left of the green line, but not both, as very high-risk. The first analysis compares the industry mix of the selected enterprises, while the second analysis evaluates the selection of high-risk enterprises against actual bankruptcies.

Agreement between the two models concerning the selection of very high-risk enterprises is strongest in the telecommunications industry, and weakest in the ship-building industry, shipping and commercial services. However, with the exception of commercial services, these industries have few enterprises represented in the study. For a period covering all years and all industries, the models agree in their classification of enterprises as very high-risk for approximately 48 per cent of the selected enterprises.[11] By comparison, with a completely random distribution of value pairs, one would expect to find only 1 per cent (10 per cent multiplied by 10 per cent) of the observations in this area.

As an extension of the analysis above, we have studied industry imbalances in the models' risk classifications. When only one of the two models has classified an enterprise as very high-risk, this is described as a "one-model selection". The two industries with the largest proportion of one-model selections are telecommunications, where KMV accounts for close to three-quarters

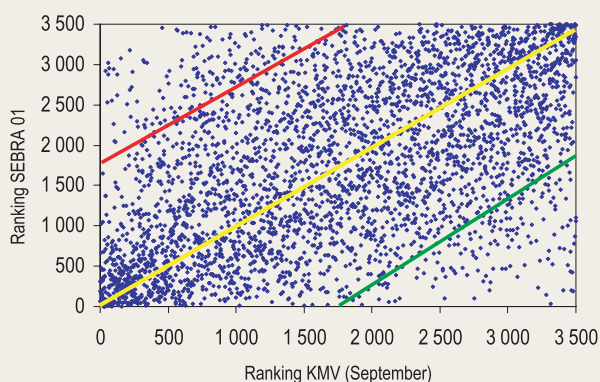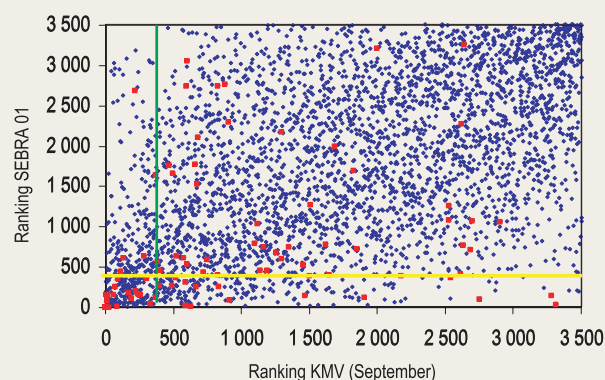**Chart 5** Ranking of all enterprises on the basis of risk exposure after the 2000 financial year. Delimitation of the 10 per cent of the enterprises classified as very high-risk. Actual bankrupt enterprises in the period 2001–2003 (red marks)

of the one-model selections, and the hotel and restaurant industry, where KMV accounts for less than one-third of the one-model selections. Not surprisingly, the industries with relatively few enterprises show the largest deviations from the average, with regard to both agreement and imbalances. Therefore, the results for these industries may be partly due to chance.

It is also interesting to study whether the selection of the 10 per cent of enterprises classified as very high-risk tallies with the enterprises that actually went bankrupt. Note that the share of bankrupt enterprises among the 10 per cent classified as very high-risk may be read directly from the power curves. Therefore, the analysis here focuses on evaluating how much the credit risk models missed the mark in their predictions. For this purpose, we still use Chart 5 which shows the rankings of the enterprises represented by value pairs, as well as which of these enterprises went bankrupt in the three subsequent years. The analysis focuses on those cases where either SEBRA or KMV classifies an enterprise as low risk, while the other model classifies the same enterprise as very high-risk and the enterprise goes bankrupt. This is unsatisfactory for the credit risk model that predicted that the credit risk associated with this enterprise was low. An enterprise's risk exposure is regarded as low if

Table 4. Bankrupt enterprises within selected risk categories after different financial years. Number and share of the total number of bankrupt enterprises

Financial year	Risk classification						Total	
	SEBRA: Very high risk KMV: Very high risk		SEBRA: Very high risk KMV: Low risk		SEBRA: Low risk KMV: Very high risk			
1998	5	15 %	0	0 %	0	0 %	33	100 %
1999	8	13 %	1	2 %	0	0 %	63	100 %
2000	14	17 %	4	5 %	1	1 %	84	100 %
2001	11	24 %	4	9 %	0	0 %	46	100 %

[9] KMV places most of the property management enterprises in a different database than the one used in the comparison.

[10] Other limits are of course possible. With the limit of 10 per cent, the enterprises that are selected may be characterised as "very high-risk".

[11] Calculated as: $\dfrac{\text{Number of enterprises classified by both models as very high risk}}{0.1 \times \text{Total number of enterprises}}$

the enterprise is among the 50 per cent of enterprises with the lowest risk. The analysis shows that KMV missed the mark far more often than SEBRA (see Table 4). A total of nine enterprises that KMV classified as low risk and SEBRA classified as very high-risk went bankrupt. The only case of bankruptcy among the enterprises that SEBRA classified as low risk and KMV classified as very high-risk occurred after the 2000 financial year (the enterprise is in the northwest corner of Chart 5).

Ideally, all bankrupt enterprises should have been classified by both SEBRA and KMV as very high-risk. Following the four financial years in question, between 13 and 24 per cent of the bankrupt enterprises are in this category.

The most obvious conclusion emerging from the analyses in this section is that SEBRA classifies enterprises in the hotel and restaurant industry as more high-risk than KMV does. Unlike SEBRA, KMV has not been specially developed for Norway. One possible explanation for the results for the hotel and restaurant industry may therefore be that they are due to special conditions regarding this industry in Norway.

6. Summary

The comparison of the SEBRA model and the KMV Private Firm model shows that both models are good at selecting bankruptcy candidates among large unlisted Norwegian limited companies. On the basis of accuracy ratios, the SEBRA model's predictions are somewhat better than the predictions of the KMV model. This means that the SEBRA model's use of a larger number of accounting variables more than compensates for the KMV model's advantage of using updated market information. A further development of the SEBRA model may be to include some market indicators. The industry comparisons show some differences in the two models' assessments. The most prominent difference is that the SEBRA model considers the hotel and restaurant industry to be considerably more high-risk than the KMV model does.

The fact that overall the accounting-based SEBRA model provides more accurate predictions than the KMV Private Firm model does not necessarily mean that accounting-based credit risk models are better than market-based credit risk models. The reason for the difference in the quality of predictions may be that attempts are made to use the market-based model in an area (unlisted enterprises) where this type of model has some drawbacks due to the lack of market prices. When evaluating the results of the comparison, it is also important to be aware that the comparison is based on a limited time period and that the event the models are measured against, namely bankruptcies, contribute to a bias in favour of the SEBRA model.

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Management of financial crises in cross-border banks

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Financial integration in Europe is increasing. The emergence of large, cross-border banks poses new challenges to the authorities. The management of financial crises in such banks will involve a number of authorities in many countries. Conflicts of interest between the authorities in different countries may hinder effective crisis solutions. Crisis management agreements between supervisory authorities and central banks aim to clarify the division of responsibilities and facilitate the exchange of relevant information. The Nordic central bank governors signed an agreement in 2003. This article provides an overview of developments and discusses the challenges facing the authorities.

1   Introduction

Banks are subject to specific supervision and regulation by the authorities because financial crises in the banking sector can have substantial repercussions on the real economy. Nonetheless, crises may occur. The responsibility for resolving a financial crisis in a bank lies primarily with the bank itself. Owners and management are responsible for ensuring that the bank does not end up in a critical financial situation and they also have the main responsibility for managing any crises that might arise. Experience of earlier banking crises shows, however, that the authorities must also have contingency arrangements in place for coping with crises.

The emergence of large, cross-border banks poses new challenges to the authorities. If a large cross-border bank should experience a serious financial crisis, central banks, supervisory authorities, deposit guarantee funds and political authorities in several countries will be involved. The current division of roles and responsibilities between the authorities has not, however, been adjusted to accommodate the extensive activity of cross-border banks in host countries, whether through a subsidiary or a branch.[2] Conflicts of interest may therefore arise between the authorities in different countries.

We begin this article by providing a short summary of developments in the banking sector in Europe. Section 3 focuses on the challenges facing the authorities with regard to managing financial crises in cross-border banks, including conflicts of interest. In Section 4, we discuss the work that has been done internationally to clarify the division of roles and responsibilities in relation to supervision and crisis management in cross-border banks. Finally, Section 5 describes some of the proposed solutions to the conflicts of interest that can arise in a crisis situation. A key question is the extent and content of the home country's responsibility for crisis management. For a cross-border bank organised in a branch structure, the responsibility lies with the relevant home country. For banks organised in a subsidiary structure, the formal responsibility lies with the host-country authorities. A number of factors suggest, however, that the responsibility for crisis management for banks in a subsidiary structure should also lie with the parent bank's home country authorities. Irrespective of the way responsibilities are assigned, the authorities should focus on avoiding crises, strengthening market discipline and ensuring that banks themselves take responsibility for resolving financial crises.

2.   Developments towards cross-border banks in Europe[3]

Legislation for financial markets and financial institutions in the EU has been designed to promote a common market. The introduction of a common currency has expanded the basis for a common financial market in Europe. Integration has progressed furthest in the foreign exchange, capital and money markets, cf. ECB (2004), and has been more modest in banking, particularly in the retail segment, see EU (2004). There has been considerable consolidation in the banking sector, primarily by establishing large, national entities.

There is, however, a growing trend towards cross-border banking groups in Europe. A number of studies have shown that there are substantial efficiency gains in connection with the establishment of foreign banks; see Clarke, Cull, Peria and Sánchez (2001). In the EU, there is strong political pressure to lay the basis for more cross-border enterprises in general, including the financial sector. New rules for establishing European Companies (Societas Europaea) will facilitate cross-border mergers and the cross-border relocation of company headquarters in the EEA area. Large, cross-border banks have already been established in the Nordic, Baltic and Benelux countries.

In the regulation of cross-border banks, it is important to distinguish between subsidiary banks and branches. This distinction has important consequences with regard

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[1] With thanks to Arild Lund and Charlotte Østergaard for their useful comments.

[2] Foreign banks can offer banking services to local customers either via a branch or subsidiary bank, or as cross-border services provided from abroad, for example via the Internet or via sales or representative offices. In this article, the term cross-border banks is used of banks that provide services to other countries via subsidiary banks or branches established in another country.

[3] Structural developments in the European banking sector are discussed in Øverli (2003) (Norwegian only).

Nordea

Nordea is a Nordic bank with a subsidiary structure founded on the four previously independent Nordic banks Merita Bank, Nordbanken, Unibank and Christiania Bank og Kreditkasse, from Finland, Sweden, Denmark and Norway, respectively. The banking group has market shares of between 10 and 40 per cent in the four countries. The bank currently operates as a group of legally independent subsidiaries, but with business segments and risk control managed across the legal structure and across country borders. Nordea plans to convert the current subsidiary banks into branches and to establish itself as a European Company. The merged bank will have its headquarters in Sweden.

Table 1. Traditional view of host-country responsibility for foreign-owned branches and subsidiary banks

Host-country authorities are responsible for:	Subsidiary banks	Branches
Solvency assessment (supervisory authorities)	x	
Liquidity support (central bank)	x	x
Capital support (political authorities/Ministry of Finance)	x	
Deposit guarantee (deposit guarantee fund)	x	(x)[1]

[1] In the EEA area, branches of credit institutions based in another EEA state are entitled to purchase additional cover in the host country's deposit guarantee fund if the host country's guarantee fund has better coverage than the home-country fund of which the branch is a member.

to the prevention and management of problems in cross-border banks. *Subsidiary* banks are separate, independent legal entities and are subject to supervision in the country where they operate – in the same way as other national banks. The parent bank is similarly subject to supervision in its home country, and the home country is also responsible for consolidated supervision of the group.[4] *Branches* are not independent legal entities. Branch and parent company are one and the same legal entity. The responsibility of host-country supervisory authorities for the supervision of foreign branches is therefore limited. The responsibility for resolving a financial crisis in the bank will lie with the authorities in the parent bank's home country.

Even though the regulatory framework for banks in the EU provides for cross-border establishment using branches, the subsidiary structure continues to dominate. Dermine (2003) gives a number of reasons for this:

- The parent bank limits its exposure to the subsidiary bank.
- The subsidiary bank maintains a local connection.
- The bank maintains its membership in the national deposit guarantee scheme.
- There may be tax reasons for maintaining a subsidiary bank structure.

