

## Recent developments in the corporate bond market

Compared with some neighbouring European countries, bonds long played no more than a minor role as a financing instrument for German enterprises outside the financial sector. During the past few years, however, this market segment has undergone a sharp expansion and has become more important in corporate financing. This has been due to a number of factors. The introduction of the euro, for example, has led to the integration of the national markets for corporate bonds and has seen them gaining in depth and liquidity. An additional factor was that the technology boom of the late 1990s resulted in a marked increase in the financing needs of the large listed telecommunication enterprises in particular. This trend was reinforced by the concurrent wave of corporate mergers and acquisitions. Following the slump in share prices in 2001, the market for corporate bonds benefited from investors switching to investments promising a higher yield. This article explains the transformation in this market and the underlying factors influencing it.

### Overview of the present situation and market developments

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Since the introduction of the euro and the integration of the national bond markets, German non-financial corporations have obtained an increasing amount of their funding

*Dynamic  
development  
of the market  
since the intro-  
duction of the  
euro ...*

### Corporate bonds outstanding\* – an international comparison

Position: September 2003

Item	Non-financial corporations domiciled in				
	Germany	France	Italy	United Kingdom	USA
Outstanding amount as % of GDP	6	23	12	26	26
Percentage market growth since 1993	+ 907	+ 280	+ 1,522	+ 524	+ 63
Percentage market growth since 1998	+ 613	+ 144	+ 1,119	+ 139	+ 22

Source: Bank for International Settlements, Bundesbank calculations. — \* Money market instruments and bonds.

Deutsche Bundesbank

through the issuance of corporate bonds. Since the launch of monetary union, there has been a sixfold increase in the German corporate sector's volume of debt securities (including money market paper) outstanding in the euro area. Among the larger European economies, this dynamic growth has been outpaced only by Italy. However, this growth is also due to the fact that, in terms of their volume, the German and Italian corporate bond markets were long overshadowed by those of other European countries. Even though German enterprises' combined outstanding amount of bonds has increased to €143 billion (September 2003), in relation to GDP (6%) it is considerably lower than in the USA or France where bonds have long played a significant role in corporate financing. Lately, US and French non-financial enterprises'

... but still at a low level by international standards

outstanding volume of bonds and money market instruments was equivalent to around one-quarter of their GDP. It is worth noting in this context that, during the past few years, bond-issuing German enterprises have launched their debt instruments mainly in other European countries.<sup>1</sup>

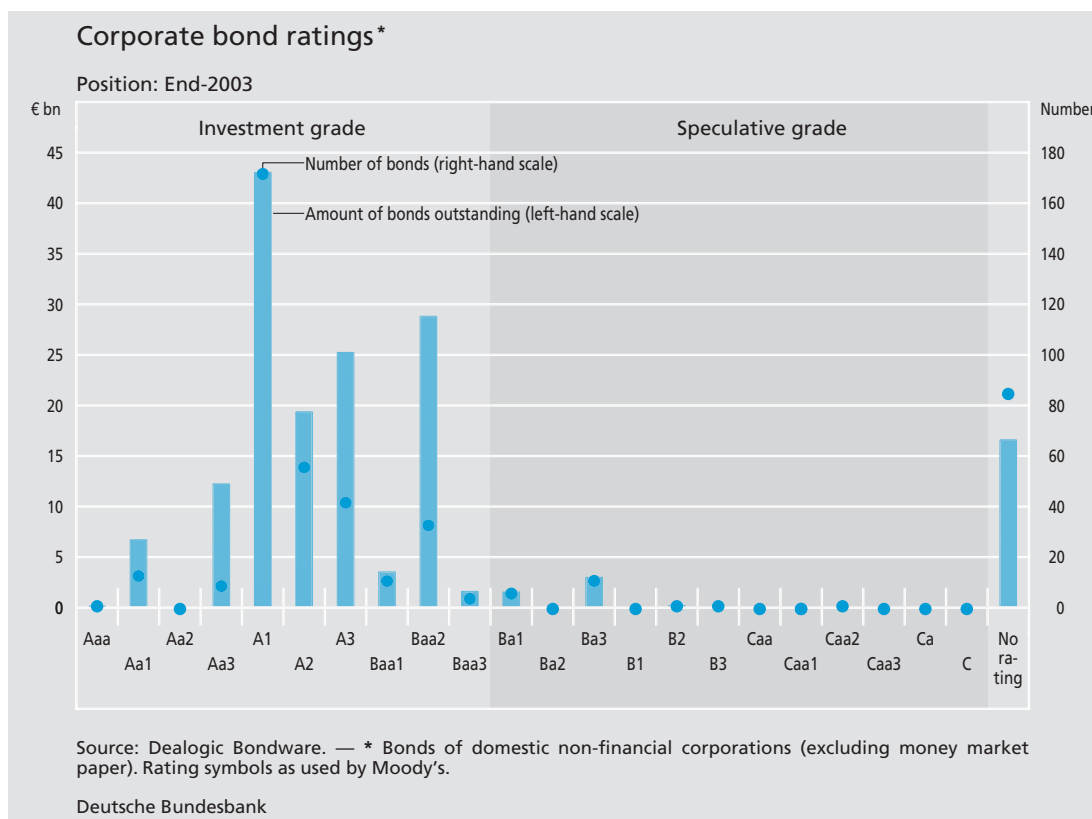
The issuance of corporate bonds is concentrated on a small number of industries. In first place is the car and air transport industry (28% of the overall volume), followed by telecommunications and IT enterprises (23%) and the energy sector (12%). The average outstanding volume per bond issue in the telecommunications and IT sector amounts to about €1 billion, while the issues of enterprises in the car and air transport sector are on average less than half as large (around €400 million). The outstanding bonds consist very largely of paper which the rating agencies classify as "investment grade".<sup>2</sup> Just under two-thirds carry a rating in the highest category (Aaa to A3). These are primarily

