DEUTSCHE
BUNDESBANK

# FINANCIAL STABILITY REVIEW

November 2005

The *Financial Stability Review* is published by the Deutsche Bundesbank, Frankfurt am Main. It is available to interested parties free of charge.

This is a translation of the original German-language version, which is the sole authoritative text.

Deutsche Bundesbank, Wilhelm-Epstein-Strasse 14, 60431 Frankfurt am Main, Germany
Postfach 10 06 02, 60006 Frankfurt am Main, Germany

Tel +49 69 9566-1
Fax +49 69 561071
Telex 4 1 227 within Germany
4 14 431 from abroad

Internet http://www.bundesbank.de



ISBN 3-86558-096-3

The German original of this *Financial Stability Review* went to press on 4 November 2005.

# Financial Stability Review | November 2005

## LIST OF BOXES IN THE FINANCIAL STABILITY REVIEW

Analysis



Articles



Abbreviations and symbols

p Provisional; e Estimated; . Data unknown, not to be published or not meaningful; – Nil.
Discrepancies in the totals are due to rounding.

# Foreword from the President of the Deutsche Bundesbank

The Deutsche Bundesbank is presenting its *Financial Stability Review* as a separate publication for the first time after publishing the two previous reviews in December 2003 and October 2004 as part of its *Monthly Report*. Financial stability is of crucial importance not only for monetary stability but also as a topic in its own right. Functional shortcomings in the financial system, especially owing to instabilities, can cause considerable economic costs.

We define financial stability as the financial system's ability to perform its key macroeconomic functions well, including in stress situations and during periods of structural adjustment. This embraces the efficient allocation of financial resources and risks as well as the provision of an efficient financial infrastructure. Even in a stable financial system, it is not possible to rule out tensions in some market segments or among certain market participants, say as a result of competition or technological change. The financial system does have to be in robust condition, however, for it to be able to cope with such challenges. This primarily requires the market players to act on their own responsibility, especially with regard to risk management and risk provision, as well as an appropriate market discipline.

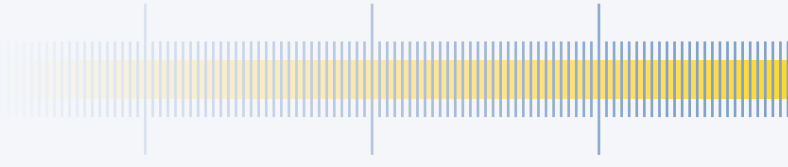
The analysis of financial stability is not confined to individual risks but also notably encompasses systemic risks – in other words, the danger of a self-reinforcing process that could spiral into a crisis, thus impairing the functional viability of the entire financial system or major parts of it. Systemic risks may arise if, for example, major intermediaries and/or various markets are subject to the same risks, which may easily give rise to contagion effects. For that reason, particular attention is paid to the interactions between and within the three components of the financial system: intermediaries, financial markets and financial infrastructure. In analysing stability, it is crucial to identify changes in the risk potential prior to the actual emergence of any systemic risks.

The *Financial Stability Review* brings together the expertise the Bundesbank has gained in the field of macroeconomic and financial market analysis, from international cooperation in the field of financial stability, its involvement in banking supervision as well as in its capacity as the operator and overseer of payment systems. It condenses these insights and provides assessments. It begins by identifying the principal risks arising from the international and domestic economic and financial market setting. This is followed by a detailed analysis of the risk situation and risk-sustaining capacity of the German banking and insurance industries as well as the financial infrastructure. The main, analytical part of the review is complemented by three in-depth articles which examine specific current financial stability issues: the role of bank competition, stabilisation progress in emerging market countries, and developments in corporate bond spreads.

Frankfurt/Main, November 2005

Professor Axel A Weber
President of the Deutsche Bundesbank

# Analysis



# Overall assessment

*Stability of the financial system firmer*

In 2005 the stability of the German financial system has strengthened further. This development has been assisted, firstly, by the considerable efforts undertaken by the German banks to lift their earnings and, secondly, by robust growth in the world economy along with moderate rates of inflation, and favourable financing conditions in the financial markets. Moreover, the corporate sector in the major industrial countries has made progress with its balance sheet adjustments.

*Easing of the risk situation in the banking system*

A point to be highlighted is the generally marked easing of the risk situation in the banking system, above all when compared with the situation in 2001 and 2002. At that time, there had been a marked deterioration in credit quality, especially in the case of large enterprises and commercial real estate borrowers; this had led to a massive rise in provisioning. The more relaxed risk situation is now gradually having a positive impact on earnings via a significant lowering of loss provisions. The banks have laid the foundations for this, in particular, by reducing risks in their loan portfolios, adjusting their balance sheets, and by pursuing a conservative risk provisioning policy in the past few years. Furthermore, the improved credit quality of large international enterprises and rising share prices in Germany have had a positive impact on current risk provisioning needs and the banks' and other investors' potential returns. By contrast, the persistent sluggishness of domestic economic activity is still restricting the scope to increase income.

*Risk factors on the international front*

A slowdown in global economic momentum might, however, significantly hamper the recovery process in the German financial system, especially as domestic economic activity is generating hardly any stimuli at present. Several risk factors in the international field could dampen the pace of global growth in the period ahead. For example, the sharp rise in crude oil prices, alongside expectations that these prices could become entrenched at a high level, are already having a dampening effect. In addition, a continuation of consumption-driven business activity in the USA might be vulnerable – particularly in view of households' high level of indebtedness – to rising interest rates, stagnating or declining house prices and a halting increase in employment. As the imbalances in the current accounts of major economies and regions are growing, the outlook for a tension-free process of adjustment has probably dimmed.

Even so, there are factors which could mitigate the risks to Germany's economic development – and, with it, the German financial system – arising from these external influences. For example, greater energy efficiency and the now faster recycling of the oil-exporting countries' growing revenues into export demand have lessened the impact of rising oil prices on the German economy. The experience of the past few years also shows that shifts in some exchange rates have only a moderate effect on Germany.

*Domestic risk factors*

The internal risks to the German financial system stemming from the still fragile do-

mestic economic dynamics consist at present mainly in a persistently low demand for credit, especially in the case of business loans. This is a reflection of muted investment demand and of the ongoing sluggish condition of the real estate markets. By contrast, investment in machinery and equipment has developed positively of late and the propensity to invest is increasing, not least on the part of small and medium-sized enterprises (SMEs). In the commercial real estate markets, a deceleration of the downward trend is apparent, which means that the slide may be bottoming out, and in the housing market, too, there are signs that justify cautious optimism concerning future developments.

*Role of the international financial markets …*

Over the past few years, the international financial markets have been characterised by a protracted phase of low interest rates and predominantly low volatility. The downside of the favourable financing climate is a very ample provision of liquidity, which contributes to an increased risk propensity on the part of many market players. This is reflected *inter alia* in low risk premiums and an increase in leveraged trading positions. Risks arising from any existing weaknesses might potentially materialise in the wake of a reversal in the financial markets if, for example, monetary policy were to switch to a neutral course or a cyclical reversal were to occur in the credit quality of major issuers. However, stress tests of German banks' major risk factors confirm the banks' ability to cope with significant shocks.

*… and financial players*

Sudden liquidity shortages in individual markets with perhaps sharp price surges are a risk that has to be taken seriously, especially as the market players are increasingly pursuing similar trading strategies. In actual fact, both the correlation of banks' trading results and the correlation of hedge funds' performance, especially those of funds of funds, have increased. In this connection, additional liquidity risks arise from the growing preference on the part of hedge funds for less liquid investments. Such risks also arise from the development of innovative instruments with complex structures, whose market liquidity could be impaired in stress situations. In the banks' relationships with the hedge funds, sophisticated risk management and a sound settlement infrastructure, which currently do not keep pace in all cases with business developments, are therefore becoming increasingly important. Above all, the goal of enhancing transparency in the hedge fund sector deserves high priority.

*Elements of the ability to sustain risk: profitability …*

Profitability, which is a key factor in the banking system's ability to sustain risk, is shaped crucially by the macroeconomic setting. First, it influences the demand for credit and bank services and thus institutions' income prospects and, second, the risk situation in the individual lending segments. A gradual improvement has been apparent recently in the loan portfolios of credit institutions with a business focus on SMEs. The weak state of the commercial real estate markets is reflected, however, in many Pfandbrief (mortgage) banks' disproportionately high levels of write-downs as well as, in some cases, in strains resulting from their ties with investment companies that have launched real estate funds. Specialised consumer banks find themselves faced with increasing loan loss provisions because households' credit quality has declined slightly – albeit from a high level. Even so, the finan-

cial condition of households in Germany does not present any particular risk potential; as a rule, the margins precisely in consumer credit business exceed the risk of loss.

*… and capitalisation*

Capitalisation, as a further essential component of the German banking system's ability to sustain risk, has shown a satisfactory course of development. Nevertheless, implications of the changeover to the new IAS/IFRS accounting standards should be monitored very closely. Comprehensive reforms of the liability systems that safeguard institutions in the savings banks and credit cooperative sectors merit a positive assessment.

*Stronger financial base in the insurance sector*

The insurance sector is also extremely important for German financial stability. This sector now manages more than one-quarter of households' financial assets in Germany. Overall, the insurance sector has been able to further strengthen its financial base. Its trend-oriented investment behaviour had led to considerable investment income losses at the beginning of the decade, compelling this sector to liquidate substantial capital reserves in the past few years. Nevertheless, the persistently low interest rate level is placing a particular strain on the life insurance companies. Owing to their conservative investment policy, they generate comparatively little investment income but, on competitive grounds, are very reluctant to reduce the overall remuneration of policyholders' accounts. It also remains to be seen what impact tax and regulatory changes will have on the sector's rather heterogeneous product mix. Attention also has to be paid to reinsurance business, where the large payouts of claims in 2004 and 2005 – given the unfavourable capital market conditions – can only partly be cushioned by the globally interlinked insurance companies.

*Limited potential risk from the financial infrastructure*

The financial infrastructure used by the German market players can still be attested a generally low risk potential in terms of the threat to financial stability. However, precisely in the area of settlement systems, there is scope to further reduce operational risk in future.

# Macroeconomic risks

Monetary stability and steady economic growth in line with potential growth are the most important macroeconomic requisites for financial system stability. Weaknesses in macroeconomic developments may hold risks both for the financial markets and financial institutions.

## Risks emanating from international environment

*International influences on German financial system*

Global macroeconomic developments affect the stability of the German financial system in several ways. First, Germany's considerable dependence on exports and its close integration into the world economy through direct investment mean that external cyclical and exogenous shocks have a direct impact on the economic situation. Second, sharp fluctuations in the international financial markets and incidences of a major economic downturn abroad spill over into the German financial system in general and bank lending in particular.[1]

*Three macroeconomic risk factors*

In view of the still robust state of the world economy and the persistently sluggish economic recovery in most large European economies, three macroeconomic risk factors in the international environment deserve special attention: the sharp increase in crude oil prices, the fact that the US economy continues to be sustained by consumption, and the increasing global imbalances.

*Crude oil price rise as a risk factor*

The upturn in the world economy continued during the first six months of 2005 albeit at a somewhat slower pace towards the end of this period.[2] The main reason for the weakening momentum was probably the marked increase in crude oil prices. The markets expect very high oil prices for the foreseeable future; the prices for long-dated futures contracts have seen a disproportionately large rise during the past few months and are now only slightly below the current spot prices (see chart 1.1.1 on page 14).

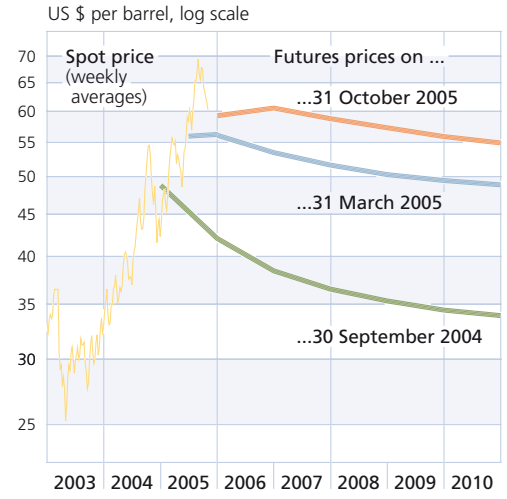
*Economic agents coping with energy price increase*

The negative consequences of the sharply rising prices for the world economy have been limited on the whole so far compared with the distortions in earlier periods.[3] This applies in particular to households in western Europe and Japan, whose real energy-related income losses since the last oil price low at the end of 2001 have been less severe than those of US consumers. This has been due both to the exchange rate shifts to the detriment of the US dollar and to the greater energy efficiency of private consumption in Europe and Japan.[4] Moreover, it seems that the increase in the revenues of the oil-exporting countries is now being channelled much more quickly into imports of goods than was the case in the past.[5]

**1** At the end of June 2005 the consolidated external claims of the German banking system amounted to about €2.6 trillion; this means that the German banking system is the world's largest creditor group.
**2** See also IMF, World Economic Outlook, September 2005.
**3** It is worth noting that the IMF has made virtually no changes to its latest forecasts on world economic developments for 2005 and 2006 even though the oil price assumptions on which its forecasts were based have since been revised sharply upwards to $54.23 for 2005 and $61.75 for 2006. Evidently, the endogenous forces of the global upswing are being seen as very robust.
**4** See Deutsche Bundesbank, Monthly Report, August 2005.
**5** See also Deutsche Bundesbank, Monthly Report, May 2005.

Chart 1.1.1

**CRUDE OIL FUTURES PRICES***




Source: Datastream. — * Spot price and futures contract prices for light sweet crude oil on the NYMEX.

DEUTSCHE BUNDESBANK

This may reduce the cyclical risks posed by an oil price increase, especially in Europe.

*No second-round effects so far*

In contrast to what happened during the oil crises of the 1970s, there have evidently been no second-round effects so far in terms of prices. Consequently, core rates have remained much lower than the headline rates of consumer price increases. Expectations for longer-term inflation have barely risen so far.

*Favourable financing conditions*

The continuing, very favourable financing conditions in the capital markets have played a major part in the remarkable resilience of the world economy, which has been coping fairly well with the strains and risks emanating from the crude oil market and other commodity markets. This has been of particular benefit to a number of emerging market economies in the form of relatively low interest rate premiums (see the article entitled "Stability level achieved in highly indebted emerging market economies" on pages 117 ff). However, signs, for example, of second-round effects from the marked rise in crude oil prices could heighten expectations that inflation rates will rise, and that would be reflected in an increase in long-term interest rates.

*Continuation of consumer-led economy in USA as a risk factor*

For some time now, the strong growth in the world economy has been driven by the two growth poles, the United States and Asia, especially China, India and other Asian emerging market economies. The economic situation in the United States, which accounts for about one-fifth of the world's annual economic output, has a not inconsiderable impact on the European economy through international finance and trade relationships. In view of the fact that the cyclical recovery in Germany is not yet self-sustaining and is largely dependent on exports, a deterioration in the fundamentals or diminished growth expectations in the United States could also have repercussions for the German financial system.

*Buoyant consumption brings saving to a virtual standstill ...*

The main risk to economic growth in the United States lies in the large volume of household debt. In the United States, economic growth is traditionally driven, on the demand side, more by households' spending on consumption than is the case in many other economies (see chart 1.1.2). The rapid growth in consumption during the past few quarters is due to increases in disposable income, partly as a result of the continued rise in employment, low real interest rates and

wealth effects in the wake of the boom in the housing market. The potential for additional credit-financed consumer spending, which has arisen from the refinancing of mortgage loans or the taking out of new ones since 2000, will probably diminish increasingly even in a scenario that is only slightly less favourable with a slower rise in house prices and no further fall in interest rates. With a saving ratio close to zero, households as a sector have largely relinquished their natural role as suppliers of capital, and that raises an additional question about the sustainability of such a constellation (see chart 1.1.3).

*… and creates large household debt …*

While household debt in the United States has grown during the past few years to 119% of disposable income, which is a high figure by international standards, debt servicing has shown only a moderate increase to 13.6% of disposable income at the last count owing to the low interest rate level. Indicators of the financial soundness of the household sector such as the ratio of bad loans, which has fallen to a long-term low, and households' net worth, which has grown as a result of the rapid rise in property prices, can no longer conceal the attendant weaknesses, however (see box 1.1 on page 16).

*… which sets limits on further consumption potential*

Large debt and the regular associated payment commitments have markedly increased households' vulnerability in the event of a loss of income, greater interest expenditure or slower-than-expected growth in property prices.[6] In these cases, negative repercussions for consumption in the United States are to be

**6** It is also likely that, as debt increases, the potential to improve credit quality in retail banking will be largely exhausted.

Chart 1.1.2

## CONTRIBUTIONS TO PERCENTAGE CHANGE IN REAL GDP IN THE UNITED STATES

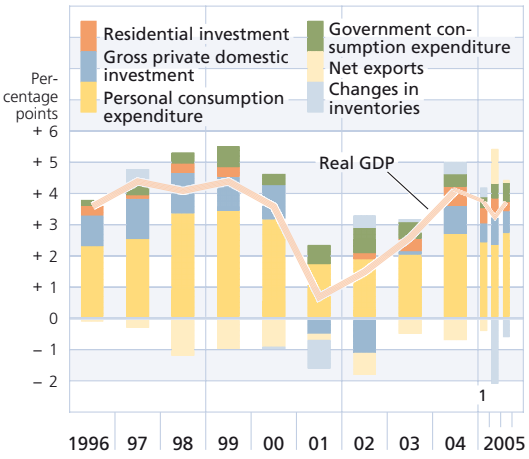
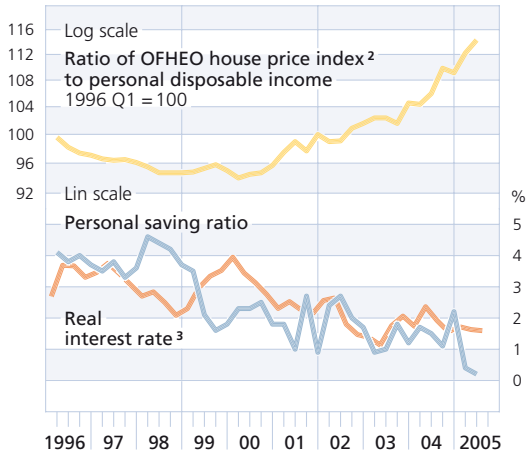



Chart 1.1.3

## REAL ESTATE PRICES, SAVING RATIO AND REAL INTEREST RATE IN THE UNITED STATES




Source: Bureau of Economic Analysis. — **1** From 2005, seasonally adjusted annualised quarter-on-quarter change. — **2** Source: Office of Federal Housing Enterprise Oversight (OFHEO). — **3** Ten-year inflation-indexed US government bonds.

DEUTSCHE BUNDESBANK

Box 1.1

## THE IMPORTANCE OF FOREIGN REAL ESTATE MARKETS FOR THE GERMAN FINANCIAL SYSTEM

Real estate markets are generally very sensitive to interest rate changes.[1] In line with this pattern, the real estate markets in many countries recorded more dynamic construction investment and price rises following the sharp decline in key interest rates and mortgage rates in 2001 and 2002.[2] Owing to its size, developments in the US market are particularly significant for the stability of the international financial system. From a German perspective, the real estate markets in the United Kingdom and in the other large member states of the euro area also have a certain relevance. In this connection, there are three possible channels through which shocks can be transmitted to the German financial system: cyclical effects, its investment in foreign real estate markets, and business relationships with other financial intermediaries whose financial standing is heavily dependent on the state of the real estate markets.

Between early 2001 and mid-2005, house prices in the United States rose by 44%, whereas households' disposable income increased by only 23%. By historical standards, such a large difference in growth rates is unusual, although this can be partly explained by the low level of mortgage lending rates. During the same period, residential real estate investments alone accounted for 12% of the overall economic growth in the United States. One of the effects of this was the generation of major stimuli to the labour market and to labour income. An even more significant real estate market contributor to economic growth was probably in the "private consumption" sector since this is where wealth effects and housing equity withdrawal are reflected. The higher debt-to-income ratio of US households, particularly in the middle and low income groups, and the larger percentage of variable-rate real estate loans have also made consumption more sensitive to interest rate changes. Furthermore, "more exotic" types of credit have been introduced into the market, which allow the borrower to defer interest payments and redemptions over longer periods of time - "interest only mortgages", for example. In subsequent periods, this can result in substantial financial burdens for these households. Owing to the overall greater vulnerability and the key function of the real estate market for private consumption, we believe that, in the medium term, a severe slowdown of growth in the US cannot be ruled out, which could then also affect the export-dependent German economy.

The direct exposure of German banks, insurance companies and investment funds in the real estate markets in the United States, the United Kingdom and the member states of the euro area is, if anything, limited and not excessively concentrated. Nevertheless, valuation losses resulting from higher counterparty risks for loans, securities and participating interests with a link to foreign real estate markets would constitute an additional burden in an economically weaker setting. Among the foreign counterparties of the German financial institutions, the large and well diversified financial intermediaries, in particular, probably have sufficient reserves and effective risk management systems to be able to cope with a stress scenario in the real estate markets. For some smaller and specialised foreign banks, there are, in fact, signs of possible vulnerabilities, such as risk concentrations in commercial real estate and construction firms. However, given the size of these banks, systemic risks are extremely unlikely.

**1** See, for example, Kostas Tsatsaronis, Haibin Zhu, What drives housing price dynamics: cross-country evidence, BIS Quarterly Review, March 2004, p 75 ff. — **2** Other factors which also influence the dynamics in the real estate markets are fiscal, regulatory and demographic changes, as well as the expected income growth.

DEUTSCHE BUNDESBANK

expected,[7] especially as the negative effects of "exotic" financing instruments would probably also come into play.

*Global imbalances as a risk factor*

Cyclical and exchange rate risks are associated with imbalances in the world economy that have built up over a period of years (see chart 1.1.4 on page 18). IMF forecasts currently assume that the US current account deficit will increase to 6.1% of gross domestic product in 2005 and 2006, not least in view of the trade-weighted appreciation of the US dollar in the first six months of 2005.[8]

*Scenarios for reducing imbalances*

Essentially, there are three conceivable scenarios for the unwinding of global economic imbalances. In one generally tension-free scenario, capital flows are fundamentally changed by a combination of economic and exchange rate policy adjustments. This requires further growth-promoting structural reforms in Europe and Japan, increased private and public sector saving in the United States as well as greater exchange rate flexibility in Asia. Such a mix would take pressure off the foreign exchange markets. A second scenario envisages an orderly reduction of imbalances through exchange rate and interest rate channels. A decline in investor interest in US-dollar-denominated financial assets leads to a depreciation of the US dollar and a gradual increase in interest rates followed by a reassessment of real and financial assets; both effects would probably not remain confined to the United States. This might be followed by a period of weaker economic growth world-wide, resulting in additional strains on the balance sheets of financial institutions owing to a deterioration in credit quality. Finally, a third scenario, namely a crisis scenario, envisages the risk of rapid exchange rate movements, including temporary overshooting. This might happen if, in the financial markets, there were a sudden reassessment of the relevance and medium-term sustainability of the US current account deficit. In this case, financial intermediaries could face the challenge, in particular, of volatile and abrupt changes in financial market prices.

*Lasting correction of fundamental causes of imbalances not in sight*

The prospects of a smooth unwinding of the existing imbalances have not improved during the past few months. The shifts in the international current account structure accompanying the sharp rise in oil prices have now to be added to the existing regional differentials in economic growth rates and the hesitant response of economic policymakers.[9] The envisaged budgetary consolidation in the United States will probably be delayed owing to the hurricane damage, the cost of which cannot yet be reliably quantified. Even if they are consistently pursued, the structural reforms already in hand in Europe and Japan will only become fully effective in the medium and long term anyway. In the short term, it is unlikely that there will be any sustained change in the different regional saving and investment patterns that are at the root of the global financial imbalances.

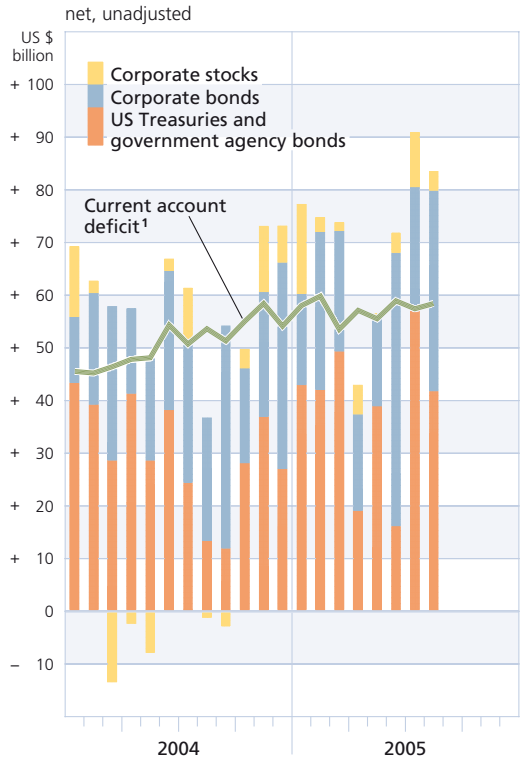
*New exchange rate system in China*

China has taken an important economic policy step towards more exchange rate flexibility by slightly revaluing the renminbi against the US

**7** In the past few years, some European countries have likewise been recording large house price increases and, associated with this, a marked increase in household debt along with a largely stable debt servicing ratio.
**8** See IMF, World Economic Outlook, September 2005.
**9** It is worth noting that the aggregated bilateral current account surplus of the oil-exporting countries in the Middle East and Russia vis-à-vis the United States will probably exceed that of the emerging market economies in east Asia at the end of 2005.

Chart 1.1.4

**PRIVATE PORTFOLIO CAPITAL INFLOWS INTO THE UNITED STATES AND US CURRENT ACCOUNT DEFICIT**




Source: US Treasury and Bureau of Economic Analysis. — **1** Excluding income and current transfers.

DEUTSCHE BUNDESBANK

dollar and linking it to a currency basket.[10] However, the immediate effects on global imbalances of even a fairly strong appreciation of the renminbi against the US dollar will probably remain slight.[11] For the current year, it is more likely that the Chinese current account surplus will actually increase to about 6% of GDP (compared with 4.2% in 2004). It is still unclear how far the new exchange rate regime in China will also be linked to a restructuring of the investment of foreign currency reserves and what effect this might have on the international foreign exchange and capital markets.

*Investors remain very willing to finance US current account deficit*

This means that, in terms of the fundamentals, a reduction of the external imbalances is unlikely in the near future. At the same time, however, there is little sign of these imbalances being abruptly unwound in the foreign exchange markets in the immediate future. The capital inflows of public and private investors have so far been indicating that there is a continuing high degree of willingness to finance the growing US current account deficit. This is being encouraged even more by the recent increase in the positive interest rate differential of US dollar bond yields vis-à-vis yields on comparable securities in other major countries.

*German economy and financial system affected mainly indirectly*

There are also mechanisms to mitigate the risks of setbacks. For example, the US dollar derives enormous support from the considerable economic power of the United States and from its role as the key international currency. Moreover, experience over the past few years has shown that the direct effects of exchange rate movements on economic growth in the euro area are generally limited. This is particularly true in the case of Germany. For example, the regional diversification of German foreign trade reduces the effects of exchange rate movements vis-à-vis individual currencies. Another point is that Germany's trade with the other euro-area countries, which accounts for more than 40% of all German exports, is not affected by exchange rate movements, at least

**10** After the announcement of the change in the Chinese exchange rate regime Malaysia likewise ceased to peg its currency to the US dollar.
**11** Production costs and labour costs in the US are currently about 30 times those in China.

not directly. Germany's price competitiveness has also improved during the past few years.

Generally speaking, none of the three international macroeconomic risk factors is likely to pose an acute risk to the German financial system at the moment. In the medium term, however, they may cause a discernible deterioration in the global economic environment, especially if several of these risk factors were to come into operation at the same time.

## Risks emanating from domestic environment

*Weak growth in bank lending*

The sluggish domestic economy is reflected in a persistent weakness in bank lending. Loans to German non-financial corporations continue to decline, the most recent annual fall being 1¾%. The present lending volume is now about 8½% below the peak at the end of 2001. It is striking that, in contrast to this, the low point in lending to non-financial corporations in the euro area is long past and that bank lending is now expanding at an annual rate of just over 6¼% (see chart 1.1.5 on this page). The sluggish investment activity can also be seen in the fact that German non-financial corporations had a financial surplus of about €12 billion in 2004.[12] The weakness in demand is making it more difficult to acquire new business and to achieve profitable margins. Nevertheless, margins in corporate lending are proving to be comparatively resilient. This suggests that the German banks are operating in a decidedly risk-aware manner (see chart 1.1.6 on this page).

**12** See Deutsche Bundesbank, Investment and financing in 2004, Monthly Report, June 2005.

Chart 1.1.5

### LOANS OF GERMAN BANKS TO DOMESTIC NON-FINANCIAL CORPORATIONS AND INDIVIDUALS

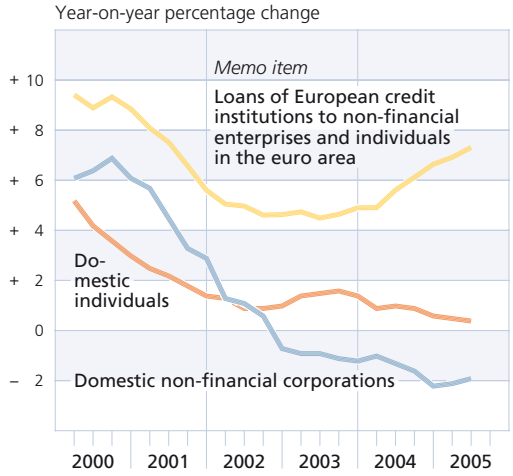
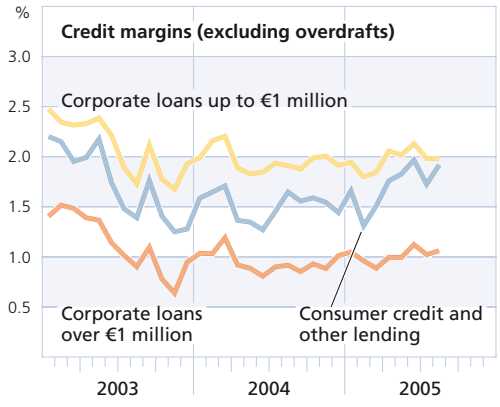



Chart 1.1.6

### RISK PREMIUMS OF GERMAN BANKS IN NEW LENDING BUSINESS*




Sources: Harmonised euro-area interest rate statistics, Bloomberg and Bundesbank calculations. — * The risk premiums are calculated on the basis of individual time bonds as the differential vis-à-vis maturity-appropriate yields of European government bonds and aggregated over all maturities weighted by volume. In order to eliminate volume effects over time as far as possible the volumes are kept constant.

DEUTSCHE BUNDESBANK

Chart 1.1.7

## INVESTMENT PROPENSITY OF SMEs*

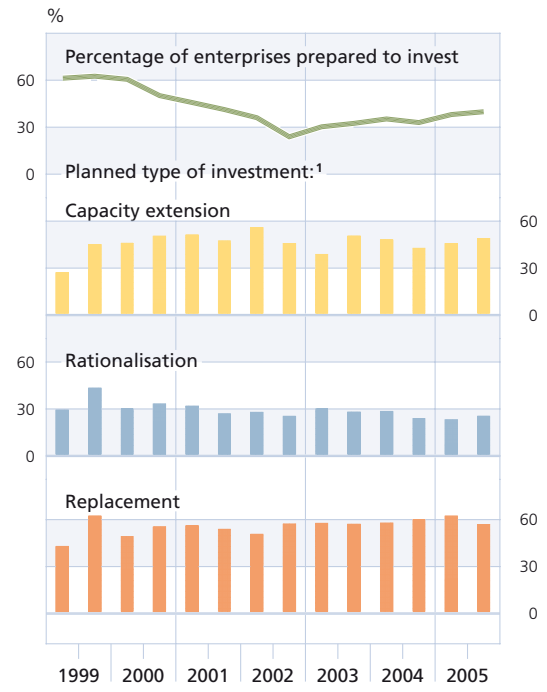
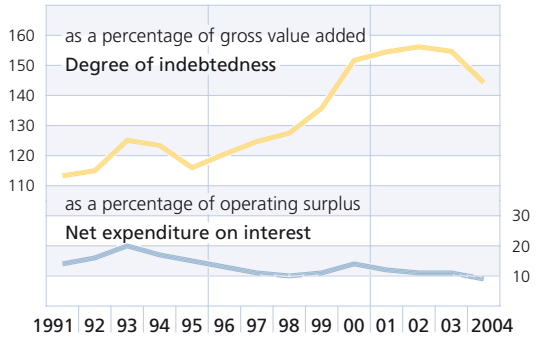



Chart 1.1.8

## ENTERPRISES' FINANCIAL INDICATORS




* Source: Creditreform survey "Wirtschaftslage und Finanzierung im Mittelstand". — **1** Types of investment may be cited more than once.

DEUTSCHE BUNDESBANK

*Balance sheet structures*

The upside of the weakness in investment activity is that the adjustments of the balance sheet structures in the non-financial corporate sector in Germany have made good progress. Above all, large enterprises reduced their liabilities last year. This means that the level of indebtedness fell from 156% of gross value added in 2003 to 145%. Enterprises' interest burden has shown a further decrease (see chart 1.1.8 on this page).

At all events, there are signs of a slight recovery in investment activity. In the second quarter, overall economic output was bolstered by a slightly improved domestic demand. The positive development in investment in machinery and equipment continued at a slower pace, which means that it has now moved away from its low in the spring of 2004. Real spending on buildings remained subdued, however. Moreover, inventory investment made a positive contribution to growth in the first half of 2005 as stock positions were increased sharply with the help of imports.

*Investment in machinery and equipment recovers slightly*

According to the surveys by Creditform on the investment propensity of small and medium-sized enterprises' (SMEs), around 40% of SMEs want to invest in the coming 12 months. That is, at least, the highest figure since 2001 (see chart 1.1.7 on this page). SME investment plays a crucial role in the development of bank loans, which are the main source of refinancing for SMEs.

*Real estate market weak*

In Germany – unlike other countries – the real economy has not been supported by a positive wealth effect on consumer demand resulting from rising house prices or by positive prospects for employment in the construction

sector. The German real estate market is still showing itself to be weak, especially in the commercial and industrial segments. The markets for office space are going through an adjustment phase with falling peak rents and rising vacancy rates. The market for retail outlet space is developing along similar lines. However, the segment of "top locations" has held up relatively well despite a decline of more than 1% in the price level last year. In the secondary locations, by contrast, rents, which have fallen considerably on a longer-term comparison, fell by 2.5% last year.[13] House prices have likewise fallen latterly, albeit with significant differences from region to region. In western Germany, prices are now at roughly the 2000 level. The adjustment in house prices that has been under way in eastern Germany since 1995 is continuing (see chart 1.1.9).

*Mutedly positive future outlook in housing*

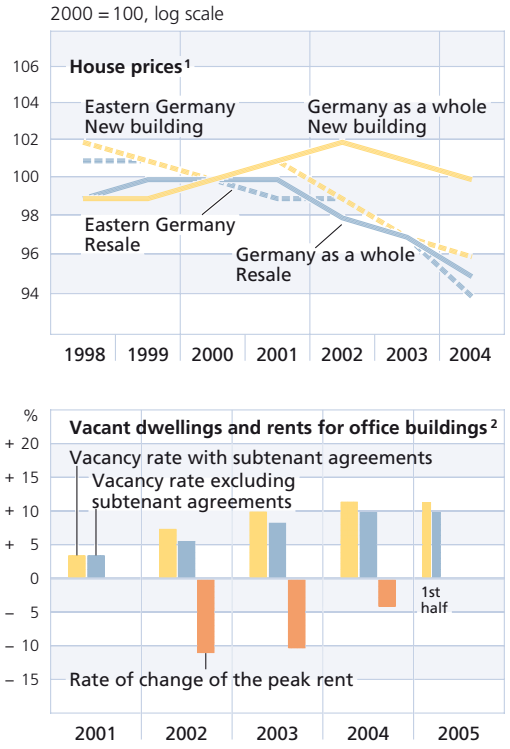
Given the subdued outlook for the economy in Germany and a certain amount of supply-side pressure with regard to both office and retail outlet space, the situation cannot be expected to pick up significantly in the short term. At all events, the downward trend appears to be weakening and a bottoming-out now seems possible. The future outlook for residential property is likely to be mutedly positive. This is suggested by certain fundamentals such as the current interest rate level and the development in rents and households' disposable income. This is also indicated by the increasing interest of foreign investors in German real estate.

*Strains for banks and funds*

All in all, the downward trend in the German housing market stands in stark contrast to the boom in a number of other countries. The weakness of the market is putting a strain on the German financial system through both larger write-downs and a lack of new business. Mortgage banks' value adjustments in 2004 were at an exceptionally high level, for example. At the same time, open-end real estate funds focusing on investment in Germany have shown falling yields in the past two years.

Chart 1.1.9

## REAL ESTATE MARKET IN GERMANY




**1** Source: Bundesbank calculations based on BulwienGesa AG data. — **2** Weighted office area average in Berlin, Düsseldorf, Frankfurt am Main, Hamburg, Munich and Wiesbaden. Source: Jones LangLasalle and Bundesbank calculations.

DEUTSCHE BUNDESBANK

**13** See BulwienGesa AG, Real estate index, February 2005.

# Risk situation in the financial markets and in the international financial system

## Interest rate environment and search for yield

*Capital markets still characterised by a "search for yield" …*

This year, as in the preceding three years, the international financial system has been marked by a continued low interest rate environment and abundant liquidity in key industrial countries. In Japan, key interest rates have remained at all-time lows and, in the United States, despite multiple interest-rate hikes, monetary policy up to and into the fourth quarter cannot be regarded as having been restrictive. In the euro area, too, interest rates remain at an all-time low level, and the money stock M3 has grown very sharply throughout the reporting period, leading to the creation of high excess liquidity. In view of the worldwide abundance of liquidity, the low long-run yields on government bonds and the flattening of the yield curves (see chart 1.2.1 on page 23), "the search for yield in riskier assets" is likely to define the actions of many market participants for the time being.

*… , which is also reflected in investors' increased propensity to take risks*

Although different factors affect valuation in the individual market segments, in many cases the factors they have in common are signs of relatively low risk premiums and increasing use of leveraged instruments, such as in credit markets. The moderate volatility in the international financial markets (see chart 1.2.2 on page 23), seen against the background of the currently robust macroeconomic data, reflects a relatively strong feeling of safety.[1]

If, however, the macroeconomic environment unexpectedly worsened, for instance, this could trigger a turnaround in sentiment that would also be reflected in a much more pronounced aversion to risk in the financial markets. Investors who made their investment decisions expecting lastingly low risk premiums and volatility would then suffer losses on their investments. At the same time, the attendant deterioration in financing conditions could also have a perceptible impact on corporate investment and private housing construction. In addition, if uncertainty in the financial markets were to grow further, households could also be expected to increase their precautionary savings.

*Low real interest rates …*

A major starting point for the international "search for yield" consists in the low long-term interest rates on low-risk government bonds. In the US capital market, the decoupling from the usual relationship between expected long-term economic growth and real capital market rates (see chart 1.2.3 on page 24) remains particularly pronounced. By contrast, the gap between ten-year real interest rates and growth expectations is not as large in the euro area.

*… attributable to special factors*

The gap between real interest rates and growth expectations may be explained by a

**1** See also Deutsche Bundesbank, The role of volatility patterns in financial markets, Monthly Report, September 2005.

number of special factors. Prominent among these are the unusual net savings of the global corporate sector, increased demand on the part of insurance companies and pension funds for longer-term debt instruments,[2] and capital inflows into developed western economies through currency intervention by Asian central banks and the revenues of oil-exporting countries. One cannot rule out the possibility that special factors will continue to dampen yield levels for an extended period and that market players will develop a greater appetite for risk.[3] The magnitude of this special bond market risk will probably be determined to a large extent by the length of the preceding phase of decoupling and the abruptness of the subsequent correction.

*Low risk premium despite numerous uncertainty factors*

A continuation of the tightening of monetary policy in the USA and the consequent gradual onset of liquidity withdrawal are fundamentally likely to put upward pressure on long-term capital market rates. Against the background of considerable uncertainty about the sustainability of the special factors, the current valuation level of the bond markets, particularly in the United States, seems to be based to a considerable extent on a low risk premium, which is also reflected in the low level of implied volatility.[4]

Chart 1.2.1

**YIELD CURVE SLOPE***

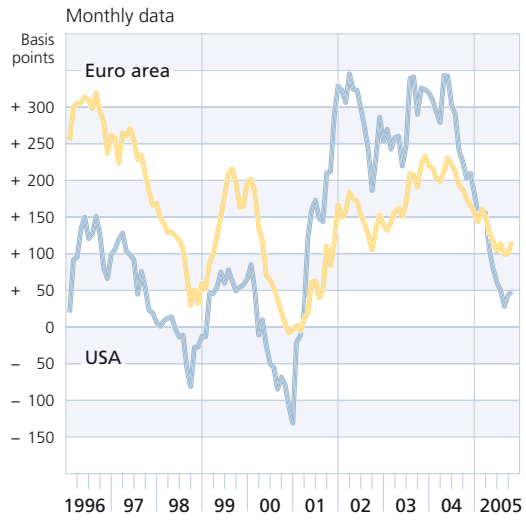
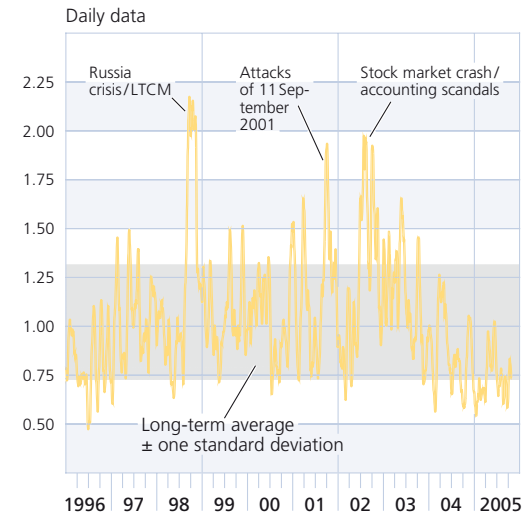



Chart 1.2.2

**VOLATILITY INDEX FOR THE FINANCIAL MARKETS****




Sources: Bloomberg and Bundesbank calculations. — * Interest rate differential between ten-year government bonds and three-month repo rates. — ** Normalised and aggregated 30-day historical volatility of equity indexes (S&P 500, Dax 30), currencies (euro/US dollar, yen/US dollar) and bond indexes (Rex, Bloomberg-US Treasuries).

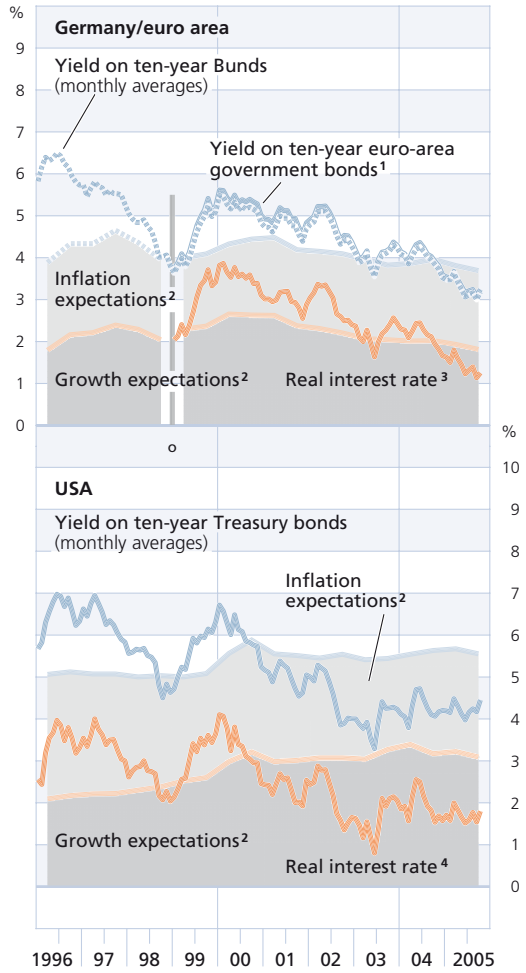
DEUTSCHE BUNDESBANK

**2** This reflects the need for a matching of maturities between very long-term liabilities and the investment of financial assets.
**3** See Deutsche Bundesbank, Risk appetite in a dynamic financial market environment, Monthly Report, October 2005.
**4** The risk premium for the expected volatility of the macroeconomic environment, contained in the real interest rate, could likewise have diminished, thus being a reason for somewhat lower real interest rates over the long term. This effect, however, is probably too small in quantitative terms to be considered the main explanation for the existing gap vis-à-vis growth expectations.

*Interest rate shocks could also hit the German bond market*

Chart 1.2.3

## INTEREST RATE LEVEL AND EXPECTATIONS ABOUT INFLATION AND GROWTH




**1** GDP-weighted average. — **2** Bundesbank calculations based on semi-annual surveys of short-term and long-term expectations regarding the development of the consumer price index and gross domestic product over the next 10 years. Source: Consensus Forecast. — **3** Ten-year inflation-indexed French government bonds. — **4** Ten-year inflation-indexed US government bonds. — **o** From 1999, expectations for the euro area. The nominal yield on German government bonds in the euro area depends on the growth and inflation expectations of the entire currency area. Owing to the elimination of exchange rate risk upon the establishment of the euro area, the interest rate spread between German government bonds and government bonds from the rest of the euro area is affected only by differences in credit rating and liquidity.

DEUTSCHE BUNDESBANK

If one takes – for simplicity – the gap between the long-run growth expectations and capital market rates as a measure of the potential for correction, any yield increase in the United States will probably be stronger than in the euro area. However, spill-over risks cannot be ruled out. Strong interest rate shocks in the international financial system could also spill over to the German bond market.[5] In addition, other consequences, such as exchange rate adjustments and effects on other asset markets, could not be ruled out.

## Risk situation in equity and corporate credit markets

### Risk situation in European equity markets

*Low interest rate environment has promoted upward trend in European equity markets*

Year to date, the low interest rate environment has also promoted the upward trend in European equity markets. A breakdown of the EuroStoxx share price movements according to the dividend discount model (see chart 1.2.4 on page 25) shows that, particularly in the second quarter, falling real interest rates had a price-supporting effect. Moreover, dividend trends and positive corporate earnings expectations in the past two quarters helped drive prices upwards. By contrast, the especially pronounced increase in the implied risk premium in the second quarter had a dampening impact on prices; events surrounding General Motors (GM) and Ford, in particular, probably had a major impact on sentiment.

**5** The average correlation between the two-day yield changes of ten-year US government bonds and German Federal bonds ("Bunds") was just over 0.7 between January 2003 and September 2005. Depending on the cause of a strong increase in yields, the correlation could be much higher, but also lower, in periods of stress.

*European shares valued near their long-term average*

Despite the price increases since the beginning of the year, the valuation level of European shares, on a long-term average, currently does not seem to be based on extremely low risk premiums. For instance, the price-earnings ratio (PER) of German and European equities, calculated on the basis of equity analysts' earnings estimates for the next 12 months, at just over 12 and just under 13 respectively, was at a rather low level by historical standards.[6] This valuation presupposes, however, that the domestic and external cyclical prospects presumed in the earnings estimates do not undergo a sustained deterioration.

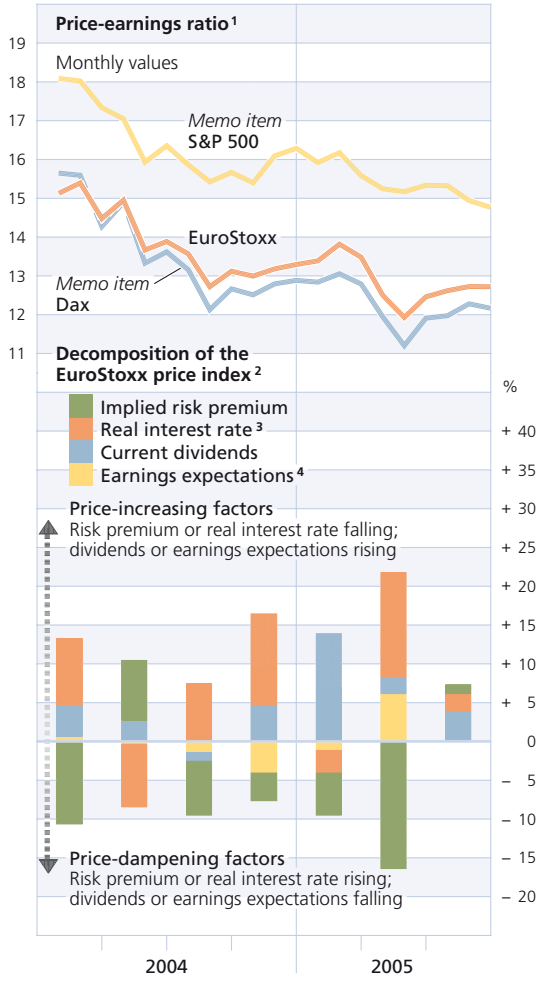
## Risk premiums in the corporate credit markets[7]

*Market for corporate bonds under pressure early in the year, …*

In the corporate bond markets, too, the search for yield by many investors is continuing to contribute to extraordinarily low risk premiums. In the February-March period, the yield spreads between corporate bonds and government bonds hit all-time lows across all credit rating classes. The downgrade of US car manufacturers GM and Ford (including their financing subsidiaries) to non-investment grade,[8] however, subsequently triggered an abrupt upward movement. It was mainly corporate bonds from the automobile sec-

Chart 1.2.4

### VALUATION AND DECOMPOSITION OF THE EUROSTOXX INDEX



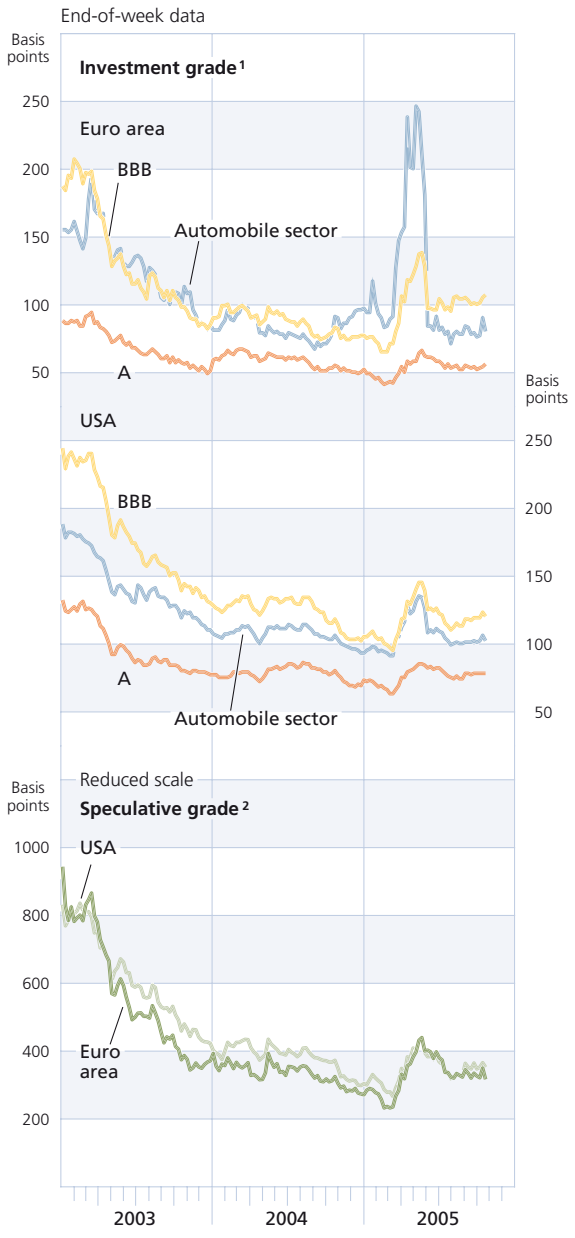

**1** Based on earnings expectations over the next twelve-month period according to I/B/E/S. Earnings estimates from April 2005 onwards include the conversion of accounting practices to the IFRS. Source: Thomson Financial Datastream. — **2** Factors contributing to price change in the three-stage dividend discount model according to R J Fuller and C C Hsia (1984), A Simplified Common Stock Valuation Model, *Financial Analysts Journal,* September-October, pp 49-56. Imputed long-term expectation of earnings growth: 2.6%. Balance of positive and negative influences: period-on-period change in price level. — **3** Average yield on ten-year euro-area bonds less the average inflation expectation over the next ten years. Source: Consensus Forecast. — **4** Medium-term expected earnings growth (in three to five years) according to I/B/E/S analyst estimates. Source: Thomson Financial Datastream.