At the same time, centralisation in these cross-border banks is increasing. Thus, although subsidiary banks are formally maintained as independent companies, management of these banks is often centralised across global business segments, with global risk management and control (see the Basel Committee (1999)).

3. Which authorities are responsible for cross-border banks?

The division of responsibilities between the authorities in different countries for subsidiary banks and branches of foreign banks has not really been adjusted to accommodate large cross-border banks.[5] Table 1 provides an overview of the "traditional" perception of the division of responsibilities between the relevant authorities for a cross-border bank.[6]

The traditional view is that the host-country authorities are responsible for subsidiary banks, while responsibility for branches is divided between host-country and home-country authorities. It has been pointed out, however, that it would be natural for the home country's authorities to take broader responsibility for a global group with subsidiary banks or branches in a number of countries, including responsibility for those areas traditionally regarded as the host country's responsibility. Specifically, it could be argued that extraordinary liquidity support for a wholly foreign-owned subsidiary bank or branch should not be the responsibility of the host country's central bank. On the other hand, the host country's central bank will be responsible for financial stability in that country and it will therefore clearly have a keen interest in the crisis management of a large cross-border bank, especially if the bank is systemically important.

At present, no authorities are required to take into account the effects on other countries of a crisis in a large cross-border bank. The host country does not control crisis management in branches of foreign banks, while the home country normally focuses on problems in the domestic market without taking into account the adverse effects in the host countries of a bankruptcy. However, if the bank is organised in a subsidiary structure, the host countries will be in control of crisis management in subsidiary banks in the host country and

[4] Home- country supervision is exercised by the authorities in the country where the bank has established its headquarters. Host- country supervision is exercised by the authorities in the country where the bank has established a branch. The latter term is often used to refer to host-country supervision of subsidiary banks. We will adhere to this convention in the following.

[5] See for example Lastra (2003) and Herring (2004).

[6] See Huizinga (2003) for a more detailed discussion. The table presents a simplified overview. In the EEA area, for example, the host country supervisory authorities currently have limited responsibility for liquidity supervision for foreign branches.

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Table 2. Home-countries' and host-countries' views on support in the event of a financial crisis in a cross-border bank

	Bank is large in host country	Bank is small in host country
Parent bank is large in home country	1: Both interested in support	2: Differing views on support
Parent bank is small in home country	3: Differing views on support	4: No support

might seek to isolate the subsidiary banks from the rest of the group, so-called "ring-fencing". This may hinder a joint solution that might have been better overall.

Table 2 presents a simple, schematic overview of home countries' and host countries' views on support in the event of a financial crisis in a cross-border bank – depending on the size of the bank.

If the bank in question is a large bank both in the home and host countries (1), the authorities in both countries will be interested in minimising the adverse affects of a crisis. This may make it easier to find a joint crisis management solution.[7] If on the other hand, the bank is small in the one country and large in the other (2 and 3), it may be more difficult to come to an agreement as to who should provide liquidity support or capital in a crisis. If the parent bank is very large relative to the home-country banking market and economy, the home-country authorities will be particularly interested in finding a coordinated solution – because they will not alone be able to raise the necessary funds to keep the bank in operation.

3.1 Subsidiary banks

As shown in Table 1, it is usually assumed that the host-country authorities have "home-country responsibility" for all banks established in the country, including subsidiary banks of foreign banks. A banking group with subsidiary banks in several countries therefore has to relate to many different authorities. This may result in overlapping areas of authority and give rise to potential conflict in a crisis management situation involving a cross-border bank. Crisis management in a bank with subsidiaries in other countries becomes even more complicated when these banks do not function as independent entities but operate under centralised management.

This can be resolved either by ensuring that subsidiary banks operate more independently, or by regarding and treating subsidiary banks more as branches, i.e. holding the parent bank responsible for a subsidiary bank's liquidity and solvency while giving the parent bank's home country authorities greater responsibility for supervision and crisis management.

In New Zealand, the authorities have instructed systemically important subsidiary banks to operate more independently, firming up on requirements that the board of directors of foreign-owned subsidiary banks must be independent and expecting the bank to have technical and administrative systems that can function independently of the parent bank's systems in the event of a problem in the parent bank, see Reserve Bank of New Zealand (2004a and 2004b). One of the considerations behind the new regulation was the importance of ensuring that large, systemically important banks have assets in the country that can be made available in the event of a financial crisis in the bank, and that a board of directors with whom the authorities can communicate directly is in place in New Zealand. Capital requirements for the subsidiary banks also ensure that buffer capital is available in the country. This structure will allow the bank to be closed and reopened quickly – if serious problems should arise – thereby reducing the risk of financial instability in the host country as a result of a financial crisis in a cross-border bank.

Alternatively, the authorities may accept the trend towards more global, centralised structures in cross-border banking groups, while at the same time requiring the parent bank to take more responsibility for its subsidiary banks (beyond the limited liability that the equity capital represents). In other words, the parent bank must be expected to provide some financial support to subsidiary banks. US banking regulations include a similar, basic principle (of financial strength) requiring holding companies that own banks to provide financial and administrative assistance to their subsidiary banks, see FDIC (1987) and Ashcraft (2004).

Because of the limitations on shareholders' liability, the legal basis for claiming support from a foreign parent bank over and above the capital the bank holds in the subsidiary bank may be weak.[8] Banking regulation has generally been focused on shielding banking companies in a financial group from this kind of claim from other companies in the group. However, if a banking group has been operating as though it were a branch structure, the court might instruct a parent bank to support its subsidiary bank.[9] The court's decision will, however, remain unknown until a major financial crisis occurs in such a cross-border banking group. Whether a clearer answer can be found without such a crisis is an open question.

The parent bank must be expected to have a vested interest in supporting its subsidiary banks if they encounter problems, whether or not it is under a legal obligation to do so. If the subsidiary does not receive support, the resulting loss of reputation will quickly reduce the group's borrowing capacity in international capital markets. In addition, the parent bank has often provided substantial loans to subsidiary banks far in excess of the subsidiary's equity capital. In practice, then, the parent bank will usually support its foreign subsidiary banks in a crisis.[10]

With increased parent bank responsibility, it will be

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[7] If the parent company was established with a branch in the host country, the responsibility for support will mainly lie with the home-country authorities. If the parent bank has been established with a subsidiary bank in the host country, however, it is less clear where the main responsibility for support lies. Thus, even in a situation where both countries are interested in resolving the crisis together, there is potential for conflict.

[8] For an interesting discussion of this issue, see Evans (2003), pp. 90-91.

[9] See Goldberg (2003) and Hübkes (2003, p. 31) for discussions of these issues.

[10] During the banking crisis in Argentina in 2000, however, the parent banks (Scotiabank and Credit Agricole) of some foreign-owned subsidiary banks did not intervene when the subsidiary banks went bankrupt.

natural for the authorities in the parent bank home country to assume greater responsibility for the banking group as a whole – including greater responsibility for the subsidiary banks. Strengthening home-country supervision in this way is included in the new Basel Capital Accord (Basel II). The supervisory authorities in the parent bank's home country will, for example, have a leading role in approving internal models for credit risk. The banking industry in Europe is in favour of an even stronger role for the home supervisor ("lead supervisor"), see European Financial Services Roundtable (2004).

The conversion of subsidiary banks that are not very independent into branches will result in closer alignment of the actual management structure with the bank's formal legal structure and also give a clearer lead role for the parent bank and the home-country authorities, both in general and in crisis situations. On the other hand, conversion to a branch structure will raise a number of new challenges for the host-country authorities, particularly if branches' activities in the host country are extensive.

3.2 Branches

One of the key issues is whether the home-country authorities, in a crisis situation, will take account of the effects of the crisis in other countries where the bank has branches.[11] The host-country authorities have generally little influence over crisis management in the bank and may therefore be interested in more influence and responsibility for crisis solutions affecting the branches, especially if the branch has extensive activities in the host country.[12]

In New Zealand, the authorities responded to the situation, instructing all systemically important branches in New Zealand with total assets in excess of NZD 10 billion to re-establish as subsidiaries (see the Reserve Bank of New Zealand (2004a)). A similar solution is not feasible in Europe, where the system is based on freedom of establishment and home-country supervision of banks. The question is then how to preserve financial stability in a branch structure, particularly when the branch is large in the host country.

Danmarks Nationalbank (2004) emphasises access to information about the banking group in order to alleviate the situation for the host-country authorities (p. 76):

"... it is crucial to the host countries that any formal framework for actual central-bank cooperation entails full and equal access to information on both the branch's and the bank's global financial position and risks. To this end, host-country and home-country

supervisory authorities have to engage in binding cooperation. The home country should not have an information advantage."

It is unlikely, however, that access to information will in itself remove the conflicts of interest that might exist between home-country and host-country authorities, cf. Table 2.

3.3 Deposit guarantee schemes

Ordinary deposits in banks are covered in most countries by bank deposit guarantee funds in the event the bank should encounter problems. In the EU, this is a home-country responsibility. If a large EU bank chooses to locate its head office in a small country, this responsibility may be a heavy burden for the home-country guarantee fund, and ultimately for the home-country's taxpayers if the state has to cover any guaranteed deposits that private deposit guarantee funds are not able to cover.[13]

Sweden's Deposit Guarantee Board (2003) has highlighted this problem and proposed *"that branch activity in other EEA Member States is guaranteed/protected by the host country guarantee system. The guarantee/protection should thereby continue to apply unchanged in each country, irrespective of the formation of a European Company."* The principle of home country responsibility, however, is an important element in EU regulation of banking activities. It is therefore not likely that the deposit guarantee responsibility will be transferred to host countries in the near future. Such a change would also imply that the relationship between supervision and guarantee fund responsibility would be broken, since the host country would not be responsible for supervision and monitoring of the bank.

If a subsidiary is converted into a branch, the current legislation requires that guarantee fund responsibility be transferred from the host country to the home country. This may have unintentional effects since the national guarantee funds have quite different structures. The EU Directive for deposit guarantee schemes is a minimum directive, and the guarantee schemes vary from country to country, both with regard to size and type of deposit covered. Deposits in Sweden have, for example, less cover than in the other Nordic countries.[14] A branch can, however, purchase supplementary cover ("topping-up") in the host country guarantee fund. Supplementary cover is, however, seldom used today.[15]

The conversion of a subsidiary bank into a branch may also have a negative competitive influence on local banks. The transfer of the new branch to the home-coun-

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[11] Freixas (2003) shows that there is no incentive for the home-country authority to contribute to an optimal crisis solution in situations where only host countries are affected

[12] See Mayes and Vesala (1998) for an early and very instructive discussion of these issues, particularly Chapter 6: Handling of banking problems and crisis management.

[13] Strictly speaking, guaranteed deposits should never be too large for the deposit guarantee scheme if members' premiums are set at the correct level (actuarially correct).

[14] The fund covers SEK 250 000 of sight deposits. The Deposit Guarantee Fund in Norway covers all deposits up to NOK 2 million.

[15] No branches have purchased supplementary cover in Norway. A draft regulation concerning membership in the Norwegian Bank Guarantee Fund for foreign branches in Norway was circulated for comment by the Ministry of Finance in July 2004.

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- The authorities should ensure that large financial institutions can quickly provide relevant and updated information about their financial position in a crisis.
- Large financial institutions should carry out regular crisis management exercises and stress testing to test relevant risk factors.
- Responsibility for coordination vis-à-vis large financial institutions should be clearly defined, particularly in crisis situations.
- Agreements on crisis management should be established between supervisory authorities, including procedures for exchanging relevant information.
- Similar agreements should also be established where necessary between central banks and supervisory authorities.
- Competition authorities should also be involved in the work on crisis management as they may have to consider the competitive implications of crisis management measures.

Crisis management agreements (Memoranda of Understanding)

Nordic agreement

In June 2003, the Nordic central bank governors signed an agreement on the management of financial crises in a Nordic bank with activities in two or more Nordic countries. The agreement contains procedures for the coordination of crisis management between the central banks. The agreement emphasises nonetheless that the main responsibility for managing a crisis lies with the relevant bank or group. Central elements in the agreement are:

- In a potential financial crisis the central banks establish a crisis group responsible for providing joint and rapid access to and management of information. The agreement specifies the information that must be obtained.
- The crisis group contacts relevant authorities in the different countries, including the relevant supervisory authorities. If a bank's solvency is in doubt, the countries' Ministries of Finance should be consulted.
- If an MoU is established for a specific bank, one of the central banks is given the responsibility of keeping an updated fact-book containing relevant public information about this bank.