Concentration on individual industries...

... and credit ratings

<sup>1</sup> See also Deutsche Bundesbank, The relationship between bank lending and the bond market in Germany, *Monthly Report*, January 2000, p 33-47. German enterprises issue bonds mostly through foreign financing subsidiaries. This is mainly explained by tax advantages in trade earnings tax. When trade earnings tax is calculated, 50% of the interest on long-term debt (with a maturity of over one year) is included in the assessment basis while interest on short-term loans remains tax-free. This trade tax burden may be circumvented by using a foreign financing subsidiary as a vehicle which then lends the resources short term to the domestic parent company.

<sup>2</sup> Rating agencies such as Standard & Poor's (S&P) or Moody's make a distinction in their credit assessment between bonds which are "investment grade" and those which are "speculative grade". The rating agencies thereby provide information on the expected default risks of corporate bonds. The range of rating grades for long-term liabilities extends from AAA (blue-chip credit rating) to CCC- (highly speculative) in the case of S&P and Aaa to Caa3 in the case of Moody's. The investment grade comprises the ratings AAA to BBB- according to S&P and Aaa to Baa3 according to Moody's.



bonds of car, air transport and energy enterprises. Telecommunications and IT enterprises are mostly rated somewhat less highly, however, with a B rating being dominant. The higher-risk "high yield bonds" accounted for 5% of the bonds outstanding (3% of the outstanding volume).

factor was that life insurance companies and pension funds switched from equities to bonds, leading to great demand for such paper. Moreover, the decline in yields in the market for government bonds encouraged investment in higher-interest-bearing and more risky corporate bonds.

*Increasing demand for corporate bonds*

On the demand side, the introduction of the euro opened up new investment opportunities especially for internationally operating institutional investors such as investment funds and insurance companies as the launch of the euro meant the abolition of earlier contractual or statutory restrictions on their involvement in foreign debt markets. In addition to such structurally higher demand, temporary factors have recently also helped to make corporate bonds more attractive. One

## Factors determining market developments

### Theory of mixed financing

In contrast to bank loans, the issuance of debt securities is associated with high fixed costs. These include, for example, the costs of preparing the prospectus and "roadshow" presentation for institutional investors. For that reason, financing via the bond market

*Issue costs*

comes into consideration mainly for enterprises with a major need for debt financing whereas smaller firms prefer to obtain their funds in the form of bank loans.<sup>3</sup> Attempts at explaining this situation which are based primarily on the differing level of issuance costs of various forms of financing are soon confronted with their limitations, however. For example, they are unable to explain why some enterprises of a certain size category obtain funds by issuing bonds while others take out loans.

