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Norges Bank Investment Management

Investments in a turbulent credit market

June 2003

In 2002, the global market for corporate debt was characterised by wide price fluctuations. An unusually large number of companies with high ratings from rating agencies went bankrupt. At the same time, 2002 was the year in which the Petroleum Fund gradually entered the market for non-government bonds. The fixed income portfolio had previously consisted almost exclusively of government bonds. The phasing in of non-government bonds has taken place without major losses for the Petroleum Fund, but has represented a very considerable challenge to Norges Bank's management. Transaction costs have been lower than estimated in advance, and the management has resulted in outperformance of the benchmark portfolio.

Introduction

The Ministry of Finance has changed the benchmark portfolio for fixed-income securities in the Government Petroleum Fund, with effect from 2002. As a result of the change, the benchmark no longer consists only of securities issued by governments with a high credit rating (government bonds); non-government-guaranteed fixed income paper is now to be included in the index that shows how the Petroleum Fund's portfolio shall normally be invested.

The background to the change was partly that a fund as large as the Petroleum Fund should be invested in all major financial markets, in order to spread risk as much as possible. Markets for non-government-guaranteed bonds grew rapidly in the US and Europe towards the end of the 1990s, while markets for government bonds became smaller by comparison. Another important reason was that the long-term return on non-government-guaranteed bonds is normally higher than that on government bonds. See also the article "Non-government-guaranteed bonds in the Petroleum Fund" published in 2002 on the Petroleum Fund's website.

Non-government-guaranteed bonds include corporate bonds, bonds issued by home loan mortgage corporations and partly state-owned lending institutions and also asset-backed securities. This article focuses in particular on corporate bonds, which are securities issued by private companies. Large segments of the market for these securities are characterised by far poorer liquidity than the market for government bonds. This means there are fewer counterparties to trade with, and that a far smaller volume of securities can be traded without affecting prices. Some bonds in the benchmark portfolio are owned in their entirety by investors who intend to hold them until maturity, and it is thus impossible to buy them.

The market for corporate bonds

Corporate bonds are negotiable debt instruments issued by private companies. These instruments constitute a substantial share of the non-government-guaranteed securities in the Petroleum Fund's fixed income benchmark. There are about 4500 different bonds issued by more than 900 companies in the index, even though it is limited to corporate bonds with investment grade ratings from the rating agencies (see box). This means that all issuers have high creditworthiness.

Corporate bonds can be bought in either the primary or the secondary market. New paper is issued in the primary market. Companies wishing to borrow money can go to the market for new loan capital. Brokers and banks serve as lead managers. The loans are extended by investors on standardised terms, and the price of the new security is typically fixed either by auction or through a round of tendering among a number of investors. The buyers have no transaction costs other than the issue price.

Transactions effected after the securities have been issued take place in the secondary market. Brokers act as intermediaries between buyers and sellers, and set their own bid and offer prices for the securities. The difference between the bid and offer prices is the remuneration received by the brokers for acting as intermediaries. Thus purchases in the secondary market involve a transaction cost for the buyer.

It is difficult to measure the size of transaction costs exactly, because there is no central and transparent market place where prices can be observed. On the contrary, the market place is rather opaque. Trading proceeds by telephone, and a buyer cannot know with certainty who has securities available, or at what prices. A buyer therefore never knows with absolute certainty what he would have had to pay to brokers other than those he actually trades with. This means that buying corporate bonds can be costly, because a buyer initially possesses less information than other market participants, for example brokers.

Each broker will have a limited volume of a selection of corporate bonds for sale. In order to build up a portfolio with approximately the same properties as the Petroleum Fund benchmark, Norges Bank has to buy a very large number of different securities. Because of the Fund's size, it is often necessary to buy volumes that are substantial compared with the volumes normally traded in the market. This means that Norges Bank risks influencing the price of the securities through its purchases.