Agreements within the EU

The agreement between the Nordic central banks is based on an MoU that has already been established within the EU, see ECB (2003). The EU agreement involves both central banks and supervisory authorities and contains principles for the identification of the authorities responsible for crisis management, the required flows of information between all the involved parties and the practical aspects of supplying information. The ECB's *MoU on payment systems* (2001) lays the basis for cooperation and information sharing in general. The purpose of the agreement is to limit the systemic risk associated with central payments systems by ensuring efficient cooperation between those overseeing the systems and those supervising the institutions participating in the payment systems.

try deposit guarantee fund will lead to a shortfall in the home-country fund, and other member banks will have to increase their payments for a period. In the host countries, however, the other banks will benefit if the converted bank is not permitted to withdraw payments already made to the fund.

4. International cooperation

The trend towards larger cross-border financial conglomerates has been extensively analysed and discussed in international bodies.[16] As early as in 1996, the Basel Committee established a separate committee - *Joint Forum on Financial Conglomerates* – to monitor developments.[17] In 1999, the Joint Forum published a report on the principles of supervision of financial conglomerates, see Basel Committee (1999). The G10 countries also established a working group to study the effects on monetary policy and financial stability of the ongoing consolidation in the financial sector. The group published an extensive report in 2001, see G10 (2001). In the EU, a group of experts has published two reports on crisis management (the Brouwer reports), see Economic and Financial Committee (2000 and 2001). These reports highlighted the need for clearer guidelines for crisis management in cross-border banks, and the importance of rapid and open communication between central banks and supervisory authorities when financial crises occur.

Several agreements (*Memoranda of Understanding*) have been drawn up between central banks and super-

visory authorities to improve cooperation between the relevant authorities (see box). The Nordic central bank governors signed such an agreement in 2003. The Nordic supervisory authorities have drawn up a similar cooperation agreement.

Such MoUs can clarify some important aspects, for example information management and communication in a crisis situation. They are not, however, legally binding and are often fairly general.

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[16] A financial conglomerate is a corporate group where at least one of the entities is an insurance company and at least one is a bank or securities firm.

[17] The Joint Forum was established in 1996 by the Basel Committee on Banking Supervision, the International Organisation of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS). The group comprises supervisory authorities from thirteen countries and an observer from the EU. The Basel Committee on Banking Supervision comprises participants from the largest industrialised countries (the Group of Ten).

In addition to the problems discussed in section 3, other factors may make it difficult to arrive at clearer guidelines and agreements for crisis management in cross-border banks:

- Financial crises differ.
- The authorities may pursue a policy of constructive ambiguity to avoid generating expectations of liquidity support.
- Different countries' authorities may also have different attitudes to the use of equity support for banks in crisis.
- Central banks also have varying views of which instruments are most appropriate in a crisis, for example general liquidity support to the market vs. liquidity support to (large) individual banks.
- Supervision of banks is exercised differently in different countries. There are different views on the scope and content of home country supervision.
- Rules for the winding-up of banks differ across different countries. Not all countries have separate rules for placing a bank under public administration.
- The flow of information between relevant authorities, particularly across borders, can sometimes be hindered by formal rules, weak cooperative relations or conflicts of interest.

Even though an MoU does not guarantee an unimpeded flow of information and effective crisis management, MoUs are nonetheless a considerable advance on improvising solutions in the midst of an ongoing crisis.

5. Further cooperation and proposals for solutions

The authorities in the Nordic countries are continuing to cooperate on supervision and crisis management in relation to cross-border banks. The Nordic central banks will work to expand their cooperation based on the signed MoU. In an international context, work in this field is continuing in various fora, including, for example, the ECB's *Task Force on Crisis Management*. Some proposed solutions are discussed in the following section.

5.1 National or supranational crisis resolution?

One possible way forward may be to transfer some of the responsibility for crisis resolution to supranational institutions. If so, these institutions must have access to relevant information so as to be able to assess the credit risk of a liquidity loan. So far, the idea of establishing a supranational European supervisory authority or giving the ECB supervisory responsibility has met with strong resistance. And if the crisis is widespread and capital injection is required, the political authorities must in any case be involved. In the EU, the political authorities can discuss a crisis within the relevant EU institutions, but any financial support must still be granted by the national authorities.

Without formal supranational solutions, it is all the more important to ensure good cooperation between the central banks and supervisory authorities involved. Within the EU, new supervisory committees have recently been established to promote closer cooperation within the EEA area.[18] In addition, the ECB is involved in the work to establish more effective crisis management procedures, for example within the BSC (Banking Supervision Committee of the ESCB).[19] According to Goodhart (2004), the ECB should in general *"…be encouraged … to adopt a role of arbiter on handling financial crises when these have inter-country European overlaps, in those cases of disagreement and deadlock between the national bodies"*. Schoenmaker (2003, p. 57) also points out that efficient decision-making mechanisms in acute crises have been used previously within the EU, for example during the secret negotiations (between central banks, Ministries of Finance and the European Commission) that resulted in new parities within the EMS (European Monetary System). This shows, according to Schoenmaker, that it should also be possible to find appropriate decision-making mechanisms for crisis resolution in the banking sector within the EU.

If a financial crisis in a bank can be resolved without the extensive use of public funds, the problem of distributing support for the bank among the various national authorities may to a large extent be avoided. In this connection, Mayes (2004) highlights the importance of effective rules for placing banks under public administration so that large banks can actually be closed without causing significant damage. International coordination of such rules is therefore also an important measure in the management of financial crises in large, cross-border banks, cf. the World Bank's work in *Global Forum on Insolvency*.[20]

5.2 Market discipline and private solutions

A natural way forward to minimise the use of public funds and the associated conflicts of interest between authorities dealing with a crisis is to strengthen market discipline and ensure that banks themselves take more responsibility for resolving financial crises in large

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[18] Under the Lamfalussy process, supervisory committees have been established for insurance, the securities market and banks; participants include representatives for central banks and supervisory authorities. Norges Bank, along with Kredittilsynet (Financial Supervisory Authority of Norway), is an observer in the CEBS (Committee of European Banking Supervisors), see http://www.c-ebs.org/.

[19] The BSC also includes participants from supervisory authorities and central banks. It was recently decided that the BSC and the CEBS would cooperate closely in their future work on crisis resolution within the EU/EEA.

[20] See also Report of the Contact group on the legal and institutional underpinnings of the international financial system, G10 (2002).

UK banks establish a crisis fund

The UK central bank, the Bank of England, has asked the 14 largest banks, including HBOS, Barclays, Royal Bank of Scotland, Lloyds TSB, HSBC and Abbey National to establish a joint fund of GBP 2bn (about NOK 25bn) that can act as a safety net in the event of serious problems in the payment system. Each bank will contribute from GBP forty to four hundred million. The central bank emphasises that even though the probability of a serious crisis is very small, this fund is being established to avoid a situation where the central bank has to provide support for a systemically important bank in a crisis. Such a crisis would be very serious for the payment system as a whole and might at worst bring all customer payments to a standstill, thereby threatening London's position as a centre of finance, cf. Bank of England (2003, pp. 98–99) for further discussion.

Table 3 Selected large European banks ranked by capital adequacy. Per cent

Deutsche Bank	13.9
UBS	13.3
Fortis	12.4
Credit Suisse	11.8
ING Bank	11.3
Banco Santander	10.6
DnB NOR	9.8
HVB	9.7
Nordea Bank	9.3

Source: Bankscope

banks. Gros (2003) remarks that the first step the authorities should discuss when a bank crisis arises is how to arrive at good private solutions.[21]

The authorities, for example, can create conditions and help to arrive at a solution whereby private participants purchase all or part of a crisis-hit bank. Or the authorities can instruct the banks themselves to establish their own crisis fund (see box). The guarantee fund in Norway, for example, can provide capital support to a crisis-stricken bank.

As part of the process to strengthen market discipline, it is important to eliminate the impression that some banks are so large and important that they will always receive support if they run into financial difficulties ("too big to fail"). Expectations of support may induce banks take undesirably large risks and creditors may not monitor their loans – i.e. moral hazard problems. Kane (2000) maintains that banks consolidate in order to become so large that they "have to" receive support if they run into a serious financial crisis. Refusing an application to establish a large bank is not an option in the EEA area as this would conflict with the EU principles on the right of establishment. Expectations of automatic support may, however, be reduced if the authorities can send credible signals that a financial crisis in a large cross-border bank will be resolved without recourse to public funds. Particular emphasis should therefore be placed on formulating rules and frameworks that provide for effective crisis management without contributions from the public sector.

In Switzerland, efforts have been made to reduce the risk of having to use public funds in a crisis resolution by changing the regulatory framework so that it is not as easy for the state to provide support to companies in

financial difficulties. In addition, Swiss supervisory authorities require the large international banks in the country to hold capital far in excess of the minimum capital requirements laid down in the Basel rules (see Table 3). According to the Swiss authorities, banks in Switzerland are not over-capitalised, even with a capital adequacy that is 20-50% above the Basel requirements (see Zuberbühler (2004)).

6. Summary

The establishment of Nordea has highlighted issues related to financial crisis management in cross-border banks for the Nordic authorities, in particular for banks with large, systemically important subsidiaries or branches in the host countries.

The responsibility for resolving a financial crisis in a bank lies of course primarily with the owners and management of the bank itself. Experience of earlier banking crises shows, however, that the authorities must also have contingency arrangements in place for coping with crises. To ensure effective crisis management, it is important that roles and responsibilities have been clearly defined in advance.

In a financial crisis in a cross-border bank established with a branch structure, the main responsibility for resolving the crisis lies with the authorities in the parent bank's home country. There are arguments to suggest that home-country authorities should also have the primary responsibility for banks in a subsidiary bank structure. This would reduce the number of authorities that banks have to relate to, and is in line with developments in banking where an increasing number of cross-border banks are organised in subsidiary structures under central management.

At the same time, it is important to take host countries' legitimate interests into account. This requires close cooperation between the authorities, for example through agreements (MoUs). However, these agreements cannot be expected to resolve the fundamental conflicts of interest that may arise in a crisis, and the issue of distributing liquidity or solvency support must therefore be resolved in some other way.

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[21] Under the Lamfalussy process, supervisory committees have been established for insurance, the securities market and banks; participants include representatives for central banks and supervisory authorities. Norges Bank, along with Kredittilsynet (Financial Supervisory Authority of Norway), is an observer in the CEBS (Committee of European Banking Supervisors), see http://www.c-ebs.org/.

First and foremost, efforts should be made to avoid crises by establishing good early warning systems and appropriate regulatory frameworks for financial institutions. One relevant measure might be to set the required level of capital adequacy for large cross-border banks well above the minimum requirement.

Within the EU/EEA area, the consultation process can be strengthened within existing bodies, particularly in the new supervisory structure for the banking sector, where participants also include the central banks. The ECB will in any case have an active role in the event of a crisis in a large cross-border bank. More centralised structures for banking supervision and crisis resolution may emerge within the EU in the longer term.

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Statistical annex

Norges Bank publishes more detailed statistics on its website, www.norges-bank.no. The Bank's statistics calendar, which shows future publication dates, is only published on this website.