DEUTSCHE BUNDESBANK

**6** When comparing the current earnings outlook with past performance, account must be taken of the fact that, from April 2005, the earnings forecasts already include changes reflecting the International Financial Reporting Standards (IFRS) and are currently higher than the previous earnings which were reported in accordance with the German Commercial Code (Handelsgesetzbuch). This will probably push down the PER by approximately ¾ of a point.
**7** See also the article "Corporate bond spreads" starting on page 134.
**8** Standard & Poor's made the first move in May; in the meantime, Fitch and Moody's have also downgraded Ford and GM to non-investment grade status.

Chart 1.2.5

## CREDIT SPREADS OF CORPORATE BONDS




Sources: Merrill Lynch, Bloomberg. — **1** Spread between seven to ten-year corporate bonds in each rating category and government bonds with a comparable maturity. — **2** Spread between corporate bonds with a residual maturity of at least one year and government bonds with a comparable maturity.

DEUTSCHE BUNDESBANK

tor that were affected; however, interest rate spreads widened throughout the entire corporate bond market (see chart 1.2.5).

The increased interplay between the markets for corporate bonds, stocks and OTC derivatives (especially for credit default swaps and structured finance instruments) played a key role. This is attributable, among other things, to the development of new and increasingly complex financial instruments for dealing in credit risk, which make it possible to leverage against changes in companies' credit quality. Despite the fact that tensions remained confined to the credit markets during this period and the market situation eased again in June, weaknesses in some market participants' valuation models – among other things – came to light. This raises the question of the possible implications of unexpected credit events or a general turnaround in the credit quality of the corporate sector.

*… but financing conditions still generally favourable owing to low risk premiums*

The spreads have receded distinctly since June, albeit not enough to hit previous historical lows. In conjunction with the generally low capital market yields, the conditions for companies active in the capital market to obtain outside finance have remained very favourable. This also benefits German issuers, who tap the international bond market mainly through foreign financing subsidiaries.[9]

*Improved credit quality of companies active in the capital market contributes to narrowing spreads*

In addition to "the search for yield", the credit quality of companies active in the capital market in the United States and western Europe,

**9** According to Dealogic Bondware, the outstanding issue volume of domestic companies in the international financial market, as at end-June 2005, was around €230 billion; at the same time, by contrast, €77 billion worth of domestic industrial bonds were outstanding.

which remains very good, is an additional factor explaining the low level of risk spreads. In both economic areas, it was financial sector companies in particular that saw their credit ratings rise sharply since the beginning of the year. Credit quality in the non-financial sector, however, has also stabilised, on the whole. In parallel to this trend, the default rate for corporate bonds dropped to a level last reached nearly eight years ago. This reflects the general improvement in balance sheets achieved in the past few years and underscores the increased resilience of the corporate sector (see chart 1.2.6 on page 28).

*Apex of the credit cycle may be at hand*

However, a variety of signs indicate that the development in credit quality is likely to soon reach its cyclical apex, which means that the current risk premiums might rise. From a global perspective, the default rates for corporate bonds have recently risen slightly. Moody's expects this movement to continue moderately over the next twelve months.[10] Moreover, company-specific risks also have to be considered, such as the sustained difficulties being experienced by companies in the US automobile sector. A consequent increase in market uncertainty could lead to a general reassessment of the risks associated with corporate bonds and to considerable market corrections that would also indirectly affect German financial intermediaries and investors.

*Potential pressure on earnings and the phasing out of balance sheet consolidation*

Finally, the dampening of economic growth induced by high crude oil prices is probably putting a strain on corporate earnings. The corporate sector also seems to be witnessing the approaching end of the phase of balance sheet consolidation. One sign of this development is that numerous companies have been increasing their share of outside capital for some time through share buy-backs or by offering special dividends. This generally reduces the buffers against the risks of a less favourable economic environment.

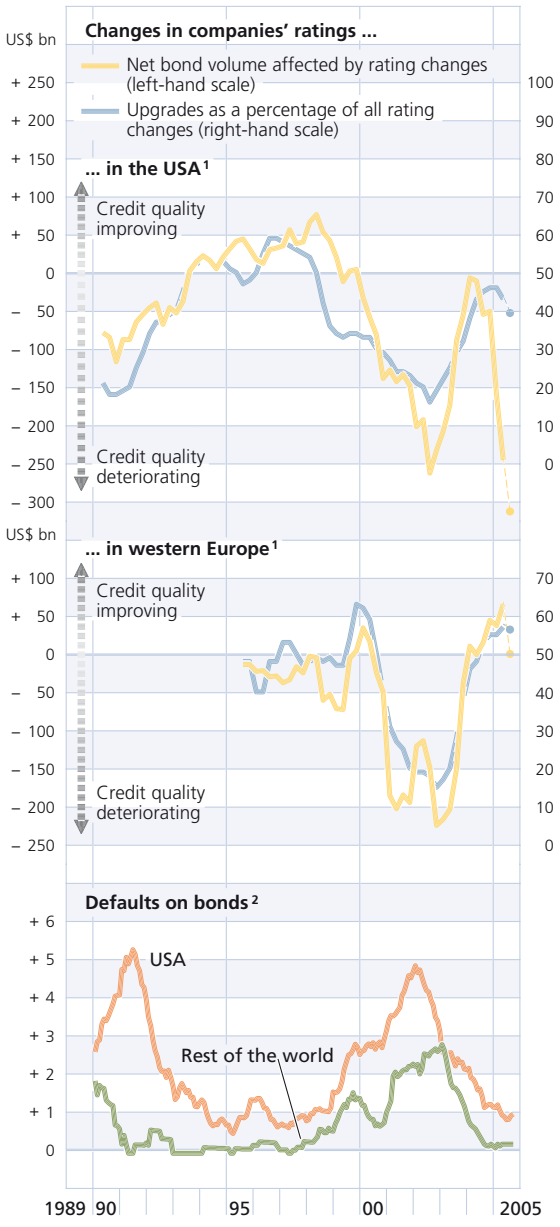
*Significant growth in leveraged buy-outs (LBOs)*

The low costs of obtaining outside finance and the continuing search for profitable investment opportunities have also led, in the past few quarters, to a strong rise in takeovers funded primarily by borrowing, also known as leveraged buy-outs (LBOs). The volume of loans granted by bank consortiums (ie syndicated) for such buy-outs doubled in western Europe in the first three quarters of 2005 in comparison with the same period of 2004. There is a certain risk inherent in such transactions, not only because of the small percentage of own funds, which, according to an analysis by the Fitch rating agency, averaged well below 30% in the first half of 2005.[11] Another relevant aspect is that an increasing number of LBOs are conducted to finance dividend payments to the new owners at the expense of the equity ratio (also known as recapitalisation). The resulting change in the capital structure generally reduces the credit quality of the company taken over and also increases the credit risk for the existing creditors. However, the extent of such transactions, at around €25 billion in the first half of 2005,[12] is still relatively limited compared with the overall credit market, which means that the resultant overall economic risks should currently not be overstated.

**10** See Moody's Investors Service, September Default Report, 6 October 2005.
**11** See Fitch Ratings, The European Leveraged Credit Markets in H105: A Half of Two Quarters, August 2005.
**12** Ibid.

Chart 1.2.6

INDICATORS OF CREDIT QUALITY




Sources: Moody's, Bundesbank calculations. — **1** Four-quarter moving average. ● = Latest position: 2005 Q3. — **2** Includes insolvencies and defaults on interest and redemption payments. Number of issuers affected as a percentage of all rated issuers; 12-month moving average.

DEUTSCHE BUNDESBANK

## Counterparty, market liquidity and operational risks

*Momentum of the financial system holds additional uncertainty*

Even though the international financial system has repeatedly demonstrated its resilience and flexibility in the past few years, its highly innovative momentum and continued structural change entail additional elements of uncertainty. For one thing, the range of institutional market players has widened, especially to include the largely unregulated and relatively intransparent hedge fund industry. In addition, increasingly complex financial instruments, eg new forms of credit derivatives and structured finance products, are now being brought onto the market. These are providing considerable challenges for risk analysis, operational processing and risk management. Against this background, moreover, market liquidity risk is becoming increasingly significant. In the past, financial market participants have often learned only from failures or losses; therefore, it remains to be seen how resilient the most recent generation of products and the newer market segments will be in the face of major market tension.

*Rising interest rates in particular could reveal weaknesses*

The long phase of favourable financing conditions could have lent impetus to the development of weaknesses in the financial system which, if the low interest rate environment persists, could still remain hidden or even grow further. These include, for example, relatively highly leveraged (or credit-financed) financial assets. Any risks in this respect would probably become apparent only in the event of an unexpected rise in interest rates and risk premiums in the major economies. A further normalisation of the monetary policy environment in key countries, in particular, could

lead to such a stress test. This will be the acid test of whether all market participants' risk management systems are up to the task and whether the – in some cases, newly developed – risk transfer instruments have effectively contributed to an improved allocation of risks within and outside the financial system.

## OTC derivatives markets

*Strong growth in OTC derivatives, especially the markets for credit risk transfer*

The volume of derivatives traded "over the counter" (OTC), ie not on exchanges, has increased considerably in the past few years.[13] Credit derivatives[14] and structured credit products, especially collateralised debt obligations (CDOs), have seen strikingly strong growth (see also box 1.2 on pages 34-35). OTC derivatives markets are global markets whose participants are often located in different countries. German banks are very active in this field[15] and, to that extent, are closely intertwined with these markets, which can generate both positive financial stability effects and specific risks.

*Wider diversification of risk*

The increased use of derivatives can contribute to greater stability among financial intermediaries. Increased trade in credit risk has particularly helped to spread risk more widely within the economy. In addition, the current low interest rate environment is also likely to have been relevant to the fast growth of trade in credit risk. Credit derivatives and the subordinated tranches of CDOs, because of their leverage effect, are more sensitive to changes in credit quality and thus offer the prospect of attractive returns in an environment of falling risk premiums. In addition, given lower risk premiums on standard credit products, innovative and more complex instruments[16] have recently been developed at an accelerated pace.

*Counterparty risks …*

Although the increasing use of derivatives may lead to an improved management of market and credit risk,[17] it also entails its own risks. In the case of OTC derivatives, counterparty risk is an extremely important factor, since, for example, there is no exchange to act as a central counterparty. Not only netting agreements but, in particular, the increased use of collateral are likely to have contributed to reducing this risk.[18]

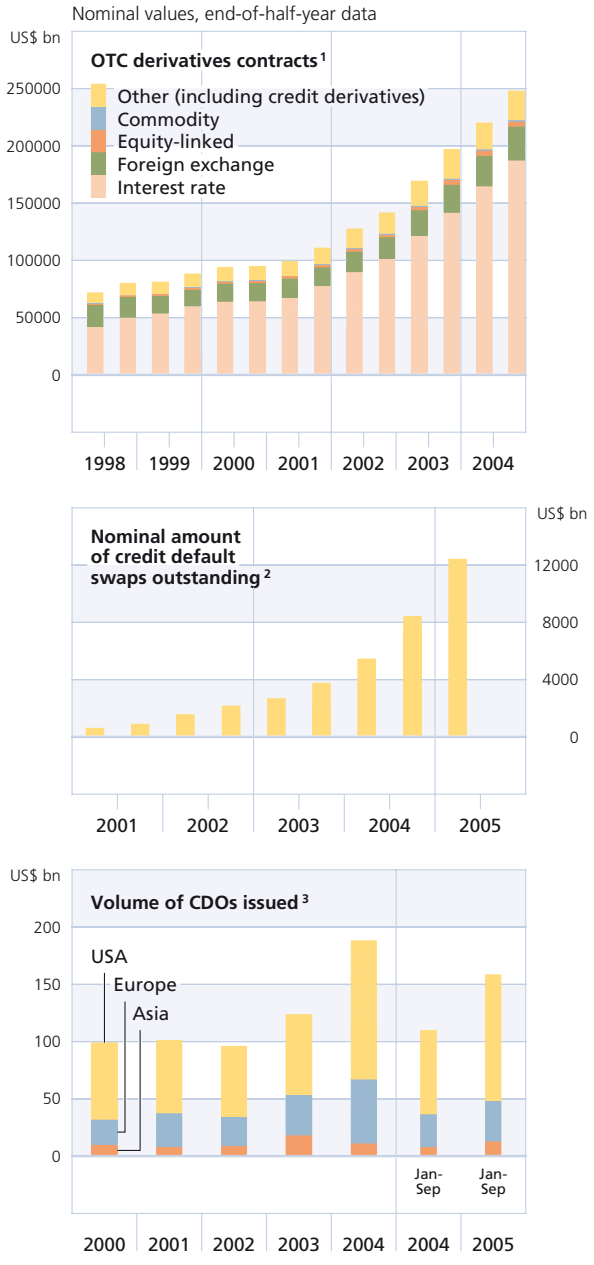
*… to hedge funds and …*

There are two particularly noteworthy aspects in this context. One is that hedge funds have markedly expanded their activities, especially in the OTC credit derivatives markets. This has given rise to repeatedly voiced concerns that banks are lowering their risk standards in the face of stiff competition for prime broker mandates for hedge funds. In particular, prime brokers appear to be making concessions to counterparties regarding the required transparency of business relationships and the

**13** According to BIS data, the total nominal value of open contracts stood at US$248 trillion at the end of December 2004. This represents an average annual increase of 21% since the end of December 1998.
**14** According to the International Swaps and Derivatives Association (ISDA), the nominal value of credit derivatives outstanding totalled around US$12.43 trillion at the end of June 2005, corresponding to growth of 48% in the first half of 2005.
**15** According to BIS statistics, German banks accounted for around 15% of the global OTC derivatives market at the end of December 2004.
**16** Including CDOs of CDOs (CDO squared) and "first-to-default baskets"; see box 1.2 on pages 34-35.
**17** In the case of OTC derivatives traded directly between two parties, the contractual terms can be tailored more closely to the parties' needs than in the case of standardised (and exchange-traded) contracts.
**18** According to ISDA, the percentage of collateralised positions rose from 30% at the end of 2002 and 50% at the end of 2003 to 55% at the end of 2004.

Chart 1.2.7

## OTC DERIVATIVES AND CDOs




**1** Source: BIS. — **2** Source: International Swaps and Derivatives Association. — **3** Includes cash CDOs (collateralised debt obligations), in which the reference assets were transferred to a special-purpose vehicle through a true sale, as well as the funded portion of synthetic CDOs. Source: JPMorgan.

DEUTSCHE BUNDESBANK

amount of collateral posted (the "initial margin").[19]

*… from a high concentration of market makers*

Another source of counterparty risk is the high concentration of market makers. This is particularly pronounced, for instance, in the market for credit derivatives (including structured financial instruments) and the market for US dollar interest rate options.[20] The highly concentrated intermediary function is a double-edged sword in terms of financial stability. Although concentration on a small group of financial institutions with specific expertise probably reduces the likelihood of a disruption occurring, at the same time the potential for systemic damage in the event of a (voluntary or forced) withdrawal of an intermediary or a market disruption increases.

*Interplay between counterparty, liquidity and market risk*

In addition, counterparty risk and market liquidity risk are closely interlinked. The latter is particularly associated with the simultaneous unwinding of similar trading positions ("crowded trades"), especially in the event of an abrupt change in expectations. This can lead to sharp swings in market prices which, in turn, can impact on the market values of the OTC derivatives contracts which are based thereon. This causes risk exposures to counterparties to increase, and additional collateral might be required ("margin calls"), which might exacerbate tensions that, *in extremis*, could spill over to other markets. Against this background, one of the greatest challenges

**19** See eg Counterparty Risk Management Policy Group II, Toward Greater Financial Stability: A Private Sector Perspective, 27 July 2005, page 53.
**20** One reason for the high concentration is that market maker activities require complex risk management systems, the development of which entails significant overhead costs. Also, a very good credit rating is required for acceptance as a counterparty.

facing market participants is to develop integrated methods of evaluating counterparty, liquidity and market risk.[21]

*Tensions in spring illustrated vulnerability of credit derivatives market*

The significant rise in risk premiums and market liquidity tensions in the credit markets in spring of this year, when some market participants immediately unwound their trading positions in credit derivatives and indexed CDO tranches as a consequence of the downgrade of GM and Ford, is a sign of the vulnerability of the relatively young market for credit derivatives.

*Greater importance of operational risk …*

Finally, the strong growth in complex financial instruments has been accompanied by a rise in the importance of operational risk and greater challenges for risk management practices. A case in point: the rapid growth in credit derivatives has led, among other things, to capacity bottlenecks in settlement, owing to which the processing of trade settlements has encountered delays.[22] This could lead to problems in determining the risk that has actually been incurred, which could impair risk management in the event of market strains. Additional challenges are caused by the evaluation of complex instruments for which there are no publicly quoted market prices and which are therefore based on models ("mark-to-model") with, at times, insufficient data.

*… and reputational and legal risk*

It is questionable whether it can be ensured, in connection with the increasing transfer of risks outside the financial system, eg to institutional and private investors, that all actors adequately assess the complex risks and their parameters as well as potential concentrations of risks.[23] This could give rise not only to financial risks to investors but also reputational and legal risks to the financial intermediaries involved, whom the transfer of risk may have lulled into a false sense of protection.

## Foreign financial institutions

*Particular significance for global financial system*

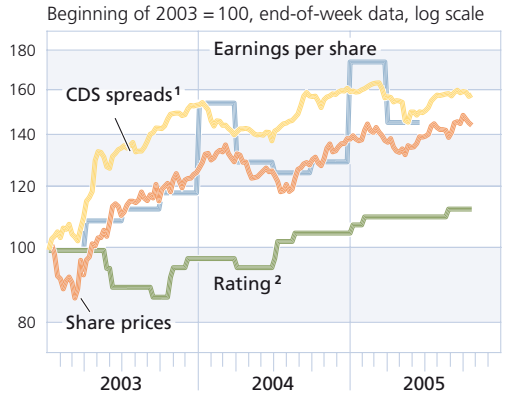
In the wake of the globalisation of financial markets, a number of financial institutions have gained particular significance for the stability of the global financial system through their size and the complexity of their activities.

These agents[24] are at once important counterparties and competitors of internationally active German financial institutions. Owing to close interbank relationships, high concentration in some market segments (such as derivatives trading) and these institutions' key importance in the financial infrastructure, shocks that either hit one of these institutions exogenously or that are caused by these institutions' activities themselves can spill over very quickly across national borders to other institutions and financial systems.

**21** See Counterparty Risk Management Policy Group II, Toward Greater Financial Stability: A Private Sector Perspective, 27 July 2005, p 48, and Stress testing at major financial institutions: survey results and practice, Committee on the Global Financial System, January 2005.
**22** Another problem is that, in many cases, hedge funds assign their OTC derivatives contracts to third parties without the consent of their original counterparty.
**23** One particular critical factor is likely to be the dependency of some investors on external ratings, as even the rating agencies themselves often have to navigate uncharted waters with their valuation models.
**24** The institutions chosen here are ABN Amro, Bank of America, Barclays, Bear Stearns, BNP Paribas, Citigroup, Credit Agricole, Credit Suisse Group, Goldman Sachs, HSBC Holdings, ING Bank, JP Morgan Chase, Lehman Brothers, Merrill Lynch, Morgan Stanley, Royal Bank of Scotland, Société Générale and UBS. They were chosen according to four criteria: the extent of short-term liabilities, their importance in the OTC derivatives market, their ranking in international bond issues, and their status in prime brokerage business with hedge funds.

Chart 1.2.8

**INDICATORS FOR INTERNATIONAL FINANCIAL INSTITUTIONS***




Source: Bloomberg. — * Contains a group of selected institutions that were all given equal weighting. Higher values show a more positive development of the large complex foreign financial institutions. — **1** Credit default swap spreads (inverted). — **2** Average issuer rating assigned by S&P, Moody's and Fitch.

DEUTSCHE BUNDESBANK

*Resilience has continued to improve from the point of view of market players*

In the light of several shocks in the past few years, large and complex foreign financial institutions have demonstrated a high level of resilience, with improvements in risk management practices and the evolution of risk transfer markets probably having played a role.[25] Market indicators show that they are still seen in a healthy state. Boosted by rising profits in the first ten months of the year, these institutions' share prices largely moved sideways (see chart 1.2.8 on this page); for 2006 earnings are expected to grow by an average of 7%.[26] The risk premiums for large and complex institutions as measured by credit default swap spreads mostly stood at low levels throughout the year. Only in April-May did this indicator undergo a sharp temporary swing. Market rumours that institutions involved in extensive trade with hedge funds had sustained considerable losses resulting from market tension were not substantiated.[27]

*Investment banking profits up*

With regard to investment banking, the major foreign financial institutions benefited in the first three quarters of the year from larger global volumes of consultancy mandates for corporate mergers and acquisitions, syndicated loans and bond issues, relative to the same period a year earlier.

*Flatter yield curve an impediment to further profit increases*

For many internationally active financial institutions, the flattening of the US yield curve has made the environment more difficult. However, to date, institutions have generally been able to compensate for this by generating higher profits from other sources of revenue. As long as the yield curve continues to flatten, or if the US market even sees an inverse yield curve, the contributions of net interest income to revenue could fall even more significantly.[28] For institutions with a presence in the US or UK retail lending markets, there is a further earnings risk in distinctly falling credit demand among households and an increasing demand for risk provisioning, especially if the boom in these countries' real-estate markets should come to an end. If consumption were to weaken, it is doubtful whether an increase in credit demand from the corporate sector would be enough to stabilise earnings.

**25** At the same time, however, the evolved state of risk transfer markets has pushed other types of risks to sophisticated financial institutions, such as operational, counterparty, reputational and legal risks, to the fore.
**26** I/B/E/S analyst estimates.
**27** In addition, since the beginning of the year, the long-term ratings for three institutions within the group of large complex foreign financial institutions have been upgraded by at least one major rating agency, whereas there were no downgrades.
**28** The share of net interest income in this group's overall earnings fell from 24% in the second quarter of 2004 to just under 22% in the second quarter of 2005.

*Market risk has considerable significance*

Those sources of income that are heavily dependent on the capital market situation deserve particular attention.[29] In principle, it stands to reason that more risky business strategies will be punished by the market, eg through markdowns on price-earnings ratios, lower ratings, higher risk premiums and higher collateral for claims on those institutions. However, one cannot rule out the possibility of slackening discipline in periods of low capital market volatility and relatively constant earnings trends.

### Hedge funds

*Increased importance of hedge funds for financial markets and financial stability*

The volume of assets managed by hedge funds worldwide, which has grown to over US$1 trillion, along with high transaction volumes[30] and the leveraging of risk positions (see box 1.3 on pages 38-39), have increased the influence of the hedge fund industry on financial markets as well as the importance of this industry for financial stability. However, in the second quarter of this year, international net capital inflows to hedge funds were down on the quarter.[31] The sub-par performance of hedge funds is likely to have been a factor;[32] in particular, individual arbitrage strategies recorded losses and outflows of capital. In some cases, this was associated with the tension in the credit markets in April and May 2005.

*Not only positive implications but also potential source of risk*

Hedge funds are generally likely to enhance the efficiency of financial markets by contributing to price formation and liquidity and standing ready to acquire risk. However, the 1998 LTCM crisis[33] also showed that hedge funds can be a source of risk to the global financial system. There are two main channels through which risks could potentially be transmitted to the German financial system: banks' business relations with hedge funds and an influence of hedge funds on market dynamics and market liquidity which could be unfavourable to other market participants.

*Direct risks apparently low*

A survey of financial institutions conducted by the ESCB's Banking Supervision Committee showed that European and German banks' risk exposure to hedge funds relative to their business volume is generally limited (see box 1.4 on page 40). However, indirect risks could result from transactions with hedge funds' foreign prime brokers.

*Risks to market liquidity*

However, it is particularly liquidity risks that harbour the potential for disrupting markets. In stress situations, hedge funds could amplify price movements in the financial markets, as was the case this spring in the credit markets. This applies especially to tight markets in which competition between hedge funds is particularly intense (eg convertible arbitrage). If unexpected events occur, loss-limitation strategies and the margin calls often lead to the simultaneous unwinding of positions. This can engender a one-sided market, leading to sharp price movements and a dry-

**29** The earnings contributions from the trading units of the major foreign financial institutions have averaged around 15% of total revenue since the beginning of 2003; for some institutions this figure is even in excess of 35%.
**30** CSFB estimates that, on the New York Stock Exchange and the London Stock Exchange, hedge funds transactions account for 40-50% of all transactions, and for the entire market for convertible bonds, 70%; see European Wholesale Banks – Hedge Funds and Investment Banks, 9 March 2005.
**31** According to HFR, net capital inflows remained low in the third quarter of the year, too.
**32** The CSFB Tremont hedge fund index picked up by 1.34% between the beginning of 2005 and June 2005.
**33** The Long Term Capital Management hedge fund ran into trouble following the Russia crisis. Owing to the large volume of outstanding positions, the US Federal Reserve facilitated a private-sector bailout.

Box 1.2

## CREDIT RISK TRANSFER INSTRUMENTS – SPECIFIC RISKS AND RECENT DEVELOPMENTS

Collateralised debt obligations (CDOs) are among the most important instruments of the of recent vigorously expanding market for credit risk transfers.[1] One defining feature of these structured finance products is that the claims on the payment flows from the pool of assets are split into various tranches with different risk/return profiles, which are geared towards the individual preferences of investors. Defaults of assets from the collateral pool are initially incurred by the equity/first loss tranche. Only once this tranche has been exhausted will the junior or mezzanine tranches be called upon. Losses in senior tranches occur only in the case of an extreme deterioration of the credit quality of the asset pool. Therefore, these senior tranches usually have a very high rating which is above the average rating of the securitised assets.

In terms of risk, there are two characteristics of structured finance instruments that need to be emphasised. First, the CDO tranche risk depends greatly on the assumptions of the correlation of the probability of default of the underlying reference pool. In the case of a low default correlation, the reference assets evolve relatively independently of each other in terms of credit quality, which means that the probability distribution is centred on the expected portfolio loss. Losses are most often limited to the subordinated tranches (equity/mezzanine tranches). In the case of a high correlation, the probability increases that the expected loss will lie in the tails of the loss distribution. Either only a few assets or a large number of assets default simultaneously. As a result, the individual CDO tranches react differently to the correlation changes, depending on their degree of subordination. The value of the equity tranche increases, for example, if the correlation increases provided the expected loss remains unchanged, since in that case there is a greater probability that only a few reference assets will default. For mezzanine tranches, there is a high probability that these tranches will remain unaffected in the case of both a high and low correlation. Yet, there is a significant default risk for medium levels of default time correlation.

A second characteristic is that subordinated CDO tranches (equity/mezzanine tranches) are investment products with leverage. [2] [3] Depending on the volume of the tranche and the position in the loss distribution, decreases in value of the reference pool in the case of subordinated tranches can quickly lead to a considerable loss of the nominal amount of the tranche, even if the decrease in value is only small relative to the value of the overall portfolio.

From a financial stability perspective, particular attention needs to be paid to some more recent developments in the credit derivatives market. In the last couple of years, single tranche CDOs have been among the fastest growing market segments. Here, banks create an individual CDO tranche according to investors' particular risk requirements, usually at the mezzanine level, which means that in-

**1** See Deutsche Bundesbank, Credit risk transfer instruments: their use by German banks and aspects of financial stability, Monthly Report, April 2004, p 27 ff, for a definition and for information on the use of these instruments. — **2** This means that their delta - a measure of risk for the sensitivity of the value of a tranche in the case of changes to the risk premiums of the reference assets - is considerably greater than 1. — **3** The leverage is calculated by dividing the expected decrease in value

DEUTSCHE BUNDESBANK

vestors assume only a small part of the credit risk of the asset pool. The arranging bank usually protects itself against changes in the credit quality by selling credit protection in the credit derivatives market for the assets contained in the reference portfolio. For a standard mezzanine tranche that has a delta greater than one, a hedging requirement arises for the multiple of the nominal amount of the individual CDO tranche. Since a dynamic adjustment of the hedging position is required, which presupposes a constant liquid market for credit default swaps, the arrangers are exposed to large liquidity risks. Furthermore, there are also basis, correlation and model risks that should not be ignored.

A second important trend is the emergence of innovative products with increasingly complex structures, which has probably been triggered not least by the fall in risk premiums for standard credit products. For example, the asset pool for structured finance CDOs also contains tranches of other ABS transactions and, in the case of CDOs of CDOs (CDO squared), tranches of other CDOs. CDOs of CDOs offer greater leverage compared with conventional CDOs and are more exposed to correlation risks. Despite the marked expansion of the spectrum of possible reference assets for the underlying asset pool over the past few years, CDO transactions often contain the same reference assets. As a result of these overlaps, the default of just a few counterparties could already lead to significant losses if the degree of diversification in the asset pool is smaller than the investor had anticipated.

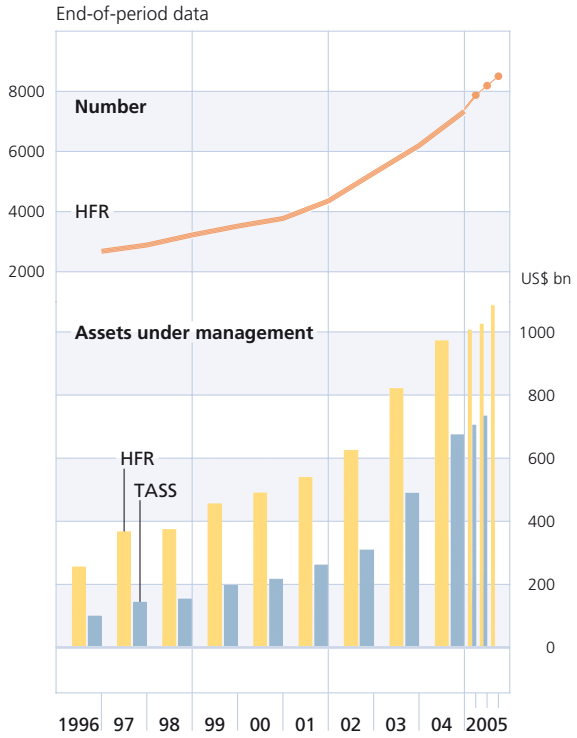
Finally, the introduction of CDS indices (DJ iTraxx and DJ CDX) was of great significance for the development of the market. These are synthetic indices which track a basket of credit default swaps for individual companies. Using these indices, a CDS index-linked contract hedges the asset pool of the enterprises contained in the index against default risk. Furthermore, correlation products, such as first-to-default baskets and CDS index tranches, are traded; these make it possible for investors to conduct "correlation trades", which reflect various estimations of the correct default correlation of a portfolio.

This provides market players with a large number of trading, hedging and arbitrage strategies. The introduction of the standardised CDS index tranches has led to enhanced price transparency as market prices are set continuously, making market assessments on the correlation derivable. Furthermore, the improved liquidity makes risk management easier. For the stability of the financial system, it is nonetheless crucial that all market players be able to accurately assess the risks of the complex instruments and trading strategies and identify the limitations of the models that are currently being applied. The real acid test of many of the credit derivatives market instruments will probably only occur, however, when there is a general fall in credit quality.

of a tranche in the case of a spread change - expressed as a percentage of the nominal amount of the tranche in question - by the decrease in value for the entire portfolio as a percentage, see M S Gibson, Understanding the risk of synthetic CDOs, Federal Reserve Board, Finance and Economics Discussion Series paper, No 2004-36, pp 12.

Chart 1.2.9

## NUMBER OF HEDGE FUNDS AND ASSETS UNDER MANEGEMENT*




Sources: Hedge Fund Research (HFR) und TASS. — * Excluding funds of hedge funds. Hedge fund databases only comprise cross-sections of the entire hedge fund industry. They should be used primarily to interpret trends (rather than as an exact representation of the industry).

DEUTSCHE BUNDESBANK

ing-up of market liquidity. High leverage and similar trading strategies alike contribute to the creation of such a scenario.[34] From a systemic perspective, similar trading strategies outweigh the positive rise in granularity in the hedge fund industry since the time of the LTCM crisis. The increase of pairwise correlations of yields is a sign of greater similarity of trading strategies. Pairwise correlations picked up somewhat over the course of the first half of 2005. It is worth noting that among hedge funds not only the correlation of returns within specific strategies has increased but also the co-movement of returns across all strategy groups, although the level of correlation is just 0.34. By contrast, funds of hedge funds are displaying a high co-movement of returns, at over 0.7 at present.

*Parallelism with market trends*

An analysis of the relationship between hedge fund returns and various market indices shows that the average return of the funds is currently displaying a high co-movement with the performance of equity markets (see chart 1.2.10). Moreover, the similarity of average returns increases as implied volatility in the equity markets decreases. Hence concentration on a small number of key trends in a quiet market environment is one potential explanation for the greater uniformity of hedge funds' trading strategies, in addition to the increased imitation of trading strategies.

*Risks to the balance sheet liquidity of hedge funds*

In addition, unforeseen capital withdrawal by investors, eg in the event of a loss, can make it necessary to unwind positions at short notice. The pressure to close out is all the greater the shorter the lock-up periods and the less liquid the investments are. Meanwhile, hedge funds are increasingly investing in less liquid assets;[35] owing to a lack of available data, it is not known whether the capital commitment periods for investors will be correspondingly extended. In this context, the liquidity risk would increase particularly with funds of hedge funds, which have either short lock-up periods or none whatsoever. When single

**34** Hedge funds and banks' own-account trading often exhibit similar market behaviour.
**35** See Deutsche Bank, Alternative Investment Survey 2005.

hedge funds extend their periods, this is usually associated with an extension of the duration gap[36] for funds of hedge funds.

## Initiatives by market participants and supervisors

*Private sector group with recommendations to market participants*

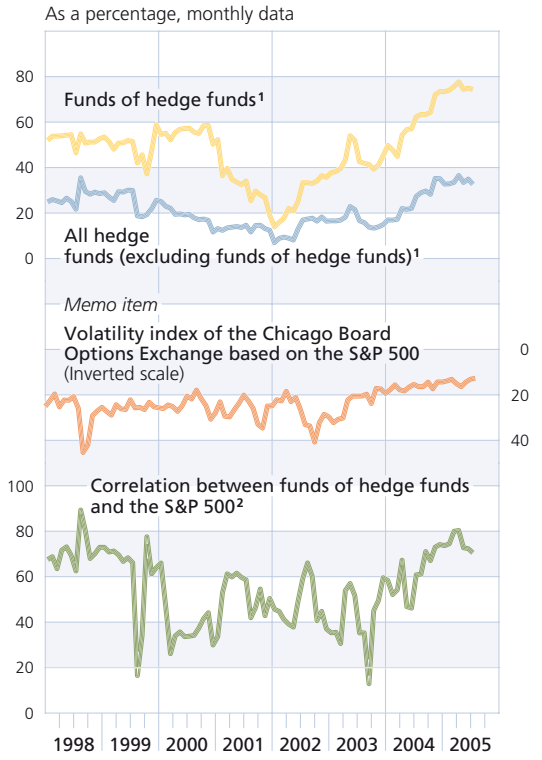
Against the background of the considerable challenges associated with growing trade in complex financial instruments, such as in OTC derivatives markets, and the increased participation of the hedge fund industry, this year leading market players re-established the "Counterparty Risk Management Policy Group".[37] The group's recently published final report contains, among other things, numerous recommendations for risk management, transparency and operational improvements.

*Lack of transparency making risk assessment more difficult*

Owing to the lack of transparency, it remains difficult to assess the stability risks of the hedge fund industry. This is especially the case regarding the potential interplay of market, liquidity and credit risk in combination with leverage and similar strategies. From a financial stability point of view, therefore, a high priority should continue to be given to improving transparency. It generally appears to be unfeasible to have either national regulations or an approach agreed exclusively within the European Union, as hedge funds could move to less regulated jurisdictions. Therefore, voluntary measures by the hedge fund industry currently appear to be a realistic alternative. In this context, the latest initiatives by the private sector[38] and foreign supervisory authorities[39] include key proposals that should be followed up.

Chart 1.2.10

### CORRELATION OF HEDGE FUND RETURNS




Sources: TASS, Bloomberg and Bundesbank calculations. — **1** Pairwise correlations of hedge fund returns estimated using a 12-month rolling window. — **2** Monthly returns; correlation estimated using a 12-month rolling window.

DEUTSCHE BUNDESBANK

**36** Difference in the capital commitment between the assets and liabilities side.
**37** At the time, the aim of the private sector group, established in January 1999, was to improve counterparty and market risk management, inadequacies in which had played a major role in the financial market turbulence in autumn 1998.
**38** See the Recommendations of the Counterparty Risk Management Policy Group III, July 2005, and MFA's 2005 Sound Practices for Hedge Fund Managers August 2005.
**39** See (UK) Financial Services Authority, Hedge funds: A discussion of risk and regulatory engagement, June 2005.

Box 1.3

## LEVERAGE OF HEDGE FUNDS

Unlike investment funds, hedge funds can leverage their investments. For this to occur, hedge funds borrow money (balance sheet leverage) and take up positions with comparatively low capital input, eg using derivatives and short positions (instrumental leverage). Leverage multiplies the chance/risk profile of the portfolio.

Leveraging not only amplifies market risks, but may also intensify liquidity risks. If prices move counter to the position of the fund, additional collateral has to be supplied. In order to remain invested given available collateral, positions have to be liquidated ("fire sales"). In less liquid markets, the prices could then continue to move to the detriment of the fund and consume capital.

As a rule, hedge funds permit, at best, a limited insight into their portfolio, which restricts outsiders from monitoring risks. In their risk management, counterparties, therefore, rely very heavily on collateral and the quantitative limits on credit facilities.

The lack of transparency of the hedge fund industry also impedes regulatory authorities from assessing the risks which result from a high leverage. Currently, indirect sources have to be used as an alternative, which, ultimately, do not provide sufficient information:

– The easiest method is to carry out a survey among market players. The Hennesse Group, for example, conducts a survey every year among hedge fund managers, *inter alia*, regarding the amount of leverage deployed. This survey revealed a slight increase in leverage between 2003 and 2004 from 141% to 148%. However, one should bear in mind the methodical limitations of surveys: selection bias, current trends, strategic answers, inconsistent definitions, specific perspective of the respondent, conflicts of interest etc.

– In commercial databases, such as those of Tass/Lipper or Hedge Fund Research (HFR), hedge fund managers provide voluntary information, including on leverage. Although the provision of this information is relatively up-to-date and is consistent with market conditions, its informative value is subject to considerable constraints. First, the individual databases are only representative to a certain extent, especially as most of the largest hedge funds are not included. Second, the recorded leverage values are not based on any standardised definition or method of calculation. Finally, the information appears to be unreliable in part as, in individual cases, the information is subsequently corrected or proves implausible.

– The balance sheet leverage can be approximately assessed using BIS statistics on international credit. Since a large number of hedge funds (around one-third of the managed assets) are domiciled on the Cayman Islands, the claims of foreign banks on non-banks on the Cayman Islands could serve as a rough proxy for changes in lending to hedge funds.

Unlike commercial databases, there is no selection bias. All claims on all hedge funds domiciled on the Cayman Islands should be captured. Nevertheless, there are other constraints:

1. The BIS statistics also include transactions with other non-banks for which, however, there are no separate data. This primarily includes the purchase of ABS that were issued by special purpose entities on the Cayman Islands. Over the past few years, the amount of these securities has also increased.

2. As a result of the light regulation, it can be presumed that hedge funds with above-average leverage have settled on the Cayman Islands.[1]

**1** Data from the Tass database suggest that strategies with typically high leverage (global macro, convertible arbitrage and fixed income arbitrage) are overrepresented on the Cayman Islands. — **2** See also: P McGuire, E Remolona, K Tsatsaronis, Time-varying exposures and leverage in hedge funds, BIS Quarterly Review, March 2005. — **3** In a style analysis based on individual

DEUTSCHE BUNDESBANK

3. Even using this method, the economically more significant instrument leverage cannot be estimated, as only loans and securitised claims are recorded in the statistics.

The available data show that, during the course of the past few quarters, there has been an increase in international banks' credit positions vis-à-vis non-bank debtors on the Cayman Islands. Recently, these assets have also been growing more quickly than the total amount of assets under management. This could indicate a certain increase in the leverage.

– Another way of estimating leverage is style analysis.[2] This method involves making assumptions about key determinants of the performance of individual hedge fund strategies (eg general equity market developments for a long/short equity strategy, measured by a broad stock index). The fluctuations of these factors are then compared with the fluctuation of the hedge funds' rates of return. The higher the leverage, the stronger the changes in these factors should be reflected in the performance of the hedge funds.

The advantage of this type of analysis is that it also captures instrumental leverage. One particular difficulty which presents itself with this analysis, however, is identifying the factors which actually affect performance, particularly in the case of changes to the investment strategy. Thus the informative value of the analysis is limited if a hedge fund switches between long and short positions (speculation on rising and/or falling market prices). For instance, the statistical model would be unable to identify an increase in hedge fund returns if it occurred during the first two weeks of the month against the backdrop of a rising DAX index, followed by a fall of returns during the next two weeks, despite a further rise in the DAX. In this case, it would appear that the monthly return of the hedge fund is not affected by changes in the DAX index. For frequently changing long and short positions of similar volumes, the estimated leverage would be almost zero, although the actual leverage may be much higher. Therefore, it is hardly surprising that the regressions do not have a particularly good explanatory value.[3]

The BIS study points out that this method is more suitable for assessing changes than levels. The model delivers results consistent with market intelligence. According to this study, the leverage of the hedge fund industry was at its highest level in 1998/99 and has been declining in cycles ever since, but has been increasing slightly again since the beginning of the year.

It is not only the lack of data which is problematic, but also the interpretation of the leverage. The leverage varies both between the different strategies and sometimes considerably within the strategies themselves. This makes sense in economic terms, as in fixed income arbitrage strategies, for example, traders speculate on changes of only a few basis points, which means that attractive returns are not possible without the use of leverage. Furthermore, the market risks are also smaller for arbitrage strategies than for directional/opportunistic strategies, the success of which is dependent on correctly anticipating the future market developments (for global macro funds, for example).

Generally speaking, a better assessment of the leverage would be advantageous for financial stability analysis since leverage can exacerbate any existing risks. Nevertheless, information on leverage is not sufficient *per se* for assessing risks. The implications are dependent, for instance, on whether similar trading strategies are used, whose simultaneous unwinding could influence the market dynamics and market liquidity. To this extent, the interpretation of changes in leverage is only worthwhile if other risk factors are also considered at the same time.

hedge funds, two of the three hedge fund categories have an R-square of approximately 10%, and for the third one the figure is roughly 15%. Own index-based calculations indicate a higher R-square.

Box 1.4

## GERMAN BANKS' EXPOSURES TO HEDGE FUNDS

The analysis of the links between banks and hedge funds provides scope for an improved assessment of the potential risks to financial stability arising from the increased activity of hedge funds. This issue was at the centre of a survey by the Bundesbank among major German banks that was carried out in the early summer of 2005 as part of an initiative of the Banking Supervision Committee (BSC) of the European System of Central Banks.

Overall, only a few German institutions have close direct exposures to the hedge fund industry. Cash lending of German banks to hedge funds is currently primarily done on a collateralised basis, above all by means of reverse repo transactions. However, the share of these loans in terms of the balance sheet total among German banks active in this field is in the low single-digit range.

Hedge funds are also active trading partners in banks' OTC transactions. However, among all German banks having such trading exposures to hedge funds, the share of all OTC transactions that is accounted for by outstanding amounts from hedge funds as counterparties lies in the single-digit range; in view of banks' earnings, however, these transactions with hedge funds have, in some cases, a much greater weight because of the buoyant hedge fund trading activity.

When defining trading and credit limits the banks deploy advanced value-at-risk approaches which are normally supplemented by various stress tests. In addition, the banks have developed specific rating tools internally into which, among other things, the impressions of on-site visits to hedge fund managers are also taken into account. Moreover, the banks are willing to terminate business relations with individual hedge funds or to reduce existing limits if the funds fail to meet the necessary transparency requirements.

At present, only two German credit institutions invest on a larger scale in hedge funds and funds of hedge funds. However, some banks intend to build up or increase exposures. Particularly with regard to the new players it is crucial to ensure that the hedge funds are thoroughly selected and monitored. To this end it may be necessary to carry out further adjustments to the banks' risk management.

Regarding financial stability, the survey revealed some weak spots and potential sources of risk that call for particular vigilance. Firstly, greater market power can be observed especially among large hedge funds, which can lead to a deterioration in the banks' counterparty discipline. Secondly, some banks are still having problems aggregating their hedge fund exposures at the overall bank level. Thirdly, the banks are having difficulties in identifying the entire extent of leveraging and hence also the risk profile of a hedge fund. This is compounded by the tendency for large hedge funds in particular to deploy more than one prime broker. Finally, the question remains open as to whether banks maintain a sufficient view of the sector as a whole and its possible co-movement when carrying out risk assessment of individual hedge funds.

DEUTSCHE BUNDESBANK

*Minimum requirements for risk management promote integral risk analysis among German banks*

Against the background of the necessary integral risk analysis, it is also a welcome development to see that, in Germany, the "Minimum requirements for the risk management of credit institutions" (MaRisk) are currently being prepared by supervisors for publication, which is scheduled for the end of the year. They combine the "Minimum requirements for the credit business of credit institutions" (MaK), the "Minimum requirements for trading activities" (MaH) and the "Minimum requirements for the organisation of internal auditing" (MaIR) and are being amended to include interest rate risk, liquidity risk and operational risk. This is likely to promote the further integration of the various risk categories in the risk management systems being used by German credit institutions.

# Stability in the German banking system

*Banks countered heavy burdens at the start of the millennium…*

The German banking industry has successfully continued the trend towards consolidating its stability that was observable back in 2004. This has taken place against the background of enormous burdens at the start of the millennium. The fact that Germany slid into persistent sluggish growth in the spring of 2001 hit the German banking system through two transmission channels. For one thing, there was a marked deterioration in credit quality, especially in business loans and in commercial real estate loans. For example, there was a massive increase in loss provisions, which reached their cyclical peak in 2002, due in part to a quite conservative risk provisioning policy. For another thing, there was a slump in demand for loans to enterprises for financing investment. Along with the earlier decline in demand for banking services in the wake of the shift to a more bearish mood on the stock exchanges, this led to falling income and declining capacity utilisation, thus weakening the operational efficiency of German banks.

*… by taking extensive adjustment measures*

The German banking industry responded with a bundle of measures. A key thrust of these measures was to strengthen operational efficiency by cutting staff and partially withdrawing from some lines of business. For example, between 2002 and 2004 the German banking industry cut its staffing level by around 7%. Nevertheless, the earnings situation will probably not improve properly before the German economy returns to a sound growth path. A second package of measures was aimed at reducing risks in the credit portfolios and adjusting the balance sheets in order to ease the risk situation. These efforts have meanwhile led to a noticeable recovery in the risk situation; furthermore, the individual ability of German banks to sustain risks, as measured by the regulatory capital requirements, has improved in the medium term.

## German banks' credit risks

Credit risk is the most important type of risk for German credit institutions. In accordance with Principle I, capital charges for credit risks add up to more than 90% of the required regulatory capital.

## Business with large corporates

Lending to large borrowers (wholesale business) on both sides of the market typically involves internationally operating groups. German banks are active in this segment as both financial intermediaries for capital market transactions as well as lenders.[1]

*Low default rates*

On the back of general improvements in the balance sheet ratios of the corporate sector, which were supported by a robust global economy, the credit quality in this segment has been exceptionally good in recent years.

**1** For instance, in the first three quarters of 2005, German institutions participated in syndicated loans amounting to € 900 billion. Source: Dealogic Loanware.