Far smaller purchases are necessary to influence prices in the market for corporate bonds than for government bonds. The liquidity in the market is thus generally far poorer. At the same time, there are substantial differences within the market for corporate bonds. Some bonds, particularly newly issued securities from large companies, are relatively liquid, while others can be very difficult to obtain. The benchmark contains some corporate bonds that are almost never offered in the market. It can therefore be very expensive, and in some cases very difficult, to buy a well diversified portfolio of corporate bonds.

The market price of the individual corporate bond depends strongly on credit quality, as perceived by rating agencies and market participants. In a normal market situation, trading the bonds of a particular company can be a simple matter. But if the company experiences problems of any kind, for example a sharp fall in the share price as a result of negative news about

the company, the spread between brokers' bid and offer prices may widen rapidly. The liquidity of the bond may also diminish if prices are influenced more by a buyer or seller indicating interest. If, for example, a company is excluded from the Petroleum Fund's index because of a decline in credit quality, selling securities in that company will often be both difficult and costly, because many others will tend to want to dispose of the same securities at the same time.

Credit risk

Prices for corporate bonds are influenced by the general interest rate level in the market, just like prices for government bonds. In addition, however, a number of special factors influence prices for these securities. Developments in results, i.e. the earnings and debt-servicing capacity of the issuing company, will be very important for this company's bonds. General factors, such as the general environment or interest among investors for corporate debt, may influence the price of all corporate bonds in the market. An example of the latter might be a lack of confidence and scepticism in the market regarding the ability of companies in general to meet their debt-servicing obligations. Such a lack of confidence may arise in situations where a few large companies have committed material breaches of good accounting practice or have suddenly gone bankrupt, such as we have seen this past year.

By credit risk, we normally mean the risk of a change in the price of a corporate bond relative to the price of a government bond, i.e. compared with the safe investment option. The difference in yield between the two investment options is normally called the credit spread.

As a rule, the credit spread is positive. To put it another way: securities with credit risk offer a higher return than government paper. This can be regarded as compensation or a premium for the risk associated with investing in credit-risky securities. Investors want to be paid both for the risk of the issuer going bankrupt or not meeting his obligations for some other reason, and for the high transaction costs of trading in credit-risky securities. The higher the credit spread, the cheaper these securities will be compared with government paper with the same maturity.

Chart 1: Credit spreads in the Petroleum Fund's benchmark index in the period 31 January to 31 December 2002. Percentage points

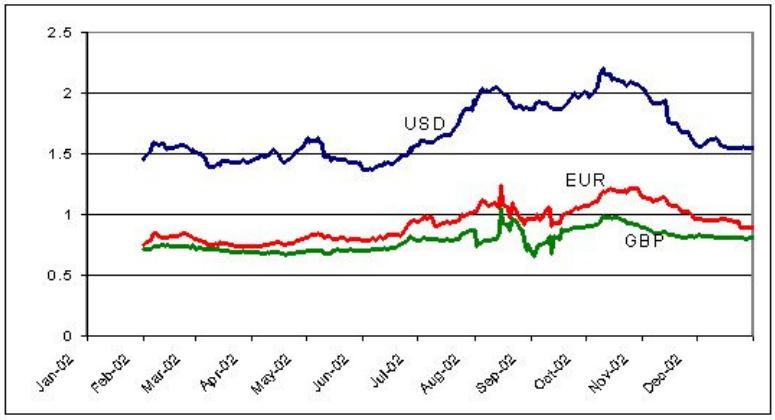


Chart 1 shows the credit spread in markets for corporate bonds issued in USD, GBP and EUR. The credit spreads in the chart are average (market-weighted) spreads for the corporate bonds in the Petroleum Fund benchmark. The spreads against government bonds are all positive. The chart shows that credit spreads changed fairly substantially during 2002, and were different for the three currencies.