Financial institution balance sheets

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

	31.12.2003	31.07.2004	31.08.2004	30.09.2004	31.10.2004
FINANCIAL ASSETS					
Foreign assets	**250 975**	**292 177**	**275 567**	**262 432**	**252 022**
International reserves	250 941	291 893	275 528	262 394	251 919
Other assets	33	283	39	38	103
Government Petroleum Fund investments	**844 587**	**953 981**	**971 708**	**987 451**	**984 356**
Domestic claims and other assets	**39 195**	**39 754**	**33 928**	**30 116**	**53 288**
Securities	23 281	22 626	22 822	22 839	22 953
Loans	12 552	14 488	8 497	492	27 490
Other claims	1 901	1 209	1 202	5 385	1 454
Fixed assets	1 461	1 432	1 407	1 399	1 391
Costs	**174 151**	**61 446**	**64 479**	**62 123**	**39 547**
TOTAL ASSETS	**1 308 907**	**1 347 358**	**1 345 682**	**1 342 122**	**1 329 213**
LIABILITIES AND CAPITAL					
Foreign liabilities	**51 963**	**74 022**	**58 183**	**63 887**	**57 758**
Deposits	256	1 019	1 055	1 101	1 014
Borrowing	49 776	70 925	55 125	60 656	54 607
Other liabilities	267	369	304	473	529
Counterpart of Spesial Drawing Rights allocation in IMF	1 664	1 710	1 700	1 657	1 608
Government Petroleum Fund deposits	**844 587**	**953 981**	**971 708**	**987 451**	**984 356**
Domestic liabilities	**191 993**	**204 078**	**197 347**	**176 532**	**201 647**
Notes and coins in circulation	46 249	43 735	43 191	43 103	43 232
Treasury	108 586	124 776	116 108	99 686	135 531
Other deposits	28 343	16 324	18 434	29 573	18 076
Borrowing	8 229	4 217	4 661	3 772	4 234
Other debt	586	15 026	14953	398	575
Equity	**46 213**	**46 213**	**43 483**	**43 483**	**43 483**
Valuation adjustments	**123 469**	**27 025**	**27 544**	**17 758**	**-15 926**
Income	**50 682**	**42 038**	**47 416**	**53 011**	**57 896**
TOTAL LIABILITIES AND CAPITAL	**1 308 907**	**1 347 358**	**1 345 682**	**1 342 122**	**1 329 213**
Commitments					
Allotted, unpaid shares in the BIS	275	275	275	275	275
International reserves					
Derivatives and forward exchange contracts sold	53 004	114 276	96 400	84 079	100 082
Derivatives and forward exchange contracts purchased	55 485	114 659	100 589	97 500	104 436
Government Petroleum Fund					
Derivatives and forward exchange contracts sold	236 920	504 782	483 176	486 045	438 583
Derivatives and forward exchange contracts purchased	248 582	503 429	495 561	514 635	445 943
Rights [1]					
International reserves:					
Options sold	646	3 400	2 744	2 391	2 327
Options purchased	647	4 151	3 801	2 391	2 484
Government Petroleum Fund:					
Options sold	4 324	22 755	18 362	16 003	15 579
Options purchased	4 331	31 896	29 545	20 088	16 616

[1] Options presented in terms of market value of underlying instruments as from December 2003.

Table 2. Norges Bank. Specification of international reserves. In millions of NOK

	31.12.2003	31.07.2004	31.08.2004	30.09.2004	31.10.2004
Gold	3 142	287	0	0	0
Special drawing rights in the IMF	2 237	2 041	2 054	2 002	1 929
Reserve position in the IMF	6 641	6 089	6 166	5 678	5 513
Loans to the IMF	703	629	619	596	566
Bank deposits abroad	92 681	133 472	105 894	83 750	73 818
Foreign Treasury bills	744	158	221	102	129
Foreign Treasury notes	107	0	0	0	0
Foreign certificates	1 315	813	813	826	755
Foreign bearer bonds [1]	109 063	99 517	114 441	120 999	121 515
Foreign shares	33 566	50 987	51 901	52 065	52 217
Accrued interest	742	-2 099	-6 581	-3 623	-4 523
Total	250 941	291 894	275 528	262 395	251 919

[1] Includes bonds subject to repurchase agreements

Source: Norges Bank

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

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Cash holdings and bank deposits	2 131	2 542	2 252	2 396	2 497
Total loans	191 526	191 220	189 541	189 393	189 623
Of which:					
To the general public [1]	189 323	188 541	186 850	186 607	186 585
Claims on the central government and					
social security administration	-	-	-	-	-
Other assets	6 698	4 844	5 883	4 700	5 557
Total assets	200 355	198 606	197 676	196 489	197 677
Bearer bond issues	29	25	24	20	20
Of which:					
In Norwegian kroner	29	25	24	20	20
In foreign currency	-	-	-	-	-
Other loans	191 539	189 764	188 204	188 341	188 139
Of which:					
From the central government and					
social security administration	191 539	189 764	188 204	188 341	188 139
Other liabilities, etc.	5 844	5 455	6 081	5 064	5 736
Share capital, reserves	2 943	3 362	3 367	3 064	3 782
Total liabilities and capital	200 355	198 606	197 676	196 489	197 677

[1] Includes local government administration, non-financial enterprises and households

Sources: Statistics Norway and Norges Bank

Table 4. Banks.[1] Balance sheet. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Cash	4 112	4 980	4 157	4 633	4 390
Deposits with Norges Bank	34 092	26 784	27 772	18 046	29 768
Deposits with Norwegian banks	25 354	19 982	23 586	32 390	21 230
Deposits with foreign banks	32 315	56 636	43 252	54 376	25 867
Treasury bills	10 469	7 288	7 170	7 280	5 074
Other short-term paper	7 977	7 394	4 695	13 626	11 759
Government bonds etc. [2]	4 561	5 529	7 070	7 300	7 862
Other bearer bonds	98 869	105 734	108 253	117 961	118 235
Loans to foreign countries	46 814	51 186	52 883	61 235	52 597
Loans to the general public	1 163 475	1 186 014	1 212 904	1 245 327	1 277 267
Of which:					
In foreign currency	88 806	85 731	88 128	85 142	82 131
Loans to mortgage and finance companies, insurance etc. [3]	107 895	108 890	120 103	125 617	92 022
Loans to central government and social security admin.	286	139	546	706	713
Other assets [4]	162 731	143 072	162 244	145 231	149 879
Total assets	1 698 950	1 723 628	1 774 635	1 833 728	1 796 663
Deposits from the general public	773 152	786 055	798 519	834 449	814 465
Of which:					
In foreign currency	23 892	24 001	27 405	29 771	29 769
Deposits from Norwegian banks	29 953	21 756	27 284	32 924	21 254
Deposits from mortg. and fin. companies, and insurance etc. [3]	44 247	47 767	50 318	51 384	53 165
Deposits from central government, social security admin. and state lending institutions	7 770	10 090	8 423	8 305	8 008
Funds from CDs	66 759	70 673	71 972	73 819	77 116
Loans and deposits from Norges Bank	7 224	19 995	6 816	18 745	4 460
Loans and deposits from abroad	199 767	220 247	235 694	246 385	226 177
Other liabilities	459 640	435 033	463 035	450 928	470 685
Share capital/primary capital	28 667	28 530	31 276	29 316	29 322
Allocations, reserves etc.	75 351	76 999	77 682	80 252	80 517
Net income	6 420	6 483	3 616	7 221	11 494
Total liabilities and capital	1 698 950	1 723 628	1 774 635	1 833 728	1 796 663
Specifications:					
Foreign assets	154 257	193 506	186 196	206 172	175 553
Foreign debt	434 835	467 134	501 660	504 876	492 533

[1] Includes commercial and savings banks

[2] Includes government bonds and bonds issued by lending institutions.

[3] Includes mortgage companies, finance companies, life and non-life insurance companies and other financial institutions.

[4] Includes unspecified loss provisions (negative figures) and loans and other claims not specified above.

Sources: Statistics Norway and Norges Bank

Table 5. Banks.[1] Loans and deposits by sector[2]. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Loans to:					
Local government (incl. municipal enterprises)	7 965	8 095	9 304	9 234	8 913
Non-financial enterprises[3]	364 038	356 382	358 150	360 523	363 014
Households[4]	791 472	821 537	845 450	875 570	905 340
Total loans to the general public	1 163 475	1 186 014	1 212 904	1 245 327	1 277 267
Deposits from:					
Local government (incl.municipal enterprises)	39 051	38 484	41 849	43 031	37 093
Non-financial enterprises[3]	220 971	234 285	233 651	235 336	236 327
Households[4]	513 129	513 286	523 019	556 083	541 045
Total deposits from the general public	773 152	786 055	798 519	834 449	814 465

[1] Includes commercial and savings banks

[2] Includes local government administration, non-financial enterprises and households.

[3] Includes private enterprises with limited liability etc., and state enterprises.

[4] Includes sole proprietorships, unincorporated enterprises and wage earners, etc.

Sources: Statistics Norway and Norges Bank

Table 6. Mortgage companies. Balance sheet. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Cash and bank deposits	3 613	2 926	3 519	3 084	4 699
Notes and certificates	2 626	970	852	2 166	3 366
Government bonds[1]	665	1 296	680	1 122	1 606
Other bearer bonds	56 802	53 979	58 051	60 538	59 585
Loans to:					
Financial enterprises	33 764	36 617	41 048	41 311	43 542
The general public[2]	198 596	210 435	216 425	222 139	225 171
Other sectors	9 760	9 195	9 224	9 443	9 115
Others assets[3]	4 833	6 180	9 462	7 623	5 090
Total assets	310 659	321 598	339 261	347 426	352 174
Notes and certificates	28 173	32 440	32 757	26 303	26 755
Bearer bonds issues in NOK[4]	58 227	57 544	56 761	53 665	53 468
Bearer bond issues in foreign currency[4]	110 587	110 490	122 970	135 009	136 285
Other funding	96 326	103 000	108 981	115 930	117 646
Equity capital	13 002	12 273	12 571	12 889	13 141
Other liabilities	4 344	5 851	5 221	3 630	4 879
Total liabilities and capital	310 659	321 598	339 261	347 426	352 174

[1] Includes government bonds and bonds issued by state lending institutions.

[2] Includes local government administration, non-financial enterprises and households.

[3] Foreign exchange differences in connection with swaps are entered net in this item. This may result in negative figures for some periods.

[4] Purchase of own bearer bonds deducted.

Sources: Statistics Norway and Norges Bank

Table 7. Finance companies. Balance sheet. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Cash and bank deposits	2 471	1 951	2 380	2 365	2 166
Notes and certificates	99	103	141	129	134
Bearer bonds	0	0	0	0	0
Loans[1] (gross) to:	91 840	92 956	98 070	102 425	99 527
The general public[2] (net)	88 363	89 039	93 313	96 524	94 880
Other sectors (net)	3 311	3 700	4 540	5 671	4 396
Other assets[3]	2 210	2 599	2 679	3 022	2 272
Total assets	96 620	97 609	103 270	107 941	104 099
Notes and certificates	0	0	0	0	0
Bearer bonds	533	533	533	533	657
Loans from non-banks	11 628	11 826	12 461	12 706	12 472
Loans from banks	70 372	70 994	74 688	78 033	75 015
Other liabilities	5 619	6 030	6 722	7 183	6 478
Capital, reserves	8 468	8 226	8 866	9 486	9 477
Total liabilities and capital	96 620	97 609	103 270	107 941	104 099

[1] Includes subordinated loan capital and leasing finance.

[2] Includes local government administration, non-financial enterprises and households.

[3] Includes specified and unspecified loan loss provisions (negative figures)

Source: Norges Bank

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

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Cash and bank deposits	13 998	21 557	21 252	20 000	23 191
Norwegian notes and certificates	32 025	29 484	16 743	22 731	20 078
Foreign Treasury bills and notes	5 071	7 473	5 872	2 555	2 761
Norwegian bearer bonds	144 077	140 295	146 591	147 247	146 334
Foreign bearer bonds	104 633	108 540	123 189	130 335	130 826
Norwegian shares, units, primary capital certificates and interests	39 559	47 853	55 122	50 139	61 116
Foreign shares, units, primary capital certificates and interests	41 861	50 052	54 704	61 237	60 724
Loans to the general public [1]	23 599	20 628	20 263	19 737	18 379
Loans to other sectors	692	676	711	685	651
Other specified assets	55 798	53 731	54 719	52 958	59 749
Total assets	461 313	480 289	499 166	507 624	523 809

[1] Includes local government administration, non-financial enterprises and households

Source: Statistics Norway

Table 9. Non-life insurance companies. Main assets. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Cash and bank deposits	6 722	7 583	7 095	8 179	5 854
Norwegian notes and certificates	13 681	12 465	11 423	12 539	13 144
Foreign notes and certificates	1 193	1 072	654	1 260	2 097
Norwegian bearer bonds	14 862	16 764	19 776	18 730	20 320
Foreign bearer bonds	12 475	11 403	12 179	12 750	12 425
Norwegian shares, units, primary capital certificates, interests	7 301	7 863	8 653	8 734	9 182
Foreign shares, units, primary capital certificates, interests	6 139	6 471	7 104	7 757	8 063
Loans to the general public [1]	1 173	1 285	1 308	1 287	1 338
Loans to other sectors	264	206	203	207	201
Other specified assets	44 944	41 615	47 425	43 495	40 167
Total assets	108 754	106 727	115 820	114 938	112 791

[1] Includes local government administration, non-financial enterprises and households.

