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November 2007

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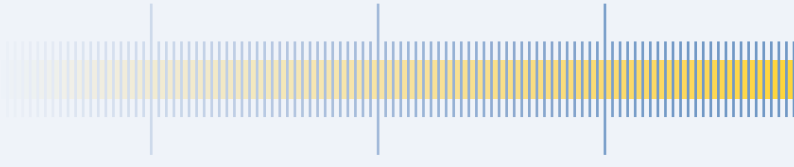
Analysis

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 Data unknown, not to be published or not meaningful; – Nil.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.

Analysis



Overall assessment

Test of resilience for the financial system

From mid-2007 onwards, considerable distortions emerged in the international financial markets, stemming from the problems in the US subprime mortgage market, which have since put the global financial system's resilience to a rigorous test. A wide-ranging reassessment of credit risks has been under way, primarily in the markets for structured securities. This led to mutual confidence among the market players becoming so shaken that – in view, additionally, of the banks' own heightened need for liquidity – the distribution of available liquidity in the money market was and is operating only in a very restricted manner. The German banking and financial system, too, is being faced with major challenges. It has nevertheless proved to be stable and functionally viable even in a clearly worse operational setting. Not least thanks to a marked improvement in their risk-bearing capacity over the past few years, the German banks have coped well on the whole. Individual problem cases owing to institution-specific risk concentrations were resolved within the banking system. The implications of the changed situation in the global financial system will affect the earnings of the larger German banks in the second half of 2007. The risk that this could trigger a significant adverse feedback process via the domestic supply of credit and the real economy appears slight, however.

Reassessment of risks

In the international financial markets, a long-expected comprehensive reassessment of financial risks was initiated in the third quarter of this year. The catalyst for this was an accumulation of negative news in connection with the market for subprime mortgages in the USA. The adjustment process focused on the securitisation market, in which loans and isolated credit risks are packaged, structured and sold on as asset-backed securities (ABS) or collateralised debt obligations (CDOs). In the past few years, the large demand for such securities, which predominantly have a good rating, accompanied by decreasing credit quality requirements contributed to a very buoyant new trade not only in risky mortgage loans but also in leveraged loans.

Global confidence shock

When a marked rise in the default rates of US mortgage loans led to an extensive downgrading of securitisation instruments, however, this unleashed a global shock to confidence, especially as it simultaneously became known that two prominent hedge funds had run into financial difficulties. As a consequence, the turbulence gradually spread to other market segments in the wake of the market players' rising risk aversion and tight liquidity conditions.

Vulnerabilities in securitisations

In this context, it proved to be the case that the tradability and broad dispersion of credit risks actually improves the resilience of the financial system only if the quality standards are kept high at all stages of the transfer process and no new risk concentrations arise. Consequently, given the vulnerabilities that have become obvious in the complex chain of credit risk distribution, the resulting emergence of uncertainty about the valuation of these complex and predominantly illiquid financial instruments has placed an ongoing

heavy strain on the functional viability of parts of the securitisation market.

SPVs in distress

Moreover, risks suddenly became manifest, which had been assumed by the banking system in the context of risk and maturity transformation and, to reduce balance sheets and free up capital, had been transferred to special-purpose vehicles – SPVs – such as asset-backed commercial paper conduits and structured investment vehicles. These investment vehicles refinance themselves on favourable terms through highly rated money market paper. When the crisis of confidence in the securitisation market gave rise to general doubts about the intrinsic value of the assets used to back the securities of such SPVs, they ran into refinancing difficulties. Some SPVs therefore drew unexpectedly on financial institutions' liquidity facilities, which meant that the resulting risks were retransferred to bank balance sheets.

Spillover to the money market

During August, the uncertainty about financial institutions' potential direct and indirect risk positions caused the crisis of confidence to spill over to the interbank money market. In addition, the dislocations in the securitisation and syndicated loan markets further increased the banks' need for liquidity. It became obvious that some markets players had underestimated the liquidity risk and, above all, the interdependence of financing liquidity and market liquidity.

Signs of easing

Since mid-September, there have been signs at times of a certain stabilisation in the international financial markets. The injection of liquidity by a number of central banks, including the Eurosystem, played a part in this. Even so, the situation in the euro-area money market has not yet returned to normal. Liquidity hoarding and uncertainty about the risk situation of potential counterparties is still prevalent in the interbank market, resulting in a very cautious lending policy, especially for periods of more than one month. A return of confidence is the key to solving the friction in the money market.

Large international financial institutions robust, but under pressure

Large foreign financial institutions, which are of relevance to the German financial system mainly in terms of possible counterparty risks, are currently facing an accumulation of strains. Owing to their comfortable capital base and basic earning power, they fundamentally have a high degree of resilience to the present tensions. Some institutions have made large write-downs, however. The changed market setting is also likely to depress these institutions' earnings prospects.

Correction in the corporate credit markets and …

In the international corporate credit markets, the rise in risk premiums has terminated a prolongued period of exceptionally favourable financing conditions. This was marked by a relaxation of credit standards, especially for riskier financing, such as syndicated leveraged loans. Seen in that light, the recent correction is fundamentally to be seen as a welcome return to normal. Moreover, the euro-area and US corporate sectors are in fundamentally good shape.

… credit risk transfer markets

A lengthier process of adjustment may be expected in the credit risk transfer markets. A major factor in this is the difficult task of (re-) valuing complex structured financial products. With regard to those securitisations that contain US subprime mortgage loans, the actual scale of the defaults in the US real estate market will emerge only gradually. Future move-

ments in US house prices, which are closely linked to the overall level of activity in the US economy, are likely to have a crucial impact on this.

Financial market turmoil as an autonomous source of uncertainty

In terms of the macroeconomic risks to the German financial system, the financial market turmoil has given rise to an autonomous source of uncertainty. This is added to the familiar risks stemming from the US real estate market, global imbalances and the high price of oil.

Correction in the US real estate market

An end to the quantity and price adjustments in the US real estate market is not yet in sight. The scale of potentially dampening effects on consumer demand in the United States depends crucially on future developments in the US labour market. Overall, the risk of a sharper downturn in the US economy has increased materially. As things stand at present, however, this does not represent a serious threat to the development of the German economy as long as the US setting does not become recessionary and additional shocks do not lead to an accumulation of risks.

German banks' credit supply behaviour

In the bank-based German financial system, the banks' credit supply behaviour is a prime channel for possible cyclical feedback effects. Potential strains on liquidity and the capital base due to unplanned balance sheet expansion, portfolio adjustments and higher refinancing costs might prompt the banks directly affected by the market disruptions to become more cautious in their lending, particularly to larger enterprises and weaker borrowers. By contrast, small and medium-sized enterprises as well as households should hardly be affected. The available surveys on the banks' credit supply behaviour substantiate the finding that the recent events in the financial markets are having no more than a muted impact. Accordingly, investment and economic expansion in Germany are unlikely to face excessive financing constraints.

Uncertainties in the forex markets

Despite the gradual reduction in global imbalances in the past few months, the risks of abrupt exchange rate movements have not diminished. Foreign investors could conceivably rebalance their portfolios to the detriment of the US dollar, especially in the event of a stronger-than-expected slowdown in the US economy or of frictions in the US financial system. This might provoke a disorderly depreciation of the US dollar. Furthermore, it has again become apparent that a liquidation of carry trades also greatly increases volatility in the forex markets. Finally, the crude oil markets harbour a significant potential for macroeconomic disruption.

Macroeconomic risks to be rated as higher overall

Given this constellation, the macroeconomic risks to the German financial system are now, overall, to be rated as notably higher. In the cyclical baseline scenario, overall economic activity in the coming year is likely to be dampened only moderately, however. The German economy is currently in firm and robust shape, not least owing to ongoing buoyant global economic growth. If several of the cited risk factors were to materialise simultaneously, the economic outlook would be dulled perceptibly, but there would be no expectation of a recession in Germany because of that.

German banking system remains stable

The turmoil in the international credit markets has tested the resilience of some areas of the

German banking system. A number of institution-specific vulnerabilities were brought to light, necessitating rigorous intervention by the owners and other banks or banking groups. Nevertheless, the German banking system remained fully functional and stable at all times. A notable risk-bearing capacity is in place for absorbing the losses that are likely to result from the corrections in individual market segments – especially in the case of structured securities and risky syndicated loans. Although the results of the big, internationally active banks are likely to be adversely affected from the second half of 2007 onwards, their performance and risk-bearing capacity have shown a continuous improvement since 2003, which means that they are also able to cope with a marked increase in risk.

German banks' liquidity situation satisfactory

The liquidity situation has proved satisfactory even under difficult market conditions. This is indicated, not least, by the stress tests for assessing risks to market liquidity and refinancing that were conducted by the Bundesbank for the first time this year. Furthermore, the German institutions possess large pools of collateral which they can mobilise for refinancing at the Bundesbank. The turbulence also affected the money market funds in the form of outflows and performance dips. Tensions caused by the tighter liquidity situation essentially remained confined to the category of ABS funds, however.

Diverse development in credit risks

With regard to domestic business, the German banks' credit quality showed a further improvement in 2006. This was helped by the sound condition of both German enterprises and households. This is reflected principally in a renewed decline in portfolios of non-performing loans in relation to the gross volume of non-bank loans; the ratio is now at its lowest level since the late 1990s. According to the quarterly reports of the big German banks published so far, however, a moderate increase in loans with a specific loss provision requirement is to be expected this year. Furthermore, the recent market turmoil has made it more difficult to distribute leveraged loans to other investors. The credit institutions operating in this market accordingly have had to take more loans on to their own books. Owing to the corrections in the financial markets, there have been value impairments in this market segment, too, which have dented the results of the banks involved.

On the whole, the results of the macro stress tests likewise point to a continuing high degree of resilience in the German banking system. Even if the crisis in the international credit markets were to be accompanied by a general slowdown in the pace of growth, the expected loss provision rates are not very different from those of the baseline scenarios.

Market risk balanced overall

The development of German banks' market risks is balanced overall. Stress tests reveal that there has been a decline in interest rate risks both for big banks active in the market and for small and medium-sized banks. By contrast, the risk-adjusted proprietary trading results of the commercial banks and central institutions of the savings banks and credit cooperatives have declined sharply in the wake of the distortions in the credit markets in the third quarter of 2007. The diversification of the aggregated risk exposure has also increased under the impact of the turmoil.

Risk-bearing capacity stabilised

Overall, the German banking system's risk-bearing capacity has stabilised at a high level. A heterogeneous and, by and large, slightly declining earnings situation and a small fall in the level of reserves contrast with a substantially increased capital base. There has been a further improvement in the quality of capital, helped recently by the low level of risk provisioning, which, all in all, nonetheless appears adequate. Capitalisation remains satisfactory even if some banks reintegrate assets from off-balance-sheet vehicles into their balance sheets or cannot distribute exposures on the scale planned. The bank-specific risk-bearing capacity components are bolstered by guarantee schemes and protection arrangements that have been further strengthened.

Medium-term income risk

Banks face considerable income risks in the medium term, however, albeit for different reasons. Big, internationally active institutions must expect the financial market turmoil to have longer-term repercussions for the profitability of some more volatile components. Smaller, more regionally active institutions, by contrast, are not directly affected by the subprime crisis. These institutions, whose earnings depend predominantly on interest income, are still having to contend, however, with a – structural as well as cyclical – decline in their net interest result. Irrespective of this, the assessments from more comprehensive bank evaluation models for the primary institutions of the respective bank groups remain at a comparatively high level, which underlines the stability of this category of banks.

Insurers in stable state

The German insurance sector continues to be in a stable state overall. Reinsurers, in particular, are currently seeing their course of business return to normal following high payouts in 2005 and record profits in 2006. While life insurance companies benefited from a slight pick-up in new business in 2006, their relatively poor capital investment performance remains a challenge, however. Some branches of non-life insurance are, in turn, confronted with unfavourable trends in claims and persistently fierce competition, although they, too, are operating in the context of a satisfactory capital base. Following the healthcare reform, private health insurers have to adapt to the introduction of a base tariff offering a standard healthcare package and to the portability of provisions set up to cover insurees' higher treatment costs with advancing age. Major challenges for the insurance industry are, in the short term, the interest-rate-related erosion of their hidden reserves, in the medium term, the implementation of the new European framework for the supervision of the insurance sector (Solvency II) and, in the long term, a possible transformation of the insurance industry due to the growth of markets for insurance-linked securities (ILS).

Lessons of the financial market turmoil – an interim assessment

The crisis of confidence in structured securitisations and credit derivatives revealed vulnerabilities in a market segment which has been expanding rapidly in the past few years and which has become increasingly important for many financial institutions' business models. The process of adjustment that is now under way in the financial system will probably correct cyclical exaggerations as well as assist the ongoing structural maturation of the securi-

tisation market. It would be wrong, however, to call into question the general usefulness of the technique of securitisation or of the separate trading of credit risks. Rather, it is in the interests of all the parties involved to continue to make use of the extended opportunities to allocate credit risks more broadly by means of sophisticated mechanisms.

Analysis of turbulence

An in-depth debate is now taking place at central banks, at the political level and in international supervisory bodies (including the Basel Committee on Banking Supervision, Committee on the Global Financial System, CEBS, BSC) concerning the causes, determinants and dynamics of the distortions with the aim of identifying and eliminating shortcomings. In this connection, the onus is on the market players affected by the tensions to draw appropriate conclusions from these experiences. But, at the same time, the relevant public authorities also have a responsibility to counteract the unhealthy developments which have come to light. The objective is to strengthen the financial system so that it can fulfil its function of allocating capital and risks even in critical periods. The Financial Stability Forum (FSF) is facilitating the exchange of information and the coordination of activities in this respect. A report on the vulnerabilities detected in the crisis and on any perceived need for action, to be compiled in close cooperation with the above-mentioned and other bodies, will be presented by the FSF to the finance ministers and central bank governors of the G7 countries in spring 2008.

With this in this mind, an initial interim assessment from the perspective of the Deutsche Bundesbank is presented below.

Risk management at credit institutions, and consolidation issues

Originate-to-distribute business models

Given the persistent distortions in the money market, the securitisation crisis has highlighted the major relevance of liquidity risk: liquidity is crucial for the functioning of the financial system. Moreover, the growing prevalence of originate-to-distribute business models is leading to the increasing interdependence of the availability of financial resources, financing liquidity and market liquidity.

Management of liquidity risk

Incorporating liquidity facilities into banks' internal liquidity risk management is an important and indispensable aid. Second, setting consolidation requirements for the respective accounting entities may help to facilitate the integrated overview needed in this context. Third, stress tests and contingency plans should play a greater role in the management of liquidity risk.

Transparency: challenges for financial intermediaries

Both suppliers and investors called on

When distributing credit risks, financial intermediaries need to set more effective incentives for monitoring credit quality when the loan is granted. In addition, restoring lost confidence in the securitisation instruments and their valuations requires arrangers to provide greater transparency regarding the securitisation structures. In the wake of the boom, ever more complex products were developed, the risk properties of which were very opaque. Some investors, on the other hand, perhaps trusting that the market setting would remain benign, often felt neither occasioned nor able to analyse complex products in detail and,

instead, let themselves be guided too much by the ratings. The arrangers of securitisations, together with the other parties involved (in other words, principally the originators, the servicers and the securitisation portfolio managers) will have to ensure that investors regularly obtain a more precise picture of the performance and risks of the securitisations in their portfolios. It is, first and foremost, up to the investors to press for this; the market clout they have gained in the wake of the turbulence should make it easier for them to assert their interests.

Greater standardisation

The market players are currently searching for appropriate solutions in order to revive the securitisation market. Simpler and more highly standardised transactions could help in regaining investor confidence. This might also pave the way for a more liquid secondary market for securitisations. Nevertheless, there are likely to be limits to the standardisation of securitisation transactions because the loans underlying the portfolios are very specific and, traditionally, many securitisations are tailor-made to suit institutional investors' demands.

Improved transparency for hedge funds necessary

An improvement in the transparency of hedge funds remains a desirable objective, even if they were not at centre stage in the recent market turmoil, although financial difficulties encountered by some hedge funds did act as a catalyst for a general reassessment in the financial markets. It was precisely a rapid fall in the value of illiquid collateral assets which revealed the need for a robust management of counterparty risk by prime brokers. Furthermore, some banks felt obliged to act in support of closely linked hedge funds on reputational grounds. For this reason, the implementation of the Financial Stability Forum's recommendations on strengthening market discipline and transparency in the hedge fund industry, which were made in May this year, continue to deserve full support. A British hedge fund working group has now published a consultation paper containing proposals on improved disclosure and voluntary best-practice standards. These represent a significant step forward, even though they still have to be discussed in depth in the coming weeks.

Valuation issues

Owing to the low market liquidity, scarcely any reliable market prices are available at present for many of the financial instruments backed by subprime mortgage loans. Financial institutions especially, in conjunction with external auditing firms, will have to make a decision on the intrinsic value of assets on the basis of the existing valuation rules and, as appropriate, using pricing models. The applied valuation methods will have to be consistent and transparent.

Transparency: challenges for rating agencies

Greater transparency needed concerning securitised assets

Rating agencies should help to boost market confidence in future by providing more information on the nature and quality of the assets underlying securitised positions. Above all, with multi-layered securitisations there arises a lack of transparency, which the rating agencies, too, should counteract by supplying a greater amount of standardised information.

Rating methodology needs refining

Moreover, the rating agencies have been confronted with the realisation that their valua-

tion models severely underestimated the risk content, especially the size and correlation of the probabilities of default inherent in subprime mortgage loans and securitisation transactions based on them. The steps that have already been initiated to enhance the rating methodology merit a positive assessment.

Separate rating scale for structured securitisations

The risk properties and rating process for structured financial instruments differ markedly from those for traditional bonds. The users of securitisation ratings need to be aware of these differences. During the securitisation boom, investors appear often to have based their investment decisions primarily on ratings. One of the reasons for this is that institutional investors' investment mandates and some regulations generally refer to the traditional rating scale for bonds, which is also used to rate securitisations. A possible outcome of this is that structured securitisations, while formally meeting minimum quality requirements for ratings, may actually carry materially higher risks (with a commensurately higher return) than originally intended. With this in mind, consideration should be given to rating structured securitisations on a separate scale. This would create greater awareness of the special nature of such financial instruments for all involved and might also promote a more critical examination of the relative importance that investors wish to attach to external ratings in their investment decisions.

Regulatory framework

Regulation not a panacea

Even with additional regulation, it will not be possible to completely prevent distortions in the financial markets in the future. Moreover, regulation is always accompanied by an incentive to circumvent the rules via regulatory arbitrage. Even so, the events in the third quarter of 2007 revealed shortcomings in the existing regulatory framework that can and should be remedied. Whatever the nature of any possible regulatory intervention, however, it has to be ensured that a level playing field remains in place and that any new regulations are coordinated internationally, especially within the European Union.

Capital charge for financing commitments

Within the existing regulatory framework, it has been possible to design liquidity facilities in such a way that they have not had to be backed by capital. This shortcoming was identified and remedied by the Basel Committee on Banking Supervision when drawing up the Basel II framework. With the compulsory introduction of the new capital rules (Pillar 1) in January 2008, financing facilities for special-purpose vehicles will be subject to a capital charge, which makes regulatory arbitrage more difficult. Furthermore, the Basel II rules emphasise the need for functionally viable and integrated internal control mechanisms, especially in the context of the supervisory review process (Pillar 2) and the disclosure requirements (Pillar 3), and therefore introduce a new qualitative element into capital requirements. In the light of recent experience, however, it will have to be examined whether the risk weights and conversion factors for liquidity facilities agreed under Basel II adequately reflect the risk of such exposures.

Large exposure rules

In 2008, the treatment of credit commitments in connection with large exposures will likewise become more differentiated and risk-sensitive, and counting towards the ag-

gregate large exposure limit will be tightened. To prevent the circumvention of individual large exposure limits through granting liquidity facilities to several special-purpose vehicles, detailed thought should be given to whether and under what conditions loans to SPVs constitute a single borrower entity and, hence, should be aggregated.

Risk factors affecting the German financial system

Financial market risks

Disorderly adjustment in the international financial system

Mortgage crisis in USA as a trigger of market tensions

In summer 2007, risk premiums on many financial instruments rose considerably in the international financial markets, and market volatility increased appreciably (see Chart 1.1.1). This "global uncertainty shock" was triggered by the smouldering mortgage market crisis in the United States. The dimming of the outlook for an increase in the value of US residential real estate serving as collateral was accompanied by an equally strong surge in the expected default rates on loans to households with low credit quality. The problem was exacerbated by very lax credit standards and inadequate credit assessments, but also by the involvement of unregulated lenders. This led major rating agencies to announce, in June, that they would review numerous debt instruments secured by mortgages for a possible downgrade. At the same time, the news came out that several hedge funds had sustained major losses in trade in high-risk mortgages.

Extension to a general repricing of risks

The ensuing general repricing of risks spread gradually in July and August to other market segments and also led to crisis-like situations in the European financial markets. The first stage involved a rise in credit risk premiums, mainly those on assets that are directly linked to the high-risk segments of the US mortgage market or the corporate sector. Structured securitisations, which virtually ceased being issued and traded, as well as syndicated loans to higher-risk borrowers (leveraged loans), the reselling of which halted, were particularly affected. The turmoil on the credit markets broadened amid increased risk aversion, unwinding of leveraged trading positions (deleveraging) and a flight to safe and liquid government bonds. This was reflected in, among other things, major price fluctuations in the foreign exchange markets, equity markets and, to a lesser extent, emerging market assets. The fluctuations may have also been partially reinforced by market mechanisms such as the typically pro-cyclical requirements for collateral[1] and risk management using Value at Risk (VaR) limits.[2]

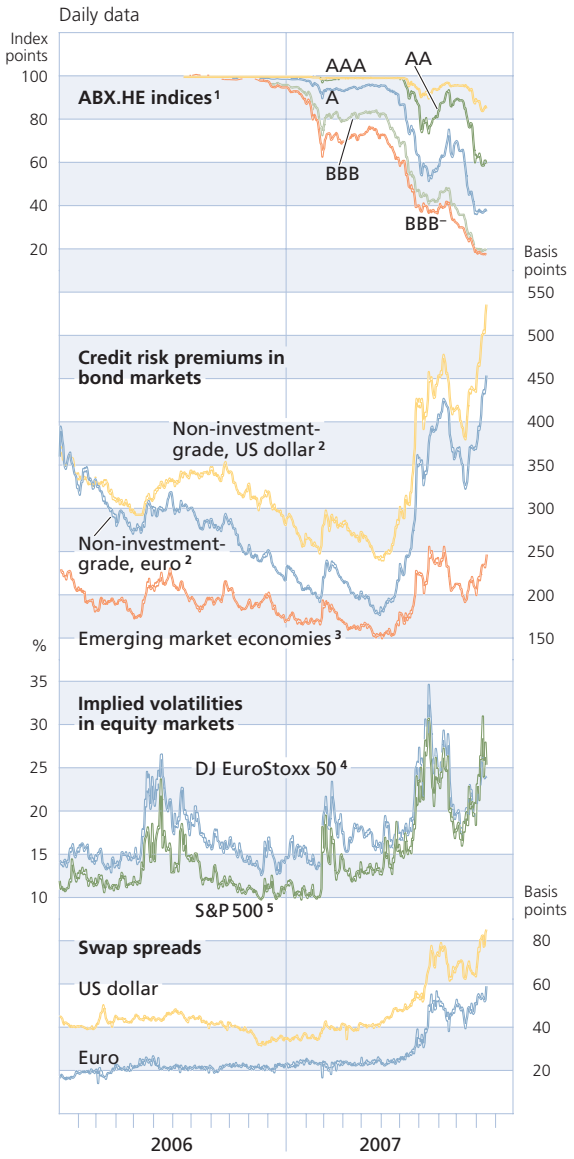
Money markets also affected

In August, uncertainty about potential strains on financial institutions led to a substantial widening of swap spreads and a lengthy period of tight liquidity in the money markets of key currency areas (see Chart 1.1.2). In the euro area, the risk premiums on unsecured money market loans reached levels several times those of their all-time highs. They also proved to be much more sustained – and therefore potentially much more severe in terms of their implications – than in other such cases in the recent past. The lack of transparency of credit institutions' risk exposure,

1 Particularly margin calls for counterparty risk from OTC derivatives.
2 For more on reinforcement mechanisms and interplay between market-related risks see Deutsche Bundesbank, Financial Stability Review, November 2006, p 34 f.

Chart 1.1.1

MARKET RISK INDICATORS



Sources: Bloomberg, JP Morgan and Bundesbank calculations. — **1** ABX home equity indices 2006-2 (Asset Backed Credit Default Swap Benchmark Indices) for securities backed by US subprime mortgage loans. — **2** Yield spread between corporate bonds (rated BB (Standard & Poor's) or Ba (Moody's) or lower) with a residual maturity of at least one year and government bonds with a similar maturity. — **3** Emerging Markets Bond Index Global. Yield spread over US Treasuries. — **4** The VSTOXX volatility index. — **5** The CBOE Volatility Index (VIX).

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valuation problems and consequently their reluctance to deal with potential counterparties in the interbank market played a key role. The credit institutions' unusually large need for liquidity also resulted from their commitment to special-purpose vehicles (SPVs), which were no longer able to obtain funding via the commercial paper (CP) market, as in the past; consequently, the issuance volume of CP by these vehicles has been declining since August. Now-cautious investors regarded the credit quality of these assets which are being used to back the securities – mainly structured credit products – as too shaky.

Increased vulnerability to shocks

Vulnerability to shocks already higher earlier

What is notable about the events of this past summer is that, at the beginning, a housing market slump in the United States was all it took to trigger a comprehensive reassessment of the risk situation by the international financial markets. This suggests that a latent vulnerability to shocks had already existed – including in some segments of the European financial system. Another contributory factor may have been an unusually large appetite for risk on the part of many market participants, which, among other things, intensified the demand for higher-risk investments and lowered the risk premiums on such assets. As previous market tensions had been overcome relatively quickly – most recently in February and March 2007 – many market participants apparently developed entrenched expectations that, owing to structural improvements, the international financial system would also be able to withstand major shocks without any difficulty.

Box 1.1

TENSION IN THE INTERBANK MARKETS AND CENTRAL BANK INTERVENTIONS

Recourse to liquidity lines by special-purpose vehicles (SPVs) caused banks to have high actual and expected refinancing needs in the interbank money market. The surge in demand for liquidity in the US money market, which began on 8 August, immediately spilled over to the Asian and European markets. The already tense market situation was exacerbated further by the fact that the majority of market participants built up liquidity buffers to hedge their own financing risks. In addition, the high degree of uncertainty regarding counterparties' direct and indirect risk positions reduced willingness to lend money on an unsecured basis for maturities of a week or longer. This led to a sustained drying up in the futures market and a refinancing shift towards the overnight market. Money market rates, especially those at longer maturities, rose significantly as a result.

In order to counteract the strains in the money market and bring the overnight rate back towards the corresponding key rate, some central banks[1] – including the Eurosystem – injected additional liquidity into the market via open market operations as soon as the tensions emerged.[2] In addition, the US Federal Reserve Board began by cutting the discount rate[3] and then expanded the collateral framework with a view to broadening the supply of liquidity and restricting the volatility in the overnight rate.

The Eurosystem initially provided central bank money via one-day operations. However, only a very limited amount of liquidity was distributed in the interbank market. Injecting large amounts of liquidity into the market through main refinancing operations (MROs) with a maturity of one week was therefore an important move. In this way, the EONIA could largely be kept to a level close to the minimum bid rate of 4.00%, although there was a rise in volatility.

However, this did not lead to an improvement in the situation at longer maturities (between one week and one year). Consequently, the Eurosystem attempted to revive the longer-term money market areas via two additional refinancing operations with a maturity of three months. Despite this, there was barely any improvement in the situation, as the excess liquidity is being traded almost exclusively in the overnight market, not least owing to many banks' restrictive business policies and own liquidity needs. For this reason, the longer unsecured rates have remained at a very high level since the distortions first emerged. The current situation certainly does not constitute a new equilibrium at which medium and long-term money market maturities will remain in the medium term. It reflects, instead, a state of dysfunction, an exceptional situation characterised by high risk aversion, mutual mistrust among banks and – as a result – a hoarding of liquidity.

Given the current tense situation in the credit markets, flexible open market operations in the Eurosystem will be of crucial importance. They safeguard the banking system's liquidity and thus stabilise the financial markets. However, the Eurosystem's money market operations can only act as a supporting mechanism. The important issue is restoring trust among market participants and thus ensuring the distribution of available liquidity in the money market – including at longer maturities.

1 The Bank of England was an exception, deciding to provide additional liquidity for the first time on 13 September. — **2** The Eurosystem, the Bank of England and the Bank of Japan kept interest rates unchanged of late; before the crisis, the markets had expected all three to raise interest rates. The Federal Reserve Board initially cut its benchmark rate, the federal funds rate, by 50 basis points to 4.75% on 18 September. — **3** Interest rate at which commercial banks in the United States can borrow money from the Federal Reserve, similar to the Eurosystem's marginal lending facility.

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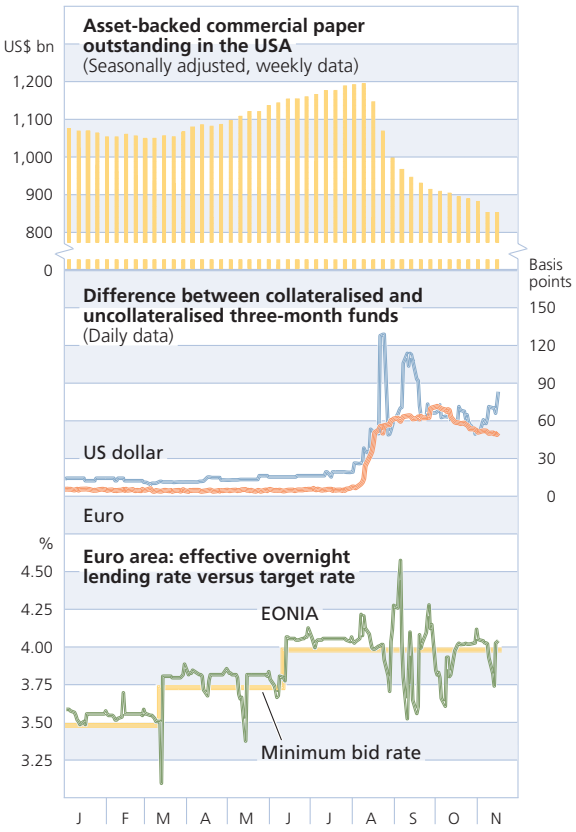
Chart 1.1.2

TENSION IN THE MONEY MARKETS



Sources: Bloomberg and the Federal Reserve Board.

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Deficiencies in the securitisation process

Credit risk dispersion through securitisation and derivatives has certainly led to a fundamental improvement in the resilience of the financial system over the past few years. This has been associated with the expectation that the dynamic upswing of the market for credit risk transfers[3] would bring about a more efficient distribution of risks in the financial system (see Chart 1.1.3). In the past few months, however, some of these hopes have been disappointed. Amidst the market turmoil, deficiencies in the securitisation process were revealed, a sign that many financial market innovations and practices are not yet fully developed. Strong investor demand for higher-yielding structured instruments led to a relaxation of credit standards, especially for high-risk US real estate loans. This may point to a weakening of incentives to assess and monitor credit quality if the loan originators and the intermediate agents – such as the structurers of securitisations – regularly resell the credit risks quickly.[4]

Problems with ratings and valuations

In addition, many investors relied largely on readily available credit assessments by rating agencies, only to discover that even high investment-grade ratings provided surprisingly little protection against such investments sustaining heavy market price losses (see Box 1.2 on page 22). Erroneous assessments of the level and the correlations of the default risks from subprime mortgages contributed to this turn of events. In addition, it is important to note that credit risks are at times transferred in a securitisation process that encompasses multiple layers, making it additionally difficult to value these complex and relatively illiquid financial instruments.

Overlending

A combination of expanded opportunities for credit risk transfer, problematic incentive struc-

3 These include instruments such as credit default swaps, securitisations and trading in loans. This market's dynamic growth is reflected in, among other things, the volume of ABS issues.

4 The incentive to monitor credit quality was watered down by, for instance, contractual agreements allowing resold loans which had difficulty being serviced within the first few months to be retransferred to the originator. This clause, however, often led to a dead end because, as the number of defaults rose, many specialised US finance providers which had advanced high-risk mortgages filed for bankruptcy.

tures[5] and the search for yield by investors led to an overeagerness to issue loans, including high-risk loans. Many market participants seemed to be unduly confident that valuations would remain high, purportedly liquid markets would remain liquid and the favourable financing terms would last. On the strength of this evidence, the allocation of credit risk in the international financial system through securitisation and trade in credit derivatives does not necessarily translate into improved resilience.