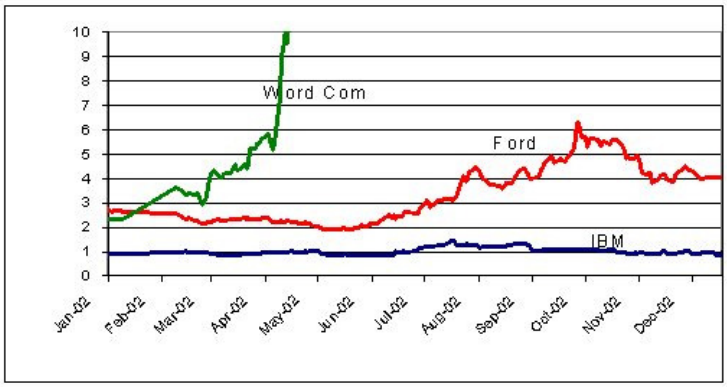
There are several reasons why the market-weighted credit spreads are different for different currencies. The issuers in the different markets are not the same, and the investors who buy the paper are not the same either. There are also a number of more technical reasons for the differences: different swap spreads (prices for interest rate swap agreements against government bonds), different volatilities in these spreads; different legislation concerning non-government securities and the treatment of bankruptcy; different liquidity for corporate bonds etc. Nevertheless, there appears to be correlation in the spreads in the different currencies, so that they move more or less in step over time. This may be due to more general factors which are independent of currency, such as interest in corporate debt compared with interest in other fixed income instruments.

We can imagine that credit spreads in the market are made up of a number of components. We have already distinguished between company-specific risk and general factors such as the swap spread and the general environment for credit products. There tends to be a limit to how much swap spreads and compensation for credit exposure generally change over time. These common components move within certain limits or bounds. We may experience major and unexpected changes over a short period of time, but the common spread components will have an upper and a lower bound. The movements in Chart 1 are the average for a large number of corporate bonds, and therefore largely due to such general components.

Company-specific risk, on the other hand, may remain still for a long time, then suddenly move sharply in a negative direction. For an individual company, this component of the credit spread has no upper bound at all - it may explode. This may happen, for example, if a company goes bankrupt.

For long periods, credit spreads for individual companies may appear to move around a sort of average. One might be led to believe that wide spreads signal that corporate bonds are cheap, because the spread can be expected to narrow again. This may be the case, but there is also a risk of the spread exploding and never moving back. The owner of securities who experiences such a substantial spread increase loses a lot of money on it.

Chart 2: Credit spreads in 2002 for three different corporate bonds.* Percentage points



* Yield spread IBM bonds with coupon 5.375% and maturity 01.02.09 against US government paper T 6.6% maturity 15.05.09, spread Ford 7.35% 15.10.11 against T 5% 15.08.11, spread WorldCom 8.25% 15.05.31 against T 5.375% 15.02.31.

Chart 2 shows movements in the credit spread for three corporate bonds through 2002. The spread of the one security (issued by IBM) widened a little, but then rebounded, so that on the whole investors in this security did not lose money on the change in spread. The other spread (Ford) expanded sharply, but reverted towards the end of the year. In this case, the investors lost by holding this security rather than other, safer securities, but the loss was reduced towards the end of the year. The third spread expanded sharply and never rebounded, because the company that had issued the security (WorldCom) went bankrupt. Investors in this paper suffered substantial losses on their investments.

Generally, then, corporate bonds offer a higher current return than safe investment options - the current yield is higher. But if the credit quality deteriorates and the risk of bankruptcy increases, the price of the corporate bonds may fall relative to other securities, and the return will be poorer than that offered by other options. The worst thing that can happen to an investor is that the issuer can no longer fulfil the payment conditions in the loan covenant, for example as a result of the bankruptcy of the company that issued the security. Owners of corporate bonds nevertheless have better protection for their claims than shareholders have. In the event of a bankruptcy, bondholders have a claim on the company's assets before shareholders can receive anything at all.