Source: Statistics Norway

Table 10a. Securities funds' assets. Market value. In millions of NOK

	30.06.2003	30.09.2003	31.12.2003	31.03.2004	30.06.2004
Bank deposits	5 737	4 602	5 992	6 312	7 132
Treasury bills, etc. [1]	5 292	5 855	4 158	4 772	4 131
Other Norwegian short-term paper	21 373	22 491	25 185	21 817	21 218
Foreign short-term paper	388	469	614	232	236
Government bonds, etc. [2]	4 121	4 080	4 469	4 974	5 435
Other Norwegian bonds	26 972	25 806	26 715	28 824	30 379
Foreign bonds	4 313	5 180	6 752	6 859	6 950
Norwegian equities	20 731	23 326	28 871	32 242	32 627
Foreign equities	32 583	36 195	43 581	51 975	53 674
Other assets	3 082	3 394	3 718	4 038	4 157
Total assets	124 593	131 399	150 056	162 044	165 937

[1] Comprises Treasury bills and other certificates issued by state lending institutions.

[2] Comprises government bonds and bonds issued by state lending institutions.

Sources: Norges Bank and Norwegian Central Securities Depository

Table 10b. Securities funds' assets under management by holding sector. Market value.
In millions of NOK

	30.06.2003	30.09.2003	31.12.2003	31.03.2004	30.06.2004
Central government and social security administration	691	704	726	982	1 169
Banks	2 209	1 645	1 844	684	676
Other financial enterprises	14 658	16 204	25 921	26 364	27 048
Local government admin. and municipal enterprises	10 497	10 775	12 944	11 998	12 413
Other enterprises	22 903	23 607	27 869	27 436	28 161
Households	66 344	70 372	72 793	83 969	85 247
Rest of the world	4 642	5 094	4 605	7 266	7 880
Total assets under management	121 943	128 402	146 702	158 699	162 593

Sources: Norges Bank and the Norwegian Central Securities Depository

Securities statistics

Table 11. Shareholdings registered with the Norwegian Central Securities Depository (VPS),
by holding sector. Estimated market value. In millions of NOK

Holding sector	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Central government and social security administration	228 580	279 981	312 837	313 479	330 408
Norges Bank	2	3	3	3	3
State lending institutions	18	20	21	20	21
Banks		12 980	24 336	24 831	15 806
Savings banks	3 350				
Commercial banks	10 731				
Insurance companies	23 254	27 214	29 197	29 701	32 226
Mortgage companies	30	7	7	7	7
Finance companies	2	2	3	2	3
Mutual funds	26 280	31 769	34 870	35 122	36 659
Other financial enterprises	48 764	49 070	37 883	35 501	36 293
Local government administration and municipal enterprises	3 890	4 765	4 977	4 726	4 996
State enterprises	6 677	6 755	8 282	8 731	7 188
Other private enterprises	143 478	145 887	156 172	162 929	168 838
Wage-earning households	47 553	47 000	52 080	50 028	54 423
Other households	1 981	2 234	2 445	2 365	2 632
Rest of the world	209 647	228 064	250 851	271 278	316 727
Unspecified sector	720	543	526	502	496
Total	754 955	836 296	914 490	939 225	1 006 726

Sources: Norwegian Central Securities Depository and Norges Bank

Table 12. Share capital and primary capital certificates registered with the Norwegian
Central Securities Depository, by issuing sector. Nominal value. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Banks		27 512	29 983	30 146	30 140
Savings banks	11 511				
Commercial banks	15 845				
Insurance companies	2 528	2 530	2 700	1 584	1 584
Mortgage companies	2 194	2 194	2 194	2 244	2 244
Finance companies	5	5	5	5	5
Other financial enterprises	20 092	16 861	17 120	17 069	16 995
Local government administration and municipal enterprises	2	2	197	197	197
State enterprises	18 268	18 273	18 277	18 277	17 945
Other private enterprises	45 814	45 220	45 511	45 588	47 199
Rest of the world	5 422	5 224	6 296	7 206	7 250
Unspecified sector	4	0	0	0	0
Total	121 684	117 821	122 284	122 317	123 560

Sources: Norwegian Central Securities Depository and Norges Bank

Table 13. Net purchases and net sales (-) in the primary and secondary markets of shares registered with the Norwegian Central Securities Depository, by purchasing, selling and issuing sector[1]. Estimated market value. In millions of NOK

2004 Q3	Purchasing/ selling sector																
Issuing sector	Cent.gov't and social security	Norges Bank	State lending inst.	Banks	Insur. com-panies	Mort. com-panies	Fin. com-panies	Secur. funds	Other financ. enterpr.	Local gov't & munic. enterpr.	State enterpr.	Other private enterpr.	Wage-earning house-holds	Other house-holds	Rest of the world	Unsp. sector	Total [2]
Banks	2	0	0	147	-40	0	0	-141	74	-21	-1	-78	1	3	74	0	18
Insurance companies	0	0	0	0	-3	0	0	4	0	-11	0	5	4	0	1	0	0
Mortgage companies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finance companies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other financial enterpr.	1 355	0	0	-971	-179	0	0	-1 134	556	-60	-1	-568	-760	-38	2 229	-6	422
Local gov't. admin. and municipal enterprises	0	0	0	1	5	0	0	13	0	-15	-1	-2	5	0	-8	1	0
State enterprises	-18 190	0	0	1 467	176	0	0	66	-309	-61	552	-339	-425	-58	16 958	-2	-164
Other private enterprises	5 394	0	-4	3 995	514	0	0	458	-1 779	-76	-181	-3 927	1 547	51	11 802	41	17 835
Rest of the world	-710	0	0	8 942	-788	0	0	-1 244	-937	-30	0	-385	-540	44	-1 952	-6	2 393
Unspecified sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	-12 149	0	-4	13 581	-315	0	0	-1 977	-2 397	-274	368	-5 294	-167	1	29 103	27	20 504

[1] Issues at issue price + purchases at market value – sales at market value – redemptions at redemption value.

[2] 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 14. Bondholdings in NOK registered with the Norwegian Central Securities Depository, by holding sector. Market value. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Central government and social security administration	27 183	28 630	28 173	28 049	27 256
Norges Bank	8 275	6 549	8 884	7 571	7 963
State lending institutions	141	126	122	105	101
Banks		83 504	82 415	90 254	92 251
Savings banks	34 638				
Commercial banks	45 872				
Insurance companies	208 000	213 906	224 418	221 806	230 185
Mortgage companies	16 348	16 912	16 983	16 630	17 785
Finance companies	63	61	127	110	135
Mutual funds	30 387	30 897	34 734	37 329	41 894
Other financial enterprises	8 245	5 231	5 877	8 042	9 119
Local government administration and municipal enterprises	22 801	23 283	22 187	22 943	23 979
State enterprises	2 813	6 087	2 585	2 756	2 857
Other private enterprises	23 075	24 451	24 968	25 201	25 821
Wage-earning households	18 125	20 134	21 269	22 390	22 481
Other households	6 436	6 933	6 990	7 448	7 804
Rest of the world	74 887	78 992	78 628	77 176	72 241
Unspecified sector	270	216	213	228	216
Total	527 559	545 910	558 573	568 038	582 091

Sources: Norwegian Central Securities Depository and Norges Bank

Table 15. Bondholdings in NOK registered with the Norwegian Central Securities Depository, by issuing sector. Nominal value. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Central government and social security administration	149 395	152 392	157 946	157 012	159 945
State lending institutions	169	148	144	123	119
Banks		159 244	163 638	174 496	180 675
Savings banks	88 407				
Commercial banks	70 132				
Insurance companies	317	317	252	252	252
Mortgage companies	62 856	62 854	62 996	58 968	60 651
Finance companies	500	500	500	500	625
Other financial enterprises	2 617	2 619	2 619	2 699	2 699
Local government administration and municipal enterprises	48 661	51 652	57 326	58 505	59 047
State enterprises	32 415	32 721	29 215	33 107	33 404
Other private enterprises	38 999	40 220	34 085	36 035	34 898
Households	196	213	213	213	99
Rest of the world	16 397	17 792	19 156	21 096	21 657
Unspecified sector	0	0	0	0	0
Total	511 059	520 673	528 090	543 006	554 072

Sources: Norwegian Central Securities Depository and Norges Bank

Table 16. Net purchases and net sales (-) in the primary and secondary markets for NOK-denominated bonds registered with the Norwegian Central Securities Depository, by purchasing, selling and issuing sector.[1] Market value. In millions of NOK

2004 Q3	Purchasing/ selling sector																
Issuing sector	Cent.gov't and social security	Norges Bank	State lending inst.	Banks	Insur. com-panies	Mort. com-panies	Fin. com-panies	Secur. funds	Other financ. enterpr.	Local gov't & munic. enterpr.	State enterpr.	Other private enterpr.	Wage-earning house-holds	Other house-holds	Rest of the world	Unsp. sector	Total[2]
Central government and social security admin.	-2 021	1 351	0	3 491	6 527	302	-3	2 113	-83	-157	10	183	14	472	-4 586	2	7 614
State lending inst.	0	0	-25	-4	-1	0	0	0	0	0	0	0	0	0	0	0	-29
Banks	-285	0	0	2 849	8 971	1 085	41	5 975	1 622	578	86	198	1 505	394	-912	12	22 120
Insurance companies	0	0	0	-12	10	0	0	20	-25	0	0	12	0	0	-5	0	0
Mortgage companies	-121	0	0	1 023	-1 612	-493	1	13	-7	-200	-1	-356	-50	-20	233	-1	-1 593
Finance companies	0	0	0	80	-44	0	0	21	0	-12	0	0	10	0	69	0	125
Other financial enterprises	0	0	0	-203	-405	0	0	-34	1 057	-68	0	-1	5	-56	-26	0	269
Local gov't. admin. and municipal enterprises	356	0	0	743	-1 441	17	-6	553	576	508	8	-234	-13	-24	-27	1	1 017
State enterprises	460	0	0	1 856	1 667	51	0	254	203	-307	-3 194	35	17	101	-463	1	681
Other private enterprises	-311	0	0	-1 199	1 239	0	5	1 124	370	84	-52	1 322	64	-15	-543	-1	2 086
Households	0	0	0	0	-20	0	0	0	-26	0	0	-34	-6	-2	0	0	-88
Rest of the world	3	0	0	454	1 884	0	39	1 037	161	125	1	302	583	32	-761	5	3 866
Unspecified sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	-1 920	1 351	-25	9 077	16 776	963	76	11 075	3 848	552	-3 143	1 427	2 128	883	-7 020	20	36 068

[1] Issues at issue price + purchases at market value – sales at market value – redemptions at redemption value.

[2] 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 17. NOK-denominated short-term paper registered with the Norwegian Central Securities Depository by holding sector. Market value. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Central government and social security administration	9 257	1 443	1 744	1 379	1 812
Norges Bank	10 288	7 471	6 689	10 232	10 117
State lending institutions	0	0	0	0	0
Banks		16 439	13 355	19 510	17 117
Savings banks	3 924				
Commercial banks	12 333				
Insurance companies	58 291	53 719	44 357	46 338	43 489
Mortgage companies	3 247	1 778	2 139	2 710	3 145
Finance companies	36	41	17	17	3
Mutual funds	28 802	29 881	26 993	25 364	23 781
Other financial enterprises	3 695	3 286	4 264	5 411	4 158
Local government administration and municipal enterprises	2 296	2 031	2 146	1 826	2 022
State enterprises	4 293	6 473	5 284	2 563	4 348
Other private enterprises	3 676	3 761	5 049	2 064	2 276
Wage-earning households	237	160	41	37	17
Other households	1 152	1 293	889	852	880
Rest of the world	9 249	10 423	10 058	9 192	6 533
Unspecified sector	0	0	0	0	0
Total	150 775	138 200	123 024	127 495	119 698

Sources: Norwegian Central Securities Depository and Norges Bank

Table 18. Outstanding short-term paper, by issuing sector.[1] Nominal value. In millions of NOK

Issuing sector	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Central government and social security administration	79 784	68 013	62 332	66 426	61 051
Counties	334	404	574	694	694
Municipalities	4 913	5 468	5 531	5 251	5 257
State lending institutions	0	0	0	0	0
Banks	38 832	42 602	38 203	44 213	41 713
Commercial banks	6 010	7 713	.	.	.
Savings banks	32 822	34 889	.	.	.
Mortgage companies	3 568	5 843	3 260	1 317	997
Finance companies	0	0	0	0	0
Other financial enterprises	0	19	19	19	19
State enterprises	3 280	2 860	2 510	2 310	2 225
Municipal enterprises	6 621	6 276	6 326	5 681	6 066
Private enterprises	8 065	6 674	6 299	8 062	6 966
Rest of the world	4 090	3 493	3 723	2 000	2 600
Total	149 487	141 652	128 777	135 973	127 588

[1] Comprises short-term paper issued in Norway in NOK by domestic sectors and foreigners and paper in foreign currency issued by domestic sectors.