Hence, in the last two to three years defaults on rated bonds have declined considerably both overall and in the non-investment grade segment. At the same time, the share of upgrades in relation to all rating changes has risen markedly both in Europe and in the United States over the past two years.[2]

*Financial markets expect high credit quality*

The forward-looking market or market-oriented indicators also reflect the expectation that the high credit quality will remain essentially intact, at least in the short to medium term. The market for credit default swaps signals a relaxed assessment of the risk situation at large European enterprises. After widening for a time following the downgrades of General Motors and Ford, the CDS premiums of the benchmark iTraxx indices have now more or less regianed the levels seen in late 2004/ early 2005. Additionally, according to Moody's KMV, the expected default frequencies (EDF) fell consistently for both German and European listed enterprises. They have since returned to the level recorded in 2000. However, for more than four years now, large European enterprises have been rated better than German ones, which is most likely a result of the weak domestic German economy.

*Turnaround in credit quality?*

However, some of the market indicators suggest that the credit quality of large enterprises may have already passed its peak. In the market for BBB-rated corporate bonds, for instance, risk spreads have still not yet entirely returned to the levels recorded before the downgrading of General Motors and Ford. With respect to US BBB-rated bonds with longer maturities, spreads have actually widened somewhat since July. The slight deterioration in the ratio of downgrades to upgrades of non-financial corporations carried out by several rating agencies might point towards an upcoming reversal in the credit cycle. This may reflect to some extent the fact that the phase of balance sheet consolidation in the corporate sector is fading out. Thus the more frequent instances of share buy-back programmes and/or special dividend payouts seen in the recent past are pushing up the leverage of the firms in question.

*Financial soundness of large enterprises*

However, a possible weakening in the credit quality of large international enterprises would have to be seen in the context of the existing high level. The financial soundness of the large enterprises should make them resilient also in the event of more sluggish global economic momentum, even if the probability of individual credit events, particularly in energy-sensitive sectors, may have increased owing to the rise in the price of oil.

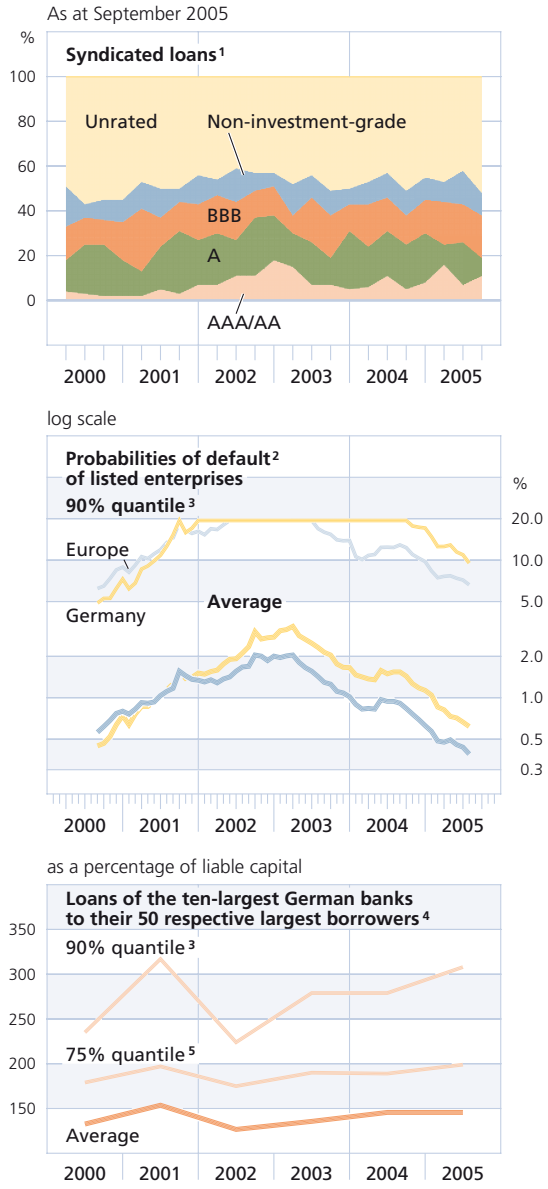
*Syndicated loans*

The generally robust condition of large enterprises is also reflected in banks' portfolios. In the past three years, German banks' share of syndicated lending business (measured by the volume of new business) in the rating classes AAA to BBB has averaged 42%; by contrast, the share of non-investment grade loans was merely 10%.[3] With the exception of loans with a rating of AAA to AA, there has been no substantial change in the ratings of syndicated loans over the past three years. Syndicated loans are, however, taking on increasing importance in the financing of company takeovers using borrowed capital (leveraged buy-outs – LBOs). The credit risks arising from

**2** See chart 1.2.6 on page 28.
**3** There remains a large fraction of unrated syndicated loans (approximately 48%).

Chart 1.3.1

## LENDING TO LARGE CORPORATES




**1** New business; participation of at least one German credit institution as an arranger or provider. Source: Dealogic and Bundesbank calculations. — **2** Expected default frequency (EDF) according to Moody's KMV. If an EDF of more than 20 % is calculated, it is capped at 20 %. — **3** Threshold which 90 % of all banks do not exceed. — **4** Source: credit register of large loans in accordance with section 14 of the Banking Act. — **5** Threshold which 75 % of all banks do not exceed.

DEUTSCHE BUNDESBANK

this business appears limited, however, from today's standpoint owing to the as yet low volumes involved.[4]

*No rise in concentration risk*

Disregarding credit risk mitigation techniques, the single-borrower concentration of the ten largest German banks, has increased slightly since 2002. On average, in the second quarter of 2005 these banks' 50 largest loans amounted to approximately 150% of their liable capital, compared with 130% in 2002. Lending to the largest borrower increased during this period by 3 percentage points on average to around 17% of liable capital. Despite these moderate increases, these concentration levels do not point to any critical concentration risk in banks' balance sheets.

*Conclusion : little risk from wholesale business*

Wholesale business ought to pose little risk to German financial stability as the credit quality may be considered as still being high, the risk propensity of German banks has tended to fall and there are no signs of increased concentration risks.

### Financing of small and medium-sized enterprises (SMEs)

*Corporate insolvencies remain high …*

A salient feature of the German economy is its plethora of small and medium-sized enterprises which receive a large share of their

**4** In the first half of 2005, all of the LBO transactions in western Europe taken together totalled € 25 billion. See Fitch Ratings. The European Leveraged Credit Markets in H105: A Half of two Quarters.

financing in the form of bank loans.[5] These enterprises, whose business model is largely dependent on domestic demand, benefited less from the global upturn of the past few years than internationally operating companies.[6] Thus over 39,000 firms in Germany had to initiate insolvency proceedings in 2004, although for the first time in five years the number went down slightly by ½% (see adjacent chart). The aggregate figure, however, masks a mix of varying tendencies. Whilst the insolvency rate of partnerships and corporations fell by 12%, insolvencies of sole proprietorships and very small businesses, which account for around two-fifths of all corporate insolvencies, rose by 8%. The renewed increase in the insolvency rate of sole proprietorships is likely to be the counterpart to the buoyant creation of subsidised one-person businesses by unemployed individuals. The altered insolvency structure has helped to push down the average claims affected per corporate insolvency for the past 2½ years. They have now fallen well below the level of 2002, when an unusually high number of large enterprises with correspondingly high debts became insolvent.

Chart 1.3.2

**CORPORATE INSOLVENCIES**


Source: Federal Statistical Office and Bundesbank calculations.

DEUTSCHE BUNDESBANK

*… but fell slightly in the first half of 2005*

In the first half of 2005, there was increasingly firm evidence suggesting that the wave of insolvencies is likely to have peaked. The number of corporate insolvencies fell by approximately 4% year on year. As insolvencies represent more of a lagging cyclical indicator, an overall decline is likely for the full year as well. However, the economic forecasts do not point towards any significant decline in the next few months. The GDP growth rates as projected by professional forecasters for this year and next year are unlikely to be sufficient to significantly brighten the macroeconomic environment for small and medium-sized enterprises.

*Profitability and business climate*

The profitability of small and medium-sized enterprises is currently being squeezed by the sharp rise in energy prices and the weak momentum of domestic business activity in Germany. Even so, according to surveys con-

**5** In both 2002 and 2003 the financing volume of the German Mittelstand amounted to around € 200 billion, more than one-third of which was credit-financed (government/agency assistance: around 20% of the investment volume; own funds: 38%, see KfW Mittelstandpanel 2004). This financing structure is also reflected in the balance sheet structures of SMEs. Their bank debts total around 40% of the balance sheet total. In this context, the relative share of bank debts typically declines in line with the size of the enterprise (see "Diagnose Mittelstand 2005" published by DSGV).
**6** The differential between the KfW Ifo business climate indices for SMEs and large enterprises has been negative since 2002; however, in September 2005 it reached –1.0% – the highest level since May 2002.

ducted by Creditreform,[7] 63.3% of the firms surveyed expect their earnings to improve or stabilise in the near future. Hence, despite the weak domestic economy and intense competition, expectations in the SME sector have improved considerably since reaching a low in the fourth quarter of 2002. The KfW Ifo business climate indicator of small and medium-sized enterprises points to a gradual improvement in the situation, too, both in terms of the one-month observations as well as in the less volatile three-month observations.[8] In September 2005, the indicator showed a positive result (+3.6%) for the first time since April 2001, thus improving considerably since its low in 2002. This increase cannot, however, mask the fact that the current level of the indicator still signals a muted economic situation.

*Slight improvement in equity base*

There has been a slight improvement in the equity base of small and medium-sized enterprises – doubtless fostered in part by the forthcoming introduction of Basel II – which has lifted the credit ratings of SMEs. According to Creditreform,[9] 37½% of SMEs had a capital ratio of 20% or more in the third quarter of 2005; this represents an increase of around 2 percentage points since 2003. By contrast, there has been no improvement at companies which have low capitalisation (a capital ratio of below 10%).[10]

*Quality of SME portfolios*

The general slight improvement in the situation of the SME sector has also led recently to a better credit quality of banks' SME portfolios, measured here by the portfolios of savings banks and credit cooperatives. In mid-2005, the large exposures of prudential risk category 3[11] amounted to only 0.8% of all large exposures, with risk category 2 exposures totalling 1.1% of all large exposures (see chart 1.3.3 on page 47). These percentages are the lowest recorded over the past three years. Particularly the category 2 exposures have been clearly trending downwards since the second quarter of 2004 on average throughout the banking sector. It is gratifying to note that this slight easing has also been observed at banks with weaker portfolios (90% quantile[12]).[13] The loan loss risk stemming from category 3 exposures is additionally mitigated by the fact that the share of credit for which no loan loss provisions have been made is largely collateralised. The potential loss stemming from risky category 2 exposures likewise appears to be sustainable. Respondents to the Bank Lending Survey report that the credit standards for SMEs were tightened continuously until early 2004 and thereafter were slightly eased up to early 2005. This suggests that institutions are demanding more collateral and paying more attention to the creditworthiness of potential

**7** See Creditreform, Wirtschaftslage und Finanzierung im Mittelstand, a twice-yearly survey of around 4,000 small and medium-sized enterprises (employees < 500, turnover < € 50 million).
**8** See KfW-Ifo Mittelstandsbarometer (SME barometer). The Indicator, exactly like the Ifo business climate index, represents the balance of positive and negative assessments of the business situation and expectations. However, only small and medium-sized enterprises are surveyed.
**9** See Creditreform, loc cit.
**10** Around 37% of SMEs have a capital ratio of below 10%.
**11** Risk category 1: sound; risk category 2: prone to risk; risk category 3: specific provisions have already been made. Large exposures account for around 30% of savings banks' and credit cooperatives' commercial portfolios, which means that their credit quality is a good indicator of the quality of these banks' commercial credit portfolios. The analysis is necessarily restricted to large exposures because they are the only type of exposures classified in different risk categories.
**12** 90% of banks have lower ratios.
**13** The improvements in creditworthiness are not yet reflected in the volume of non-performing loans. The share of non-performing loans in savings banks' and credit cooperatives' non-bank lending rose steadily from 6.1% in 2000 to 7.4% in 2004. However, this rise is likely to be explained by the lagging-indicator property of non-performing loans. The evolution of large exposures in 2005 points to the likelihood of a reduction in the share of NPLs in the near future.

borrowers. The unsecured share of exposures at risk should therefore tend to decline.

*Slight easing in overall risk position of SMEs*

On balance, the risk situation in lending to SMEs has thus eased somewhat. The capital base at SMEs is rising slightly and the institutions are working on a more exact assessment of the risk involved with their small and medium-sized borrowers. Nevertheless, the risk involved in lending to SMEs is still at a considerable level, owing mainly to weak domestic business activity and the ongoing large number of insolvencies.

## Commercial real estate

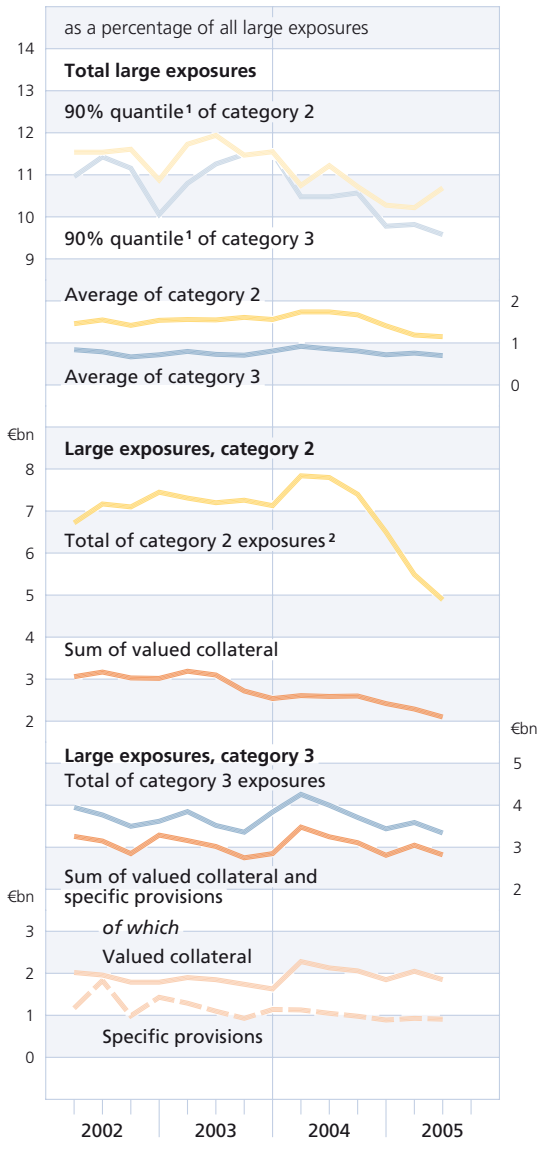
*Credit risk and price developments*

Real estate loans to commercial borrowers in Germany total around €600 billion, with around 50% each destined for housing and commercial construction. Credit risks arising from the financing of commercial properties correlate strongly with the price developments of real estate via the value of the collateral and the creditworthiness of the borrower. Hence the unfavourable situation in the commercial property markets is, among other things, being reflected in corporate insolvencies. The combined insolvency ratio of the construction and real estate services sectors stood at around 1.6% in the past two years, which was higher than the average of all enterprises (1.3%).[14] The weak market environment can also be seen in the fact that the recovery rates[15] for foreclosure sales on

**14** Sources: Federal Statistical Office, Bundesbank calculations. Insolvency ratio: insolvent enterprises in the construction and real estate services sectors in relation to all enterprises active in these sectors.
**15** Taken from the LGD grading project of the Association of German Pfandbrief Banks. Loss Given Default (LGD) = loss expressed as a percentage of the overall exposure in the event of default.

Chart 1.3.3

### ANALYSIS OF LARGE EXPOSURE PORTFOLIOS *

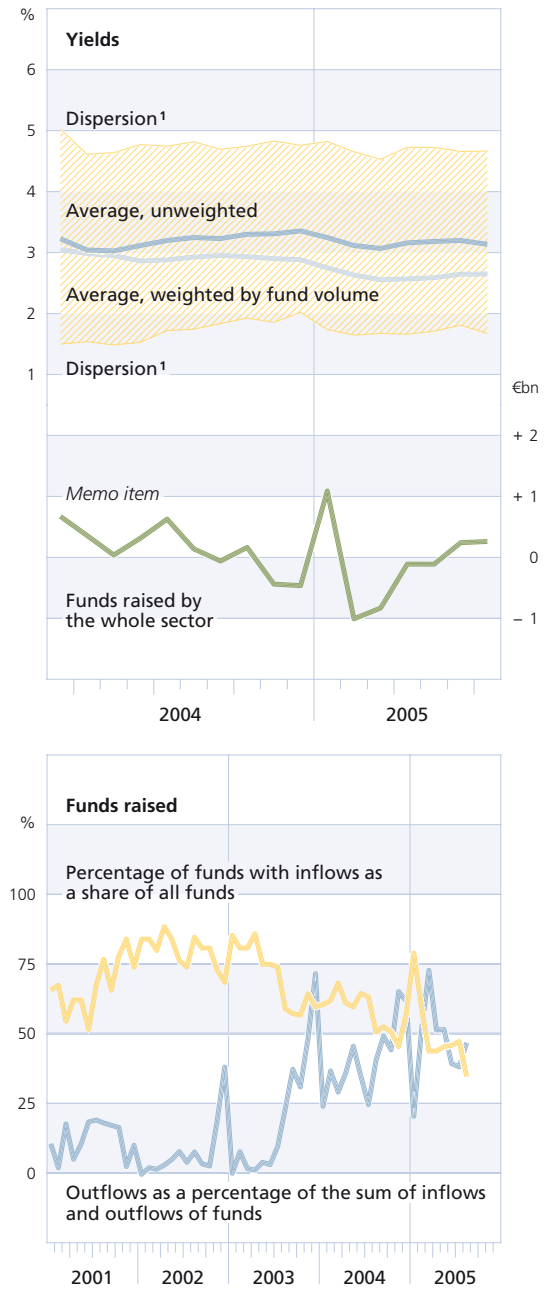



Sources: credit register of large loans in accordance with sections 13, 13a and 13b of the Banking Act. Data from savings banks and credit cooperatives. — * Large exposures are broken down into three risk categories: category 1: sound; category 2: prone to risk; category 3: specific provisions have already been made. — **1** Threshold which 90% of all banks do not exceed. — **2** Specific provisions have been made to only a very limited extent.

DEUTSCHE BUNDESBANK

Chart 1.3.4

## YIELDS OF AND FUNDS RAISED BY OPEN-END REAL ESTATE FUNDS




Source: BVI and Bundesbank calculations. — **1** Average yield ± one standard deviation.

DEUTSCHE BUNDESBANK

residential properties financed by property developers and of commercial properties are currently somewhat lower than those for owner-occupied dwellings.

*Links between banks and open-end real estate funds*

Apart from losses arising from direct credit relationships, financial intermediaries may be exposed to further strains arising from their links to open-end real estate funds. The investment companies which launch the funds are often subsidiaries of banks and insurance corporations. Owing to below-average returns, a number of these investment funds had to, at times, redeem a large number of fund units and accordingly experienced liquidity outflows (see adjacent chart). The performance problems were concentrated at relatively large funds with an investment focus on the German office building market.

*Funds supported by parent companies*

The parent companies of those investment funds which have been most affected have supported their funds by providing liquidity assistance, purchasing fund units and transferring properties with a stable value so as to enhance performance. As a result, this has dented the parent companies' earnings in a triple-figure million amount. Due to the strength of their profit situation and capital base, the parent companies have been able to bear the risks arising from the open-end real estate funds launched within their respective group.

*Measures to improve earnings*

To mitigate the threat of a further outflow of funds, the fund originators have also initiated extensive measures to improve earnings. A number of investment companies intend to reduce the targeted volumes of their funds. This eases the investment pressure which

arises through a high inflow of funds. Above all, many investment companies are pursuing the internationalisation of their investment portfolios. Studies by the Federal Association of Investment and Asset Management Companies (BVI)[16] show that 37 of 48 new acquisitions in the first half of 2005 (representing 92% based on market value) were located outside Germany. As at June 2005, around 57% of the funds' entire real estate portfolio was located outside Germany; this amounted to 25 percentage points more than in 2000. With respect to investments in Europe, the established centres such as London, Milan and Paris still enjoy major importance thanks to their infrastructural and locational advantages despite already high valuations. Since the latest round of EU enlargement, these have been joined increasingly by properties in east European cities with a relatively low current valuation. Although the share of investment outside Europe has been growing for several years now, it accounts for little more than 3% of the aggregate total of real estate assets. Besides exposures in the United States, investments in Asia and in the Pacific are gaining importance.

*Structural features of open-end real estate funds*

Taken as a whole, these measures have managed to halt both the yield decline of the open-end real estate funds as well as the outflow of funds, which is a first positive sign for the entire sector. For a number of individual funds, however, there is still need for action.

Moreover, the potential liquidity problems inherent in the design of open-end real estate funds persist: investors in mutual fund shares are allowed to liquidate their holdings at short notice, whereas the funds' assets, with the exception of a cash reserve, are locked up over the long term. Supply and demand for mutual fund shares are not balanced by the price mechanism; instead the mutual funds determine the redemption price based on the value of the underlying assets.

The proposal currently under discussion to introduce exchange-traded REITs[17] might be one way of expanding the range of investment options (albeit more of a medium-term prospect) with a view to avoiding the potential liquidity risks arising from open-end real estate funds.

*Pfandbrief banks and market weakness*

With respect to their primary business model, especially the Pfandbrief banks, formerly known as mortgage banks,[18] have also been affected by the still unsatisfactory development in the market for commercial properties. This is expressed in the write-downs on loan losses, which declined only slightly in 2004. Additionally, banks have not been able to push through higher risk premiums in the current market environment. Moreover, many Pfandbrief banks are facing weak credit demand. Last year, loans granted by Pfandbrief banks for housing construction fell by 6% and the Pfandbrief banks' market share of residential real estate financing fell by 1.8 percentage points (to a current level of 13%). Although

**16** See Federal Association of Investment and Asset Management Companies, press release of 19 August 2005.
**17** Real Estate Investment Trust. Exchange-traded securities on real estate mutual funds. The price is determined by supply and demand. Following the launch, there is a secondary market; hence the fund itself can no longer experience liquidity difficulties owing to its underlying structure.
**18** In this Review the term "Pfandbrief bank" refers to the institutions which before 19 July 2005 were called "mortgage banks" (Hypothekenbanken). Institutions which have since then received a new Pfandbrief licence are not dealt with in this article.

Box 1.5

## THE INTERRELATION BETWEEN YIELDS AND THE AMOUNT OF RESOURCES RAISED BY OPEN-END REAL ESTATE FUNDS

A correlation analysis shows that mutual funds[1] with a higher yield attract relatively more resources (= inflows less outflows).[2] This correlation was, with the exception of the "stress period" of Q2 2005, always significant at the 1% or 5% level.

A regression analysis[3] confirms the interrelation – also testing for the dynamics of the resources raised – for the yields on an alternative investment – in this case an investment in bonds – and for the total amount of resources raised in the sector. The interrelation remains intact also in the case that the yield is substituted by a risk-adjusted measure of performance, such as the Sharpe ratio (regression (2)).

In line with expectations, the amount of resources raised by open-end real estate funds drops when bonds post higher yields. However, no statistical significance is found. One reason for this may be the fairly short observation period from April 2004 to August 2005. This period is probably too short to identify portfolio shifts occurring on the basis of changed yield relationships between various investment products. Furthermore, the amount of resources raised by an individual investment fund does not follows the amount of funds

### REGRESSION RESULTS[4]

Dependent variable: inflows or outflows of resources into or out of open-end real estate funds

| Independant variables | Dynamic, pooled estimation with yield | Dynamic, pooled estimation with Sharpe ratio |
|---|---|---|
| | (1) | (2) |
| Flow of resources in previous period | 0.484<br>(3.95)** | 0.628<br>(5.51)** |
| Yield of the fund | 0.006<br>(3.87)** | –<br>– |
| Sharpe ratio of the fund | –<br>– | 0.0005<br>(2.71)** |
| Yield of bond investment | –0.0003<br>(–0.72) | –0.0003<br>(–0.73) |
| Total flow of resources in the sector | 0.585<br>(0.93) | 0.456<br>(0.70) |
| Constant | –0.012<br>(–2.71)** | 0.003<br>(1.24) |
| $R^2$ | 0.62 | 0.64 |
| Observations | 321 | 321 |

### RESULTS OF THE LOGIT MODEL[4]

Dependent variable: relative probability of an outflow of resources

| | |
|---|---|
| Independant variable Yield of the fund | –1.180<br>(–8.97)** |
| Constant | 3.561<br>(0.467)** |
| Pseudo-$R^2$ | 0.28 |
| Surface under ROC | 0.84 |
| Confidence band ROC | 0.80 bis 0.88 |
| Observations | 401 |

**1** Each month, the data of 23 to 25 mutual funds are factored into the correlation analysis and the following analyses. — **2** Yields and fund raising each on a rolling three-month average: for example, yield = (yield$_t$ + yield$_{t-1}$ + yield$_{t-2}$)/3 — **3** Pooled OLS regression with an instrumented, endogenous and lagged variable. Dynamic panel estimators are rejected by various test procedures — **4** t-values in brackets. * / ** Significance at 5% / 1% level. All variables on rolling three-month

DEUTSCHE BUNDESBANK

raised by the sector as a whole. From a financial stability viewpoint, this deserves a positive evaluation.

As the yield of open-end real estate funds thus plays a central role in investors' decision-making, the measures taken by fund originators to increase returns can be valued using a logit model with the following form:

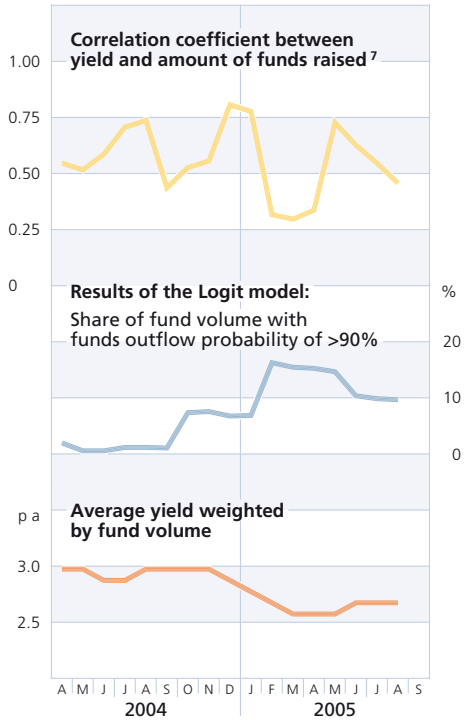
$$\text{Prob}(\text{flow of funds} = 1) = \frac{e^{\beta_0+\beta_1 \text{ yield}}}{1+e^{\beta_0+\beta_1 \text{ yield}}}$$

(flow of funds = 1 means outflow
flow of funds = 0 means inflow)

The model assigns an outflow probability for each fund yield (logit-link function). This enables us to calculate, firstly, the probability of an outflow of resources for a given yield and secondly, the change in this probability for a given a change in the yield.

According to this model[5], the probability of an outflow[6] falls by 69% (and 11% respectively) if the yield of a fund rises by 100 basis points (10 basis points). Moreover, the probability of an outflow is greater than 90% if a fund is yielding less than 1.15% pa. This currently includes around 10% of the total volume of open-end real-estate fund resources, which is clearly more than in the second and third quarters of 2004. Compared with early 2005, the situation has, however, eased somewhat. Not least, investment companies' comprehensive measures to increase yields have contributed to this development.

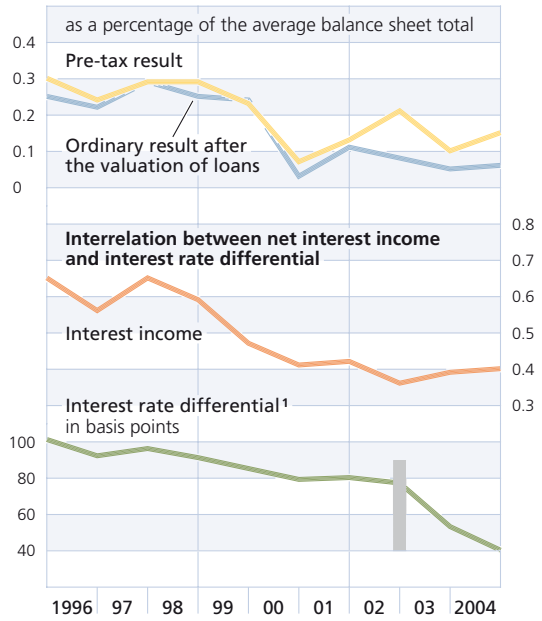
## EMPIRICAL RESULTS OF THE ANALYSIS OF OPEN-END REAL ESTATE FUNDS




averages. Instruments for the flow of resources in the previous period: all exogenous variables and flow of resources in the preceding quarter. **5** The coefficient of the yield (here β) is -1.18 and is significant at the 1% level. The corresponding odds ratio (=ê(-β)) is 0.31. — **6** The change in the probability of an outflow in relation to the probability of an inflow. — **7** Cross-section correlation of all funds in one month between resources raised and yield.

Chart 1.3.5

**PROFITABILITY OF PFANDBRIEF BANKS***




* The term Pfandbrief bank refers to those institutions which, prior to 19 July 2005, belonged to the group of mortgage banks. — **1** Difference between the interest rates on (from January 2003) housing loans to households with an initial interest-rate lock-in period of over 10 years or (until December 2002) mortgage loans secured by residential real estate at fixed rates for a period of ten years and the yields on domestic mortgage Pfandbriefe outstanding with an average residual maturity of over nine and up to and including ten years.

DEUTSCHE BUNDESBANK

the government financing business is booming, margins in this lending segment are traditionally low.

*Earnings situation of Pfandbrief banks*

The earnings situation of the Pfandbrief banks has stabilised over the past five years, but, with only a few exceptions, has remained at a relatively low level (see adjacent chart). Furthermore, since 2001 the profit for the year and the ordinary result after the valuation of loans have tended to diverge; in future, this could place strains on the profit for the year.

Moreover, the spread between interest receivable on mortgage loans and interest payable on Pfandbrief issues narrowed considerably in 2003 and 2004. Interest income, however, remained practically constant because a number of institutions which had originally engaged in long-term refinancing adopted the variable part of interest rate swaps, and this part got a positive present value owing to the unexpectedly protracted phase of low short-end interest rates. A number of institutions have conducted close-out transactions to make immediate profits on this positive present value (actually these profits would have been distributed over the entire maturity of the swap).

*Quality of the German Pfandbrief*

However, the current events surrounding one mortgage bank which is experiencing problems arising from interest rate risks, actually attest to the quality of the German Pfandbrief. This is ensured not least by a strict separation between assets used as cover for the Pfandbrief and the rest of the Pfandbrief bank's assets. This is one of the reasons why rating agencies up to now have always assigned Pfandbrief issues a top-notch rating.

*Sector undergoing changes*

The Pfandbrief banks are responding to the difficult market setting and the changed regulatory environment which ensued following the replacement of the former Mortgage Bank Act (*Hypothekenbankgesetz*) by the Pfandbrief Act (*Pfandbriefgesetz*) in different ways. Some of them are more likely to be more closely integrated into their banking group or banking association, while others are searching for strategic investors; however, the latter

approach is proving to be difficult in the current market environment.

*Opportunities and risks of internationalisation strategy of mutual funds and mortgage banks: chances and risks.*

Many German financial intermediaries which conduct business with commercial properties view a strategy of internationalisation as the logical way out of the weakness of the domestic market.[19] Indeed, in the past few years, the yields in many foreign real estate markets have been higher than those in the German market. Furthermore, the additional diversification in the property portfolios reduces the dependence on local market developments. According to surveys conducted by the Federal Association of German Investment and Asset Management Companies,[20] whereas German open-end real estate funds, for instance, had to write down nearly €900 million in 2004 on their German properties, they were able to record a net rise in the value of their investments abroad totalling €174 million. This divergent trend in the change in value of German and foreign real estate portfolios began in 1998. In the medium term, however, the institutions are also exposing themselves to the risks arising from sometimes high valuations in many of the markets. It is therefore important for them to ensure that their risk management strategies keep pace with their new business activities.

## Households' financing

In general, households' credit quality in Germany has deteriorated slightly of late. This is

**19** In the aggregate, Pfandbrief banks' foreign exposures have increased threefold since 1997. In reality, however, only a few of these banks have actually expanded abroad while others have retained their business focus in Germany.
**20** See Federal Association of Investment and Asset Management Companies, press release of 19 August 2005.

Chart 1.3.6

### HOUSEHOLDS' FLOW-OF-FUNDS ACCOUNT

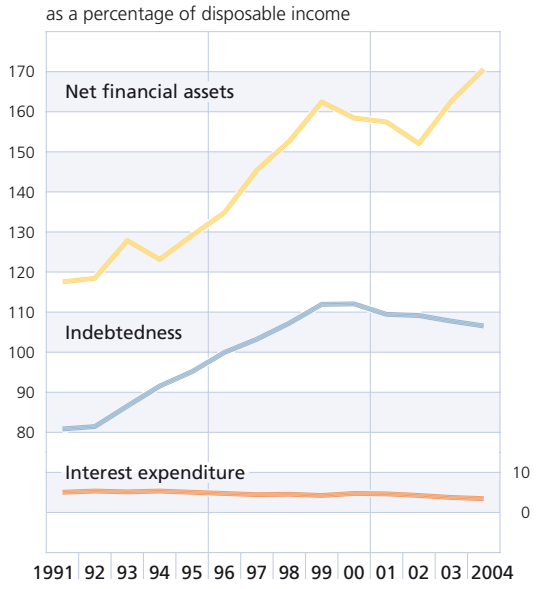
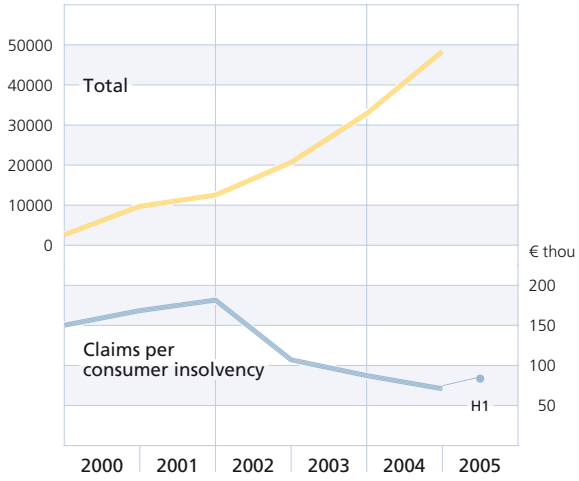



Chart 1.3.7

### CONSUMER INSOLVENCIES*




* Source: Federal Statistical Office and Bundesbank calculations.

DEUTSCHE BUNDESBANK

Chart 1.3.8

## FORECLOSURE SALES OF REAL ESTATE* IN GERMANY

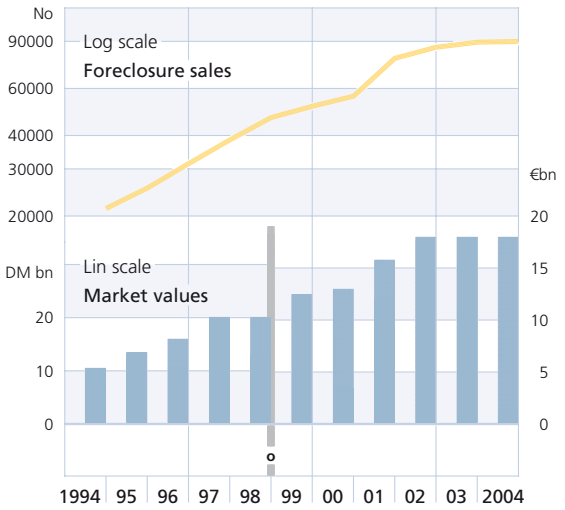
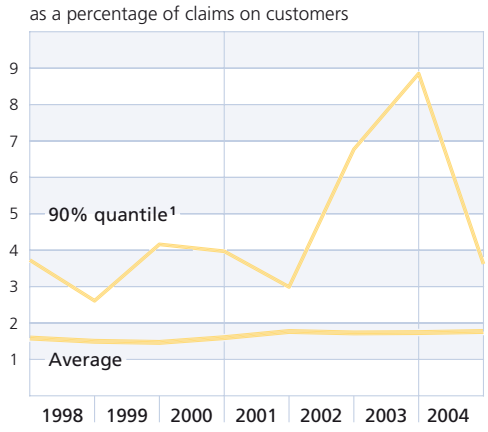



Chart 1.3.9

## NON-PERFORMING LOANS** AT BUILDING AND LOAN ASSOCIATIONS




***** Source: Argetra GmbH, Ratingen. — **o** From 1999 data in euro. — ****** Loans which require specific provisions to be made as a percentage of the gross volume of non-bank loans. — **1** Threshold which 90% of all banks do not exceed.

DEUTSCHE BUNDESBANK

most likely a result of high unemployment. All the same, the financial situation of German households does not bear any explicit risk potential. Households' (gross) debt ratio declined slightly in 2004 to 107% of disposable income (see chart 1.3.6 on page 53). Their interest expenditure ratio fell to just over 4%. At 171% of disposable income, household wealth measured in terms of net financial assets is at its highest level since the reunification of Germany.

*Consumer insolvencies*

However, consumer insolvencies rose by 46% last year to nearly 50,000 cases (see chart 1.3.7 on page 53). In the first half of 2005, the number of consumer insolvencies was up 42% on last year's corresponding figure. This big jump can still partly be put down to the fact that it is a relatively new instrument which has only existed in Germany since the insolvency law reform of 1999, the attractiveness of which has been additionally enhanced by the possibility introduced in 2002 to defer the costs of court proceedings. That more widespread use is meanwhile being made of this instrument is also suggested by the fact that the average claim per insolvency case has tended to decline over the past few years.

*Foreclosure sales*

The number of foreclosure sales involving real estate and the total market value concerned reached record levels in 2004 (see chart 1.3.8 on this page). Of these properties, 63% were pure residential real estate. The situation appears to have stabilised in the first half of 2005.[21]

**21** Properties foreclosed in the first half of 2005: 48,000 (-0.9% yoy) with a total value of €9.6 billion (+1.7% yoy).

## Private housing loans

*Limited risks arising from private housing loans*

The risk arising from private housing loans, which have a total volume of €770 billion, is limited. This is due firstly to the prevailing financial culture. Fixed-rate loans predominate in Germany, meaning that households are exposed to few interest rate risks and their creditworthiness is barely impaired by rising interest rates. Secondly, in contrast to the situation in some other countries, there has been no increase in the level of private mortgage indebtedness; in the past 14 years, households' real estate loans have remained fairly constant at around one-quarter of their total financial assets. Another indication that there has been no significant deterioration in the credit quality of private housing loans is the relatively low volume of non-performing loans in the portfolios of building and loan associations, which serves as a reliable barometer of the risk arising from private housing loans (see chart 1.3.9 on page 54).

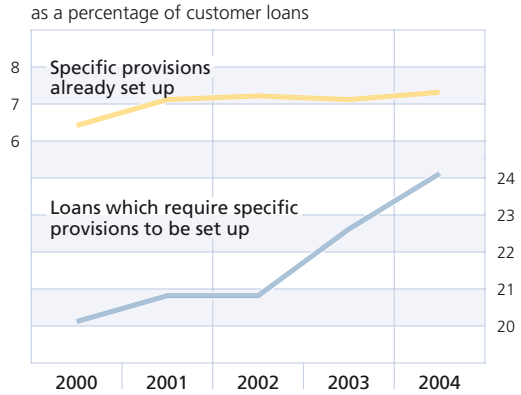
## Consumer credit

*Provisions rising*

In the growing consumer credit business, by contrast, the continuous rise in consumer insolvencies appears to be making an impact. The provisions of specialised consumer credit banks[22] have increased markedly in the past few years. The ratio of specific provisions to the gross volume of non-bank loans rose from 6.5% in 2000 to 7.4% in 2004. In line with this development, the consumer credit banks' share of non-performing loans in the gross volume of non-bank loans has risen steadily over the past five years from 20.1% to 24.2% (see chart 1.3.10 on this page).

Chart 1.3.10

**QUALITY OF CREDIT PORTFOLIOS OF SELECTED CONSUMER CREDIT BANKS***




* 16 institutions. For each of these institutions the share of consumer credit in the sum of all credit to non-banks amounts to 80 % or more. Together, the 16 institutions account for more than 21 % of all consumer credit.

DEUTSCHE BUNDESBANK

*Costs covered by margins*

However, consumer credit portfolios are typically very granular and, owing to the large number of loans involved, the possibilities of risk controlling are much better than in the case of loans to enterprises. This allows lending terms to be differentiated on a case-by-case basis. Responses to the Bank Lending Survey indicate that the margins on riskier consumer loans have been widening continuously for the past two and a half years, whereas margins on average-risk loans have tended to narrow since the fourth quarter of 2003. The difference between the (average) risk premium and the loan loss provisions made in

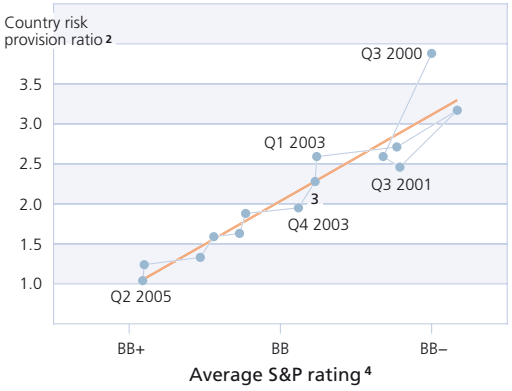
**22** This group consists of 16 institutions. Each of these institutions has a ratio of instalment loans to all loans to non-banks of over 80%. Taken together, all of the 16 institutions have more than 21% of all instalment loans of the entire banking system on their books.

Chart 1.3.11

## CROSS-BORDER LENDING TO DEVELOPING COUNTRIES*


Chart 1.3.12

## CORRELATION BETWEEN COUNTRY RISK PROVISION RATIO AND RATING**




* Source: BIS consolidated banking statistics. — **1** Annual average. — ** Sources: Country Risk Regulation, S&P and Bundesbank calculations; 15 most important countries with an S&P rating of BBB+ and below. — **2** Quotient from country risk provisions and the volume of risk-prone claims for each country, each weighted by the volume of risk-prone claims. — **3** From 30 September 2003 changeover to quarterly reporting. — **4** Weighted by the volume of risk-prone claims.

DEUTSCHE BUNDESBANK

each respective year stood at 137 basis points in 2004, compared with 114 basis points in 2003. As a result, the high margins continue to cover the costs of rising loan defaults in this market segment.

### Country-related (risk) exposure

*German banks' lending to European transition countries posting high growth rates*

The country-related exposure arising from lending to foreign borrowers is concentrated on loans to developing countries and emerging-market economies.[23] With respect to these countries, according to the data in the BIS consolidated banking statistics, German banks continue to be among the largest lenders in terms of volume. German institutions have expanded their lending activity particularly strongly to European transition countries of late. Growth has not, however, been restricted solely to the ten new EU member states. Lending to the other European transition countries has also increased sharply, primarily to Russia, Turkey and Romania. At the same time, lending to Latin America has been reduced further. Overall, it is striking that German credit institutions have recently expanded their foreign lending to a below-average extent only.

*Derivatives used to reduce country-specific risks*

Changes in banks' credit risk vis-à-vis specific countries may arise from the use of guarantees, credit commitments and the use of derivatives – which has become increasingly important in the recent past. As from the start of this year, the BIS statistics now take bet-

**23** The lion's share of German credit institutions' lending to foreign borrowers is practically subject to no special country risks. This can be seen in the fact that the 25 most significant countries recorded in the BIS consolidated banking statistics, which account for more than 90% of all loans to foreigners, have an average S&P rating of AA+.

ter account of this factor. Recently released figures for the first quarter of 2005 show that the current exposure of German banks vis-à-vis developing countries has been reduced by around one-fourth by the use of both conventional and new credit risk transfer instruments. At the international level[24] the corresponding figure is less than 10%.[25] This is a further indication of German banks' cautious risk policy vis-à-vis developing countries.

*Ratio of country-specific risk provisions in line with medium-term trend*

The amount of German banks' country-specific risk provisions are also no cause for concern at the moment. According to the data reported pursuant to the Country Risk Regulation,[26] at mid-2005 German banks had outstanding exposures amounting to around €116 billion to countries with an S&P rating of BBB+ and lower. Of this volume, 88% is concentrated in just 15 countries. On average, around 31% of the exposures to these countries are covered by collateral.[27] Taking additional account of existing provisions for counterparty risks and country risks, German banks' value at risk vis-à-vis these countries amounts to just under €9 billion. The current country risk provision ratio is just over 1%. This represents the lowest level in the past five years. At the same time, however, the average quality of German banks' foreign lending has increased. Thus the average S&P rating of the group of countries under analysis, weighted by the volume of claims, is currently close to BB+ (see chart 1.3.12 on page 56). Hence, in light of the improved ratings (see the article "Stability level achieved in highly indebted emerging market economies" on page 116), German banks' current country risk provision ratio seems to be in line with the medium-term trend.

## Macro stress test on the resilience of the German banking system

Macroeconomic developments are among the main determinants of credit risk. For the past two years the Bundesbank has therefore been carrying out its own macro stress tests for the German banking system using econometric estimates.

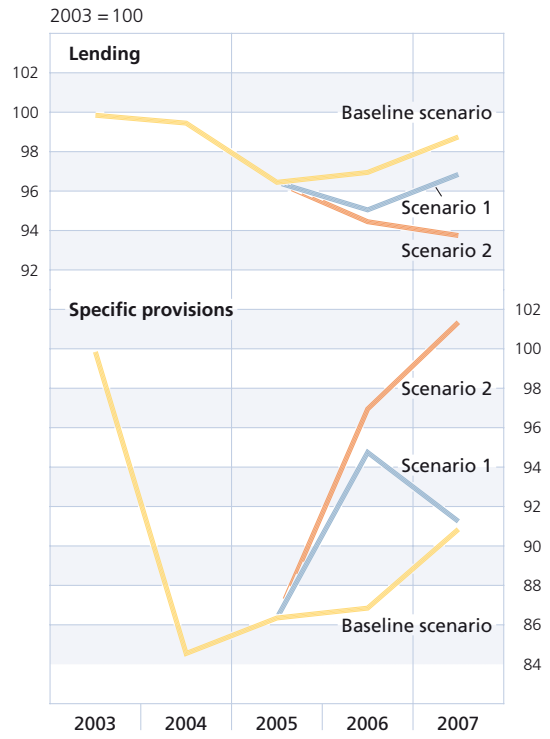
*Baseline scenario*

The baseline scenario of the macro stress test for the German banking system (see box 1.6 on page 59) assumes that the German economy will move roughly into potential growth in 2006 and 2007. This means that German banks' lending would then have gone through its low point and would steadily be picking up even if the peak reached at the end of 2001 is not matched in the 2006-07 projection period. The level of loss provisions would remain almost unchanged in 2006 and would then rise again slightly in 2007 owing to the expansion in lending. In this scenario, the loss provision rate is therefore likely to remain more or less constant. Profitability in the German banking system should likewise improve along with the rising demand for credit.

**24** The benchmark comprises 18 countries – mainly industrial nations – which have reported all details on risk transfers to the BIS. The group of reporting countries is to be enlarged.
**25** The figures for Germany and for the other countries are, however, only partially comparable. For Germany, derivatives are reported in the statistics at their credit equivalent amount in accordance with section 14 of the Banking Act, while other countries report derivatives at their market value.
**26** Pursuant to the Country Risk Regulation, credit institutions whose lending volume to borrowers domiciled outside the EU, the EEA, Switzerland, the USA, Canada, Japan, Australia and New Zealand exceeds a total of €10 million have to report their outstanding volume of foreign credit in accordance with section 25 (3) of the Banking Act.
**27** In addition to the collateral listed in section 20 (2) sentence 1 No 2 of the Banking Act, the term collateral here also includes, for instance, derivative positions which mitigate credit risk.

Chart 1.3.13

## MACRO STRESS TEST




Baseline scenario: German economy moves into potential growth. Scenario 1. Permanent 100-basis-point increase in interest rates together with a growth rate in 2006 which is 0.5 percentage point below the potential growth rate; move on to potential growth path in 2007. Scenario 2. Zero growth in 2006 and 2007 with unchanged interest rate level.

DEUTSCHE BUNDESBANK

*Stress scenarios …*

Compared with this baseline scenario, two shocks are simulated. The two stress scenarios assume the following developments over a two-year horizon.

Scenario 1. A permanent 1 percentage point interest rate increase from 2006 together with overall economic growth that remains ½ percentage point below potential in 2006 before moving, with a time lag, on to the potential path in 2007.

Scenario 2. Zero growth in 2006 and 2006 with an unchanged interest rate level.

The first scenario of an interest rate shock could be associated with a significant depreciation of the US dollar. It is conceivable that the long-term interest rate would rise in the United States if the rest of the world were to become less willing to finance the US current account deficit. Owing to the international interest rate link in the financial markets, this could spill over to European interest rates. The second scenario of the real economy sliding into stagnation could be the outcome of several negative components, which might include permanently higher oil prices as well as a strain on the price competitiveness of German enterprises as a result of a dollar depreciation.

*… and their implications*

In the first scenario the loss provisions of the credit institutions do increase temporarily. Lending, which initially declines, and the assumed lagged move to baseline growth are enough, however, to initiate the correction for 2007. In the second scenario, by contrast, loss provisions which in 2007 will actually exceed the 2003 level rise throughout the forecast period. Lending would then continue its downward trend.

The stress test indicates that the German institutions would currently cope relatively well with an interest rate shock. Prolonged weak economic growth could, however, cause problems for weakly capitalised banks with regard to their profitability and capitalisation.