Also minor changes in credit quality, such as downgrading by rating agencies, may lead to a weaker return on corporate bonds than on other investment alternatives. We can therefore say that in normal times corporate debt offer a higher yield and return than safer alternatives, but that sometimes the return relative to alternative investments may be highly negative. Such negative situations or outcome ranges, are often called "tails" because of the form they take in a diagram that illustrates returns, where they extend far beyond the main concentration of the outcomes.

Credit risk is a wide and very interesting field of study in itself. An important starting point for this field of study is the theories that describe investment in corporate bonds as equivalent to the purchase of a safe government security and the sale of a put option on the company's value over the period to maturity of the investment (security). According to these theories, the excess return on purchase of a corporate bond may be regarded as the cashing in of an option premium. The question is whether this premium is good enough. This illustrates that credit risk is not concerned only with traditional analysis of companies' credit quality. It is particularly important for investors to determine whether they are being paid enough for the extra risk involved in investing in corporate bonds.

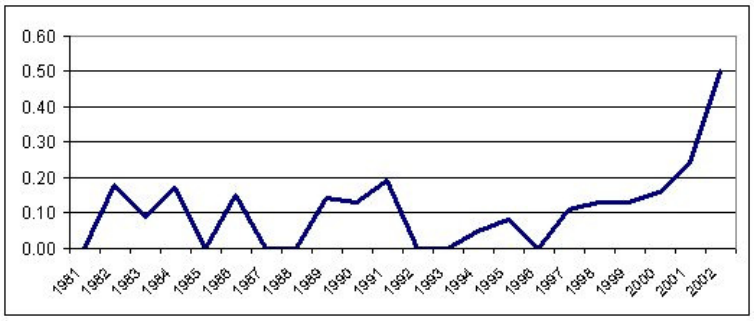
The market for corporate debt in 2002

This past year has been characterised by substantial unrest in the market for corporate debt. At the beginning of the year, the market was relatively quiet, and yield spreads against government bonds (credit spreads) remained stable (see Chart 1). Later in the spring, however, several events occurred that all contributed to amplified credit spreads.

The general interest in corporate debt abated substantially in pace with sharply falling equity markets as the year progressed. The market was especially affected by a number of major bankruptcies; that of the telecommunications company WorldCom, in the US, received particular attention in the media. WorldCom was among the large issuers of corporate bonds in the US. In retrospect it appears that this company may have financed much of its operations by means of loan capital. The bankruptcy was particularly dramatic for bond investors because of the large volume of securities involved in the bankruptcy. Corporate bonds generally also saw spreads increasing (prices falling) as a result of revelations about manipulation of the accounts information in a number of companies.

Chart 3 shows the frequency of bankruptcy in the last twenty years among companies with investment grade ratings for their securities from the recognised rating agency Standard & Poor's. In 2002, the frequency of bankruptcies among such companies was more than twice as high as in any other year from 1981 onwards. Even in a year as extreme as 2002, however, only 0.5 per cent of investment grade rated companies went bankrupt. An investor with a portfolio of investment grade corporate bonds was thus only involved in a relatively small number of bankruptcies, even in 2002. However, many companies were downgraded by the rating agencies, and their credit spread widened as a result. In addition, the many bankruptcies strongly influenced credit spreads for corporate bonds generally.

Chart 3: Bankruptcies among companies that Standard & Poor's had rated as investment grade. Number of bankruptcies. Per cent.



As a result of the bankruptcies and downgradings, corporate debt as an asset group performed poorly in 2002 compared with government bonds. This may seem a little strange, since Chart 1 shows that credit spreads rebounded sharply towards the end of the year in several markets. However, the developments in the chart are due to the exclusion from the market-weighted index of a number of the securities that were downgraded, so that only safer securities remained in the Petroleum Fund's benchmark. The market-weighted spread in the chart therefore provides the misleading impression that the relative prices of corporate bonds and government bonds had reverted to a low level at the end of the year. If securities from companies that had been downgraded or gone bankrupt during the year had been included in the calculations, the spread in the chart at the end of the year would have been considerably higher.