Source: Norges Bank

Credit and liquidity trends

Table 19. Credit indicator and money supply

| | Volume figures at end of period NOKbn | | | Percentage growth | | | | |
| | | | | Over past 12 months | | | Over past 3 months, annualised rate[4] | |
	C2[1]	C3[2]	M2[3]	C2[1]	C3[2]	M2[3]	C2	M2
December 1995	936.0	1 081.5	530.3	4.9	4.9	6.0	5.4	1.3
December 1996	992.5	1 166.0	564.4	6.0	5.7	6.4	7.8	4.6
December 1997	1 099.1	1 309.6	578.5	10.2	10.4	1.8	10.1	3.0
December 1998	1 192.8	1 461.4	605.3	8.3	12.6	4.4	6.4	5.4
December 1999	1 295.0	1 620.9	670.1	8.4	8.6	10.5	9.9	8.4
December 2000	1 460.9	1 842.4	731.8	12.3	11.2	8.8	12.0	7.3
December 2001	1 608.2	2 010.3	795.4	9.7	7.8	9.3	9.0	10.5
December 2002	1 724.9	2 098.7	855.3	8.9	7.8	8.3	9.8	9.0
July 2003	1 797.5	2 202.7	870.9	7.5	6.4	3.9	6.7	3.0
August 2003	1 811.2	2 226.2	867.2	7.5	6.5	4.6	6.6	2.6
September 2003	1 817.4	2 211.9	855.3	7.6	6.3	4.1	6.8	2.5
October 2003	1 829.2	2 236.9	868.9	7.6	6.5	2.8	7.5	1.8
November 2003	1 842.0	2 235.3	856.9	7.0	5.8	3.3	7.3	2.9
December 2003	1 847.2	2 230.7	873.1	6.9	5.5	1.9	7.0	1.8
January 2004	1 864.0	2 260.0	880.3	6.9	5.4	1.3	6.6	0.8
February 2004	1 874.8	2 274.5	877.2	7.1	5.5	2.0	7.0	1.2
March 2004	1 883.1	2 274.3	886.7	7.1	5.6	3.7	7.2	6.6
April 2004	1 895.0	2 296.3	883.8	7.2	5.6	4.6	7.7	12.1
May 2004	1 909.7	2 304.9	889.6	7.1	5.6	4.6	8.2	13.3
June 2004	1 930.9	2 333.1	919.3	7.6	5.8	5.6	9.0	9.0
July 2004	1 938.3	2 348.5	912.4	7.8	6.3	4.8	9.1	4.1
August 2004	1 948.6	2 342.0	898.7	7.8	5.8	3.9	8.9	
September 2004	1 961.7		903.4	8.0		5.7	9.1	
October 2004	1 977.4		906.3	8.4		4.6		

[1] C2 = Credit indicator. Credit from domestic sources; actual figures.

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

[3] M2 = Money supply (see note to Table 21).

[4] Seasonally adjusted figures

Source: Norges Bank

Table 20. Domestic credit supply to the general public[1], by source. In millions of NOK. 12-month growth as a percentage

| | 31.12.2001 | | 31.12.2002 | | 31.12.2003 | | 31.10.2004 | |
	Amount	%	Amount	%	Amount	%	Amount	%
Private banks	1 030 694	9.6	1 097 144	8.2	1 185 722	7.8	1 289 167	10.0
State lending institutions	176 494	5.1	185 932	5.3	188 593	1.4	186 559	-1.4
Mortgage companies	167 698	15.6	182 006	10.9	210 326	15.3	226 618	13.3
Finance companies	79 474	14.6	83 234	9.9	89 257	7.0	94 705	12.3
Life insurance companies	24 482	0.2	23 124	-5.5	20 628	-10.8	18 379	-21.7
Pension funds	3 742	7.1	3 936	5.2	3 936	0.0	3 936	0.0
Non-life insurance companies	934	-43.4	919	-1.6	1 285	39.8	1 338	10.6
Bond debt[2]	89 671	8.2	107 399	19.8	114 147	6.3	123 661	8.0
Notes and short-term paper	23 752	-2.1	26 145	10.1	19 614	-25.0	20 642	-4.4
Other sources	11 227	69.8	15 036	33.1	13 646	-9.2	12 391	-13.1
Total domestic credit (C2)[3]	1 608 168	9.7	1 724 875	8.9	1 847 154	6.9	1 977 396	8.4

[1] Comprises local government administration, non-financial enterprises and households

[2] Adjusted for non-residents' holdings of Norwegian private and municipal bonds in Norway.

[3] Corresponds to Norges Bank's credit indicator (C2).

Source: Norges Bank

Table 21. Composition of money supply. In millions of NOK

Actual figures at end of period	Notes and coins	Transaction account deposits	M1[1]	Other deposits[2]	CDs	M2[3]	Change in M2 last 12 months, total
December 1995	42 069	178 653	217 727	296 799	15 731	530 257	28 952
December 1996	43 324	208 073	247 938	294 741	21 686	564 365	34 108
December 1997	46 014	227 382	269 597	278 741	30 200	578 538	14 173
December 1998	46 070	237 047	279 189	292 820	33 322	605 331	26 793
December 1999	48 020	300 128	343 494	295 820	30 802	670 116	64 785
December 2000	46 952	328 816	371 339	326 350	34 152	731 841	61 725
December 2001	46 633	344 110	386 148	370 171	39 048	795 367	63 526
December 2002	44 955	360 341	400 623	409 704	45 001	855 328	59 961
July 2003	41 101	380 559	417 465	421 656	31 773	870 894	33 809
August 2003	40 724	374 424	411 388	425 179	30 603	867 170	40 809
September 2003	40 262	375 762	412 349	411 515	31 433	855 297	34 594
October 2003	40 816	384 107	421 197	416 966	30 757	868 920	24 249
November 2003	41 806	379 363	417 288	407 412	32 234	856 934	27 769
December 2003	46 249	387 309	428 996	407 337	36 806	873 139	17 811
January 2004	42 801	388 505	427 385	419 593	33 284	880 262	13 670
February 2004	42 224	393 706	432 244	415 276	29 726	877 246	18 479
March 2004	41 872	398 672	436 799	416 023	33 895	886 717	32 407
April 2004	42 057	391 151	429 453	428 562	25 775	883 790	39 269
May 2004	43 162	393 995	432 802	425 358	31 404	889 564	38 834
June 2004	43 704	428 193	467 793	419 011	32 459	919 263	48 235
July 2004	43 735	422 117	461 620	419 108	31 643	912 371	41 477
August 2004	43 191	406 141	445 281	422 594	30 792	898 667	31 497
September 2004	43 103	409 565	448 700	423 216	31 435	903 351	48 054
October 2004	43 232	414 667	453 881	419 012	33 377	906 270	37 350

[1] Narrow money, M1, comprises the money-holding sector's stock of Norwegian notes and coins plus the sector's transaction account deposits in Norges Bank, commercial banks and savings banks (in NOK and foreign currency).

[2] Excluding restricted bank deposits (BSU, IPA, withholding tax accounts, etc).

[3] Broad money, M2, comprises the sum of M1 and the money-holding sector's other bank deposits and CDs (in NOK and foreign currency) excluding restricted bank deposits (BSU, IPA, withholding tax accounts, etc).

Source: Norges Bank

Table 22. Household financial balance. Financial investments and holdings, by financial instrument. In billions of NOK

	Financial investments					Holdings				
	Year			Q2		Year			At 30 June	
	2001	2002	2003	2003	2004	2001	2002	2003	2003	2004
Currency and deposits	34.5	48.3	25.2	29.4	34.0	481.4	529.9	556.5	565.2	597.0
Securities other than shares	6.7	1.9	2.8	0.2	1.5	21.6	23.0	27.9	25.1	29.6
Shares and other equity	3.9	20.3	40.5	8.4	7.4	152.4	162.9	211.1	186.3	231.5
Mutual funds shares	2.0	-2.1	4.1	0.2	-1.1	76.9	59.8	78.3	70.8	91.8
Insurance technical reserves	40.1	32.0	42.6	6.7	6.5	490.0	506.3	558.8	529.0	583.7
Loans and other assets[1]	6.4	19.3	18.5	-2.6	-5.9	148.2	168.1	186.6	176.4	186.3
Total assets	93.6	119.6	133.8	42.2	42.4	1 370.4	1 450.0	1 619.2	1 552.9	1 720.0
Loans from banks (incl. Norges Bank)	67.3	71.7	92.2	21.9	29.8	660.4	727.8	822.1	764.6	876.0
Loans from state lending institutions	7.7	7.5	2.5	-0.3	0.0	148.5	156.0	158.5	158.8	158.4
Loans from private mortgage and finance companies	14.1	13.5	15.7	3.7	4.9	67.7	80.5	96.2	88.3	104.6
Loans from insurance companies	-0.6	0.4	-1.7	-0.1	0.3	16.1	16.5	14.7	16.9	15.1
Other liabilities[2]	7.2	5.7	-0.5	10.7	11.3	118.7	123.2	122.8	129.5	128.1
Total liabilities	95.7	98.7	108.2	35.8	46.2	1 011.4	1 104.0	1 214.2	1 158.0	1 282.2
Net financial investments / assets	-2.1	20.9	25.6	6.4	-3.8	358.9	346.0	405.0	394.9	437.8

[1] Loans, accrued interest, holiday pay claims and tax claims.

[2] Other loans, securities other than shares, tax liabilities and accrued interest.

Source: Norges Bank

Table 23. Money market liquidity. Liquidity effect from 1 January to end period. In millions of NOK

Supply+/withdrawal–	1.1 - 31.12		1.1 - 30.11	
	2002	2003	2003	2004
Central government and other public accounts				
(excl. paper issued by state lending institutions and government)	5 950	-13 408	-37 479	-70 082
Paper issued by state lending institutions and government	-13 598	-41 322	-48 889	17 203
Purchase of foreign exchange for Government Petroleum Fund	56 545	14 620	14 620	45 590
Other foreign exchange transactions	421	0	0	75
Holdings of banknotes and coins [1] (estimate)	1 741	-1 337	3 153	2 183
Overnight loans	0	0	0	0
Fixed-rate loans	-15 140	12 000	24 000	-12 000
Other central bank financing	-18 700	18 716	18 680	180
Total reserves	17 219	-10 731	-25 915	-16 851
Of which:				
Sight deposits with Norges Bank	17 219	-10 731	-25 915	-16 851
Treasury bills	0	0	0	0
Other reserves (estimate)	0	0	0	0

[1] The figures are mainly based 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 24. Nominal interest rates for NOK. Averages. Per cent per annum

	1-month		3-month		12-month		Interest rate on banks' overnight loans in Norges Bank	Interest rate on banks' sight deposits with Norges Bank
	NIDR	NIBOR	NIDR	NIBOR	NIDR	NIBOR		
July 2003	4.1	4.0	3.6	3.5	3.4	3.2	6.0	4.0
August 2003	3.5	3.3	3.3	3.1	3.4	3.2	5.4	3.4
September 2003	3.0	2.9	3.0	2.8	3.2	3.0	4.8	2.8
October 2003	2.9	2.8	3.0	2.9	3.2	3.1	4.5	2.5
November 2003	2.9	2.8	3.1	2.9	3.2	3.1	4.5	2.5
December 2003	2.9	2.8	2.8	2.6	2.9	2.8	4.4	2.4
January 2004	2.5	2.3	2.4	2.3	2.5	2.3	4.2	2.2
February 2004	2.3	2.1	2.1	2.0	2.2	2.1	4.0	2.0
March 2004	2.1	1.9	2.0	1.8	2.1	1.9	3.8	1.8
April 2004	2.1	2.0	2.1	2.0	2.3	2.2	3.8	1.8
May 2004	2.1	2.0	2.1	2.0	2.4	2.3	3.8	1.8
June 2004	2.2	2.0	2.2	2.0	2.5	2.4	3.8	1.8
July 2004	2.1	2.0	2.1	2.0	2.3	2.2	3.8	1.8
August 2004	2.1	2.0	2.2	2.0	2.4	2.2	3.8	1.8
September 2004	2.1	2.0	2.1	2.0	2.2	2.1	3.8	1.8
October 2004	2.1	2.0	2.1	2.0	2.3	2.1	3.8	1.8
November 2004	2.1	2.0	2.1	2.0	2.3	2.1	3.8	1.8

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 25. Short-term interest rates[1] for selected currencies in the Euro-market.
Per cent per annum

	DKK	GBP	JPY	SEK	USD	EUR	Interest rate differential NOK/EUR
July 2003	2.1	3.4	0.0	2.8	1.1	2.1	1.2
August 2003	2.1	3.5	-0.1	2.8	1.1	2.1	0.9
September 2003	2.1	3.6	0.0	2.8	1.1	2.1	0.6
October 2003	2.1	3.8	0.0	2.8	1.1	2.1	0.6
November 2003	2.2	3.9	-0.1	2.8	1.1	2.1	0.6
December 2003	2.2	4.0	0.0	2.8	1.1	2.1	0.4
January 2004	2.1	4.0	0.0	2.7	1.1	2.1	0.1
February 2004	2.1	4.1	0.0	2.5	1.1	2.1	-0.2
March 2004	2.1	4.3	0.0	2.3	1.1	2.0	-0.3
April 2004	2.1	4.3	0.0	2.1	1.1	2.0	-0.2
May 2004	2.2	4.5	0.0	2.1	1.2	2.1	-0.2
June 2004	2.2	4.7	0.0	2.1	1.5	2.1	-0.2
July 2004	2.2	4.8	0.0	2.1	1.6	2.1	-0.2
August 2004	2.1	4.9	0.0	2.1	1.7	2.1	-0.2
September 2004	2.1	4.9	0.0	2.1	1.9	2.1	-0.3
October 2004	2.1	4.8	0.0	2.1	2.1	2.1	-0.2
November 2004	2.1	4.8	0.0	2.1	2.3	2.2	-0.3

[1] Three-month rates, monthly average of daily quotations.