Shocks spread more easily by securitisation markets

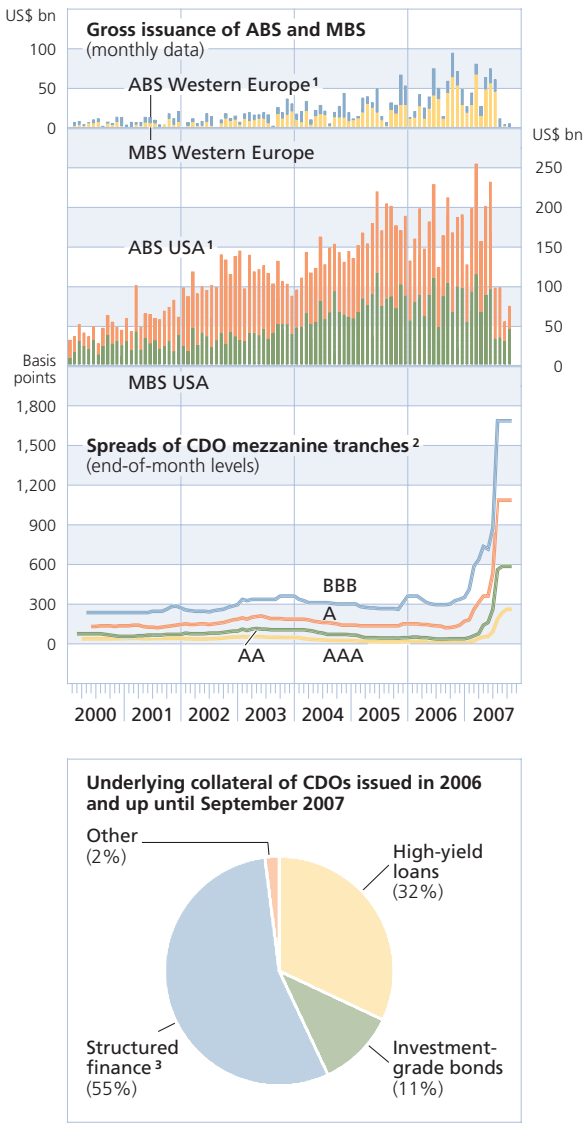
In this context, the markets for credit risk transfer played a considerable role in transmitting shocks in the international financial system. The sudden increase in investors' risk aversion hit a broad spectrum of asset-backed securities and structured finance instruments (such as CDOs) where deficiencies in credit quality and in the complex chain of credit risk transfer are likewise assumed to exist (see Chart 1.1.3).[6]

Shifting risks to non-banks reduces transparency

A broad geographical dispersion of credit risks, in principle, increases the ability to absorb regional shocks such as the downturn of the US real estate market. However, risk transfer within the international financial system also involves a higher potential for contagion between national banking markets.[7] In addi-

Chart 1.1.3

INDICATORS OF ACTIVITY IN THE SECURITISATION MARKETS



Sources: Dealogic, JP Morgan and SIFMA. — **1** Including inter alia collateralised loan obligations and collateralised bond obligations. — **2** The spreads indicate the difference in yields between the listed mezzanine tranches of collateralised debt obligations and US LIBOR. — **3** Including assets such as residential mortgage-backed securities, commercial mortgage-backed securities and other asset-backed securities.

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5 Traders in loans, too, are prone to herd behaviour because they are unlikely to pass up potential commission income from securitisation transactions even in an obviously overheated market as long as their competitors are active in the market and it looks like the risks can be transferred.
6 For instance, securitised housing loans in countries with sharply rising real estate prices (UK, Spain), commercial real estate loans and US consumer loans.
7 At the end of June 2006, non-residents were holding US$341 billion worth of US non-agency mortgage-backed securities. This represented around one-fifth of the entire market. Germany accounted for US$22 billion (source: US Treasury Department, Report on Foreign Portfolio Holdings of US Securities).

Box 1.2

RATINGS FOR STRUCTURED FINANCE PRODUCTS

Ratings play a central role in evaluating risk and marketing structured finance products[1] and are a significant source of information in investment decisions. Not all investors devote sufficient resources to carrying out their own in-depth analysis of the securitised asset pool (from eg subprime mortgages) and of the often very complex structures resulting from the formation of tranches with different risk/return profiles. Ratings are also referred to in investment mandates and in regulatory rules.

Ratings evaluate the default risk using expected loss (EL) and the probability of default (PD). Market and liquidity risks, which can have a significant influence on the value of a structured finance product, have thus far not been taken into account by rating agencies in their assessments. Although the risk characteristics and rating stability of tranched instruments, as well as the rating process applied to them, clearly differ from those of traditional bonds, rating agencies use the same rating scale for both.

Assumptions, particularly those regarding the PD of the debtor or reference assets, their correlations and the recovery rates in the event of default, are fed into the rating model. In the case of structured finance, the reliability of the models and the assumptions have often not yet been tested over a complete credit cycle. This results in higher model risk, ie that the actual risk is not accurately mapped by the methodology used. Furthermore, ongoing adjustments to the rating methodology and the parameters of the model hamper the comparability of the ratings and the evaluation of the rating stability over time.

In contrast to a bond portfolio, tranched products involve leverage, ie the lower-ranking a tranche and the smaller its volume, the higher the probability of a complete default. In addition, the loss distribution often shows a broader dispersion, ie the probability of large losses is greater and increases with higher correlation. In the case of structured products whose underlying asset pool is made up of other structured instruments (eg CDOs based on tranches of mortage-backed securities), losses can quickly accumulate and also impair more senior tranches, in particular when the actual default correlation is higher than expected.

Empirical studies show that the ratings of structured products are, on average, more stable than ratings for corporate bonds, ie rating changes occur less often. However, if rating changes do occur, they are more likely to be downgrades of several notches.[2] In the case of structured products based on tranches of other structured finance products, this effect is correspondingly stronger. A deterioration in the credit rating of the reference pool or adjustments to the rating methodologies have a more severe impact on the assigned rating, though this may be subject to a time lag.

The rating of structured finance products is an iterative process whereby, using the models provided by the rating agencies, the arranger adjusts the product structure until the desired rating is achieved. In this way rating agencies assist in the development of products.[3]

It is questionable whether all investors take adequate account of differences between these products and equally rated traditional bonds or whether higher returns in the same rating category are their primary concern. Thus, ratings-based investment mandates offer arbitrage opportunities, the result of which can be portfolios with higher risks than actually intended.

1 See Committee on the Global Financial System, The Role of Ratings in Structured Finance, January 2005. — **2** See Moody's Investors Service, Structured Finance Rating Transitions: 1983-2006, January 2007. — **3** Recent market developments have led to fees for structured finance ratings becoming an important source of income for rating agencies.

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tion, the partial transfer of risks to non-banks involves a loss of transparency. This makes it more difficult to pinpoint potential risk concentration among individual investors, which contributed to market uncertainty.

Role of liquidity

Uncertainty reduces market liquidity

Growing uncertainty in the markets also led to an appreciable decline in liquidity in the international financial system. The high level of market liquidity – ie the possibility of concluding large transactions without this having a major impact on the market price – over the past few years could well have fuelled expectations that even complex financial instruments could be traded at will without any problems. This apparently also led investors to expose themselves to high liquidity risks through maturity transformations.

Special-purpose vehicles' funding liquidity drying up …

The close correlation between market liquidity and funding liquidity became particularly clear as many investors used the short-term money market to refinance their longer-term investments. Special-purpose vehicles (SPVs) were a particularly notable example (see Box 1.3 on page 24). These investors typically buy investment-grade tranches of structured finance products – often exposed to US real estate markets – and, to a considerable extent, refinance themselves by issuing (short-term) commercial paper. Doubts arising about the intrinsic value of their assets made lenders loath to "roll over" maturing debt. Concerns that this could lead to emergency asset sales, in turn, had repercussions on the market liquidity of the structured finance products. Because the possibility of obtaining finance through asset-backed commercial paper (ABCP) was limited, moreover, SPVs drew on the liquidity facilities granted to them by banks.[8] This meant considerable financing obligations for the banks concerned, including individual German banks.

… contributing to a crisis of confidence in the interbank money market

Difficulties in the transfer of syndicated or securitised loans created a need among banks for additional liquidity. Against this background, the increasing uncertainty about potential counterparty risk exposures culminated in a sustained dwindling of confidence in the interbank money market (see also Box 1.1 on page 19).

Tighter terms for leveraged investors causing added strain

In addition, market financing conditions also became tighter for leveraged investors, especially owing to demands to post additional collateral (margin calls). Under stress, the ability of these investors to play their usual role as liquidity providers was noticeably impaired. Tensions in market and financing liquidity thus became locked in a mutually reinforcing spiral.[9] At the same time, the difficulties experienced by some market players in adequately assessing and managing liquidity risk came to light.

Re-intermediation of risks

Risks returned to balance sheets

A particularly significant phenomenon from a financial stability perspective was the unexpectedly large volume of risks which, having appeared to be in the hands of non-bank agents, returned to the banking system or to

8 Alternatively, the sponsor banks directly assumed the commercial paper themselves.
9 See also M K Brunnermeier and L H Pedersen, Market Liquidity and Funding Liquidity, Working Paper, Princeton University, June 2007.

Box 1.3

ABCP CONDUITS, SIVS, SIV-LITES

In the case of special-purpose vehicles (SPVs) which refinance themselves by issuing commercial paper, a distinction is made between asset-backed commercial paper (ABCP) conduits and structured investment vehicles (SIVs). In contrast to ABCP conduits, SIVs refinance themselves using not only ABCP but also by issuing medium-term notes with a maturity of 1-3 years and capital notes, which provide for profit sharing. Both approaches involve the obligation to assure liquidity lines in the event of market disruptions. ABCP conduits have liquidity facilities amounting to around 100% of their assets whereas, in the case of SIVs, this is often only 5-10%. In addition, SIV managers rely on being able to sell assets in the event of market disruptions. SIV-lites are a newer form of SIVs which are subject to less stringent diversification guidelines and are more highly leveraged. Most SIV-lites have invested sizeable funds in North American mortgage-backed securities.[1]

Concerns about the quality of the SPVs' assets were key factors behind the slump in demand for ABCP in August and September. If an ABCP conduit is not granted access to the ABCP market, the sponsor bank may be forced – due to the liquidity guarantee – to completely take over the financing of the conduit, an action which gives rise to a considerable need for liquidity. In such a case, the conduit's portfolio is transferred to the bank's balance sheet and must be backed by regulatory capital.[2] If SIVs are not granted access to the CP market for several weeks, they may be forced to reduce their assets. In such a case, sponsors often have to weigh up potential losses as holders of capital notes against further liquidity injections.

1 According to Moody's, SIV-lites have invested around 96% of their funds in RMBS, primarily in US RMBS. According to S&P, in the case of SIVs, only 2% of investments are in subprime RMBS. — **2** An alternative would be that the bank firstly increases the quality of the assets in a conduit (for example, by overcollateralising or swapping assets) in order to regain investors' confidence.

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banks' balance sheets. Banks were tapped through the provision of liquidity facilities to SPVs (or through the purchase of commercial paper or assets of the conduits they sponsored). Financial institutions also encountered other counterparty risks. Although counterparty risk exposures to hedge funds are usually backed by collateral, its value can plummet unexpectedly quickly in times of market turmoil. Moreover, in order to maintain their reputations, banks saw the need to retrospectively hedge the risks of their affiliated hedge funds or investment funds (including money market funds).[10] Through this channel, risk that was thought to have been permanently unloaded found its way back onto balance sheets, thus subjecting the liquidity of the banking sector to considerable strain. In this regard, it has also been shown that, in periods of market tension, the planned sale of loans (such as in an originate-to-distribute business model) can fail owing to a sudden drying up of market liquidity during the securitisation or selling process.

Current situation and risk outlook

Measures by central banks contributed to a certain stabilisation …

Liquidity injections by several central banks, including the Eurosystem, since mid-August owing to the marked tensions in the money markets (see also Box 1.4 on page 26) and the interest rate cuts by the US Federal Reserve led to a certain stabilisation, at times, in the international financial markets beginning in September. Various initiatives in the United States, moreover, were aimed at tempering the im-

10 Reputation risks can also be caused by the sale of securitisation products if investors feel insufficiently informed of the risk factors involved.

pacts of the real estate crisis, particularly on households. Given the continuing stagnation in the CP market, several large US banks and the US Treasury Department announced, in mid-October, the creation of a Master Liquidity Enhancement Conduit (M-LEC) intended to purchase the high-quality paper of SIVs in refinancing difficulties to avoid price distress caused by forced sales. There is no telling at present whether such initiatives can make an appreciable contribution to resolving the current problems.

… yet new tensions cannot be ruled out entirely

The continued shaken trust and confidence between market participants has made it difficult for the money markets to return to normal. Although many internationally operating institutions have published quarterly reports, uncertainty about the potential financial strain caused by direct and indirect risk exposures as well as dependency on functioning securitisation and refinancing markets has been only partly dispelled. Given the persistently risky situation, renewed tensions in key markets cannot be ruled out altogether; in particular, volatility may be expected to remain at a high level for a longer period of time. The macroeconomic outlook – generally a key determinant of market participants' appetite for risk – is currently marked by an above-average level of uncertainty. A contributory factor is that protracted financial market friction, for its part, could have negative repercussions on growth. This is the case, for instance, with regard to a persistently high risk premium in the three-month LIBOR, as many financial contracts use LIBOR as a reference variable. Another potential channel for repercussions is the behaviour of lenders should they decide to considerably reduce their balance sheet risks.

Precise figures of defaults in US real estate market only gradually coming to light

One of the main factors delaying the process of reducing tensions in the international financial system is that the actual dimension of defaults in the US real estate market is only gradually coming to light. Given the extent of the forthcoming adjustments to interest rates on variable-rate mortgage loans in the coming quarters, it stands to reason that defaults will tend to continue their rise, especially if US residential real estate prices continue to slide. The considerable increase in the percentage of risky mortgages compared with earlier real estate cycles makes it more difficult to forecast default rates and their correlations and thus to value complex financial products. The downgrading process launched by rating agencies for structured credit products is likely to continue in the coming months. This could put additional pressure on investors, especially if the highest rating categories were also affected to a major extent by the downgrades.

Adequate risk premiums prevent tension

With regard to the crisis of confidence in the credit risk transfer market, more transparent securitisation structures could make an important contribution to regaining investors' confidence. These include less complex securitisations, more information, and better incentive systems.[11] Such market-led (where possible) solutions, however, will probably need quite a bit of time to take effect. Ultimately it could also help to avoid new tension in the markets if the risk premiums on many financial instruments do not fall back to the low levels of the first half of 2007.

11 A hallmark of good incentive systems is that they ensure symmetry between profit and liability, which is often the basis for longer-term business relationships.

Box 1.4

COMPREHENSIVE AND FLEXIBLE COLLATERAL FRAMEWORK

The monetary policy framework of the Eurosystem ensures that a wide range of counterparties can participate in its operations. Financially sound institutions which are included in the Eurosystem's minimum reserve system and also fulfil the formal and operational criteria defined by the Eurosystem are eligible to participate. For all Eurosystem credit operations – these being liquidity-providing monetary policy operations and intraday credit – adequate collateral must be provided, whereby the Eurosystem accepts a broad spectrum of euro-denominated securities.

On 1 January 2007, a single list of collateral was introduced, which replaced the former two-category system step by step up to 31 May 2007 and also broadened the range of eligible collateral. This was accompanied by the standardisation of the authorisation criteria for eligible assets throughout the entire euro area.

All of the authorisation criteria and utilisation requirements as well as the procedures, regulations and methods for credit assessments, the risk control measures and the valuation principles for underlying assets have been published.

The single list of collateral contains a broad spectrum of eligible issuers and debtors. Eligible debt instruments may be issued by central banks, public sector entities, private sector entities and international or supranational organisations. Eligible debtors of credit claims are non-financial corporations, public sector entities and international or supranational organisations.

With the introduction of the single list of collateral, restrictions regarding the maturity of credit claims were abolished, meaning that, in effect, there are no longer any restrictions on minimum or maximum maturity.

A list of eligible marketable assets is published on the ECB's website on a daily basis. As at October 2007, these securities had a nominal volume of approximately €9,600 billion. This volume is essentially available to all counterparties within the Eurosystem as the collateral may also be used on a cross-border basis.

Asset-backed securities and, therefore, also asset-backed commercial paper (ABCP) – being a subset of this asset group – are fundamentally among those securities accepted as marketable assets. Given the current situation, particularly in the ABCP segment, it must be taken into account that the collateral valuation principles laid down by the Eurosystem also accept paper without a current market price as collateral as long as it is traded on a regulated market or a market accepted by the Eurosystem. In such cases, the Eurosystem takes recourse to a theoretical price when determining the price and lending value. For this purpose, two central units providing theoretical valuations for utilised debt instruments without a current market price were established at the Banque de France and the Deutsche Bundesbank.

Marketable assets may be submitted to the Deutsche Bundesbank in the form of a pledge while non-marketable assets may be submitted by way of assignment (undisclosed assignment). The assets submitted are separated from the lending transactions to be collateralised and initially consolidated into a collateral pool (pooling). This ensures that the aggregate lending values of the assets submitted as collateral are not less than the level of total credit utilisation. Collateral can therefore be submit-

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ted and released independently of individual drawdowns.

Collateral can be mobilised in the following ways.

- The pledging of securities deposited in Germany via Clearstream Banking AG, Frankfurt, the national central securities depository (CSD).
- The cross-border use abroad (European Economic Area) of issued or deposited marketable assets via the national CSD's links to other European CSDs.
- The cross-border use of marketable and non-marketable assets via the Eurosystem's correspondent central banking model whereby a central bank holds collateral for the benefit of a lending central bank in another EU member state.
- The pledging of marketable assets via the Xemac collateral management system operated by Clearstream Banking AG, Frankfurt. The Deutsche Bundesbank is notified of a global amount which it then posts to the counterparty's collateral account. One particular advantage of this option is that the assets used in Xemac are also accepted as collateral for money market operations (Euro GC Pooling), making it possible to switch rapidly between interbank and central bank refinancing. The specific assignment of one or more security categories to a money market operation is replaced by the transfer of a lump sum in Xemac, which makes collateral management considerably easier.
- The quick and convenient assignment of credit claims via the Deutsche Bundesbank's web-based submission and administration platform (KEV).

It must be noted that, on the basis of the Eurosystem's transparent and homogeneous framework, German counterparties have at their disposal a broad spectrum of eligible assets, which can be mobilised flexibly through various channels. In principle, counterparties can also use marketable securities without a current market price as collateral. Through taking recourse to a theoretical price, the Eurosystem ensures that the spectrum of eligible assets – also and especially in phases of illiquidity in individual market segments, as is currently the case with ABCP – is not restricted and that counterparty refinancing is not made even more difficult. Furthermore, the range of eligible counterparties is very large meaning that smaller and medium-sized banks are not dependent on large banks in the interbank money market. This limits any contagion effects during a crisis of confidence.

German counterparties have used the available possibilities for increasing their collateral held at the Bundesbank for refinancing purposes as and when required. For instance, since the beginning of the year, the counterparties of the Bundesbank have increased their collateral pools from roughly €550 billion in total to just under €660 billion (balance at the end of October 2007). Since the beginning of August 2007 alone, the stock of submitted assets was topped up by almost €100 billion. This increase occurred in an evenly weighted manner involving all available channels of mobilisation and types of securities.

Global current account imbalances: a latent risk for financial markets

The possibility of a disorderly adjustment of global current account imbalances, especially if the US economy cools down unexpectedly quickly, still represents a latent risk for the financial markets. In such a scenario, the possibility of outflows of funds from the US dollar area could not be ruled out; this would not only involve turmoil in the foreign exchange markets but could also lead to rising capital market interest rates in the United States. There is no telling to what extent the liquid bond market in the euro area would see capital inflows under such conditions or would follow the rise in yields. However, it is highly possible that such fundamental changes in the international currency system would also be reflected in price volatility on the European bond markets.

Corporate credit markets

One consequence of the financial market turbulence has been a dampening of the hitherto very favourable conditions for corporate financing. Even though this correction has hit largely healthy corporate sectors and may therefore be interpreted as a welcome return to normal, its abruptness constitutes a test of the resilience of some credit market segments to shocks. The percentage of borrowers whose financing turns out to be unsustainable is likely to rise in the coming years. The extent of potential problems depends largely on the persistence of the current tension in the markets and on future economic activity.

Relaxation of standards for risky loans

Cyclical loosening of credit standards

A cyclical loosening of credit standards was visible throughout the corporate sector between 2004 and mid-2007.[12] However, standards were loosened particularly egregiously in the market segment of leveraged loans, whose recent dynamic growth was marked largely by acquisitions by private equity companies. Rising debt-to-earnings ratios and falling spreads led to a continued decline in investors' risk-adjusted returns in this market segment up until the summer of this year (see Chart 1.1.4).

Borrower-friendly structures …

The schedule and type of repayment of exposures were also subject to further loosening – for instance, non-amortising structures became increasingly predominant, and the use of payment-in-kind tranches rose.[13] In addition, lending contracts were designed with a view to giving borrowers a large amount of leeway, for example, regarding retrospective and flexible adjustment of credit conditions. Many transactions also did away with typical creditor protection clauses ("covenant lite"), making it more difficult for creditors to obtain timely information about a borrower's financial situation and thereby diluting market discipline.

… enabled borrowing even where credit ratings were weak

In the short term, these relaxed credit standards enable even companies with weak credit ratings to access the market and to survive, as is shown by the decline in the average credit rating of new issues of non-investment-grade instruments. However, the financial resilience

12 See ECB, Bank Lending Survey for the Euro Area; Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices, various issues.
13 A payment-in-kind structure gives the borrower a choice between repayment in cash or in the form of a further credit tranche or bond.

of many companies is therefore more vulnerable to a deterioration in the economic outlook and the financing conditions. This could also have a medium-term impact on the structured securitisations on which such loans are based.

Financing conditions

Higher capital market spreads

The mid-year rise in risk premiums in the capital markets coincided with a distinct deterioration of the hitherto very favourable financing conditions.[14] Higher LIBOR spreads in the money market had an adverse effect on companies which were swapping fixed-rate payment obligations for variable-rate cash flows on the basis of LIBOR. In addition, there were concerns regarding debt rollover on the commercial paper market.

Issue volumes in decline overall in third quarter

Therefore, since the middle of the third quarter, many investment-grade companies have moved to the longer-term corporate bond market, even at the price of a rise in expected financing costs; issue volumes have recovered somewhat following the mid-year slump. This avenue was initially largely closed to non-investment-grade companies since investors' propensity to invest in higher-risk instruments fell sharply. However, unlike in Europe, in the USA the number of companies issuing non-investment-grade bonds began to go back up as early as October (see Chart 1.1.5).

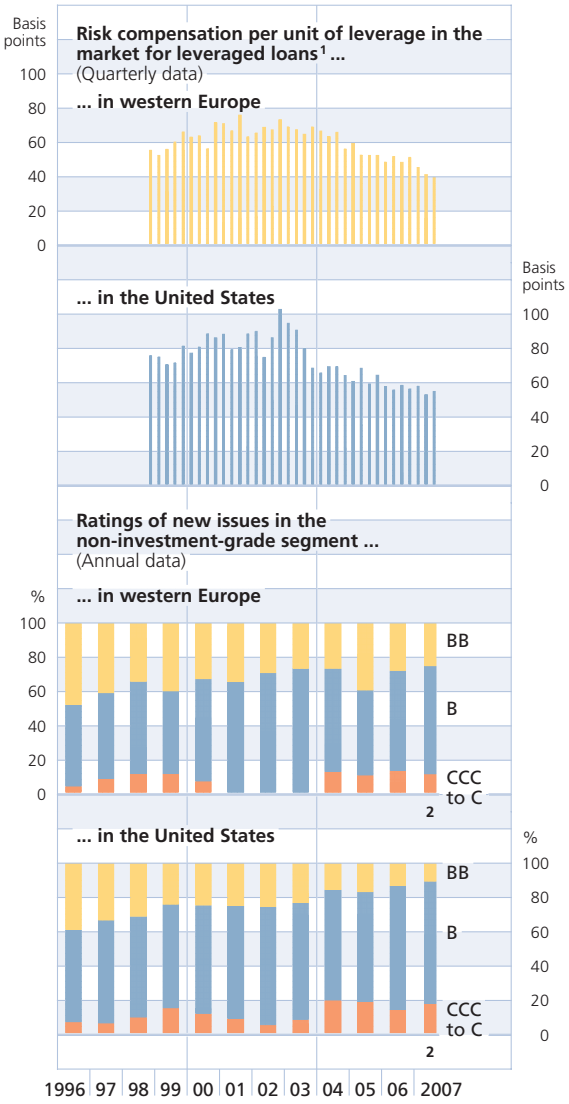
Increased risk awareness in the syndicated loan market ...

A key factor was the reassessment of risk in the market for high-risk syndicated corporate loans, which was affected by extreme caution

14 In addition, the risk-free euro-denominated interest rates rose throughout the maturity spectrum over the course of the year.

Chart 1.1.4

RISK COMPENSATION AND RATING QUALITY OF NEW ISSUES IN THE CREDIT MARKETS



Sources: S&P's LCD and Moody's. — **1** Calculated by dividing the average spreads of new credit tranches that are structured for institutional investors, weighted by the issue volume, by the average of the ratios of total debt to EBITDA (earnings before interest, taxes, depreciation and amortisation) of the companies considered. Falling spreads indicate a worsening of the expected risk/return ratio for investors. — **2** Issues until end-September 2007.

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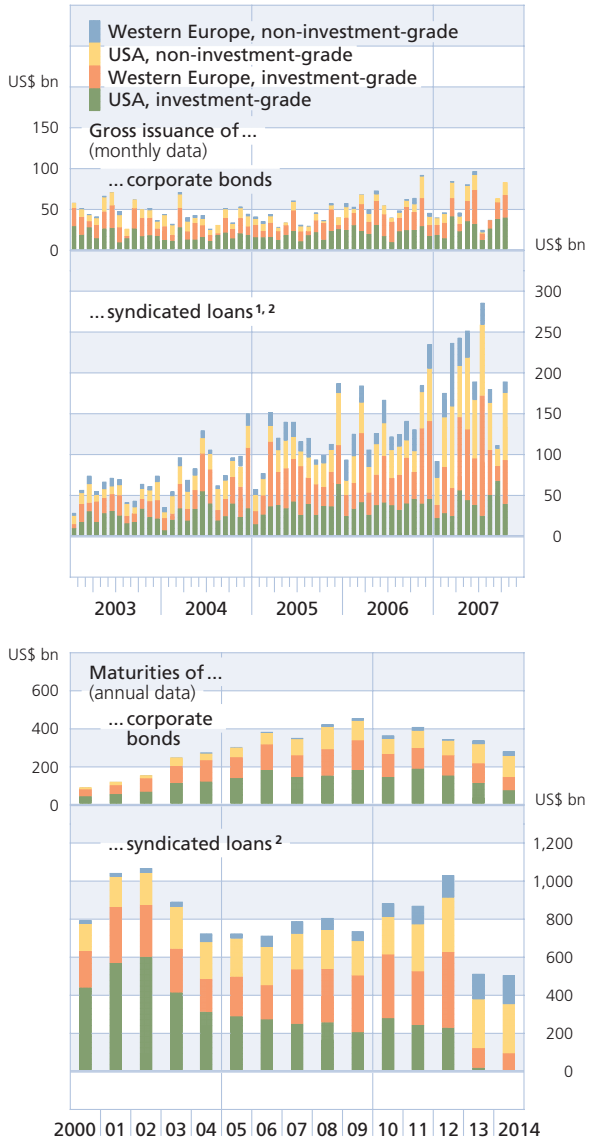
Chart 1.1.5

GROSS ISSUANCE AND MATURITIES IN THE CORPORATE CREDIT MARKETS



Source: Dealogic. — **1** Credit facilities committed by the syndicating banks, not the loans actually drawn. — **2** Non-investment-grade loans comprise leveraged and highly leveraged loans which either have received a non-investment-grade rating from S&P or Moody's or whose issue premium is more than 150 basis points higher than LIBOR.

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on the part of key non-bank investors such as managers of collateralised loan obligation (CLO) funds[15] (see Charts 1.1.5 and 1.1.6). Despite comparatively solid fundamentals in this segment, contagion effects from the US subprime mortgage market are surfacing; the deficiencies in the securitisation process there have also caused an appreciable rise in risk aversion and yield expectations among potential investors in CLO tranches.[16] Against this background, the search has begun for a new price equilibrium to the entire spectrum of tranches of CLOs – a key precondition for a sustained increase in the issuance of CLOs.

… could make it difficult for companies to roll over debt

The stronger the deterioration in the pricing terms, the more doubtful it will be that companies that have been able to obtain finance in the credit markets at very favourable terms in the recent past will be able to roll over their debt. In 2008 alone, repayments or refinancing will be due for high-risk loans as well as syndicated loans and credit lines worth a total of US$75 billion in western Europe and around US$320 billion in the USA (see Chart 1.1.5).

Terms for bank-based financing expected to worsen

Financing conditions for companies in Europe also depend to a great degree on credit institutions' future behaviour. Recent market surveys also indicate that a certain deterioration in the underlying conditions for corporate finance may be expected. However, according to these surveys, this situation is likely to be

15 CLO funds are special-purpose vehicles which purchase corporate loans, repackage them and sell them to end investors as tranches of varying credit quality.
16 There was also, for a time, a particular reluctance to invest in AAA tranches, which are typically demanded to a large extent by credit insurers (monolines), conduits and SIVs. By contrast, insurance companies, asset management firms and hedge funds are key investors in low credit quality tranches. See Citi, Who Buys What in Structured Credit?, 27 June 2007.

less strained in Germany than in the rest of the euro area (see the section on macroeconomic risks).

Company fundamentals

Company fundamentals in good shape

The current tension in the credit markets has impacted on corporate sectors in western Europe and the United States which, on the whole – despite the problems of some segments such as leveraged loans – are still in good shape.

Profitability high, leverage near average, defaults low

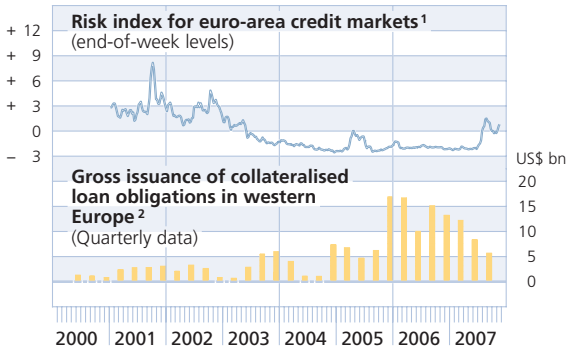
Since 2002, the profitability of listed non-financial companies has gradually improved, and the return on sales is well above its multi-year average. However, following a period of falling borrowing, beginning in 2006 the leverage of European and US companies has risen back to levels near their multi-year averages. The good overall profitability and financial situation coincided with a low incidence of payment difficulties, causing the default rate for weaker borrowers in the United States to fall to a record low of 1.1% in October 2007. The comparable default rate in Europe is at a relatively low 2.0% (see Chart 1.1.7).

Company fundamentals expected to deteriorate

There are mounting signs, however, that this positive fundamental overall situation could deteriorate somewhat. For instance, for the next 12 months, the Moody's rating agency has predicted a rise in the default rate on speculative-grade bonds to 4.0% in the United States, whereas the rate in Europe, at 2.6%, could roughly remain at its current level.[17] In addition, the low values for the cash flow-to-profit ratio in the balance sheets of German and US companies are casting doubt on the sustainability of the reported corporate profitability.

Chart 1.1.6

RISK ASSESSMENT AND DEMAND IN THE CREDIT MARKETS



Sources: Bloomberg, Dealogic and Bundesbank calculations. — **1** First common factor arising from the principal components analysis of bond spreads and their volatilities for various rating grades and the 10-year euro interest swap spread. Explained variance: 68.7%. — **2** Moving average of the previous two quarters.

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Equity market valuations

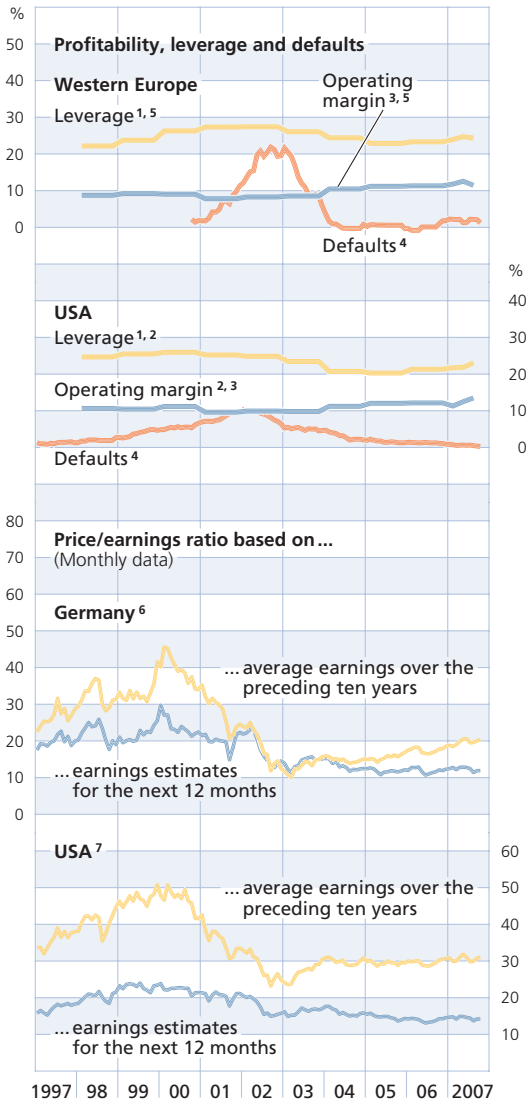
Risks in equity markets

The relatively low cash flow-to-profit ratios are also being reflected in the equity market valuation ratios. German and US enterprises have been valued moderately on the basis of current profitability estimates for the next 12 months; the price/earnings ratios for the DAX 30 and S&P 500, at 12.4 and 14.7, are below their long-term averages of 16 for each index. However, the price-to-cash flow ratios for broad market indices in Germany and the

17 See Moody's, Default Report, October 2007.

Chart 1.1.7

FUNDAMENTALS AND VALUATION OF LISTED COMPANIES



Sources: Moody's, Bloomberg and Thomson Financial Datastream. — **1** Defined as debt divided by total assets. Medians. — **2** Includes companies of the Russell 1000 Index ex Financials. — **3** Defined as EBIT divided by sales. Medians. — **4** Moving average of the previous 12 months in the non-investment-grade segment. Monthly data. — **5** Includes companies of the DJ STOXX 600 ex Financials. — **6** For the DAX 30. — **7** For the S&P 500.