*Possibility of subsequent renegotiation*

Besides the respective issuance costs, bonds and bank loans differ in many other respects. There are major differences between the two forms of financing in the event of, say, insolvency or restructuring. If there is a small number of creditors, it is easier for enterprises to adjust the terms and conditions of lending. Financing via a few banks therefore more readily offers the opportunity to renegotiate than does financing via a large number of bond holders.<sup>4</sup> On the one hand, the possibility of subsequent renegotiation may be advantageous for both sides if this avoids the liquidation of the enterprise. On the other, the debtor might anticipate this and adjust his investment behaviour to the detriment of the lender. In this context, a mixed use of bank loans and debt instruments may be interpreted as a self-commitment on the part of the enterprise in order to deliberately restrict the possibility of renegotiation at a later date. This does not imply that insolvency or restructuring is immediately impending. Nevertheless, the implications for the capital structure become clearer with an increasing probability of default.

Another approach assumes that, owing to their regular contacts with the debtor and the ongoing monitoring of credit, relationship bankers have better information on their debtors than do holders of debt instruments. Holders of debt instruments can dispose of their paper comparatively easily in the event of a deterioration in the debtor's credit rating. Despite any price losses, they therefore have lesser incentives to monitor the borrower carefully than do banks which can sell their loans only with difficulty. Moreover, in relationship banking the financial standing of the debtor has to be monitored only by one institution rather than by each investor separately. This advantage, which is especially relevant to small and medium-sized enterprises, is counterbalanced by the drawback that the intensity of competition is reduced by a fairly strong linkage between the bank and the enterprise.<sup>5</sup> This ultimately strengthens the banks' negotiating power. Consequently, enterprises try to optimise this conflict of aims by means of mixed financing. This is also apparent in corporate financing reality, which is characterised by the use of differing financing instruments.

*Information asymmetries between debtor and creditor*

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<sup>3</sup> See D Blackwell and D Kidwell, An investigation of cost differences between public sales and private placements of debt, in *Journal of Financial Economics* 22, 1988, p 253-278.

<sup>4</sup> See, for example, E Detragiache: Public versus private borrowing: a theory with implications for bankruptcy reform, in *Journal of Financial Intermediation* 3, 1994, p 327-354.

<sup>5</sup> See R G Rajan: Insiders and outsiders: the choice between informed and arm's-length debt, in *Journal of Finance* 47, 1992, p 1367-1400.

## The high yield bond market

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The pace at which the corporate bond market has grown has varied among the individual credit segments. The distribution of bond holdings across rating categories shows that most paper is classified as "investment grade" (medium to high quality issuers) by rating agencies (see chart on page 17). However, the share of speculative bonds – known as "high yield bonds" – has increased. In the euro area, the volume of such bonds currently amounts to around €50 billion, which is about five times more than at the beginning of monetary union. The telecommunications sector was initially the dominant force in this field: at the end of 1999, it held a roughly 50% share of the European market for high yield bonds. Consolidation in the technology sector and the increasing involvement of enterprises from other sectors, however, have meant that this share had fallen to approximately 7% by the end of 2003.

Owing to the globalisation of the financial markets, this development was strongly influenced by the US market, which was also reflected in the fact that bond issues were launched in accordance with US law. Now, however, German corporate bonds are increasingly being issued in accordance with German law. Besides having the psychological advantage of familiarity, this also means that the additional costs incurred by involving

lawyers for different jurisdictions can be avoided. Legal issues are of particular relevance to the formulation of covenants. In the interests of investor protection, it is necessary to provide transparency with regard to the risks associated with an investment. The mandatory performance of certain company valuation procedures, such as a due diligence, may help to inform investors. The duties to act as well as to cease and desist, which are highly standardised in the USA, are particularly important guidelines for German issuers. The similarity to US structures also plays a role with regard to lending banks in Germany. In considering bank loans and high yield bonds to be of equal ranking – as is often accepted in the USA – lending banks help to enhance the placeability of these bonds.