Sources: OECD and Norges Bank

Table 26. Yields on government bonds[1]. Per cent per annum

	3-year	5-year	10-year
July 2003	3.8	4.3	4.9
August 2003	3.9	4.4	5.0
September 2003	3.7	4.3	4.9
October 2003	3.9	4.4	4.9
November 2003	3.9	4.4	5.0
December 2003	3.5	4.1	4.8
January 2004	3.2	3.7	4.5
February 2004	2.8	3.4	4.3
March 2004	2.7	3.3	4.1
April 2004	3.1	3.9	4.7
May 2004	3.3	4.1	4.9
June 2004	3.3	4.1	4.7
July 2004	3.1	3.8	4.5
August 2004	3.0	3.6	4.3
September 2004	2.8	3.5	4.2
October 2004	2.8	3.5	4.2
November 2004	2.7	3.3	4.0

[1] 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 27. Yields on government bonds[1] in selected countries. Per cent per annum

	Germany	Sweden	France	UK	Japan	US	Interest rate differential NOK/DEM[2]
July 2003	4.1	4.4	4.0	4.3	1.0	4.0	0.8
August 2003	4.2	4.7	4.2	4.5	1.1	4.4	0.8
September 2003	4.3	4.8	4.2	4.6	1.4	4.3	0.7
October 2003	4.3	4.9	4.3	4.9	1.4	4.2	0.6
November 2003	4.5	5.0	4.4	5.0	1.3	4.3	0.5
December 2003	4.4	4.9	4.3	4.9	1.4	4.3	0.4
January 2004	4.3	4.7	4.2	4.8	1.3	4.1	0.3
February 2004	4.2	4.6	4.1	4.8	1.2	4.1	0.1
March 2004	4.0	4.4	4.0	4.7	1.4	3.8	0.1
April 2004	4.2	4.6	4.2	4.9	1.5	4.3	0.5
May 2004	4.3	4.7	4.3	5.1	1.5	4.7	0.6
June 2004	4.4	4.8	4.4	5.2	1.8	4.8	0.3
July 2004	4.3	4.6	4.3	5.1	1.8	4.5	0.2
August 2004	4.2	4.5	4.1	5.0	1.6	4.3	0.1
September 2004	4.1	4.4	4.1	4.9	1.5	4.2	0.1
October 2004	4.0	4.3	4.0	4.8	1.5	4.1	0.2
November 2004	3.9	4.2	3.9	4.7	1.5	4.2	0.2

[1] Government bonds with 10 years to maturity. Monthly average of daily quotations.

[2] Differential between yields on Norwegian and German government bonds with 10 years to maturity.

Sources: OECD and Norges Bank

Table 28. Banks. Average interest rates and commissions on utilised NOK loans to the general public at end of quarter. Per cent per annum

	Loans, excl. non-accrual loans							
			Non-financial public enter-prises	Non-financial private enter-prises		Credit lines	Repayment loans	
	Total loans	Local govern-ment			House-holds	Overdrafts and building loans	Housing loans	Other loans
2003 Q3								
Commercial banks	5.00	4.29	4.09	5.19	4.92	6.84	4.70	5.04
Savings banks	5.44	4.02	4.24	6.14	5.27	8.11	4.96	6.06
All banks	5.23	4.16	4.14	5.57	5.12	7.42	4.85	5.48
2003 Q4								
Commercial banks	4.48	4.41	3.50	4.59	4.44	6.51	4.20	4.51
Savings banks	4.96	3.35	3.85	5.61	4.81	7.59	4.51	5.56
All banks	4.73	3.89	3.64	4.99	4.65	7.03	4.37	4.96
2004 Q1								
All banks	4.34	2.98	3.14	4.58	4.28	6.76	4.01	4.51
2004 Q2								
All banks	4.13	2.84	2.88	4.34	4.08	6.62	3.82	4.27
2004 Q3								
All banks	4.12	2.88	2.83	4.27	4.09	7.01	3.77	4.21

Source: Norges Bank

**Table 29. Banks. Average interest rates on deposits in NOK from the
general public at end of quarter. Per cent per annum**

	Total deposits	Local govern- ment	Non- financial public enterprises	Non-financial private enterprises	House- holds	Deposits on transaction accounts	Other deposits
2003 Q3							
Commercial banks	2.26	2.82	2.55	2.12	2.29	1.88	2.69
Savings banks	2.27	2.97	2.76	2.36	2.19	1.58	2.66
All banks	2.27	2.91	2.60	2.21	2.23	1.76	2.67
2003 Q4							
Commercial banks	1.81	2.48	2.16	1.81	1.77	1.63	2.03
Savings banks	1.87	2.53	2.37	1.91	1.80	1.32	2.17
All banks	1.84	2.51	2.25	1.84	1.79	1.50	2.12
2004 Q1							
All banks	1.42	1.92	1.66	1.37	1.40	1.13	1.67
2004 Q2							
All banks	1.25	1.81	1.73	1.25	1.20	1.00	1.49
2004 Q3							
All banks	1.28	1.82	1.70	1.28	1.24	1.02	1.52

Source: Norges Bank

**Table 30. Life insurance companies. Average interest rates by type of loan at end of quarter.
Per cent per annum**

	Housing loans	Other loans	Total loans
30.09.2003	4.3	5.5	4.9
31.12.2003	4.1	5.3	4.7
31.03.2004	3.7	5.2	4.5
30.06.2004	3.6	5.1	4.4
30.09.2004	3.6	5.1	4.4

Source: Norges Bank

**Table 31. 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
30.09.2003	6.0	6.1	5.6
31.12.2003	5.5	5.7	5.2
31.03.2004	5.1	5.4	4.5
30.06.2004	4.8	4.9	4.1
30.09.2004	4.8	4.8	4.0

Source: Norges Bank

Profit/loss and capital adequacy data

Table 32. Profit/loss and capital adequacy: banks[1].
Percentage of average total assets

	2002	2003	Q3 2003	Q3 2004
Interest income	7.5	5.8	6.2	4.2
Interest expenses	5.4	3.9	4.2	2.4
Net interest income	2.1	1.9	2.0	1.8
Total other operating income	0.7	0.9	0.8	0.8
Other operating expenses	1.8	1.6	1.6	1.5
Operating profit before losses	1.0	1.2	1.1	1.1
Recorded losses on loans and guarantees	0.5	0.4	0.5	0.1
Ordinary operating profit (before taxes)	0.6	0.7	0.7	1.1
Capital adequacy ratio [2]	12.2	12.4	12.0	11.8
Of which:				
Core capital	9.6	9.7	9.4	9.3

[1] Parent banks (excl. foreign branches) and foreign-owned branches / subsidiary banks.

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

Source: Norges Bank

Table 33. Profit/loss and capital adequacy: finance companies[1].
Percentage of average total assets

	2002	2003	Q3 2003	Q3 2004
Interest income	9.7	8.5	8.7	6.3
Interest expenses	5.6	3.8	4.1	2.1
Net interest income	4.1	4.7	4.6	4.3
Total other operating income	2.5	2.3	2.3	1.4
Other operating expenses	4.1	4.0	4.0	3.0
Operating profit before losses	2.5	3.0	2.9	2.7
Recorded losses on loans and guarantees	0.6	1.0	1.0	0.6
Ordinary operating profit (before taxes)	1.9	2.0	1.9	2.1
Capital adequacy ratio [2]	10.9	10.9	9.8	10.9
Of which:				
Core capital	9.3	9.4	8.3	9.1

[1] All Norwegian parent companies (excl. OBOS) and foreign-owned branches.

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

Source: Norges Bank

Table 34. Profit/loss and capital adequacy: mortgage companies[1].
Percentage of average total assets

	2002	2003	Q3 2003	Q3 2004
Interest income	5.3	4.4	4.6	3.3
Interest expenses	4.7	3.8	3.9	2.8
Net interest income	0.7	0.7	0.7	0.5
Total other operating income	-0,0	0.0	0.0	0.0
Other operating expenses	0.2	0.1	0.1	0.1
Operating profit before losses	0.5	0.5	0.6	0.4
Recorded losses on loans and guarantes	0.0	0.0	0.0	0.0
Ordinary operating profit (before taxes)	0.5	0.5	0.5	0.4
Capital adequacy [2]	12.7	12.2	12.5	12.3
Of which:				
Core capital	10.4	9.6	10.0	9.4

[1] All Norwegian parent companies.

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

Source: Norges Bank

Exchange rates

Table 35. The international value of the krone and exchange rates against selected currencies. Monthly average of representative market rates

	Trade-weighted krone exchange rate [1]	1 EUR	100 DKK	1 GBP	100 JPY	100 SEK	1 USD
July 2003	102.57	8.2893	111.52	11.84	6.14	90.24	7.29
August 2003	102.40	8.2558	111.08	11.81	6.24	89.37	7.41
September 2003	102.15	8.1952	110.34	11.76	6.36	90.37	7.31
October 2003	102.26	8.2278	110.74	11.80	6.42	91.32	7.04
November 2003	101.95	8.1969	110.22	11.83	6.41	91.14	7.01
December 2003	101.55	8.2414	110.74	11.74	6.22	91.34	6.71
January 2004	105.45	8.5925	115.36	12.42	6.41	94.04	6.81
February 2004	107.82	8.7752	117.77	12.96	6.51	95.63	6.94
March 2004	105.34	8.5407	114.65	12.72	6.42	92.49	6.97
April 2004	103.00	8.2938	111.42	12.46	6.43	90.47	6.92
May 2004	101.55	8.2006	110.21	12.21	6.10	89.83	6.83
June 2004	102.74	8.2856	111.45	12.47	6.24	90.62	6.83
July 2004	104.82	8.4751	113.98	12.73	6.32	92.16	6.91
August 2004	103.06	8.3315	112.04	12.45	6.19	90.70	6.84
September 2004	103.42	8.3604	112.40	12.27	6.22	91.96	6.84
October 2004	101.52	8.2349	110.71	11.91	6.06	90.87	6.60
November 2004	100.18	8.1412	109.55	11.65	5.98	90.48	6.27

[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).