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United States, at 7.1 and 11.4 respectively, are valued above their average.[18] The fact that analysts have distinctly reduced their estimates of medium-term result growth since July is also a sign that the profitability of DAX 30 companies will tail off in the future. The medium-term forecasts for S&P 500 companies, however, remain optimistic. On the whole, the valuation levels appear to be vulnerable to an increasing deterioration in economic activity.

Resilience of foreign financial institutions ...

Significant position of large and complex foreign financial institutions in the credit markets

Owing to their central role in the markets for credit risk transfers, as counterparties in the interbank and OTC derivatives market and in the provision of liquidity in the international financial system, the group of large and complex foreign financial institutions[19] requires particularly close monitoring from a financial stability perspective. Important factors include not only their considerable market influence but also potential contagion effects on the German financial system.

Stress test for risk management and business models

The financial market tension has subjected these major financial institutions' risk management and business models to a stress test.

18 The long-term averages are 4.4 for Germany and 9.7 for the United States. The calculations are based on the broad market indices for Germany and the United States calculated by Thomson Financial Datastream.
19 The foreign institutions already reviewed in earlier Bundesbank Financial Stability Reviews are ABN Amro, Bank of America, Barclays, Bear Stearns, BNP Paribas, Citigroup, Crédit 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. These institutions 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.

This is also evidenced by market indicators which, since the middle of the year, have shown a distinct rise in the risk premiums on credit default swaps for these banks and a decline in share prices given high volatility (see Chart 1.1.8). In the current state of turmoil, it is striking that the correlation between the CDS premiums of US and European financial institutions is higher than average. This shows evidence of the international character of this market disruption. It probably also reflects the market players' assessment that institutions are currently facing similar risks, albeit to varying degrees.

Appreciable rise in Value at Risk a sign of higher risks

One component in this context is the inherent risk in proprietary trading in a hostile market environment. As a case in point, aggregated Value at Risk (VaR) of trading books in the first two quarters of the year already indicated higher market risks among these institutions. Owing to the distinct rise in volatility towards mid-year and changes in the correlations of financial market prices, these VaR amounts continued to grow in the third quarter.

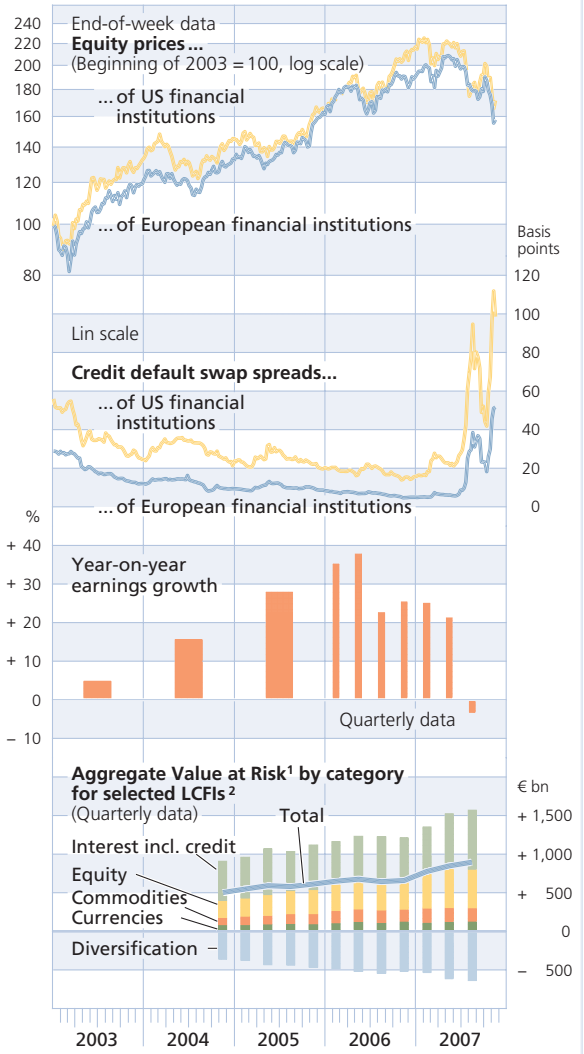
Accumulation of burdens …

Moreover, as a consequence of the market tension, the financial institutions acting as risk dealers were initially unable to sell large volumes of structured or syndicated loans (eg for leveraged buyouts) in the market (warehousing risk).[20] Since these loans can only be resold – if at all – at a huge price discount or subject to other concessions, many institutions have already taken write-downs in their latest quarterly financial statements. In addition, the

20 Market estimates pointed to a volume of around US$315 billion worth of committed but undistributed leveraged buyout loans as at October. US financial institutions accounted for around two-thirds of this figure.

Chart 1.1.8

INDICATORS OF THE RESILIENCE OF INTERNATIONAL FINANCIAL INSTITUTIONS*



Sources: Bloomberg and annual reports. — * A group of 18 institutions selected according to four criteria: the volume 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. — **1** One-day holding period, 99% confidence level. — **2** Comprises the following institutions: Bank of America, Bear Stearns, BNP Paribas, Citigroup, Crédit Agricole, Credit Suisse Group, Goldman Sachs, JP Morgan Chase, Lehman Brothers, Merrill Lynch, Morgan Stanley, Société Générale and UBS.

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extended provision of bridge finance for such exposures creates a considerable need for additional liquidity at accordingly high refinancing costs. Similar strains have been caused by the drawing of committed liquidity facilities by ABCP conduits and other investment vehicles. The extent to which this impairs the liquidity situation and the profit and loss accounts of the banks in question depends not least on how quickly the market environment calms down and to what extent unwanted exposures can be resold. In addition, the support measures for closely affiliated hedge funds by individual financial institutions, undertaken largely for reputational reasons, could hit profitability.

… yet resilience fundamentally high

The major foreign financial intermediaries are armed with a fundamentally high level of resilience with which to cope with this accumulation of burdens. This is evidenced not only by their continuously evolving risk management practices but also, above all, by the high underlying profitability they have shown in recent years, which has contributed to creating a sound capital buffer. The earnings figures that have now been presented for the third quarter likewise indicate that the recent market turbulence, despite leaving pronounced marks in the profit and loss account, has generally appeared to be manageable.

Commissions under pressure

However, the changed market setting is likely to place these institutions' profitability under pressure. This is attributable to the large share of relatively volatile sources of earnings among a segment of the banking industry. Affected are not only proprietary trading but also commission income from the underwriting of bond and share issues, consultancy in mergers and acquisitions, and prime brokerage business with hedge funds. These business areas had contributed to record profits in the past few years. A significant and fast-growing percentage of commission income has resulted from the move to an originate-to-distribute business model, particularly among US banks. Because the securitisation and structuring business has slumped, the earnings outlook for this sector hinges on a quick resolution to the crisis of confidence in the markets. In principle, it may be expected that financial institutions which are more broadly diversified in terms of their business areas will be better able to cope with the market turnaround.

… and of hedge funds

Considerable hedge fund activity in the credit markets …

The impact of hedge funds during the financial market turbulence is highly difficult to judge because of the relative opaqueness of both the industry itself and the market for credit risk transfers. Hedge funds' credit market strategies, according to rough estimates, encompass nearly one-quarter of assets under management in the industry.[21] This covers a broad range of investment strategies, from arbitrage to investments in higher-risk tranches of structured products and distressed securities.

… contributed to improved liquidity in normal market situations

In addition, market surveys show that hedge funds' share in transaction volumes in numerous financial market segments continued to rise distinctly up until and into the first few

21 See IMF, Global Financial Stability Report April 2006, p 56; Fitch Ratings, Hedge Funds: The Credit Market's New Paradigm, 5 June 2007; HFR Report Q2 2007; and Bundesbank calculations.

months of 2007.[22] For instance, in the US market, around 29% of the overall volume of fixed-income trading (including related derivatives) was accounted for by this group of investors (as against 15% in the prior 12-month period). They also made up 41% (32% a year earlier) of the market for leveraged loans and even 86% (47%) of turnover in the market for distressed debt. Trading volumes for securitised products, too, have seen a considerable presence on the part of hedge funds. They accounted for an estimated 25% of the market for ABS, around 20% of the MBS market and nearly 50% of the structured credit risk products market. To that extent, hedge funds, given a normal market environment, have helped to improve market liquidity, particularly in less liquid sub-markets.

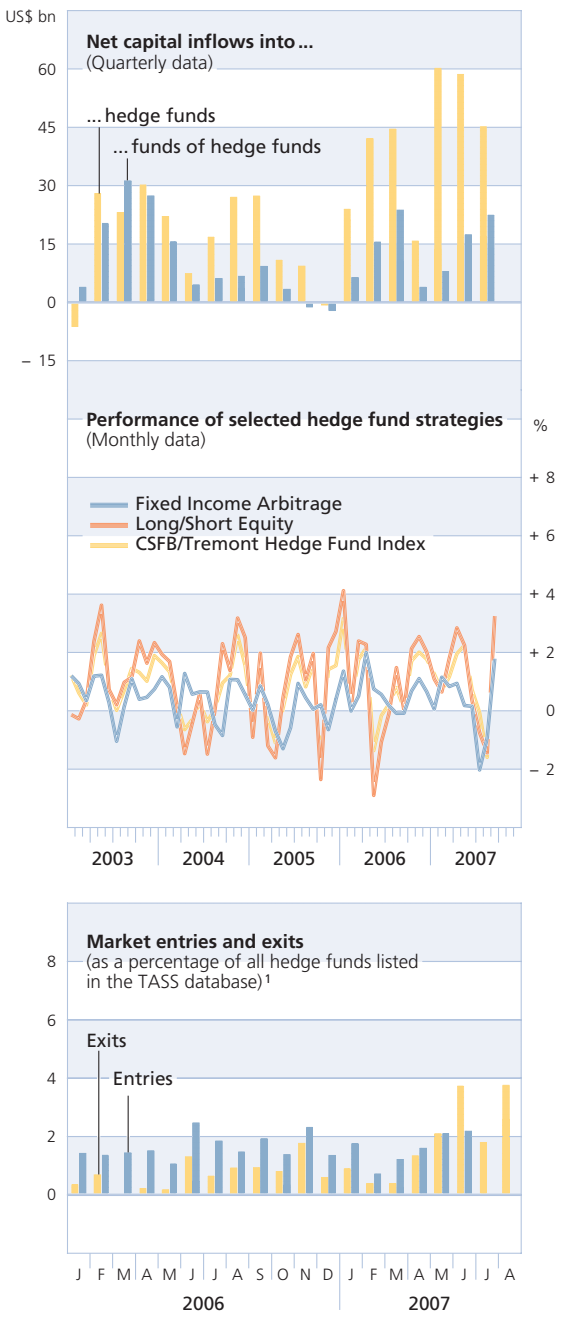
Distressed situation of individual hedge funds as a catalyst for general repricing of risks

The intensification of the market situation in the summer also put hedge funds under considerable pressure. The financial distress encountered by some hedge funds which had been focused on subprime mortgage loans acted as a catalyst for a general repricing of risks in the market. In addition, extensive deleveraging by these investors increased market volatility. Trading losses and margin calls imposed by their prime brokers had forced hedge funds to make this move. Funding liquidity risks to hedge funds also resulted from investors withdrawing funds at short notice. In distressed market situations, the ability of hedge funds to perform their ascribed role as liquidity providers is therefore very limited, if at all possible. In the meantime, hedge funds (some of which were

22 See Greenwich Associates, In US Fixed Income, Hedge Funds are the Biggest Game in Town, August 2007; Fitch Ratings, loc cit.

Chart 1.1.9

HEDGE FUND INDUSTRY



Sources: Bloomberg, HFR, TASS and Bundesbank calculations. — **1** Data are subject to constant revision, and their coverage may be incomplete at the current end.

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newly established) which purchase loans at low prices could have a stabilising effect on the securitisation markets.

Unfavourable value trends led to more funds closing than average

In this environment, most hedge fund strategies, especially credit market-related investment approaches, saw their values take a major hit in the summer months (see Chart 1.1.9). Those hedge funds that were specialised in structured financial products sustained particularly heavy losses. In addition, hedge funds have seen a marked rise in their exit rate, which is likely to be attributable to financial distress and the unfavourable profitability trend.[23] It is impossible to determine conclusively to what extent this entails risks to banks. However, as mentioned earlier, major prime brokers felt compelled to undertake support measures in individual cases for closely affiliated hedge funds.

Continue initiatives to enhance market discipline and improve transparency

Against this background, it remains necessary to push ahead with private and public sector initiatives to enhance market discipline and transparency in the hedge fund sector. A key step lies in implementing the recommendations made in spring 2007 by the Financial Stability Forum, which were endorsed by the heads of state or government at the G8 summit in Heiligendamm, Germany.[24] This includes enhancing the risk management practices of key financial intermediaries which act as the counterparties of hedge funds. Initiatives in the Anglo-Saxon countries to improve best practices in the hedge fund industry represent another step in the right direction.[25]

Macroeconomic risks

Stable macroeconomic environment amidst increased risks

Developments on the international financial markets are also affecting the macroeconomic risks for the German economy.

To evaluate the overall potential for disruption meaningfully, however, account has to be taken not only of the extent of the risk but also of risk-bearing capacity. The cyclical upturn has strengthened further: investment activity is robust, export activity is continuing to run at a very high speed, and although the fiscal burden resulting from the increase in turnover tax at the beginning of the year has curbed the general economic momentum, it did not interrupt the growth process. Private consumption has so far remained the only weak link in the chain of macroeconomic development. With the considerable progress made on the labour market and the increases in negotiated pay settlements that are now beginning to take effect, however, consumption should gather pace even though inflation has increased towards the end of the year. Overall, this means that the turbulence on the international financial markets is encountering the domestic economy in what is a comparatively favourable cyclical juncture.

Baseline scenario

As things now stand, the most plausible scenario is that the changes in the macroeconomic and financial-market-specific data set will moderately dampen overall economic growth

23 The annual exit rate for hedge funds is usually around 12%.
24 An initial progress report was presented to the G7 finance ministers and central bank governors in October.
25 A hedge fund group in the United Kingdom headed by Sir Andrew Large recently presented a consultation paper. In addition, the President's Working Group on Financial Markets in the United States has likewise initiated work which is to culminate, by the end of the year, in recommendations for hedge funds and investors.

in the coming year. However, they do not justify any fundamental change in the overall cyclical picture in the direction of a recession.

Risk factors

The following risks can be identified at present. One is that the danger of a substantial downturn in the US economy has increased while the oil markets continue to provide considerable potential for disruption. However, global imbalances have declined somewhat. This does not mean, though, that the German economy is enjoying marked tendencies towards an easing of tensions from this front. Quite the opposite: a clouding of the macroeconomic outlook in the United States and the associated change in short-term interest rate spreads have resulted in a sharp appreciation of the euro.

Additional risks from money and credit markets

The potential impact of tensions on the international money and credit markets represents a new element in the risk scenario. The real economic repercussions are difficult to foresee from today's perspective. They will be all the stronger in their effect the longer price formation in these markets is disrupted. Changes in banks' lending behaviour will probably be one of the main transmission channels to the German economy.

Risk assessment more difficult

If the risk factors cited were to become a reality, this picture of the baseline scenario would become even less favourable. It is not surprising that the cyclical slowdown becomes all the more visible the greater the accumulation of the corresponding risk factors. However, even a culmination of rising financing costs, higher exchange rates and a sharper downturn in the US economy as a result of the US real estate market would not be cause for a recessionary scenario in Germany if the shocks are plausibly calibrated.

US real estate market

Sharp cooling-down in US real estate market …

The US real estate market has cooled down substantially since peaking in summer 2005. Despite initial signs of the housing market stabilising at the end of 2006, this turned out at the beginning of 2007 to have been no more than a temporary development. The problems on the subprime mortgage market, together with the decline in overall construction work, contributed to the continuation of the slide.

For example, the number of building permits issued in summer 2007 was 41% lower than in the third quarter of 2005 while that of housing starts was down by 38%. Real housing investment was down by almost 24%. This fall in investment activity alone has reduced the US GDP growth rate by an average of ¼ percentage point per quarter since spring 2006.

… continues unabated

There is still no end in sight to the adjustment process on the real estate market. In the third quarter of 2007, for example, the number of new owner-occupied houses sold was 41% down on the third quarter of 2005; sales of existing owner-occupied houses fared only somewhat better (–25%). The resultant housing glut can clearly be seen in the high ratio of supply to demand in the case of new owner-occupied houses. In this latter segment, the corresponding interval between availability and purchase grew from 4.5 months in the third quarter of 2005 to 8.5 months in summer 2007; the time-lag for existing owner-occupied houses (single-family houses) lengthened from 4.6 months to

9.6 months. This means that in both cases the figures are far above their respective long-term averages.

Real estate prices stagnant or falling

The rising pressure from the supply side also affected real estate prices. According to the OFHEO Index, for example, the quarter-on-quarter increase in house prices decelerated from more than 3% in the second quarter of 2005 to a mere 0.1% in the second quarter of 2007. Other price indices for the US market are already indicating falling prices.

The US subprime market was the catalyst for the spillover of the adjustments on the US real estate market to other financial market segments beginning in the summer of this year. Encouraged by favourable financing conditions and the possibility of securitising the corresponding credit risks, the subprime mortgage loans issued nearly tripled in 2004-05. This probably gave the upturn on the real estate market a discernible boost at that time.

Problem of adjustable rate mortgages

Since mid-2005, however, the number of serious payment delinquencies has risen sharply, especially in the case of subprime adjustable rate mortgages (ARM). Owing to the resulting detrimental effects on borrowers' capital, the deceleration in house price increases and the falling prices in some regions curtailed options for refinancing mortgage loans. As borrowers were – in some cases – strained significantly beyond their financial capacities, the number of loan delinquencies within the first few months after concluding the contracts rose sharply.

Particularly affected here are subprime ARMs, where the percentage of delinquent loans increased within the past two years by just under seven percentage points to 17% in the second quarter of 2007. The interest rate adjustments due in the coming months will presumably result in a further rise in such delinquencies, thereby putting even more pressure on house prices.

Tighter credit standards

In the first half of 2007, many creditors reacted to the emerging problems by significantly tightening the credit standards for subprime and non-traditional mortgages. A deepening and lengthening of the downturn on the real estate market was therefore already foreseeable.

However, the more prime segments of the US mortgage market were also affected by the financial market turbulence, especially mortgages exceeding US$417,000 which may not be purchased by the semi-governmental mortgage lenders Fannie Mae and Freddie Mac. In addition, the most recent data show that banks also tightened their credit standards in the prime segment (mortgages with first-class credit ratings) over the course of the summer. Furthermore, commercial loans were subjected to stricter rules. The risk of a general and drastic lending constraint has therefore increased in the past few months.

Possible weakening of private consumption

In addition to the threat of a discernible reduction in investment lending, significantly weaker private consumption constitutes the major risk to macroeconomic growth in the United States in the coming quarters. In view of the cumulative effects of increasing defaults and foreclosures as well as stricter lending standards and stagnant or falling real estate prices on the income, wealth and confidence of consumers, the likelihood of this has grown. This is true

despite the strong growth in private consumption in the third quarter of 2007. Given the decline in personal saving to a very low level, the lack of relief through positive wealth effects will probably trigger a gradual rise in the personal saving rate and thereby act as a further curb on potential consumption.

Weaker US growth but no slide into recession

As things now stand, US GDP growth will probably remain below potential well into next year. There will probably be a time-lag in the effect of the cuts in the Fed funds rate on the real economy, and they will bring no lasting relief to the core problem on the mortgage market. Even so, there is still no reason to see the scenario of the US economy sliding into a recession as more than a risk, even though a significant slowdown following the dynamic macroeconomic development in the second and third quarters of 2007 seems possible.

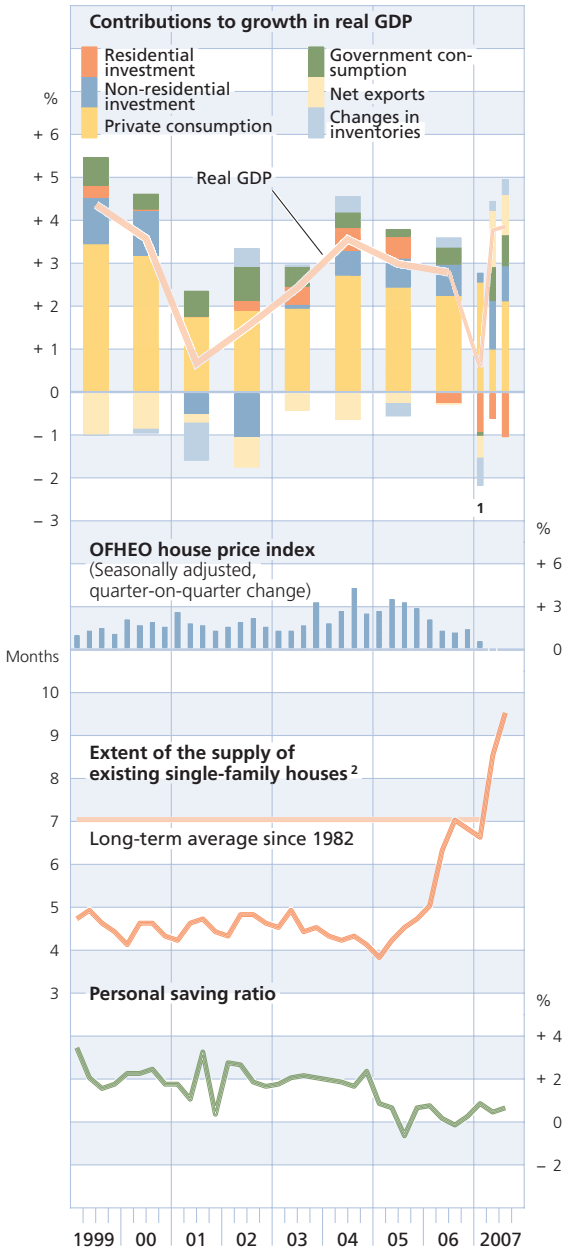
Macroeconomic effects of changes in financial market prices and credit standards

Stable starting position

The financial market turbulence emanating from the US real estate market has been a further risk factor for the real economy since the summer. Rising risk premiums, persistent tension in the interbank market and various other market segments and the threat of pressure on the profitability of commercial banks are exerting their own negative impact on the outlook for the real economy. It is extremely difficult at present to quantify the extent of these contractionary forces. Crucial factors will be further developments on the financial markets and the losses which financial market players will ultimately have to sustain.

Chart 1.1.10

US ECONOMY



Sources: Bureau of Economic Analysis, Office of Federal Housing Enterprise Oversight (OFHEO) and National Association of Realtors. — **1** From 2007, seasonally adjusted annualised quarter-on-quarter-change. — **2** Ratio of available existing single-family houses to those sold.

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Transmission channels

Generally speaking, the US financial market turbulence can affect the German financial system in the following key ways: possible contagion effects on the German mortgage market, negative effects on the direct capital market financing of corporations and repercussions for domestic bank lending to the private sector.

Low risk of spillover to domestic real estate market

There is only a slight risk that the subprime crisis will spill over directly to the German real estate and mortgage market. In contrast to many other real estate markets, including European markets, the German market is characterised by very moderate price rises and is free from the danger of overheating or the formation of a bubble. Furthermore, German lending standards for private real estate loans are stricter than in US subprime segments. Another factor is the typically long-term interest rate fixation period for mortgages in Germany. This avoids the need for borrowers to make unexpected adjustments to their monthly interest payments at short notice, a scenario which can contribute to a deepening of the crisis.

Direct capital market financing relevant for only a minority of enterprises

Direct financing via the financial markets is relevant for only a minority of enterprises in Germany. To date, the effects on corporate financing have also seemed manageable, on the whole. The widening of corporate bond spreads, particularly for low credit ratings, is at least partly to be seen as a return to normal following overly optimistic risk assessments. Overall, the direct impact felt by most of the enterprises that finance themselves on the capital market is likely to be restricted to tolerable spread increases. However, opportunities for new issues seem to have shrunk; this is particularly true of securities of a low credit quality (see the section on financing conditions).

Mainly lending activity of involved institutions affected

Strains on the capital base, increased refinancing costs and heightened risk aversion are the effects which banks may expect to feel. Those institutions directly affected by the market distortions through their direct and indirect exposures in the ABCP markets – in this case, primarily securities from US subprime real estate markets – might alter their lending behaviour more distinctly as a consequence.

Strains on capital base

The critical exposures of directly affected institutions are reflected in strains on their income statement or their capital base. On the one hand, valuation losses are having a direct impact on profits or capital, depending on the accounting approach used. On the other, the – in some cases very large – assumptions of assets or commercial paper from their conduits and undistributed syndicated loans are placing an additional burden on the capital position in their own books through an increase in risk-weighted assets. At the same time, the usual relief afforded through the sale or securitisation of assets is largely unavailable for precisely those segments which are critical.

Increased refinancing costs

In addition, there has been an increase in banks' refinancing costs, at least part of which they are likely to pass on to their customers. This, in turn, will have a more marked impact on institutions directly involved in ABCP markets. Owing to their business models, they are typically more reliant on refinancing their asset-side business on the market than savings banks and credit cooperatives, for example, which are refinanced to a significantly larger

degree through deposit business. Moreover, their usual refinancing structures depend to a greater extent on markets which currently have higher risk premiums.

Restrictions on the availability of credit for only a few segments

In principle, these developments could have repercussions for banks' lending to the private sector. However, a more significant tightening of credit standards and quantitative restrictions are likely to affect only a few segments. It should thus be assumed that the dampening effects will be felt primarily among companies active in the capital market. Restrictions in the availability of credit in this segment are to be expected, mainly for larger buyout financing and real estate projects. By contrast, small and medium-sized enterprises should hardly experience any restrictions in the availability of credit.[26]

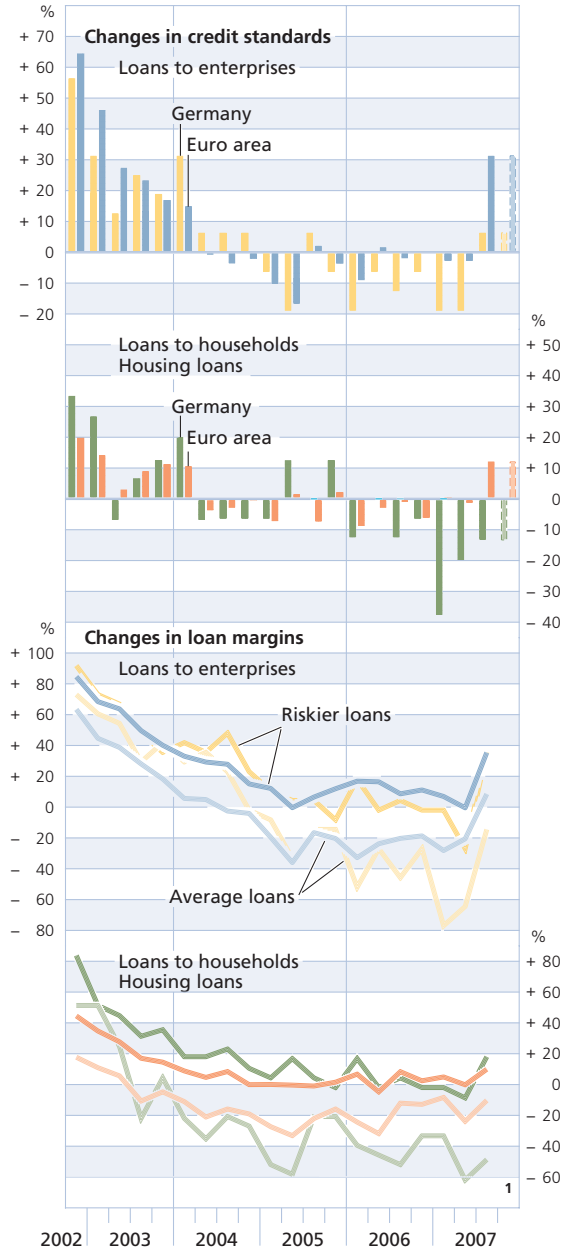
Limited effects on lending to private sector

In this respect, it should be borne in mind that strong profitability is currently allowing domestic non-financial corporations to finance a large part of their investments internally. Overall, possible financing restrictions would come at a time when business prospects for enterprises are good and no large demand-side cuts in investment are expected in the short term. Credit standards for households should also barely be affected by the current turmoil in the financial markets. Apart from the possible impact on the conditions for riskier loans in particular, these hotly contested retail segments are unlikely to be affected by restrictions in institutions' willingness to grant loans (see Chart 1.1.11). As things stand,

26 This view is also supported by data from banks recorded in the Bank Lending Survey in response to relevant ad hoc questions; see Deutsche Bundesbank, Monthly Report, November 2007 and detailed survey results at http://www.bundesbank.de/download/volkswirtschaft/publikationen/vo_bank_lending_survey_adhoc.pdf.

Chart 1.1.11

BANK LENDING SURVEY*



***** Percentage difference between the numbers of respondents reporting "tightened considerably" and "tightened somewhat" and the numbers of respondents reporting "eased somewhat" and "eased considerably". — **1** Expectations for Q4.

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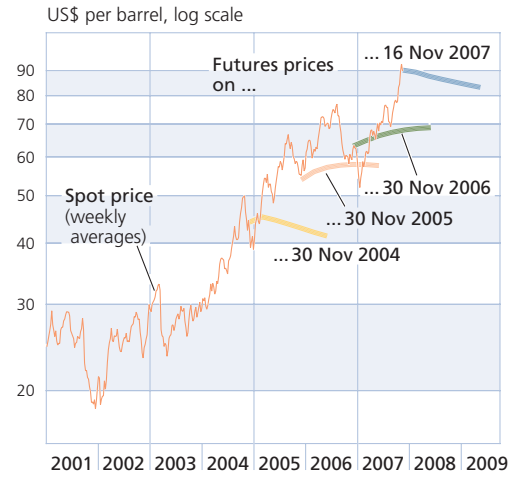
Chart 1.1.12

CRUDE OIL PRICES*



Sources: Thomson Financial Datastream and Global Insight. — * Spot price and futures contract prices for Brent crude oil.

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there is therefore no reason to fear a fall in demand caused by a lack of credit provision from banks either in the residential real estate sector or in private consumption.

Spillover channel poses limited macro risks

In summary, the macroeconomic slowdown owing to spillover effects from the financial and credit markets should have only a moderate dampening effect on the cyclical upturn in Germany. Although increased refinancing costs are broadly affecting banks and will make credit financing more expensive if passed on, this should not have a strong impact on credit growth given the low interest elasticity of credit demand and the less-than-dramatic increase in the short-term segment. In addition, the process of differentiation between debtors according to their credit rating is likely to continue. However, this should not cause a lasting reduction in long-term investments for most enterprises. Finally, another risk alongside price responsiveness of banks is that they may place restrictions on the volume of lending. Nevertheless, this would affect first and foremost those institutions involved in securitisation activities, mainly in the corresponding lending categories. "Bread and butter" corporate lending, which broadly influences the German economy's investment outlook, will probably be less affected by this. However, the extent to which the greater significance of this channel in other European economies will have additional repercussions for the German economy cannot yet be reliably assessed.

Oil prices

Visible increase in crude oil prices

Crude oil prices have risen sharply following their latest trough in January 2007. The price of Brent crude oil fluctuated above the US$90 mark in the first half of November, thus exceeding January's level by almost 70%. In euro terms, however, the oil price rise was dampened somewhat by the strong appreciation of the euro. At the end of the period under review, the price of Brent crude oil was €62½, compared with €40 in mid-January 2007.

Forward quotations also up

A sharp rise was also experienced in forward quotations, although not to the same extent as the spot price. Forward premiums (contango) thus became forward discounts (backwardation), which have expanded significantly over the past few weeks. Medium-term (six-month) and longer-term (18-month) deliveries were quoted at a discount on the spot price

of US$2¾ and US$7¼, respectively. This could indicate that tension in the markets is expected to ease slightly.

Background of price movements

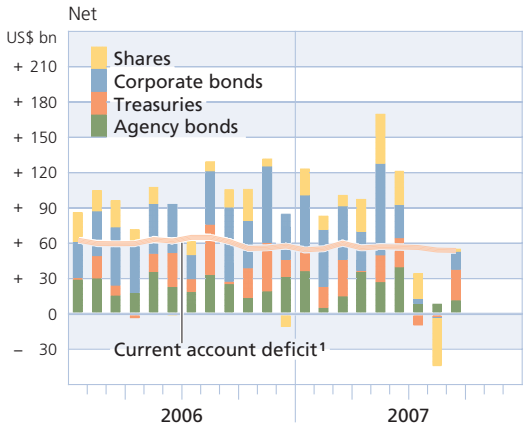
The most recent increase in prices was caused by the geopolitical conflicts that have recently returned to the fore and the in some cases surprising reduction in US crude oil inventories. This could indicate a situation of short supply, which has apparently not been mitigated significantly by the rise in the OPEC's production quotas on 1 November.

Uncertainties remain

In such an environment, further price upswings owing, for example, to increased geopolitical conflicts or unfavourable weather conditions cannot be ruled out. On the other hand, the economic slowdown in the United States and the more moderate pace in other industrial countries indicate that a phase of somewhat weaker growth in oil demand is approaching, at least temporarily. In the medium term, there are signs of a certain easing in that a sizeable extension of additional refinery capacities is planned. However, as this will be implemented by means of a few large projects, bottlenecks in the production of petroleum products cannot be ruled out in the event of delays. The refinery margins were comparatively low in summer 2007, which temporarily weakened the impact of high oil prices on consumer prices. However, a process of normalisation has recently begun.

Chart 1.1.13

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



Sources: US Treasury Department and Bureau of Economic Analysis. — * Portfolio investment in the US. — 1 Excluding income and current transfers.