Box 1.6

## MACRO STRESS TESTS

Macro stress tests assess the extent to which economic shocks affect the quality of a credit portfolio and whether they threaten banks' stability. Future loan losses and provisions are forecast using a regression approach. The approach used here specifies a simultaneous equation system for banks' credit risk and credit decisions. The basic structure of the chosen panel regression approach is as follows.

$$(1)\ \lambda_{it} = 0.16 \cdot \lambda_{i,t-1} + 1.6 \cdot \Delta K_{it} - 11.9 \cdot \Delta y_t + 0.07 \cdot \Delta r_t$$

$$(2)\ \Delta K_{it} = 0.02 \cdot \Delta K_{i,t-1} + 1.71 \cdot \Delta y_t - 0.01 \cdot \Delta r_t$$

The credit risk of bank i at time t is measured using the provisioning rate, wq. The logit transformation allows for the fact that the provisioning rate is invariably positive by defining $\lambda$ = ln wq – ln (1–wq). GDP growth $\Delta y_t$ and the (annual) changes in the risk-free year-on-year interest rate, $\Delta r_t$, are input in the risk equation as explanatory macro variables. Above all, the relevant bank's current credit growth, $\Delta K_{it}$, has proved significant as an additional (institution-specific) explanatory variable, which, in turn, can be explained by past credit growth as well as by GDP growth and interest rates.[1] This approach makes it possible to model a non-linear relationship between aggregate credit risk and explanatory macro factors. To do so, non-linear logit transformation is used for the provisioning rates and the heterogeneous nature of the credit portfolios is explicitly accounted for by the panel data and methods used.

The estimations confirm the crucial influence that macroeconomic factors exert on banks' credit risk. A 1% drop in economic output may be expected to result in an 11% to 12% increase in provisions, while an unexpected 1 percentage point rise in interest rates would see provisions rise by an average of around 17%.

Alongside macroeconomic factors, institution-specific variables play an important part in determining the amount of loan loss provisioning in the respective credit portfolios and, in particular, the average credit quality. The previous year's provisioning rate and, particularly, current credit growth have proved to be good proxy variables. It should be borne in mind in this connection that credit growth is closely linked to the general economic situation.

The model with equations (1) and (2) is able to simulate the future development of provisioning in credit business based on stress scenarios for macroeconomic growth and interest rates and to assess the banking system's resilience to macroeconomic shocks.

**1** The model as specified was estimated using a dynamic panel approach. In particular, the choice of a GMM estimator took account of the fact that the credit growth in equation (1) is an endogenous variable which has to be modelled accordingly using lagged values.

DEUTSCHE BUNDESBANK

Chart 1.3.14

## MARKET RISKS IN BANKS' PORTFOLIOS

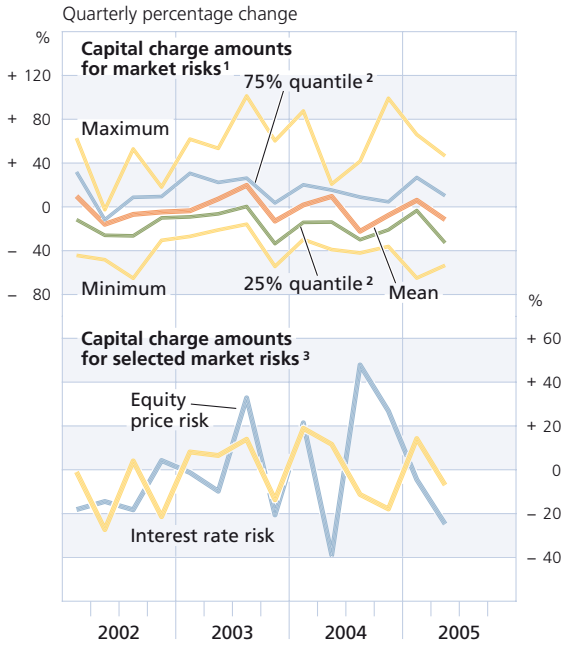



Chart 1.3.15

## CORRELATION OF TRADING RESULTS*


**1** Banks using their own market risk models. — **2** Value undershot by 75% (25%) of credit institutions. — **3** In the trading book pursuant to Principle 1. Based on those banks that have developed their own market risk models and that also explicitly model each type of risk. — * Data for 12 institutions that have their own market risk models. The trading results of each individual bank are correlated with those of every other bank in a rolling window of 50-day observations. For 12 banks, this therefore produces 66 pairwise correlations, from which a mean is calculated.

DEUTSCHE BUNDESBANK

## German banks' market risks

*No significant increase in market risk capital requirements …*

During 2004 and up until the second quarter of 2005 the market risk capital requirements[28] of German banks calculated using their own market risk models did not increase significantly. A slight decline is even visible at the current end. A positive development in terms of risk aspects, moreover, is that the relative changes to capital charges for market risks are spread over a broad range. This heterogeneous phasing of the build-up and run-down of market price risks serves to curb the systemic risk stemming from the market.

Disaggregation of the capital charges of market risk into its two key subcomponents – interest rate risk and equity price risk – shows that the risks in both categories have remained roughly constant year-on-year. The decline in the capital charges is thus attributable to both subcomponents. German banks therefore currently seem to be handling market risks prudently in their trading books.

## Correlation of trading results

*… however, increase in correlation among banks' trading results*

With regard to financial stability, however, the sharp rise in the correlation of trading results during 2004 calls for increased vigilance. As a mean of the pairwise correlation of the daily trading results of twelve German banks with their own market risk models, co-movement at the end of 2004 was even higher than the level during the stress situation surrounding 11 September 2001.

**28** The capital requirements of a market risk model are equivalent to the value at risk calculated in the model, multiplied by a factor defined by banking supervisors.

It should be noted, however, that the pairwise correlations of the banks are fed unweighted into this measure, which means that all the banks receive the same weighting irrespective of their size. By contrast, such size effects are taken into account in a diversification index.[29] This would indicate that significant diversification effects still exist despite the increase in pairwise correlations.

## Market risk stress test

*Regular stress tests are conducted to simulate the impact of extreme situations on the liable capital*

In order to better evaluate the market risk, the Bundesbank regularly conducts stress tests with a representative selection of German banks. This involves simulating the effects of extreme, yet conceivable situations that could potentially occur on the on and off-balance-sheet positions of the banks. It can then be seen whether the banks have sufficient capital to withstand the assumed stress situations without the need for countermeasures.

The scenarios in question relate to the most significant market risks facing German banks, ie interest rate risk, equity price risk, exchange rate risk and volatility risk. The banks calculate the changes in the market value of all positions in the banking book and trading book on the basis of predefined scenarios.

Table 1.1

### RESULTS OF THE STRESS TESTS IN MARKET RISK

Changes in market value as a percentage of liable capital (weighted mean)

| Scenarios | 2003 | 2004 | 2005 |
|---|---|---|---|
| | **Large, internationally operating banks** | | |
| **Yield curve** | | | |
| Twist (+) | – 1.2 | – 0.62 | – 0.37 |
| Parallel shift (+) | – 0.84 | – 0.52 | 0.27 |
| Peak (+) | – 0.37 | – 0.15 | – 0.17 |
| Twist (–) | 1.16 | 0.63 | 0.55 |
| Parallel shift (–) | 0.70 | 0.60 | 0.11 |
| Peak (–) | 0.43 | 0.16 | 0.24 |
| Euro appreciation | – 0.29 | 0.07 | – 0.05 |
| Euro depreciation | 0.19 | 0.18 | 0.36 |
| Fall in share prices | – 9.86 | – 8.00 | – 9.33 |
| Volatility | – | – | 0.26 |
| | **Medium-sized and smaller banks**[1] | | |
| **Yield curve** | | | |
| Twist (+) | – 0.97 | – 1.15 | – 0.76 |
| Parallel shift (+) | – 1.00 | – 1.29 | – 0.92 |
| Peak (+) | – 0.42 | – 0.49 | – 0.22 |
| Twist (–) | 0.98 | 1.07 | 0.82 |
| Parallel shift (–) | 0.97 | 1.31 | 1.01 |
| Peak (–) | 0.42 | 0.43 | 0.23 |
| Euro appreciation | – 0.05 | – 0.35 | – 0.75 |
| Euro depreciation | 0.08 | 0.44 | 0.66 |
| Fall in share prices | – 0.60 | – 1.57 | – 1.18 |
| Volatility | – | – | 0.11 |

Table 1.2

### EXPLANATION OF SCENARIOS

Changes in basis points[2]

| Scenarios | Short-term[3] | Medium-term[4] | Long-term[5] |
|---|---|---|---|
| **Yield curve** | | | |
| Twist (+) | 110 | 60 | 40 |
| Parallel shift (+) | 70 | 70 | 70 |
| Peak (+) | 0 | 30 | 0 |
| Twist (–) | – 110 | – 60 | – 40 |
| Parallel shift (–) | – 70 | – 70 | – 70 |
| Peak (–) | 0 | – 30 | 0 |
| Euro appreciation/ depreciation | 15% appreciation/depreciation[2] of the euro. | | |
| Fall in share prices | Simultaneous 30% fall[2] in share prices across all markets. | | |
| Volatility | 20-percentage-point increase[2] in the volatility of share prices and exchange rates.[2] (Scenario not comparable to previous years) | | |

**1** Seven institutions. — **2** Within one day. — **3** No more than three months. — **4** More than three months but not more than five years. — **5** More than five years.

DEUTSCHE BUNDESBANK

**29** This is calculated as the ratio of the value at risk of the aggregated trading portfolios of all banks and the sum of value at risks of the individual banks. Having risen to around 0.75 as a result of 9/11, it has fluctuated in the range of 0.3 to 0.6 over the past three years. (See also Memmel C/Wehn C (2005), The supervisor's portfolio: The market price risk from 2001 to 2003 – Analysis and models for risk aggregation, Deutsche Bundesbank Discussion Paper Series 2 (02/05).)

Chart 1.3.16

**VALUATION RESULT* OF GERMAN BANKS**

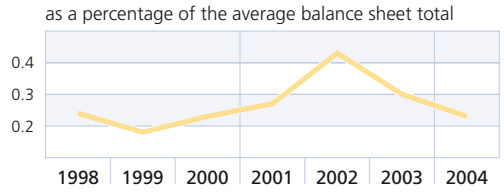
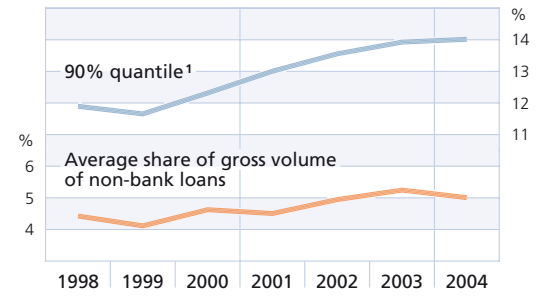



Chart 1.3.17

**NON-PERFORMING LOANS** IN THE GERMAN BANKING SYSTEM**




* Net expenditure on the valuation of loans, other assets and securities. — ** Loans with a specific provision requirement as a percentage of the gross volume of non-bank loans. — **1** Threshold which 90% of all credit institutions undershoot.

DEUTSCHE BUNDESBANK

*Big banks, in particular, hedged against rising interest rates*

Regarding the interest rate risk, various types of yield curve shifts were investigated. What is striking is that several institutions are hedged against a rise in interest rates. These institutions acted upon the expectation of rising yields by taking short interest rate positions or buying put options. According to the stress test, the potential gains would be high enough to outweigh the credit book losses resulting from a rise in interest rates.

*Long interest rate positions predominant among smaller and medium-sized institutions*

The importance of short interest rate positions and the use of put options has increased significantly among larger institutions since 2003. By contrast, long interest rate positions remain predominant among smaller and medium-sized institutions, which indicates that these banks are pursuing a more traditional buy-and-hold strategy. However, in this situation, too, these banks have reduced their potential for losses in the event of an abrupt rise in interest rates compared with the two preceding years.

*German banks' equity price risk*

The stress test also established, with regard to the equity markets, that big banks' risks tend to be much higher than those of smaller and medium-sized banks. It should be borne in mind, however, that large, internationally operating banks generally have greater equity holdings. In addition, in view of the share price increases over the past few months, these banks will most likely have built up some hidden reserves to offset any future losses. Against this background the figures shown in the table are likely, in some cases, to considerably overstate the actual risk situation. Besides, in the light of the fact that there are currently no signs of excessive overvaluation in the equity markets, there is no cause for particular concern regarding equity price risk.

*Stress test passed again*

Overall, the test results show that the institutions surveyed would be able to withstand the shocks assumed in the market prices. The key risks are posed by a change in interest rates or equity prices. As in previous years, the risks posed by a change in the exchange rate or an increase in volatility remain small.

## Performance of German banks

### General trends

*Profitability strengthened*

The profitability of the German banking system has strengthened slightly during the course of this year. This is especially apparent in the case of those banks whose costs resulting from earlier restructuring measures in cost and risk management are now ceasing to be a factor and whose loss provisions are showing a marked decline. Given this situation, future increases in profitability will probably be possible only if credit quality remains at a high level internationally and also continues to stabilise nationally.

*Asset valuation improves*

In 2004, net income or net charges from the valuation of assets already returned to a level that was usual in Germany in the second half of the 1990s. According to provisional information, a further decline is in the offing for this year. Given the cautious lending policy of the past few years and the relaxed risk situation, especially in business with large corporate customers, this decline appears understandable. The portfolios of non-performing loans – measured as loans with a loss provision requirement – are also declining. Their share of the gross volume of non-bank loans fell to 5.1% in 2004, which means that the 2003 peak of 5.3% is likely to have been overcome. Owing to the typical time lag in the case of "problem" loans, the return to the longer-term average level will still take some time. This reduction is not yet uniformly apparent in all the sectors of the German banking system either.

*Lack of international comparability*

Nevertheless, when assessing these values, it should be borne in mind that there is still no international standard definition of the term "non-performing loan" (NPL). While many countries define NPLs by the criterion of "90 days past due", the relevant definition in Germany is given by reference to "loans with a loss provision requirement". This definition is broader than the "90 days past due" criterion. Furthermore, the portfolio of NPLs is shown on a gross basis in Germany, ie before deduction of write-downs. Owing to this broader definition, the calculated NPL portfolio and the NPL ratio therefore probably tend to be greater in Germany than in most other countries. This means that the German figures are only intertemporal and are not internationally comparable.

*Efficiency recovers again*

Measures of efficiency, such as the cost-to-income ratio or the deviation from the minimum cost combination (see box 1.8 on page 67), have settled down again at levels that appeared in the years before 2001. This means that most of the overcapacity that had arisen from the efforts of many banks to expand into – in some cases – unsustainable lines of business towards the end of the 1990s and the ensuing slump in demand at the start of the millennium is likely to have been eliminated from the market. Further, decidedly necessary progress in terms of costs is likely to be increasingly difficult to achieve, however.

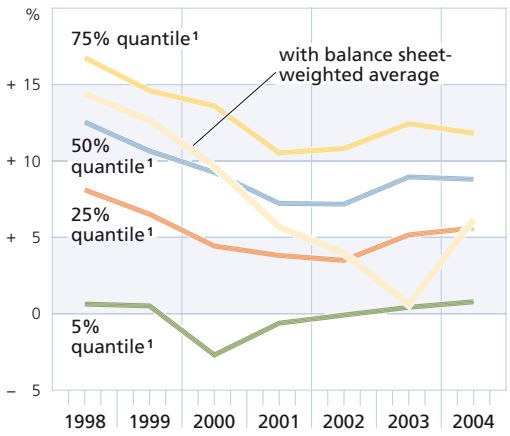
*Improved performance recently*

On the whole, there are signs of German credit institutions' profitability strengthening.[30] For the median among the German credit institutions, the return on equity in 2004 was virtually at the 2000 level. Admittedly, this did

**30** See Deutsche Bundesbank, The performance of German credit institutions in 2004, Monthly Report, September 2005, pp 15-43.

Chart 1.3.18

**DISTRIBUTION OF GERMAN BANKS' RETURN ON EQUITY ***




* Ratio of the pre-tax profits to the balance sheet capital. — **1** Threshold which 75% (50%, 25%, 5%) of all credit institutions undershoot.

DEUTSCHE BUNDESBANK

not yet apply to the weighted average as the big banks, in particular, had still not finalised their adjustments. There is also a lack of support in terms of economic growth, without which embarking on a sustained course of expansion is made much more difficult on the income side.

### Big internationally active banks

*Divergence in result driven by write-downs …*

The effects of the real economic strains can be gauged by the results of the big, internationally active banks.[31] There is a striking discrepancy between their operating result and their pre-tax profits in the period from 2001 to 2004. This reflects the fact that the German banks had to make provisions, especially to business and real estate loans, as well as write-downs on participating interests, which were much larger than average. The divergence in the result between German and other European banks[32] was driven crucially by the write-downs during these years.

*… and setback in terms of efficiency*

A similar pattern emerges in the case of operating efficiency, measured by the cost-to-income ratio. In the difficult years 2001 and 2002, the European banks had to accept an increase in the cost-to-income ratio of no more than a 1.2 percentage points, while the big internationally active German banks showed a deterioration of 5.7 percentage points. This was due mainly to fact that the German banks' income from 2001 onwards was falling far behind that of their European competitors. As a consequence, they had to withdraw more capacity from the market, which included an accelerated reduction in staff. It naturally follows from this that the narrowing of the gap between the results in the two groups of banks since the previous year cannot be viewed unequivocally as a process of catching-up but rather as a return to normal after adjustment for the special situation. At all events, they succeeded in doing this under difficult market conditions. Even so, there is still a deficit in the average efficiency of most big internationally active German banks.

*Asset productivity increases*

Besides this trend towards normality with regard to provisioning and cost efficiency, it is

**31** The aggregate comprises eight German banks from all three sectors, whose consolidated balance sheet total exceeds €250 billion in each case and which also operate on a large scale in the international markets.
**32** The benchmark group consists of 16 European banks which – like the German group – have a balance sheet total of more than €250 billion and for which a continuous database is available.

Box 1.7

## NON-PERFORMING LOANS MARKET

The increase in loan sales over a period of almost two years has contributed significantly to a contraction in the volume of non-performing loans (NPLs) on the balance sheets of German credit institutions. NPLs with a nominal volume of around €12 billion[1] changed hands in Germany last year alone, the majority of which were secured by property. They accounted for more than half of the decline in NPLs in 2004. Several transactions have also taken place already this year or are currently in the negotiation phase, which means that annual sales are likely to be just as high as last year.

From a microeconomic perspective, these sell-offs are of great importance. On average, those institutions which have actively been selling loans have reduced their NPL ratio by around 20%.

Foreign institutional investors are among the largest buyers of German NPLs. The return on equity of around 20% that these buyers are targeting often cannot be achieved simply by disposing of the NPL efficiently or benefiting from economies of scale; instead, buyers also need to leverage their assets through debt financing. As far as risk transfer is concerned, the proportion of German credit institutions among the purchasers' lenders is important. Data up to the first quarter of 2005 show that German banks have lent almost €1 billion[2] to the four largest buyers of German NPLs, more than half of which was within the past 12 months. Overall, there is a broad spread of both lenders and borrowers. Therefore, granting these loans should not result in any specific concentration risks for German banks. Moreover, there is no striking correlation between the credit which a single bank grants to an NPL buyer and the latter's purchase of that bank's NPLs.

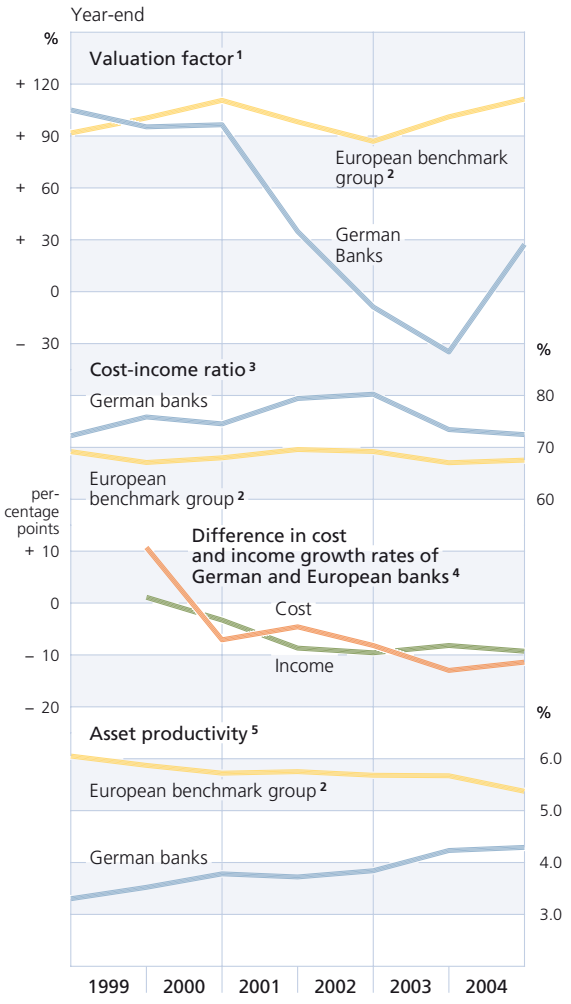
The interim picture from a financial stability perspective is generally positive. The gradual development of a satisfactorily functioning market for NPL trading provides German banks with an additional credit risk transfer instrument. It permits more variation and a simpler diversification of credit risks. However, the nascent German NPL market has presumably also benefited from yield-seeking behaviour. As such, it will have to prove its absorption capacity once investors' preferences shift to other asset classes, for example, in the light of an upturn in interest rates.

**1** This figure does not take account of undisclosed transactions. Sales of loans are often negotiated tacitly between two parties. Systematic data are not available for these transactions. — **2** Source: Data from the credit register for loans of €1.5 million or more ("Millionen-Evidenzzentrale").

DEUTSCHE BUNDESBANK

Chart 1.3.19

**COMPONENTS OF THE RETURN ON EQUITY OF EIGHT BIG INTERNATIONALLY ACTIVE GERMAN BANKS**




Source: Bankscope and Bundesbank calculations. — **1** Ratio of pre-tax profits to the operating result produced by the sum of net interest received, net commissions received and the net trading result (operating income) less general administrative spending. — **2** 16 banks with a balance sheet total of more than €250 billion. — **3** Ratio of general administrative spending to operating income. — **4** Cost/income growth rates of German banks less cost/income growth rates of European banks. A relative improvement of German banks vis-à-vis European banks is evident when the differences in income growth rates exceed the differences in cost growth rates. — **5** Ratio of operating income to the risk-weighted assets.

DEUTSCHE BUNDESBANK

notable that the German banks were able to effect a steady improvement in their asset productivity. This happened against the trend in the case of the European banks, whose asset productivity has shown a gradual decline – a development which is probably also consistent with the flattening of the yield curve and the fall in risk premiums in many credit markets. This indicates that the German banks have made major progress in managing the economic capital and, therefore, in optimising to the potential return.

*Return on equity approaching international standard*

In the current year, the most important trends in performance are likely to continue. Unless there are further major corporate insolvencies towards the end of the year, which would have a severe impact on net income or net charges from the valuation of assets, the gap between the operating result and pre-tax profits will probably close to a large extent. This by itself brings German banks' return on equity closer to the international standard. The recovery in cost efficiency should also essentially continue. The progress in asset productivity is also likely to be maintained. The regained room for manoeuvre following the adjustment process is also revealed by the fact that, since the beginning of 2005, big internationally operating banks, in the aggregate, have increased their risk-weighted assets again for the first time in about three years.

## The Landesbanken

*Reorientation continues*

The reorientation of business activity by a number of Landesbanken, necessitated by the elimination of the guarantors' responsibility for ensuring the solvency of a public law insti-

Box 1.8

## USING STOCHASTIC FRONTIER ANALYSIS TO MEASURE COST EFFICIENCY

When providing services and financial products, banks use factors of production which they demand at given prices. Cost efficiency is achieved if a bank produces given outputs at minimum cost. Observable input and output quantities and costs make it possible to estimate the efficient cost function empirically. Individual banks may deviate from the frontier either because of (i) random errors or (ii) suboptimal demanded inputs.[1] The model uses stochastic frontier analysis to express costs as a function of output, input prices for labour, property and debt and equity capital. In addition, a composite error term is assumed. The components represent white noise and inefficiency. An estimation with fixed effects and time-varying efficiency enables comparisons to be made across banks from the three pillars because it takes account of systematic differences. Bank-specific efficiency is the conditional expectation of the distribution of systemic deviations given realisation of the error term. Bank-specific cost efficiency can assume values between 0% and 100%. A value of 90% indicates that the bank could have produced its output at 10% lower cost.

### COST EFFICIENCY

as a percentage from 1993 to 2004


For the period from 1993 to 2004, estimated mean cost efficiency is 74.7% while mean operating costs are around €84 million. Hence, the average bank could have made additional savings of around €21 million. The sharp drop in cost efficiency in 2000 and 2001 is striking. With the onset of the stock market slump and the shrinking demand for credit, many banks were unable to maintain the efficiency level given their use of resources and platforms. One possible explanation is that banks were only partially successful in the short term at reducing overcapacities that had arisen. The marked efficiency gain in subsequent years shows the significant efforts which banks have made to control costs.

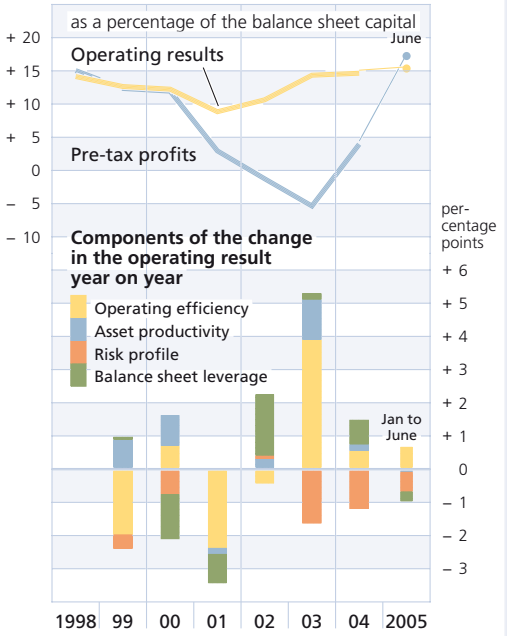
**1** See M Koetter, "Measurement matters – Input price proxies and bank efficiency in Germany", Research Centre of the Deutsche Bundesbank, Discussion Paper (Series 2), 01/2005.

DEUTSCHE BUNDESBANK

Box 1.9

## BREAKDOWN OF RETURN ON EQUITY INTO COMPONENTS

### RETURNS ON EQUITY OF EIGHT BIG INTERNATIONALLY ACTIVE GERMAN BANKS




Return on equity (RoE) is defined as the ratio of the pre-tax result (R) to balance sheet equity (E) which can be expanded step-by-step using the variables operating result (opR), operating income (opJ), risk-weighted assets[1] (RWA) and total assets (A)

$$\frac{R}{E} = \underset{(1)}{\frac{R}{opR}} \cdot \underset{(2)}{\frac{opR}{opJ}} \cdot \underset{(3)}{\frac{opJ}{RWA}} \cdot \underset{(4)}{\frac{RWA}{A}} \cdot \underset{(5)}{\frac{A}{E}}$$

(1) The valuation factor is the ratio of the pre-tax result to the operating result (R/opR). It indicates the impact of risk provisioning, special write-downs and that of net other income/expenditure on the overall result.

(2) The ratio of the operating result to the operating income (opR/opJ) denotes operational efficiency. This operational efficiency corresponds to (1 – cost-to-income ratio).

(3) The ratio of the operating income to the risk-weighted assets (opJ/RWA) indicates asset productivity. It indicates income in relation to risk.

(4) The risk profile is measured by the ratio of risk-weighted assets to total assets (RWA/A).

(5) Lastly, the ratio of assets to equity (A/E) determines balance sheet leverage.

Variables 3, 4 and 5 can be simplified to give the revenue efficiency (opJ/E) which indicates the contribution made by the revenue side to the ROE.

Variables 2, 3, 4 and 5 together indicate the operational return on equity shown in yellow on the chart.

The columns show the contribution to the change in operational return on equity made by its individual components.

**1** Including market risk positions.

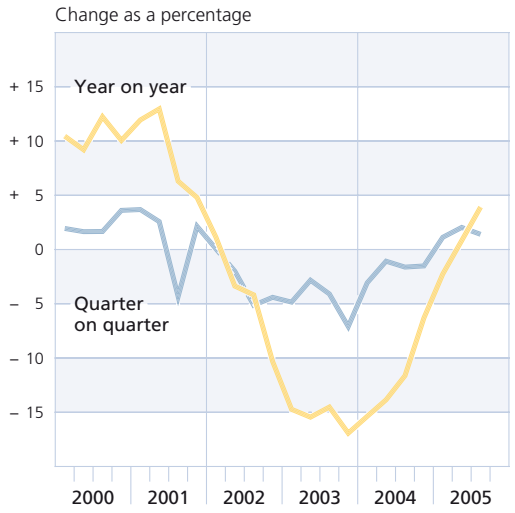
DEUTSCHE BUNDESBANK

tution and guarantors' uncalled liability, is still under way. Many measures have been aimed at achieving or maintaining an adequate rating. These include the strengthening of the business and risk network with the savings banks, capital measures and, in some cases, a considerable provisioning with liquidity.

The readjustment of the business models has not universally created a sound basis for a sustained improvement in profitability. Although pre-tax profits grew in the first six months of 2005, and in some cases did so considerably, much of the improvement resulted from the decline in risk provisioning. In operating terms, according to the group definition, however, five out of seven Landesbanken suffered falling operating income in 2004 (compared with the previous year) and four suffered a fall in income in the first half of 2005 (compared with the previous half-year), with a mixed picture being presented with regard to the individual components of net interest received, net commissions received and the net trading result. In the medium term, substantially more productive sources of income are required, whether from business with corporate and private customers or from selected niche markets. By contrast, business models which rely principally on contributions to incomes from network business with the affiliated savings banks are scarcely likely to safeguard the profitability needed in the medium term.

Chart 1.3.20

**RISK-WEIGHTED ASSETS OF EIGHT LARGE INTERNATIONALLY OPERATING BANKS**




DEUTSCHE BUNDESBANK

### Savings banks and credit cooperatives

*Medium-term changes in retail business*

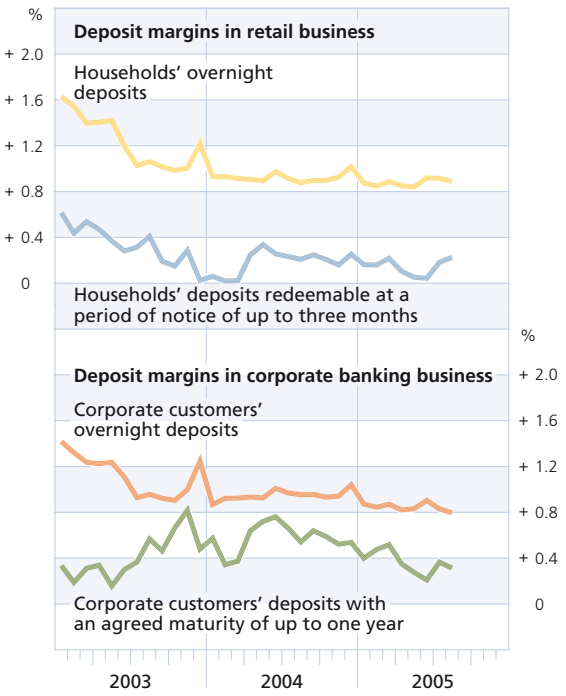
The institutions focused on the steadier business with small investors on the liabilities side as well as on loans for housebuilding and loans to small and medium-sized enterprises on the assets side were much less severely affected by the slump at the start of the decade. Even so, signficant medium-term shifts are taking place in these markets, and these shifts are bringing about a sustained transformation of the environment for profitability and stability. These include intense competition on the deposits side as a result of new products and new competitors, and this is exerting pressure on margins. At the same time, new competitive conditions are increasingly taking hold of the credit markets for households, ie for consumer credit and mortgage loans.

*Net interest received under pressure*

For the savings banks and credit cooperatives, general interest rate developments, along with these microeconomic changes, are playing

Chart 1.3.21

**GERMAN BANKS' INTEREST MARGINS IN DEPOSIT BUSINESS***




Source: Harmonised euro area interest rate statistics, Bloomberg, Bundesbank calculations. — * The margins for non-overnight deposits are calculated on the basis of the dominant maturity in new business as the differential vis-à-vis bank bonds of the same maturity. In order to exclude volume effects over time as far as possible, the volumes are kept constant.

DEUTSCHE BUNDESBANK

a major role. The decline in the interest rate level over the longer term has substantially depressed interest margins as the income from the maturity transformation of short-term deposits into longer-term loans is falling. These medium-term developments were reflected in the erosion of net interest received between 1994 and 2001; in the case of the savings banks and credit cooperatives, net interest dropped from 3.15% (of the average balance sheet total) in both cases to 2.28% and 2.41% respectively. There was a temporary recovery in 2002 and 2003, but this did not continue in 2004 and is unlikely to do so in the current year either. Given the currently foreseeable conditions of strong competition, which restricts the scope for margins and risk premiums, as well as relatively low capital market rates, which dampen the rate of return on maturity transformation, net interest received by the networked institutions is likely to remain under pressure in the medium term.

*Progress in commission business*

It is therefore important that the network institutions continue to follow the international trend towards non-interest income playing an increasing role. In actual fact, they succeeded in making significant advances in commission-related business last year, powerfully assisted by the boom in life insurance policies, which was precipitated by a tax change at the end of the year. At all events, in the current year it looks as though net commissions received will remain quite stable even without this special factor.

*Consolidation*

A further response to the growing pressure on results was a furious pace of consolidation, especially in the case of the credit cooperatives. The number of credit institutions fell by 33% between 1997 and 2004, which was much more sharply than in the European Union as a whole. All in all, the wave of mergers is likely to have made a positive contribution to the stability of the sectors (see box 1.10 on page 71). At the microeconomic level, the motive of avoiding future problem cases appears to have been dominant.[33] At least, institutions involved

**33** M Koetter, J Bos, F Heid, C Kool, J Kolari, D Porath, Accounting for distress in bank mergers, Bundesbank Discussion Papers, Series 2, Banking and Financial Studies 09/2005.

Kasten 1.10

## SUCCESS OF MERGERS

Given the rapid rate of mergers – particularly among cooperative banks over many years – the question arises as to just how successful this wave of consolidation has been.

A recent study[1] based on stochastic frontier analysis (see box 1.8) measures the success of merging banks against two criteria: the level of and change in cost efficiency. Merged banks are compared with the average values for a control group of banks which did not merge in the period under review. The table divides the institutions into four groups based on the extent to which the new bank's cost efficiency was above or below the average level of the control group following the merger and whether the change in efficiency was above or below the average change of the control group (success/failure). Rated accordingly, the proportion of mergers classified in group I (up to nine years after they occurred) is around 50%. This means that every second merger is a success both in terms of the level of and improvement in cost efficiency.

Across all mergers (both successes and failures), the average additional efficiency gain achieved by the merger is limited, however, standing at around 1 percentage point. Institutions that merge with large *ex ante* efficiency differences (ie with the potential to transfer management qualities) only boost their efficiency in the short term. In the medium and long term, the more successful mergers are those between similarly efficient banks. In addition, mergers where a problem bank assumes the role of the acquiring institution only rarely result in sustained efficiency gains. However, if a problem bank is taken over in a merger, the proportion of successes is comparable with mergers between sound institutions, indicating that mergers of this nature can promote stability in the banking system.

### DISTRIBUTION OF SUCCESSFUL AND UNSUCCESSFUL MERGERS OVER TIME

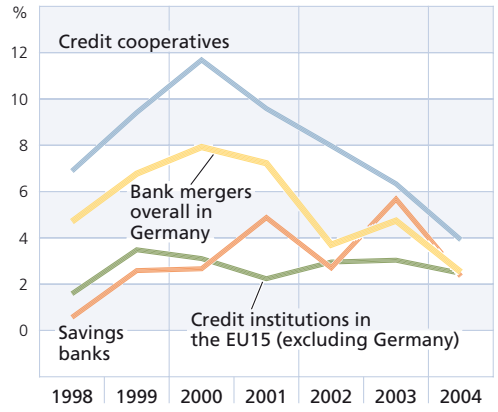
| Time | Comparison of | Group (%) I | II | III | IV | Number |
|---|---|---|---|---|---|---|
| Year | CE level | Success | Success | Failure | Failure | . |
| Year | CE change | Success | Failure | Failure | Success | . |
| 1 | . | 48 | 28 | 16 | 8 | 1 127 |
| 2 | . | 53 | 20 | 21 | 6 | 903 |
| 3 | . | 48 | 21 | 25 | 6 | 677 |
| 4 | . | 51 | 19 | 25 | 6 | 466 |
| 5 | . | 50 | 19 | 24 | 8 | 306 |
| 6 | . | 53 | 17 | 26 | 5 | 200 |
| 7 | . | 50 | 13 | 34 | 3 | 143 |
| 8 | . | 57 | 11 | 26 | 6 | 99 |
| 9 | . | 46 | 17 | 29 | 9 | 59 |

**1** M Koetter, "Evaluating the German Bank Merger Wave", Research Centre of the Deutsche Bundesbank, Discussion Paper (Series 2), Banking and Financial Studies, 12/2005. — **2** The benchmarks for comparing the CE level and the CE change are the average values for a control group of banks which did merge.

DEUTSCHE BUNDESBANK

Chart 1.3.22

**MERGER RATES***




Source: ECB and Bundesbank calculations. — * The merger rate corresponds to the percentage of institutions which have merged within a single year relative to the total number of institutions within a given category of banks.

DEUTSCHE BUNDESBANK

in mergers show, on average, weaker financial profiles than the non-merging institutions.

## Solvency of German banks

### Capitalisation and effects of the application of IFRS by banks

The solvency of the German banking system is based on two pillars: the individual credit institution's ability to sustain risk and the protection schemes in the various sectors. Overall, the German banking system's own funds and core capital base can be described as adequate in terms of the risk situation.

*Medium-term improvement in liable capital base*

The German institutions' individual ability to sustain risk measured in terms of their own funds and core capital ratios (pursuant to section 10 of the German Banking Act, but also known as capital and Tier 1 ratios) based on the rules for drawing up individual accounts laid down in the German Commercial Code) has improved in the medium term. At an average of 14.5% and 10.3%[34] respectively, the own funds and core capital ratios are currently well above the minimum regulatory requirements of 8% and 4%. The ratios for those institutions with the poorest level of capitalisation (10% quantile) have also risen continuously and, at 10.4% and 6.7%, are currently at their highest level since January 1999. Weighted by the balance sheet total, however, the average core capital ratio of the banking system has declined slightly since the third quarter of 2003. This is due to the continued unfavourable (earnings) trend of some large institutions. The losses in 2002 and 2003 (and, in one case, in 2004 as well) were, in the short run, not fully offset by capital increases and affected the capital base. However, capitalisation has remained stable despite the strains imposed by these burdens because the banks were able to reduce their risk weighted assets considerably. Moreover, following long negotiations with the European Commission, some Landesbanken were placed in the unique situation of having to make sizeable backpayments on federal states' deposits which had been remunerated at rates other than the prevailing market ones. The required adjustments proved successful in this case, too, and did not trigger any uncertainty in the markets. Overall, the absolute level of own

**34** All German institutions. Adjusted for extremes.

funds and core capital in the German banking sector has been on the increase again since March of this year.

*Ratios pursuant to the Banking Act based on the German Commercial Code …*

The regulatory capital ratios pursuant to section 10 read in conjunction with section 10a of the Banking Act are still calculated on the basis of the rules laid down in the Commercial Code for drawing up individual accounts. Consequently, they are not affected by the mandatory application of the IAS/IFRS for the consolidated accounts of listed institutions which came into force in 2005.

*… Basel capital ratios also based on IFRS*

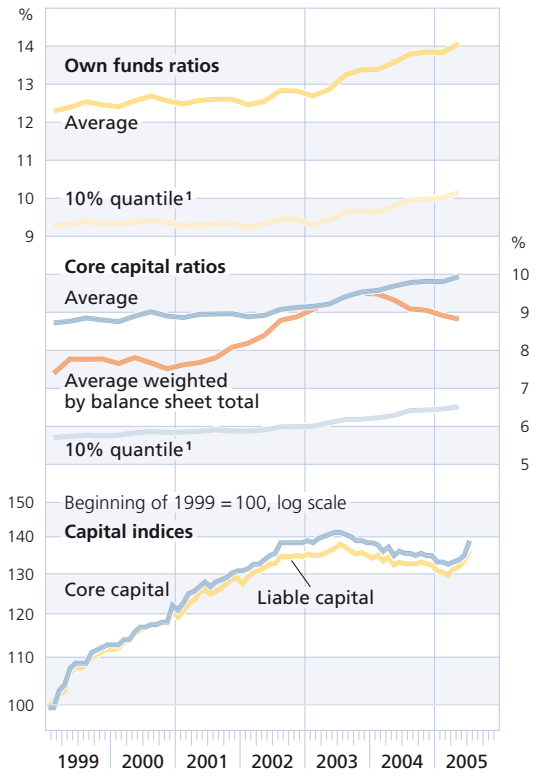
However, the application of international accounting standards may have an impact on the way some German institutions, namely those that submit reports under the 1988 Basel Capital Accord (Basel I) as internationally operating institutions, calculate their capital base. To calculate the Basel capital ratios, internationally operating banks may use consolidated accounts drawn up in accordance with international accounting standards (IAS/IFRS or US GAAP). Three of the eight large internationally operating institutions currently exercise this option. As a result, the possible capital effects of applying international accounting standards to the capital base of German banks can be evaluated only on the basis of reports to the 1988 Basel Capital Accord database.[35]

*Capital recorded tends to be higher when IFRS are applied …*

For the purpose of comparison, the eight large internationally operating institutions' capital ratios for the consolidated Principle I (ie ratios calculated on the basis of individual accounts drawn up in accordance with the provisions of the Commercial Code) are considered. The overall ratio indicates the ratio between the eligible own funds and the sum of the risk weighted assets and the capital charges for market risk positions. For the purpose of the consolidated Principle I, the average overall ratio of the eight institutions was 10.4% (see chart 1.3.24 on page 74). At 10.6%, the average overall ratio of those five institutions which submit reports under

Chart 1.3.23

**GERMAN BANKS' OWN FUNDS AND CORE CAPITAL***



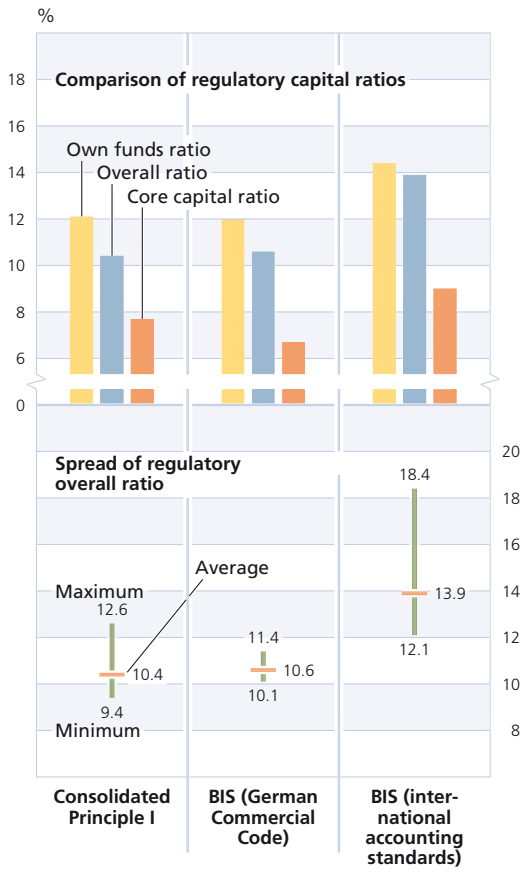

* Pursuant to sections 10 and 10a of the German Banking Act; all banks. — **1** Value achieved or exceeded by 90% of banks.

DEUTSCHE BUNDESBANK

**35** Data are based on aggregated reports under the Basel Accord of 1988 submitted for the June 2005 reporting period. The eight large institutions also submit these reports applying the prudential consolidation group rule.

Chart 1.3.24

**IMPACT OF ACCOUNTING PRACTICES ON REGULATORY CAPITAL RATIOS**




DEUTSCHE BUNDESBANK

the Basel Capital Accord based on the provisions of the Commercial Code was only slightly higher. By contrast, the three institutions whose Basel reports were based on consolidated accounts produced in line with international accounting standards showed an average overall ratio of 13.9%. This may be due in part to individual and special circumstances. However, a general tendency for a higher level of capital to be recorded when international accounting standards are applied has been evident ever since consolidated accounts were first recognised for the calculation of capital ratios pursuant to Basel I. All the various regulatory capital ratios (core capital ratio, own funds ratio and overall ratio) are equally affected. In individual cases, the differences may, however, be smaller.

*… and possible factors behind the improvement in the ratios*

In one current case, a bank significantly improved both its core capital ratio (from 6.6% to 11.1%) and its overall ratio (from 12.2% to 18.4%) as a result of using IFRS-based accounts for the first time for Basel Capital Accord reporting. The main factors behind the improvement arising from the changeover to IFRS were the accounting treatment of deferred taxes, the measurement of trading activities and the accounting treatment of shareholdings. While these factors relate to the case at hand, they are very likely to be exemplary and hold true in a similar form for other institutions that change over to international accounting standards for the calculation of the Basel capital ratios. This illustrates the significance of using prudential filters for the calculation of regulatory capital based on consolidated accounts. In the current case, however, special effects were also at work. These arose from the accounting treatment of current profit and mean that the ensuing higher capital recorded cannot be attributed entirely to the different valuation and accounting principles following the changeover to IFRS.

*No direct impact on the balance-sheet capital of German banks*

The changeover to IAS/IFRS accounting standards for consolidated accounts which became mandatory for certain listed enterprises from 2005 did not entail any accounting-related

conversion effects for the eight large German institutions. The big banks which draw up their consolidated accounts in accordance with international accounting standards had already taken advantage of the option introduced in 1998 under section 292a of the Commercial Code of preparing consolidated accounts in line with recognised international accounting principles. The other large institutions will not change over to IAS/IFRS until 2007.

### Protection schemes

*Reforms of protection schemes*

When the solvency of savings banks, Landesbanken and credit cooperatives is being assessed, not only the institution's individual liable capital base, but also the joint and several liability mechanisms in the form of institutional protection schemes must be taken into account. Similar to the deposit guarantee fund operated by the private banks, which guarantees deposits up to the equivalent of 30% of the respective bank's equity capital (excluding the bank's excess payment), these schemes make a significant contribution to the stability of the financial system as a result of the confidence they generate. However, the difficult economic environment has placed increased strains on the schemes and led to higher contribution rates for members. This provided the impetus for comprehensive reforms of the guarantee systems in both the cooperative banking sector and the public banking sector, with the latter also having to search for ways to compensate for the abolition of state guarantees. These reforms have either entered into force already or will do so shortly. The key elements of the reforms comprise internal procedures within the protection schemes to assess the member banks' credit risk, and contribution rates which depend on the credit rating. Moreover, the guarantee schemes in both sectors now have more extensive rights of influence over their individual members and there has been a considerable increase in guarantee funds in the savings bank and Landesbank sectors. Closer cooperation between the members of a scheme, for example, as provided for in the "New Association Concept" of the Association of Savings and Giro Banks of Hesse and Thuringia (Sparkassen- und Giroverband Hessen-Thüringen), is also to be welcomed from a stability viewpoint as are the additional guarantee funds being established in some regional savings bank associations alongside the national mutual protection scheme. To sum up, the reforms lay the foundations for ensuring that privately financed institutional protection is future proof.

### Market indicators

An analysis of market-based indicators shows that, in recent months, financial market sentiment, in respect of the stability and efficiency of German banks, has continued to improve slightly.

*Credit default swap premiums indicate no increased risk potential …*

Credit default swap premiums,[36] as a measure of the default risk in the markets' perceptions, do not indicate any heightened risk potential for the biggest German banks. Although the credit default swap premiums of the big German banks also followed general market developments in early summer this year and

**36** The signals that can be deduced from the market indicators may be affected by the general conditions in the financial markets, such as market liquidity or market participants' current attitude to risk.

Chart 1.3.25

## CREDIT DEFAULT SWAP PREMIUMS OF GERMAN BIG BANKS

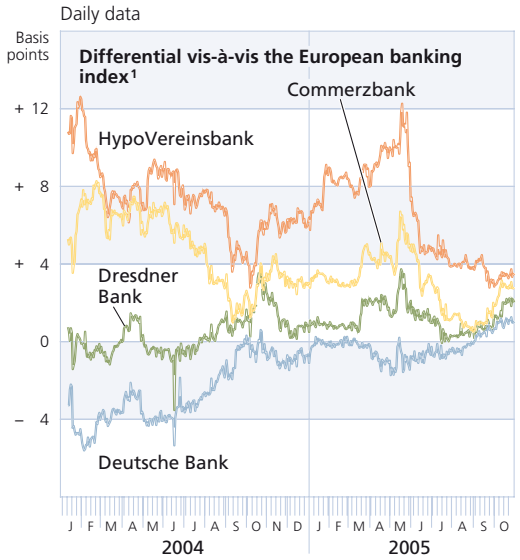
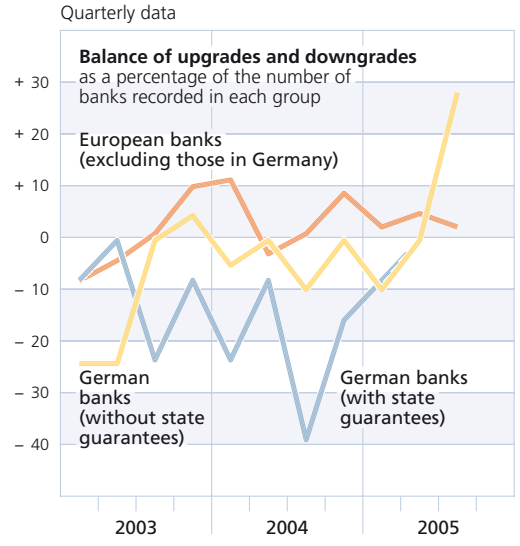



Chart 1.3.26

## RATING UPGRADES AND DOWNGRADES OF SELECTED BANKS




Sources: Bloomberg, agencies and db Research. — **1** Based on Dow Jones iTraxx CDS Indexes.