The corporate landscape in Germany is a further structural feature which could foster market growth. The German corporate landscape is characterised by numerous small and medium-sized firms which might not obtain an investment grade rating owing to their lack of size and earnings predictability.<sup>1</sup> In contrast to bank loans, which sometimes encroach upon entrepreneurial freedom of action, high yield bonds – despite market monitoring – tend to establish greater flexibility in corporate governance.

<sup>1</sup> See E I Altman, *The Anatomy of the High Yield Bond Market: After Two Decades of Activity – Implications for*

*Europe*, Salomon Smith Barney, Global Corporate Bond Research Group, September 1998.

## Structural determinants

*Higher market liquidity after the introduction of the euro...*

The expansion of the market for corporate bonds over the past few years was due, in particular, to the financing behaviour of fairly large companies which have made increasing use of the bond market as an alternative to bank loans and internal financing. The main agents in these developments have been the complete liberalisation of capital transactions in all countries of the EU as well as the fact that there is now no exchange rate risk following the introduction of the euro with the earlier segmented markets of the various countries participating in EMU having become integrated.<sup>6</sup> For the enterprises, the expanded and, therefore, more liquid market opens up the opportunity to place even large-volume issues on favourable terms and conditions. Furthermore, there are indications that the direct issuance costs have fallen owing to keener competition among the investment banks in the wake of monetary union.<sup>7</sup>

*... greater market orientation of bank financing...*

The increasing risk orientation in banks' lending business, too, is likely to have an impact on the market for corporate bonds. The ongoing development of the prudential regulations and especially the planned new Basel Accord (Basel II) have led to the banks improving their procedures for measuring and controlling credit risks. In turn, this has resulted in a more risk-appropriate pricing of loans. As a result, particularly for larger enterprises, there is greater substitutability – and therefore competition – between bank loans and debt issuances.

Finally, the liberalisation of important markets outside the financial sector has also left its

mark on the market for corporate bonds. Deregulation in the case of many European enterprises, first and foremost in the telecommunications sector, led to the emergence of a large borrowing requirement that was partially covered by the issuance of bonds.

*... and deregulation in the markets for goods and services*

## Temporary factors

Furthermore, temporary factors have also played a part in the past few years. For example, German enterprises' inflows of funds have been subject to sharp fluctuations. Prior to 1998, German enterprises financed themselves predominantly through retained profits and write-downs, ie internally, whereas, in the wake of the technology boom, numerous mergers and acquisitions as well as the buying of the UMTS licences, the demand for external funds increased perceptibly. This stimulated German enterprises' issuing activity in the euro-area bond market. Empirical studies on enterprises' issuing behaviour show that corporate mergers and acquisitions in the late 1990s in particular brought with them an increased need for financial resources.<sup>8</sup> The buying of enterprises was not always financed directly by the issuance of bonds. Instead, it was often the case that banks first granted bridging loans.<sup>9</sup> An additional empirically relevant factor in the decision to issue

*Technology boom, corporate mergers and acquisitions...*

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<sup>6</sup> See Deutsche Bundesbank, International integration of German securities markets, *Monthly Report*, December 2001, p 15-28.

<sup>7</sup> See J A C Santos und K Tsatsaronis, The cost of barriers to entry: evidence from the market for corporate euro bond underwriting, *BIS Working Paper* No 134, 2003.

<sup>8</sup> See, for example, G de Bondt, Euro area corporate debt securities market: first empirical evidence, *ECB Working Paper* No 164, 2002.

<sup>9</sup> The analyses conducted by de Bondt (2002) indicate a time lag of up to three quarters.

... and the relative costs of bond financing...

bonds concerns the costs of bond financing when compared with the costs of other forms of financing such as share issuances or bank loans. A higher stock market evaluation tends to lower the issuance volume of bonds. Conversely, the weak equity market of the past few years appears to have encouraged the corporate sector in its issuing activity. Alongside other forms of financing, borrowing via the bond market offers enterprises an additional option for raising capital.