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Global imbalances

Decline in US current account deficit for the first time since 2001

In view of the global imbalances, there was a slight easing of the situation in 2007. There was even a reduction in the US current account deficit for the first time since 2001. The more subdued import demand in the United States and the effective depreciation of the US dollar were major factors behind this development.

The correction of the US dollar's exchange rates over the year, however, did not take place across the board, but rather primarily against the euro (9¾%) and the Canadian dollar (15¾%). In particular, the Asian currencies' exchange rates against the US dollar were significantly less flexible. Here, the accumulation of reserves continued.

Appreciation of euro as a risk factor

From the start of the third quarter of 2007, there has been an increase in the risk of a further marked appreciation of the euro owing to the effects of the US mortgage crisis and

Box 1.5

HAS THE MARKET ENVIRONMENT FOR CARRY TRADES CHANGED?

Carry trades are relevant for financial stability especially to the extent that their disorderly unwinding could be reflected in extreme exchange rate movements and major asset losses. This centres on two risk factors, which could also occur in other financial market segments. Firstly, the strong leverage of trading positions using derivatives or credit financing and, secondly, the intrinsic momentum of widely-used strategies (crowded trades) that market participants possibly underestimate.

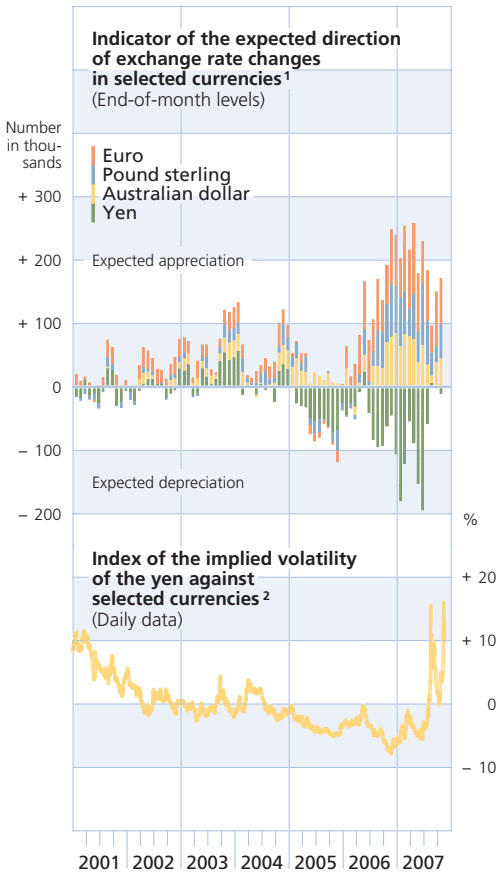
No reliable data are available on the overall volume of carry trades, for which different instruments can be used. This is especially true for the amount of leverage used, for instance by hedge funds that are active in this area. Irrespective of the quantification difficulties involved, the long period over which exceptionally high yields have been achieved with simple currency carry trade strategies – even without leverage – is reason enough to be more vigilant. In addition, the surge in volatility in foreign exchange markets in August marked at least a break in the multi-year trend of lower exchange rate fluctuations.

Looking back, the conditions for currency carry trades were exceptionally favourable from the end of 2004 until June 2007. On the financing side, there was a liquid currency available at money market rates of below 1%: the yen. On the investment side, there were numerous currencies with high money market interest rates or attractive prospects of value gains with riskier assets. Yields could be increased beyond the mere difference in interest rates by investors also profiting from the depreciation of the yen against high-interest currencies.

The abrupt appreciation of the yen against these currencies in August points to at least a partial unwinding of carry trades. For example, the yen shot up by 10% against the Australian dollar in one day. If the increase in implied volatility – which determines the costs of hedging currency risks – proves to be of a lasting nature, carry trades would become significantly less attractive even if the interest rate differentials between the currency areas were to persist.

Carry trades seem to be particularly susceptible to a slowdown in global growth. In this case, a general increase in risk premiums in the financial markets could be linked to a greater volatility of currencies and, at the same time, lower expectations of asset value growth in investment countries. The exact point at which the ratio of financing costs and yield prospects becomes so unattractive for a critical number of investors that this triggers a massive unwinding can, however, hardly be foreseen.

MARKET INDICATORS FOR THE CARRY TRADE ENVIRONMENT



1 Number of net long and short futures contracts on the Chicago Mercantile Exchange that are classified as being for "non-commercial" trading purposes. — **2** First common factor of the principal component from the implied three-month volatilities of the yen against the Australian dollar, pound sterling, euro and US dollar.

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corresponding fears of a continued slowdown in growth in the United States. However, to date the exchange rate movements have fitted the pattern of an anticipated adjustment to higher risk premiums on investments in US dollars. However, a regionally broadly based depreciation of the US dollar would be an important adjustment channel for a gradual correction of global imbalances.

Mortgage crisis not caused by global imbalances

Although the mortgage crisis was not itself caused by global imbalances, the preceding boom in real estate prices certainly contributed to the growing US current account deficit owing to diminished savings and buoyant consumption.

However, the mortgage crisis also coincided with concerns in the second half of the year that the US capital market could be adversely affected by the turmoil and may no longer be considered such a safe haven. In particular, there are fears that a further intensification of the mortgage crisis could cause foreign investors to withdraw from risky financial segments, leading to a disorderly depreciation of the US dollar. In this context, debate on the importance of carry trades to developments in the forex markets is continuing (see Box 1.5 on page 44).

Stability situation in the German banking system

Test of resilience

The turmoil in the international credit markets has subjected certain segments of the German banking system to a real test of resilience. The causes of the distortions lie in the affected credit markets themselves, particularly the US mortgage market and the structured securitisations market. The quality of the securitisations was negatively affected by misguided incentives in lending and in assessing the creditworthiness. This occurred in the context of a high demand from investors, who underestimated the risk content, particularly of highly rated tranches, with regard to liquidity, the correlation structure of individual tranches and a possible rating migration.

Credit crisis led to liquidity risk

However, the credit market crisis spilled over with unexpected speed and force into the money markets and thus reached the core sphere of stability of the global banking and financial system. Considerable uncertainty in the money markets led to a liquidity squeeze, particularly during the latter part of the third quarter. On the one hand, banks were unsure about the volume of their own liquidity needs, as it was difficult to assess what liquidity burdens they would face and how long the liquidity shortage would last. On the other hand, transparency deficits engendered mistrust about the liquidity and credit quality situation of other market participants. Thus, alongside the direct question of the need for writedowns in the securities portfolios, the crisis in the international credit markets soon turned into a serious liquidity problem.

Stable refinancing basis…

Owing to its financing structure, the German banking system is comparatively resilient to disruptions in the interbank market. The liabilities side of the balance sheets is traditionally broadly diversified, with a high proportion of customer deposits, and thus overall it has a stable refinancing basis. Moreover, the amount by which loans to non-banks exceed deposits is marginal. This also reflects the fact that credit growth in Germany has been relatively moderate in recent years, particularly compared with countries whose real estate market has undergone a strong expansion.

…but considerable liquidity commitments

However, some banks have assumed considerable liquidity commitments to off-balance-sheet vehicles. These special-purpose vehicles (SPVs) differ greatly on the assets side as regards the quality of their receivables. Only some of the SPVs have assets connected to the US subprime mortgage market. A point that they all have in common is that they have predominantly invested in investment-grade instruments.

A first systemic element appeared when investors in money market paper, which all SPVs use to refinance themselves, no longer differentiated sufficiently between different degrees of credit quality. Insofar as the refinancing of more and more conduits faltered or dried up completely, these banks felt compelled to provide liquidity, either by temporarily purchasing revolving money market paper themselves or by taking securities onto their own bank balance sheet. In two cases, these liquidity

Box 1.6

CAPITAL BACKING AND LARGE EXPOSURE RULES FOR LIQUIDITY FACILITIES IN CONNECTION WITH OFF-BALANCE-SHEET VEHICLES

Credit and financial services institutions are the direct addressees of the regulations on capital backing requirements and large exposure rules. Owing to their structure, special-purpose vehicles (SPVs) are typically not classified as institutions and so the regulations only cover direct risk exposures to SPVs – for example liquidity facilities – and not risk positions held by the SPV itself.

Owing to the transitional period for introducing Basel II, institutions may still apply the general regulations of Principle I until the end of 2007 for meeting the capital backing requirements for liquidity lines. They stipulate that credit lines have to be backed by capital only if they cannot be terminated without notice and unconditionally and have an original maturity of more than a year. In this case 50% of the valuation base of credit lines is counted towards the capital requirements (prudential conversion factor). In the past, liquidity lines were typically provided with a maturity of 364 days, so that they did not have to be included in the capital charge.

The introduction of the Solvency Regulation/Basel II capital framework, with which all institutions are required to comply as from 1 January 2008, has largely abolished the zero weighting for short-term credit lines. For example, in the Credit Risk Standardised Approach (CRSA) credit lines that cannot be terminated without notice and unconditionally at any time are subject to a conversion factor of 20% if they have a maturity of up to one year or of 50% if they have a maturity of more than a year. In the IRB approach, the conversion factor amounts to 75%, irrespective of the maturity.

These general rules are complemented by special rules for the capital backing of liquidity facilities which an institution enters into in the context of securitisation transactions, including corresponding conversion factors, which map the probability of utilisation arising from a given tranche. The risk weight, which is also relevant for the amount of the capital charge, depends on the external credit assessment and the measurement approach used by the institution (standardised or IRB approach).

The future capital rules in connection with large exposures likewise differ from the *status quo*. Up to now, only credit lines with an original maturity of more than a year have had to be included in the calculation of the aggregate large exposure limit.

By contrast, the new rules stipulate that 50% of credit lines with a maturity of up to one year must be counted towards the individual and aggregate large exposure limits. Only credit lines that can be immediately terminated and whose utilisation does not produce a large exposure excess amount can be disregarded. These regulatory changes mean that the rules for backing credit lines with capital are now differentiated in a more risk-sensitive manner and tightened as regards counting credit lines towards the aggregate large exposure limit. However, whether the 50% capital charge for credit lines within the large exposure regime really is risk-appropriate is a question that is already being discussed at CEBS level.

Furthermore, for the majority of purchasing enterprises there arises the question of the formation of single borrower units. The existing regulation in section 19 (2) of the German Banking Act is focused on a direct controlling influence[1] or, alternatively, mutual financial interdependencies. Therefore, the approach is oriented directly to company-law provisions or contractual obligations but does not encompass the effect of third factors, such as comparable risk profiles or similarities in the economic content of the borrowing entities' structures. Thus, there is ultimately no aggregation into a single borrower unit in such cases.

Overall the rules stipulated in Basel II represent considerable improvements in the prudential assessment of existing risks – both with regard to capital backing and the large exposure regime. Furthermore, in future, within the framework of the supervisory review process, there will be additional discretionary regulatory scope to impose higher capital requirements. The disclosure requirements recently introduced within the framework of Pillar 3 constitute a further disciplinary factor: particularly in connection with off-balance-sheet vehicles and securitisation transactions, the comprehensive qualitative and quantitative disclosure requirements should lead to a completely new quality of market transparency. Against this background, any further-going regulatory amendments that may be necessary should be considered with circumspection and moderation.

1 The Banking Act contains the – nationally more stringent – provision of an irrefutable statutory presumption of the need for aggregation in certain company-law constellations (eg majority ownership).

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facilities were excessive compared with the size of the institution. The entry into force of Basel II and the amended version of the Regulation governing large exposures and loans of €1.5 million or more (*Gross- und Millionenkreditverordnung*) has introduced important changes into the regulatory framework with regard to the treatment of liquidity facilities. In future, liquidity facilities and credit lines will be taken into account to a greater extent in measuring capital adequacy (see Box 1.6 on page 47).

Stability maintained

The liquidity squeeze and the international credit crisis revealed individual institution-specific vulnerabilities which necessitated rigorous intervention by the owners and other banks or banking groups. Nevertheless, the German banking system remained fully functional and stable at all times. A notable risk-bearing capacity is in place for absorbing the losses that are likely to result from the corrections in individual market segments – especially in the case of structured securities and risky syndicated loans. Although the results of the big, internationally active banks are likely to be adversely affected in the second half of 2007, their performance and risk-bearing capacity have improved continuously since 2003, which means that their profitability and financial base are adequate for coping with this.

The liquidity situation has proved satisfactory even under difficult market conditions, as the following liquidity risk stress tests show. Furthermore, the German institutions possess large pools of collateral that they can mobilise for refinancing at the Bundesbank (see Box 1.4 on pages 26 and 27).

Vulnerabilities

However, the results of the stress tests also indicate vulnerabilities. Some institutions still need to develop and implement operationally sustainable business models that provide them with adequately stable sources of income which they can then use as a basis for engaging in additional lines of business promising higher returns but which are correspondingly risky and volatile. Where this does not appear possible on an adequate scale owing to tough competition or the segmentation in the German banking market, commercially-oriented consolidation measures might prove conducive to fostering financial stability.

Liquidity risk stress tests

Liquidity risk stress tests to quantify market liquidity and refinancing risks

In addition to the stress test analyses based on prudential reporting data, in 2007 the Bundesbank, for the first time, conducted a survey of large internationally active institutions on the results of certain liquidity risk scenarios. The twelve participating banks calculated the effects that the scenarios listed below would have on liquidity, based on their internal methods for measuring and managing liquidity risk.[1]

- Scenario 1: rating downgrade by two notches.
- Scenario 2: "market crisis"; negative market development, limited to one financial market (which is significant for the institution concerned).

1 These methods are not based on stochastic models, as are used, for example, in credit risk, but rather on a gap analysis, ie matching inflows and outflows of liquid assets over time (maturity mismatch approach). At the same time, a stock of liquid assets is retained which, if required, can quickly be liquidated (stock approach). In some areas, for example the modelling of derivatives, stochastic models are also used.

Box 1.7

CONSOLIDATION OF SPECIAL-PURPOSE VEHICLES

Credit institutions may be required to consolidate special-purpose vehicles (SPVs) on two legal counts. First, the respective provisions of the German Commercial Code establish a possible consolidation requirement.[1] In addition, consolidation requirements can arise on prudential grounds pursuant to the provisions of the German Banking Act.

The consolidation requirement in accordance with the provisions of the Commercial Code is based on the ability to control a company (control concept); company-law relationships such as a participating interest (presumption of a participating interest from 20% upwards) in conjunction with single management or other possibilities of controlling a company (majority voting rights, right to appoint board members or contractual control rights) serve as criteria for a consolidation requirement. However, the legal status of most off-balance-sheet vehicles – which are normally set up as foundations – does not generally fall within these criteria.

The IAS/IFRS contain more broadly defined consolidation rules. Besides comparable general rules pursuant to IAS 27, additional provisions apply in SIC-12. These basically focus on the consideration of economic circumstances and links. According to this, a consolidation requirement can also be triggered by a corresponding orientation of a special-purpose entity (SPE) to serve the interests of an institution (particularly in relation to – also implicitly – taking on risks) and by the retention of a majority of residual and ownership risks or assets by the institution. Meeting one of these criteria suffices. A qualifying stipulation is that the circumstances must be assessed on a case-by-case basis, taking into account all of the relevant factors.[2] Often the respective vehicles are designed in such a way that a plurality of companies and entities are involved. This can intentionally lead to a multi-layered division of risk and returns, so as to avoid a consolidation requirement.

It is likewise against this regulatory backdrop that the provision of liquidity facilities to special-purpose vehicles must be assessed, from which additional aspects for a consolidation requirement may arise. This may be the case if the individual contractual agreement stipulates an acquisition of assets if the credit line is drawn on. Under IAS/IFRS, a consolidation requirement for the SPV may also arise if, in the context of purchasing ABCP[3] of sponsored SPVs itself, the bank becomes the primary risk bearer or takes over the SPV's first-loss piece. Such a takeover of subordinate tranches is likely to be of particular relevance for structured investment vehicles (SIVs) as – in contrast to ABCP conduits – their liabilities side is structured, ie they issue refinancing instruments with different degrees of subordination. Changes in market data can also lead to a reappraisal of the consolidation requirement. Thus, for example, a recalculation of the expected losses of a securitised portfolio can result in a clear shift in the distribution of risk and trigger a consolidation requirement for the party concerned.

The prudential consolidation requirement, while taking as its starting point the company law provisions of the Commercial Code, focuses primarily on enterprises in the particular guise of an institution, which usually does not embrace SPVs. Whereas the European Banking Directive[4] grants the competent national authorities discretionary scope in assuming a parent company/subsidiary relationship if a controlling influence is exercised, pursuant to section 1 (7) of the Banking Act the mere possibility of exercising influence suffices. In practice, however, this definition of consolidation, too, falls short of the target because of the individual legal design of SPVs, which typically prevents a legally unchallengeable assessment of exercising an influence. The German legislators are currently considering extending the consolidation requirements within the framework of the Commercial Code.[5]

1 The use of IAS/IFRS is compulsory for EU companies active in the capital market – this routinely applies to companies that have listed their own shares on the stock exchange – for the financial years from 2005 onwards. For companies which only have debt securities listed on the stock exchange or which already use other international accounting rules, IAS/IFRS is compulsory from the financial year 2007. Just under half of the large institutions in Germany currently already use IAS/IFRS to compile their financial statements. — **2** This shifts the focus from a rules-based consolidation requirement to one resulting from the individual contractual agreements. — **3** Asset-backed commercial paper. — **4** Article 4 No 12 and 13 of Directive 2006/48/EC of the European Parliament and of the Council of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions (recast). — **5** See current draft law modernising the Commercial Code (Act Modernising Accounting Law – Bilanzrechtsmodernisierungsgesetz).

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– Scenario 3: combination of scenarios 1 and 2.
– Scenario 4: "systemic shock"; crisis in an important financial market with spillover effects on other markets.
– Scenario 5: operational problems with a strong bearing on the liquidity position.[2]

The scenarios were deliberately kept general so that they could be tailored to each institution's business profile and calculated using methods that already exist internally.

Drawing on credit lines and securitisation liquidity facilities emerge as relevant liquidity risk drivers

The key liquidity risk drivers that the participating banks consider in the stress tests are the likelihood of drawings on credit lines and liquidity facilities granted to ABCP conduits, the wholesale refinancing capacity, customer deposits and the degree of liquidity of assets held for trading. Further liquidity risk drivers are, for example, rollover ratios in various product classes, the sales prospects of capital market issues and defaults on expected incoming payments.

Positive net liquidity position even after occurrence of stress scenarios

According to the information provided by the institutions, in all cases the liquidity risk stress tests that were conducted within the survey resulted in a positive net liquidity position and thus the banks' liquidity was assured in the scenarios considered.[3]

As expected, systemic crises trigger the most serious consequences

As expected, for most of the banks that took part in the survey the "systemic shock" scenario produced the biggest decrease in the net liquidity position, followed by scenario 2, "market crisis". It is difficult to make a comparison with the combined scenario, as some banks only considered the market crisis scenario and not the combined scenario. The "rating downgrade" scenario did not turn out to be the most serious scenario for any of the institutions.[4]

Survey gave valuable insights into the institutions' liquidity risk management

Although, as a pilot project, the stress test survey has its limitations, it sent a reassuring message with regard to the liquidity situation of the twelve participating banks. Furthermore, noteworthy findings emerged concerning the methods used by the institutions for measuring and managing liquidity risk, the stress test assumptions and the liquidity-relevant risk factors. By expanding the range of participating institutions, future stress test surveys could be of even greater informative value for the banking system.

Current financial market turmoil largely taken into account in stress test assumptions

As the survey was conducted before the turbulence broke out in the international financial markets, these developments could not be reflected in the quantitative results. However, it was clear from interviews with the institutions that the majority of them continuously include current market developments, such as increased drawings on liquidity facilities and credit lines granted to conduits, in their internal stress tests.

Stress test assumptions predominantly appropriate

The institutions' stress test assumptions can predominately be regarded as conservative, such as some institutions' assumption of a hundred per cent prolongation of maturing loans or the non-availability of uncollateralised refinancing during a stress event.

2 In addition, a baseline scenario (showing the liquidity position under normal business conditions) was to be calculated to assess the relative effects of the stress tests.
3 The individual results were not aggregated as the scenarios took on different bank-specific forms which impaired the comparability of the results.
4 None of the participating banks provided data for scenario 5 "operational problems".

Stress tests based on prudential reporting data

In addition to the liquidity risk stress test survey of twelve institutions presented above, the Bundesbank continuously analyses the implications of certain liquidity risk scenarios using prudential reporting data under the Liquidity Regulation (*Liquiditätsverordnung)* and Principle II (*Grundsatz* II).[5] A check is carried out on whether individual scenarios lead to a violation of the liquidity requirement, ie to a regulatory liquidity ratio of less than 1. This liquidity ratio is defined as a quotient of the liquid resources available within a month and the corresponding payment obligations expected in this period.

The stress test results show that in most cases the liquidity requirement is overfulfilled even after the occurrence of the scenarios. On average, the liquidity ratio is well above the regulatory benchmark of 1. Over the last three years, the ratio has fallen slightly on average. However, it should be noted that the reporting data used do not contain all of the variables needed to quantify the liquidity risks and thus the data only permit an initial assessment of an institution's liquidity position.

Liquidity in the money market funds segment

General uncertainty among financial market participants in connection with the US subprime segment also had an impact on parts of the investment fund industry. In particular, fund segments that had invested in asset-backed or riskier fixed-income securities were affected.

Inflows of resources in first half of the year

Money market funds[6] invest part of their financial resources, to varying extents, in asset-backed paper such as mortgage-backed securities (MBS) and collateralised debt obligations (CDO) in order to achieve a better rate of return compared with the market interest rate. In contrast to other fund segments, the group of money market funds recorded significant inflows of resources in the first half of this year. However, in recent months, the fact that the instruments in which numerous money market funds invested part of their financial resources have been particularly affected by the repercussions of the financial market turmoil has proved problematic. For some funds this was reflected in both a poorer performance and a weaker inflow of resources. A significant outflow of resources is actually observable at the current juncture (see Chart 1.2.1). As well as the weaker performance, the increased liquidity needs of many investors may have been another key factor in this. However, as most of the pure or near money market funds had sufficient cash holdings or a sizeable stock of lastingly liquid securities, they were regularly able to accommodate investors' wishes to redeem units. This situation has since stabilised significantly.

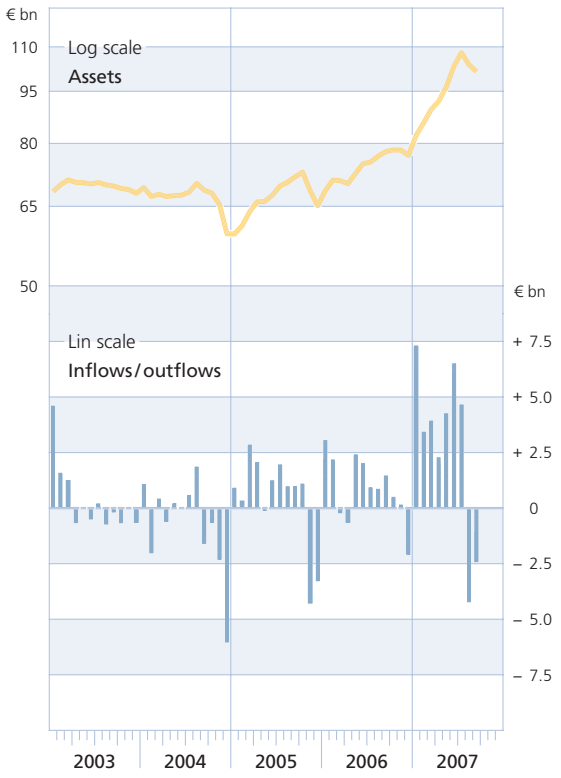
Limited redemption opportunities for ABS fund units

However, the category of ABS funds,[7] which typically invest a particularly high proportion of their resources in asset-backed securities, was affected more greatly and more lastingly. The drying up of the market liquidity of many se-

5 On account of the current transition phase, at present most of the reports are still based on Principle II.
6 The funds must meet certain criteria in order to be assigned to the group of money market funds. These are defined by the Federal Financial Supervisory Authority (BaFin) in the guideline "Richtlinie zur Festlegung von Fondskategorien gemäß §4 Abs. 2 InvG". It states that at least 85% of the investment fund's value must be invested in money market instruments and bank deposits – with a maximum maturity of 12 months in each case – and in money market fund shares.
7 Classification of funds with a high proportion of asset-backed securities based on different sources (including BVI (Federal Association of German Investment and Asset Management Companies), Bloomberg).

Chart 1.2.1

MONEY MARKET FUNDS DISTRIBUTED IN GERMANY



Source: Federal Association of German Investment and Asset Management Companies (Bundesverband Investment und Asset Management e.V.).

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curitisations, which occurred in the third quarter within a very short space of time, made it more difficult for the funds to price and unwind positions. Consequently, some mutual funds decided to suspend the issuing and redeeming of mutual fund shares or to incorporate some securities into their own books, so as to avoid having to offload positions in the market. At times, roughly half of the assets of the ABS funds in Germany considered here were subject to redemption constraints. There were nevertheless considerable outflows from this fund segment. Between the beginning of July and the end of September, the fund volume of the ABS funds under consideration fell by a total of over 30%. A comparison of the development of the price and volume of individual funds on the reference date reveals a significant increase in variability, with higher outflows and price markdowns prevailing (see Chart 1.2.2). However, the chart also clearly shows that not all funds were affected in equal measure. Amongst other things, this is accounted for by differences in the investment focus and customer structure.

Both retail[8] and institutional investors, including banks, who had invested financial resources in this category of funds were affected by the consequences. They were firstly denied access to supposedly liquid assets. This proves to be particularly problematic if large parts of their individual liquidity reserves are invested in this asset class. Secondly, investors sustained some perceptible losses in the value of the funds in what is perceived to be an extremely safe market segment (at their peak, losses for individual funds reached over 30% comparing the highest and lowest levels in 2007). However, there was and still is considerable uncertainty with regard to the adequate valuation of some asset-backed securities, which also makes it difficult to quote a price for mutual fund shares.

Funds demand securitised assets

However, in addition to the direct effects on the fund investors, there are also implications for financial stability as a whole. As described

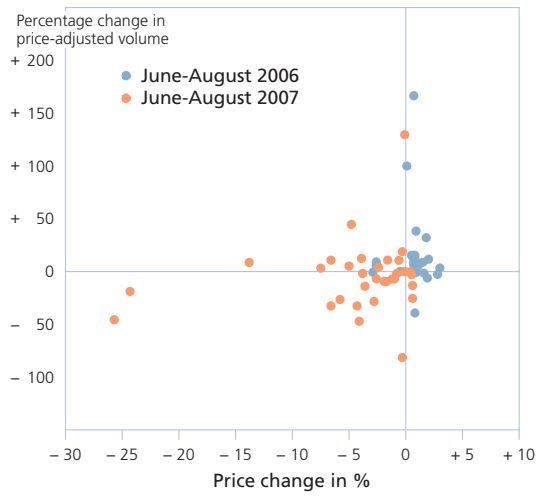
8 According to data from the BVI, German investors have invested roughly €4 billion in ABS funds.

at the beginning of this section, money market funds often demand securitised assets. If money market funds are now forced to divest these securities or no longer purchase them, an important purchaser of these securitisations will be lost. If more investors subsequently shy away from these securities, it will become more and more difficult to carry on trading in these securitisation instruments or to place new transactions in the market.

Other bond-based fund segments that invested in higher interest-bearing securities also suffered losses, particularly in performance. There were periods of tight liquidity, in particular for fixed-income securities from the emerging market and the high-yield investment segments. However, up to now, individual funds have been able to cope well with these temporary constraints in the marketability of some paper.

Chart 1.2.2

SELECTED ABS FUNDS: PERFORMANCE AND VOLUME



Source: Bloomberg and Bundesbank calculations.

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Credit risks

Financial position of German enterprises

Slight rise in enterprises' level of debt

German enterprises are in a sound condition. They have an improved capacity to generate internal funds, which provides them with a basis for sound growth. Nevertheless, there are initial signs of a flattening-out of the consolidation course which has been pursued since 2003. For example, there was a slight rise in the level of debt again for the first time in three years. In relation to gross value added, the leverage ratio is still at somewhat over 150% and, in 2006, was back at the 2004 level. (see Chart 1.2.3). The net interest burden also increased marginally against the backdrop of rising interest rates for German enterprises, although it is still significantly lower than at the beginning of the 1990s.

Further decline in corporate insolvencies

There was a further decline in corporate insolvencies; year-on-year, they fell by 18% in 2006 and by a further 11% in the first half of 2007 (see Chart 1.2.4). This confirms the improved condition of German enterprises. The renewed absence of major insolvencies meant that, in year-on-year terms, the volume of credit losses resulting from insolvencies went up only marginally by 3%.

Marked increase in risk premiums for corporate bonds

The large, listed enterprises continue to be in robust shape. Average expected default frequencies of enterprises (EDFs in accordance with Moody's KMV) reached their lowest

Chart 1.2.3

GERMAN ENTERPRISES' FINANCIAL INDICATORS

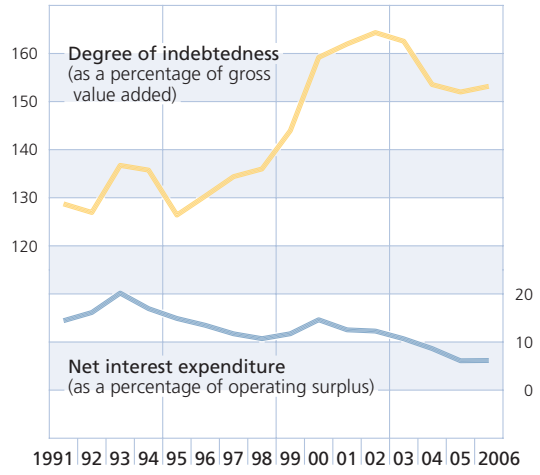
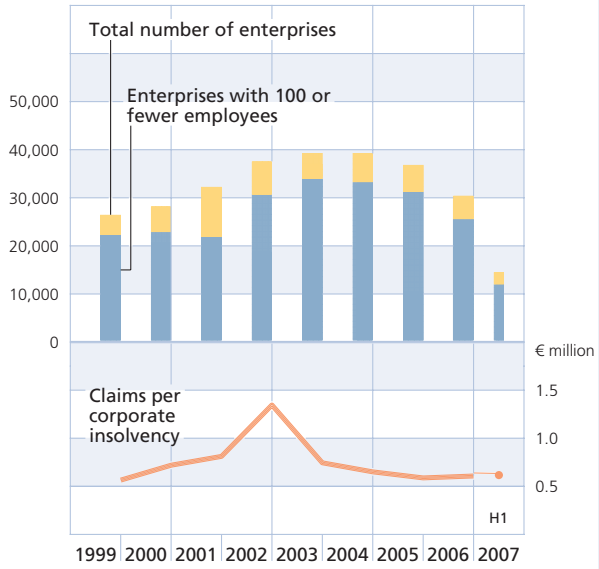


Chart 1.2.4

CORPORATE INSOLVENCIES*



* Source: Federal Statistical Office and Bundesbank calculations.

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level in five years in mid-2007. Nevertheless, corporate bond spreads showed a marked increase in recent months, which was certainly due primarily to the turbulence in the financial markets in the wake of the subprime crisis in the USA. A crucial factor for the credit quality of large enterprises will be the future development of the world economy. An overspill of the crisis in the financial markets to the real economy and an associated sharp deceleration in the pace of growth in the world economy would probably lead to a further increase in risk premiums and the average expected default rates of corporate bonds.

Performance of SMEs

Owing to the favourable economic situation, small and medium-sized enterprises recorded a further improvement in their profitability in 2006. They are still optimistic when looking to the future. By contrast, there was an increase in the heterogeneity of the equity base in this sector. There has been an increase both in the percentage of enterprises with ample capitalisation and in the percentage of those with a capital base of less than 10%.[9]

Financial position of households

Decline in household debt continues

In contrast to the corporate sector, the decline in household debt continued in 2006. Net financial assets in relation to households' disposable income rose, for the fourth year in succession, to around 200%; debt, also in relation to disposable income, fell slightly for the fifth year in succession and now stands at just under 105% (see Chart 1.2.5). The inter-

9 See Creditreform, Wirtschaftslage und Finanzierung im Mittelstand, a twice-yearly survey of around 4,000 medium-sized enterprises (employees < 500, turnover < €50 million), autumn 2007.

est burden remained at 4%, as in the previous two years.

Further increase in consumer insolvencies and PDI

By contrast, there was a further sharp rise in the number of consumer insolvencies by 34% to more than 92,000 cases in 2006, albeit with a continuing decline in claims per consumer insolvency (see Chart 1.2.6). In 2006, there was also a slight rise of 2.1% in the private debt index (PDI), which is calculated by Schufa on a yearly basis; it now has a score of 1,132.[10] However, both indicators show a slowdown in the increase; in 2005, consumer insolvencies rose by as much as 40% and the PDI by 4.0%. Owing to the scheduled legislative changes in 2008, which aim to simplify the consumer insolvency procedure, the number of insolvency petitions might show a noticeably sharper rise again next year without this necessarily leading to a deterioration in households' financial situation.[11]

Further decline in foreclosure sales

The number of foreclosure sales of real estate and the total market value declined slightly in year-on-year terms in 2006 as well as in the first half of 2007 (see Chart 1.2.7).