DEUTSCHE BUNDESBANK

rose by up to 10 basis points in the wake of the rating downgrades of the two major US car groups, the premiums have since returned approximately to their starting level (see chart 1.3.25 adjacent). However, the premiums of the big German banks went up more sharply in early summer than those of their European competitors; this underlines the fact that the German banks still have some catching-up to do.

*… and rating developments paint a positive picture at the current end*

Developments in the external ratings issued by major international agencies have also painted a positive picture for German banks recently. Whereas the balance of upgrades and downgrades at European banks (excluding those in Germany) has been positive for over a year now, this figure also turned significantly positive for German banks in the third quarter of this year and clearly surpassed the performance of the other European banks in this period. As a result, German banks were able to reduce the rating gap between themselves and their European competitors slightly. With an average rating of A, however, German banks are still rated about two levels lower.

*Share prices also driven by speculation on acquisitions*

The fact that the big German banks' share prices have generally outperformed those of their European competitors since the beginning of the year is also likely to have been due to speculation on acquisitions. At the same time, ratings by banking analysts from major brokers are underpinning the renewed improved sentiment for the German banking sector. For example, professional market observers have issued more buying than selling recommendations for both German and other European shares of the banking sector so far this year.

A default indicator derived by using theoretical option-price-based measures[37] suggests an improvement in the efficiency and resilience of German listed banks. In this respect, the position of the big German banks, in particular, has improved.

*Importance of market indicators at public credit institutions increases*

Market indicators have also been playing a more important role in assessing the efficiency and stability of public sector credit institutions since the abolition of state guarantees. For the Landesbanken active in the capital market, external ratings by the major agencies have been available for senior unsecured bonds for some time. Whereas this rating at Moody's averages Aa3, the equivalent rating at S&P is more than two levels lower. The reason for the difference can be found in the different approaches of the agencies. While the primary financial strength of an institution is the decisive rating factor for S&P – which Moody's again considers separately in its financial strength rating – internal support from the association and, where applicable, through the supporting authorities, plays an important role for Moody's when assigning ratings.[38]

*Rating agencies reward internal support from the association and through supporting authorities*

A comparison of Moodys' financial strength and unsecured ratings provides a rough estimate of the extent to which these factors are being rewarded. If, as a benchmark, the correlation between these two rating categories for European private banks is considered, it emerges that the unsecured rating is over two

Chart 1.3.27

**DISTANCE TO DEFAULT ACCORDING TO THE MERTON MODEL FOR GERMAN BANKS***

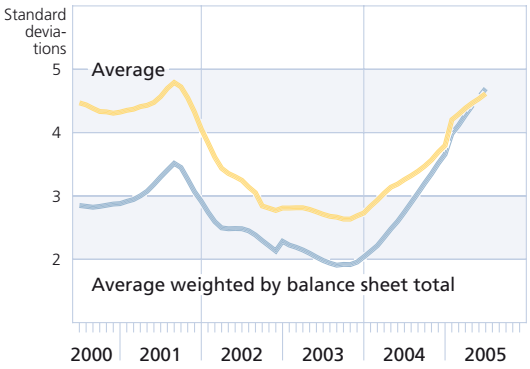
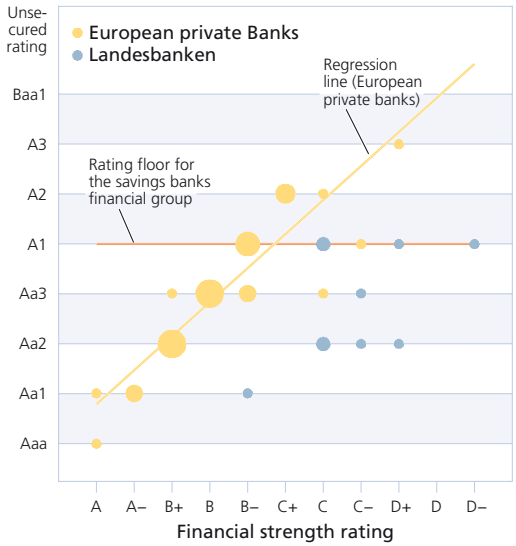



Chart 1.3.28

**CORRELATION BETWEEN FINANCIAL STRENGTH RATING AND UNSECURED RATING****



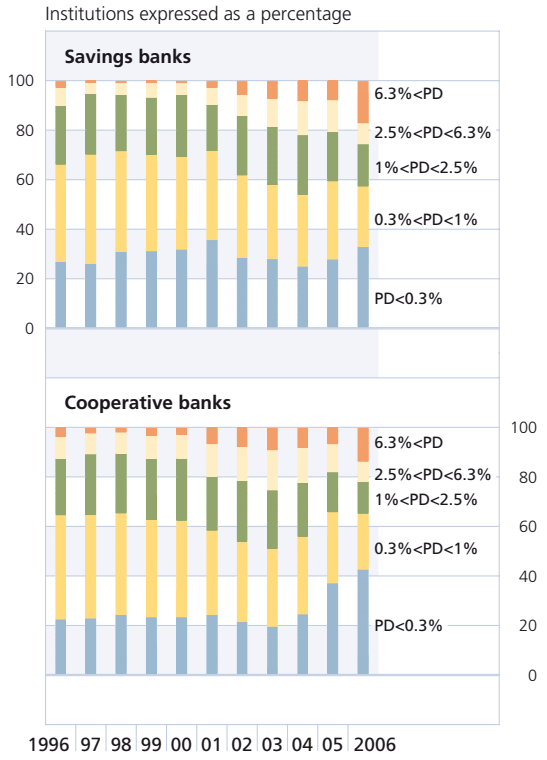

* Source: Bloomberg and Bundesbank calculations. The estimates are based on data from 11 German banks. The indicator states by how many standard deviations the value of the firm exceeds the liabilities. — ** Source: Bloomberg. Rating according to Moody's. The size of the circle reflects the number of banks.

DEUTSCHE BUNDESBANK

**37** See R Merton (1974), On the pricing of corporate debt: The risk structure of interest rates. Journal of Finance, Vol 29, No 2, pp 448-470 and R Gropp, I Vesala, G Vulpes (2002), Equity Market Signals as Leading Indicators of Bank Fragility, ECB Working Paper No 150.
**38** Advancement of mutual insurance schemes has even led to Moody's lowering the rating floor to A1 for the entire savings bank group.

Chart 1.3.29

**HAZARD RATE MODEL: DISTRIBUTION OF THE PROBABILITY OF DEFAULT (PD)***




* Estimate of PD over 12 months, ie an institution's existence would be endangered within the coming year without support from its affiliated network.

DEUTSCHE BUNDESBANK

levels higher for Landesbanken on average. Ultimately, it is crucial for the refinancing costs of the Landesbanken that the financial markets also reward these factors. However, as no Landesbank has yet issued a large-volume, ie liquid, benchmark bond since state guarantees were removed, there is still no reliable up-to-date indicator for this. Owing to the large amount of liquidity that banks acquired in the run-up to the removal of state guarantees, the banks are unlikely to be put to the test for some time.

*Few savings banks with individual credit rating from a rating agency*

Unlike the Landesbanken, only seven, mainly large, savings banks so far have an individual credit risk assessment from an external agency; this is between Aa3 for senior unsecured paper and A1[39], the lower rating limit. As there is often insufficient revenue from rating-sensitive business to meet the cost of an external rating, a sizeable "wave" of ratings at savings banks will remain unlikely. Added to this is the fact that all savings banks can already show a credit rating indirectly as a result of Moody's setting the lower rating floor at A1 – which, moreover, is actually better than the average rating for German banks.

*Hazard rate model helps when analysing the stability of savings banks and cooperative banks*

Another tool for assessing the stability of savings banks and credit cooperatives is a hazard rate model developed at the Bundesbank. It condenses various indicators concerning the profitability, solvency and risk into one probability of default figure. A recent thorough audit of default figures[40] necessitated a reassessment of the model used in the last stability review.[41]

*Still a large proportion of good institutions …*

At both savings banks and cooperative banks, the proportion of good and very good institutions (one-year probability of default under 1%) has stabilised at last year's value, which

**39** This applies to the six savings banks rated by Moody's.
**40** The main reason for the audit is the revaluation of the section 29 reports (Banking Act), the reassessment of older default events and the systematic consolidation of merger information. This led, particularly in the period between 1999 and 2002, to a clear downward adjustment of the default figures at cooperative banks and an upward adjustment at savings banks.
**41** See Deutsche Bundesbank, Report on the stability of the German financial system, Monthly Report, October 2004.

was fairly high anyway.[42] This is an indication of the improved resilience of both banking groups, which traditionally demonstrate a high degree of stability owing to their non-volatile business.

*… but also an increase in the proportion of high-risk institutions*

At the same time, however, it is striking that in the case of the savings bank sector over the medium-term, the proportion of institutions in the high-risk categories has continuously increased since 2001. In the case of the cooperative banks, an increase has been recorded, albeit only at the current end. This development is to be observed closely, particularly with a view to possible burdens on mutual insurance schemes. In individual cases, the lower credit quality could also support efforts to progress with consolidation.

**42** At savings banks, however, this proportion is still over 10 percentage points lower than between 1996 and 2001.

# Stability in the German insurance industry

*Capital investment losses of the past few years ...*

German insurance companies have managed to strengthen their financial performance, which had been impaired by the capital market developments at the beginning of the decade. The sector's trend-oriented investment behaviour led to pronounced capital investment losses between 2000 and 2002. Up until the mid-1990s, life insurers in particular invested mostly in fixed-income securities, the yield on which fell continuously, thus impairing the payment of the total interest on policyholders' accounts which, for competitive reasons, was consistently high. Insurers responded to this situation by increasingly shifting to shares, but only after the rising share prices seemed to be becoming entrenched. As a result, the sector's equity exposure calculated at book value was significantly higher than the long-term average when the DAX plummeted in early 2000.

*... now largely overcome*

German reinsurers and non-life insurers were able to deal with the resulting capital investment losses relatively quickly. This was due not only to the capital injections across the entire insurance industry but also, and mainly, to the fact that the possibility of adjusting premiums annually from 2003 helped to bring about a positive result in underwriting business. By contrast, the overall interest on life insurance assets had reached a level that was barely attainable on a lasting basis via the capital market. From 2001, therefore, the sector was forced to significantly liquidate its equity capital buffers and lower its bonuses. All in all, however, stability has since been consolidated in all three insurance sectors despite the further challenges being faced by the life insurance and reinsurance industries owing to the persistently low interest rate environment and the high losses resulting from catastrophes in 2004 and 2005.

## Key medium-term risks

The low interest rate environment, structural shifts in the regulatory and tax framework, and an emerging trend towards higher damage claims owing to catastrophes and other risks pose major threats to the insurance sector.

*Low interest rate environment*

The current low interest rate environment is making it increasingly difficult for the life insurance sector to generate – partially guaranteed – returns on policyholders' funds. At the same time, opportunities for financing core underwriting business through interest-bearing investments are shrinking across all sectors.

*Regulatory influences amplifying effects on interest rates*

From a regulatory point of view, the International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS) as well as the Solvency II risk capital standard, which the EU envisages will come into effect in 2010, are having an impact on insurance business. In drawing up the insurance-specific IFRS, it was not possible to punctually formulate measurement rules for insurance contracts which could be agreed by all parties owing to the

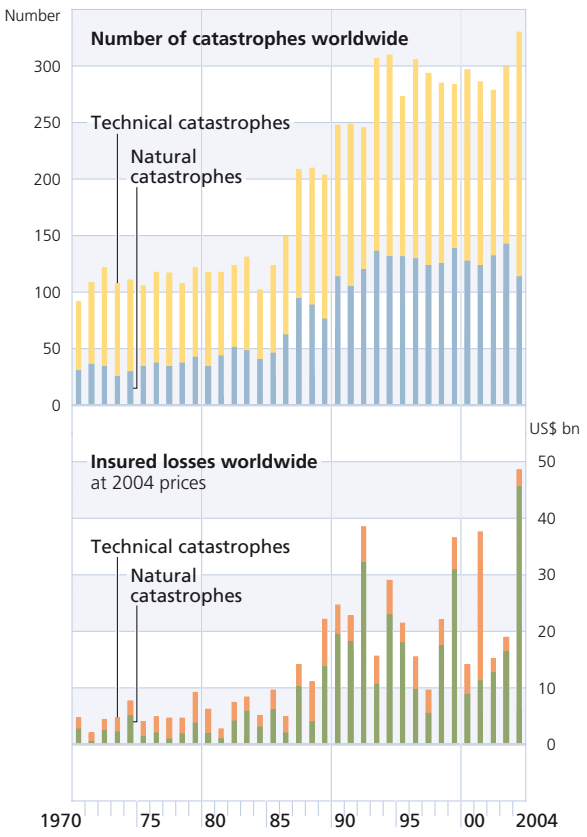
extensive particularities of the industry. While complete fair value measurement of liabilities has thus been deferred, insurers' assets are already to be measured at fair value. Accounting-related volatility in earnings and equity is therefore to be expected during a transitional period ("Phase 1"). The new solvency rules could reduce the attractiveness of volatile investment forms such as shares and derivatives, as the required volume of capital will increase in line with the investment risks. For this reason, it is possible that the regulatory environment will trigger an increase in the demand for scarcely fluctuating fixed-income securities. Such a development would further amplify the risks inherent in a low interest rate environment.

*Tax effects and longevity risk for life insurers*

Changes in the product mix of life insurers are to be expected as a result of amendments to tax law. The Retirement Income Act (*Alterseinkünftegesetz*), which entered into force in January 2005, will gradually introduce the downstream taxation of endowment policies and annuities, and will centre the majority of tax privileges on the supplementary, government-sponsored "Riester" and "Rürup" private pension plans. Endowment policies, which have up to now been especially tax-privileged, have thus become less attractive. At the same time, longevity risk will play a greater role as the demand for annuities increases and the baby-boom generation reaches retirement age. The risk arises from the potential underestimation of mortality risk, which – as the revision of the mortality tables taking effect this year shows – will lead to a higher valuation of insurance technical reserves. In low interest rate phases, in particular, such underestimations can result in valuation jumps owing to the discounting of long-term liabilities.

Chart 1.4.1

**LOSS FREQUENCY AND SEVERITY**



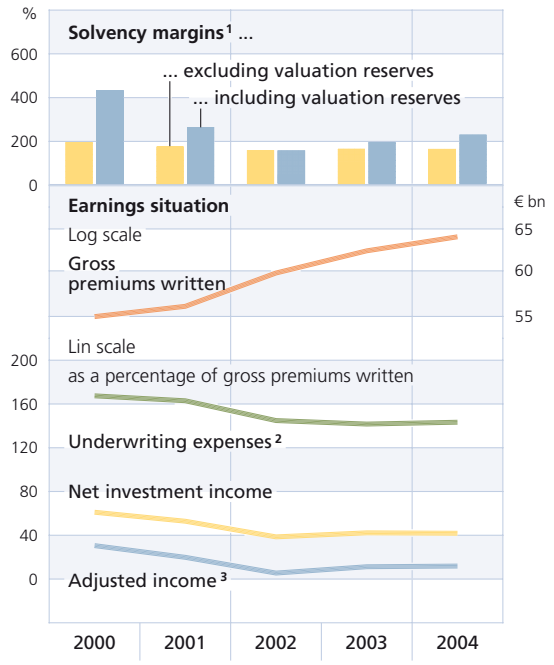

Source: Swiss Re, sigma No 1/2005.

DEUTSCHE BUNDESBANK

The hedging opportunities for longevity risk are still limited. Comprehensive coverage by the reinsurance industry would require solutions to dealing with extremely long maturities and a lack of international opportunities for diversification. Risk transfer through innovative capital market products ("longevity bonds") is

Chart 1.4.2

## SOLVENCY AND PROFITABILITY OF THE 50 LARGEST GERMAN LIFE INSURERS




Source: Moody's. — **1** The solvency margin represents the ratio of an insurance company's own funds to certain insurance technical reserves, risk capital and premiums. Margins calculated on the basis of published annual reports. — **2** Insurance payments and operating expenditure. — **3** Profit for the year plus transfer to the reserve for premium refunds.

DEUTSCHE BUNDESBANK

still at a rudimentary stage and is suffering from the fact that the greatest demand for extremely long-term investments is coming from the insurance industry itself. Regardless of this, the matching of maturities of insurance technical reserves formed over several decades is being hampered by the absence of capital investment with a corresponding duration and an attractive return.

*Higher frequency and greater severity of losses in non-life business*

The global reinsurance industry has recorded a rising trend in the number of natural catastrophes and technical, ie man-made, disasters as well as insured losses over the past two decades (see chart 1.4.1 on page 81). Even though the loss statistics are likely to have been distorted upwards as a result of improved documentation, the greater population density and value concentration suggest a rising trend in the frequency and severity of losses. Added to this are extensive payment obligations in the area of liability insurance – in particular in the USA –, the complexity of which increases with advancing technical progress and which are often linked with legal risks. The quality of risk modelling as well as the premiums and terms of cover, which are renegotiated annually, are accordingly becoming ever more important.

## The risk and earnings situation of individual insurance sectors

### Life insurance companies

*German life insurers' situation marked by moderate underwriting results ...*

In 2004, the German life insurance companies again drew closer to their former financial strength; however, there was a slowdown in the catch-up trend. The solvency margin of the 50 largest life insurers[1] therefore still failed to return to the levels achieved at the turn of the century; their return on equity fell from 10.1% in 2003 to 8.4% in 2004. Premium growth, at 2.8%, was below the average of the past five years (3.3%). However, a large part of the new business generated through the phasing-out of the tax advantages on the

**1** The data concerning the earnings and solvency situation of the 50 largest German life insurers were provided by Moody's. The companies' market share amounts to around 94%.

flagship product – endowment policies – was not concluded until the end of the year, which means that the resultant premium growth will only be fully recognised as income this year. As the sum of insurance payments and operating expenditure as well as net investment income stagnated in relation to premium growth, the industry's adjusted income rose only marginally (see chart 1.4.2 on page 82).

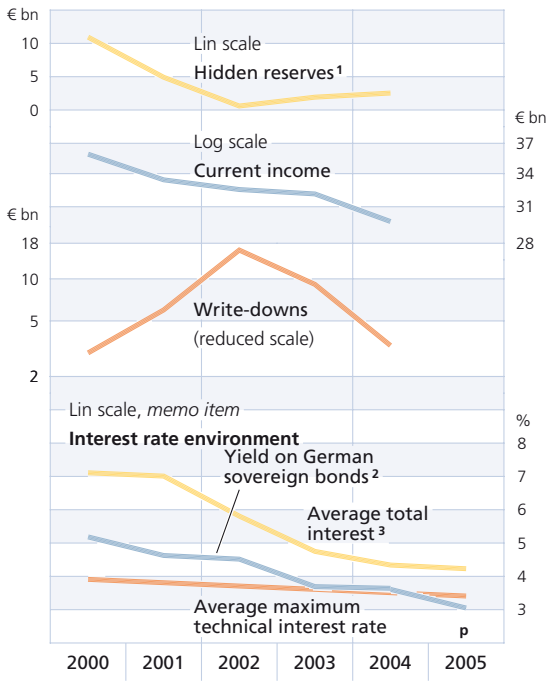
*... and a careful capital investment policy*

On the assets side, the sector's unnetted hidden losses (0.28% of capital investment[2]) were almost completely cancelled out in 2004, not least in view of the reviving equity markets. At the same time, a decline in life insurers' risk propensity was discernible: equity exposure[3] fell from 11.3% in 2003 to 10.3% in 2004. This prevented extensive participation in the increased share prices. The rise in the share of interest-bearing investments to around 80% towards the end of 2004 as well as increasing interest in lower-risk fixed-income securities, eg issued by sovereign issuers and/or euro-area residents, points in the same direction.

The current market environment is making it more difficult to seize income opportunities. Although there is an increasing preference for less liquid assets such as loans and borrowers' notes, they are currently showing rather low spreads. The sector's real estate portfolio, although growing slightly, accounts for around 4% of capital investment and is thus too small to make a substantial contribution to earnings growth *per se*. Moreover, in the current market situation, it is subject to non-negligible valuation risks. The demand for alternative investment vehicles, such as private equity (0.3% of capital investment) and hedge funds, remains weak. However, structured products (eg collateralised debt obligations, asset-backed securities and credit-linked notes), which account for just under 5% of capital investment, are gaining importance. Measured in terms of the limitations of the Investment Regulation (*Anlageverordnung*), the

Chart 1.4.3

## SUB-ITEMS OF GERMAN LIFE INSURERS' CAPITAL INVESTMENT



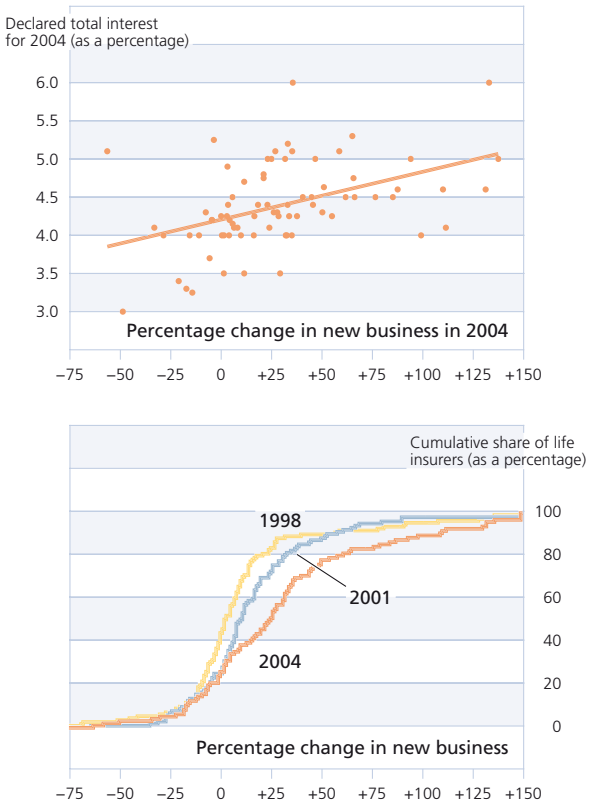

Sources: Moody's, Assekurata, BaFin, GDV and Bundesbank calculations. — **1** Ratio of the difference between the market value and book value of all investments and the book value of the investments. — **2** Public sector bonds. — **3** Sum of the maximum technical interest rate and bonuses.

DEUTSCHE BUNDESBANK

**2** The data on capital investments were provided by BaFin.
**3** Measured as the share of direct and indirect holdings of equities and participation rights in total capital investment calculated at book value.

Chart 1.4.4

## COMPETITION AMONG THE 50 LARGEST GERMAN LIFE INSURERS




Sources: Zeitschrift für Versicherungswesen, Assekurata.

DEUTSCHE BUNDESBANK

capital investment of German life insurers may be rated as conservative. The sector's greater risk awareness can be explained largely by the high investment losses from 2000 to 2002; this may harbour the risk of a certain degree of pro-cyclical investment behaviour.

*Low interest rates permanently detrimental ...*

The great importance of interest-bearing capital investments alongside a careful policy regarding other investment is the key explanation for the sector's weak net investment income. Standard & Poor's expects that direct yield on fixed-income securities will diminish by 10 to 15 basis points per year as older, higher interest-bearing investments mature and are replaced on current terms.[4] This development could continue in the future if the change in the regulatory environment described above leads to a further reduction in the demand for more volatile capital investments. An increase in longevity risk would have the same effect if insurers were to enlarge their share of long-dated bonds in order to extend the duration of their investments.

*... and impede the allocation of bonuses*

In 2004, the gap between the still relatively high – and largely guaranteed – overall interest on policyholders' credit balances (between 4.2% and 4.5%)[5] and net interest on investments (4.9%)[6] narrowed further. This is due, among other things, to the fact that a further sizeable reduction in the annual bonuses faltered for competitive reasons. An official lowering of the maximum technical interest rate (currently 2.75%; see box 1.11 on page 86), which is applied throughout the industry, could trigger movement. However, this would initially offer only a modest level of relief: the average guaranteed interest rate (estimated at 3.5%)[7] is determined chiefly by outstanding policies, while a lowering of the maximum technical interest rate would affect only new business. A further means of reducing guaran-

**4** See Standard & Poor's, Insurance Industry Risk Analysis, Germany, May 2005.
**5** See Assekurata, Die Überschussbeteiligung in der Lebensversicherung 2005, January 2005.
**6** See the German Insurance Association (*Gesamtverband der deutschen Versicherungswirtschaft or GDV*), Geschäftsentwicklung 2004, Die deutsche Lebensversicherung in Zahlen, September 2005.
**7** See Standard & Poor's, Insurance Industry Risk Analysis, Germany, May 2005.

teed interest rates would be to market more products which transfer the investment risk to the customer. However, growth in such unit-linked insurance products is subdued, not least because of policyholders' negative investment experiences.

*Greater competition in writing new business*

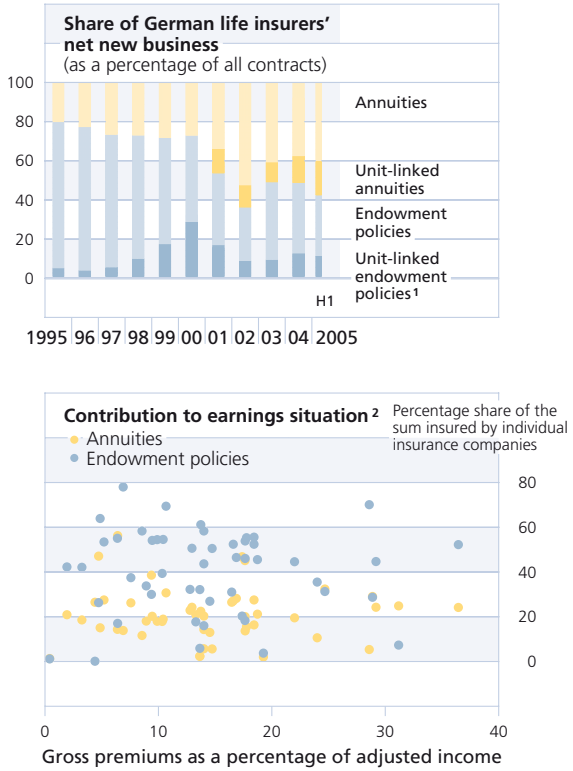
The total interest rate level as well as the gradual restoration of former financial strength are key competitive factors in writing new business (see chart 1.4.4 on page 84). This has experienced an increasing spread in recent years, which is to be taken as an indication of a rise in competition in the life insurance business. Competition arises from the fact that, in view of demographic developments, a greater volume of outstanding policies will mature in future and it will be more difficult on balance – despite an increasing demand for pension products – to achieve a net inflow of premiums. For instance, 33 of the 95 insurers surveyed by the *Zeitschrift für Versicherungswesen* journal recorded an unweighted average negative premium growth level of 4.3% in the record year of 2004.

*Impact of longevity risk on insurers' earnings*

The rising competition in life insurance business has coincided with changes in the product mix, which are being caused by the altered tax structure for pension payments and the public's increasing general awareness of a need for retirement provisions. This is evident, for example, in the sales of the "Riester" private pension plan, which strengthened following the rather disappointing results of the two previous years. The share of "Riester" private pension plan contracts in the overall number of new life insurance contracts rose from 2.3% in 2004 to 7.4% in the first half of 2005 (although the "Riester" contracts are relatively unimportant in terms of value).[8] At the same time, the trend towards annuities – which was already apparent in the preceding years – intensified at the expense of endowment policies (see chart 1.4.5).

Chart 1.4.5

## ENDOWMENT POLICIES VERSUS ANNUITIES




Sources: GDV and Zeitschrift für Versicherungswesen. — **1** Including unit-linked annuities up to and including in 2001. — **2** Data on the 50 largest German life insurers in 2004.

DEUTSCHE BUNDESBANK

**8** Source: GDV. Demand for "Riester" pensions is also being stimulated by means of a simplified incentive procedure (permanent supplement application).

Box 1.11

## DETERMINING THE MAXIMUM TECHNICAL INTEREST RATE IN LIFE INSURANCE

The technical interest rate at which the contractually agreed payments on expiration of a life insurance policy are discounted must be calculated in a way that makes the interest rate attainable during the entire lifetime of the insurance contract irrespective of the capital market interest rate level. In order to restrict the insurers' scope of discretion, the German Federal Ministry of Finance lays down a maximum technical interest rate limit pursuant to section 65 (1) number 1a of the Insurance Supervision Act (*Versicherungsaufsichtsgesetz*) in conjunction with the Covering Reserve Ordinance (*Deckungsrückstellungsverordnung*). This rate may not exceed 60% of the interest rate on the government bonds of the country in whose currency the contract is denominated; the arithmetic mean of the yields on bonds outstanding over the past ten calendar years is used for this purpose. Scenarios for future interest rate developments are included in the decision.

Since 2000, the maximum technical interest rate – which at the same time usually lays down the guaranteed payment on the insured parties' premiums[1] – has been lowered gradually from 4% to 2.75% (since 1 January 2004). By way of routine, at the beginning of 2006, the Federal Ministry of Finance will consider – at the recommendation of BaFin (the Federal Financial Supervisory Authority) – a possible further reduction in the maximum technical interest rate, which would affect all new contracts concluded from 2007. The decision will be based on the recently published interest rate report of the German Association of Actuaries (*Deutsche Aktuarvereinigung*), which recommends reducing the interest rate to 2.25%.

**1** As the technical interest rate serves only as the upper limit of the interest rate guarantees, insurers can also provide lower guarantees or none at all – as is the case for unit-linked life insurance policies. For competitive reasons, however, no use has yet been made of the option of providing lower guarantees.

DEUTSCHE BUNDESBANK

The decisive issues for financial stability here will relate to how life insurers respond to the shifting positions of different life insurance products, how the still evolving "Riester" and "Rürup" private pension plan markets are divided up among providers and how efficiently the insurance industry can deal with longevity risk. As things now stand, it would be premature to evaluate the different product strategies chosen by individual companies. For instance, a comparison of the 50 largest life insurers for 2004 shows that it is not possible to prove a statistical correlation between the adjusted income level and the product mix (see chart 1.4.5).

### Reinsurance companies

*Reinsurers at the start of a downswing*

The price developments with respect to contract renegotiations suggest that the reinsurance market is currently at the start of a cyclical downswing.[9] The sector will probably still be able to impose largely normal market conditions and, in return, forgo new market shares. Such behaviour could explain the decline in gross premiums written by the German reinsurance sector[10] in 2004 and in the first half of 2005.

It is striking that there are divergent trends in the underwriting results of the large, globally active German reinsurers and those of the

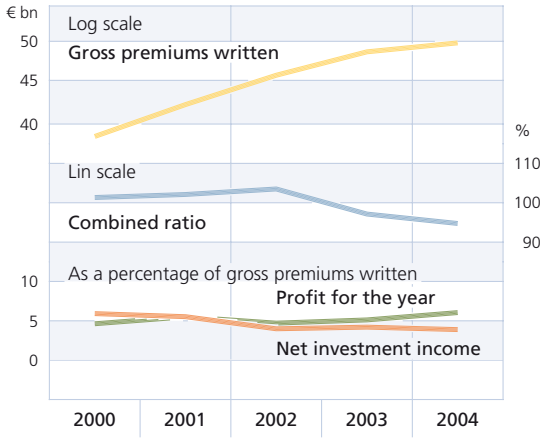
**9** The underwriting results in non-life business follow a cyclical pattern caused, amongst other things, by (un)favourable loss experiences, the return on investments and insurers' endeavours to gain larger market shares. The cycles are divided into phases with low premium rates (soft markets) and ones with high premium rates (hard markets).
**10** The following information is based on data published by nine (annual figures) and four (semi-annual figures) of the fifteen largest German reinsurers.

smaller companies which focus more on the German or European market. While the latter profited from the unusually small loss volume in Europe in 2004 (some companies even managed to improve their combined ratio[11] despite falling premiums), the larger companies had to cope with the most expensive loss year to date following the hurricanes in 2004 which hit the USA especially hard. This year's hurricanes Katrina, Rita and Wilma, having caused estimated losses of between US$35 billion and US$70 billion, appear to be continuing the trend. German reinsurers are likely to have underwritten a considerable portion of these losses solely on account of their large market share in the global reinsurance business. It can be assumed, however, that they have passed on substantial amounts of claims to other reinsurers through retrocession.[12] Provided that the retrocessionaries themselves have adequate financial strength, this would considerably lower the net cost to German reinsurers. Nevertheless, it is possible that some companies will post a negative underwriting result owing to the magnitude of the losses.

Given the low interest rate environment, the sizeable amounts of claims paid out by several German reinsurers in 2004 will be offset by only a slight improvement in net investment income. Therefore, the outcome of the next annual renegotiation rounds will be crucial for the stability of the sector. In particular, it remains to be seen whether the – generally expected – increases in premiums in the catastrophe field will be accompanied by significant, no longer risk-adequate premium reductions in other branches.

Chart 1.4.6

**EARNINGS SITUATION OF THE 50 LARGEST GERMAN NON-LIFE INSURERS**




Source: Moody's.

DEUTSCHE BUNDESBANK

## Non-life insurance companies

*Increasing price competition among non-life insurers*

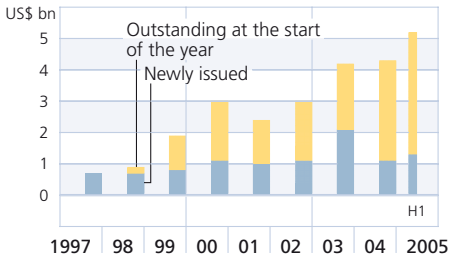
The majority of German non-life insurers have been relatively unaffected by the loss events in the USA owing to the focus of their operations and reinsurance cover. For most companies, risks are more likely to be posed by the growing price competition on the domestic market and diminishing market discipline. In fact, a price-related decline in gross premiums has been recorded, in particular, in the motor insurance sector – the industry's most important line of business – but also in the area of

**11** The combined ratio expresses the ratio of an insurance company's incurred losses and expenses to its premium income.
**12** Retrocession involves the transfer of a part of an underwritten risk to another reinsurer for a premium. This secondary reinsurance serves the purpose of spreading the risk in economic and geographical terms.

Box 1.12

## SECURITISATION OF CATASTROPHE RISK

### VOLUMES OF CATASTROPHE BONDS (WORLDWIDE)




Source: Swiss Re Capital Markets, ILS Quarterly, July 2005.

A higher frequency and greater severity of natural catastrophes puts a strain on the profitability of reinsurance companies, which chiefly provide coverage for primary insurers' peak risks. Hurricane Katrina recently highlighted the limits of insurability: due to the absence of diversification possibilities, individual hundred-year losses can put financial pressure on the reinsurance sector if they occur at times with thin financial buffers or premium prices which are not commensurate with risk.

Catastrophe bonds have offered a means of transferring risk since the early 1990s. Catastrophe risks with a low probability of occurrence but high losses in the event of occurrence are transferred to the capital markets through the issuance of bonds. If the loss event occurs, the bondholders' principal and interest, as a rule, pass to the issuer. However, the market is growing only slowly (see the chart above). According to Swiss Re data, 62 bonds were outstanding at the end of June 2005; these were issued by eleven sponsors and accounted for a total of 0.4% of the premium volume in the non-life sector worldwide in 2004. The lack of momentum is also discernible in the fact that no outstanding growth in new issues has been recorded in the "hard" market – ie a period in which there is a strong demand for reinsurance cover – evident since 2002.

The lack of momentum is ultimately likely to be attributable to catastrophe bonds' lack of market maturity. For instance, the sluggish demand for catastrophe bonds results not only from their low correlation with other financial products, but also from the relatively high risk premiums involved, especially in the current low interest rate environment. However, the risk premiums' appropriateness is questionable as the restriction of compensatory payments to rarely occurring hundred-year losses means that issuers derive hardly any relief from the bonds. Hardly any events to trigger redemption have occurred up to now; moreover, catastrophe bonds are rarely even subject to rating downgrades.[1] Possible explanations for the cleft between the "fair" market value of the bonds and the risk premium actually paid are investors' limited experience of the bonds to date, the tight secondary market and the absence of any possibility of tranching owing to the low issuance volume.

Therefore, greater convergence of catastrophe bonds with other bond yields may be expected only once a critical threshold has been crossed. A development of this kind would certainly have a positive stability impact. For instance, issuers could benefit from the securitisation of insurance risk – comparable with the securitisation of credit risk in the banking sector – through improved risk diversification and more efficient capital allocation. This would ultimately benefit the entire insurance industry owing to the network position of reinsurance companies within the industry. However, the risk potential generally involved in securitisation must not be overlooked. This includes, in particular, insufficient transparency with regard to transactions and counterparties, an increase in legal risks given incomplete standardisation and the removal of operational business from prudential regulation, which enables insurance risk to be taken on by unregulated market participants, such as hedge funds.

**1** This applies especially to catastrophe bonds whose redemption is tied to such technical parameters as the severity of an earthquake or a hurricane.

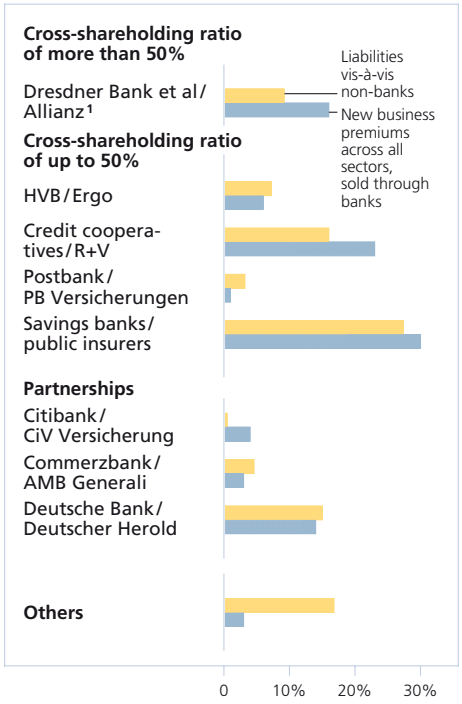
DEUTSCHE BUNDESBANK

industrial property insurance. All in all, gross premium growth already slowed down noticeably in 2004 (see chart 1.4.6): the German Insurance Association (*Gesamtverband der deutschen Versicherungswirtschaft*) is expecting a 0.5% decline in the current year. With the expected 0.5% increase in loss payments – which may also be cyclically induced – the result for 2005 would be a rise in the combined ratio which, however, is likely to remain at a relatively favourable level. Here again, however, it is hardly likely that net investment income will be able to offset a persistent deterioration in the underwriting result in the current low interest rate environment despite the sector's share participation of around 22%, which is considerably larger than that of life insurers.

Chart 1.4.7

**MARKET SHARES OF SELECTED BANCASSURANCE PARTNERSHIPS**

Current at end-2003




Sources: Mercer Oliver Wyman and Bundesbank calculations. — **1** The credit cooperatives in Bavaria also sell Allianz insurance policies. In the absence of more precise information, their market shares in banking business were divided equally between the credit cooperatives and Allianz.

DEUTSCHE BUNDESBANK

## Bancassurance

*Bancassurance growing in importance ...*

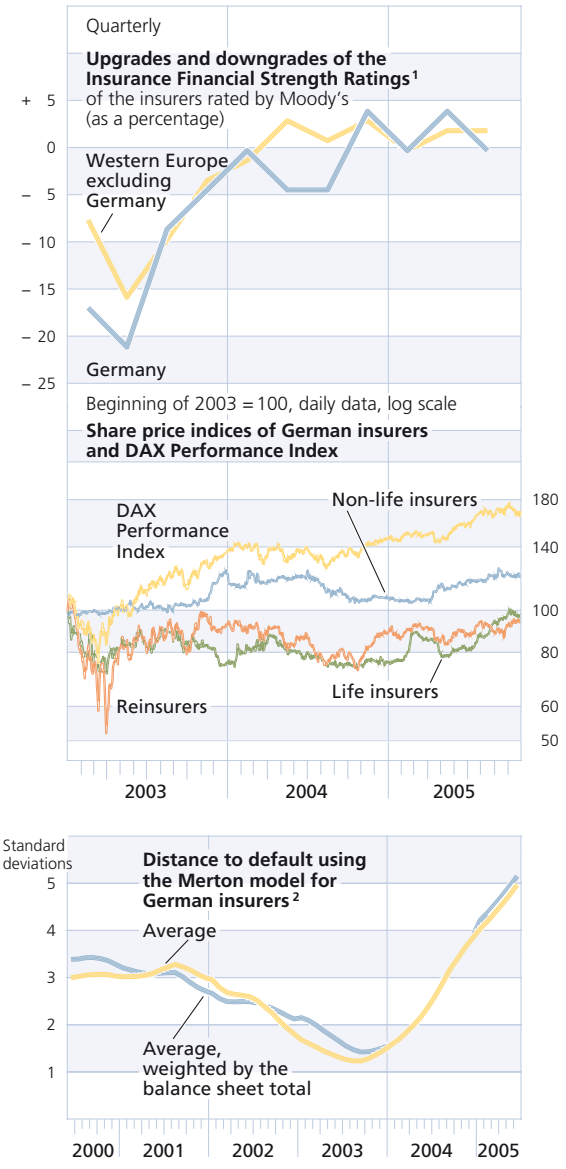
The increasing importance of retirement as a reason for saving is leading to fiercer competition between insurers, banks and investment companies and thus to a greater demand for partnerships and cross-shareholding within the financial system. Owing to the similarity of the investment goals, many German life insurers offer competing products focused on capital investment. For instance, according to the Federal Association for Investment and Asset Management, just under 20% of the assets managed by mutual funds open to the general public are placed with insurance-related investment companies. Moreover, virtually all German building and loan associations (*Bausparkassen*) are traditionally linked to an insurer through a group or network.

*... but muted recourse to banks as a distribution channel*

It is notable, however, that actual bancassurance business – using bank branches as a distribution channel for the insurance industry – is less pronounced in Germany than on a European average. Unlike in many European countries, private banks in Germany have only a relatively small base of potential insurance customers owing to their modest market shares in the retail business. The majority of potential bancassurance customers have a

Chart 1.4.8

## MARKET INDICATORS FOR GERMAN INSURANCE COMPANIES




Sources: Moody's, insurers' own annual reports, Datastream, Bloomberg and Bundesbank calculations. — **1** A positive percentage stands for net upgrades while a negative percentage stands for net downgrades. — **2** The estimates are based on the data provided by ten German insurers. The indicator shows by how many standard deviations goodwill exceeds liabilities.

DEUTSCHE BUNDESBANK

bank account with an entity in the savings bank sector or the cooperative bank sector; both sectors have their own insurance groups, however, which means that competitors' offers are mediated only to a limited extent. The three-pillar structure is thus ultimately also mirrored in the bancassurance concepts. A further reason for the below-average use of bancassurance solutions in Germany could possibly be that German banks often do not efficiently exploit their established client base, ie too little cross-selling.

The regular discussion about whether cross-shareholding among partners is advisable to make the most of the advantages of bancassurance has not reached an unequivocal conclusion. A comparison of the market share in deposit business and successful mediation in insurance business illustrates that the size of the market share in bancassurance business is determined not only by the existence of cross-shareholding but also, to a considerable extent, by the distribution capacity of the bank involved and the maturity of the existing cooperation base (see chart 1.4.7). In this way it becomes clear that the especially successful bancassurance partners include both banks with a more or less tight system of cross-shareholding and banks with simple cooperation agreements or hybrid forms. Irrespective of this debate, however, market participants seem to be in agreement that the distribution alliance – in whatever form – of insurers and banks will become increasingly important in the coming years, if only because banks are growing more and more dependent on net commission income. The associated diversification of distribution channels or income sources is likely to strengthen the stability of both sectors.

## Market indicators

*Insurers' catching-up process confirmed by market participants, but not yet considered to be completed*

Market participants perceive that the stability of insurance companies has increased further although it is assumed that life insurers and reinsurers still have a need for adjustment. In terms of financial strength ratings, German insurers have again been subject to more upgrades than downgrades on balance since the end of 2004, which means that they have now caught up with companies in other European countries. While the major global rating agencies deem the German non-life insurance market to be "stable", the prospects for the German life insurance sector – unlike those of several competing European markets – and for the global reinsurance business – in the light of the extensive losses resulting from hurricanes – range from "stable" to "negative".

The share price indices of all three German insurance sectors are still falling behind the positive growth of the German DAX 30 share index. Life insurers and reinsurers, in particular, were evaluated with considerably greater scepticism over the entire period. In view of the sector's financial strength, which has been growing again since 2003, the cautious market assessments suggest that investors are giving the existing risks on both markets a stronger weighting. Considering the modest fluctuations at the current end, however, it appears that market participants are assuming that German non-life insurance companies will be able to cope relatively well with the effects of the hurricanes in the USA.

A default indicator derived using option pricing procedures paints a rather positive picture (see chart 1.4.8). It shows – without making a distinction between small and large companies – that the resilience of German listed insurers has been strengthening since the end of 2003.

# Financial infrastructure

## Stability of payment and securities settlement systems

A safe and efficient infrastructure for payment and securities settlement systems is a crucial requirement for the stability of the German financial system. On the whole, the financial infrastructure currently in place in Germany poses only a small potential risk for financial stability. Although the disruptions which occurred during the reporting period occasionally delayed the settlement process, they did not destabilise the financial markets. Nevertheless, the operation of settlement systems, in particular, still entails operational risks which need to be reduced even further in the future.

*Definition of Core Principle VII for payment systems*

The Eurosystem's initiative of working towards an amendment of Core Principle VII "Security and operational reliability" of the "Core Principles for Systemically Important Payment Systems"[1] should help to reduce these risks. The numerous events of the past few years, such as terrorist attacks or power outages, have shown the importance of business continuity planning (BCP), which enables operations to continue as normal after technical disruptions, for payment systems' resilience to crises. The recommendations are intended for systemically important payment systems and their participants. They detail the expectations for operational security as a comprehensive strategy for business continuity planning, business continuity planning based on numerous scenarios and objectives for restarting systems and resuming business operations, and regular industry-wide or local tests to ensure the effectiveness of business continuity planning. Initially, discussions about the recommendations were held between representatives from the individual central banks and market players. A public consultation was concluded in July 2005. The Eurosystem is currently analysing the opinions submitted by the European banking industry before it can finalise these recommendations.

*Oversight provides a positive picture on the whole*

While performing its oversight tasks last year, the Bundesbank was unable to detect any risks to the stability of the financial infrastructure. The oversight focussed on those systems which are systemically important for the German financial market, ie systems which, were they to suffer a major delay or total failure, would threaten the financial markets' ability to function and might have a negative impact on the liquidity position of the market players.

*RTGS$^{plus}$ as an integral component of TARGET*

Owing to its importance for financial stability, the ESCB's individual payment system, TARGET, is monitored by the participating EU central banks on the basis of the ECB Governing Council's decision concerning compliance with the "Core Principles for Systemically Important Payment Systems". Under the agreed standard procedure, each central bank is responsible for overseeing its own TARGET component, thus the Bundesbank oversees RTGS$^{plus}$. The aim of the oversight is to assess that RTGS$^{plus}$ always complies with the afore-

**1** The "Core Principles for Systemically Important Payment Systems" were adopted by the G10 central bank governors in 2001 and assumed by the Eurosystem as standard.

mentioned Core Principles. In addition to the Core Principle for security and operational reliability, the Governing Council's decision also specifies other requirements designed to ensure the risk-free but also efficient operation of payment systems, for example requirements regarding the management of liquidity and credit risks. Roughly every three years (the last time in 2003), a complete assessment is carried out on the compliance of RTGS$^{plus}$ with all the Core Principles. In addition to this, RTGS$^{plus}$ is monitored on a continuous basis. This includes an analysis of all the circumstances and information which may have an impact on the safety and efficiency of RTGS$^{plus}$. These may be changes to the system design, operating statistics or incidents. If the analyses highlight any inadequacies, internal measures are taken to resolve them.

*Legal certainty in the TARGET system*

Issues identified during the oversight may need to be clarified at a European level, too. For example, on the subject of TARGET the ESCB recently defined in more detail the requirements for compliance with Core Principle I.[2] The definition is oriented towards the provision of legal opinions intended to clarify the legal relationships between the participants in the system and place them on a firmer footing. These opinions relate to the legal status of participants (capacity opinions) and to the statutory provisions of their home countries (country opinions), which may have an impact on the legal enforceability of the system requirements particularly in the event of insolvency. The ESCB's work included defining the circumstances under which a legal opinion on an affected participant needs to be updated, and who possesses the expertise to draw up such an opinion. With regard to assessing whether a legal opinion requires updating, under the Terms and Conditions the participants are legally obliged to report any relevant legal changes to the central bank operating the system. Furthermore, the central bank may actively check whether any relevant legal amendments have occurred. An active role on the part of the central bank would, however, require considerable evaluation resources since it would have to gather information both on the legal relationships of the individual participants and the statutory provisions of the specific countries. Consequently, the Bundesbank is of the opinion that using the participant's precise knowledge of its own legal relationships and those of its home country – as is contractually provided for – is an appropriate and efficient way to ensure that TARGET fulfils Core Principle I. Furthermore, with regard to the participation of institutions from other EEA countries, the Bundesbank is in favour of abolishing compulsory legal opinions of home country legislation since the fundamental legal issues have been resolved by implementing EU Directives.

*Use of CLS continues to increase*

Since the mid-1990s the G10 central banks have been increasing efforts to reduce foreign exchange settlement risk. The result of several studies was to define measures to be taken by the central banks, individual banks and the entire industry in order to lower settlement risk. The development of Continuous Linked Settlement (CLS) was the key element of this process. CLS reduces settlement risks in foreign exchange transactions by settling on a payment-versus-payment (PVP) basis. It can now settle trades in 15 currencies. CLS is

**2** The system should have a well-founded legal basis under all relevant jurisdictions.

currently being used by 58 direct participants (settlement members) worldwide, including five German banks. According to a survey conducted by the BIS, in spring 2004 CLS accounted for almost one-quarter of the global settlements of foreign currency transactions. This figure is likely to have risen significantly since then because four additional currencies can now be settled via CLS and both the volume and value of trades have gone up considerably. This rise was also due in part to the fact that the number of market players using CLS indirectly (third parties), ie via a direct participant, has more than tripled since mid-2004. Owing to CLS's contribution to the elimination of settlement risk in foreign exchange transactions and given its current market share, CLS is of particular importance for financial stability. Problems in the CLS system could have a direct negative impact on the stability of the financial system. For this reason, CLS is subject to a cooperative payment systems oversight led by the Federal Reserve Bank of New York in which the Bundesbank is also involved. Compared with the previous year, the risks for financial stability arising from the settlement of foreign exchange transactions have declined thanks to the increased use of CLS.