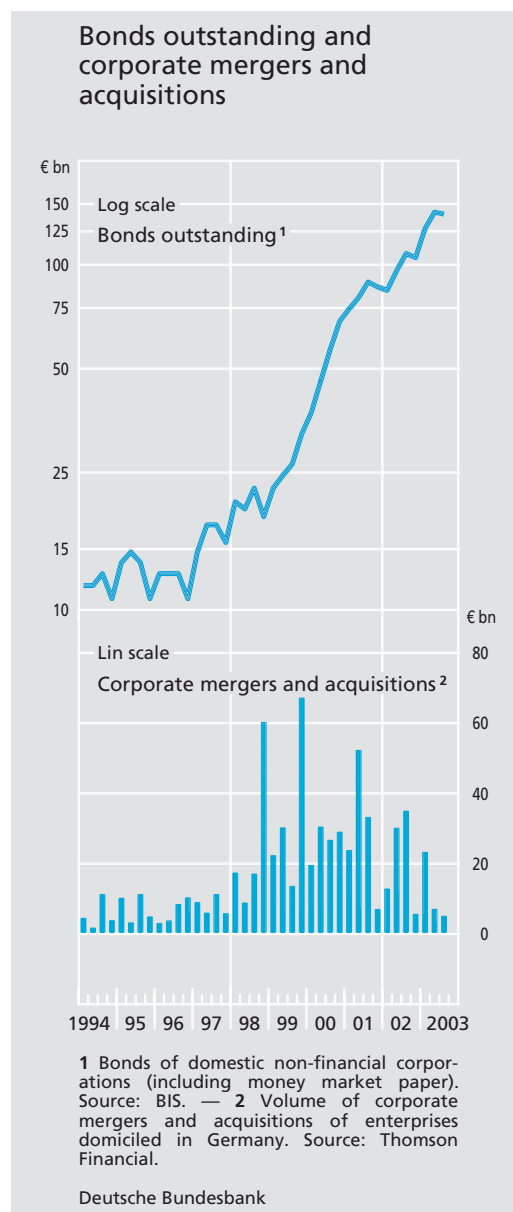
... became less important after 2000

Following the end of the technology and takeover boom as well as the slump in stock market prices, these temporary factors became less important from 2000. Between 1999 and 2001, the external financing of non-financial corporations exceeded their internal financing<sup>10</sup> (see chart on page 22), but declined noticeably thereafter. As a result of the slump in investment after the bursting of the technology bubble, the subsequent more subdued issuing activity of German enterprises and very weak bank lending, internal financing became the predominant form of financing again in 2002.