Developments in the German real estate market

Sluggish performance of real estate market appears to be over

The favourable economic situation in 2006 as well as a number of special factors helped to overcome the marked sluggishness in the real

Chart 1.2.5

HOUSEHOLDS' FINANCIAL ASSETS AND INDEBTEDNESS

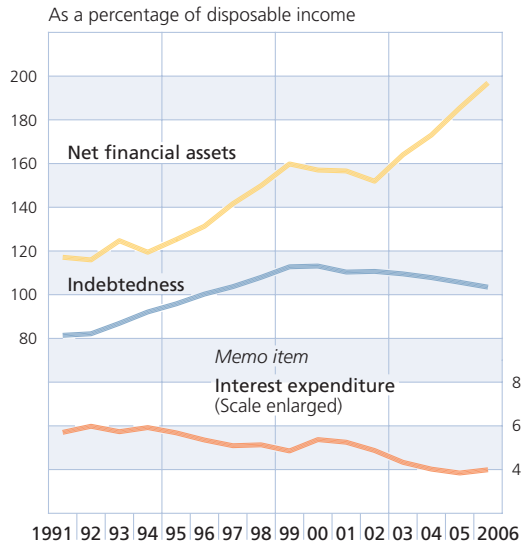
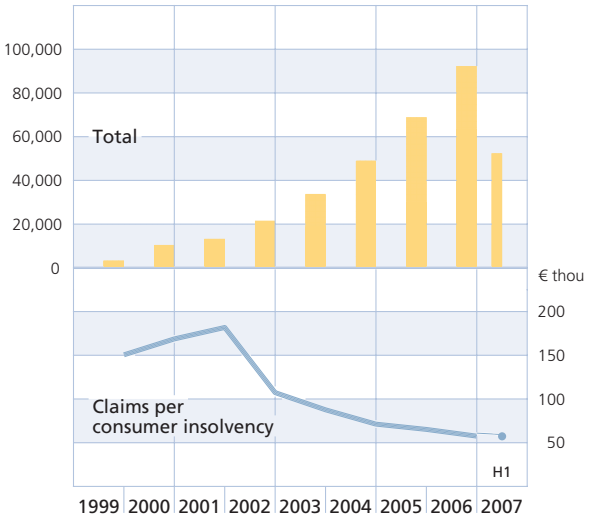


Chart 1.2.6

CONSUMER INSOLVENCIES*



* Source: Federal Statistical Office and Bundesbank calculations.

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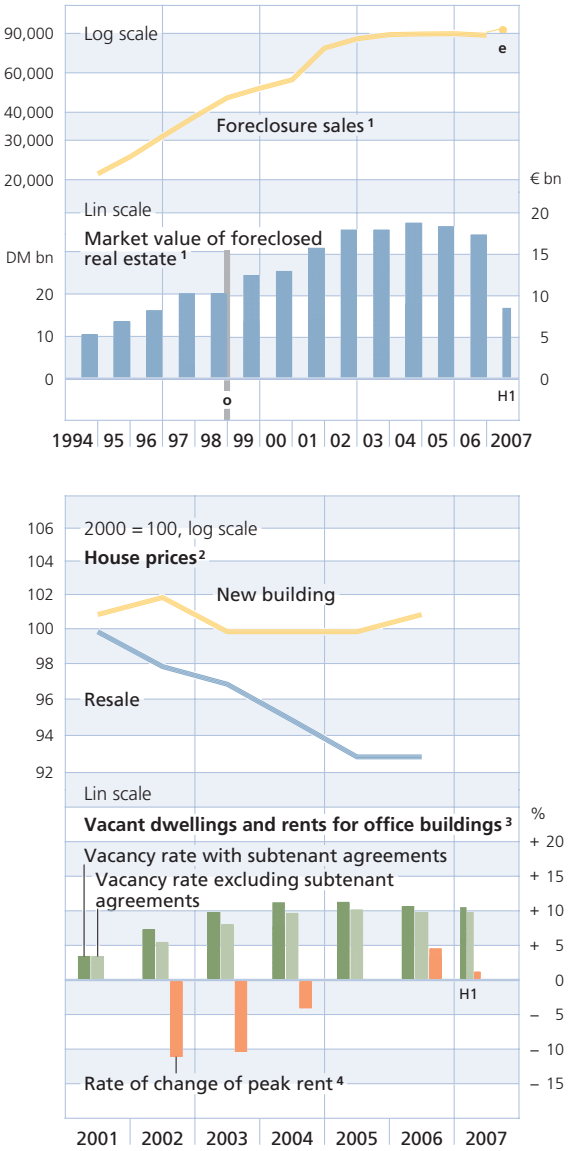
10 See Der Privatverschuldungsindex (PVI) – Kritische Anzeichen der Privatverschuldung in Deutschland, Schufa Holding AG, Wiesbaden, 20 June 2007.
11 The preliminary draft proposes that insolvency proceedings should no longer take place in the case of petitions which have been rejected owing to insufficient total assets. Instead, the remaining debt procedure should follow on directly.

Chart 1.2.7

REAL ESTATE MARKET IN GERMANY



1 Source: Argetra GmbH, Ratingen. — **2** Source: Bundesbank calculations based on BulwienGesa AG data for owner-occupied appartments and terraced houses. — **3** Weighted office area average in Berlin, Düsseldorf, Frankfurt am Main, Hamburg, Munich and Wiesbaden. Source: Jones LangLasalle and Bundesbank calculations. — **4** First half of 2007 compared with 2006 as a whole. — **o** From 1999, data in euro.

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estate market. According to the Bundesbank's property price indicators,[12] there was no further fall in the price of older housing in 2006 for the first time in four years, which remained instead at the prior-year level. The prices of new dwellings went up slightly, in fact, for the first time in three years (see Chart 1.2.7).

Office buildings market remains subdued

Improvements in the market for office buildings remain slender. Year-on-year vacancy rates declined only marginally in 2006 and stagnated in the first half of 2007. While peak rents were as much as 5% up on the year in 2006, their growth slowed down in the first half of 2007. Furthermore, large regional differences exist in the market for office buildings, this movement often being driven by individual major contracts.

The German real estate market has stabilised on the whole. Given the importance of real estate as loan collateral, this contributes to financial stability. At the same time, price movements in the German real estate market appear to be free of exaggerations.

Indicators of portfolio quality …

Renewed decline in portfolios of non-performing loans

Last year, the portfolios of non-performing loans – measured as loans with a specific loss provision requirement – declined substantially and, in 2006, were at their lowest level since the late 1990s. Their share of the gross volume of non-bank loans went down from 4.1% in 2005 to 3.3% in 2006 (see Chart 1.2.8). However, the quarterly reports of the

12 The Bundesbank's property price indicators refer to standardised reference units and are calculated on the basis of data from BulwienGesa AG.

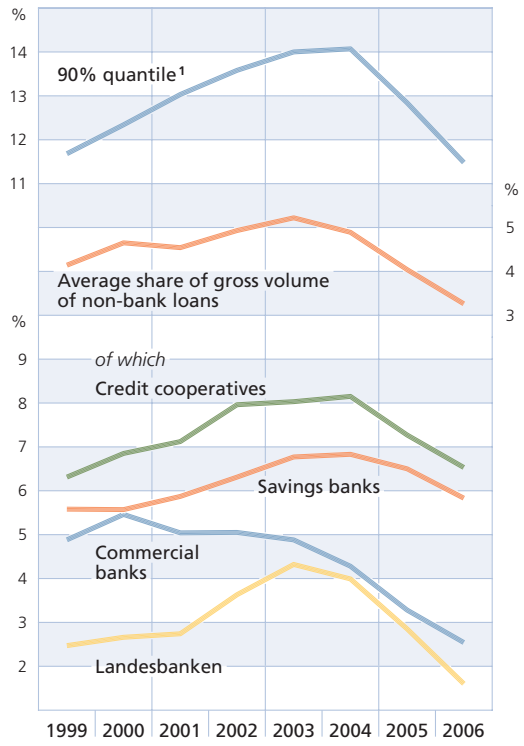
large German banks which have been published so far indicate that the number of loans with a specific loss provision requirement may increase again this year.

Sectoral differences

The share of non-performing loans in the gross volume of non-bank loans at savings banks and credit cooperatives, which issue loans primarily to small and medium-sized enterprises and households, was again higher than that at commercial banks and Landesbanken,[13] and even marginally higher than at the end of the 1990s. By contrast, in 2006, the commercial banks and the Landesbanken recorded a fall in the year-on-year level again and were therefore clearly below the values recorded at the beginning of the decade. This is also likely to reflect the fact that these banks appear to have made greater use of the option of selling non-performing loans or of hedging credit risks increasingly by means of credit derivatives.

Chart 1.2.8

NON-PERFORMING LOANS* IN THE GERMAN BANKING SYSTEM



* Loans with a specific loss provision requirement as a percentage of the gross volume of non-bank loans. — **1** Threshold which 90% of all credit institutions do not overshoot.

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… in corporate credit

At the mid-year point of 2007, corporate credit accounted for just over 37% of the German banks' total domestic lending business (excluding loans to government and interbank loans), whereas somewhat more than 17% of domestic loans were issued to self-employed persons (see Chart 1.2.9).

Concentration risks

Disregarding credit risk mitigation techniques, the single-borrower concentration of the ten largest German banks improved slightly on the year. In the case of 75% of the banks, loans to their respective 50 largest borrowers account for no more than 125% (2006: 140%) of the regulatory capital (see Chart 1.2.10). The average remains virtually unchanged at 105% of the regulatory capital. The resulting concentration risk appears to be manageable.

Better quality of SME portfolios

The risk situation in business with SMEs developed favourably again in view of buoy-

13 Nevertheless, the interest margins are still higher than at commercial banks and Landesbanken.

Chart 1.2.9

STRUCTURE OF GERMAN BANKS' DOMESTIC LENDING BUSINESS BY CATEGORY OF DEBTOR*

June 2007

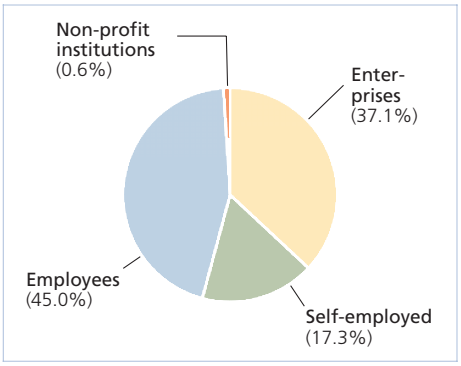
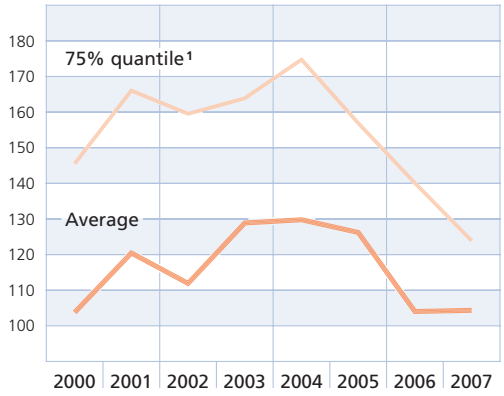


Chart 1.2.10

LOANS BY THE TEN LARGEST GERMAN BANKS IN A GIVEN YEAR TO THEIR RESPECTIVE 50 LARGEST BORROWERS**

As a percentage of the regulatory capital for solvency purposes



* Excluding loans to government and interbank loans. — ** Source: central credit register for loans of €1.5 million or more pursuant to section 14 of the German Banking Act. Calculated on the basis of book values plus specific loss provisions and excluding collateral and other credit risk mitigation techniques. — **1** Threshold which 75% of the banks do not overshoot.

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ant domestic activity and declining corporate insolvencies. In line with this, the quality of SMEs' portfolios – measured, in this instance, by the large exposures of savings banks and credit cooperatives – showed a further improvement.[14] By mid-2007, the average shares of the risk categories 2 and 3 had declined again slightly to 0.7% and 0.4% respectively (previous year's figures: 1.0% and 0.6% respectively). However, given that economic activity is expected to develop somewhat more moderately next year, a further decline is rather unlikely (see Chart 1.2.11).

… in private housing loans and consumer credit

Some 45% of domestic loans (excluding loans to government and interbank loans) issued by German banks are taken up by households. Around 78% of these are housing loans.

Rate fixation periods for housing loans generally longer

There is a long tradition of fixed-rate loans for private housing construction in Germany. In the past four and a half years, for example, an average of 65% of new loans granted for private housing construction had an initial rate fixation period of five years or more[15] (see Chart 1.2.12). Between the end of 2005 and mid-2007, the share of loans with an initial

14 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 has to be confined to large exposures since these are broken down by risk category (risk category 1: sound; risk category 2: prone to risk; risk category 3: specific loss provisions have already been made).
15 The significance of fixed-rate loans is underestimated in the presentation of new loans owing to the frequently revolving character of short-term loans. In terms of existing loans, the percentage of long-term loans is higher, although only data with original maturities are available in this context and not with rate fixation periods.

rate fixation period of more than ten years went up – not least, in the light of expectations of higher interest rates – by 6 percentage points to 34%. Fixed-rate loans have the advantage for households that they have to bear only marginal interest rate risks. This, together with the collateral requirements for borrowers, contributes to the stability of housing loans. The good credit quality of private housing loans is reflected, for example, in the lower number of non-performing loans last year.

Fewer risks from consumer financing

Credit risks in the area of consumer finance have been reduced. There was a year-on-year decline in 2006 both in the share of non-performing loans in the gross credit risk exposures and in the specific loss provisions in relation to non-bank lending (see Chart 1.2.13).

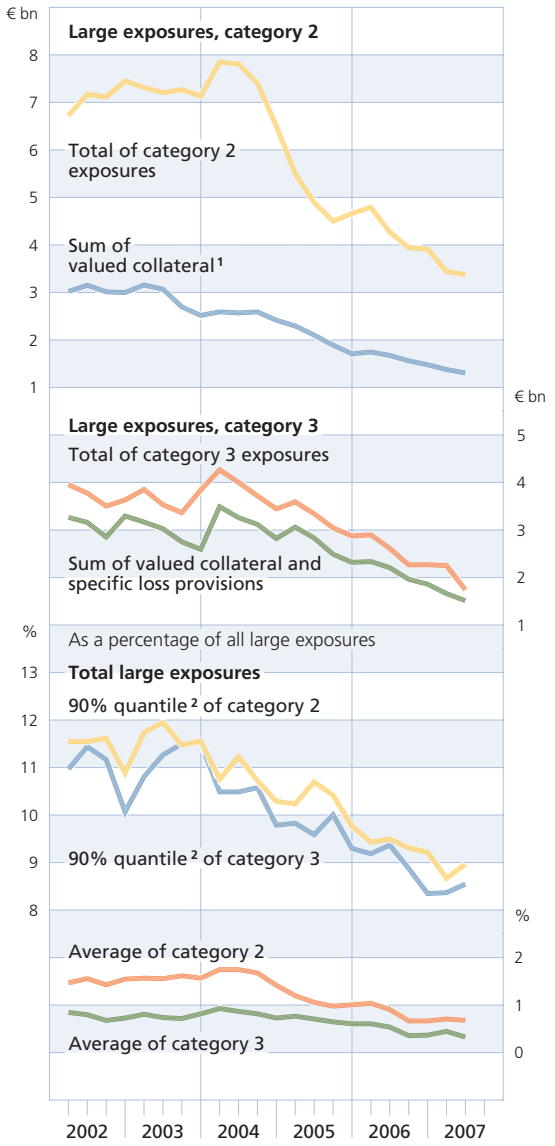
Credit markets for households still highly competitive

The competitive intensity in loans to households appears to be increasing. In recent quarters, participants in the Bank Lending Survey,[16] for example, reported that they have lowered their credit standards applied to loans for housing purposes and to consumer credit owing to increasing competition from other banks (see Chart 1.1.11). With regard to financial stability, however, this is offset by the fact that income from retail banking business is usually less volatile than income from other business sectors. Nevertheless, in recent months, the participating banks have been reporting that they have lowered their collateral requirements. In future, this could lead to an increased need for write-downs.

16 See Deutsche Bundesbank, Bank Lending Survey – Results for Germany, October 2007.

Chart 1.2.11

ANALYSIS OF LARGE EXPOSURE PORTFOLIOS*



Sources: central credit register for loans of €1.5 million or more pursuant to sections 13, 13a and 13b of the German 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 loss provisions have already been made. — **1** Specific loss provisions have been made to only a very limited extent. — **2** Threshold which 90% of all banks do not overshoot.

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Chart 1.2.12

RATE FIXATION PERIODS OF GERMAN BANKS FOR NEW HOUSING LOANS*

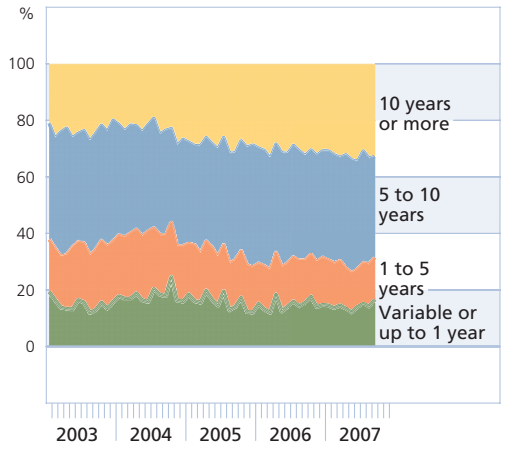
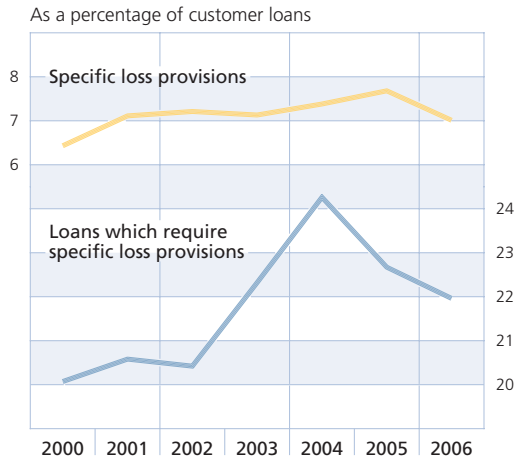


Chart 1.2.13

QUALITY OF CREDIT PORTFOLIOS OF SELECTED CONSUMER CREDIT BANKS**



* Source: Harmonised MFI interest rate statistics. — ** Sixteen institutions. For each of these institutions the share of consumer credit in the sum of non-bank loans amounts to 80% or more. Together, the 16 institutions account for more than 21% of all consumer credit in the German banking system.

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Country risk[17]

German banks' lending to developing countries and emerging market economies

According to the data in the BIS consolidated banking statistics, German banks are among the most important lenders to developing countries and emerging market economies. In the first quarter of 2007, there was an increase in lending to Asian countries, in particular, a large share of which was to China and India. Lending by German banks to Latin America showed below-average dynamics (see Chart 1.2.14).

Country risk provision ratio slightly above the medium-term trend

German banks granted credit of around €254 billion to countries with an S&P rating of BBB+ and lower in the second quarter of 2007, 91% of which was accounted for by the 15 countries with the largest loans. Around 60% of these loans were backed by collateral. The average quality of lending to these countries has improved steadily since 2000. The US subprime crisis has had no more than a marginal impact on the emerging market economies. At the same time, the country risk provision ratio went down to 0.49% in the second quarter of 2007, and is now at its lowest level for seven years. This ratio is still slightly above the medium-term trend, however (see Chart 1.2.15). The country risk seems to be limited on the whole.

Macro stress tests

Conceptual limitations …

For a number of years now, the Bundesbank has been regularly conducting stress tests in order to assess the resilience of the German

17 The country-related exposure, considered here, arising from lending to foreign borrowers is focused on loans to developing countries and emerging market economies.

banking system (see also the article Stress tests: methods and areas of application, pages 97-112). These tests are based on stress scenarios, which are very unlikely to occur in the short to medium term, but which are nevertheless plausible. These stress tests are subject to conceptional limitations. First, they each cover only a part of the macroeconomic transmission channels, and, second, real shocks are invariably more complex and extensive than partial stress scenarios. For these reasons, the Bundesbank publishes the results of a number of stress test approaches.

The core issue here is how stability in the banking system would be affected if certain risks emanating from the financial markets or the macroeconomic setting were to materialise.

… especially with regard to financial market developments

By contrast, market developments which are driven largely by liquidity and which affect only certain sections of the financial markets are difficult to model as exogenous shocks. Modelling feedback and interaction processes between the financial and the real sectors raises similar problems. These qualifying aspects must therefore always be taken into consideration as well when trying to calculate model scenarios in the current situation.

No marked dampening effect of individual risk factors

Simulations by the Bundesbank using macroeconomic models (Bundesbank model and the NIESR's global model NiGEM) highlight the finding that individual risk factors *per se* do not have a marked dampening effect on the foreseeable economic development in Germany. Only an accumulation of individual shocks results in a perceptible reduction in macroeconomic activity. For example, the international impact of a sharp

Chart 1.2.14

CROSS-BORDER LENDING TO EMERGING AND DEVELOPING COUNTRIES*

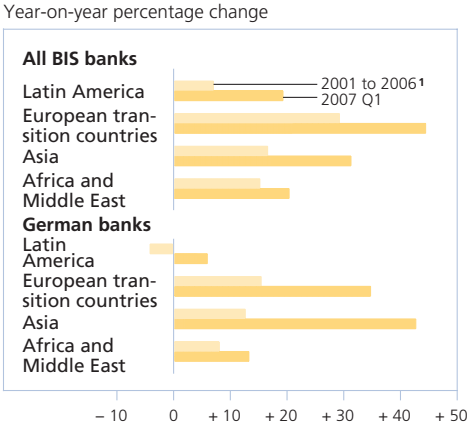
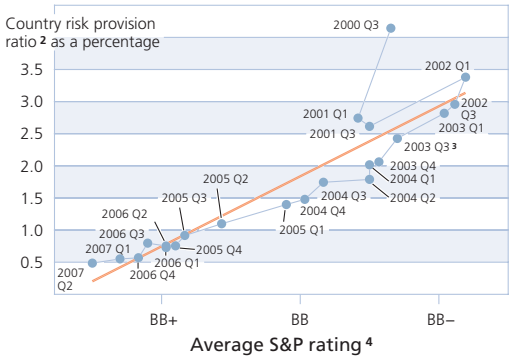


Chart 1.2.15

CORRELATION BETWEEN COUNTRY RISK PROVISION RATIO AND RATING**



***** Source: BIS consolidated banking statistics. A temporal comparison of the data for German banks is limited owing to the acquisition of one large bank. — **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** Sum of all the quotients from country risk provisions and the volume of risk-prone claims for each country, each weighted by the country-specific share of the total volume of the risk-prone claims of all the 15 countries. — **3** From 30 September 2003, changeover to quarterly reporting. — **4** Weighted by the volume of risk-prone claims.

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Table 1.1

RESULTS OF THE MACRO STRESS TESTS

Scenario	Net transfers of specific loss provisions (median)[1]		Non-performing loans (median)[1]		Net interest received (median)[2]	
	2008	2009	2008	2009	2008	2009
Baseline scenario	0.52	0.51	2.51	2.39	2.28	2.24
Oil price shock	0.58	0.65	2.64	2.73	2.28	2.18
Adjustment of global imbalances	0.48	0.50	2.46	2.40	2.23	2.16
Reassessment of risks	0.53	0.54	2.55	2.48	2.28	2.31
US downturn	0.53	0.55	2.55	2.51	2.28	2.31

1 As a percentage of non-bank loans. — **2** As a percentage of the balance sheet total.

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downturn in the US real estate market is, as a rule, only slight as long as the downturn is confined to this sector. This should not be interpreted as a decoupling of the rest of the world from the US business cycle, but merely as a subdued reaction to a US-specific shock.

Upturn not in danger

The dampening effects for the world economy, and thus for the German economy as well, become more obvious as soon as additional global shocks, such as a deterioration in financing conditions owing to a general rise in risk premiums, are assumed. Even then, the increase has to markedly exceed the current level for significant revisions to materialise in the baseline scenario. All in all, according to the simulation findings, the upswing in Germany is not in danger, but downside risks are more clearly identifiable. Much will depend, for example, on the strength and the duration of the adjustment process in the US mortgage market and on the extent to which this produces additional spillover effects on the international financial markets.

Four scenarios

This section describes four scenarios in which GDP growth declines significantly in relation to the baseline scenario. The shocks are staggered over several quarters so that they do not take full effect all in one go.

– Scenario 1 "oil price shock": The scenario posits a permanent rise in crude oil prices by a total of US$40; US$10 in each of the first three quarters and a further US$5 in each of the two subsequent quarters. In comparison with the baseline scenario, there is a marked slowdown in economic activity.

– Scenario 2 "adjustment of global imbalances": The exchange rates against the US dollar are changed by a rise in the risk premium on the US dollar and a decline in the risk premium on other currencies. In this scenario, the effective exchange rate of the US dollar falls by around 9% in the first year and by just over 14% in the second year. The euro appreciates more noticeably against the dollar, ie by over 18% in the first year and by almost 32% in the second year. The impact of this scenario on German GDP is limited.

– Scenario 3 "reassessment of risks in the financial markets". It is assumed that there is an increase in the risk premiums contained in share prices. Furthermore, an

Box 1.8

DIRECT AND INDIRECT EXPOSURE OF GERMAN BANKS IN THE US SUBPRIME MARKET

The effects of the increasing number of defaults in payment on US subprime loans and the associated market distortions are having an impact on German banks as well.

The volume of direct lending to US subprime debtors and/or to the financial intermediaries that granted these loans is negligible, however. German banks confine their lending in the US real estate market primarily to the financing of commercial property.

Investment in predominantly structured securities, which are partially based on US subprime real estate loans, is a much more important transmission mechanism. Nevertheless, the share of subprime loans in relation to the balance sheet total of the affected German banks is less than 1%. Furthermore, the available data show that the vast majority of the tranches recorded in the books have a good or very good credit rating. Although the market value losses in these indirect investments are likely to have a certain negative impact on the profitability of German banks, this remains at a manageable level.

Liquidity facilities and credit lines on special-purpose vehicles which hold longer-term assets (sometimes in the form of securitised (mortgage) loans) and which are refinanced in the short term using money market paper or repo lines (see Box 1.3 on page 24) are a further significant transmission mechanism. When drawing on the line – for example, when reaching trigger thresholds for the market value or the available liquidity – the liquidity from the institutions involved has to be provided at extremely short notice. Alternatively, revolving issues of commercial paper can also be purchased; as a result, the banks' liquidity situation is affected in the same way. In both cases, the risks arising from value changes are transferred from the portfolio of the special-purpose vehicle to the bank.

Overall, the volumes of subprime-related loans held by securitisation vehicles in relation to the balance sheet totals and the capitalisation of the German banks obliged to assume the risks are manageable. Even so, little distinction was made in certain market phases, which means that virtually all the large internationally active banks were faced with outflows of liquidity.

In the medium term, adverse effects on the income sources of some banks are to be expected if sales of asset-backed securities, commercial paper and money market funds were to fall to a persistently lower level.

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Box 1.9

RISKS FOR GERMAN BANKS STEMMING FROM THE LEVERAGED LOAN MARKET

The financial market turbulence this summer also had an impact on the market for leveraged loans. In the past few years, the credit institutions active in this area – which granted credit lines to finance acquisitions using a large proportion of borrowed capital – benefited from a great demand for such loans, especially from institutional investors. However, the changed risk assessment in the financial markets led to a deterioration in the conditions for transferring these risks.

The information available on ten German banks shows that some of them granted credit lines for fixed volumes of credit in order to finance acquisition transactions. The current difficulties in the transfer of these risks mean that the affected institutions are compelled to take the loans into their own books – with matching implications for their liquidity situation.

Nevertheless, when making these leveraged loan commitments, the banks under consideration confined themselves mainly to senior positions. The market adjustments resulted in value reductions in this market segment, too, (see chart) and these are likely to have a negative impact on the economic situation of the affected banks. On the whole, however, these effects are limited.

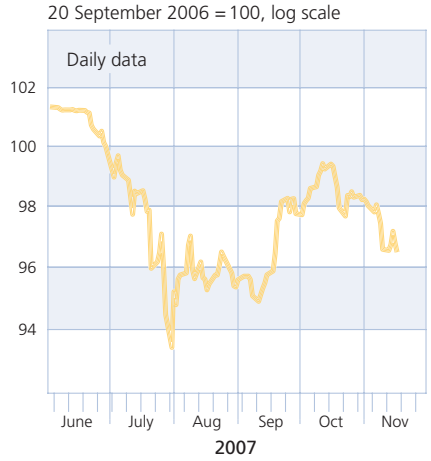
The adverse effects on the profitability of the banks active in this business area are more likely to materialise over the medium term. Fewer and/or smaller transactions being conducted in future will lead to a decline in commissions received.

The leveraged loan portfolios held by the banks themselves consist almost exclusively of senior loans; subordinated risk exposures are retained only in exceptional cases. At the institutions, these portfolios consist of around 100 different tranches on average, with the average retained credit volume per transaction (final take) making up around €30 million.

The described market price adjustments also have an impact on these positions; provided that the economic situation of the target enterprises is not directly affected by developments in the financial markets and that there is no noticeable general deterioration of the underlying credit risk, the negative effects appear limited. However, a refinancing of the existing liabilities is likely to be difficult in this setting. The higher risk premiums would increase the financial burden for the target enterprises. The increased use of non-amortising structures in the past few years proves to be unfavourable in this context.

Own investment in private equity funds or the direct provision of equity capital to target enterprises plays a subordinate role at German banks with a correspondingly limited risk of loss.

ITRAXX LEVX SENIOR SERIES 1 INDEX[1]



Source: International Index Company.

1 The iTraxx LevX Senior Index is based on 35 equally weighted credit default swaps, which refer to senior leveraged loans to European enterprises. The swaps on which the index is based have an average maturity of five years.

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investment premium is used to increase the user cost of capital worldwide by 3 percentage points for a period of four quarters. There is a slight decline in overall economic growth as a result of these developments.

– Scenario 4 "US downturn": In addition to the shocks assumed in scenario 3, a further intensification of the crisis in the US housing market is assumed. House prices fall by 5%. An additional decline is assumed for housing investment as well. Private consumption in the USA is further dampened by the negative wealth effect. The cyclical effects are somewhat stronger than in scenario 3.

Effects in the model

In principle, a distinction is made between the following effects: a decline in GDP has a negative impact on banks as there is an increased need for write-downs and a lower demand for credit, both of which are reflected in the interest rate margin and the net interest received. As the return on the maturity transformation, the endogenous yield curve is a major determinant of net interest received.

Given the selected parameters, the scenario of the oil price shock proves to be the one which has the greatest negative impact on the German economy and thus on the banking system. For the median institution, the loss provision rate in 2009 increases by 0.14 percentage point compared with the baseline scenario. The stock of non-performing loans (in relation to the gross volume of non-bank lending) is 0.34 percentage point higher. The supposed decline in the credit risk in the form of lower loss provisioning rates in the

Box 1.10

ASSESSMENT OF MARKET RISK USING VALUE AT RISK MODELS

The analysis of market risks in German banks' trading books applies to those banks which are allowed to use their own risk model to determine the amount of regulatory capital required to cover these kinds of risks. At present, this is the case for 15 banks, which cover a large part of the trading activities of the German banks. The risk models are based on the concept of Value at Risk (VaR), which determines the value of the portfolio losses that is not exceeded with a given probability and within a given holding period.

For the group of banks with their own market risk model, the share of regulatory capital requirements arising from market risk positions in the total regulatory capital requirements has been 3% on average over the past four years. This does not include the counterparty risks in the trading book; these make up a similar share. Market price risks in the banking book are likewise excluded in the case of interest rate risks and share price risks.

VaR models derive the potential losses under the assumption of normal market circumstances. In this context, the market risk position is determined both by market-driven factors (market prices, volatilities and correlations between the market prices of financial instruments) and by banks' individual decisions (adjustments of open positions and improvements to the market risk model used). For their internal management of market risk, the banks are increasingly applying extreme stress scenarios as a complement to the VaR models based on normal market conditions.

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Chart 1.2.16

MARKET RISKS IN BANKS' PORTFOLIOS

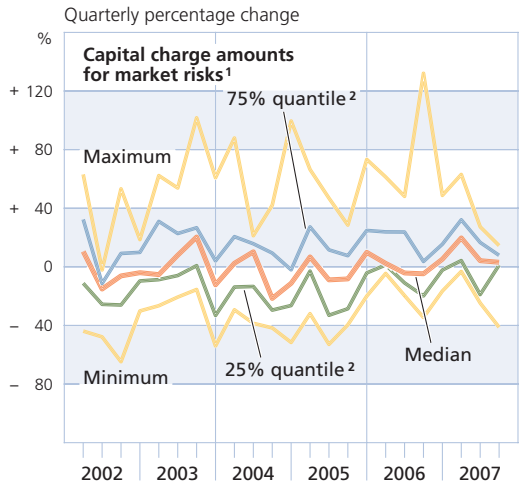
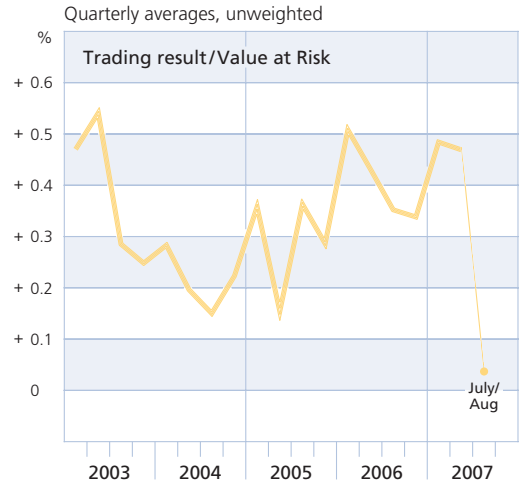


Chart 1.2.17

RISK-ADJUSTED TRADING RESULTS OF THE LARGEST MODEL BANKS*



1 Pursuant to Principle I/Solvency Regulation for banks using their own market risk models. — **2** Threshold undershot by 75% (25%) of credit institutions. — * Prudential data from the backtesting of the market risk models of Commerzbank, Deutsche Bank, Dresdner Bank, DZ Bank, HVB and WestLB.

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second scenario is due solely to the assumed marked lowering of the interest rates across all maturities. The extent to which these developments lead to an increase in risks in the longer term cannot be predicted using the econometric model.