*New design for the cooperative oversight of SWIFT has proved a success*

The communication network SWIFT is used by over 7,500 financial institutions in over 200 countries. In 2004 the German banking industry was the third largest user worldwide. Many market infrastructures (for example payment systems) also use SWIFT which means that it is extremely important for the stability of the overall financial system that SWIFT functions smoothly. For this reason, the decision was taken to restructure the cooperative oversight of SWIFT by the G10 central banks (led by the National Bank of Belgium) from 2004 to make it more effective. SWIFT oversight focuses on issues of security, operational reliability, the resilience of the technical systems and business continuity planning. Representatives of the G10 central banks, the ECB and the Chairman of the BIS Committee on Payment and Settlement Systems (CPSS) meet regularly in the SWIFT Cooperative Oversight Group (OG) to discuss the common strategy for the oversight of SWIFT. Within the OG there is the Executive Group (EG) whose task is to maintain direct contact with SWIFT and present the strategies and recommendations discussed by the OG to SWIFT's management and to keep up to date with new developments at SWIFT. The fundamental oversight tasks are carried out by the Technical Oversight Group (TG), where experts with specialised IT knowledge discuss technical issues and report their findings to the OG. The reorganisation of the cooperative oversight of SWIFT will make a lasting contribution to the reduction of financial stability risks.

*Improving liquidity management in the new settlement model …*

In November 2004 customers of the German central securities depository Clearstream Banking AG (Clearstream) were introduced to a more flexible securities settlement procedure, which allows them to use more than one central bank account to provide liquidity for the cash settlement of securities transactions in advance. This has not only opened up additional sources of central bank liquidity for participants but also allows a better distribution of central bank liquidity available for settlement purposes.

*… and an extension of overnight processing*

Moreover, in March 2005 Clearstream introduced another overnight settlement cycle,

which works using central bank liquidity provided in advance. Since then Clearstream's settlement system has been available approximately 18 hours per day. The new real-time processing enables additional interaction during the night between Clearstream and the International Central Securities Depositories, Clearstream Luxembourg and Euroclear. Securities transfers involving more than one system can thus be coordinated more effectively in the interest of the market players. Previously rejected transactions, new orders or recent releases of instructions can be processed during the night by early morning. Experience has shown that it has been possible to achieve a sustained rise in settlement efficiency for all systems involved in the overnight processing – indicated by a significant reduction of failed transactions. Furthermore, the overall safety of settlements has increased owing to the introduction of this second overnight cycle. Transactions previously settled during the day are now being shifted to the risk-free overnight processing, where securities transactions are settled on a DVP basis using central bank liquidity provided in advance by the participants. Finally, the smooth delivery of securities and the improved interoperability also contributes to the integration of the European securities markets.

## Financial market legislation in Germany and the EU

Regulatory framework requirements constitute rules for market players and as such have a considerable impact on the efficiency and stability of financial markets. The recent legislative measures are based almost entirely on the Financial Services Action Plan (FSAP), which was adopted by the European Commission in 1999 to establish or rather accomplish the single market. As part of this action plan, nearly all European and national capital market legislation has been or will be revised with the objective of creating a level-playing field in the European financial markets. At the same time, partly in response to the various accounting scandals and corresponding legislative measures in the United States, it aims to improve investor protection and corporate governance in Europe. The German Parliament also pursued this objective when it passed its own extensive legislative package in July 2005 to strengthen corporate governance in German companies.[3]

*Implementation of FSAP strengthens single market …*

In spring 2005, once most of the FSAP measures had been implemented at least at a European level, the Commission issued a "Green Paper on Financial Services Policy (2005-2010)"[4] for consultation. In this Paper the Commission presented what it considered to be necessary follow-up work upon completion of the FSAP. In line with the regulatory recess demanded by many financial market players, over the next few years precedence will be given to implementing the remaining FSAP measures and enforcing them at national level rather than to new regulatory initiatives. Consequently, new directives have been an-

*… and the ensuing "Green Paper on Financial Services Policy (2005-2010)"*

**3** *Gesetz zur Unternehmensintegrität und Modernisierung des Anfechtungsrechtes – UMAG* (Act on corporate integrity and the right to set aside resolutions of the shareholders' meetings), *Gesetz zur Einführung von Kapitalanleger-Musterverfahren – KapMuG* (Law on test case litigation for investors) and the *Gesetz über die Offenlegung der Vorstandsvergütungen – VorstOG* (Law on the public disclosure of remuneration of board members of listed companies).
**4** COM (2005) 177

nounced only in a few areas, such as payment systems.

*EU Prospectus Directive*

A key area of capital market law are the disclosure requirements, which reduce information asymmetries and should thus contribute to investor protection. The aim of these sometimes complicated regulations is to improve confidence in the financial markets and thus contribute to their efficiency and stability. An important part of the disclosure requirements was revised by the EU Prospectus Directive.[5] This Directive, which was implemented into national law on 1 July by the Securities Prospectus Act (*Wertpapierprospektgesetz*), is designed to make it easier for companies to raise capital throughout the EU in that a prospectus approved in one member state will be recognised in all member states (European passport). Since 1 July 2005 the prospectus review process has been carried out by the Federal Financial Supervisory Authority (BaFin). Prior to this, responsibility lay with the federal state's securities admissions office at the stock exchange concerned. In order to avoid any competitive disadvantages vis-à-vis other countries, for securities offered in Germany and abroad – in contrast to the original wording of the Government bill – a prospectus in English is sufficient.

*EU Market Abuse Directive*

The EU Market Abuse Directive[6] was implemented into German law in October 2004 by the Act improving investor protection (*Anlegerschutzverbesserungsgesetz*). The Act improving investor protection has tightened the prohibition on insider dealing as defined in the Securities Trading Act (*Wertpapierhandelsgesetz*) and extended the ad hoc disclosure requirements. Another new rule provides that the issuer may, at its own responsibility, decide to postpone publication to prevent damage to its legitimate interests. Previously, the issuer would have required permission from BaFin to do this. This rule, which also corresponds to the legal situation in the United States and Switzerland, for example, will mean less work for the supervisory authorities but an increased liability risk for companies. A detailed implementing regulation concerning the amended prudential supervisory system was adopted in December 2004.[7]

*German law on mortgage bonds*

With the aim of establishing a level-playing field across Europe, the state guarantees which ensured the solvency of public law institutions and the guarantors' uncalled liability were abolished on 19 July 2005. This required a reform of the law on mortgage bonds. The new Mortgage Bond Act (*Pfandbriefgesetz*), which entered into force on 19 July 2005, saw the abolition of the specialist bank principle. Issuers of Pfandbriefe must apply for a licence from BaFin. It is expected that the new Act will also ensure the quality and competitiveness of German Pfandbriefe in Europe. The new Act has replaced the three statutes which were formerly applicable.

*Importance of financial market legislation for financial stability*

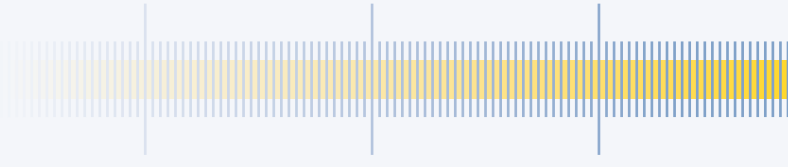
The fact that the FSAP, adopted by the European Commission in 1999 in order to create a single European financial market, has been and will be rapidly implemented at all levels in Germany is to be welcomed. As far as national

**5** 2003/71/EC
**6** 2003/6/EC
**7** See *Wertpapierhandelsanzeige- und Insiderverzeichnisverordnung* (Securities Trading Reporting and Insider Register Ordinance) of 13 December 2004, Federal Law Gazette 2004 Part I, No 68, page 3376 of 17 December 2004, Legal basis is the Commission Directive 2004/72/EC of 29 April 2004.

implementation of the directive is concerned, Germany is one of the frontrunners. By contrast, implementation in the other EU member states is, in some cases, very sluggish. This delays overall market integration and reduces the intended benefits with regard to efficiency and stability; it entails disadvantages for German companies, financial service providers and investors since the advantages of a single financial market cannot yet be put to effective use.

On the one hand, the FSAP harmonises the regulatory framework requirements in the European financial markets and thus contributes to their stability. On the other hand, this involves some major changes for several market players, which now need to be implemented and upheld by both the financial market players and the supervisory authorities. For this reason, it is hoped that the European Commission will maintain its objective presented in the Green Paper and place the emphasis over the next few years on implementing adopted measures and conducting cost/benefit analyses in the area of financial market legislation.

# Articles



# Bank competition and the stability of the financial system

A marked process of consolidation has taken place in the past few years within the three pillars of the German banking system. Above all, a large number of mergers among the credit cooperatives and savings banks has led to a significantly reduced number of credit institutions. Even though this process has lost some momentum, all the signs point to its continuing in the next few years. Similar developments can also be observed in many other countries.

Given this situation, this article will generally attempt to highlight the implications of concentration and competition in the banking sector for the stability of the banking system as discussed in the literature. Even though no obvious correlation can be derived from a theoretical perspective, empirical studies point to a higher concentration and a lower level of competition having a stabilising influence. Nevertheless, as the degree of competition also appears to have intensified notwithstanding the consolidation process in Germany, such a correlation cannot necessarily be applied to the German financial system. Moreover, the analysis below ignores effects of bank competition which go beyond their impact on the stability of the financial system. To that extent, it is not possible to make any assessment of the possible macroeconomic benefits of a change in the degree of competition.

## Macroeconomic importance of a stable financial system

*Stable financial system facilitates …*

The essential role of a financial system consists in the efficient allocation of national savings to investment. The financial system should ensure that diversification possibilities are exploited and that, ultimately, a macroeconomically desirable trade-off between reward and risk can be achieved in capital allocation. In this context, the expected return on capital, resulting from the contractually agreed share in the future earnings of the temporarily loaned capital, has a key steering function. It can only perform this function effectively, however, if it is ensured that the contractually agreed shares of the earnings can also actually be realised. It is only under these circumstances that the individual economic agents' investment activity can be decoupled from their current wealth, that the macroeconomically efficient investment opportunities can be realised irrespective of past individual incomes and that optimal capital allocation can, therefore, be achieved.[1] A functionally viable financial system thus provides an effective mechanism for allocating capital, thereby contributing, other things being equal, to a higher productivity of investment and faster economic growth.[2]

**1** R La Porta, F Lopez-de-Silanes, A Shleifer and R Vishny (1997), Legal determinants of external finance, in Journal of Finance, 52, p 1131 ff, describe, for example, the impact of the legal system on the enforceability of financial contracts and thus, ultimately, the availability of external corporate financing.
**2** R Levine (1999), Law, Finance, and Economic Growth, in Journal of Financial Intermediation, Vol 8, p 8 ff, shows the contribution to growth of an improved enforceability of financial contracts.

*… more efficient allocation of capital and accelerated growth,*

A stable financial system ensures that the customary cyclical or financial shocks, if they exceed individual financial market agents' ability to sustain risk, do not trigger self-perpetuating mechanisms. Such a development could lead to a financial crisis with severe price distortions or even a temporary paralysis of the capital markets. This means that financial crises impair the working of the allocation mechanism or make it temporarily inoperative. Consequently, they entail real economic losses of output and growth. Furthermore, crisis-induced excessive price fluctuations in the capital markets result in an inefficiently high risk premium, which additionally hampers the allocation function and impedes investment, thus contributing in the long run to lower growth.[3]

*… reduces negative impact of asymmetric information …*

Efficient capital allocation can be impaired not only by a lack of enforceability of financial contracts but also, in particular, by an asymmetric distribution of information on investment returns and risks. A supplier of capital will refrain from making an investment if, say, he possesses less information than the seeker of capital and therefore suspects that he will be investing in an excessively risky undertaking.[4] Over time, however, enterprises and financial intermediaries can succeed in establishing a reputation for a safe but profitable investment strategy, thereby limiting the problems resulting from an asymmetric distribution of information. The collapse of enterprises or financial intermediaries in a financial crisis means that this reputation is lost and the problems of asymmetric information suddenly become more virulent. Additionally, a higher probability of financial crises reduces the expected future benefits of such an established track record or reputation. In an unstable financial system, enterprises and financial intermediaries therefore have less incentive to choose secure investments in order to build up a positive reputation. Furthermore, the incentives for the market players to invest in information procurement and processing are generally reduced if frequently occurring financial crises mean that it is unlikely that they will be able to benefit from such information in the future.

*… and ensures greater liquidity*

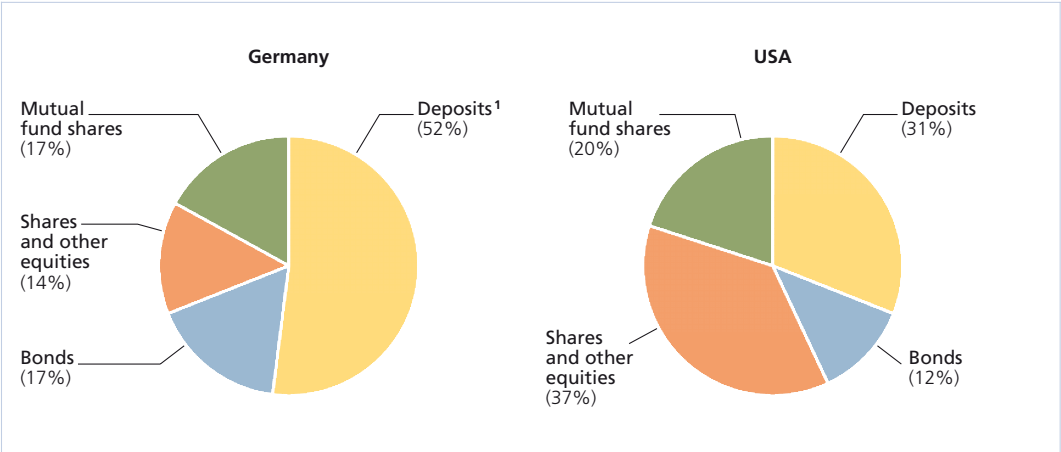
A further major function of the financial system is liquidity transformation. The financial system should permit long-term real investment while concurrently ensuring that investors can also liquidate their investment at short notice by, say, selling their shares to other investors. Financial market turmoil during crises periods may also mean that long-term corporate securities can perhaps only be sold at a large discount. For investors in need of liquidity it may therefore be an advantage in times of crisis to give preference to what would normally be an inefficient liquidation of their real investment rather than a sale. The more often investors have to expect a financial crisis and, therefore, the premature termination of long-term investments, the less profitable it is *a priori* to place capital in productive long-term real investments.[5] Seen in this light,

**3** R Levine (2005), Finance and Growth, in P Aghion und S N Durlauf (eds), Handbook of Economic Growth, provides a more detailed overview of studies on the connection between financial system developments and economic growth. F Allen and H Oura, Sustained Economic Growth and the Financial System, discuss the connection between the design of the financial system and economic growth in Monetary and Economic Studies, December 2004, p 95 ff.
**4** A detailed account of the reasoning behind this may be found in D Jaffee and J Stiglitz (1990), Credit Rationing, in B M Friedman und F H Hahn (eds), Handbook of Monetary Economics, Vol. II, p 837 ff.
**5** F Allen and D Gale (1998), Optimal Financial Crisis, in Journal of Finance, Vol 53, p 1245 ff, analyse this problem in depth.

Chart 2.1.1

## BREAKDOWN OF HOUSEHOLDS' PORTFOLIOS*

Year-end 2004




***** Excluding investments placed with insurance enterprises and pension funds. — **1** Including cash.

DEUTSCHE BUNDESBANK

too, a stable financial system therefore not only prevents crisis-induced short-term losses of output but also increases macroeconomic growth in the long term.

*Importance of a stable financial system for monetary policy*

A stable financial system is particularly important, not least, for monetary policy. In order for the central bank to safeguard price stability, monetary policy impulses have to have an effective and, in particular, predictable impact on the economy as a whole. A fragile financial system disrupts this link.[6] Furthermore, the fear of serious disruptions in the financial markets might prevent a central bank from raising interest rates even though it would be necessary from a monetary policy point of view.

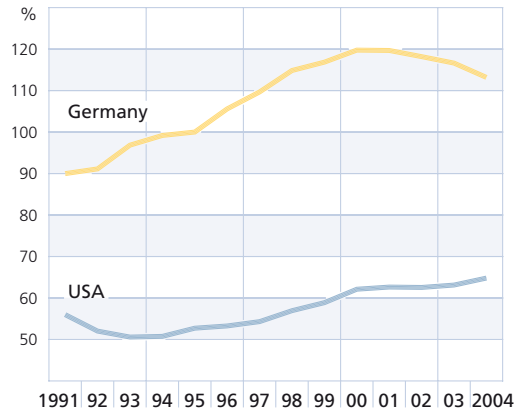
*Importance of banks in different financial systems*

Banks have widely different roles in terms of the specific way in which the actual national financial systems are organised.[7] Especially when compared with the US financial system, banks in the German financial system play a much bigger role in the allocation of capital.[8] For example, the percentage not only of bank deposits but also of other financial instruments issued by banks in households' portfo-

**6** See C Goodhart and H Huang (2005), The lender of last resort, in Journal of Banking and Finance, Vol 29, p 1059 ff, for a more detailed account of this consideration.
**7** F Allen and D Gale (2000), Comparing Financial Systems, Cambridge MA, describe the differing characteristic features of financial systems and provide a detailed account of the differing role of banks in the various systems.
**8** A comprehensive description of the German financial system and the role of the banks may be found in J Krahnen and R Schmidt (2004) (eds), The German Financial System, Oxford. For a European comparison, see ECB (2004), Report on Financial Structures.

Chart 2.1.2

**LOANS* TO THE DOMESTIC PRIVATE SECTOR IN RELATION TO GDP**




Source: IMF International Financial Statistics and Bundesbank calculations. — * Including securitised loans.

DEUTSCHE BUNDESBANK

lios in Germany is significantly higher than is the case in the United States (see chart 2.1.1 on page 103). Likewise, bank lending to the private sector plays a far more important role in the German financial system than in the US system (see chart 2.1.2 above).

## Special role of the banks[9]

*Advantages of banks in information procurement*

One major advantage the banks have as a source of finance is that they have better access to information and can process this information more efficiently. As a rule, investors can at least partly offset their information deficit vis-à-vis capital seekers by obtaining additional information. Nevertheless, costs are typically incurred in obtaining such information. As, in most cases, such information costs do not depend on the amount of capital made available and, in principle, would have to be paid for by each potential capital supplier, the concentration of financing on a single bank means that economies of scale can be exploited in information procurement.[10] Owing to this focus on a "Hausbank", the latter can, moreover, reap maximum advantage from the enhanced level of information. This can prevent a sub-optimal level of investment in information procurement, which might result from the non-exclusivity of information use if funding were provided by a plurality of investors. In contrast to private investors, banks are also better able to act as the sole or principal financier of an enterprise and maintain longer-term financing relationships. This leads to a flow of information over time to banks which improves their ability to assess and monitor a given enterprise or undertaking.

*Information problems connected with bank refinancing*

The role of the banks in information procurement and processing results in the accumulation of information capital as a key component of banks' assets. Naturally enough, outsiders and, therefore, a bank's capital suppliers, too, find it difficult to value this information capital. The banks' advantage with regard to problems of asymmetric information in corporate financing thus leads to the financing of banks itself being fraught with information asymmetries. Since, however, credit institutions typically have a better diversified portfo-

**9** For a comprehensive overview of the efficiency gains through banks, see G Gorton and A Winton (2005), Financial Intermediation, in G Constantinides, M Harris und R Stulz (eds) p 431 ff, Handbook of the Economics of Finance.
**10** See D Diamond (1984), Financial Intermediation and Delegated Monitoring, in Review of Economic Studies, Vol 51, p 393 ff, for a more detailed account of this argument.

lio than most firms and, therefore, a steadier earnings performance, information problems in the financing of banks are less serious.[11] Furthermore, the characteristic refinancing of banks through short-term callable deposits acts as a disciplining mechanism which ensures that bank managers pass on the gains from the obtained information advantage to their own investors.[12]

*Banks provide liquidity benefits*

By refinancing long-term loans through short-term fixed-rate deposits, the banks also improve the liquidity transformation of the financial system. The liquidity insurance offered by banks' deposit contracts may go beyond the risk-sharing provided by the financial markets. This is because, unlike the usual financial and insurance contracts, bank deposits can ensure an efficient risk-sharing even if the actual liquidity needs of individual investors cannot be observed.[13]

## Bank competition

*Efficient capital allocation …*

Given the banks' special role in the financial system as outlined above, the welfare implications of increasing competition likewise differ somewhat from the standard view. Generally, economists favour as much market competition as possible in order to maximise the cost-effectiveness of aggregate output and the range of goods and services provided or, in the case, of banks, to optimise the efficiency of capital allocation. Even so, depending on the particular market under consideration, there are situations – caused, for example, by cost structures – in which perfect competition does not necessarily achieve the best macroeconomic results. At least in some business segments, banks appear to operate on such less-than-ideal markets. Given the importance of information asymmetries for some parts of banking business described above, it becomes clear that the fundamental role of competition in banking business or in bank lending business warrants a correspondingly nuanced assessment.[14] For example, besides the objective of matching prices as closely as possible to costs and efficient production, the ongoing monitoring of lending business as well as the perpetual availability of credit are other desiderata that need to be factored into the equation.

*… information asymmetries in lending business …*

*… and interactions with the intensity of competition*

The granting of bank loans is characterised by the above-mentioned information intensity and asymmetry which underlies this business. The initial und subsequent ongoing procurement of information for the duration of the credit relationship may therefore be seen as a necessary investment by the bank in the borrower. Depending on the transparency of the enterprise, obtaining such information is more or less cost-intensive. This intensity is characteristic of the type of relationship between the bank and the borrower – relationship banking versus standard credit – and thus one of the

**11** A more detailed discussion of this argument can be found in D Diamond, *op cit*.
**12** This argument is developed by C Calomiris and C Kahn, The Role of Demandable Debt in Structuring Optimal Banking Arrangements, in American Economic Review, Vol 81, p 47 ff and D Diamond and R. Rajan (2000), A Theory of Bank Capital, in Journal of Finance, Vol 55, p 2431 ff.
**13** This argument essentially goes back to D Diamond and P Dybvig (1983), Bank Runs, Deposit Insurance, and Liquidity, in Journal of Political Economy, Vol 91, p 401ff. A discussion of the general validity of this function of banks may be found in E-L von Thadden (1999), Liquidity Creation through Banks and Markets: Multiple Insurance and Limited Market Access, in European Economic Review, Vol 43, p 991 ff.
**14** For an overview of the general academic debate, see N Cetorelli (2001), Competition among banks: Good or bad?, Federal Reserve Bank of Chicago, Economic Perspectives, second quarter, pp 38 ff.

crucial features of the product for which the banks are competing in the respective credit market. Potential interactions between the degree of competition and the attractiveness of such relationships may therefore have a crucial impact on the availability of credit depending on the type of borrower and the point in the business cycle.

*Limited informative value of national measures of market structure*

Despite the importance of competitive intensity for allocative efficiency in banking business, quantifying it is comparatively difficult and is not captured by clear standard measures. Measures of market structure and concentration are the most frequently used indirect yardsticks for describing the degree of competition in banking markets. An international comparison of such structural measures for national banking markets is shown in the box 2.1 on pages 108-109. According to such national measures of concentration, Germany, for example, ought to be marked by extremely intense competition. At the same time, however, the higher measures of concentration for Germany's regional banking markets reveal that such national measures of bank structure may be a rather poor gauge of the relative competitive intensity of a given banking market (see box 2.2 on pages 114-115). This is especially the case as regional market definitions are probably more relevant than national definitions – not least because of the regional principle that applies to large parts of the German banking system notwithstanding the trends towards internationalisation and consolidation.

*Link between market structure and competitive behaviour*

Quite apart from these problems of market definition, however, even the hypothesis of a fundamental link between market concentration and competitive behaviour is open to question. It may of course be generally assumed, in line with the classical structure-conduct-performance paradigm,[15] that market structure can clearly influence the competitive behaviour of market players. In other words, a concentrated market promotes strategic behaviour on the part of the suppliers, as a result of which the volume of supply may be smaller and the prices higher than under conditions of perfect competition. An observed increase in market concentration may, however, also result from the activity of the more efficient firms, which use their efficiency lead in order to expand their market share (efficient structure hypothesis[16]). Growing concentration in the wake of bank consolidation would then reflect not so much dwindling competition as a reapportionment of the market in favour of the more efficient suppliers. Moreover, even a relatively more highly concentrated market might theoretically be subject to a high degree of competition solely as a result of the threat of new players entering the market – for example, foreign competitors. Such "contestable" markets[17] require simple legal rules and low-cost market entry. In Europe, the legal requirement is in place as a result of the single market for financial services and ongoing legislative harmonisation. On the cost side, not least in Germany, the technical developments of the past few years have greatly facilitated market entry through new marketing channels (direct banks, for instance) and have thus

**15** See J Bain (1951), Relation of Profit Rate to Industry Concentration: American Manufacturing 1936-1940, Quarterly Journal of Economics, Vol 65, p 293 ff.
**16** See H Demsetz (1974), Two Systems of Belief About Monopoly, in H J Goldschmidt, H M Mann and J F Weston (eds), Industrial Concentration: The New Learning, Mass: Little, Brown.
**17** See W J Baumol (1982), Contestable Markets: An Uprising in the Theory of Industry Structure, American Economic Review, Vol 72, p 1 ff.

heightened competitive pressure both directly and indirectly.

*Empirical estimations of competitive behaviour*

To avoid relying on market structure measures in assessing competitive behaviour (which, for the reasons cited above, are indeed problematical), the New Empirical Industrial Organization (NEIO) therefore offers empirical methods of gaining insights into competitive behaviour in individual markets. For banking markets, the most frequently applied methods are the Rosse-Panzar or H statistic and the estimation of a Lerner Index, which gives the relative margin between prices and marginal costs (see box 2.1 on pages 108-109). By applying these competition indicators, which are estimated using econometric methods, the actual level of competition within a banking system can be determined much more reliably – especially if the estimations are based on bank microdata – than is possible using simple national market structure measures. This is because the problems of market definition occur barely or not at all depending on the chosen method.

*Increase in competition in the 1990s*

For most European countries, these indicators show an increase in competition during the 1990s.[18] Studies for Germany likewise suggest a strengthening of competition during this period. Nevertheless, in some cases, results for local banking markets still indicate a certain market power.[19] (See also box 2.2 on pages 114-115 for a comparison of empirical competition and stability measures for European countries).

*Relationship lending and competition*

Given an overall tendency towards growing competition, its impact on the bank-customer relationship is especially interesting in view of the aforementioned information asymmetries. In particular, the relationship of less information-transparent small and medium-sized enterprises (SMEs) with their banks is characterised by very close bank-customer ties (relationship lending). Increasing competitive pressure can make such close relationships more difficult as, for customers, it facilitates the switch to another bank, which means that investment in input-intensive information procurement and implicit liquidity guarantees become less interesting for a potential "house bank". This is because the bank has limited scope to achieve compensatory earnings following critical financing periods for its borrower or the cost-intensive collection of information.[20] Only sparse empirical evidence has been found for such effects to date. A multi-country study found indications that a higher degree of bank concentration fosters the growth of sectors which are especially dependent on external financing.[21] By contrast, a study for the USA was unable to confirm this effect and, in fact, produced opposite results.[22]

**18** See, for example, J A Bikker and K Haaf (2002), Competition, concentration and their relationship: an empirical analysis of the banking industry, Journal of Banking and Finance, Vol 26, p 2191ff; J Fernandez de Guevara, J Maudos and F Perez (2005), Market power in European Banking Sectors, Journal of Financial Services Research, Vol 27, p 109ff.
**19** See H S Hempell (2002), Testing for Competition among German Banks, Deutsche Bundesbank, Research Centre, Discussion paper No 04/2002, and, additionally, with a focus on local banking markets, K-H Fischer and H S Hempell (2005), Oligopoly and Conduct in Banking; An Empirical Analysis, Deutsche Bundesbank Research Centre, Discussion paper, forthcoming.
**20** Caminal/Matutes (2002), Market power and banking failures, International Journal of Industrial Organization, Vol 20, p 1341ff; B N Anand und A Galetovic (2000),: Information, Nonexcludability, and Financial Market Structure, Journal of Business, Vol 73, p 357ff. However, investment in relationship banking could also be interpreted as a strategic response of product differentiation by means of which incumbent banks attempt, at least in part, to shield themselves from greater price competition in transaction lending. (See A W Boot and A V Thakor (2000), Can Relationship Banking Survive Competition?, Journal of Finance, Vol 55 No 3, p 679ff).
**21** See N Cetorelli and M Gambera (2001), Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data, Journal of Finance, Vol 56, p 617ff.
**22** See S E Black and P E Strahan (2002), Entrepreneurship and Bank Credit Availability, Journal of Finance, Vol 57, p 2807ff.

Box 2.1

## MEASURES OF MARKET STRUCTURE: A EUROPEAN COMPARISON

The measures of market structure typically used in connection with competition issues are, first, simply the number of banks operating on the national market and, second, concentration ratios (CR), which model the percentage market share of the largest banks, as well as the Herfindahl-Hirshman Index (HHI), which is calculated from the sum of the squared market shares of all the banks in a given market. The index takes account of both the total number of banks and the distribution of their market shares within a market and, as a result of the squaring, gives a particularly high weighting to larger market shares. For measures of market structure, reference variables for the market in question are, typically, the balance sheet total and the volume of credit or deposits at the national level.

The degree of bank concentration measured by these national structural measures varies quite considerably within Europe. According to these figures, the German banking market is the least concentrated (when compared with other European countries), which initially suggests a very high level of competition.

### Number of banks as well as CR5 and HHI measured by the balance sheet total: a European comparison*

| | Number of banks | | CR5* in % | | HHI* in % | |
|---|---|---|---|---|---|---|
| Country | 1998 | 2003 | 1998 | 2003 | 1998 | 2003 |
| Austria | 898 | 814 | 42 | 44 | 0.052 | 0.056 |
| Belgium | 123 | 108 | 63 | 83 | 0.091 | 0.207 |
| Denmark | 212 | 203 | 71 | 67 | 0.144 | 0.111 |
| Finland | 348 | 366 | 86 | 81 | 0.212 | 0.242 |
| France | 1,226 | 939 | 41 | 47 | 0.049 | 0.060 |
| Germany | 3,238 | 2 225 | 19 | 22 | 0.013 | 0.017 |
| Greece | 59 | 59 | 63 | 67 | 0.117 | 0.113 |
| Ireland | 78 | 80 | 40 | 44 | 0.047 | 0.056 |
| Italy | 934 | 801 | 25 | 27 | 0.021 | 0.024 |
| Luxembourg | 212 | 172 | 25 | 32 | 0.022 | 0.032 |
| Netherlands | 634 | 481 | 82 | 84 | 0.180 | 0.174 |
| Portugal | 227 | 200 | 45 | 63 | 0.058 | 0.104 |
| Sweden | 223 | 222 | 56 | 54 | 0.079 | 0.076 |
| United Kingdom | 521 | 426 | 25 | 33 | 0.022 | 0.035 |

### Measures of market structure and the problem of market definition

The national measures of market structure described above can only serve as initial indicators of competitive behaviour, however. Their widespread use is due, first, to their simple computation and, second, the often limited availability of data, which makes empirical studies far more difficult in some instances. When calculating such measures, however, delineating

*Source: ECB, Report on EU Banking Structure, November 2004. — **1** See, for example, H Degryse and S Ongena (2005), Distance, Lending Relationships, and Competition, Journal of Finance, Vol 60, No 1, p 231 ff — **2** See K-H Fischer and C Pfeil (2004), Regulation and Competition in German Banking: An Assessment, in J P Krahnen and R H Schmidt, The German Financial System, p 310. The measures of regional concentration they describe are calculated on the basis of DEUTSCHE BUNDESBANK bank branches per administrative district (*Kreis*). Unlike for the USA, for example, data on deposit or credit volumes are unavailable for such narrow regional definitions in Germany. — **3** The findings of K-H Fischer and H S Hempell (2005), Regional Markets, Oligopoly and Market Power in Banking; An Empirical Analysis, Deutsche Bundesbank Research Centre, Discussion paper, forthcoming, likewise point to the existence of banks' continuing perceptible market power, precisely in regional markets, and the importance of regional bank concentration in Germany. — **4** See T Bresnahan (1989), Empirical Studies of Industries with Market

the market can be a crucial problem: structural measures on a national basis indirectly assume a national competitive arena, whereas local markets still play a key role in many segments of lending business, in particular.[1] National concentration measures therefore sometimes tell us very little about the (local) market structures that are actually relevant. Taking Germany as an example, this becomes clear when juxtaposing the national HHIs cited above with the, in principle, comparable regional measures.[2] The regionally or locally measured HHIs differ in this instance considerably from national measures and would, indeed, suggest a certain market power in regional banking markets.[3]

**Herfindahl-Hirshman Index (HHI) – Differences in banking market delineation – national vs regional – Example: Germany**

| Year | National definition[6] | Regional definition[7] (Average of all districts and cities) | |
|---|---|---|---|
| | | West | East |
| 1996 | 0.011[8] | 0.198 | 0.280 |
| 1998 | 0.013 | 0.200 | 0.302 |
| 2000 | 0.015 | 0.206 | 0.325 |

## Empirical methods of measuring competition

The New Empirical Industrial Organization (NEIO)[4] provides empirical methods of measuring the degree of competition in order to circumvent at least some of the cited problems. For banking markets, the most frequently used methods are the estimation of a Rosse-Panzar statistic (H statistic) or a Lerner Index. The H statistic developed by Panzar and Rosse[5] is based on estimating a reduced-form yield function, which models the sum of the obtained factor price elasticities. A value of 1 reflects perfect competition, a value smaller than or equal to 0 reflects complete collusion.[9] To calculate a Lerner Index, banks' marginal costs are estimated econometrically, either in isolation or simultaneously in a system of equations that may additionally contain a price equation and, where applicable, demand equations. Using these estimation results, a relative price-cost margin is calculated on the basis of price variables. A higher margin indicates greater market power.[10] (See comparison of estimated Lerner indices and stability indicators for Europe in box 2.2 on pages 114-115) For Germany, as for most European countries, both indicators suggest an increase in competition during the 1990s. However, the German results for local banking markets point to a certain market power in more narrowly defined local banking markets.

Power, in R Schmalensee und R Willig (eds), Handbook of Industrial Organization, Volume II, Elsevier Science Publishers B.V., Netherlands. — **5** J C Panzar and J N Rosse (1987), Testing for Monopoly Equilibrium, Journal of Industrial Economics, Vol 35, pp 443-456. — **6** Source: ECB, Report on EU Banking Structure, November 2004; — **7** Fischer/Pfeil (2004), *loc cit*: regional HHIs calculated on the basis of percentage shares of branches; — **8** Deutsche Bundesbank, Bank balance sheets, bank competition and monetary policy transmission, Monthly Report, September 2001, p 51-70. — **9** See, for example, J A Bikker and K Haaf (2002), Competition, concentration and their relationship: an empirical analysis of the banking industry, Journal of Banking and Finance, Vol 26, pp 2191 ff. For Germany, see H S Hempell (2002), Testing for Competition among German Banks, Deutsche Bundesbank Research Centre, Discussion paper No 04/2002. — **10** For Europe, see J Fernandez de Guevara, J Maudos and F Perez (2005), Market power in European Banking Sectors, Journal of Financial Services Research, Vol 27, p 109 ff. For Germany, see K-H Fischer and H S Hempell (2005), *loc cit*.

For Germany, however, a link was identified between the concentration of local banking markets and banks' investment in information-intensive customer relationships.[23]

*Competition and business cycle*

At the same time, the particular nature of the credit relationship has more than just general implications for the availability of credit for borrowers of varying degrees of transparency. Depending on the type of credit relationship, credit availability fluctuates over the business cycle. Thus, relationship banking may cushion the impact that the business cycle has on lending.[24] While this amounts to a liquidity guarantee at the corporate level, it would tend to smooth cyclical fluctuations at the aggregate level. From a macroeconomic perspective, therefore, a weakening of these close relationships might strengthen procyclical effects. This could impact adversely on macrostability and thus pose additional risks to financial stability.

## The necessity of bank regulation in the light of financial stability

*Expectation-induced liquidity risks*

In the past, financial instability often originated from liquidity crises. The liquidity transformation function performed by banks – ie the refinancing of long-term investments, especially loans, through short-term or callable deposits – means that they have to predict their liquidity needs as accurately as possible. This is because obtaining a large amount of suddenly needed liquidity – by, say, selling or collateralising long-term investments – is usually possible only at a discount owing to the poorer level of information of other investors. It is therefore associated with higher opportunity costs than forward-looking liquidity management. However, the need to determine liquidity requirements as accurately as possible in advance also implies, in principle, the possibility of a destabilisation of the banks through the mere formation of expectations. If depositors expect that the flow of funds into a bank will be much smaller than planned owing to a lack of new deposits or that other depositors will withdraw a sizeable amount of funds unexpectedly at short notice, they will inevitably surmise that the bank's short-term procurement of liquidity will likewise be dearer. For depositors, this implies a deterioration in the expected earnings and, ultimately, the expected default risk of this credit institution, making it appear wise to withdraw existing deposits from this bank and to make no new deposits. In the extreme case, such an expectation-driven process could be a self-fulfilling prophecy and spill over to the entire banking system.[25]

*Advantages of deposit insurance schemes and …*

One effective regulatory instrument for preventing such expectation-triggered banking crises is a compulsory deposit insurance scheme which guarantees investors the repayment of their funds even if the bank becomes insolvent. This can prevent such expectation-driven effects from triggering liquidity crises. A crucial requirement in this context, however, is a premium structure geared to the individual bank's risk profile. The reason for this is

**23** See K-H Fischer, (2005), Acquisition of Information in Loan Markets and Bank Market Power – An Empirical Investigation, presented at the Conference of Banking Structure and Competition of the Federal Reserve Bank of Chicago in May 2005.
**24** See F Allen and D Gale (1997), Financial Markets, Intermediaries, and Intertemporal Smoothing, in Journal of Political Economy, Vol 105, p 523 ff.
**25** This argument essentially goes back to D Diamond and P Dybvig *loc cit*.

that a deposit insurance scheme nullifies the depositors' incentive to take due account of the bank's risk profile when making their investment decisions. This would mean the loss of a major disciplining effect on the bank's managers. For that reason, deposit insurance in many financial systems is confined to small investors or smaller deposits as, in such cases, an extensive procurement of information prior to the investment decision would make little economic sense anyway.[26]

*… disadvantages*

A shortcoming of deposit insurance schemes is that a complete risk adjustment of the deposit insurance premium is scarcely achievable as information asymmetries make an assessment of the default risks by the deposit insurance scheme more difficult. Owing to a lack of risk sensitivity on the part of many depositors and a mismatch between the insurance premium and the risk, a deposit insurance scheme could *per se* set distorted incentives for the banks' shareholders and thus, ultimately, the bank's managers. As a major part of the losses is borne by the deposit insurance scheme and not solely by the shareholders, whereas the shareholders benefit fully from the profits, the shareholders have an incentive to encourage the bank's managers to pursue a lending strategy that does not take adequate account of the risks.[27]

*The role of capital requirements*

However, such distorted incentives can be largely corrected by regulatory minimum capital requirements, especially where these are tailored to the default risk. By requiring banks to hold a high level of liable capital, the share of any losses that have to be borne by the shareholders is also larger. Conversely, the losses to be borne by the deposit insurance scheme are reduced. This lessens the shareholders' incentive to induce the bank's managers to pursue an excessively risky investment strategy and thus reduces the credit institutions' default risk. Ultimately, however, a possible incentive to assume excessive risks cannot be entirely eliminated even by statutory capital requirements. This could be achieved only by full equity financing, but this is not efficient on account of the advantages of the partial financing through deposits described above.

## Interaction between bank competition and stability

*Positive incentive effect of future profits*

In principle, both allocative efficiency and the stability of the financial system have to be taken into account in order to determine a macroeconomically optimal degree of competition in the banking sector. While allocative efficiency does tend to be strengthened by a higher level of competition, intense competition can increase the fragility of the banking system. In the literature, one major effect of bank competition on the stability of an individual bank is perceived to be the prospect of future profits generating a disciplining effect if there is a low level of competition. The greater the expected future profitability of a bank is, the more rewarding it is for the bank to avoid insolvency. Accordingly, it will not take up incentives to pursue an inefficiently risky lending

**26** See M Dewatripont and J Tirole (1994), The Prudential Regulation of Banks, Cambridge MA, p 59 ff and p 109 ff.
**27** This argument can already be found in R Merton (1977), An Analytic Derivation of the Costs of Deposit Insurance and Loan Guarantees: An application of Modern Option Pricing Theory, in Journal of Banking and Finance, Vol 1, p 3 ff.

strategy, which, as mentioned above, might stem, for example, from an deposit insurance scheme.[28]

*Competition and information procurement*

More intense competition among banks may also lead to an average shortening of the duration of financial relationships between firms and banks. This means that the lending bank can gather specific information from the financing relationship – which may be important for a very efficient lending decision – over no more than a comparatively short period. As described above, with increasing competition a bank also has to expect that a financing relationship that has been entered into is not a permanent one. For this reason, it may appear advantageous to the bank to reduce its investment in costlier and more precise company evaluations and credit assessments, which might likewise tend to contribute to higher default risks.

*Supplying liquidity to enterprises*

Competition-induced shorter financing relationships between banks and enterprises also reduce, as mentioned, banks' incentive to support firms that experience a temporary liquidity shortage. This is because more intense competition reduces a bank's ability to compensate for a waiver of claims to save an illiquid enterprise by receiving higher rates of interest on loans granted to this borrower in the future. In this sense, too, increasing competition among banks should thus result in a higher probability of loan defaults.

*Impact on corporate strategy*

On the other hand, if a current creditor bank has a smaller information lead over other financiers with regard to a firm's precise default risk, this prevents the firm from becoming dependent on the bank in question and consequently having to accept poorer credit conditions. Excessively high lending rates may induce an enterprise to incur a moral hazard and to pursue an excessively risky investment strategy. This is due to the fact that, given a large interest burden, it may only be by choosing a very risky investment strategy that an enterprise can hope, if successful, to generate the interest payments and, beyond that, achieve a profit. The incentives to pursue too risky an investment strategy become greater as the interest burden increases. Seen in those terms, stronger competition among banks may also strengthen the stability of the credit institutions. Since competition leads to smaller interest payment burdens for firms, it induces borrowers to select a safer investment strategy and might thus, ultimately, bring about a smaller default risk.[29]

*Consequences of individual bank failures for the real economy*

At the same time, reduced dependence on a "Hausbank" also makes it easier for firms – in the event of their "Hausbank" being distressed – to obtain loans from another bank without necessarily having to accept significantly poorer terms and conditions. This lessens the real economic effects of individual bank crises.

*Profits as a cushion against exogenous shocks*

A credit institution's ability to bear risk is generally determined not only by its equity cover but also by its profitability. If greater competi-

**28** Initial empirical evidence of this was supplied by M Keeley (1990), Deposit Insurance, Risk and Market Power in Banking, in American Economic Review, Vol 80, p 1183 ff. See also T Cordella and E L Yeyati (2002), Financial opening, deposit insurance and risk in a model of banking competition, in European Economic Review, Vol 46, p 471 ff and C Matutes and X Vives (2000), Imperfect Competition, Risk Taking, and Regulation in Banking, in European Economic Review, Vol 44, p 1 ff.
**29** A detailed account of this argument is provided by J Boyd and G. De Nicoló (2005), The Theory of Bank Risk Taking and Competition Revisited, in Journal of Finance, Vol 60, p 1329 ff.

tion leads to structurally lower profits, it also increases banks' susceptibility to exogenous shocks and self-fulfilling liquidity crises. On the other hand, in a concentrated banking sector, deposit-taking institutions can reduce their liquidity holdings thanks to economies of scale and scope in payment settlement, for example. However, this can increase the overall banking sector's susceptibility to exogenous liquidity shocks and expectation-driven liquidity crises.[30]

*Effect of greater competition with other forms of investment …*

More intense competition between bank deposits and other investment vehicles owing to a more liquid market for direct investment erodes banks' profits on the refinancing side. But it can also have a stabilising impact insofar as it reduces contagion effects. This is because, with a more liquid capital market, any fire sales by distressed financial intermediaries result in smaller price distortions. Crises of individual institutions therefore have a smaller impact on the profitability of other institutions, and so the systemic risk declines.[31]

*… and financing*

A more liquid corporate bond market has implications for the stability of credit institutions which are generally similar to those of increasing competition among banks. More intense competition between bank loans and corporate bonds erodes banks' ability to sustain risk and may lessen their incentive to procure information. At the same time, better access to the capital market reduces firms' dependence on relationship lending. Not least, this allows enterprises to tap other financing sources during crisis situations in the banking sector.

*Empirical interaction unclear*

All in all, numerous effects point to both a stabilising and a destabilising impact of an increasing competition within the financial sector. A simple empirical comparison of concentration and competition measures with financial stability indicators, however, indicates a relatively clearer correlation (see box 2.2 on pages 114-115). This tends to confirm the arguments which suggest that more concentration and less competition have a positive impact on the stability of the financial system. More nuanced studies, which take account of the varying impact of concentration and the degree of competition, come to a different conclusion in some cases, however. They indicate that, while a high degree of concentration is indeed conducive to stability, a banking system with fewer institutional constraints on competition is hit less often by banking crises.[32]

## Conclusions

The stability of the financial system is of crucial importance not only for general economic developments but also for the efficacy of the central bank's monetary policy. As banks, especially in Germany, are a key element of the financial system, the economic condition and the structure of the banking system are closely linked to the stability of the financial system and macroeconomic developments.

**30** This point is also made in J Boyd, G De Nicoló and B Smith (2004), Crises in Competitive versus Monopolistic Banking Systems, in Journal of Money, Credit, and Banking, Vol 36, p 487 ff.
**31** F Fecht (2004), On the Stability of Different Financial Systems, in Journal of the European Economic Association, Vol 2, p 969 ff, studies these reciprocal effects.
**32** This is the conclusion reached by, for example, T Beck, A Demirgüç-Kunt and R Levine (2005), Bank Concentration and Fragility: Impact and Mechanics, NBER Working Paper No 11500.

A competitively structured banking market, by allocating capital more efficiently in the economy, therefore tends *per se* and *a priori* to boost welfare. But the various problems of information asymmetries that are inherent to banking business may be intensified by both a high and a low level of competition and have a destabilising effect on the system as a whole. A theoretical evaluation of the influences of competition on the stability of the banking and financial system therefore cannot come to a clear-cut verdict.

Empirical studies likewise come up against difficulties because, for one thing, the degree of stability cannot be modelled unambiguously by individual indicators and, for another, determining the degree of competitive intensity raises significant problems. This is frequently due to the use of overly coarse measures of market structure whose precision is additionally blunted by problems in defining the relevant market. Moreover, international analysis shows that concentration processes have often been the result of financial crises. Nevertheless, simple comparisons of competition and stability indicators as well as extensive econometric studies point to a positive correlation between stability and concentration, or market power, in the banking sector. At the same time, there are some indications that although concentration has a stabilising effect, institutional constraints on competition have a destabilising impact.

In the light of these findings, the consolidation efforts undertaken in Germany, especially by the smaller banks, are to be welcomed with regard to their implications for the stability of the German financial system in terms of the

Box 2.2

## RELATIONSHIP BETWEEN BANK COMPETITION INDICATORS AND FINANCIAL STABILITY INDICATORS

While a theoretical approach to identifying a link between the degree of competition in the banking system and financial stability provides no clear-cut answer, attempts to analyse this issue empirically are fraught with difficulties. Besides the problems of finding suitable measures of market structure and competition described in box 2.1 on pages 106-107, analysing the complex interaction of very different factors is a difficult task to solve when assessing financial stability.

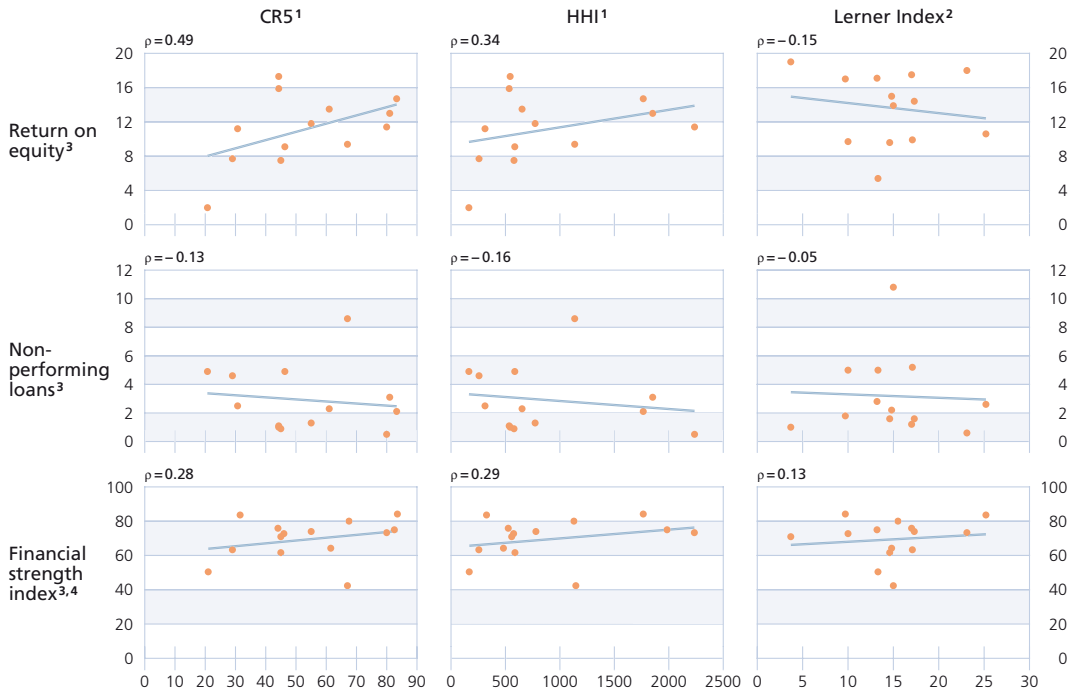
A simple comparison of various bank competition and financial stability indicators across European countries suggests that a certain link between these indicators exists (see chart opposite), although such a comparison can have no more than an illustrative character. For this comparison, different competition indicators – concentration measures and estimation results[1] – as well as various indicators of the banking system's stability and resilience to risk (return on equity, share of banks' non-performing loans and a rating agency's Bank Financial Strength Index) were used. Overall, the correlations shown in these scatter plots point to a certain positive link between greater market power of banks and financial stability: a mostly positive correlation of the competition indicators with the return on equity and the Bank Financial Strength Index as well as a negative correlation with the share of non-performing loans.