### Price formation aspects

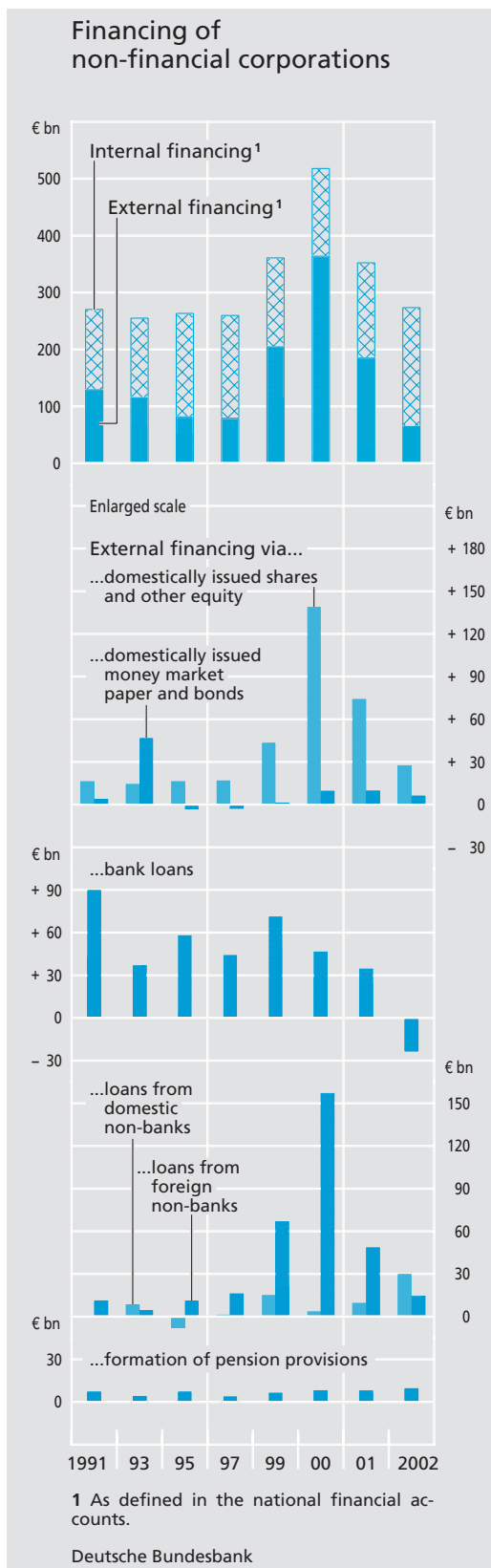
Cyclicality of financing conditions

Along with the growing importance of bonds for corporate financing, price formation in the market for corporate bonds is increasingly becoming a focus of interest. This centres on the rating agencies' assessment of the default risks and on the cyclicality of yields in the secondary market. Both of these have a crucial impact on corporate financing conditions. Excessive yield fluctuations of corporate bonds



which clearly go beyond movements in the general interest rate level plus a premium for the higher credit risks may lead to overinvestment at times when yield premiums are very low and to underinvestment at times when yield premiums are very high. Compared with a financial system which is dominated by relatively steady lending by relationship bankers,

<sup>10</sup> As defined in the national financial accounts, which count pension provisions as part of external financing.



a purely market-based system of corporate financing might lead to major fluctuations in borrowing and, ultimately, in real investment as well.

In Germany and Europe as a whole, rating agencies have clearly assumed a more prominent role in the assessment of creditworthiness since the late 1990s. Their judgement influences not only the investment decisions of potential investors but also the enterprises' decision to issue bonds. That is because the assessment by the rating agencies is reflected in the remuneration that an issuer has to offer and therefore has a major influence on the financing costs. For example, between April 2002 and January 2004 the average interest rate premium of European corporate bonds with a maturity of seven to ten years in the highest (AAA) rating grade (compared with government bonds of the same maturity) was around ¼ percentage point. By contrast, enterprises placed in the lowest investment grade (BBB) had to pay an average interest rate premium of roughly 1¾ percentage points. The interest rate premiums are even higher for bonds whose issuers are no longer classified as investment grade. Taking the average of the past two years, a C rating implied a premium of more than 20 percentage points. The interest rate premium therefore compensates the investors for the higher default risk of an enterprise with a poorer credit rating.

*Assessment of the default risks by the rating agencies*

Roughly just under 90% of the corporate bonds outstanding in Europe assessed by Moody's rating agency were classified as investment grade. Individual enterprises' rating

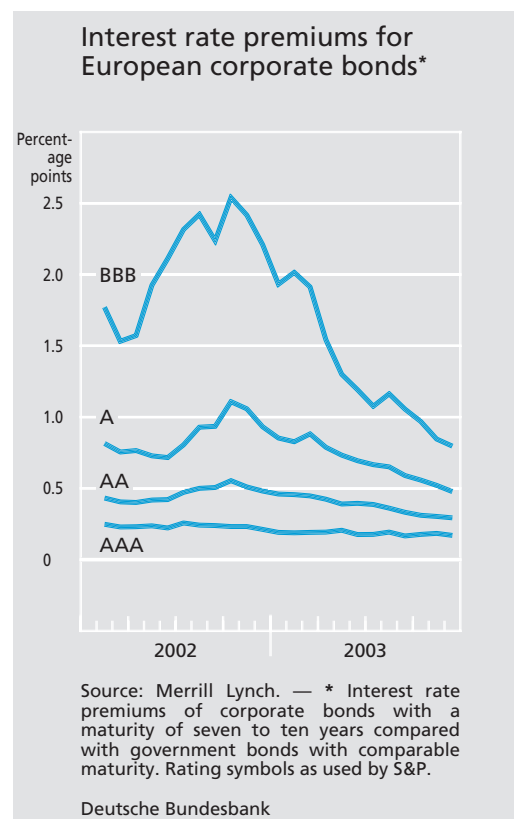
*Cyclical susceptibility of secondary importance for the rating process...*