Rating agencies

All corporate bonds in the Petroleum Fund's benchmark index have a rating from the two large rating agencies Standard & Poor's (S&P) and Moody's. Bond issuers pay these rating agencies to assess the credit quality of their bonds. The agencies look at the issuer's ability to pay, and in general at the security for lenders specified in the conditions in the loan prospectus. On the basis of these factors, the agencies assess the probability of the loan obligation being fulfilled, and set credit quality ratings accordingly. These ratings may be altered during the life of the loan if something happens to the ability to pay of the issuer or to other collateral that forms the basis for the loan covenant.

S&P's highest rating is AAA, and Moody's is Aaa. The lowest investment grade ratings are BBB from S&P and Baa from Moody's. Lower ratings than this are called 'speculative grade'. The Petroleum Fund's benchmark index contains only bonds with an investment grade rating.

The rating agencies do not only rate corporate bonds. Most fixed income instruments in the market, including government bonds, have a rating from at least one of the agencies. Very few issuers have such high creditworthiness that they can raise a loan in the market without the backing of a credit rating from the agencies.

Management of securities with credit risk in Norges Bank

Norges Bank has built up a new team of staff to manage the new instruments with credit risk in the Petroleum Fund. A number of them worked throughout 2002 from the Bank's New York office. The US credit market is both far larger and more developed than credit markets in Europe and Asia. Six new mandates have also been allocated to external fixed income managers. These are limited, specialist assignments for instruments requiring a high level of expertise, where Norges Bank has not wished to build up the expertise internally.

A separate unit has also been established in Norges Bank to monitor regularly the credit quality of the portfolio, and to check on an independent basis that management takes place in compliance with specific rules and regulations. Internal expertise has also been built up to monitor how external and internal managers price their portfolios. Furthermore, the Back Office Department has been strengthened to enable it to handle a larger number of transactions and different instruments from those dealt with previously.

Through 2002, the management of non-government-guaranteed securities in the Petroleum Fund's fixed income portfolio consisted largely of two important activities:

- purchase of new securities
- building up and management of a broadly diversified portfolio

The first of these activities focuses exclusively on transactions in the new securities. Much time and resources have been spent this first year in gaining an overview of the market place for non-government paper. Norges Bank daily compiles information on prices and available securities (stocks of securities) from a number of brokers, and stores this information electronically.

This information base has formed the point of departure for the Bank's trading activities. The base contains a good overview of who has stocks of the securities that are to be bought for the Petroleum Fund, and at what price. Norges Bank's managers have contacted the broker or brokers who can offer the securities most cheaply, and attempted to negotiate a good price for them. Norges Bank has placed emphasis on using those brokers who offer the best prices over time, and who can offer the best possible service. At the same time, the Bank is trying to establish a practice whereby its managers do not develop too close a relationship with particular counterparties.

In other respects, too, the ground has been prepared for a cost-effective transition from the old to the new benchmark. As a general rule, the Petroleum Fund receives new capital each month, and the portion that is to be invested in fixed income instruments is used to purchase the new credit-risky securities. Norges Bank has also been able to use its general knowledge of fixed income markets and its established customer relationships to push down transaction costs and the risk associated with the execution of all the transactions.

The other activity focuses on the portfolio construction itself. Norges Bank's objective has been to achieve a broadly diversified portfolio closely in line with the benchmark by focusing on, for example, market shares in various currencies, holdings in various industry sectors, cash flows along the time line, exposure to individual issuers, spread exposure and diversification of securities over different rating classes. At the end of 2002, the Petroleum Fund's fixed income portfolio contained corporate bonds issued by many hundreds of different companies, and an even larger number of different individual bonds.