Empirical studies, which are not based solely on straightforward correlations but also take account

*Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and United Kingdom. — **1** Average for 2001-2003. – Source: ECB, Report on EU Banking Structure, November 2004. — **2** Average Lerner indices based on estimated marginal costs for the period 1995-2001 from S Carbó, D Humphrey, J Maudos and P Molyneux (2005), Cross-Country Comparisons of Competition and Pricing Power in European Banking, mimeo. — **3** Average for 2001-2003 (for a comparison with estimated Lerner indices: 2000-2001). Source: IMF, Global Financial Sta-

DEUTSCHE BUNDESBANK

## CORRELATIONS BETWEEN INDICATORS OF BANK COMPETITION AND FINANCIAL STABILITY FOR EUROPEAN COUNTRIES*




of the various determinants of financial stability by means of econometric estimations, generally also find indications of a positive correlation between stability and concentration, or market power, in the banking sector.[5] A current cross-country study[6] attempts, however, to separate the effects of concentration and competition using additional variables that take account of the regulatory and institutional competitive environment. It contains indications that concentration tends to have a stabilising effect, whereas institutional constraints on competition – such as obstructing market access for foreign banks – have a destabilising effect.[7]

bility Report, September 2004 (data for Denmark only for Financial Strength Index). — **4** Constructed for each country on the basis of the weighted average of Moody's bank ratings; scaling from 0 to 100 for lowest and highest rating respectively. — **5** See one of the first studies on this by M C Keeley, (1990), Deposit Insurance, Risk and Market Power in Banking, in The American Economic Review, Vol 80 pp 1183–1200, or more up-to-date studies by *inter alia* J Gan (2004), Banking market structure and financial stability: Evidence from the Texas real estate crisis in the 1980s, Journal of Financial Economics, Vol 73, pp 567 ff ; V Salas and J Saurina (2003), Deregulation, market power and risk behaviour in Spanish banks, European Economic Review, Vol 47, p 1061 ff. — **6** T Beck, A Demirgüç-Kunt and R Levine (2005), Bank Concentration and Fragility: Impact and Mechanics, NBER Working Paper No 11500 (although the cited caveats regarding the suitability of the applied market structure indicators apply to this study, too). — **7** However, empirical studies on the deregulation of bank branches for the USA give contradictory indications in terms of banks' risk behaviour.

potential efficiency gains and the enhanced resilience of the banking sector. As empirical studies simultaneously point to a growing level of competition, no losses in the efficiency of capital allocation are to be feared as a result.

# Stability level achieved in highly indebted emerging market economies

No sooner had the fallout from the international debt crises of the early 1980s been overcome than a number of highly indebted emerging market economies again ran into serious external liquidity problems posed by the surge in net outflows of capital that were triggered by dwindling investor confidence. ("Emerging market economies" is the term used to denote those developing and transitional countries which have made the greatest economic progress and generally enjoy access to the international financial markets.) The aforementioned wave of difficulties began in the mid-1990s and again resulted in considerable losses of income and jobs, had a detrimental effect on the world economy and caused creditors to sustain, in some cases, huge losses. At the same time, the IMF intervened as a kind of "international crisis manager" with ever-increasing financial packages, a move which, given the implications for market participants' risk awareness, raised doubts about the appropriateness of the IMF playing such a role. This led to a change in thinking on the part of most participants. Thus, many emerging market economies adopted radical economic policy reforms. This is also in Germany's interests as economic stability in the emerging market economies benefits German exporters and protects the German financial sector against extensive losses on its investments there. However, the currently very low risk premiums for paper issued by this group of countries do not reflect their own efforts at rehabilitation alone but, in view of the record lows reached in world interest rates, also the search for better yields ("yield-seeking" behaviour). In the event of a turnaround in international interest rate movements some countries which still show a considerable need for adjustment could suddenly appear less attractive for foreign investors and thereby slide into new balance of payments difficulties. These problems can best be solved through sustained improvements in economic policy. Moreover, all emerging market economies with loans from the international markets are advised to adopt the "Principles for Stable Capital Flows and Fair Debt Restructuring in Emerging Markets" developed by major emerging market economies and representatives of financial intermediaries. Applying these principles may assist in crisis prevention and make it easier to solve any debt problems that may nevertheless arise.

## Lessons from the crises of the 1990s

*Weak banking systems exacerbate crises*

The debt crises since the 1990s have been due partly to the fact that the governments of the emerging market economies had borrowed heavily in foreign currency in the international financial markets without ensuring that this adequately strengthened their debt servicing capacity. In contrast to the situation in earlier crises, when foreign banks had been the principal creditors, it was now the international capital markets that were the main source of borrowed funds. One of the widely applied policies of the emerging market economies was to peg their exchange rates to the US dollar, and this made it appear inexpensive to borrow abroad. However, the access to relatively inexpensive capital proved to be illusory, with painful economic consequences when confidence in the borrowers was shaken, new foreign currency loans were refused and ultimately the domestic currency had to be devalued. This made it more difficult, if not completely impossible, for the emerging market economies to refinance maturing foreign currency debt while the debt level in terms of the domestic currency increased as a result of depreciation and aggravated sovereign debtors' frequently existing budgetary problems even further. In many countries, moreover, the banking system was a particular weak point. Inadequate regulation and supervision, as well as a belief in government support in the event of a crisis, meant that banks often pursued an unhealthy lending policy based on foreign currency borrowing. When the domestic currency depreciated, this resulted in massive losses of capital. The consequent instability in the banking system led to even more serious real economic problems in the countries affected by a debt crisis.

*Investors insufficiently aware of risk*

Furthermore, regarding the causes of crises, it turns out that for a long time foreign creditors greatly underestimated the many risks to a country's liquidity or were not even able to make an accurate assessment owing to a lack of information. In some cases international investors actually avoided weighing up the risks in the hope that international agencies would come running to the rescue in the event of a crisis. Such expectations appear to have been particularly rife immediately after the Mexico crisis of 1994-95, the reaction to which had been massive international balance of payments assistance. The risk premiums (spreads) on bonds issued by Latin American countries initially rose steeply before falling back quickly to a level which was actually somewhat lower in 1997, ie before the outbreak of the Asia crisis, than in the year before the outbreak of the Mexico crisis.[1]

*Progress in stabilisation may crucially reduce contagion risks*

It must also be emphasised that the spreading of a debt crisis to other countries observed since the 1990s does not conform to earlier global patterns. Previously, the main effects of balance of payments crises had been on neighbouring countries, ie on partner countries with which there is intensive trade owing to the low transport costs involved and which are consequently particularly affected by a downturn in demand. Instead, a global chain reaction ensued. The Asia crisis began in Thailand, spread to Indonesia, Malaysia, the Philippines and South Korea, in particular, and then finally crossed to Brazil via Russia. This new

**1** See Bank for International Settlements: 67th Annual Report (1996-97), p 102.

BOX 2.3

## MAIN FEATURES OF INTERNATIONAL DEBT CRISES

International debt problems can arise when an economy incurs large foreign currency debt to the rest of the world – typically as items offsetting persistent current account deficits. Ideally, capital imports should reflect attractive investment conditions; hence, with the aid of additional foreign savings, economic growth can be increased and debts serviced (ie remunerated and redeemed) out of the revenues resulting from investment. The government, the banking system and the corporate sector can all act as borrowers in this regard. In addition, if the debt is denominated in foreign currency, the capital must be used in such a way that the foreign currency income from exports of goods and services reaches a level that is sufficient to service the debt. However, if foreign creditors have doubts about whether these conditions are still being fulfilled (whether, for example, foreign funds are being used to finance current government expenditure instead of improving the economic infrastructure), the inflow of new capital will slow down or might even come to an abrupt halt. As a result, debtor countries begin to have trouble offsetting any current account deficits and refinancing maturing foreign debt. The consequence is downward pressure on the exchange rate.

If the external debt is denominated in foreign currency, however, even a drastic devaluation of the currency and the resulting strengthening of competitiveness would not help raise the foreign currency required for interest and redemption payments in the short term. If there are also insufficient reserve assets, the only way out of the crisis is either to seek international financial assistance or to declare bankruptcy. An actual moratorium on payments, or just the threat of one, can, in some cases, also increase risk aversion to similar countries, thereby causing a debt crisis to "spill over" to other countries (contagion effect).

In recent years, international institutions have worked on clarifying the conditions under which larger financial assistance packages can also be granted in exceptional circumstances. Furthermore, progress has been made in making unavoidable debt restructuring easier for all parties concerned. But above all, the international community has put crisis prevention at the heart of its activities by pushing ahead with economic policy reforms. These also include efforts aimed at increasing market transparency so that investors can better assess existing risks.

One of the longer-term reform strategies involves helping emerging market economies build stable and efficient national financial markets. This can help offer international investors attractive alternatives, enabling emerging market economies to incur a larger share of foreign debt in their own currency. The more progress made by the emerging market economies in this respect, the lesser the likelihood of further international debt crises breaking out. If money were to be borrowed in a country's own currency, the sole effect of a crisis of confidence (which would be unlikely but could never be ruled out) would be to exert downward pressure on the exchange rate; the debtor country's ability to pay would not be affected. Such balance of payments crises would clearly not be as dramatic as current international debt crises.

DEUTSCHE BUNDESBANK

experience, which arose, first, from the tendency at the time to give the risks posed by all emerging market economies a similar rating and, second, from a herd behaviour among investors, underlines the key importance of robust financial structures, efficient capital deployment and a reliable stability policy for ensuring successful economic development. International financial integration may well have evolved since then, as is suggested by the similarity in the pace with which yields in both the industrial countries and the emerging market economies have declined during the past few years. In another recent and welcome development, however, the risk premiums on emerging market instruments are beginning to decouple from the movements in high-yield bonds in the corporate sector of the industrial countries. This means that, while interest rate convergence has been increasing as a result of accelerating globalisation, the markets are somewhat more discerning in terms of risk. Whether this greater differentiation is sufficient to protect most of the emerging market economies against massive capital flight in the event of a new financial crisis in a major country remains to be seen. Some recent events suggest, however, that substantial progress in stabilisation will probably have a protective effect on the country involved. When, for example, in the second quarter of 2004 a prolonged increase in global interest rates was expected, the resultant increase in the risk premiums on emerging market bonds was fairly varied – with the sharpest increases occurring in those countries that were generally considered to be most in need of further adjustment.

## Emerging market economies remain committed to globalisation

*Common interests of industrial countries and emerging market economies in the globalisation process*

Despite the sobering crises suffered by the emerging market economies, globalisation is advancing by leaps and bounds. Among the driving forces behind this development are cheaper transport and the fact that major advances in communications over the past few years have been accompanied by falling costs. Added to this is the common interest shared by the industrial countries and the emerging market economies in the advantages to be gained from the increase in the division of labour. Expanding markets and stiffer competition have led to accelerated productivity gains, which, in the long run, will benefit all countries involved. Special opportunities arise for the developing countries from inflows of capital which increase the earnings of the locally abundant supply of labour and can also create additional jobs. This, together with an accelerated rise in local wages, helps to improve prosperity on a global scale. The investors from the developed world benefit because their investment opportunities increase and they tend to earn more investment income as a result. In the longer term the industrial countries, by investing in the emerging market economies, can also provide for times when their economic growth will slow down as a result of demographic developments. This way, their future living standards can be raised by drawing on their external savings. This fundamental commonality of interests means that no country will be able to escape the process of globalisation without ultimately losing out.

*Urgent need for sound and reliable legal framework*

Globalisation presents not only industrial countries, but also developing countries, with enormous challenges. As a basis for a sustainably good investment climate, the propensity towards entrepreneurship needs to be given an environment which guarantees development. In particular, it must be possible to assert legal claims speedily and reliably. These requirements are also necessary if a closed economy is to succeed. In a globally integrating economic area, however, investors will retaliate particularly harshly for any shortcomings in this respect by simply going elsewhere. Happily, legal clarity is now generally being given a prominent place in reform programmes.

*Macroeconomic stability remains anchor for confidence*

In view of globalisation, another major task to be fulfilled by the emerging market economies engaged in international financial transactions is to ensure a sustainably high degree of macroeconomic stability and, to this end, to create effective institutional safeguards. Only in this way can they make major setbacks in the form of sudden withdrawals of capital, capital flight on the part of their own citizens and external liquidity problems less likely. In the event of a loss of confidence, damage is sustained not only by the crisis countries but also by their creditors. Continual progress in stabilisation by the emerging market economies is therefore a major concern, not least in the eyes of German banks. Despite the importance attached to the international primary markets these days, the German banking system's exposure to emerging market economies is still considerable even if these loans make up only a small percentage of the German banks' total credit volume.

Table 2.1

## LENDING BY GERMAN BANKS TO BORROWERS IN DEVELOPING AND TRANSITION COUNTRIES*

€ billion

| | Total loans[1] | | Risk-adjusted loans[2] | |
|---|---|---|---|---|
| **Continent / country** | **June 2005** | **June 2004** | **June 2005** | **June 2004** |
| **The Americas** | 146.6 | 116.0 | 104.8 | 82.3 |
| *of which*[3] | | | | |
| Brazil | 9.1 | 7.5 | 5.9 | 4.1 |
| Mexico | 6.6 | 6.5 | 5.1 | 5.0 |
| **Europe (extended)** | 101.2 | 77.2 | 77.0 | 55.6 |
| *of which*[3] | | | | |
| Croatia | 6.0 | 5.5 | 5.3 | 4.8 |
| Russia | 23.8 | 19.4 | 12.9 | 8.0 |
| Turkey | 15.5 | 9.3 | 10.8 | 5.0 |
| **Asia** | 94.5 | 69.2 | 77.2 | 54.9 |
| *of which*[3] | | | | |
| China | 7.7 | 6.4 | 4.9 | 4.4 |
| India | 6.5 | 4.2 | 6.0 | 3.8 |
| Iran | 6.5 | 5.6 | 3.6 | 2.9 |
| Korea | 11.3 | 7.2 | 10.7 | 6.7 |
| **Africa** | 16.0 | 15.8 | 11.3 | 11.2 |
| *of which*[3] | | | | |
| Liberia | 5.4 | 6.0 | 4.0 | 4.2 |
| South Africa | 5.6 | 5.3 | 4.1 | 4.0 |
| **Australia/Oceania** | 4.1 | 1.7 | 3.3 | 1.3 |
| **International organisations** | 9.4 | 9.0 | 5.5 | 6.2 |
| Countries not to be reported | 0.5 | 0.1 | 9.9 | 5.2 |
| **Total** | **372.3** | **289.1** | **289.1** | **216.8** |

***** Pursuant to the Country Risk Regulation (Länderrisikoverordnung). — **1** Including offshore centres, but excluding foreign local financing. — **2** Total loans excluding registered collateral and provisions for credit risk. Classification by country according to the final borrower's domicile. — **3** The list includes countries (excluding offshore centres) to which German banks had exposures (total loans) of at least €5 billion as of 30 June 2005.

DEUTSCHE BUNDESBANK

## Stabilisation progress in many countries

*Crisis shock fosters will to reform*

The process of reform has made significant progress in most emerging market economies. The shock generated by the crises has clearly been a contributory factor here. Rising unemployment, massive reductions in growth rates and political unrest have generally increased the willingness to make necessary reforms to regain lost ground and to prevent new crises. At the same time, even the less affected countries have learned the appropriate lessons.

*International exchange of experience helpful*

Countries which plan to join the European Union and which have adopted or will adopt the EU's *acquis communautaire* have a reform agenda and a timetable. This has made it easier for them to prepare for the global challenges involved. In the other emerging market economies the pace of reform has been much more varied owing to differing political and social circumstances. Everywhere, however, these efforts were helped along by the desire to harness the efficiency inherent in market economy systems following the demise of the centrally planned economies. Owing to its extensive experience, the International Monetary Fund (IMF) is indispensable as an adviser in reform processes throughout the world, especially as it can also point to conceptual lessons that can be drawn from its own mistakes (for example, in the field of exchange rate policy where problems with fixed exchange rates went unheeded for a long time). Informal international bodies in which economic policy measures are discussed and actual experiences exchanged provide a further source of assistance. For example, the G20 approved an Accord for Sustained Growth in Berlin in November 2004. This commits the major industrial countries and emerging market economies to apply a series of economic policy principles and to adhere to a corresponding reform programme tailored to the needs of the individual countries.[2]

*Strong economic growth and large inflows of FDI*

The countries that were previously in crisis have now entirely overcome the slump in domestic demand and returned to strong economic growth. Especially in Asia, exports, in particular, have proved to be a major driving force, bringing the current accounts of most of these countries into surplus. The return of significant inflows of foreign currency through foreign direct investment (FDI)[3] is a reflection of the widely achieved turnaround. With regard to the distribution of FDI, however, China and India are by far the leaders. These are two countries which have remained unaffected by the financial crises owing to their capital controls and to the fact that their governments largely refrain from borrowing abroad. Both countries therefore appear to exemplify a suitable order of steps to be taken in opening up an economy. This includes the principle that a country should strengthen its own financial sector before embarking on a major liberalisation of its financial transactions.

*Relative decline in budget deficits and public debt*

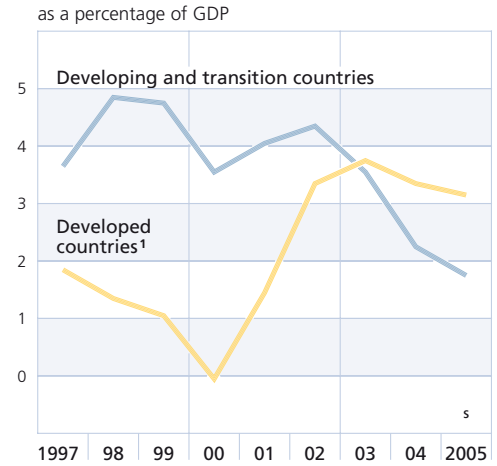
The recovery of the emerging market economies from past crises was underpinned by a period of monetary stability in that these countries' budget deficits and public debt have fallen, in some cases significantly, in rela-

**2** See Annexes to the Communiqué of the G20 Meeting of Finance Ministers and Central Bank Governors in Berlin on 20-21 November 2004. Available on the internet at http://www.g20.org.
**3** In 2004 FDI in Latin America grew strongly again after a particularly sharp decline. More rapid growth in FDI also occurred in China, India, Indonesia, Malaysia, Russia and Vietnam.

tion to GDP in all economic regions of the world since 2002 – in contrast to developments in the industrial countries. Another reason why this is worth noting is that in many countries considerable financial aid had to be given to recapitalise ailing banks. However, government debt ratios improved not only because of fiscal discipline but also as a result of the economic recovery. Such a (merely) cyclical improvement in the budget does not constitute a permanent stabilisation of public finances. Recent calculations by the IMF for a large group of emerging market economies have indicated that over half of these countries would still not have a stable government debt ratio if future GDP growth were in line with the long-term average and the risk premiums included in the interest on foreign loans returned to their average level for the period between 2000 and mid-2005.[4]

Chart 2.2.1

**GENERAL GOVERNMENT BUDGET DEFICITS**




Source: IMF. — **1** Including Hong Kong, Singapore, South Korea and Taiwan.

DEUTSCHE BUNDESBANK

*Maturities of public debt extended*

The emerging market economies have also succeeded in extending the maturities of their public debt. This, together with the lower interest rates, has resulted in a decline in the annual debt servicing costs. While the periods over which these sovereign issuers can borrow are still much shorter than in the industrial countries, there is also the case of Poland, which was able to issue a 50-year sovereign bond on favourable terms this year.

*Rising shares of public debt in local currency*

In the past few years some governments have also been able to increase the proportion of public debt denominated in local currency substantially. This applies, for example, to Brazil, where the ratio was already fairly high in the past, as well as to Chile, Colombia, Mexico, Peru and Venezuela. This trend towards borrowing more heavily in domestic currency instead of foreign currency is to be welcomed. If the level of foreign-currency-denominated debt falls, the public debt burden in the event of a depreciation of the domestic currency increases less rapidly. At the same time, the governments concerned can also promote the development of their national financial sectors, thereby making it easier to retain national savings at home. Another emerging trend is the rapid growth in the number of international investors who are being attracted to purchasing bonds denominated in domestic currency. South Africa is one of the countries which has been successful in this respect for some time now, with Poland and Turkey being among the more notable

**4** See IMF, World Economic Outlook – Building Institutions, September 2005, p 16.

recent examples. Brazil and China, too, have successfully issued sovereign bonds denominated in domestic currency to foreign investors in the recent past. Some South American countries have actually been issuing domestic-currency-denominated debt securities that are specifically aimed at international investors. The acceptance of the inherent exchange rate risk associated with such instruments is a particularly clear sign of the investors' growing confidence in the sustained progress being made by these countries in the field of financial stability.

*Banking systems stronger*

Deficiencies in the banking systems of many emerging market economies have also been addressed. Consequently, Moody's ratings for the banking systems have also improved almost everywhere during the past few years. This has been due primarily to the appreciable increase in the rates of return on bank assets as well as to the significant rise – notably in Latin America – in the reported equity capital and the fall in non-performing loans. The banking systems have also been strengthened by the reduction in currency mismatches although there is no complete picture indicating to what extent private borrowers have also managed to reduce such vulnerabilities. At all events, private foreign currency debt has grown significantly in the transition countries of central and eastern Europe, a development which has been encouraged by the presence of many foreign banks and the expected appreciation of the various domestic currencies. By contrast, major currency depreciations would cause problems for the banks with large foreign-currency exposures although this would still be manageable for international banking groups.

*Sharp rise in reserve assets*

Most of the emerging market economies have used the foreign currency which they have acquired as a result of successful exporting and the simultaneous inflows of capital to build up their reserve assets considerably. From a national accounts perspective, such an increase in official external assets represents an export of capital; on balance, therefore, emerging market economies have been unusually large net exporters of capital. As already mentioned, expectations are that in view of globalisation the emerging market economies find it easier to exploit foreign savings and can therefore increase their investment rate. One motive for accumulating extensive reserve assets has been to create a safety buffer, with Asian countries, in particular, using these assets in an effort to reduce their dependence on IMF assistance. However, the reserve assets of some countries have now reached an unprecedented scale. In not a few cases their asset holdings far exceed the level normally considered to be necessary regardless of whether the required foreign currency is to pay for imports or to service short-term external debt. Other signs that the accumulation of reserves has reached excessive levels are that China has used part of its reserves to resuscitate its banks and that many monetary authorities no longer take investment decisions on the basis of liquidity considerations alone but, increasingly, also look at expected yields.

*Decline in risk premiums*

The J P Morgan index on the risk premiums to be paid on government debt shows a significant multi-year decline and serves as an indicator of the restored confidence in the emerging market economies. Premiums on higher-risk debt have declined most. Accord-

Table 2.2

## CURRENT ACCOUNT BALANCES AND RESERVE ASSETS OF THE DEVELOPING AND TRANSITION COUNTRIES*

US$ billion

| Country/group of countries | Annual average 1997 - 99 | Annual average 2000 - 02 | 2003 | 2004 | 2005e |
|---|---|---|---|---|---|
| | **Current account balances** | | | | |
| All countries | –72.3 | 72.2 | 143.9 | 227.7 | 410.1 |
| Asia | 35.2 | 53.0 | 84.8 | 93.0 | 109.7 |
| *of which* | | | | | |
| China | 27.2 | 24.4 | 45.9 | 68.7 | 115.6 |
| India | – 4.4 | 1.3 | 6.9 | – 0.8 | –13.5 |
| Latin America | –71.3 | –39.5 | 6.3 | 18.3 | 21.5 |
| *of which* | | | | | |
| Brazil | –29.7 | –18.3 | 4.2 | 11.7 | 13.1 |
| Mexico | –12.5 | –16.6 | – 8.6 | – 7.4 | – 8.3 |
| Central and eastern Europe[1] | –22.3 | –24.6 | –37.3 | –50.1 | –56.4 |
| Commonwealth of Independent States | 0.7 | 36.9 | 35.9 | 63.1 | 105.3 |
| *of which* | | | | | |
| Russia | 5.8 | 36.3 | 35.4 | 59.9 | 101.8 |
| Africa | –13.7 | – 0.1 | – 3.1 | 0.6 | 12.5 |
| Middle East | – 0.9 | 46.4 | 57.3 | 102.8 | 217.6 |
| | **Holdings of gross reserve assets at the end of the year** | | | | |
| All countries | 709.7 | 941.8 | 1 418.9 | 1 871.5 | 2 335.8 |
| Asia | 277.3 | 399.8 | 670.3 | 934.4 | 1 181.4 |
| *of which* | | | | | |
| China | 150.5 | 225.7 | 409.2 | 615.5 | 825.5 |
| India | 28.8 | 51.0 | 99.5 | 127.2 | 143.2 |
| Latin America | 155.8 | 158.9 | 196.2 | 221.4 | 249.5 |
| *of which* | | | | | |
| Brazil | 36.4 | 35.0 | 49.1 | 52.8 | 57.7 |
| Mexico | 30.8 | 43.6 | 59.0 | 64.1 | 70.3 |
| Central and eastern Europe[1] | 86.9 | 108.1 | 160.0 | 183.2 | 200.2 |
| Commonwealth of Independent States | 18.0 | 45.2 | 92.6 | 148.4 | 229.1 |
| *of which* | | | | | |
| Russia | 10.4 | 34.2 | 73.8 | 121.5 | 195.6 |
| Africa | 42.6 | 64.1 | 91.3 | 127.1 | 165.7 |
| Middle East | 129.1 | 165.8 | 208.7 | 256.9 | 309.8 |

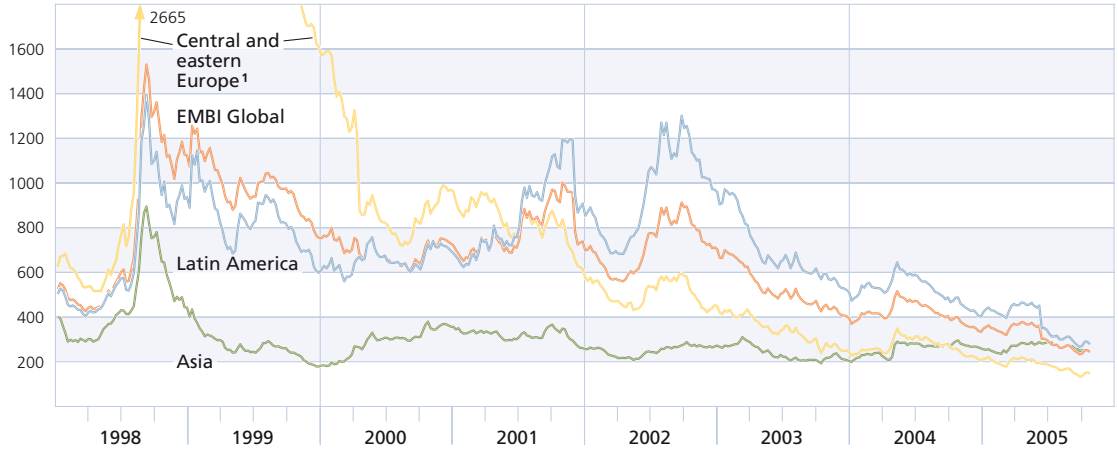
Source: IMF. — ***** Excluding Hong Kong, Singapore, South Korea and Taiwan. — **1** Including Turkey.

DEUTSCHE BUNDESBANK

Chart 2.2.2

## RISK PREMIA ON EMERGING MARKET ECONOMIES' SOVEREIGN DEBT INSTRUMENTS *

Measured in basis points, compared with US government bonds; weekly averages




Source: JP Morgan. — * JP Morgan Emerging Market Bond Index Global; includes bank loans, Brady bonds and international bonds. — 1 Including Russia and Turkey.

DEUTSCHE BUNDESBANK

ing to some international bodies, however, this is partly a reflection of the unusually low interest rate level in the industrial countries and the associated encouragement of the "search for yield". Increased investment by pension funds, life insurance companies and hedge funds has been playing a major role here. Specifically, those institutions which have to generate a minimum return that was promised to their investors have been making use of the remaining yield spreads. Even so, market participants are also reporting an increasing trend towards long-term investment in the emerging market economies.

*Improved ratings*

Another indicator of the increasing confidence in the emerging market economies is the improvement in the rating of sovereigns (reduced "sovereign risk"). Several emerging market economies have achieved an investment grade rating. This has led to the aforementioned broadening of the base of institutional investors. Compressed spreads, improved ratings and an extended investor base have had a mutually reinforcing effect.

*More resistance to political crises*

The absence of panic reactions on the markets following political crises can likewise be a sign that the underlying economic conditions have improved considerably. For example, the governments in Brazil and the Philippines are currently being accused of serious corruption, and in Thailand unrest in the south of the country has resulted in a state of emergency being called. Although these events would normally undermine the investment climate

Table 2.3

## RATING OF SOVEREIGN RISK IN SELECTED EMERGING MARKET ECONOMIES IN RESPECT OF LONG-TERM FOREIGN CURRENCY DEBT

Lowest rating (a) and current rating (b)[1]

| Country | | Moody's rating | Date | S&P rating | Date | Fitch IBCA rating | Date |
|---|---|---|---|---|---|---|---|
| East and South-East Asia | | | | | | | |
| Indonesia | a | B3 | 20/03/98 | SD | 23/04/02 | B- | 16/03/98 |
| | b | B2 ↑ | 30/09/03 | B+ ↑ | 22/12/04 | BB- ↑ | 26/01/05 |
| Korea | a | Ba1 | 22/12/97 | B+ | 22/12/97 | B- | 23/12/97 |
| | b | **A3** ↑ | 28/03/02 | **A** ↑ | 27/07/05 | **A+** ↑ | 24/10/05 |
| Malaysia | a | **Baa3** | 14/09/98 | **BBB-** | 15/09/98 | BB | 09/09/98 |
| | b | **A3** ↑ | 16/12/04 | **A-** ↑ | 08/10/03 | **A-** ↑ | 08/11/04 |
| Philippines | a | B1 | 16/02/05 | BB- | 17/01/05 | BB | 12/06/03 |
| | b | B1 ↓ | 16/02/05 | BB- ↓ | 17/01/05 | BB ↓ | 12/06/03 |
| Thailand | a | Ba1 | 21/12/97 | **BBB-** | 08/01/98 | BB+ | 14/05/98 |
| | b | **Baa1** ↑ | 26/11/03 | **BBB+** ↑ | 26/08/04 | **BBB+** ↑ | 10/05/05 |
| Latin America | | | | | | | |
| Argentina | a | Ca | 20/12/01 | SD | 06/11/01 | D | 14/01/05 |
| | b | B3 ↑ | 29/06/05 | B- ↑ | 01/06/05 | DDD ↑ | 03/06/05 |
| Brazil | a | B2 | 12/08/02 | B | 01/12/94 | B | 21/10/02 |
| | b | **Ba3** ↑ | 12/10/05 | BB- ↑ | 17/09/04 | BB- ↑ | 28/09/04 |
| Mexico | a | Ba2 | 16/05/95 | BB | 10/02/95 | BB | 30/08/95 |
| | b | **Baa1** ↑ | 06/01/05 | **BBB** ↑ | 31/01/05 | **BBB-** ↑ | 15/01/02 |
| Venezuela | a | Caa1 | 21/01/03 | SD | 18/01/05 | CCC+ | 10/01/03 |
| | b | B2 ↑ | 07/09/04 | B+ ↑ | 12/08/05 | B+ ↑ | 20/09/04 |
| Europe (extended) | | | | | | | |
| Poland | a | **Baa3** | 01/06/95 | BB | 01/06/95 | BB+ | 26/10/95 |
| | b | **A2** ↑ | 12/11/02 | **BBB+** ↑ | 15/05/00 | **BBB+** ↑ | 19/11/98 |
| Russia | a | B3 | 21/08/98 | SD | 27/01/99 | CCC | 27/08/98 |
| | b | **Baa2** ↑ | 25/10/05 | **BBB-** ↑ | 31/01/05 | **BBB** ↑ | 03/08/05 |
| Czech Republic | a | **Baa2** | 25/05/94 | **BBB** | 28/07/93 | **BBB+** | 24/11/97 |
| | b | **A1** ↑ | 12/11/02 | **A-** ↓ | 05/11/98 | **A** ↑ | 26/08/05 |
| Turkey | a | B1 | 13/03/97 | B- | 16/04/01 | B- | 25/03/03 |
| | b | B1 ↓ | 13/03/97 | BB- ↑ | 17/08/04 | BB- ↑ | 13/01/05 |
| Hungary | a | **Baa3** | 27/12/93 | BB+ | 20/04/92 | **BBB-** | 25/04/96 |
| | b | **A1** ↑ | 12/11/02 | **A-** ↑ | 19/12/00 | **A-** ↑ | 30/11/00 |
| Africa | | | | | | | |
| South Africa | a | **Baa3** | 03/10/94 | BB | 03/10/94 | BB | 22/09/94 |
| | b | **Baa1** ↑ | 11/01/05 | **BBB+** ↑ | 01/08/05 | **BBB+** ↑ | 25/08/05 |

Source: Bloomberg. — **1** If a country has been given the lowest rating by a rating agency more than once, only the most recent date is shown. The arrow next to the current credit rating shows the direction of the change since the previous rating: ↑ = upgrade, ↓ = downgrade. **Boldface**: investment grade.

DEUTSCHE BUNDESBANK

and the economy of these countries, the markets have remained calm for the time being.

*Catalyst role played by US current account deficit*

The present US balance of payments deficit forms the most significant counterpart to the improvement in the emerging market economies' financial situation through a current account that is either in surplus or running a smaller deficit. This deficit has therefore made the financial recovery of the emerging market economies easier by reducing their net external debt. The reason is that to enable these economies to acquire funds to reduce their debts or to build up their reserves other countries have to spend more than they save. It must be borne in mind, however, that the US current account deficit and the attendant overall level of debt have reached an extent which could cause foreign investors to become suddenly sceptical about the appropriateness of the monetary and fiscal policy being conducted. To avoid the risks of a sharp drop in the dollar and of soaring interest rates, a gradual reduction in the US current account deficit is desirable. Hence, there are limits to the balance of payments surpluses which the emerging market economies can run and to the associated growth and stability achievements.

*Advantages of fall in real interest rates also result of world economic integration*

The emerging market economies have also benefited from falling real interest rates worldwide. However, this rate reduction stems not least from the behaviour of the emerging market economies themselves. Given the rate at which the USA is absorbing capital, the present unusually low interest rate level would not be entirely explicable if it were not for a savings glut in the emerging market economies as a group. Even if this development is to be seen not as excessive saving but rather as a still-inadequate level of investment, the savings surplus of the emerging market economies must also be regarded as a reaction to previous overinvestment (as in the case of the property sector).[5] As a result of the low real interest rates, the emerging market economies also enjoy advantages that stem from their increased integration into the world economy: the permanent curb on price increases in the United States through imports from these countries was, after all, what launched the low-interest-rate policy in the United States, where, for a time, even deflation was viewed as a real possibility.

## Persistent vulnerabilities

*Deterioration in global economic environment could hit confidence*

The reforms introduced in most emerging market economies and the buoyant world economy have reduced the risk of new debt crises. However, there is still room in many cases for enormous improvements to be made, specifically regarding the state of budgets and the banking industry. In particular, the overall public debt-to-GDP ratio has generally been showing a distinctly falling trend but is still fairly high if the greater interest rate and exchange rate sensitivity of these economies' debt structure compared with that of the developed countries is taken into account. A sudden surge in world interest rates, which cannot be ruled out in view of the large and growing US current account deficit, for example, would very probably lead to an increase in risk premiums in many emerging market economies with foreign currency debt and

**5** China, which has a very high investment rate, is a special case. However, its saving rate is actually even higher.

therefore to a relatively sharp rise in their total interest expenditure. Another particularly critical scenario would be a simultaneously sharp deceleration in growth in the United States and China, which are currently the main driving forces behind the upturn in the world economy. A flight into quality would be even more likely under these conditions than it would in the event of a rise in world interest rates, especially as an increase in protectionism is to be expected from such a development. Another point is that in some commodity-producing countries persistent fundamental problems are obscured to a degree by increases in commodity and energy prices. By contrast, countries absorbing these goods face new price-stability challenges owing to the present high prices. Consequently, the financial robustness of individual countries still varies significantly.

*Turkey's large debt burden*

Some countries with large amounts of foreign debt require particular attention owing to their importance to the world economy. From Germany's point of view, Turkey is an obvious example owing to its geographical proximity and high degree of economic integration. This is a country which still has a long way to go until its financial system has become sufficiently robust. For example, its public debt is still considerable. In addition, the external debt of the government and the private sector, taken together, is also quite large, with a significant proportion consisting of short-term loans. Furthermore, the current account deficit has been running at more than 5% of GDP, and is tending to rise, partly as a result of sharply rising private consumption expenditure. Doubts about whether full EU membership will be possible are again putting these fundamental problems into the limelight. As a result, Turkey greatly depends on the confidence of international investors. If international interest rates were to rise sharply, Turkey's public debt could prove to be virtually unserviceable. The country's current fiscal policy, however, is on the right course. The primary surplus (ie the budgetary balance before interest expenditure) for the first six months of 2005 was actually considerably greater than the target agreed with the IMF, even though the overall budget remained in deficit.

*Stability policy in Brazil a balancing act*

Special attention is also being given to Brazil because, owing to the country's size, another crisis there will probably affect many of its neighbours in Central and South America. Brazil's public and external debt is still relatively extensive. The government has addressed this by imposing fiscal discipline. In the first six months of 2005 Brazil's primary surplus amounted to 6.6% of GDP although its overall budget remained in deficit. By contrast, the reduction in the inflation rate has faltered owing to rising wages and increases in administered prices. In response to this, the Brazilian central bank is curbing domestic demand through extremely high money market rates which are also intended to restrain the demand for imports. Moreover, Brazil also appears vulnerable externally because its reserve assets are still small in relation to its short-term external debt. The surge in export prices for raw materials has so far provided an economic counterbalance. Even so, the situation is difficult in the case of exports of industrial goods because the restrictive central bank policy has resulted in rising exchange rates. The termination of the latest standby arrangement with the IMF in March 2005 may be seen as a sign of strength and self-confi-

dence. Nevertheless, the Brazilian authorities are still facing the unusually difficult situation of having to create stability expectations as a basis for good growth opportunities in an environment of limited economic resilience on the part of general government and the business community.

*Argentina would remain in a difficult situation without a comprehensive agreement with creditors*

Owing to the debt deferment granted in June 2005, Argentina has considerably reduced its vulnerability for the time being. However, the list of unresolved economic policy problems remains a lengthy one. As a result of a pro-cyclical policy, its inflation rate is again close to 10%, a situation which is making it difficult to achieve the necessary liberalisation of energy prices, which are being kept below the level required for investment in the energy sector. Nevertheless, the debt rescheduling move imposed on international investors has been reflected in lower risk premiums.[6] In this connection it is not necessarily the specific amount of the debt reduction that is in question; instead, objections can be raised with respect to the manner in which it occurred, namely through a unilateral take-it-or-leave-it offer which, if rejected, would have led to a total loss on all investment. If this procedure were ultimately tolerated by the international community, there would be the danger of other countries which face insolvency adopting a similar approach towards their creditors in future. This would probably result in more expensive loans for all countries that were expected to treat their foreign creditors similarly in the event of a crisis. A general increase in risk premiums might even be the outcome if a confrontational debt rescheduling strategy were virtually legitimised by international bodies. One can only hope that the Argentinian government will seek a solution to this problem by agreeing on an arrangement similar to the one already applied in the implemented rescheduling plan at least with the majority of non-participating creditors, who hold almost one-quarter of the endangered claims. This is also in Argentina's interest because in the longer term it will probably need to import additional capital, for example, when its current account again goes into deficit, if not before. As long as Argentina sees itself confronted with the prospect of extensive court litigation, the public sector will probably not regain broad access to the international financial markets owing to the threat to its foreign payments.[7] This could ultimately amount to renewed balance of payments problems, especially as Argentina is still heavily indebted to the IMF. The extent to which non-residents will regain confidence in Argentina following a satisfactory debt settlement will depend on whether the economic recovery which has set in since the worst period of the crisis and which is due largely to the depreciation of its currency, to the increase in the export prices

**6** In terms of a representative index of interest rate premiums such as the EMBI Global Argentina, which shows the interest rate spreads vis-à-vis US government bonds, the reduction in the spread for Argentinian bonds was dramatic following the rescheduling. During the weekend of 10-13 June 2005 the index fell from 6,080 basis points to 950 basis points, a difference of 5,130 points. This decline is almost entirely a reflection of the exchange of the old bonds traded with large discounts against the new paper issued at par. The extent of the improvement in creditworthiness can be seen more clearly in the change in the risk premiums of bonds unaffected by the debt rescheduling. The interest rate spread of the Boden 12 bond, for example, fell by no more than 33 basis points during the weekend of the exchange. Since then, the spread compression has been more pronounced but has come nowhere near the extent of the decline in the aforementioned index.

**7** This did not prevent Argentina, in the summer of 2005, from issuing two US-dollar-denominated bonds, the first such issues since payments were suspended at the end of 2001. Although these were restricted to the domestic market and were issued under Argentinian law, it was a means of enabling Argentina to circumvent the problem of seizure of Argentinian debt service payments as all payments are settled domestically.

Table 2.4

## MACROECONOMIC INDICATORS FOR SELECTED EMERGING MARKET ECONOMIES

As a percentage of GDP (unless stated otherwise)

| | 2003 | 2004 | 2005e | 2003 | 2004 | 2005e |
|---|---|---|---|---|---|---|
| **Position** | **Turkey** | | | **Indonesia** | | |
| Real GDP (annual percentage change) | 5.8 | 8.9 | 5.0 | 4.9 | 5.1 | 5.8 |
| Consumer prices[1] (annual percentage change) | 25.2 | 10.3 | 8.4 | 6.8 | 6.1 | 8.2 |
| Budget balance[2] | | | | | | |
| total | −11.3 | −7.1 | −6.1 | −1.7 | −1.4 | −1.7 |
| excluding interest payments | 5.2 | 6.1 | 5.7 | 1.8 | 1.4 | 0.9 |
| Government debt | 82.8 | 76.6 | 70.8 | 56.3 | 53.3 | 53.5 |
| Current account balance | −3.3 | −5.1 | −5.6 | 3.4 | 1.2 | −0.4 |
| Foreign direct investment (FDI)[3] | 0.5 | 0.6 | 2.8 | −0.2 | −0.3 | 0.9 |
| Public and private sector external debt | 59.7 | 53.7 | 47.1 | 55.6 | 53.5 | 52.2 |
| Gross reserve assets (in US$ billion) | 33.7 | 36.0 | 43.5 | 36.3 | 36.2 | 31.0 |
| | **Brazil** | | | **Hungary** | | |
| Real GDP (annual percentage change) | 0.5 | 4.9 | 3.3 | 2.9 | 4.2 | 3.4 |
| Consumer prices[1] (annual percentage change) | 14.8 | 6.6 | 6.8 | 4.7 | 6.8 | 4.0 |
| Budget balance[4] | | | −3.1 | −6.5 | −5.4 | −3.9 |
| total | −3.7 | −2.5 | | | | |
| excluding interest payments | 4.3 | 4.6 | 4.8 | −2.4 | −1.1 | 0.0 |
| Government debt | 57.2 | 51.6 | 51.9 | 59.7 | 60.5 | 62.1 |
| Current account balance | 0.8 | 1.9 | 1.7 | −8.8 | −8.8 | −8.5 |
| Foreign direct investment (FDI)[3] | 2.0 | 3.0 | 2.0 | 0.6 | 3.6 | 2.8 |
| Public and private sector external debt | 44.6 | 37.6 | 29.2 | 71.3 | 74.3 | 69.6 |
| Gross reserve assets (in US$ billion) | 49.3 | 52.9 | 59.9 | 12.0 | 16.0 | 16.6 |
| | **Argentina** | | | **Poland** | | |
| Real GDP (annual percentage change) | 8.8 | 9.0 | 7.5 | 3.8 | 5.4 | 3.0 |
| Consumer prices[1] (annual percentage change) | 13.4 | 4.4 | 9.5 | 0.8 | 3.5 | 2.2 |
| Budget balance[4] | | | | −4.8 | −3.9 | −4.4 |
| total | 0.5 | 2.6 | 1.8 | | | |
| excluding interest payments | 2.3 | 3.9 | 3.6 | −1.9 | −1.2 | −1.9 |
| Government debt | 140.3 | 120.1 | [5] 75.9 | 50.3 | 51.8 | 54.0 |
| Current account balance | 5.8 | 2.0 | 1.3 | −2.2 | −1.5 | −1.0 |
| Foreign direct investment (FDI)[3] | 0.7 | 2.5 | 0.7 | 2.1 | 4.8 | 1.9 |
| Public and private sector external debt | 129.4 | 113.3 | [5] 66.9 | 42.9 | 38.2 | 31.0 |
| Gross reserve assets (in US$ billion) | 14.1 | 19.6 | 27.2 | 31.7 | 34.5 | 32.3 |
| | **Philippines** | | | **Czech Republic** | | |
| Real GDP (annual percentage change) | 4.5 | 6.0 | 4.7 | 3.2 | 4.4 | 4.1 |
| Consumer prices[1] (annual percentage change) | 3.5 | 6.0 | 8.2 | 0.1 | 2.8 | 2.0 |
| Budget balance[2,4] | | | | [6] −12.5 | | −4.5 |
| total | −4.7 | −3.9 | −3.5 | | −3.0 | |
| excluding interest payments | 0.6 | 1.5 | 3.2 | [6] −11.3 | −1.8 | −3.2 |
| Government debt | 96.5 | 98.0 | 96.7 | 38.3 | 37.4 | 39.4 |
| Current account balance | 1.8 | 2.7 | 2.1 | − 6.1 | −5.2 | −3.5 |
| Foreign direct investment (FDI)[3] | 0.3 | 0.0 | 0.9 | 2.1 | 3.6 | 3.7 |
| Public and private sector external debt | 75.7 | 65.0 | 67.5 | 38.5 | 42.2 | 38.1 |
| Gross reserve assets (in US$ billion) | 16.9 | 16.0 | 16.5 | 27.0 | 28.4 | 29.2 |

Sources: IMF, DB Global Markets Research, national authorities and Bundesbank calculations. — **1** Annual average. — **2** Turkey, Philippines and Indonesia: central government. — **3** In accordance with the balance of payments. — **4** Hungary, Poland and Czech Republic: general government balance according to the European System of Accounts (ESA95). — **5** Sharp fall in the debt level reflects a waiver of claims by creditors. — **6** Includes capital transfers to rescue the Investment Post Bank.

DEUTSCHE BUNDESBANK

of raw materials and to the world economic upturn can be maintained through anti-inflationary policies and an urgently needed liberalisation of the labour and goods markets.

*Philippines burdened by large public debt*

Turning to Asia, the situation in the Philippines should be regarded as tenuous. The Philippines are one of the countries that have been badly hit by the rise in oil prices. The balance of trade is already in deficit, and the growth in exports has been relatively slow for some time. Thanks to large transfers by guest workers living abroad, the current account is still running a surplus. At the same time, there is a risk of excessive inflation – partly driven by budgetary deficits, which are further increasing the unusually large volume of sovereign debt. The improvement in the Philippine government's revenue that has now set in owing to the increase in value-added tax and corporation tax is necessary, among other things, to reduce the government's dependence on foreign currency loans. It remains to be seen how the additional revenue will actually be used – whether to improve the fiscal situation or to increase expenditure again. Temporary market turbulence during the year in connection with unresolved fiscal problems and other delayed reform plans are a sign to international investors of the country's vulnerability.

*Setbacks in Indonesia*

The latest oil price increases have also detrimentally affected the situation in Indonesia again. This is due to the fact that, although Indonesia is still a member of OPEC, it has now become a net importer of crude oil. Furthermore, domestic fuel prices are heavily subsidised, with the result that the crude oil price increases are reflected in growing budget deficits. Confidence in the country's financial stability is therefore being undermined not only by reduced current account surpluses but also by doubts as to whether the government has the ability to continue with the necessary fiscal policy consolidation. Uncertainty among both resident and non-resident investors has been reflected in the strong downward pressure on the Indonesian currency. The central bank has countered this with a dramatic increase in the one-month money market rate since the middle of 2005.

*Current account deficits problematical in some new EU countries*

The large current account deficits in some of the new EU countries in central and eastern Europe are giving cause for concern, especially as these deficits are often accompanied by large budget deficits. In Hungary, for example, this year's current account deficit has passed the 8% of GDP mark while exports have recently dwindled. Moreover, at almost 50% of GDP, the combined foreign currency liabilities of the Hungarian government and the country's business community are considerable by international standards. Another point is that the country's reserve assets are almost entirely cancelled out by large short-term foreign debt. As regards the budget deficits of the new EU countries, however, there is some room for hope that the internal EU disciplining processes will have some effect.