assessments are quite stable over time. The long-term probability of an enterprise in the Moody's rating category Aaa being downgraded within the space of one year is no more than just over 9%. For a grade B enterprise, the probability of a downgrading within the space of one year amounts to slightly more than 12%. The relative consistency of the rating is the result of the rating agencies' attempt to assess the enterprises, as far as possible, independently of the business cycle (rating through the cycle). Across nearly all rating categories, downgrading was more likely than upgrading. This may reflect a certain selection process, ie that it is mainly "good" enterprises which issue bonds or that enterprises choose a point in time to launch a bond issue when they are given a good rating by the agencies. Despite the medium-term orientation of the rating agencies in the business cycle, there are noticeable fluctuations in the ratio of downgradings to upgradings (see chart on page 24). For instance, the relationship between the number of downgradings and upgradings in periods of economic slow-down tended to be higher (such as in 1993 or after 2000). In periods at the top of the economic cycle, upgradings sometimes exceeded downgradings. In relation to the total number of bonds assessed, the number of rating changes was nevertheless very small. The cyclicity of the default risk assessments therefore affected only a small percentage of corporate bonds.

*... even so, interest rate premiums fluctuate noticeably over time*

Irrespective of changes in the rating assessments, there were noticeable fluctuations over time in the interest rate premiums for bonds of certain rating categories. For Euro-



pean enterprises rated BBB, this premium was far more than 2 percentage points at times in 2002 but the figure had fallen to below 1 percentage point at the end of 2003. The decline in yields in the case of high-interest debt instruments with a high default rate was even more marked. The interest rate premium of C-rated European bonds declined from over 30 percentage points in 2002 to less than 10 percentage points in the following year. To a certain extent, such fluctuations in the interest rate premiums may be described empirically in terms of the determinants of a structural model for valuing higher-risk debt securities (see box on page 25). The determinants are identified as movements and volatility of equity prices, the interest rate level of risk-free investments and the enterprises' degree of indebtedness.



## Outlook

*Corporate bonds as an increasingly important form of financing...*

Besides the traditionally most important issuers of debt securities – the financial institutions and the public sector – non-financial enterprises have increasingly been issuing such paper in the past few years. While net sales in this market segment have fluctuated considerably on occasion, the overall market volume has risen sharply. The corporate sector has thus opened up a significant external source of funds for itself alongside bank loans.

*... likely to become even more significant*

Banks' increasing orientation to the financial market and the yield orientation of investors are likely to impart a strong momentum to the market in the future as well. It is not only a look back at the development of the market in the USA but also the experience in the

United Kingdom and France which suggest that this financing instrument has a considerable potential. In principle, the emergence of a market for high-yield bonds makes it possible for enterprises without an investment grade rating to tap the capital market as well. At the same time, small and medium-sized enterprises play a very important role in the German economy by international standards and, on account of their size alone, do not come into consideration as independent bond issuers. It may therefore be assumed that loan financing will continue to be a major source of funding in the future as well. That is not necessarily a drawback for corporate financing in Germany since the advantages of obtaining funding in the capital market can also be secured for smaller enterprises in other ways, such as the indirect securitisation of traditional bank loans for which a new platform has been created as part of the "True Sales" initiative of the German banks.

From an investor's perspective, there are favourable conditions in place for further market growth. The growing volume of savings associated with the necessary creation of a supplementary funded pension system represents an increasing trend potential for the future expansion of the market for corporate bonds. The establishment of major indices reflecting market developments is likely to bolster the liquidity and growth of the market. The main barriers still lie in the differences in national insolvency law and creditor protection in capital market law, which international investors see as major obstacles to market entry. Ensuring greater harmonisation in this respect remains a major task.

*Market upturn to be expected due to institutional investors*

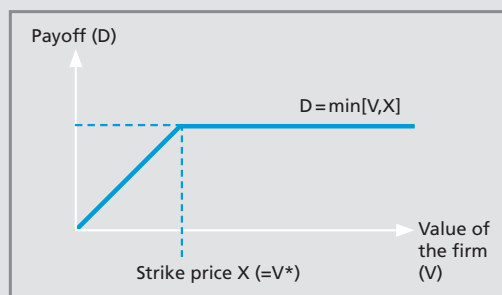
## Structural model for valuing corporate bonds

An approach to valuing corporate bonds commonly applied in finance literature is that developed by Robert C Merton (1974).<sup>1</sup> According to the Merton model, the payoff at maturity from holding a corporate bond subject to the risk of default is the same as being long a riskless asset and short a put option on the market value of the firm with a strike price equal to the nominal value of the bond.