High degree of resilience

Overall, the results point to a high degree of resilience in the German banking system.

Market risks

Development of market risks balanced overall

Over the past twelve months, the market risks of German banks have developed differently for the individual banking groups. Stress tests show that the equity price risk and the interest rate risk slightly decreased up to mid-2007 for commercial banks and central institutions of the savings bank and credit cooperative sectors. Meanwhile, there has been a rise in the capital requirements for market risk positions based on VaR models. In the case of small and medium-sized banks, a slightly smaller interest rate risk especially is apparent compared with last year. In spite of pronounced adverse effects on the trading results of the big banks active on the market owing to the financial market turmoil of the past few months, the development of market risks can still be described as balanced for the German banking system as a whole.

Market risks in the trading book

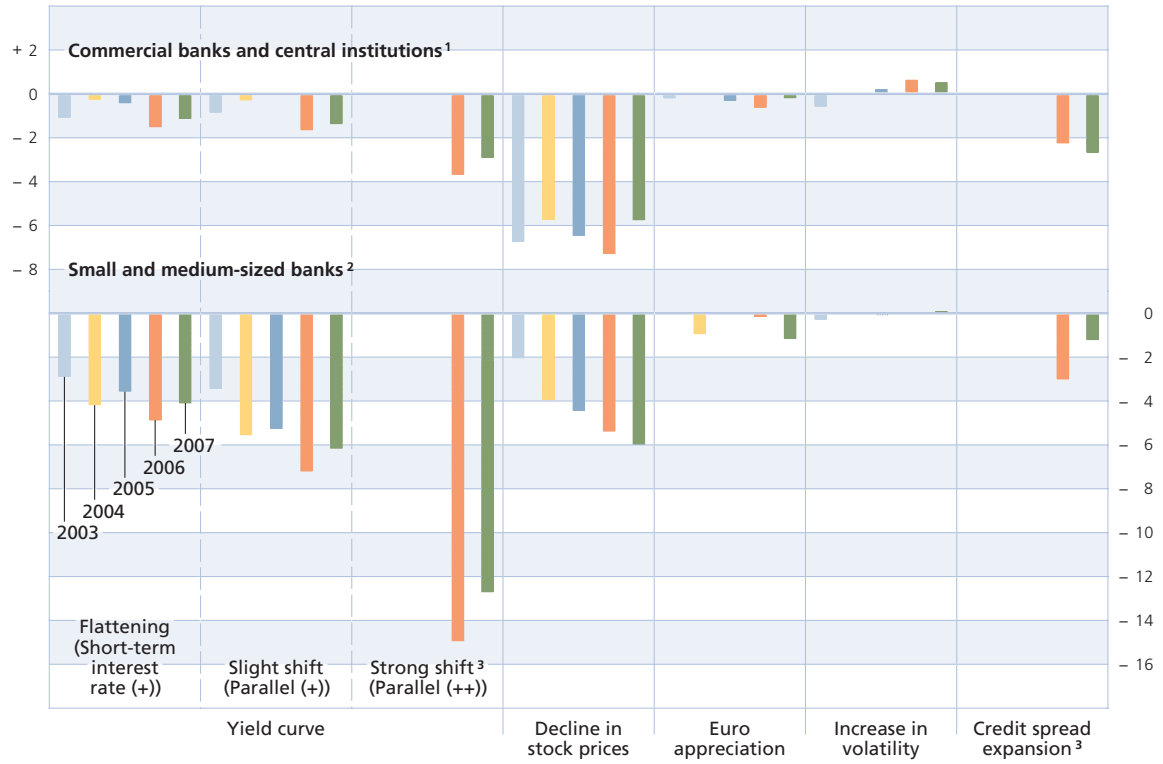
Slightly increasing capital requirements for market risks

The capital charges for market risks increased by an average of 8% per quarter from the third quarter of 2006 to the end of the third quarter

Chart 1.2.18

CHANGES IN MARKET VALUES FOR SELECTED SCENARIOS* OF THE MARKET RISK STRESS TESTS

As a percentage of liable capital, weighted averages



***** Occurring within one day in each case; 31 May 2007, 31 March 2006, 30 June 2005, 12 July 2004, 2003: 30 December 2002. For a description of the risk scenarios, see the article "Stress tests: methods and areas of application", pp 97–112. The group of mortgage banks was disregarded, owing to the small number (four participating institutions) and the short data history (since 2006). — **1** 15 institutions. — **2** Nine institutions. — **3** Scenario only included since 2006.

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of 2007.[18] In the first quarter of 2007, in particular, there was a disproportionately high rise in the risk potential owing to the stock market corrections and the associated increase in volatility (see Chart 1.2.16 and Box 1.10).

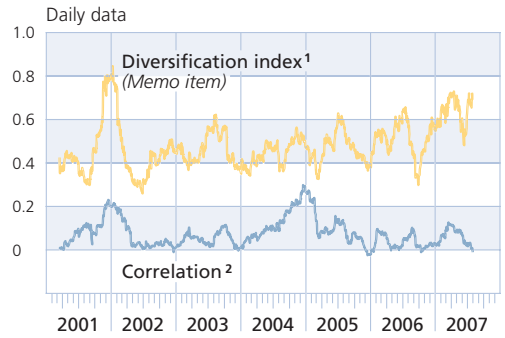
Financial market turmoil halts positive trend in risk-adjusted trading results

From early 2005 to the first half of 2007, the rise in income from proprietary trading overcompensated the increase in potential risk on an annual average. This can be seen in the development of the risk-adjusted trading results of the model banks[19] with the most significant trading portfolios.[20] However, this positive

18 The underlying VaR specifies the maximum loss which, with a probability of 99% and a holding period of ten days, is not exceeded.
19 Model banks are those 15 German banks which are allowed to use their own risk model to determine the amount of regulatory capital required to cover the market price risks in their trading book.
20 This group comprises those banks whose VaR (99%, one day holding period) was greater than €10 million on an average of the past three years: Deutsche Bank, Dresdner Bank, HVB, Commerzbank, WestLB, DZ Bank.

Chart 1.2.19

CO-MOVEMENT IN TRADING RESULTS OF GERMAN BANKS*



* Based on the daily data of 11 institutions using their own market risk models. — **1** The diversification index is an indicator of the degree of diversification of the market risk within the German banking system. A value of 1 denotes a lack of diversification; a value of 0 denotes complete diversification. — **2** The correlation is calculated as an unweighted mean of the pairwise correlations of the daily returns from proprietary trading over a moving 50-day window.

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trend was halted by the financial market turmoil in July and August 2007. In these two months, strongly declining trading results and slightly higher potential risks led to a slump in risk-adjusted trading results (see Chart 1.2.17).

Market risk stress test

Compared with the VaR-based analyses presented above, the Bundesbank's stress tests for estimating the risks from extreme changes in market prices include a broader range of small and medium-sized banks and also take market risk in the banking book into account.[21]

In the extreme scenario of a parallel upward shift of the yield curve by 150 basis points, the greatest potential loss is to be found, as expected, within the category of small and medium-sized banks (on average -12.7% of liable capital). This is due to the relatively large importance of maturity transformation in their business model. By contrast, the category of commercial banks and central institutions would merely suffer a loss of 2.9% of liable capital in the same scenario (see Chart 1.2.18).[22]

Upward shift of the yield curve particularly affects small and medium-sized banks

Following the increase in risk in the event of interest rate shocks in the past two years, consistently smaller changes in market values are apparent in this case up to mid-2007. The expectation of a continued relatively flat yield curve seems to counteract a strategy oriented towards maturity transformation.[23]

Smaller changes in market values in the event of interest rate shocks

A sharp decline in share prices by 30% within one day would lead to an average consumption of about 6% of liable capital, both in the case of commercial banks and central institutions as well as in the case of small and medium-sized banks. While the first two categories show a clear year-on-year decline of 1.5 percentage points, the risk for the small and medium-sized banks has increased over the past few years. However, the changes in market values identified in the stress test are likely to overestimate the actual share price risks somewhat in view of possible hidden reserves for equity holdings in the banking

Share price scenario with similar effect for both categories of banks

21 For an explanation of the methodology of the market risk stress tests and the risk scenarios included therein, see the article "Stress tests: methods and areas of application", pp 97-112.
22 The graphic representation of the market risk stress tests shows the seven most important of all twelve scenarios – consolidated for two categories of banks.
23 The present-value losses after a standardised interest rate shock which are regularly surveyed in prudential discussions – for a significantly larger sample of banks – also permit the inference of slightly declining interest rate risks in the banking book.

book at banks reporting pursuant to the German Commercial Code (HGB accounting standard).

Increase in risk for bigger banks in the scenario of widening credit spreads

A widening of the credit spreads in the different rating classes shows a noticeable year-on-year rise in the market value losses among commercial banks and central institutions from 2.3% to now 2.8%. The dispersion of the potential losses within this category is relatively high. In the case of small and medium-sized banks, the changes in market values have declined on average. However, since the dispersion is very high, a general decline in the credit spread risk cannot be inferred from this.

The stress scenarios assuming an appreciation or depreciation of the euro and an increase in stock market volatility have comparatively little effect on bank balance sheets. In the scenario of a 15% euro appreciation, however, an increase in risk has occurred for the small and medium-sized banks.

Stress test passed

Overall, the market risk stress test results show that the institutions surveyed are able to withstand the market price shocks assumed.

Co-movement of trading results

Declining correlations of trading results point to a moderate development of systemic risks

In addition to the analysis of the risk-adjusted trading results of the German banks that are most active in the market, the analysis of the co-movement of the trading results notably shows that systemic market risks in the banking sector can still be assessed as moderate. Following the sharp rise in 2004 and the complete reversal in 2005, the average correlation coefficient of the trading results of the model banks moved within the range of 0 and 0.1 until July 2007. This corresponds to the dispersion of 2002 and 2003 (see Chart 1.2.19).

The diversification index considers not only the linear dependencies of the trading results but also the risk potential (VaR) of the model banks, which is likewise available on a daily basis. With the inclusion of this scaling component, the index is an indicator of the degree of the diversification of market risk within the German banking system. An index value of 0 indicates complete diversification, whereas a value of 1 indicates no diversification.[24] The diversification of market risks among the banks reduces the banking sector's aggregate market risk exposure and, thus, the potential systemic risks emanating from the market sector.

In 2006, the dispersion of the index was within the range of the four preceding years; the high values at the beginning of 2002 should be seen as being an aftermath of the events of 11 September 2001. The market correction in May-June 2006 led to a temporary increase of the index value from 0.5 to 0.65 and thus to a weakening of the diversification effect. However, this effect tailed off again in the months that followed. A further rise of the index value can be seen in the first half of 2007 and again following the financial market turmoil in July of this year.

24 For the design of the diversification index, see C Memmel and C Wehn, Supervisor's portfolio: The market price risk of German banks from 2001 to 2004, Analysis and models for risk aggregation, in Journal of Banking Regulation, No 7/2006, pp 310-325.

Chart 1.2.20

RISK-BEARING CAPACITY AND ITS COMPONENTS AT GERMAN BANKS

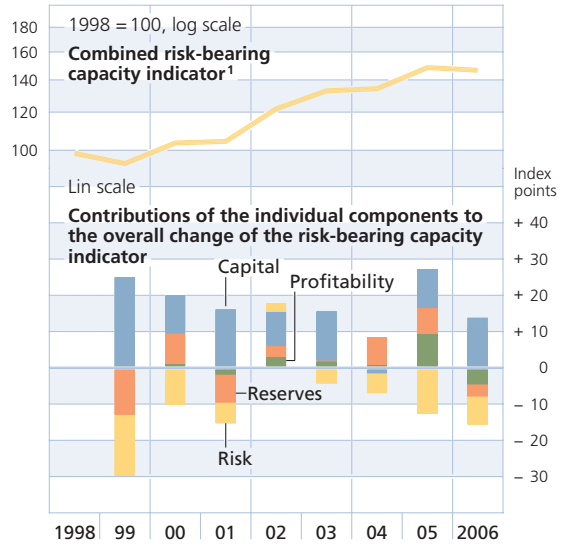
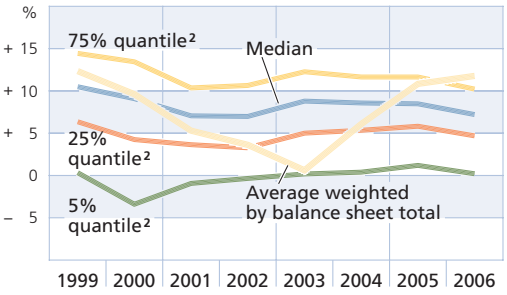


Chart 1.2.21

DISTRIBUTION OF GERMAN BANKS' RETURN ON EQUITY*



* Ratio of the result before taxes to balance sheet capital; adjusted for outliers. — **1** Calculated as the sum of operating income, risk provision reserves, reserves pursuant to section 340f/g of the Commercial Code and holding gain reserves as well as liable capital (risk-bearing capacity components in the narrower sense) less the risk position pursuant to Principle I. — **2** Threshold which 75% (25%, 5%) of all credit institutions undershoot.

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Potential co-movement in the banking sector lower than in the hedge fund sector

Similar analyses of the correlations of hedge fund returns which are carried out on a monthly basis show, moreover, that the risk of "herding" behaviour is significantly higher among hedge funds than among the German banks active in the market. The levels of the potential co-movement have diverged in recent years. While, for hedge funds, the level in 2006 is well above that of 2002, the corresponding value for the model banks is lower than at the beginning of 2002.

Risk-bearing capacity

Risk-bearing capacity raised further, but altered weight of individual components

In order to arrive at an estimate of the stability of banks or the banking system as a whole, the risks incurred need to be compared with the risk-bearing capacity. In this case, the risk-bearing capacity comprises earnings, reserves and capitalisation at a bank-specific level. Measured by these factors, the risk-bearing capacity of the German banking system has stabilised at a high level following a significant increase in recent years (see Chart 1.2.20). However, the relative importance of individual components has shifted: slightly negative net earnings growth and a small decrease in reserves contrast with a sharply increased capital base. These bank-specific components are subsidiarily bolstered at the banking group level by guarantee schemes and protection arrangements that have been further strengthened.

Performance

Differentiated profitability

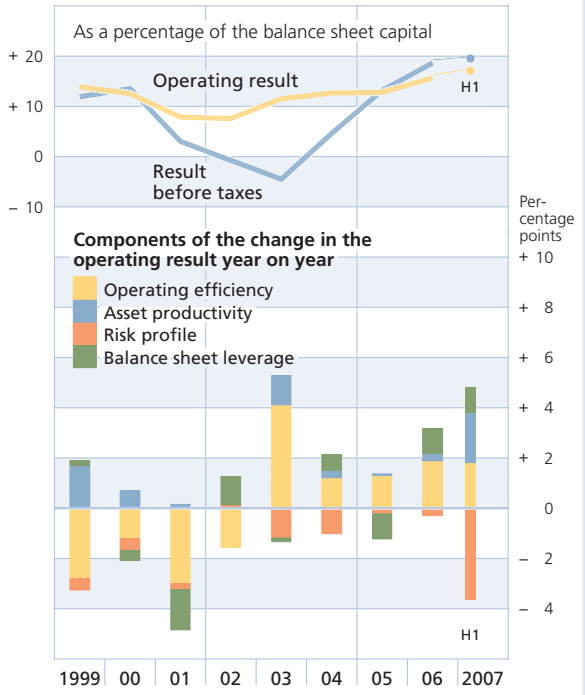
The earnings situation of German credit institutions in 2006 was very differentiated. Big, internationally active institutions, in particular,

were able in part to significantly boost their return on equity.[25] They recorded significant increases in their commission and trading results and partly also in their net interest income. In addition, owing to favourable macroeconomic framework conditions, they were recently able to keep risk provisioning at a comparatively low – but still appropriate – level. Smaller banks operating more at a regional level were mostly confronted with a very different development: they saw their income and profitability drop, owing chiefly to declining net interest income.

This differentiated performance can be clearly seen in the distribution of the return on equity. While, at 12.2%, the return on equity weighted by the balance sheet total has now returned to the levels reached at the end of the 1990s, all distribution quantiles observed show slight declines (see Chart 1.2.21).

Chart 1.2.22

RETURNS ON EQUITY OF BIG INTERNATIONALLY ACTIVE GERMAN BANKS*



* The aggregate comprises a total of eight German banks which come from all three sectors, have a group balance sheet total in excess of €250 billion in each case and are active as major participants in international markets.

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Big internationally active banks

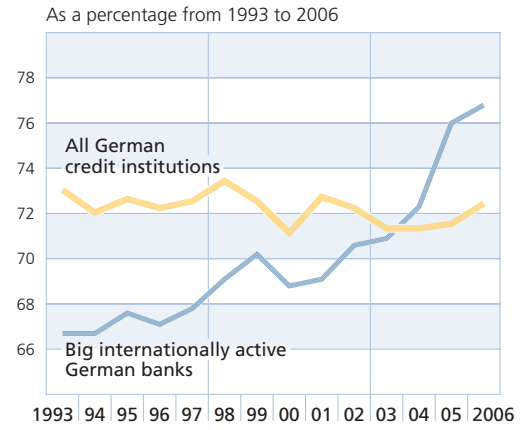
Clear increases in profitability among big banks…

In 2006, big internationally active German banks[26] were able to sharply increase both their operating result and their pre-tax result in relation to balance sheet capital to 16.3% and 19.2%, respectively (see Chart 1.2.22). The dynamic earnings pattern continued in the first half of 2007; however, first data releases of some large institutions suggest that their earnings will be significantly dented in the third quarter in connection with the recent developments in the financial markets. In mid-2007, however, these institutions were able to record their best performance of the last ten years. This is linked to a further continuous improvement of their cost-to-income ratio to 70.2% in 2006 and 66.8% in mid-2007. This is correspondingly mirrored in higher operating efficiency.

25 As a general rule, consolidated financial statements or consolidated data are used for the analysis of the risk-bearing capacity; single-entity financial statements are used only in cases in which no consolidated financial statements are available.
26 The aggregate on which this analysis is based comprises eight German banks from all three sectors which have a consolidated balance sheet total in excess of €250 billion in each case and are major participants in international markets.

Chart 1.2.23

COST-EFFICIENCY BASED ON STOCHASTIC FRONTIER ANALYSIS*



* See M Koetter: Measurement matters – input price proxies and bank efficiency in Germany, Deutsche Bundesbank Research Centre, Discussion Paper, Series 2, Banking and Financial Studies, No 01/2005.

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… boost efficiency further…

This picture is confirmed by stochastic frontier analysis.[27, 28] According to this analysis, large institutions, in particular, recently managed to significantly improve their cost-efficiency (see Chart 1.2.23). But the bulk of German banks, too, were able to improve their efficiency again compared with the previous year. At the same time, however, small institutions operating at a regional level, in particular, are still confronted with an unsatisfactory development of their cost-to-income ratio.

… on the basis of a healthy composition…

Once again, the big banks sharply raised their asset productivity.[29] A gratifying development from a stability viewpoint is that the balance sheet risk profile[30] was simultaneously lowered. This provides a clear counterweight to the slight increase in balance sheet leverage.[31]

… and is no longer marked by negative special factors

One particularly welcome aspect is that the banks' results are now hardly influenced by negative special factors: for the first time in six years the valuation factor[32] last year was well above 100% (see Chart 1.2.24). The balance of risk provision and special factors thus made a positive contribution to the result.

Clear improvement also by international standards

When compared with a European benchmark group of banks,[33] the German banks under consideration likewise progressed considerably. The ongoing improvement of asset productivity as well as of operating efficiency[34] allows the German banks to now approach a level that is quite comparable internationally. Moreover, for the first time in eight years, the earnings of the German institutions observed increased more than those of the European benchmark group.

Earnings outlook clouded, however

Looking to the future, there are two important challenges for big internationally active institutions with respect to financial stability. The first challenge is that the present earnings dynamics, which, most recently, were driven predominantly by more volatile components such as the commission and trading results, could lose momentum. The sharp decline in M&A activity

27 See M Koetter (2005): Measurement matters – input price proxies and bank efficiency in Germany, Deutsche Bundesbank Research Centre, Discussion Paper, Series 2, Banking and Financial Studies, No 01/2005.
28 The model estimates the theoretically optimal input with which – ex post – a given output could have been reached.
29 Ratio of operating income (sum of net interest income, net commissions received and trading result) to risk-weighted assets. For more information, see Deutsche Bundesbank, Financial Stability Review, November 2005, Box 1.9, p 68.
30 Ratio of risk-weighted assets to balance sheet total.
31 Ratio of balance sheet total to balance sheet capital.
32 Ratio of pre-tax result to operating result (operating income less general administrative spending).
33 The benchmark group consists of 15 banks domiciled in Europe which have a consolidated balance sheet total in excess of €250 billion in each case and major international business activity – analogous to the criteria for the German aggregate.
34 Ratio of operating result to operating income.

in the context of the present financial market environment could be an indicator of this. The second challenge is that the current dislocation in the securitisation market – apart from the associated declining revenue from fees for underwriting activities – has also resulted in a need for write-downs in warehouse portfolios. By contrast, an extremely persistent and lasting dislocation in the securitisation market, by which the originate-to-distribute business model as such would be called into question, seems unlikely.

Increased credit default swap spreads

Some uncertainty concerning these factors is evident from the market indicators that directly reflect banks' probability of default. At present, the credit default swap spreads are at clearly raised levels owing to the recent developments. However, with one interim exception, the size of the spread over the benchmark is not unusual by historical standards (see Chart 1.2.25).

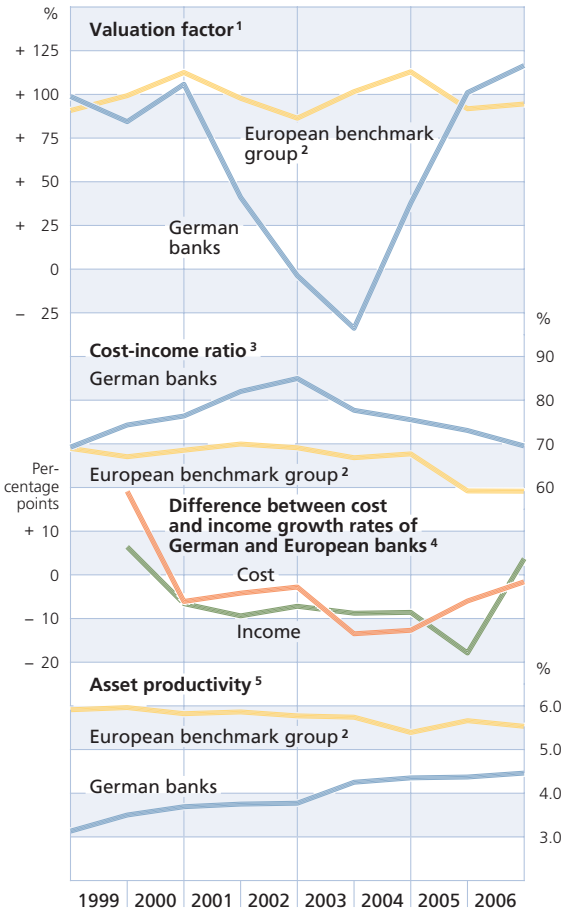
Savings banks and credit cooperatives

Profitability under pressure from declining net interest income

As small, regionally focused banks, both the primary credit cooperative institutions and the savings banks managed to slightly increase their balance sheet profits last year. However, this was significantly accounted for by extensive exceptional earnings ensuing from an amendment to corporation tax law as well as from valuation gains, in particular in the case of the credit cooperatives. There was a clear decline in the operating result of both groups. This was primarily due to lower net interest income – the main source of income for both groups of institutions – with credit cooperatives being

Chart 1.2.24

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



Source: Bankscope and Bundesbank calculations. — * The aggregate comprises a total of eight German banks which come from all three sectors, have a group balance sheet total in excess of €250 billion in each case and are active as major participants in international markets. — **1** Ratio of the result before taxes to the operating result produced by the sum of net interest received, net commissions received and the net trading result less general administrative spending. — **2** Fifteen banks with a balance sheet total of more than €250 billion each and major international business activity. — **3** Ratio of general administrative spending to operating income. — **4** 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.

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Chart 1.2.25

CREDIT DEFAULT SWAP SPREADS OF GERMAN BIG BANKS*

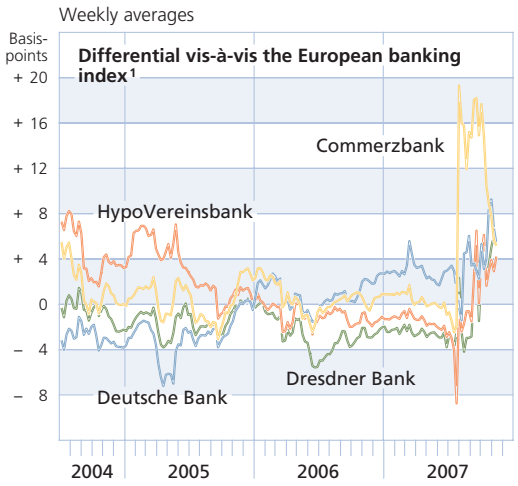
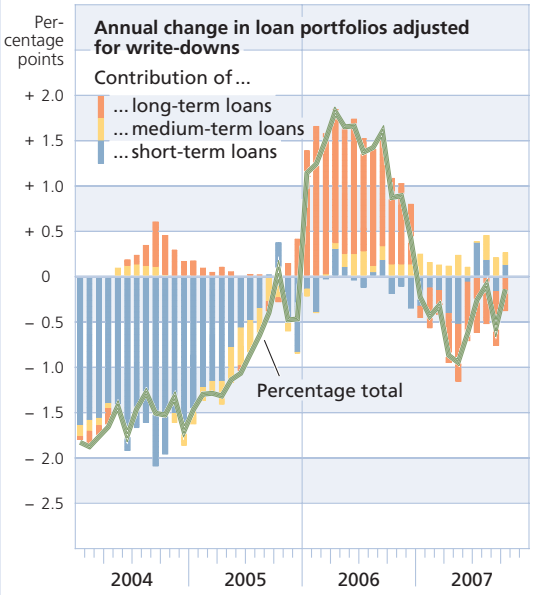


Chart 1.2.26

LENDING BY SAVINGS BANKS AND CREDIT COOPERATIVES



* Source: Bloomberg. — **1** Based on iTraxx CDS indices.

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even more affected by this than savings banks.[35]

Supportive volume growth last year…

In this context, the development of net interest income exhibits two overlapping effects. First, the development of the business volume – measured in terms of net new lending[36] – had quite a supportive effect last year in view of slightly positive growth rates (see Chart 1.2.26). However, this growth was mainly driven by long-term loans, which reduced the adaptability of the assets side of the balance sheet.

… but price factors negative on balance

By contrast, explanatory price factors showed two different developments. While, following a decline, the gross lending margins of German banks are now showing tendencies towards stabilisation, the gross deposit margins in retail banking, which are important for these banking groups organised as a network of affiliated institutions, are still making a major positive contribution – although a competition-induced weakening is becoming noticeable at the current juncture (see Chart 1.2.27). However, this structural development is currently obscured by cyclical factors. The distinctly flat and in some areas inverse yield curve prevented the generation of an adequate earnings contribution from maturity transformation, a mainstay of the networked institutions' business model. The overall effect of the price factors thus remained negative last year.

Net interest income will remain under pressure

In the medium term, also in view of a currently declining trend for new lending, the net interest income of the networked institutions

35 See also Deutsche Bundesbank, The performance of German credit institutions in 2006, Monthly Report, September 2007, pp 15-39.
36 Change in the loan portfolios adjusted for write-downs, ie balance of new lending less matured loans.

is likely to remain under pressure, resulting in two challenges: first, to find convincing solutions for the more structural competition factors and, second, to reduce the dependence on cyclical developments. Paradoxically, the financial market turmoil in the current environment of widening spreads could contribute to a more risk-appropriate pricing in this case.

Leeway from fall in write-downs used to top up reserves

By contrast, the benign macroeconomic environment again helped the institutions to further reduce risk provisioning last year. The resulting leeway was used in order to generously top up the reserves and thus ultimately to strengthen the capital base. In the credit cooperative sector, however, much of this was attributable to extraordinary earnings.

Hazard rate model indicates only a slight deterioration

The developments described above are also reflected in the Bundesbank's newly specified hazard rate model (see Box 1.11 on page 78). This model estimates the probability of an institution's existence being endangered if no support measures are provided by the affiliated network. For both groups of institutions, the two top risk categories declined slightly, whereas the category with the poorest credit quality remained almost constant in the case of the savings banks and actually fell slightly in the case of the credit cooperatives (see Chart 1.2.28).

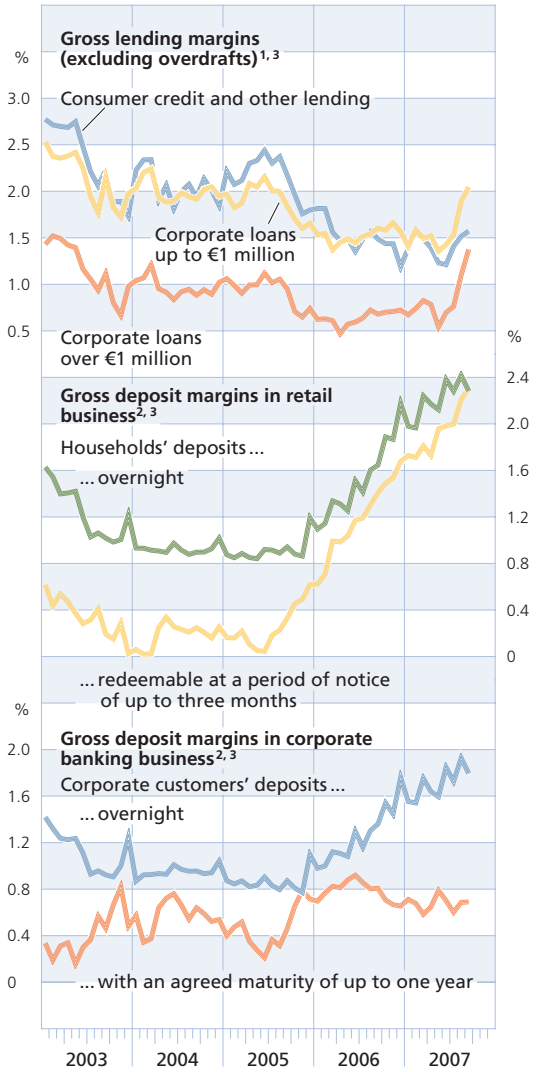
Reserves

Sound level of reserves

Reserves constitute the second line of defence in the concept of risk-bearing capacity. All in all, German banks have a sound level of reserves at their disposal. These are subdivided into risk provisions accumulated for expected

Chart 1.2.27

GROSS INTEREST MARGINS IN GERMAN BANKS' NEW BUSINESS



Sources: MFI interest rate statistics, Bloomberg and Bundesbank calculations. — **1** The gross lending margins are calculated on the basis of individual time bands as the differential vis-à-vis maturity-appropriate yields of European government bonds and aggregated over all maturities weighted by volume. — **2** The gross deposit margins are calculated as the differential vis-à-vis the interbank rate or vis-à-vis the return on bank bonds with matching maturities. — **3** In order to eliminate volume effects over time as far as possible, the volume weightings are kept constant.

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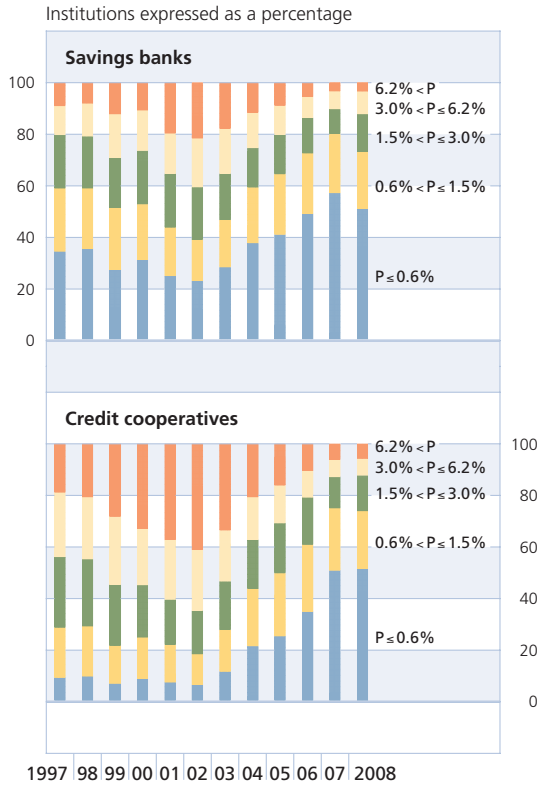
Chart 1.2.28

BUNDESBANK HAZARD RATE MODEL*



* Estimated probability (P) that an institution's existence will be endangered in the year indicated without support measures.

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losses and additional, mostly hidden reserves for cushioning unexpected losses. The latter may accrue, within the framework of single-entity reporting pursuant to the German Commercial Code, either – owing to the acquisition cost principle – automatically when the market value of assets increases, or they may be accumulated intentionally by setting up taxed general loan loss provisions pursuant to section 340f/g of the Commercial Code.

A tendency is evident towards a diminishing importance of automatically accruing hidden reserves in the wake of market developments and also as a reflection of applying international accounting rules that do not recognise this kind of reserves. By contrast, intentionally accumulated hidden reserves are gaining in importance. In anticipation of international accounting regulations, this is increasingly taking the form of the explicitly disclosed special item for general banking risks, which exhibits high capital quality, pursuant to section 340g of the Commercial Code.