## What remains to be done?

*Persist in adopting "best practices"*

In view of the progress made in stabilisation, the greatest danger facing the emerging market economies is complacency.[8] In order to prepare for a deterioration in the

**8** That is also how the IMF put it. See IMF, Financial Stability Report, April 2005, p 1.

world economic environment, emerging market economies with large foreign currency liabilities should continue to strengthen their balance sheet structures, particularly to take the opportunity to raise longer-term loans while interest rates are low and to increase the proportion of debt in domestic currency. This applies both to government and private borrowers. Such a policy requires macroeconomic stability and must be accompanied by a strengthening of the domestic financial sector. This necessitates the adoption of measures to strengthen the resilience of the banking system, promote the efficiency of the capital market and reduce the vulnerability of the corporate sector. The corporate governance of banks and enterprises can be improved, especially by creating more transparency. In order to develop the capital markets the way should be cleared to enable investment funds, insurance companies and pension funds to act as institutional investors. Improving the ways of transferring risk by using asset-backed securities and derivatives would also be in the banks' best interests and could enhance the stability of the banking systems. It may also be helpful to participate in the trend towards encouraging the establishment of foreign bank branches. Foreign institutions bring expertise with them and tend to be less cyclical in their lending behaviour owing to their better risk management, a stronger capital base, the possibility of recourse to parent funding and a better diversification of risk in the whole banking group. Greater competition can also make the domestic banking sector more efficient and thereby help to improve the allocation of capital. The more open a country's financial market is to international capital movements, the more important it is to ensure, additionally, that there is adequate exchange rate flexibility as long as the country does not intend to surrender monetary policy autonomy. A flexible exchange rate which makes everyone aware of the risks inherent in exchange rate movements also serves to curb borrowing in foreign currency.

*"Principles for Stable Capital Flows and Fair Debt Restructuring in Emerging Markets" should be applied without delay*

Despite every effort to adjust and reform, the risk of international debt crises will not be entirely eliminated as long as countries depend on foreign-currency-denominated capital. The main reason for such setbacks may be an excess of optimism on the part of borrowers and creditors alike. To avoid such undesirable developments in future, international organisations must be careful about how they provide financial assistance in crisis situations. Neither the emerging market economies as borrowers nor institutional and private investors as lenders can be allowed to escape the responsibility for their decisions. It is only under these conditions that borrowers and creditors will be able to make a careful assessment of the opportunities and risks. Nevertheless, financial assistance from the IMF may play an important role in resolving financial account crises triggered by a loss of confidence. To avoid weakening longer-term market discipline, however, unusually large volumes of emergency assistance must be granted only in special cases where it seems highly likely that the country will quickly regain its liquidity. With this in mind, the IMF redefined its financial assistance policy in 2002 and 2003, but it has not yet been put to a test in which the main criterion for assessing requests for large loans would have to be a transparent analysis of the borrowing country's debt sustainability. The possibility that the IMF may also say "No" and therefore make

rescheduling the only remaining solution has become more credible as a result of the recent increase in the volume of sovereign foreign-currency bonds with collective-action clauses. The purpose of these clauses, whose general application in internationally issued sovereign bonds was recommended by the G10 as far back as 1996, is to make rescheduling easier for the capital market segment of the foreign-currency debt incurred by government agencies. This gives creditors the chance to decide on the necessity of rescheduling by a qualified majority, ie a decision binding on all creditors. Furthermore, major sovereign issuers and representatives of the market intermediaries adopted the "Principles for Stable Capital Flows and Fair Debt Restructuring in Emerging Markets" in the autumn of 2004. The initial purpose of these principles, a preliminary version of which was published by the Institute of International Finance (IIF) in November 2004,[9] is to provide a voluntary means to prevent crises by recommending procedures to foster market transparency. However, their main objective is to reconcile the divergent interests of creditors and debtors in the event of a crisis. This means, above all, that creditors have a right to a negotiating procedure conducted in accordance with the principles of good faith. The G20 was involved in initiating the drafting of these principles and welcomed the outcome in November 2004 as a contribution towards curbing volatility in international capital flows. According to the IIF, more than 30 emerging market economies have since accepted these principles. The important thing now is actually to apply the agreed principles, starting with the rules governing transparency. In view of the voluntary nature of the guidelines, market participants must continue to be the main players. However, the IMF should at least monitor the implementation process in order to emphasise its importance for the efficient functioning of the international monetary and financial system. It would also be a good idea if the IMF were to incorporate incentives to encourage compliance with the principles into its own lending policies.

**9** The latest edition was published with explanatory notes in March 2005. See Institute of International Finance: Principles for Stable Capital Flows and Fair Debt Restructuring in Emerging Markets, Washington DC, 2005. Available on the internet at http://www.iif.com.

# Corporate bond spreads

## Approaches in theoretical modelling, empirical evidence and implications for financial stability

For some time now, European corporate bond spreads have been at very low levels. Particularly in the high-yield bond segment, the yield mark-up compared with government bonds has fallen to a historical low. It seems reasonable to assume that this development may have been fostered by the low interest rate environment. The search for higher yields may have led investors to pursue riskier investment strategies. This article presents theoretical approaches to explaining the evolution of corporate bond spreads and uses an empirical model to examine the impact of unexpected changes in money market rates on corporate spreads. In the model, an unexpected rise in these interest rates – given the modelling assumptions – is associated with a widening of the corporate bond spreads, in which the responses of different rating categories exhibit clear differences. Despite a relatively limited observation period, the results appear interesting given Europe's increasing capital market orientation – not least in terms of their implications for financial market stability.

### The current market situation

*Striking narrowing of euro-area corporate bond spreads since Q4 2002.*

Corporate bonds generally offer higher yields than government bonds, primarily owing to the risk of a potential payment default. For some time now corporate bond spreads in the euro area have been narrowing appreciably. This applies particularly to bonds of the sub-investment-grade segment. At the end of August 2005, euro-area high-yield bond spreads, at 341 basis points, were only around one-fifth as high as their September 2001 peak (1,653 bp; see chart 2.3.1 on page 135).

The investment grade segment underwent a trend reversal in October 2002. At end-August 2005, investment-grade bonds had an average spread of 44 basis points. This is approximately one-third of the spread observed in October 2002 (132 bp; see chart 2.3.1 on page 135).

The rating downgrades of the automobile manufacturers General Motors and Ford and the associated market fears of repercussions on speculative hedge fund positions in the spring of 2005 caused only a short-lived widening of spreads.

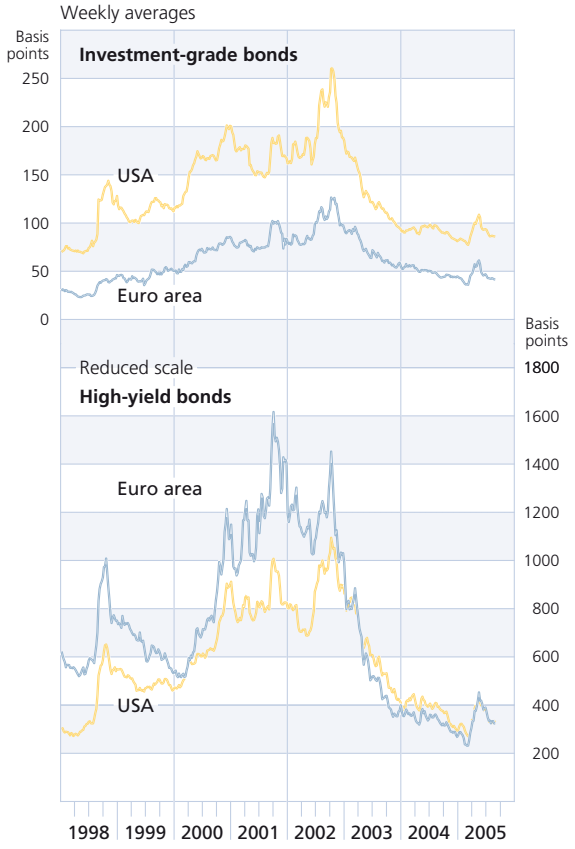
*Differences in the spread pattern vis-à-vis the USA*

In attempting to identify the determinants of current spread developments in the euro area, mere analogical inferences based primarily on the market situation in the United States provide only initial indications.

In the USA, too, the spreads on corporate bonds have converged considerably in the

Chart 2.3.1

## CORPORATE BOND SPREADS*




Source: Merrill Lynch. — * Option-adjusted spreads (OAS) by Merrill Lynch.

DEUTSCHE BUNDESBANK

past few years. However, the trend reversal of high-yield spreads occurred later, at a much lower level and to a lesser extent in the USA than was the case in the euro area. In the US investment-grade segment, by contrast, the yield spread narrowed somewhat more than in the euro area (see adjacent chart).

It is true that the bond markets of both regions are, from the point of view of investors and issuers alike, markets which are exposed to similar influences. All the same, there are clear differences in the issuer structure[1] and in the business cycles (with respect both to the current position and the amplitude) in the two economic regions. Furthermore, a structural difference exists between the two currency areas with respect to the weight of bond issuance amongst the corporate sector's various financing alternatives. Looking at the different sources of external financing, bank-based corporate borrowing continues to predominate in the euro area by far. In most of the euro-area countries, this will probably remain the case also in the near future.[2] In 2004, the outstanding volume of bonds issued by non-financial corporations in Germany did not even amount to 3.5% of gross domestic product (GDP).[3] By comparison, in the USA the ratio of corporate bonds outstanding to GDP stood at 26%.

*Euro-area bond issuance to date is of minor importance as a source of firms' external financing …*

In most European countries a significant corporate bond market only developed when the country in question joined the third stage of monetary union. For example, the volume of German corporate bonds outstanding rose nearly 20 times between early 1999 and mid-2005, while in the USA the volume of such bonds outstanding grew by only one and a half times up to the first quarter of 2005.[4]

*… however, the segment's high growth momentum makes an in-depth analysis interesting*

**1** In the euro area, the share of borrowers from the information and communication technologies (ICT) sector is much higher than in the USA.
**2** By contrast, several countries, such as France, look back on a long tradition of corporate financing on the bond market. As at September 2003, the volume of bonds outstanding issued by non-financial corporations accounted for 23% of gross domestic product there. Hence it nearly reached the US level of 26% of gross domestic product. See Deutsche Bundesbank, Recent developments in the corporate bond market, *Monthly Report*, April 2004.
**3** This does not include the bonds issued by foreign financing subsidiaries of German firms. When these are included, the corresponding GDP ratio in June 2005 was around 10%.
**4** Data source: BIS – Bank for International Settlements.

Although the growth rate in Germany is impressive, it also reflects the low starting level. The dynamic development of the European corporate bond market is a result, *inter alia*, of the introduction of the single currency and the attendant extensive integration of the financial markets.[5] Other contributory factors were the increased financing needs generated by the technology boom and enterprises' restructuring measures as well as increased activity by institutional investors.

Particularly with respect to identifying interrelationships which allow predictions about possible future spread paths in the euro area to be made, it does not suffice, therefore, to observe only the development in the United States.

## Approaches in theoretical modelling

*Option pricing theory focuses on the bond issuer's rating as a factor in the evolution of corporate spreads*

One of the best-known approaches to explaining the determinants of corporate spreads, or price discounts on corporate bonds, stems from Robert Merton.[6] According to this approach, the probability of an at least partial payment default is a key factor behind the risk premiums in the yields on corporate bonds. From the point of view of the bond buyer, the repayment of the corporate bond corresponds to the payment stream of a secure bond together with the simultaneous sale of a put option on the firm's assets. In return for having to accept the shareholders' conditionality, ie taking an option-writer's position, the bond purchaser is compensated by receiving a discount on the issue price. The value of this conditional claim increases with the probability that the firm's market value at the time of repayment will be below the value of the bond and that the shareholders will exercise their option and sell the firm. Among other things, the option price and the corresponding discount on the corporate bond should therefore increase with the issuing enterprise's degree of indebtedness. In more general terms, this means that the less sustainable a firm's debt is, the higher will be the yield spread on its bonds.

As the probability that the firm's market value will fall below the nominal value of the borrowed funds at the repayment date of the bond rises with the growing volatility of the firm's market valuation, the option price and the yield spread will also increase if the dispersion of the possible developments of the enterprise value is particularly broad-ranged. There should therefore be a positive correlation between the yield spread and the volatility of the firm's market value.

*Some countervailing effects of interest rate developments on corporate spreads*

In complete contrast to the impression that the current market situation conveys, low interest rate levels are associated according to Merton with large discounts on corporate bonds. This correspondence may be based on the idea that the interest rate level approximates the expected sustainable growth rate of

**5** One measure of the degree of integration of the European financial markets is the elasticity of European government bonds to price changes of the German benchmark Bund. In August 2005, this figure averaged 0.995. For information on the calculation and development of the degree of integration of the European bond markets see Deutsche Bundesbank, Regulation of the European securities markets, *Monthly Report*, July 2004.
**6** See R C Merton (1974), On the pricing of corporate debt: the risk structure of interest rates, in: Journal of Finance, Vol 29, pp. 449 – 470. For modifications of the Merton model see, for example, F A Longstaff/E Schwartz (1995), A simple approach to valuing risky fixed and floating rate debt, in: Journal of Finance, Vol 50, pp 789 -821.

a representative enterprise.[7] Where low interest rates stand for phases of weak growth, they are associated with higher default probabilities and a corresponding rise in corporate bond spreads.

If by contrast – as is the case in another branch of the literature – the rate of interest is not taken as an indicator of an enterprise's expected future performance but rather defines by what factor the firm's given expected earnings will be discounted to their present value, declining interest rates are associated with an improvement in creditworthiness. From an enterprise's point of view, falling interest rates naturally mean more favourable financing conditions and are therefore often associated with an improvement in growth prospects.[8]

*Portfolio theory focuses on the importance of the risk/return profile of the overall investment portfolio*

According to portfolio theory, the demand for corporate bonds is to be seen in the context of the overall portfolio profile. Investors invest their assets in a way that optimises the risk/return structure of their total portfolio.[9] Every change in the framework variables disturbs the balance of the portfolio, which in turn brings about portfolio shifts and – switching from the microeconomic level to the macro perspective of the overall financial system – leads to changes in the respective asset prices and yields.[10]

Rising yield expectations for a given asset render it more attractive and lead to declining interest in alternative investment vehicles. If, in particular, the interest rate on risk-free investments increases, this has several simultaneous effects on corporate bonds yields. First, particularly securities which are perceived to be virtually risk-free must, in the sense of an attenuated law of one price, undergo a yield increase. Second, the expected portfolio yield increases in line with the interest rate level. The average investor will attempt, in part, to take advantage of this additional yield in order to eliminate risk from his portfolio. The demand for risky forms of investment decreases and the return demanded for those securities goes up. At the same time, owing to this second mechanism, the yield spreads over risk-free forms of investment also increase. The direction of the impact of interest rate developments on corporate bond spreads outlined here is diametrically opposed to that in Merton's hypothesis: where the interest rate is not taken as a proxy for general growth expectations, as above, but instead as the yield on an investment in alternative assets, rising interest rates mean rising spreads.

If the investment portfolio has a balanced structure which is perceived to be optimal, additional securities are only added to the portfolio (and hence the weight of the respective asset in the portfolio adjusted upwards) if the price is sufficiently low and the yield is accordingly high. The more the securities already available in the market resemble the new issue, the more they will undergo rising yields or falling prices respectively. This will apply to a lesser extent to less similar substitutes. A relative increase in the supply of corporate

**7** See Longstaff/Schwartz (1995).
**8** See, for example, IMF (2004), Global Financial Stability Report, Washington, April.
**9** See H Markowitz (1952), Portfolio Selection, in: Journal of Finance, Vol 7, No 1 pp 77-91.
**10** See J Tobin/W C Brainard (1968), Pitfalls in Financial Model Building, in: American Economic Review, Vol 58, No 2, May, pp 99 – 122.

bonds should therefore lead to an increase in their yield spreads over risk-free investments.

At the same time, however, the increasing supply of an asset also increases its liquidity. In less liquid markets investors must accept greater friction and resale risks. As the liquidity of the corporate bond market increases it becomes more attractive to investors. Rising demand then pushes up bond prices. The yields on corporate bonds decline while those of alternative forms of investment rise.[11] In some circumstances this liquidity effect can offset the aforementioned positive link between firms' issuing activity and the yield spreads on their bonded debt and even trigger a countervailing movement in yields. To what extent this effect actually has an impact depends, among other things, on the maturity of the market in question.

A rising intensity of fluctuations in firms' market value will trigger a rise in portfolio risk. Investors' attempts to mitigate this will lead to shifts into relatively low-yield but less risky securities. For this reason, *inter alia*, spreads are likely to rise, particularly in the higher-yield segments of the corporate bond market.

Finally, investor preferences regarding the return on and risk of investments may vary with the real economic situation.[12] In lacklustre cyclical phases during which labour income is particularly prone to uncertainty, investors may place greater importance on the stability of their investment income. Consequently, sluggish cyclical phases lead to expectations of rising yield spreads for relatively risky bonds.

## Empirical modelling

The following empirical analysis concentrates on the effects of unexpected changes in short-term interest rates – which are of particular relevance for monetary policy – on corporate bond spreads. However, since not only the theoretical modelling approaches, but also the empirical literature[13] come up with contradictory findings in this respect, any interpretation of the results must necessarily be preliminary to some extent.

A glance at option pricing theory and macroeconomic portfolio theory suggests that the empirical modelling should include not only credit-spread developments and short-term interest rates but also other variables such as the sustainability of corporate debt, growth prospects and the volatility of firms' market value as well as the relative volumes of corporate bonds outstanding. In this context, individual variables may influence credit-spread developments through a number of interacting channels.

**11** Confirmation of liquidity effects on spread movements is found, for example, by P Collin-Dufresne, R S Goldstein, J S Martin (2001), The Determinants of Credit Spread Changes, in: The Journal of Finance, Vol 56, No 6, December, pp 2177 - 2207.
**12** See R C Merton (1973), An Intertemporal Capital Asset Pricing Model, in: Econometrica, Vol 41, No 5, September, pp 867 - 887.
**13** Whereas, Longstaff/Schwartz (1995), Duffee (1998) and Collin-Dufresne et al (2001), for example, find a negative correspondence between the development of spreads and interest rates in the USA, De Bondt (2002) finds a positive link for the euro area. The US studies are based on multivariate single-equation regressions. De Bondt (2002) examines impulse responses on the basis of a bivariate VAR using spreads on BBB-rated bonds. See G De Bondt (2002), Euro Area Corporate Debt Securities Market: First Empirical Evidence, ECB Working Paper Series, WP 164, August; G R Duffee (1998), The Relation between Treasury Yields and Corporate Bond Yield Spreads, in: The Journal of Finance, Vol 53, pp 2225 -2241.

*The degree of interaction between corporate spreads …*

The empirical analysis concentrates on the yield spreads of BBB- and AAA-rated[14] European corporate bonds with a residual maturity of seven to ten years over government bonds with the same residual maturity. The BBB spreads, expressed in basis points, are calculated as the difference between the OAS (option-adjusted spread)[15] of the Euro Area BBB Corporate Bond Index and the OAS of the Euro Area Direct Government Bond Index for bonds with a maturity of seven to ten years.[16] The AAA spreads are calculated in a similar manner.[17]

With reference to the factors derived above as potentially explanatory for describing credit spread developments, the following variables are also included in the selected model specification:[18]

*… and short-term interest rates in particular …*

– The three-month EURIBOR as the yardstick for conditions in the interbank market and hence the short end of the financial market. As the EURIBOR is influenced considerably by monetary policy operations, it is of particular interest with reference both to monetary policy and financial market stability.

– The year-on-year growth rate of the Dow Jones Stoxx 50 index of European stocks. Stock market movements simultaneously reflect prevailing market expectations with respect to real economic developments and the performance of equities, which may represent an investment alternative to corporate bonds.

– The implied volatility of stock market values. This is approximated by the logarithmic implied volatility of the Dow Jones Stoxx 50. According to option pricing theory, volatility is a determinant of bond issuers' default probability; according to portfolio theory, a rise in this indicator translates into an increase in portfolio risk, which in turn prompts investors to switch to comparatively low-risk securities.

– The difference between the yields on ten-year and two-year benchmark bonds (government bonds) in the euro area (slope). This variable (together with EURIBOR) can be used as a proxy for the capital market conditions across the entire maturity range. At the same time, it can be interpreted as an indicator of the real economy's growth prospects.

– The ratio of gross bond issues of European non-financial corporations to those of government bonds (relative issuing activity). The relative issuing activity has an impact on the fundamental liquidity of bonds in the two segments; from the investor's perspective, an increase in the relative liquidity of corporate bonds is favourable and may therefore lead to narrower spreads.

– The debt sustainability ratio as a measure of the corporate sector's ability to finance its debt through internally generated cash

**14** Thus, this covers both the upper and lower bounds of the investment-grade segment of corporate bonds.
**15** The option-adjusted spread of a bond is the yield difference vis-à-vis a reference curve (eg for government bonds) adjusted for the value of options associated with the bond, such as the issuer's right to prematurely call in the bond.
**16** In each case these were based on month-end data of the Merrill Lynch indices.
**17** The advantage vis-à-vis the high-yield segment is that investment-grade corporate bonds have greater liquidity and, consequently, are less subject to price distortions that might result from insufficient market depth.
**18** The basic data used for these variables were taken from the ECB and Bloomberg databases.

flows. This is calculated as the ratio of the sum of total loans (interpolated to monthly values) and bonds outstanding issued by non-financial corporations to the average earnings development.[19] From an investor's perspective, the higher the sustainability ratio, the lower is the sustainability of the debt; hence for the investor, the risk of an investment in the corporate bond market rises. Following Merton, it may therefore be assumed that an increase in the corporate sector's sustainability ratio would lead to a widening of corporate spreads.

*… can be studied using time series analyses*

Whereas the theoretical modelling approaches outlined above merely describe unidirectional effects, with the yield spread as the variable to be explained, econometric modelling has to take additional account of potentially existing interactions among the variables. A further consideration is that variables may show a lagged response. These two aspects are taken into account by estimating a (simple) vector autoregressive model (VAR), which, *a priori*, treats all of the model's variables as endogenous. Accordingly, the system contains an equation for each variable which describes the development of the time series as a function of its own past as well as the past values of the other time series in the model. Besides the lags of all the variables (each with a lag length of two), every equation of the reduced-form VAR contains a constant and additionally – in order to capture possible exceptional factors during this period – a dummy variable for the years 2001 to 2002.[20] The equations for the aforementioned variables enter the reduced-form VAR before the BBB and AAA spread equations in the sequence in which they have been introduced above.[21]

*Impulse-response functions provide important indications of the dynamic reactions of the system to "shocks"*

After an ordinary least squares (OLS) estimation of the reduced-form VAR for the period of April 1999[22] to May 2005, the system's dynamic responses to impulses to which it is exposed can be analysed by using the impulse responses of the variables.[23] Chart 2.3.2 on page 141 shows the impulse responses to a one-period independent shock in the EURIBOR equation together with their 97.5% confidence intervals.[24]

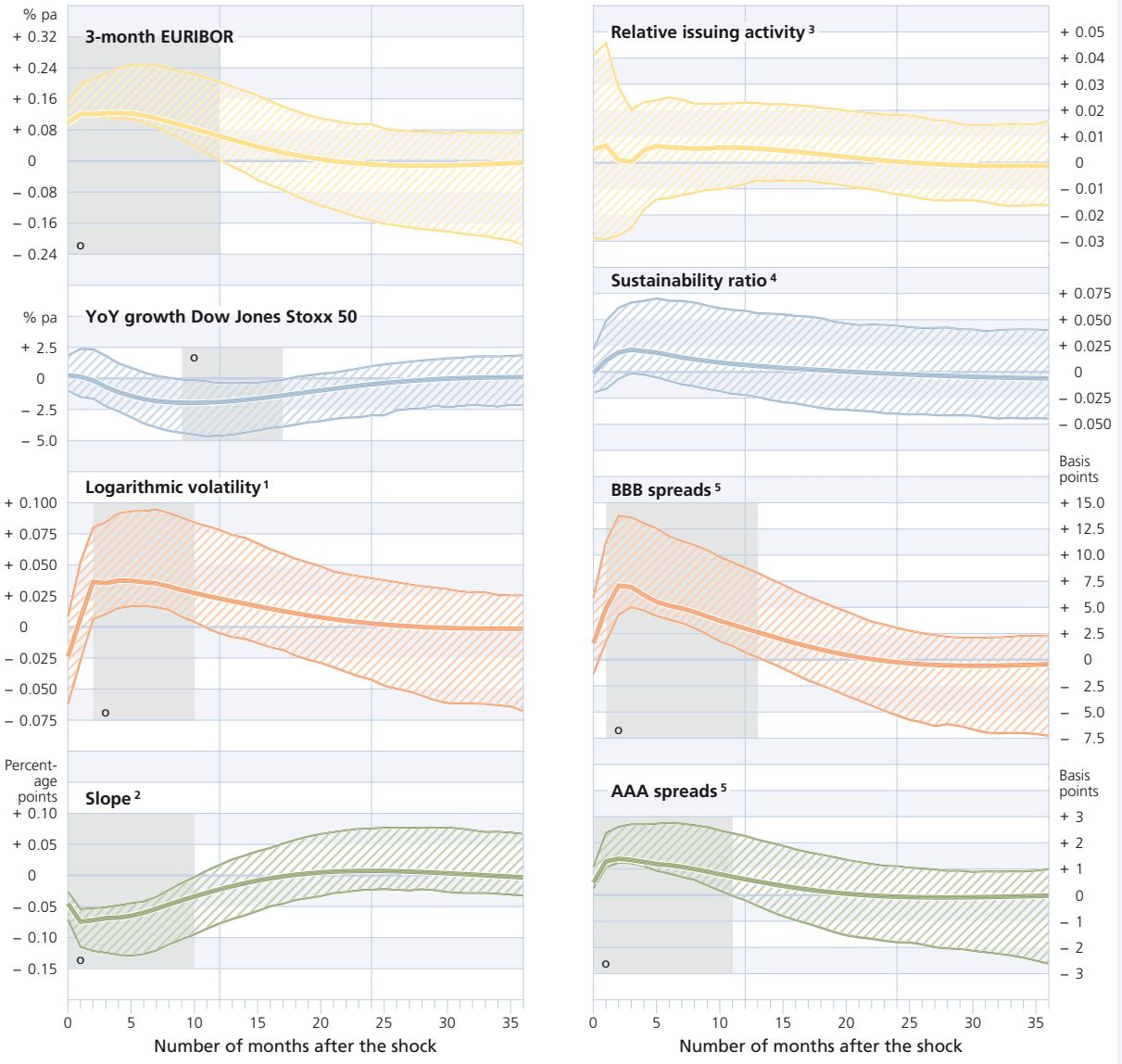
*The results are consistent with economic intuition*

The results of the responses of the system variables to an unexpected rise in short-term rates (defined as a one-period positive shock in the EURIBOR equation[25]) can be summarised as follows. The impact on short-term interest rates declines gradually; only after 13 months do

**19** The earnings development in the corporate sector was approximated by the value of the Dow Jones Stoxx 50 share index, divided by the corresponding price/earnings ratio.
**20** The shift dummy with a value of one solely for the period January 2001 to December 2002 (and otherwise zero) is intended to account for the possibility that the higher baseline level of the BBB spreads during this period may reflect an exceptional development.
**21** In order not to restrict the variables' long-run responses *a priori*, they are not differenced. Moreover, particularly in view of the short reference period, it appears questionable whether augmented Dickey-Fuller tests permit "reliable" conclusions to be drawn with respect to the non-stationarity of the variables. For information on the properties of unrestricted OLS estimations of VAR in the case of stationary and non-stationary, but cointegrated variables, see H Lütkepohl (1993), Introduction to multiple time series analysis, 2nd Edition, Springer.
**22** The start of the estimation period (April 1999) was chosen in the light of data availability and the past values required for the dynamic approach.
**23** For more on impulse responses and VAR modelling see, in particular, H Lütkepohl (2001), Vector Autoregressions, in: B H Baltagi (ed), A Companion to Theoretical Econometrics, Chapter 32, Blackwell, pp 678 - 699. Here a simple orthogonalisation was performed using the Choleski decomposition of the variance-covariance matrix.
**24** These Hall percentile confidence intervals were obtained by bootstrapping (2000 draws). For more on the advantages of these confidence intervals see H Lütkepohl (2000), Bootstrapping Impulse Responses in VAR Analyses, SFB 373, Humboldt-University Berlin, No 22/00 and A Benkwitz, H Lütkepohl, J Wolters (2001), Comparison of Bootstrap Confidence Intervals for Impulse Responses of German Monetary Systems, in: Macroeconomic Dynamics, Vol 5 No 1, pp 81 – 100.
**25** This shock is defined as a one-period unit shock in the orthogonal innovation component of the EURIBOR equation in the shock month "0". The orthogonalisation was performed using the Choleski decomposition of the variance-covariance matrix (to a lower-triangular matrix).

Chart 2.3.2

## VECTOR-AUTOREGRESSIVE MODEL: IMPULSE RESPONSES AFTER A EURIBOR SHOCK




**1** Logarithmic implied volatility of the Dow Jones Stoxx 50 share index. — **2** Yield differential between ten-year and two-year benchmark bonds (government bonds) in the euro area. — **3** Ratio of gross European corporate bond issues (non-financial corporations) to government bond issues. — **4** Ratio of the sum of loans (interpolated to monthly data) and the outstanding volume of bonds issued by non-financial corporations to the average development of earnings in the corporate sector (approximated by the value of the Dow Jones Stoxx 50 share index divided by the price/earnings ratio). — **5** Yield spreads of BBB-rated/AAA-rated European corporate bonds with a maturity of seven to ten years over government bonds calculated as the difference between the option-adjusted spread (OAS) of the Merrill Lynch Euro Area BBB/AAA Corporate Bond Index and the OAS of the Euro Area Direct Government Bond Index for bonds with a maturity of seven to ten years. — **o** The areas shaded in grey indicate the phases during which the impulse responses (on the basis of their 97.5 % confidence intervals) deviate significantly from the respective reference line (baseline).

DEUTSCHE BUNDESBANK

short-term interest rates no longer deviate significantly from the reference line (the baseline for the EURIBOR equation in the system without a shock). The significant rise in short-term interest rates is accompanied by a significant reduction of the slope in the first ten months, ie the yield curve flattens during this period. With respect to the spreads on BBB-rated corporate bonds, a significant increase is observed for the period from one to 13 months following the shock. In the case of spreads on AAA-rated bonds, by contrast, a significant positive response can be seen already in the month in which the shock occurs. The impulse response of the AAA spreads only becomes insignificant after 12 months. Both spread response functions peak two months after the shock, although a much higher peak is recorded for the spreads of the lower rating category.[26] The effects on stock market movements are significantly negative for a period of 9 to 17 months following the interest rate shock, suggesting a negative development in the real economy. The reaction of the implied volatility of the share price index leads this development; the impulse response of volatility is significantly positive during the period from two to ten months following the shock. These responses are consistent with economic intuition. After approximately 11 months, all significant processes have passed their turning points and after 18 months all of the impulse responses are insignificant, ie the economy has "recovered".

## Implications for financial stability

From a financial stability perspective the results are interesting in several respects. Against the backdrop of an increasingly liquid market for corporate bonds, the credit spread development is a variable which is increasingly mapping the market's capital and risk allocation. Furthermore, empirical studies show that spread developments and the yield curve of corporate bonds supplement the informational content of the yield curve of government bonds.[27] Given firms' growing orientation to external financing via the capital market as well as – not least – the rapid growth of the market for corporate bond derivatives, monitoring this market segment in Europe is likely to become much more important in the future from a financial stability perspective, too.

*Corporate bond spreads are both indicators of financial market conditions and a determinant of financial market stability*

As an increasingly feasible financing alternative, the corporate bond market might enhance the efficiency of capital allocation. Not least, it could help to mitigate the effects of possibly more restrictive bank lending.[28] A stable financial market environment with

**26** In the case of the 3-month EURIBOR, the shock depicted in chart 2.3.2 on page 141 corresponds to a direct increase of 0.1063 (or 10.6 basis points) in the shock month. The maximum of the spread impulse response two months later amounts to around 7.3 basis points for the BBB-rated bonds and only around 1.5 basis points for the AAA category.
**27** See B Bernanke (1990), On the Predictive Power of Interest Rates and Interest Rate Spreads, NBER Working Paper Series, WP No 3486; B M Friedman/K N Kuttner (1989), Lessons on Monetary Policy from the 1980s, in: Journal of Economic Perspectives, Vol 2, No 3, pp 51 – 72 and J Stock/M Watson (1989), New Indexes of Coincident and Leading Economic Indicators, in: O J Blanchard/S Fischer (eds), NBER Macroeconomics Annual, MIT Press, pp 351 – 394.
**28** See P E Davis (2001), Multiple avenues of intermediation, corporate finance and financial stability, IMF Working Paper, 01/115. On the one hand, capital market financing and bank lending supplement one another. On the other hand, it is apparent that in recessionary phases access to external funds via the capital market tends to be more difficult compared with financing via the banking sector. In capital market-oriented systems, financial cycles are therefore more accentuated than in bank-oriented systems with strong relationship banking. See P Artus (2001), Rating, cycle économique, cycle financier, in: CDC IXIS Flash 2001 - 221; Banque de France (2001), Le cycle financier facteurs amplificateurs et réponses envisageables par les autorités monétaires et financiers, Bulletin de la Banque de France, novembre, No 96, pp 41-65 and H Hesse/H-H Kotz (2003), Financial Cycles, Real Cycles and Monetary Policy, R Pethig/M Rauscher (eds), Challenges to the World Economy, Festschrift for Horst Siebert, Berlin 2003.

low transaction costs and – with regard to the sensitivity of spreads – low interest rate volatility will be of crucial importance for the development of the European bond market as an additional financing channel.

The analysis presented here suggests that unexpected increases in short-term interest rates lead to a significant temporary widening of the yield spreads on European corporate bonds. Within the investment-grade segment considered in this article, this is accompanied by a clear differentiation according to the rating grade: spreads of the lowest investment grade – BBB – increase much more than those of AAA-rated bonds. These differences in the responses of corporate bond spreads according to rating grade accords with the theoretical postulate that the market expects a commensurately higher return on bonds which entail greater risks. If the currently exceptionally low interest rate level were to rise markedly – and this is not anticipated by market participants – this could, according to the results of our estimation model, trigger an appreciable widening of corporate bond spreads.

# Overview | Glossary

**ABS (asset backed securities)** Securities which are backed by a pool of homogeneous unsecuritised assets. The asset pool is assigned to a special purpose vehicle which in turn serves the investors' receivables from the pool's payment streams.

**Arbitrage** Exploitation of price differences for identical goods or financial products on different markets in order to make a profit. Pure arbitrage transactions are risk-free as the purchase (on the cheaper market) and the sale (on the more expensive market) are effected simultaneously. This is not the case for arbitrage transactions in the broader sense of the term, which take advantage of deviations from historical price trends for similar or closely correlated financial instruments.

**Asset productivity** Ratio of operating income to risk weighted assets. Provides an indication of a bank's risk/return profile.

**Bank Lending Survey** Eurosystem's survey of lending policies carried out among selected banks. The survey has been conducted on a quarterly basis since January 2003. It contains qualitative questions on developments in credit standards, terms and conditions of loans and credit demand for enterprises and households.

**Basel II** New framework agreement of the Basel Committee on Banking Supervision on risk-adequate capital requirements, a supervisory review process, and greater disclosure and market discipline.

**BIS (Bank for International Settlements)** Central banks' bank with its headquarters in Basel. Fosters cooperation between the central banks. Home of the Basel Committee for Banking Supervision which works towards the harmonisation of banking supervisory standards.

**Bond spread** Yield spread (also referred to as risk or interest rate premium) of bonds with a default risk over riskless bonds of the same maturity. For example, spread of corporate bonds over government bonds of the highest credit rating. This spread compensates the investor not only for the increased risk but also for the lower level of liquidity which such bonds often have.

**BSC (ESCB's Banking Supervision Committee)** Committee comprised of representatives from the central banks and banking supervisory authorities of all 25 EU member states. The BSC focuses, in particular, on macroprudential questions both with regard to structural developments in the European banking systems and in terms of the stability of the financial system in the EU.

**CDO (collateralised debt obligation)** Structured finance instrument. In contrast to traditional ABS, the CDO pool which serves as collateral is comprised of a comparatively small number of heterogeneous assets such as securities (collateralised bond obligations, CBO), loans (collateralised loan obligation, CLO), credit derivatives (collateralised synthetic obligations, CSO) or hybrid forms.

**Combined ratio** Ratio of an insurance company's premiums to its expenditure on claims, administration and contract costs.

**Continuous Linked Settlement (CLS)** A payment-versus-payment (PVP) foreign exchange settlement system developed by a group of international private banks and operated by the CLS Bank, which is domiciled in New York. CLS has been operating since September 2002.

**Correlation** Statistical term for the linear relationship between two series of data. A positive (negative) correlation means that as the value of the first variable rises, that of the second variable increases (decreases).

**Cost-to-income ratio** Ratio of a bank's administrative expenditure to its operating income.

**Counterparty risk** Risk of default by the counterparty.

**Credit default swap (CDS)** Upon conclusion of a credit default swap agreement, the risk taker undertakes to pay the risk shedder a compensation payment if a specified credit event occurs (eg default or late payment). In return, the risk taker receives a periodic premium. The amount of the premium depends primarily on the creditworthiness of the reference entity, the definition of the credit event and the term of the contract.

**Credit derivative** Finance instrument which splits the credit risk from an underlying financial transaction, enabling the credit risk then to be transferred to investors. The most important credit derivatives include credit default swaps.

**Default risk** Refers to the risk of loss arising when a borrower is no longer able to fulfil its obligations vis-à-vis the creditor, for example as a result of insolvency.

**Derivative** Financial product whose price is directly or indirectly related to the development of the stock exchange or market price of other goods or financial instruments.

**Financial intermediary** Institution that accepts monetary capital from investors and lends it to borrowers or that facilitates dealings between investors and borrowers. Typically banks and insurance companies.

**First-loss tranche** See tranches.

**First-to-default basket** Credit derivative in which the investor agrees to assume exposure to the first claim to default in a small portfolio, usually of five reference assets. In return, the investor receives a periodic fee from the risk shedder.

**Fixed income arbitrage** Investment strategy often pursued by hedge funds. It aims at using opposing positions to exploit price inefficiencies on interest-bearing securities and derivatives without assuming any general market risk.

**Gross premiums written** Policy holders' premiums due and written in a financial year before deduction of the reinsurer's share.

**Hazard rate model** Econometric model used in duration analysis, for example, to determine default probabilities over time. As a dependent variable, the hazard rate portrays the conditional probability that an episode (eg classification under a certain creditworthiness category) will terminate at a certain point in time.

**Hedge fund** Investment fund subject to little regulation which seeks to achieve a return independent of market developments. Hedge fund managers have no restrictions in their choice of capital instruments, may effect short sales and enter into credit-financed and derivative positions. Funds of hedge funds do not invest in capital investment vehicles directly, but rather either partly or entirely in other hedge funds. As a rule, hedge funds demand performance-related fees for exceeding a specified minimum return.

**IAS/IFRS** International Accounting Standards/International Financial Reporting Standards developed by the International Accounting Standards Board (IASB) with the aim of promoting the quality, transparency and international comparability of annual accounts.

**Implied volatility** A measure of expected volatility in the prices of, for example, bonds and stocks (or of corresponding futures contracts), which can be extracted from option prices.

**Interest rate swap** Contract whereby two parties agree to exchange different interest payment flows during a specific term on fixed dates in the future. Fixed interest payments are usually exchanged for variable interest payments.

**Investment banking** Branch of banking dealing mainly with securities trading and corporate financing.

**Large exposure** As defined in sections 13, 13a and 13b of the German Banking Act. Loans to a single borrower unit which amount to or exceed 10% of the bank's liable capital.

**Leverage** Describes the possibility of increasing the return on equity through debt financing. It can be used when the return on total capital employed is higher than the interest payable on the borrowed funds. The same effect can also be achieved using derivates as, in this case, only a small capital input is needed to participate in the performance of the underlying market price.

**Loans of €1.5 million or more** Pursuant to section 14 of the German Banking Act, loans to a single borrower unit totalling €1.5 million or more.

**Loan-to-value (LTV)** Ratio of the loan amount to finance the purchase of a property to the assessed value of the property.

**Margin** In this review used to refer to the difference between the interest rates offered by a bank on loans or deposits and a reference rate.

**Median** Statistical measure which divides into two equal halves a series of observed values listed in order of size; 50% of the values are above the median and 50% are below.

**Mezzanine tranche** See tranches.

**Netting agreement** Contract which, under certain conditions – eg in the case of insolvency –, permits the mutual offsetting of claims between two counterparties. A legally binding netting agreement reduces the default risk from a gross to a net amount.

**Non-investment grade** Rating grade below BBB- (pursuant to the notation of the rating agencies Standard & Poor's and Fitch) or Baa3 (pursuant to Moody's); borrowers or securities with a non-investment grade are classified as speculative, the securities are also referred to as high yield bonds.

**Non-performing loans (NPL)** Loans whose full redemption is uncertain. In Germany, this term is understood to mean loans requiring specific loss provisions.

**Operating income** Sum of a bank's interest, commission and trading results.

**Operating result** Operating income less a bank's administrative expenditure.

**Operational efficiency** Ratio of the operating result to the operating income. Corresponds to the difference of one minus the cost-to-income ratio and provides a measure of cost efficiency.

**Operational return on equity** Product of revenue efficiency and operational efficiency. Portrays the operating power of a bank excluding risk provisioning.

**Option** Right to purchase (call option) or sell (put option) the underlying asset (eg securities or foreign exchange assets) from/to a counterparty on a specified date in the future (European option) or during a specified period in the future (American option) at a previously agreed fixed price. Options may be traded prior to maturity.

**Option-adjusted spread (OAS)** Yield spread of risk-carrying bonds over riskless bonds after adjustment for the value of the options embedded in the bonds, eg the issuer's right to premature amortisation.

**OTC** Abbreviation for over the counter. Refers to the trading of financial instruments outside of established stock exchanges.

**Overall interest** Sum of the bonuses (ie the life insurance companies' surpluses which come about as a result of gains relating to mortality, interest rates and costs, and are passed on to the policy holders) and the guaranteed interest rate.

**Prime broker** Financial institutions which provide a range of services for hedge funds. These services generally include trade settlement, the safe custody and administration of securities, securities lending, provision of (collateralised) loans, reporting on trading positions and their performance.

**Private equity** Capital invested by private companies generally in non-listed enterprises. The aim is often to restructure the enterprise and then sell it, usually via an IPO.

**Quantile** Statistical measure which divides a series of observed values listed in order of size in such a way that p% of the values are smaller than or equal to the p% quantile and (1 – p%) of the values are larger than or equal to the p% quantile.

**Rating** Scaled classification of the creditworthiness of borrowers (eg companies, banks or countries) or the securities issued by the them.

**Retail banking** Branch of banking which supplies the broad range of private customers with standardised products on the basis of simplified processes.

**Return on equity (RoE)** Ratio of the pre-tax profits in a certain period to the balance sheet capital.

**Revenue efficiency** Product of asset productivity, risk profile and the leverage of debt financing.

**Risk profile** Ratio of risk weighted assets to total assets.

**Risk provisioning** Net expenditure on write-downs, loan loss provisions and reserves executed or set aside as part of the assessment of a bank's loans, claims and securities.

**Risk weighted assets (RWA)** A bank's on and off-balance sheet items which are weighted in line with the creditworthiness categories defined in Principle I (Own Funds Principle) in order to assess the default risk.

**RTGS system (real-time gross settlement system)** Payment system in which each individual payment is dispatched in real time and irrevocably executed as soon as sufficient cover is available.

**RTGS$^{plus}$** The Bundesbank's RTGS system with liquidity-saving elements for the settlement of urgent individual payments. Settles national payments and cross-border euro payments via TARGET, the ESCB's individual payment system. Currently has 171 direct participants.

**Senior tranche** See tranches.

**Short position** By selling a security which he does not (yet) own (short sale), the seller is said to engage in a short position. He speculates on falling prices with the aim of repurchasing the security at a more favourable rate in the future and reaping the difference between the sales and the repurchase price.

**Single tranche CDO** Structured finance instrument in which only a single tranche (usually a mezzanine tranche) is sold to the investors.

**Solvency** Provision with own funds.

**Solvency II** European Commission project, which – in line with Basel II – formulates new solvency rules for the insurance sector and, in addition to the quantitative capital adequacy element, also refers to the quality of the company-specific risk management.

**Specific loss provision** Adjustment of the value of an item on the asset side of the balance sheet to reflect the actual value situation.

**Speculative grade** See non-investment grade.

**Stress test** Simulation of the effects of extreme deviations from normal (market) developments. The Bundesbank carries out regular macro stress tests in which it forecasts credit risk developments with the aid of an econometric model based on various scenarios. In micro stress tests a selection of banks are asked to calculate the changes – in the event of specified scenarios – in the market value of their positions as a percentage of their liable capital.

**Structured finance instrument** Basket of finance instruments (such as derivatives, securities or claims) bundled in such a way that a new investment product is created. For example, CDOs, the main features of which are the formation of a pool of assets, the division of claims to payments inflows from the asset pool into different tranches with various risk/return profiles and the splitting of the asset pool credit risk from the arranger's risk – usually via a special purpose vehicle.

**SWIFT (Society for Worldwide Interbank Financial Telecommunication)** Industry-established cooperative institution domiciled in Belgium, which operates a communication network used by financial institutions mainly for the exchange of information – primarily payment messages and securities trading data – on a worldwide basis.

**Syndicated loan** Granted jointly by several banks with one or more of the banks assuming responsibility for the management of the loan.

**TARGET (Trans-European Automated Real-time Gross Settlement Express Transfer)** Payment system comprising the RTGS systems of 16 EU member states (including those of all the countries which have introduced the euro) and the ECB's system. The participating RTGS systems are connected via the interlinking mechanism, enabling the immediate processing of cross-border transfers.

**Tranches** Elements of certain structured finance instruments (eg CDOs). As a rule, a distinction is made between the subordinated first-loss tranche (also known as the equity tranche), which is the first tranche to bear losses incurred as a result of default on claims from the security pool, the medium-priority mezzanine tranche and the senior tranche, which is the last tranche to bear losses.

**Underwriting result** In the case of non-life insurers as well as reinsurers, the underwriting result essentially comprises the premiums, the insurance payments and expenses incurred in operating the insurance business, but not the net investment income.

**Value at risk (VaR)** Measure of risk, which indicates the expected maximum loss which a portfolio may, with a specified probability (confidence level), experience in a certain specified period (holding period).

**Vector autoregression (VAR)** Method of analysing time series in which, in principle, every variable of the model is regarded as endogenous and described accordingly by means of an equation dependent on its own historical values and the historical data of the other variables in the model.

**Volatility** Measure of fluctuations, eg of a security yield within a certain period (corresponds to the standard deviation).

**Yield curve** Relationship between the interest rates and the maturities of an investment for issuers with the same credit rating. A normal (inverse) yield curve is when the interest rate rises (falls) as the maturity of the investment progresses.

# Overview | Bundesbank publications concerning financial stability

This overview lists selected recent Bundesbank publications on the subject of financial stability. Unless stated otherwise, the publications are available in printed form and on the internet in both German and English versions. The publications are available free of charge to interested parties and may be obtained from the Bundesbank's Communication Department. Additionally, for a fee, a tape or CD-ROM containing roughly 40,000 published time series of the Bundesbank, which is updated every month, may be obtained from the Bundesbank's Statistical Information Systems and Mathematical Methods Division. Orders should be sent in writing to the addresses stated in the imprint. Selected time series may also be downloaded from the internet.

## ARTICLES FROM MONTHLY REPORTS

For information on the articles published between 1990 and 2004 see the index attached to the January 2005 *Monthly Report.*

| | |
|---|---|
| October 2005 | New transparency rules for credit institutions \| Risk appetite in a dynamic financial market environment |
| September 2005 | The performance of German credit institutions in 2004 \| Recent trends in individual payments \| The role of volatility patterns in financial markets \| Potential financial risks faced by the International Monetary Fund |
| July 2005 | Exchange rates and interest rate differentials: recent developments since the introduction of the euro |
| April 2005 | Supervision of financial conglomerates in Germany |
| March 2005 | Credit growth, bank capital and economic activity |
| January 2005 | German banks' foreign direct investment and cross-border services |
| December 2004 | The insurance sector as a financial intermediary \| Credit default swaps – functions, importance and information content |
| October 2004 | Report on the stability of the German financial system \| Stress tests at German banks – methods and results |
| September 2004 | The performance of German credit institutions in 2003 \| New capital requirements for credit institutions (Basel II) |
| July 2004 | Regulation of the European securities markets |
| April 2004 | Recent developments in the corporate bond market \| Credit risk transfer instruments: their use by German banks and aspects of financial stability |
| January 2004 | Payment system oversight – a contribution to the stability of the financial system and the efficiency of payment operations \| The new MFI interest rate statistics -methodology for collecting the German data |

## DISCUSSION PAPERS, SERIES 2: BANKING AND FINANCIAL STUDIES

| | |
|---|---|
| 11/2005 | Financial integration and systemic risk |
| 10/2005 | The eurosystem money market auctions: a banking perspective |
| 9/2005 | Accounting for distress in bank mergers |
| 8/2005 | German bank lending to industrial and non-industrial countries: driven by fundamentals or different treatment? |
| 7/2005 | Banks' regulatory capital buffer and the business cycle: evidence for German savings and cooperative banks |
| 6/2005 | Cyclical implications of minimum capital requirements |
| 5/2005 | The forecast ability of risk-neutral densities of foreign exchange |
| 4/2005 | Banks, markets, and efficiency |
| 3/2005 | Do banks diversify loan portfolios? A tentative answer based on individual bank loan portfolios |
| 2/2005 | The supervisor's portfolio: The market price risk of German banks from 2001 to 2003 – Analysis and models for risk aggregation |
| 1/2005 | Measurement matters – Input price proxies and bank efficiency in Germany |
| 6/2004 | Estimating probabilities of default for German saving banks and credit cooperatives |
| 5/2004 | How will Basel II affect bank lending to emerging markets? – An analysis based on German bank level data |
| 4/2004 | German bank lending during emerging market crises: A bank level analysis |
| 3/2004 | Does capital regulation matter for bank behaviour? Evidence for German saving banks |
| 2/2004 | Systematic Risk in Recovery Rates – An Empirical Analysis of US Corporate Credit Exposures |
| 1/2004 | Forecasting Credit Portfolio Risk |