Source: Norges Bank

Table 36. Exchange cross rates. Monthly average of representative exchange rates

	GBP/USD	EUR/GBP	USD/EUR	EUR/JPY	JPY/USD
July 2003	1.6235	0.7004	1.137	134.9582	118.69
August 2003	1.5926	0.6991	1.113	132.2774	118.80
September 2003	1.6093	0.6969	1.122	128.9269	114.95
October 2003	1.6760	0.6976	1.169	128.1083	109.57
November 2003	1.6888	0.6927	1.170	127.8064	109.25
December 2003	1.7496	0.7022	1.228	132.4419	107.81
January 2004	1.8223	0.6921	1.261	134.1105	106.34
February 2004	1.8683	0.6768	1.265	134.7664	106.57
March 2004	1.8268	0.6712	1.226	133.0724	108.53
April 2004	1.7999	0.6655	1.198	129.0620	107.75
May 2004	1.7872	0.6714	1.200	134.3959	112.00
June 2004	1.8272	0.6642	1.214	132.8262	109.44
July 2004	1.8422	0.6657	1.226	134.0781	109.32
August 2004	1.8188	0.6693	1.217	134.5203	110.50
September 2004	1.7932	0.6813	1.222	134.4870	110.08
October 2004	1.8059	0.6914	1.249	135.9705	108.89
November 2004	1.8593	0.6986	1.299	136.0822	104.77

Source: Norges Bank

Balance of payments

Table 37. Balance of payments. In millions of NOK

	2002	2003	January-September 2003	January-September 2004
Goods balance	186 875	191 102	138 428	159 484
Service balance	22 836	21 835	13 315	13 890
Net interest and transfers	-13 632	-11 729	-6 214	-8 891
Current account balance	196 079	201 208	145 529	164 483
Distributed among:				
Petroleum activities	256 128	277 318	200 937	230 959
Shipping	19 298	18 780	13 279	16 744
Other	-79 347	-94 890	-68 687	-83 220
Net capital transfers	-431	4 724	-173	-658
Net investment in financial assets	195 648	205 932	145 356	163 825
Capital account \ Net capital outflow	195 648	205 932	145 356	163 825
Distributed among:				
Norwegian foreign investment	376 845	314 167	223 547	365 367
Foreign investment in Norway	263 819	170 757	122 536	230 399
Unallocated (incl. errors and omissions)	82 622	62 522	44 345	28 857
Distributed by purpose:				
Direct investment	27 341	2 525	762	11 562
Portfolio investment	184 122	45 507	58 985	135 502
Other investment in financial assets	-144 209	93 394	38 278	-51 506
International reserves	45 772	1 984	2 986	39 410
Unallocated (incl. errors and omissions)	82 622	62 522	44 345	28 857
Distributed by sector:				
Government administration[1]	143 422	138 747	121 135	120 740
Norges Bank	30 460	13 289	6 107	21 893
Banks	-73 450	-26 863	-27 321	-39 735
Insurance	56 238	28 122	16 520	46 055
Other financial enterprises	-28 605	-27 673	-23 227	-54 827
Non-financial enterprises etc.	-15 039	17 789	7 796	40 855
Unallocated (incl. errors and omissions)	82 622	62 522	44 345	28 857

[1] Including the Petroleum Fund

Sources: Statistics Norway and Norges Bank

Table 38. Norway's foreign assets and debt. In billions of NOK

	31.12.2002 Assets	Debt	Net	31.12.2003 Assets	Debt	Net	30.09.2004 Assets	Debt	Net
Government administration[1]	838.1	281.4	556.7	1 164.2	375.4	788.8	1 427.8	496.5	931.3
Norges Bank	226.7	64.4	162.3	254.9	62.5	192.4	289.7	76.3	213.4
Banks	125.8	371.8	-245.9	193.2	475.2	-282.0	176.6	500.3	-323.8
Insurance	171.5	25.5	146.0	220.6	26.4	194.2	9.8	5.4	4.5
Other financial enterprises	110.6	176.3	-65.7	116.5	218.0	-101.5	112.7	210.6	-97.8
Non-financial enterprises etc.									
- Public enterprises	120.3	112.1	8.1	162.2	125.7	36.5	216.8	140.2	76.6
- Private enterprises	352.7	406.7	-54.0	340.0	413.2	-73.2	330.9	407.6	-76.7
- Households and non-profit organisations	63.9	11.4	52.5	74.2	11.6	62.7	81.4	11.6	69.8
Unallocated (incl. errors and omissions)	0.0	0.0	0.0	66.5	0.0	66.5	95.4	0.0	95.4
All sectors	2 009.5	1 449.5	560.0	2 592.2	1 707.9	884.3	2 741.2	1 848.4	892.8

[1] Including the Petroleum Fund

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 enterprises. These are combined with the figures on changes in the form of transaction and valuation changes from the balance of payments.

Sources: Statistics Norway and Norges Bank

International capital markets

Table 39. Changes in banks' international assets.[1] In billions of USD

	2001	2002	2003	Q2 2003	Q2 2004	Outstanding At 30.06.04
Total	859.4	740.1	1 076.4	493.8	239.8	17 341.4
Of which vis-à-vis:						
Non-banks	442.1	315.2	545.4	185.9	39.8	6 093.6
Banks (and undistributed)	417.3	425.0	531.0	307.9	200.0	11 247.8

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 40. Banks' international claims by currency. Percentage of total international assets

	December 2001	December 2002	December 2003	Q2 2003	Q2 2004
US dollar (USD)	45.2	41.9	39.4	41.1	39.9
Deutsche mark (DEM)	..	..	..	..	..
Swiss franc (CHF)	2.1	2.0	1.8	1.9	1.7
Japanese yen (JPY)	6.2	5.6	4.9	4.7	4.7
Pound sterling (GBP)	5.4	5.3	5.5	5.1	6.1
French franc (FRF)	..	..	..	..	..
Italian lira (ITL)	..	..	..	..	..
ECU/EURO[1]	28.9	33.6	37.6	35.7	36.8
Undistributed[2]	12.2	11.6	10.8	11.5	10.8
Total in billions of USD	11 625.6	13 370.5	15 980.0	14 853.3	17 341.4

[1] From January 1999.

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

Source: Bank for International Settlements

Foreign currency trading

Table 41. Foreign exchange banks. Foreign exchange purchased/sold forward with settlement in NOK.[1] In billions of NOK at end of month

	Purchased net from:					Purchased gross from:		Sold gross to:	
	Central gov't[2]	Other financial inst.[3]	Non-financial sector	Foreign sector	Total	Non-financial sector	Foreign sector	Non-financial sector	Foreign sector
October 2003	0.1	-10.8	31.6	17.4	38.3	63.7	570.4	32.1	553.0
November 2003	0.1	-26.6	30.7	118.4	122.6	63.3	547.4	32.6	429.0
December 2003	0.1	-19.2	42.9	118.2	142.0	74.5	514.1	31.6	395.9
January 2004	0.0	-9.9	52.4	103.7	146.2	83.2	485.1	30.8	381.4
February 2004	0.0	-1.8	52.3	81.3	131.8	92.2	440.9	39.9	359.6
March 2004	0.0	10.8	47.1	133.4	191.3	87.9	475.5	40.8	342.1
April 2004	0.0	26.4	39.0	124.1	189.5	78.0	455.8	39.0	331.7
May 2004	0.0	20.3	39.3	130.7	190.3	78.6	452.1	39.3	321.4
June 2004	0.0	18.8	48.0	134.5	201.3	81.9	428.1	33.9	293.6
July 2004	0.0	15.6	49.8	116.2	181.6	81.6	359.5	31.8	243.3
August 2004	-0.2	11.0	45.4	118.1	174.3	77.0	360.1	31.6	242.0
September 2004	-0.4	15.2	42.9	131.7	189.4	74.5	388.2	31.6	256.5
October 2004	-0.3	25.0	32.9	123.5	181.1	68.4	329.7	35.5	206.2

[1] Excl. exchange rate adjustments.

[2] Central government administration, social security administration and Norges Bank.

[3] 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 42. Foreign exchange banks. Overall foreign currency position. In millions of NOK

	30.09.2003	31.12.2003	31.03.2004	30.06.2004	30.09.2004
Foreign assets, spot	223 877	249 446	243 887	265 607	236 109
Foreign liabilities, spot	392 606	418 306	460 346	458 072	434 817
1. Spot balance, net	-168 729	-168 860	-216 459	-192 465	-198 708
2. Forward balance, net	189 974	124 179	201 952	193 924	196 350

Source: Norges Bank

Table 43. Norges Banks' foreign currency transactions with various sectors. In billions of NOK

| | 2002 | 2003 | Week in 2004 | | | | | | | | | | | | | |
	1-52	1-52	35	36	37	38	39	40	41	42	43	44	45	46	47	1-47
1. Norwegian customers	**48**	**14**	**6.6**	**2.1**	**-5.6**	**1.9**	**1.1**	**-39.8**	**-0.1**	**-19.4**	**25.9**	**12.2**	**-13.2**	**3.2**	**-4.1**	**-19.3**
Net spot[1]	10	-1	8.9	-3.2	-5.0	1.9	-0.6	-36.3	4.5	-20.2	21.9	14.6	-15.8	8.3	-4.1	-23.4
Net forward[1]	38	15	-2.3	5.3	-0.6	0.0	1.7	-3.4	-4.7	0.8	4.0	-2.5	2.7	-5.2	-0.1	4.2
- Change in purchase contracts[2]	-12	-72	-2.7	-1.3	3.7	-0.4	1.9	6.4	-5.0	3.6	1.2	1.6	7.1	-3.1	-1.4	20.6
- Change in sales contracts[3]	26	-87	-0.4	-6.6	4.3	-0.4	0.2	9.9	-0.3	2.8	-2.8	4.1	4.5	2.1	-1.4	16.4
2. Foreign sector	**-81**	**-45**	**-4.4**	**-8.4**	**1.7**	**-6.3**	**-1.4**	**42.1**	**-7.7**	**9.1**	**-11.3**	**-12.9**	**2.8**	**-6.9**	**3.3**	**-29.9**
Net spot[1]	-18	15	-6.3	-1.9	-1.2	9.8	-4.6	29.3	-7.8	6.6	-9.3	-11.0	7.0	-0.8	8.1	-9.0
Net forward[1]	-63	-60	1.9	-6.5	3.0	-16.2	3.2	12.8	0.1	2.5	-2.1	-2.0	-4.2	-6.1	-4.8	-20.9
- Change in purchase contracts[2]	-126	-184	17.5	-28.4	1.3	-3.3	-7.6	42.7	-32.2	12.4	-23.0	-16.8	4.3	-1.6	-4.5	-211.7
- Change in sales contracts[3]	-189	-124	15.5	-21.9	-1.7	12.9	-10.8	29.9	-32.4	9.9	-21.0	-14.8	8.5	4.5	0.3	-190.8
3. Norges Bank	**53**	**13**	**0.6**	**1.9**	**3.0**	**2.9**	**2.7**	**2.2**	**1.7**	**1.5**	**1.4**	**1.7**	**2.5**	**2.3**	**2.7**	**34.5**
Net spot[1]	53	13	0.6	1.9	3.0	2.9	2.7	2.2	1.6	1.6	1.4	1.7	2.5	2.3	2.7	34.5
Net forward[1]	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0
- Change in purchase contracts[2]	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0
- Change in sales contracts[3]	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. Other																
Increase in Norwegian customers' net currency claims on banks	-11	-2	2.5	0.1	-1.5	4.3	-3.5	-6.8	5.6	-0.8	-1.9	-1.2	6.6	-0.3	-3.1	23.6
Increase in banks' total positions	4	-1	-0.9	2.5	0.1	0.3	-1.3	1.3	-1.1	-0.1	-1.7	0.1	1.4	0.8	-0.7	1.2
Specification of foreign sector spot:																
Net NOK claims on banks[4]	-13	35	-5.7	-2.4	-2.6	6.9	-1.6	26.1	-6.2	5.3	-11.4	-13.7	7.1	0.3	9.9	-9.5
VPS-registered shares[5]	-2	-16	0.4	1.2	-0.1	0.5	-1.8	-0.4	-0.8	1.2	-0.1	0.3	-0.1	1.6	-1.0	-16.0
VPS-registered bonds[5]	-5	-5	0.1	-0.3	1.1	-0.2	0.3	2.0	-1.2	-0.4	1.4	2.0	0.2	-2.2	-0.7	7.4
VPS-registered notes and certificates[5]	1	2	-1.1	-0.5	0.3	2.7	-1.5	1.7	0.3	0.5	0.8	0.4	-0.2	-0.5	-0.1	9.1
Foreign sector purchases of VPS-reg. securities, total	-	-	47.7	52.2	59.3	73.0	56.6	56.3	64.1	76.9	62.3	54.0	58.3	68.2	64.6	2939.5
Foreign sector sales of VPS-registered securities, total	-	-	47.0	52.6	60.7	75.9	53.6	59.6	62.4	78.2	64.4	56.8	58.3	67.2	62.8	2940.0

[1] Positive figures denote that the sectors in question purchase foreign currency from Norwegian banks.

[2] Positive figures denote that the sectors in question increase their contracts for purchase of NOK, and negative figures denote a decline in purchase contracts.

[3] Positive figures denote that the sectors in question increase their sales contracts in NOK, and negative figures denote a decline in sales contracts.

[4] Positive figures denote a reduction of NOK deposits from the foreign sector in Norwegian banks.

[5] Positive figures denote net sales of VPS-registered securities by the foreign sector.

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