The benchmark contains far more corporate bonds. However, there are limits to how broad a range of names and securities (diversification) it is reasonable to have in the portfolio. The most important constraint is the actual availability of the securities in the market. There are many securities and some companies that it is simply not possible to include in the portfolio. Although these securities are in the index, they are not available for purchase in the market. Thus Norges Bank has to accept fluctuations in the return against the index because the index cannot be fully replicated.

Another constraint may be resources to analyse and monitor all the companies and securities in the portfolio. If the aim is to have adequate, regular information about the risk associated with all holdings in the portfolio of instruments with credit risk, the many hundred different positions and all the details in the many loan prospectuses make the work very demanding.

There are a number of external sources of information that can be used. Rating agencies are separate companies that publish ratings for borrowers and some individual loans. They provide valuable information, but this does not mean that the rating can provide an indication of future problems in a company. Moreover, prices in the market may change before the ratings do, so that rating agencies actually do not provide any new information additional to that already priced into the securities.

Alternatively, Norges Bank's managers can try themselves to form an impression of the companies, and assess their credit quality in the light of official ratings, their own internal analyses, and possibly also of external research work and analyses, if any. However, bondholders may find it difficult to get hold of the most recent and most reliable information in the market before other operators. Other investor groups, for example equity investors, banks and brokering houses, or people in the company itself, may obtain valuable information first. This information may then be reflected in the prices of the securities before Norges Bank gains access to it. There is also some risk that the information that is available may be manipulated so that it is unreliable. An example of this is an income statement that does not provide a true picture of the company's activities. It may therefore be important to have a healthy scepticism concerning the information presented by other market participants, and to be aware of the constraints an investor is subject to.

Instead of trying to obtain the most detailed information possible about every single company, an investor may rely on diversification across many companies and securities preventing major losses if something unforeseen and negative should happen to some of them. Norges Bank has attempted in its day-to-day management to strike a balance between breadth of issuers and securities, on the one hand, and the need to monitor the securities that form a part of the portfolio, on the other. Generally, risk in relation to individual issuers is small because the portfolio is invested in a relatively large number of different securities and companies. Extensive diversification is thus an important principle for Norges Bank's investment management.

Since the benchmark for the Petroleum Fund's investments in securities with credit risk consists of securities with investment grade ratings, and the objective of management is to purchase securities with properties similar to those in the index, it will be relatively rare for the Petroleum Fund to hold securities issued by companies that actually go bankrupt. Furthermore, if there should be a substantial deterioration in credit quality, Norges Bank will normally be able to sell the securities before bankruptcy occurs. There may nevertheless be cases where securities are affected by bankruptcy before a sale can be effected. It is also conceivable that prices prior to a bankruptcy are so low that it may pay to take part in the bankruptcy negotiations rather than to sell.

Knowledge of the bankruptcy legislation in the country in question is normally a prerequisite for being able to take part actively in bankruptcy negotiations. As a rule, it is desirable to have specialised legal expertise at hand to deal with bankruptcies. A bankruptcy may involve a type of documentation risk, which may arise, for example, because nothing definite can be said about the settlement of the estate in bankruptcy before the bankruptcy has been fully processed. This uncertainty may stem, for example, from an interpretation of legal clauses in the loan prospectus, because although as a rule a loan prospectus describes in detail the rights and requirements made of borrower (issuer) and investor, there are a number of examples of conditions that may be interpreted in different ways in the event of a bankruptcy or other special circumstances. Norges Bank may make use of external legal advice in cases where the Bank itself does not have the necessary specialist expertise.

The Bank's experience during its first year of managing non-government securities was favourable. Norges Bank purchased a broadly diversified portfolio of non-government bonds at transaction costs that were lower than initially estimated. The Petroleum Fund's portfolio of non-government bonds outperformed the benchmark index defined for the Fund. These good results do not mean that the management task was easy, or that periods of poor results may not come later. The market for instruments with credit risk is complex, and will continue to present considerable challenges to Norges Bank's managers.

Published 27.06.2003 13:41

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