The idea behind the model can be illustrated by way of a simple example. A company issues a zero-coupon bond with a nominal value  $X$ . If the market value of the firm  $V$  is greater than the nominal value of the bond at maturity ( $V$  is greater than  $X$ ), the bondholders will get back the amount  $X$ . If, however, the market value  $V$  is lower than the nominal value of bond  $X$  ( $V$  is lower than  $X$ ), the bondholders (in the case of a limited liability company) will receive only amount  $V$  (which is equivalent to the full market value). The repayment  $D$  to the bondholders is therefore determined by  $D = \min[V, X]$  (see adjacent chart<sup>2</sup>). The repayment  $D$  thus resembles the payoff from an option on the market value of the firm where the strike price is the nominal value of the bond. The bondholder therefore grants the owners of the (limited liability) company a put option, which the said owners will exercise as soon as the company's market value is lower than the nominal value of the bond. Purchasing a corporate bond is thus the same as holding a combination of an equivalent riskless bond and a written put option (short put) on the market value of the firm with the strike price equal to the nominal value of the bond.

The price of a risky corporate bond is therefore derived from the price of a riskless bond with the same maturity less the price of the put option. In option pricing theory, the value of a put option should be derived

<sup>1</sup> R C Merton (1974), On the pricing of corporate debt: the risk structure of interest rates, *Journal of Finance* 29, pp 449-470. — <sup>2</sup> Source: A Bevan and F Garzarelli (2000), Corporate bond spreads and the business cycle, *Journal of Fixed Income* 9(4), pp 8-18. — <sup>3</sup> These variables are derived by analogy from the general option pricing factors: the price and volatility of the underlying, the strike price of the option and the riskless rate of interest. The time to maturity of the option can be disregarded in this case if it matches that of the riskless bond. — <sup>4</sup> The following variables were used for the empirical analysis of the bond spreads in the euro area. Interest rate premium: difference between the yields of a BBB-rated corporate bond index and an index for European government bonds (each with a time to maturity of seven to ten years); share price: Dow Jones EURO STOXX



from the nominal value of the bond or the degree of indebtedness (= the strike price of the option), the level and volatility of the firm's market value, and the riskless rate of interest.<sup>3</sup> A higher degree of indebtedness and a rise in the volatility of the market value raises the price of the put option and increases the interest rate spread of the bond relative to a risk-free asset. A higher riskless rate of interest, by contrast, lowers the value of the put option and should therefore raise the value of the corporate bond (= decreasing interest rate spread). A higher market value (share price) lowers the value of the put option and thus the interest rate premium of risky bonds.

The determinants derived from the model are also validated in an empirical analysis. For example, a simple regression for BBB-rated bonds in the euro area since 1999 using the factors applied in the Merton approach as independent variables explains around 45% of the monthly changes in interest rate premiums.<sup>4</sup> According to the results, the decline in stock market volatility and rising share prices have contributed to the sharp fall in interest rate premiums since 2002.<sup>5</sup> The smaller rise in the rate of indebtedness of European companies compared with the preceding period has dampened the interest rate premiums.

index; volatility: implied volatility of the Dow Jones EURO STOXX index; riskless rate of interest: yield on ten-year euro-area government bonds; degree of indebtedness: ratio of corporate indebtedness (bonds and bank loans) to GDP (linear interpolation of quarterly to monthly frequency) in the euro area. The estimation is in first differences owing to the non-stationarity of the variables. Sources: Merrill Lynch, BIS, Thomson Financial Datastream. — <sup>5</sup> The effect of the riskless rate of interest is difficult to establish, however. This may be connected with the relatively short observation period for European data. Bevan and Garzarelli (2000) show that there is a (positive) long-term relationship (cointegration) between government bond yields and interest rate premiums for corporate bonds on the basis of the US bond market from 1960 to 1999.