Solvency

Greatly strengthened capitalisation…

The capitalisation of German banks improved further in the course of 2006 and in the first half of 2007 as a result of a higher level of retention of last year's healthy profits (see Chart 1.2.29). Correspondingly, this resulted in an especially positive development of core capital and core capital ratios. This structural improvement of the capital quality – which is to be deemed positive from a stability perspective – has also been recorded by the more weakly capitalised institutions. For example, those 10% of credit institutions with the lowest core capital ratios now exhibit a historic high of just over 6.8% and were thus able to bring their core capital ratio closer to the weighted average ratio. Thus, a clear overcompliance of the regulatory minimum requirements can be noted overall; the level of capitalisation appears to be quite comfortable. The current level of capitalisation of German institutions also stands up well to international comparison (see Chart 1.2.30).

… also confirmed by stress tests

The comfortable capitalisation of large institutions, in particular, is confirmed by stress tests. Thus, for example, the integration into the balance sheet of previously unconsolidated assets from off-balance sheet vehicles[37] appears manageable even when including rating changes of these assets. This underscores the exceptional nature of the developments at two German banks that ran into distress as a result of the financial market turmoil.

Protection arrangements and guarantee schemes

Further strengthening of the systems

The German banking industry's deposit insurance and institution guarantee systems were strengthened further last year. Both schemes within the affiliated-network groups include risk-dependent contribution or support obligations which promote the self-responsibility of the institutions and thus self-discipline within the groups. In the credit cooperative sector, it was even possible to reduce the contribution obligations at the beginning of this year. In the area of public sector institutions, the reforms that became effective on 1 January 2006 – introduction of institution-specific risk elements in the support obligations and raising of the liability volumes – are likely to be conducive to strengthening the guarantee scheme. In addition to the general institution guarantee schemes that safeguard the networked institutions in their entirety, some central institutions have agreements with the savings banks affiliated to them concerning the establishment of supplementary regional funds in order to institutionally un-

37 See also Box 1.7, Consolidation of special-purpose vehicles, p 49.

Chart 1.2.29

GERMAN BANKS' OWN FUNDS AND CORE CAPITAL*

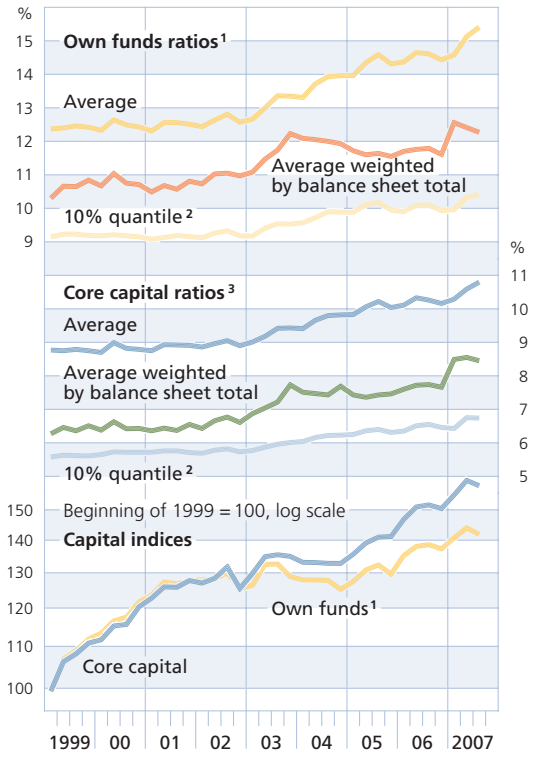
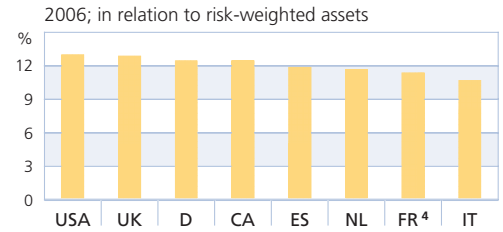


Chart 1.2.30

LIABLE CAPITAL IN AN INTERNATIONAL COMPARISON**



* Pursuant to section 10 and 10a of the German Banking Act; all banks. — **1** Regulatory capital for solvency purposes. — **2** Value reached or exceeded by 90% of the banks. — **3** Core capital for solvency purposes. — ** Source: IMF. — **4** Value for 2005.

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Box 1.11

NEW SPECIFICATION OF THE BUNDESBANK'S HAZARD RATE MODEL

The Bundesbank's hazard rate model supports banking supervisors in assessing the risks in the savings bank and credit cooperative sectors. In this context, different bank-specific ratios on profitability, solvency, credit risk and market risk as well as macroeconomic factors are included in a logit regression approach. The outcome of the rating model is the estimated probability that an institution's existence will be endangered in the coming year if no support measures are provided.

When implementing the model, a catalogue of different problem events that have occurred in the savings bank and credit cooperative sectors is applied. The severity of these events ranges from early warning signals in the form of prudential reports to capital support measures and restructuring mergers.

In contrast to the previous approach, the new specification takes account of the fact that an institution may well experience a succession of different problem events. For example, a major loss of equity capital may be followed by several capital support measures, and the bank may ultimately be saved by means of a restructuring merger. Moreover, the new specification was based on an extended set of explanatory variables, which resulted in a further increase in the model's discriminatory power.

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derpin the networking concept also at regional level.

Proven deposit insurance scheme consisting of statutory and voluntary elements

The combination of statutory and voluntary mechanisms in Germany ensures reliable and relatively comprehensive protection of depositors against the loss of deposits in the event of a credit institution's insolvency. This should continue in the future to contribute towards maintaining confidence in the German banking system, which has grown over the decades.

Stability in the German insurance industry

Conditions in the German insurance sector are stable. Reinsurers, in particular, are seeing their business patterns return to normal following record losses in 2005 and record profits in 2006. However, the slight pick-up in new business on the part of life insurance companies in 2006 should not divert attention from the need to increase their capital investment performance over the medium term. Several branches of non-life insurance, by contrast, are confronted with an unfavourable claims trend and persistently fierce competition, although they are operating in the context of a satisfactory capital base. As part of the healthcare reform, private health insurers have to adapt to the introduction of a basic tariff and the transferability of provisions set up to cover insurees' higher treatment costs with advancing age.

Economic situation

Life insurers experiencing buoyant single premium business and sales of "Riester" private pension plan contracts …

In new life insurance business, the trends of the past few years have continued. Firstly, annuities (and, in particular, unit-linked annuities) are gaining in importance vis-à-vis endowment policies (see Chart 1.3.1). Secondly, the emphasis is shifting from periodic premium business to single premium business. The key driving factor is the unabated demand for "Riester" private pension plans, which was especially strong in 2006 and the first half of 2007 (around 2 million contracts were concluded in 2006, when the third stage of government assistance was reached; around 900,000 new contracts were concluded in the first half of 2007).

… but still low net interest on investments

While the slight pick-up in new business was a positive development in 2006, in the same year the gap between net interest on investments and the average overall interest on policyholders' credit balances in the case of endowment policies narrowed to only 0.6% (2005: 1.0%); it is likely to remain unchanged in 2007. The situation is expected to ease moderately in the medium term, however. Firstly, the rise in interest rates is likely to have a favourable effect on net interest. Secondly, owing to the lowering of the maximum technical interest rate[1] to a mere 2.25%, the portfolio average guaranteed rate of return will slowly fall. Thirdly, the problem of guaranteed interest rates will be alleviated with the dwindling relative importance of, above all, traditional endowment policies.

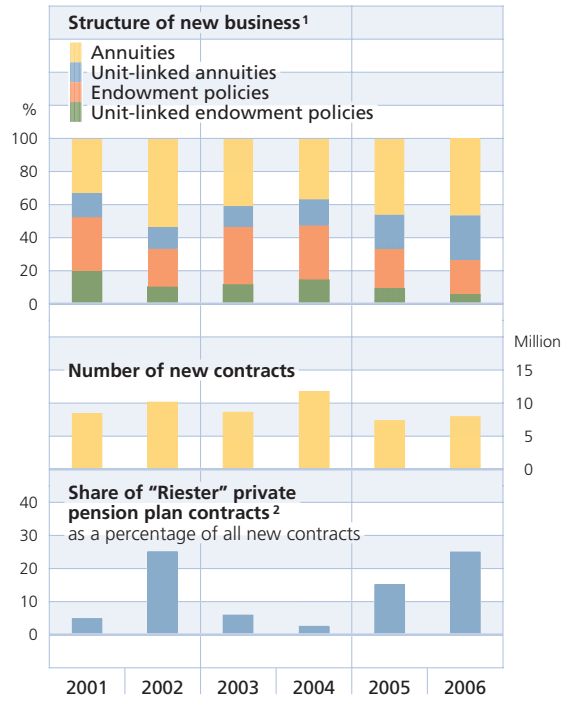
Non-life insurers impacted by "Kyrill"

In non-life insurance, the combined ratio rose to 93.0% in 2006 (2005: 90.8%) as a result of a slight decrease in premium revenue and rising insurance payouts. In 2007, premium revenue is expected to stagnate while insurance payouts will rise by more than 7%, thus pointing to a further increase in the combined ratio to around 98%.[2] Winter storm "Kyrill" contributed significantly to this unfavourable development, having caused at least €2 bil-

1 This is the statutory interest rate for the minimum return on policyholders' credit balances, which always applies only to new business. It had previously (since the beginning of 2004) been set at 2.75%. The portfolio average maximum technical interest rate currently amounts to around 3.4%.
2 Source: German Insurance Association (Gesamtverband der deutschen Versicherungswirtschaft or GDV), press release of 7 November 2007.

Chart 1.3.1

NEW BUSINESS WRITTEN BY GERMAN LIFE INSURERS



Source: German Insurance Association (Gesamtverband der deutschen Versicherungswirtschaft or GDV). — **1** Redeemed new business (number of contracts), excluding term insurance, long-term care insurance and any other individual types of insurance. — **2** Life insurance eligible for subsidy.

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lion worth of insured losses. Another factor is that competition in the field of motor insurance remains fierce.

Private health insurers' sales of supplementary insurance policies growing

In 2006, the growth of private health insurers' premium revenue outpaced that of insurance payouts. Growth in core business, ie full health insurance, is at an average level while, by contrast, the rise in ancillary business, ie supplementary insurance policies, is disproportionately high. Sales of private long-term care insurance have stagnated at a low level.

Business environment for reinsurers remains favourable

In 2006, German reinsurers were able to expand their capital base owing to higher profits. They benefited from favourable trends in major losses and general market developments (more selective underwriting policies in an environment of unflaggingly high demand for catastrophe insurance cover). Against this background, the large German reinsurance companies were able to cope well with the strains arising from above-average natural catastrophe losses in Europe in the first half of 2007 (winter storm "Kyrill" and floods in the United Kingdom). At the same time, the claims trend in other regions remained favourable. Given that prices are tending to fall and that the dollar is relatively weak at present, German reinsurers can expect to see declining premium income in the second half of the year.

Investment and risk policy

No indication that life insurers are pursuing an excessively risky investment policy

In 2006, life insurers focused their investment policy on increasing their share of bearer bonds, keeping their percentage of equities and shares in pooled investments constant, and reducing their holdings of mortgage loans as well as registered bonds, debentures and loans (see Chart 1.3.2).[3] From this general perspective, it does not appear that life insurers are pursuing a riskier investment policy.

3 According to GDV data, the share of direct and indirect holdings of equities in life insurers' investments (the "true equities ratio") amounted to around 11% in 2006.

Interest rate rise is diminishing hidden reserves but life insurers have a sufficient capital base

The rise in interest rates is currently substantially eroding valuation reserves from fixed-income securities; however, this development is being offset by higher interest income. The latest BaFin stress tests conclude that all German life insurers could weather marked interest-rate-induced price falls.[4]

Innovative financial products account for only a small share of investments

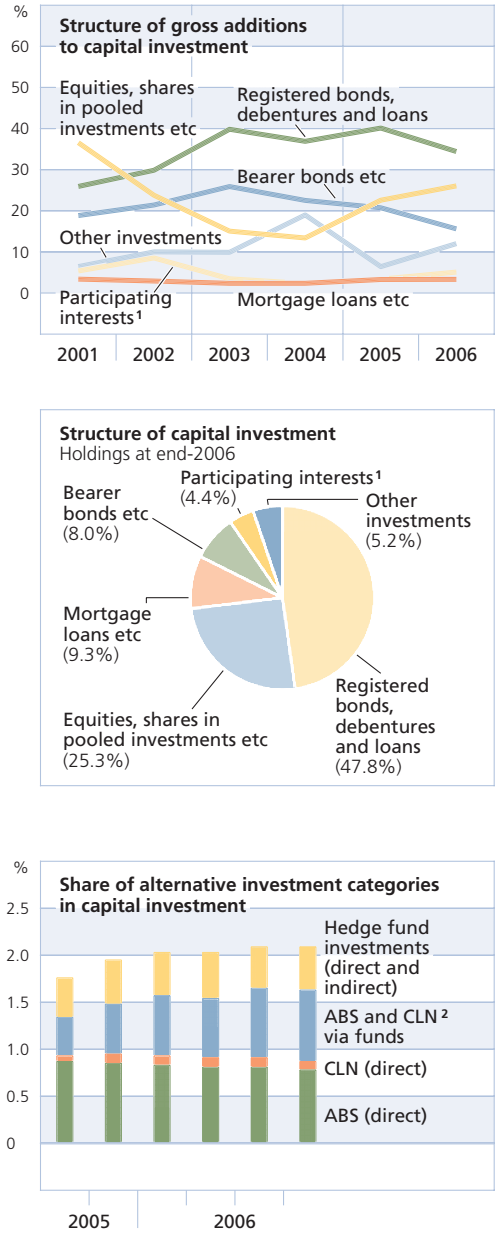
There is no evidence to confirm the speculation that German insurers may have overinvested in innovative financial products in recent years. German insurers' direct and indirect investments in asset-backed securities (ABS), credit-linked notes (CLN) and hedge funds accounted for merely 2% of the total capital investments of German primary insurers at the end of 2006 (see Chart 1.3.2).[5]

Market for insurance-linked securities still small but with the potential to transform the insurance business

Furthermore, the market for insurance-linked securities (ILS) is still being used only to a limited extent. Currently, catastrophe bonds (or "cat bonds") constitute the main method of securitising insurance risk. In addition, markets for the securitisation of other kinds of insurance risk are developing. Regulation XXX, mortality and embedded value securitisations cover risks emanating from life insurance business while motor insurance securitisation passes on risks arising in non-life

Chart 1.3.2

GERMAN LIFE INSURERS' CAPITAL INVESTMENT STRUCTURE AND INVESTMENT POLICY



Sources: BaFin, GDV and Bundesbank calculations. — **1** And investments in affiliated undertakings. — **2** Credit-linked notes.

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4 In the insurer stress tests conducted by BaFin in 2006, all of the 104 participating German life insurance companies had positive balances in all scenarios (including that of a 10% fall in the price of bonds or a simultaneous fall in the price of bonds (-10%) and equities (-5%)).

5 If the approximately 0.5% in private equity holdings are also added, the share of direct and indirect holdings of alternative investment instruments amounts to around 2.5%. (Source: BaFin and Steria Mummert ISS, Kapitalanlagestatistik, Nachweisung 673). Therefore, on average, insurers do not make full use of the framework for alternative investments laid down by the German Investment Regulation (Anlageverordnung).

Box 1.12

SECURITISATION OF INSURANCE RISK

The catastrophe bond ("cat bond") market can serve as a blueprint for the development of further insurance-linked securities. Innovative insurance-linked securities and derivatives may give rise to new possibilities in the form of broader investment opportunities, more efficient use of capital and better risk management; at the same time, however, they also hold potential risks for financial stability.

The year 2007 will probably be the third consecutive record year for new catastrophe bond issues. The average size of the transactions involved has recently increased. Nevertheless, the market is still small: for instance, the aggregate volume of all issues from 1997 to August 2007 amounts to around US$20 billion.

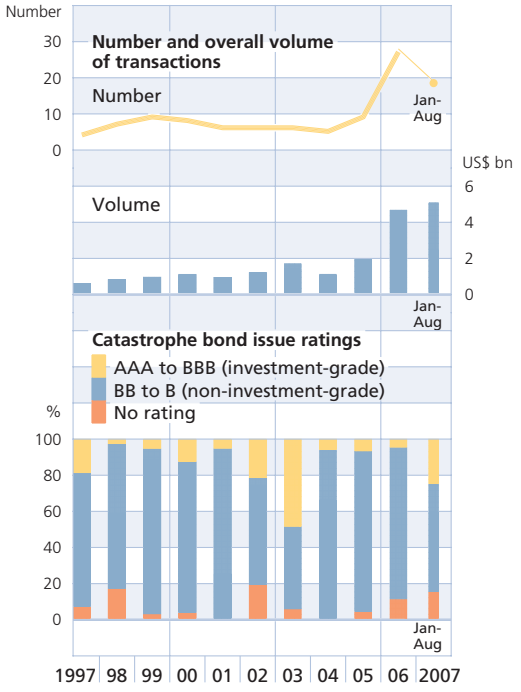
The issue ratings prove that catastrophe bonds have, from the outset, been a mostly speculative investment product. Over the entire ten-year period since 1997, around 70% of all issues have had a B or BB rating (see the adjacent chart).[1] It is not yet possible to assess whether this year's rise in the number of new issues with an investment-grade rating is an exception or the start of a trend towards higher-rated new issues.

Around 90% of all the catastrophe bonds issued since 1997 were sponsored by insurance or bancassurance groups. According to the information available, only around 4% of catastrophe bonds were issued by investment banks and hedge funds, which is somewhat fewer than issues by non-financial corporations that are subject to a high loss risk from natural catastrophes (5%). Hedge funds appear to play a greater role on the investor side than on the sponsor side.[2]

In terms of the country of domicile of the groups involved, around half of all catastrophe bonds are issued by agents in the USA and Bermuda, while the other half are issued by European players, of which three are German insurance groups. Although their market shares in catastrophe bond issues are, without exception, smaller than their market shares in traditional reinsurance business, two of these German insurance groups were among the world's ten biggest catastrophe bond sponsors in the period under review.[3]

In order to assess the role of catastrophe bonds with regard to financial stability, it is necessary to distinguish between the issuer's and the investor's point of view. Firstly, catastrophe bonds are an alternative investment product and thus a substitute, for instance, for corporate bonds with sub-par credit ratings. Secondly, for sponsors, catastrophe bonds constitute an alternative form of insurance cover against catastrophe losses and thus function as a substitute for traditional reinsurance or retrocession.[4] On the investor side, catastrophe bonds will offer new opportunities for risk underwriting and diversification. For reinsurers, who most often act as sponsors, catastrophe bonds in the longer term are likely to reduce the demand for traditional non-life reinsurance and increase the competition among providers.

CATASTROPHE BOND ISSUANCE WORLDWIDE (1997 TO 2007)



Sources: Swiss Re and Guy Carpenter.

1 Standard & Poor's, alternatively Fitch Ratings. — **2** Figures based on the evaluation by Guy Carpenter (2007), The World Catastrophe Reinsurance Market: New Capital Stabilizes Market, Appendix C, September 2007, and Bundesbank research. There is only one known case of a hedge fund entering the market via its own Bermuda reinsurance subsidiaries. No similarly detailed information is available for the demand side and investor side. — **3** Sponsors were consolidated into groups for this evaluation. — **4** If the sponsor is a primary insurer (reinsurer), catastrophe bonds are deemed to be a substitute for traditional reinsurance (retrocession).

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business.[6] It seems plausible that, following the current trial phase, the securitisation of insurance risk – like securitised lending in the banking industry – could change insurance business in general over the longer term.

Political and regulatory developments

In the past twelve months, progress has been made in important draft legislation for the insurance industry which, owing to its relevance for insurers' business models, also raises financial stability issues.

Reform of the Insurance Contract Act: profit shares

The reform of the Insurance Contract Act (*Versicherungsvertragsgesetz*) will affect, in particular, life insurers owing to its provisions relating to profit sharing with policyholders. Although the original draft bill raised cause for concern with regard to financial stability, this is now no longer the case.

Healthcare reform: basic tariff

The healthcare reform is having major implications for private health insurers through, among other things, the introduction of a basic tariff. Persons with private health insurance will be given the opportunity both

6 In 2006, the issue volume of Regulation XXX securitisations amounted to around US$4 billion and was thus comparable with that of catastrophe bonds; the other forms of ILS played a lesser role. Regulation XXX securitisation covers mortality risk in term insurance in the USA and frees up life insurers' equity capital which would otherwise be tied up as a result of the restrictive provisions laid down by the US National Association of Insurance Commissioners (NAIC) in Model Regulation 830, known during its drafting process as "Regulation XXX", to which this form of securitisation owes its name.

Box 1.13

REFORM OF THE INSURANCE CONTRACT ACT

The reform of the Insurance Contract Act (*Versicherungsvertragsgesetz*), which has now been adopted and will enter into force in the next two years, will involve, amongst other things, a revision of the provisions relating to profit shares in life insurance.[1] Pursuant to these provisions, insurers must recalculate the valuation reserves for all capital investments every year and allocate them to each contract on a causality-oriented basis so as to be able to give customers a half share of this position when their contract ends. Hidden reserves from fixed-income securities, which make up the bulk of life insurers' investments, are specifically to be included. As these are temporary items which are depleted until final maturity, they can, as a rule, be liquidated only if the securities are sold prematurely, but not if they are held to maturity. Life insurers could, in certain situations, be forced to sell prematurely and to reinvest the freed-up funds at a lower interest rate, which would make it more difficult for them to generate a guaranteed return. The legal prescription of profit shares gives rise to the expectation that, in the area of life insurance, safety margins will be liquidated and guarantee products will become more expensive (or may be further ousted).

1 The revised Insurance Contract Act will apply to all new contracts as of 1 January 2008, while the revised rules on profit shares will also have retroactive effect from 1 January 2008. All other provisions will have retroactive effect from 1 January 2009. (Source: VVG-Reform vor letzter parlamentarischer Hürde, in Versicherungswirtschaft, No 18/2007, pp 1518-1520). The German Disclosure of Information Regulation (Informationspflichtenverordnung) is to enter into force together with the revised Insurance Contract Act. This Regulation has been criticised by companies and associations but is insignificant from a financial stability perspective.

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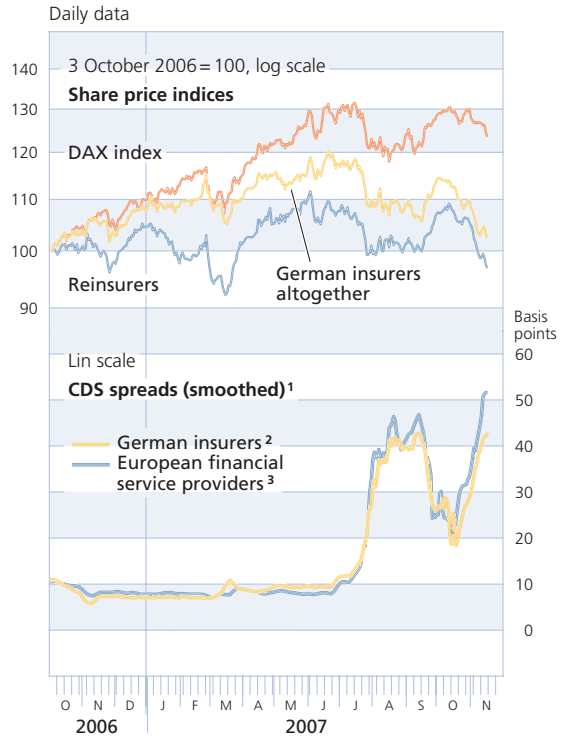
Chart 1.3.3

MARKET INDICATORS FOR GERMAN INSURANCE COMPANIES: SHARE PRICE INDICES AND CDS SPREADS



Sources: Thomson Financial, Bloomberg and Bundesbank calculations. — **1** Five-day moving averages. — **2** Unweighted average for three large German insurance companies. — **3** Based on the iTraxx CDS indices.

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to change their insurer more easily[7] and to switch to the basic tariff which is to be newly created.[8]

Both regulations will create additional costs for insurers which cannot be passed on to the beneficiaries concerned and must therefore be borne by the rest of the community of policyholders.

Solvency II

The planned reform of European insurance industry supervision (Solvency II)[9] is arousing fears, above all among smaller insurers, that it will entail excessive costs and competitive disadvantages vis-à-vis large insurance companies. Solvency II, like Basel II, has a three-pillar structure and contains revised rules on insurers' capital requirements, risk management standards and disclosure requirements. Although the introduction of the new supervisory rules may, for a short time, slightly increase the consolidation pressure which already exists in parts of the industry, from a financial stability perspective, the advantages of having a uniform, Europe-wide supervisory framework, which is in line with modern developments in financial market theory and risk management, seem to outweigh this factor.

Market indicators

Market indicators show insurers to be in a robust state

Market indicators (share prices, credit default swap (CDS) spreads, expected default frequencies (EDFs) as well as the upgrades and downgrades of the Insurance Financial Strength Ratings of German insurers) confirm that the German insurance companies are, all in all, in a robust state.

7 Up to now, it has been expensive for insurees to switch insurers as the provisions already made up to that time remained with the former insurance company. Under the new regulation, provisions set up to cover insurees' higher treatment costs with advancing age can be transferred in an amount equivalent to the benefits offered by the basic tariff. This restriction makes the possibility to switch insurers less attractive to the extent to which the insuree's tariff differs from the basic tariff with regard to the benefits offered.
8 For existing customers, these options will be limited to the first half of 2009.
9 In July 2007, the European Commission presented a draft framework directive on new insurance supervision legislation, which is to be adopted by the end of 2008 and transposed into national law as of 2010.

Share prices have risen, albeit disproportionately little

However, insurers' shares played a less than proportionate part in the general rise in share prices over the past twelve months, with reinsurers faring even worse than primary insurers (see Chart 1.3.3). The market participants, therefore, appear to expect insurers' relatively low profitability levels – in comparison with other industries – to continue, at least over the medium term.

Insurers' credit risk: low in terms of CDS spreads, albeit recently higher at times …

The curve plotting the CDS spreads for three large German insurance companies shows that, up until July 2007, market participants perceived the credit risk stemming from these companies to be declining from an already low level (see Chart 1.3.3). As a consequence of the current financial market disruptions, the CDS spreads for insurers temporarily rose to levels of around 40 basis points in September, then fell up to mid-October but have been increasing significantly again since then. Insurers have, therefore, also had to bear the brunt of the market participants' temporarily greater mistrust, although this was slightly less intense than that experienced by banks.

… but consistently low in terms of EDFs and declining further

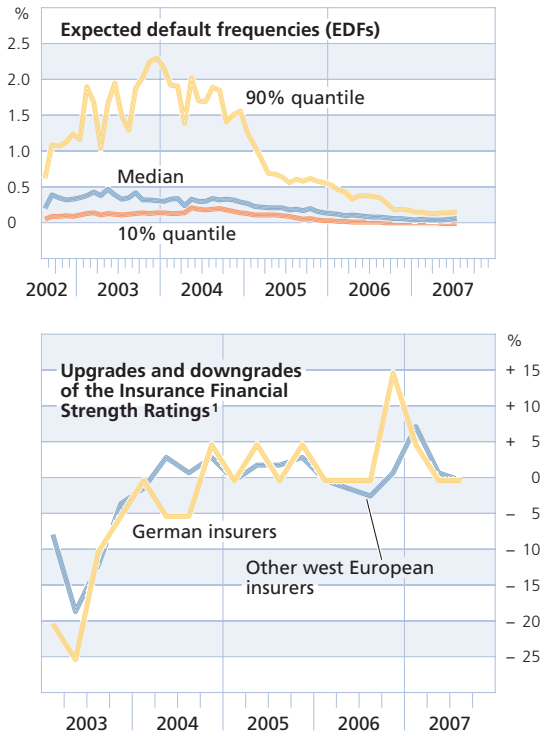
The EDFs for insurers as provided by Moody's KMV have fallen in general over the past five years. Moreover, in the past two years, the EDFs for individual companies have converged substantially, which means that the 10% and 90% quantile values have been drawing closer to the falling median value (see Chart 1.3.4).

Insurers' ratings largely unchanged

Following two years of only minor changes, several German insurers' ratings (here: Moody's Insurance Financial Strength Ratings) were upgraded in the fourth quarter of 2006 (see Chart 1.3.4). The rating prospects for life insurers and private health insurers range from "stable" to "negative"; for non-life insurers and reinsurers, the prospects are predominantly "stable".

Chart 1.3.4

MARKET INDICATORS FOR GERMAN INSURANCE COMPANIES: EXPECTED DEFAULT FREQUENCIES AND RATING CHANGES



Sources: Moody's and Bloomberg. — **1** Of the insurers rated by Moody's (as a percentage).

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Contribution to stability by the financial and regulatory infrastructure

Functioning of the payment systems

Payment systems are a significant part of the financial infrastructure of any currency area. In the euro area, a particular role is played by the individual payment systems operated by the central banks, which are interlinked as the TARGET[1] system. These allow a speedy processing of transactions with the immediate transfer of central bank money between the direct participants (generally credit institutions) and, not least on account of the volumes that are routed through them, have a major bearing on financial stability.

RTGS^{plus} as major infrastructure

In August 2007, around 153,000 payments with a value of €481 billion were processed on a daily average by the RTGS^{plus} real time gross settlement system, which is operated by the Bundesbank and simultaneously functions as the German TARGET component. This was a 10% growth in volume on the year with a corresponding increase in value of 23%. The major importance for the euro area is revealed by the fact that roughly 45% of all domestic and cross-border TARGET payments are settled using RTGS^{plus}; measured in terms of the value of the transactions, the share is around 30%.

The turbulence in the financial markets since August this year and the resulting tensions in the market for central bank liquidity have, as far as can be discerned at present, not led to any disruptions in RTGS^{plus} processing. In terms of the liquidity used for settling payments, the length of time that payments are parked in the system, as well as the deployment of liquidity management instruments and the settlement of the payments submitted, no significant changes have been observed so far compared with the corresponding months last year. This means that the innovative design of RTGS^{plus}, which is based on liquidity efficiency and saving, has proved itself even under turbulent conditions.

During the reporting period, the RTGS^{plus} core application was extremely stable in operation. A few brief, small-scale disruptions led only to minor delays in payment processing. Time-critical payments, however, were invariably executed on time. The large volume of payments on certain peak days (for example, at the end of the year) was dealt with flexibly by activating additional SWIFT communication channels. With the scheduled launch of TARGET2 on 19 November 2007, RTGS^{plus} ceased to operate.

New supervision methodology for SWIFT

For the exchange of payments and the supply of information, RTGS^{plus} uses the communication services of SWIFT. Owing to this system's major importance for the stability of the financial system, SWIFT[2] is monitored in a cooperative approach at the level of the G10 central

1 TARGET = Trans-European Automated Real-time Gross settlement Express Transfer.
2 Society for Worldwide Interbank Financial Telecommunication.

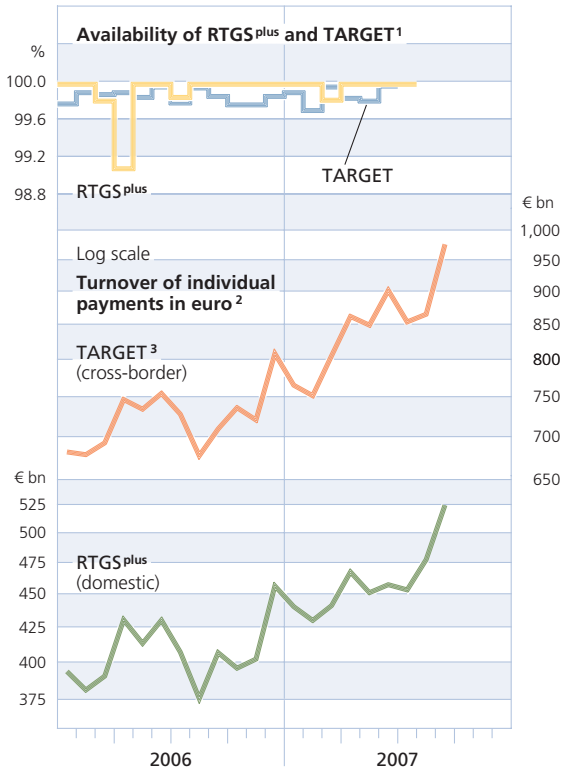
banks, although it is not a payment system. Existing monitoring methodologies can be applied to SWIFT only to a limited extent. In order to take due account of the special status of SWIFT, the central banks formulated a set of "high level expectations" (HLE), which are geared to reducing operational risks in SWIFT. This monitoring methodology was introduced in 2007.

Further reduction in settlement risks by CLS

Many credit institutions also use RTGS^{plus} to provide euro liquidity for the global foreign exchange settlement system, CLS (Continuous Linked Settlement). CLS offers a very high level of settlement security for forex transactions, as the payment flows for the currencies concerned are both settled on a payment-versus-payment (PVP) basis. In this reporting period, too, CLS increased its settlement volume, thereby contributing to a further reduction in settlement risks. Furthermore, the turbulence in the financial markets was reflected by very high numbers of transactions. On 19 September 2007, there were around 900,000 transactions with a value of US$8.4 trillion, compared with roughly 430,000 items with a value of US$4 trillion on average days. Despite the resulting very high capacity utilisation, for the most part business operations continued to run smoothly.

Chart 1.4.1

INDIVIDUAL PAYMENTS IN EURO



1 Proportion of undisrupted operating hours in the entire operating period. — **2** Working-day average. — **3** Including cross-border payments in RTGS^{plus}.

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Financial market regulation

Recent years have seen the adoption of several major European directives relating to financial market regulation, the transposition of which into German law has continued in the past few months. These directives contribute to a greater integration of the financial markets and an alignment of competitive conditions. Moreover, a single regulatory environment is strengthening the security and stability of the financial system.

Directive on markets in financial instruments

The Markets in Financial Instruments Directive (MiFID) is one of the key projects with which the European Commission is pushing ahead with European financial integration. Investor protection is to be improved and competition

in the financial services sector is to be promoted, principally through a greater degree of market transparency. This approach is to be welcomed from a stability perspective.

The MiFID regulations were originally scheduled to be transposed into national legislation by 31 January 2007. Most EU member states, however, were unable to meet this deadline. The German Act implementing MiFID[3] entered into force on 1 November 2007 and is essentially a one-to-one implementation of the MiFID regulations. Amendments bear mainly on the German Securities Trading Act (*Wertpapierhandelsgesetz, WphG*) as well as the German Stock Exchange Act (*Börsengesetz*) and the German Banking Act (*Kreditwesengesetz*).

A key element of MiFID is greater pre-trading and post-trading transparency for securities trading platforms. The fact that stock exchanges, multilateral trading facilities (MTFs) and systematic internalisers will operate on a level playing field in share trading in future is a major step forward towards greater integration and efficiency in the European securities markets. The European Commission is currently examining whether the existing rules on trading transparency, as they apply to shares, should also be extended to other financial instruments, namely bonds. Nevertheless, bond markets are not immediately comparable to stock markets. Regulatory interventions in securities markets can be justified only in situations when there are signs of market failure.

UCITS

In November 2006, the European Commission presented its programme for the modernisation of fund business in the European Union. This was contained in a White Paper on the enhancement of the EU framework for investment funds.[4] At the end of March 2007, the Internal Market Directorate General of the European Commission submitted its "initial orientations" on the subject of possible amendments to the UCITS Directive[5] for deliberation in the consultation procedure. A corresponding draft directive is therefore not expected before the start of 2008. The European Commission's plans stipulate that this regulatory project be finalised by the end of 2008. With the revision of the UCITS Directive, the European Commission is pressing ahead with its second major project in European financial market legislation. The objective is to boost cross-border selling while simultaneously guaranteeing a high level of investor protection.

The aim here is, first, to enlarge the range of investments of the "harmonised investment funds" for private investors to include open real-estate funds and funds of hedge funds. Second, the creation of a cross-border regime for "private placements"[6] of risky assets (for example, single hedge funds) is under discussion. This channel could open up the way for unregulated products from non-euro-area countries to be traded as well, which would pose certain problems in terms of supervision and stability.

3 Act Implementing the Financial Markets Directive (Finanzmarktrichtlinie-Umsetzungsgesetz, FRUG).
4 COM (2006) 686, 16 November 2006.
5 The UCITS Directive (Directive 85/611/EEC) took effect in 1985. Since then, it has been amended several times, most recently by Directive 2005/1/EC. UCITS stands for Undertakings for Collective Investment in Transferable Securities.
6 In the case of a private placement, the fund units are not sold to the general public but to specific "qualified" investors with the appropriate specialist knowledge, such as institutional investors.

Furthermore, the European Commission is making provision for a pooling of funds as well as for the cross-border merging of mutual funds. In doing so, the European Commission wishes to remedy the fragmentation of the European mutual fund industry and enhance the competitiveness of European providers. In the medium to long term, these regulations could radically change the European investment funds landscape.

Lamfalussy procedure

The aim of the Lamfalussy procedure[7] is to improve the quality and accelerate the process of European financial market regulation. In October of this year, the Inter-Institutional Monitoring Group (IIMG), which is entrusted with monitoring the practical application of the Lamfalussy procedure, presented its final report. This gave a broadly positive assessment of the Lamfalussy process and recommended additional measures for refining the procedure. These include stronger regulatory self-restraint at all levels of the procedure, a closer alignment of the legislative framework with the supplementary implementing rules in terms of timing and content and a flexible approach to selecting the appropriate legal instrument (ie directive or regulation). The report also concludes that consultation procedures should be coordinated more effectively and that impact assessments of legislative measures above and beyond the legislative framework should also be conducted in the case of important measures at levels 2 and 3 of the procedure. The transparency and the oversight of the national implementation and application of EU legislation should both be improved. A further important point of emphasis in the report concerns proposals to upgrade the level 3 supervisory committees.[8] These should create a platform for even closer collaboration between the European regulatory and supervisory authorities. Among the things needed to achieve this, the report states, are a clear European mandate, efficient decision-making procedures and adequate human and financial resources.

The IIMG's recommendations are not to be construed merely in the narrower sense as measures to refine the Lamfalussy procedure. In particular, the proposals to achieve closer cross-border coordination among the European regulatory and supervisory authorities might prove conducive to preventing and resolving financial crises more successfully, thus helping to strengthen financial stability.

Code of Conduct for Clearing & Settlement

The providers of services for the clearing and settlement of securities transactions remain under considerable pressure to harmonise their processes in order to reduce costs and deepen the integration of cross-border securities trading within the EU.

The European Code of Conduct for Clearing and Settlement is a market initiative of the stock exchanges, clearing houses and (inter-

7 The Lamfalussy procedure was introduced in the securities sector in 2001 and since 2004 has also applied to the banking and insurance sectors. It is based on the European co-decision procedure and consists of four levels. Level 1 is where the legislative framework is drawn up. At level 2 this framework is given more concrete form through the addition of implementing rules. The common and rigorous implementation of these new rules is designed to ensure a sound basis for the tasks performed at level 3 in order to achieve supervisory convergence. Level 4 is basically concerned with the application and enforcement of the EU legislation that results from this procedure.

8 These are the Committee of European Banking Supervisors (CEBS), the Committee of European Securities Regulators (CESR) and the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS). The above committees advise the European Commission when it is drafting level 2 implementing rules and, through their activities at level 3, ensure that supervisory practices among the various EU member states are convergent.

national) CSDs to create consistent, standardised and cost-efficient European underlying conditions for trade, clearing, settlement and custody in the spot market for shares. The industry is to implement this code of conduct in three stages:

- Improvement in price transparency (by 31 December 2006)
- Access to and interoperability of the systems (by 30 June 2007) and, finally,
- Unbundling of services and separate accounting (by 1 January 2008).

Compliance will be monitored by a committee chaired by the European Commission.

The code of conduct appears to have already produced results. According to the European Commission and the Council of Ministers (ECOFIN[9]), price transparency has improved. At the same time, the code is opening up access to national markets for new providers. For example, the clearing agency, LCH Clearnet Ltd, applied for access to clearing via the German stock exchange (*Deutsche Börse AG*) and the Italian stock exchange (*Borsa Italiana SpA*). As a result, it is possible to combine securities transactions that are traded on the London or Frankfurt stock exchanges, *Borsa Italiana*, and the virt-x.[10] Deutsche Börse AG has lent its support to the code of conduct and is ready to brave the competition. In September of this year, *SIS x-clear*, which is the clearing house of the Swiss SIS Group, and Eurex Clearing AG, the clearing house of Deutsche Börse AG, announced that they would be working together in equities clearing and settlement. As a result of this, both of these clearing houses will obtain reciprocal access to virt-x and the Frankfurt Stock Exchange. Furthermore, also in September of this year, Eurex Clearing AG and Clearstream Banking Frankfurt applied for access and interoperability at the stock exchanges, clearing houses and settlement organisations of France, the United Kingdom, the Netherlands, Belgium and Portugal.

All in all, the code gives the clearing and settlement service providers access to all of the relevant markets. This opening up of the post-trading markets will result in greater competition, integration and efficiency.

IOSCO code of conduct for rating agencies

The developments witnessed in the international markets in the latter half of 2007 have reignited intense discussion of the role played by the rating agencies. The implementation of the core provisions for codes of conduct for rating agencies ("code"), published by IOSCO in December 2004, was the subject of an IOSCO report in February 2007. According to this report, the major rating agencies are implementing the code, mostly with very few deviations from it. There is perceived to be room for improvement, particularly in dealing with unsolicited ratings and in ancillary services.

In the EU, rating agencies are not subject to any specific regulation at present. In December 2005, the European Commission issued a communication eschewing legislative measures to regulate rating agencies, while reserving the right to regulatory interventions in the event of new developments. The Committee of European Securities Regulators (CESR) was mandated to monitor the implementation of

9 Economic and Financial Affairs Council.
10 This is a subsidiary of SWX Swiss exchange, which trades mostly in Swiss blue chip stocks.

the IOSCO code of conduct as part of a voluntary dialogue with the major rating agencies. In January 2007, CESR published a report on this[11] for the first time, which came to broadly the same conclusions as the aforementioned IOSCO report. CESR will probably present its second report on the implementation of the IOSCO code in April 2008. In response to the subprime crisis, the European Commission has asked CESR to examine the procedures applied by rating agencies for rating structured products. The Commission does not wish to decide on possible regulatory action until CESR has published its report.

Risk Limitation Act

Based on a benchmark paper issued in August 2007,[12] a draft version of the "Risk Limitation Act" (*Risikobegrenzungsgesetz*) is now available. This contains measures on the limitation of the perceived risks in connection with financial investor activity. These proposals are designed to make the shareholder structure more transparent and to commit larger investors to the disclosure of their strategic objectives. This is to be achieved by matching amendments to supervisory legislation and to stock corporation law. In the latter area, there could be more stringent requirements for listing holders of registered stocks in the share register. In this context, it should be borne in mind that excessive requirements for correct registration and, above all, the adverse legal consequences for the holder in the event of a failure to register or incorrect registration might restrict the transferability of registered stocks. The possibility cannot therefore be ruled out that, owing to a lack of differentiation on the part of some market players, even trading in German stocks as a whole would be affected. In addition to this, systemic risks are to be kept in check by intensified market monitoring by the Federal Financial Supervisory Authority (BaFin) and the Bundesbank. The Risk Limitation Act is scheduled to enter into force in 2008.

REITs

As of this year, it has been possible to launch Real Estate Investment Trusts (REITs) in Germany, too.[13] REITs represent an international standard for indirect investment in real estate. Contrary to international practice, however, German REITs are not allowed to incorporate any residential property built before 1 January 2007. This might be one reason why the development of the market for REITs in Germany has not lived up to expectations so far. Other causes are likely to be the current unfavourable capital market environment for real estate, and the business tax reform which is scheduled to enter into force next year. Enterprises are unlikely to disclose their hidden reserves on real estate (which can be introduced into a REIT at half of the regular tax rate) before 2008 at the earliest, owing to the more favourable rates which will then apply.[14]

Investment Modification Act

The draft version of the Investment Modification Act (*Investmentänderungsgesetz*), which is soon to be adopted by parliament, stipulates that investment companies will lose their status as credit institutions. As a result of

11 See CESR's Report to the European Commission on the compliance of credit rating agencies with the IOSCO Code, Ref: CESR/06-545.
12 See Benchmarks of a law on the limitation of the risks associated with financial investments, 15 August 2007.
13 See Act on German Real Estate Investment Trusts with Quoted Shares (REIT Act), 28 May 2007.
14 The business tax reform provides for a reduction in corporation tax rates from just under 39% to below 30%. If industrial enterprises opt not to sell their real estate until 2008, they will make an additional tax saving of approximately 5% as they will have to pay a tax rate of no more than just under 15% on the hidden reserves rather than just under 20%.

this, investment companies would no longer be subject to ongoing monitoring by the Bundesbank. Up to now, the Bundesbank's involvement in the solvency supervision of investment companies was focused mainly on financial market stability. In order to analyse financial stability, the Bundesbank needs both prudential data and information relating to the investment funds launched by investment companies. From the point of view of the Bundesbank, such information is an indispensable requirement for effective crisis management since investment companies are major players in the financial markets and the investment funds which they manage can have a significant influence on the stability of the financial system. Apart from the direct influence exerted by investment companies on the markets, the contagion effects of investment companies on the banking sector are of great significance, as virtually all of the major investment companies in Germany are subsidiaries of credit institutions and thus directly affect these institutions' reputational risk. The annual accounts, management reports and auditor's reports provide essential information on the investment companies' profitability and capitalisation as well as on any possible shortcomings in their business organisation. Without a basic knowledge of the business structure, which includes the international presence, as well as the asset position of the investment companies or the funds which it has established, it is not possible to play an active role in talks with the management on the restructuring of either funds or an investment company. This is what is needed, however, because knowledge of the strategies pursued is essential for assessing risks and making an appraisal of financial stability.

Section 18 of the draft Investment Modification Act therefore provides for BaFin information to be made available to the Bundesbank. It sets out in detail which information BaFin is obliged to pass on to the Bundesbank, thus enabling the latter to obtain all of the documents and information it needs to fulfil its task of monitoring financial stability. This will also apply once capital investment companies lose their status as credit institutions and are no longer under the direct supervision of the Bundesbank.

Regulation and maintenance of long-termism in financial relations

Role of variable interest rates in subprime disruptions

The use of contracts with variable interest rates, including additional deferments of payment, played a significant role in the disruptions stemming from the subprime segment of the US mortgage market. Initially, by stoking demand, it encouraged exaggerations in certain segments and regions of the housing market. Now – especially as scheduled adjustments to interest burden are impending – this type of contract is contributing to the marked rise in default rates among borrowers. Hence, there has been a clear divergence in the default rates between the group of borrowers who concluded contracts with fixed interest rates and those having contracts with a variable interest rate in both the prime and the subprime segments.

Preserving the culture of fixed-rate loans

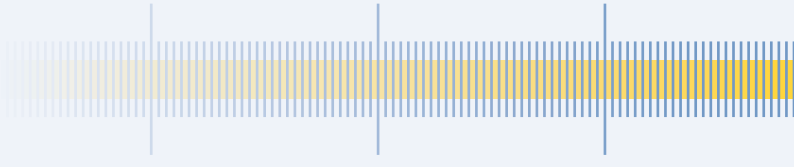
In the light of this experience, the development of the market structures in Europe should be monitored vigilantly. So far, there has been an emerging tendency in European financial market legislation to take a critical

view of fixed interest rate agreements, including the prepayment indemnity arrangement commonly used in Germany, with the aim of promoting market harmonisation and a high degree of consumer protection. The 2005 European Commission Green Paper on mortgage loans in the EU advocates a legal right to the repayment of fixed-rate loans at all times, possibly without any market-based prepayment indemnity. The Consumer Credit Directive, which is currently going through the parliamentary process, fundamentally envisages such a right, albeit with some qualifications. Mortgage-backed loans, however, are not covered by this directive.

Microeconomic and stability policy considerations argue in favour of maintaining fixed interest rate agreements. The introduction of a right to repayments at all times with inadequate compensation changes the risk-return profile of fixed-rate loans. Banks also bear the risk of making a flawed assessment of future interest rate developments when granting fixed-rate loans. In the final analysis, the expected costs of the right to repayment would probably be incorporated into the relevant terms and conditions, which is likely to mean that fixed-rate loans would become more expensive in relative terms and that their market share would tend to drop.

This could lead to a situation in which, with greater short-termism in lending business, European real estate and mortgage loan markets, including those in Germany, would be exposed in future to higher risks of exaggerations and a subsequent rise in default rates. Apart from the dubious benefit to consumers of scaling back fixed-rate loans, such a move could, in the longer term, also have the effect of weakening financial stability. It is therefore important that the fixed-rate loan remains competitive as a product for long-term financing, especially in the area of mortgage lending, and that it remains attractive in terms of the borrowers' freedom to choose and decide.

Articles



Stress tests: methods and areas of application

The importance of comprehensive risk management and its constant ongoing development have been made abundantly clear by the recent developments in the financial markets. Stress tests are one of the instruments used by the banks as well as by the central banks and supervisory authorities to detect potential vulnerabilities.

It is, above all, recently that banks have clearly expanded and refined their methodology in this area. Banks are called upon, not least by the supervisors, to conduct regular stress tests in order to ensure their capital adequacy.[1]

Furthermore, stress tests are conducted by the Bundesbank and other central banks for stability studies. In such studies, the Bundesbank pursues two different, mutually complementary approaches. On the one hand, it conducts a direct survey among banks concerning certain risk positions (bottom-up approach) and, on the other hand, it identifies the risks by analysing balance sheet data and other prudentially relevant information (top-down approach).

Stress tests provide greater flexibility than statistically oriented methods such as Value at Risk (VaR)[2] and thus make it possible to identify particular risks and potentially new risks in terms of the way in which the risk factors are configured. However, an inadequate statistical underpinning of the scenarios might lead to false conclusions being drawn. Stress tests and statistical methods are therefore not mutually exclusive but complement each other when the institutions' overall risk position is being assessed.

1 Section 123 of the Solvency Regulation; Directive 2006/48/EC (Banking Coordination Directive), Annex III, Part 6, No 32.
2 Value at Risk denotes the value which the loss amount of a position or a portfolio will not exceed with a specified probability over a predefined time horizon.

Basic principles

Term

The common definition of the term "stress test" covers a number of analytical techniques designed to determine and assess potential sources of risk and vulnerabilities in financial institutions' portfolios in the event of a severe change in the macroeconomic setting or other exceptional, but plausible situations (shocks).[3] Stress tests may be performed at the level of individual institutions or of groups of institutions as well as for the financial system as a whole.

General procedure

There is therefore a natural sequence of decisions that are to be taken in the context of stress tests. Besides the types of risk to be considered (in particular, market, credit and liquidity risks), the type of stress test module has to be defined. Furthermore, suitable stress test scenarios have to be selected and calibrated with a view to analysing their impact on the portfolios of individual banks or on an aggregate overall portfolio for the financial system.

Distinction between sensitivity analyses …

The first criterion is defining the specific analytical goal. For example, sensitivity analyses, in which only a single risk factor is considered and changed, are particularly suited to identifying main sources of risk (such as a fall in share prices or a rise in interest rates). It is assumed that changes occur only in the given risk factor under consideration. This also means, however, that neither dependencies between the individual risk factors nor banks' behavioural adjustments to the analysed shocks are taken into consideration. Consequently, such analyses are appropriate for assessing very short-term shock effects.

… and scenario analyses

In contrast to sensitivity analyses, the more complex scenario analyses involve changing more than one risk factor simultaneously, primarily to take account of the interactions between various types of risk. This, however, requires identification of the dependencies and the ability to quantify them. It should also be noted that the customary correlation and linearity assumptions typically do not hold in stress situations. Given this situation, the selection and calibration of plausible scenarios represents a challenge.

Choice of scenario based on historical data, …

In practice, historical data, for example, can be applied in order to use the largest changes observed within a given time period as the basis for the scenario definition. The advantage of this method is that historical data – provided the time series are long enough and include critical market periods – give a clue to the probability that certain events will occur. However, the use of historical data does present problems if structural changes, such as the introduction of the euro, have taken place during the observation period. In this case, it is unclear whether original interactions between risk factors still exist or whether they have changed.

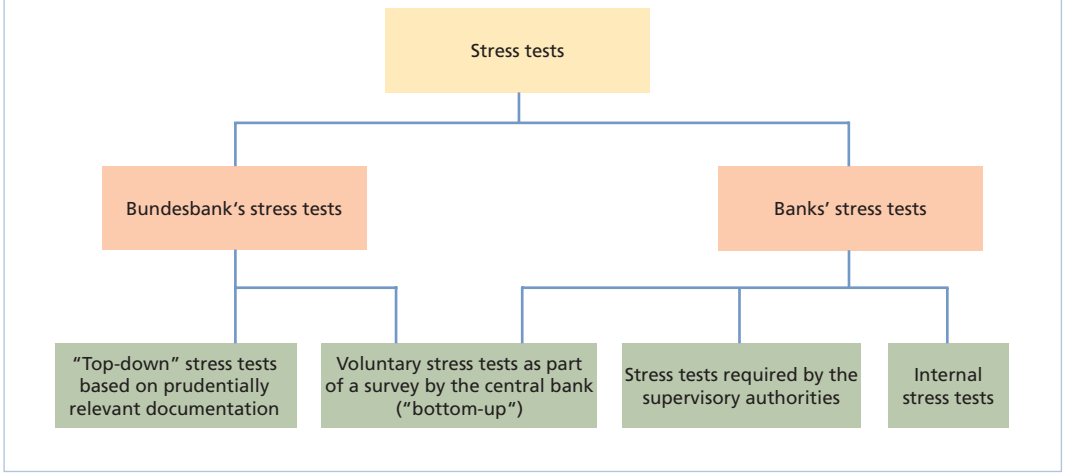
… on hypotheses or on models

If structural dependencies have changed or if a sufficiently long time series of observations is unavailable, it may be sensible to apply hypothetical scenarios. Since these are not based on historical data, new aspects can be in-

3 The following account is based on W Blaschke, M T Jones, G Majnoni and S M Peria (2001), Stress Testing of Financial Systems: An Overview of Issues, Methodologies, and FSAP Experiences, IMF Working Paper 01/88; M Cihák (2005), Stress Testing of Banking Systems, Czech Journal of Economics and Finance 53, pp 417-440; M T Jones, P Hilbers and G Slack (2004), Stress Testing Financial Systems: What to Do When the Governor Calls, IMF Working Paper 04/127.

Chart 2.1.1

OVERVIEW OF THE STRESS TEST METHODS



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cluded in the analysis. What is difficult in this context, however, is assessing how plausible the events are, and it may be prudent to make additional use of external expert knowledge for this purpose. As a further option, scenarios can also be defined on the basis of model-assisted methods. Either structural models which directly model economic causalities or purely statistical forecast models can be applied for this purpose.

Advantages and drawbacks of bottom-up approach

If uniform stress tests are conducted for studies of financial stability, the question arises as to how a coherent picture of the risk situation of the financial system as a whole can be inferred from the detailed information provided by the banks. This problem is especially acute in the bottom-up approach, in which the financial institutions each calculate their own risk positions and use their internal portfolio models into which they enter the scenarios set by the supervisory authorities. The advantage of this approach is that direct use can be made of the positive situation with regard to data and information available to the banks concerned. Drawbacks can arise in this method if the results of the individual institutions are to be aggregated to a statement regarding the stability of the overall financial system, especially if the methods used by the institutions differ widely or if the choice of surveyed banks is not representative of the banking system as a whole.

Advantages and drawbacks of top-down approach

Problems of this kind generally do not arise in the top-down approach. Here, the supervisory authority merely collects raw data from the

individual institutions, usually on the basis of reports which are submitted regularly in any case, and determines the effects of shocks on the basis of its own portfolio models. The advantage lies in the consistency and comparability of the results, although certain estimation errors are inevitable with this approach since the situation with regard to data is, as a rule, poorer than in the bottom-up approach.

Interpreting stress test results

These considerations make it clear that the informative value of stress tests is influenced by a whole variety of factors. Model specifications and assumptions probably play the most important part in this context, however.

Application of stress tests at banks

Stress tests are one of a number of tools with which banks can assess their risk situation. Their importance has increased considerably over the past few years.

Acceptance and widespread use of stress tests at banks

According to the results of one study which the Bundesbank and the Federal Financial Supervisory Authority (BaFin) conducted among 12 large German banks in 2006, all the surveyed institutions conduct stress tests regularly at least in the area of market risk. It is only the areas of credit risk and liquidity risk, where the problems of modelling are greater, that a minority has no workable stress test models, although they are working on their introduction. A study by the Committee on the Global Financial System (CGFS) in 2004, in which the Bundesbank was involved, arrived at a similar conclusion. This showed that, since the start of 2000, stress tests on credit risk had gained in significance and that stress tests on liquidity and operational risk are becoming increasingly important. Recent financial market developments are likely to further reinforce this trend.

Complementarity of stress tests and other risk measurement methods at banks

The institutions do not regard stress tests as a substitute for other methods of risk measurement but rather as a supplement to them. Whereas, say, VaR models are used principally to determine the required economic capital and for internal capital allocation, stress tests provide an opportunity to depart from the customary model or analytical framework and to question the risk assessments derived from it. Stress tests are very important especially if the data situation means that certain risks cannot be captured satisfactorily by statistical models. The majority of the large institutions surveyed therefore employ stress tests in their business planning as well, although there are large differences in the specific detailed implementation. Generally, stress tests are used as part of risk sustainability analysis and, in some cases, also for determining the required economic capital. Often, stress tests provide a basis of discussion on defining a bank's credit risk strategy. In some cases – especially in the management of market risk and liquidity risk – they are employed to establish limits and hedging strategies. In individual instances, stress tests are incorporated into the risk-adjusted performance measurement of the various lines of business.

Choice of scenario in different risk areas

Depending on the context and the type of risk, the institutions employ historical or hypothetical scenarios in their stress test analyses. The historical analyses focus, naturally enough, on the area of market risk, where long time series on daily changes in market prices are

Box 2.1

STRESS TESTS AS AN INFORMATION SOURCE FOR SUPERVISORS

Stress tests are an important source of information for the banking supervisors. This became clear especially in the light of the recent turbulence in the international financial markets (subprime crisis), which was driven mainly by market and liquidity risks. The Bundesbank conducted stress tests on both types of risk in advance, enabling it to draw valuable conclusions on how to manage the crisis.

The liquidity risk stress test survey, which the Bundesbank conducted among 12 big, internationally active institutions in spring 2007, supplied some significant data regarding the internal liquidity risk management performed by the responding banks. In addition to gaining a better understanding of the methods for measuring and managing liquidity risks applied, including the assumptions on which the stress scenarios used in risk management are based, it was also possible to obtain an overview of institution-specific risk factors which are relevant to liquidity. It became apparent that the majority of banks expect their liquidity position to be influenced most strongly by systemic crises. The assumptions made in the relevant stress scenarios may be described, predominantly, as sufficiently conservative. It was consequently possible to assume that the surveyed banks possess adequate resilience to systemic crises.

In the area of market risk, it was chiefly the widening of the credit spread that played a key role in the recent financial market turbulence. The Bundesbank has been conducting stress tests on credit spread risk for two years. In the credit spread risk scenarios, it is assumed that the spreads widen in the individual rating categories. The scenario specified by the Bundesbank relates to a widening of the spreads of all bonds of a given rating category. During the recent financial market turbulence, however, it was noticeable that there were marked diferences in the widening of the spreads from segment to segment. For instance, while credit spreads in the market for structured mortgage loans widened significantly, credit spreads for corporate bonds remained relatively moderate. Nevertheless, the responses allowed valuable conclusions to be drawn about the extent to which the banks are affected generally by downturns in earnings due to the widening of spreads.

The other scenarios of the market risk stress tests also provide valuable clues to the resilience of the banking system. The finding that the big, internationally active banks have their market risks generally under control may be regarded as a positive sign.

Taken together, the results of the stress tests provided vital information on the stability of the surveyed banks under adverse market conditions. As the surveys took place before the financial market turbulence in summer 2007, it was possible to use the results of the stress tests directly in the prudential analyses and decision-making. The results also provide valuable insights into the ongoing development of banks' internal methods of measuring and managing market and liquidity risks.

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readily available and also cover real stress events. Analyses of credit risk are much more difficult because the scale of shocks often has to be derived from expert assessments. It is likely, however, that, with the establishment and improvement of the databases, increasing use will also be made of historically or statistically based scenarios in the case of credit and liquidity risk.

The Bundesbank's stress tests

Stress tests for assessment of financial stability

Analysing financial stability, alongside maintaining price stability, is a key task of all central banks. In addition, the Bundesbank works together with the Federal Financial Supervisory Authority in the supervision of the credit institutions. Against this background, the Bundesbank employs stress tests to assess the individual credit institution's risk situation and the resilience of the financial system as a whole. The most important models used and recent developments in this area will be presented below.

Credit risk

Characterisation of credit risks

Credit risk is, in most cases, the banks' most important risk component. A distinction is usually made between default risk in the narrower sense and spread risk in the broader sense. The risk that a borrower will not be able to fulfil his financial commitments is known as default risk. Credit defaults – in the form of write-downs – directly diminish the bank's capital and therefore its solvency situation. In the broader sense, credit risk also concerns the risk of a deterioration in the borrower's credit rating without this necessarily leading to default and matching write-downs. In the case of trading book assets, which are usually entered in the balance sheet at the available market prices, a deterioration in the borrower's creditworthiness has a direct impact on the banks' capital. But irrespective of whether the assets are traded in liquid markets or not, deteriorations in the credit rating reduce the economic value of a credit position (albeit not necessarily its balance sheet value) and are therefore an important factor for assessing the institution's risk situation. The Bundesbank employs a number of different stress test models to take due account of the various aspects of credit risk.

Sensitivity analyses

Database for sensitivity analyses

Owing to its role in banking supervision, the Bundesbank possesses in-depth data on the banks' credit risk. The relevant reporting regulations have been considerably amended in the wake of the new Capital Adequacy Directive. The new rules allow banks to use their own internal model for calculating individual components to determine the regulatory minimum capital provided certain conditions are fulfilled. The most important components that can be used for the capital requirements are the estimated probability of default (PD) of the borrower, the loss given default (LGD), and the exposure at default (EAD). The impact of changes in individual risk components on the regulatory minimum capital requirements can be determined with the aid of simple sensitivity analyses.

Implementation of sensitivity analyses at the Bundesbank

At the Bundesbank, this approach has been implemented on the basis of bank data re-

ceived from some 75 banks participating in the Quantitative Impact Studies QIS 4 and QIS 5 in 2005 and 2006 respectively. The PDs provided by the banks were given mark-ups corresponding roughly to a deterioration in the borrowers' credit rating of one to two rating grades. In future, the QIS data will no longer be available in this form. Potentially, however, the information collected for the revised reporting system for large exposures and loans of €1.5 million or more will be suitable for conducting sensitivity analyses as described above, since the new reporting format also contains information on the borrowers' PDs.

Scenario analyses

Database for scenario analyses

Key information on the banks' concentration risk can be gained from the credit register of loans of €1.5 million or more. Information on banks' and insurers' credit claims exceeding the threshold value of €1.5 million is collected in this database.

Objectives of scenario analyses

The Bundesbank uses these data as a basis for regularly conducting scenario analyses designed to detect the credit portfolios' vulnerabilities to certain stress scenarios. This allows, in particular, the calculation of concentration risks resulting from a high level of lending to individual large enterprises.[4] If a given LGD is also assumed – although no detailed information is available in this respect – the individual bank's expected provisions for loan losses can be assessed directly.

Sectoral stress test as one application for scenario analyses

The more broadly defined sectoral stress tests focus on analysing whole sectors rather than individual borrowers. Since the coverage is broader than the credit register of loans of €1.5 million or more, the Bundesbank principally uses data from the borrowers statistics on the banks' lending to individual sectors. Using the sectoral stress test, it is relatively easy to determine whether banks have concentrated their lending on certain sectors and how vulnerable they are to risks stemming from a lack of diversification. Typical scenarios relate to a deterioration in the economic situation in one or more sectors in the form of an increase in insolvency ratios. Depending on the scenario, a differing number of sectors can be "stressed" directly. In order to design the scenarios as realistically as possible, correlations with other sectors are incorporated. The stressed insolvency ratios flow as default rates into the provisioning rates of the banks' loan portfolios.

Stress tests for sectoral concentrations of German banks

Model approach to analysing sectoral concentration …

To investigate the sectoral concentration in the loan portfolios of German banks, what is known as a stochastic multi-factor model is used. Such a model may be regarded as the industry standard for calculating the economic capital requirements for covering credit risks. The procedure employed by the Bundesbank is based on the method of Bonti, Kalkbrener, Lotz and Stahl (2006).[5] With this method, it is possible to consider concentration risks either as a concentration of exposures within sectors (sectoral concentration) or vis-à-vis individual borrowers.

4 To capture concentration risks effectively, affiliated enterprises have to be combined into single borrower units. One potential difficulty is that it is not possible to define all the economic links unambiguously in legal terms.
5 See G Bonti, M Kalkbrener, C Lotz and G Stahl (2006), Credit risk concentrations under stress, Journal of Credit Risk 2, pp 115-136.

… taking account of sector correlations

Instead of a point forecast of the stressed risk factor, all realisations below a given threshold are considered. Owing to the risk factor's correlation with other sectoral factors, the stress effect is transferred to other sectors as well, with the sectoral correlations having been estimated empirically from return time series of the Dow Jones EuroStoxx subindices.

Modelling of banks' credit portfolios

The banks' corporate loan portfolios can be modelled approximately by using credit information from the reports on loans of €1.5 million or more. The probabilities of default (PDs) are mapped on the basis of sector-dependent historical default rates.

Sequence of stress tests for sectoral concentrations

Two variables are used to measure the effects of the given stress scenario. First, as is commonly the case, the expected loss – conditioned on the occurrence of the stress scenario – is determined. Second, what is known as the unexpected loss given the occurrence of the stress scenario, ie the resulting increase in bank-internal capital requirements, is determined. The unexpected loss is measured by the risk measures of Value at Risk and expected shortfall. The unexpected loss is a key variable for risk management since it determines the bank-internal (albeit not necessarily the regulatory) capital requirement. In the concluding assessment of the results, the focus is on the expected loss conditioned on the occurrence of the stress scenario since the loss directly affects the income.

Market risk

Alongside credit risk, market risk is the next major category of risk. The Bundesbank's stress tests relate to the main risk factors of market risk, ie interest rate risk, equity price risk, exchange rate risk, volatility risk and, since 2006, credit spread risk.

Main risk factors analysed in Bundesbank market risk stress tests

Bottom-up approach: market risk stress tests

As a first stage in a bottom-up approach, the Bundesbank defines scenarios which assume extreme but realistic market price changes. The institutions then use their own risk models to determine the market price fluctuations of their financial positions implied by the scenarios. The results are subsequently aggregated by the Bundesbank. The voluntary survey is addressed to a representative selection of large and medium-sized banks in Germany. The number of participating institutions has been extended over the past few years with a total of 28 banks taking part in the survey in 2007. The stress tests are designed as sensitivity analyses with regard to different market risk factors, with all the on and off-balance-sheet positions being incorporated into the calculation of the value changes.

Scenarios for interest rate risk

For the analysis of the interest rate risks, the yield curve is split into three maturity bands. In total, seven scenarios are considered: four for an interest rate rise and three for a fall in interest rates. Scenarios (5) to (7) (see Table 2.1) are defined as mirror images of scenarios (1), (2), and (4). Overall, more room is given to the analysis of interest rate increases, as their negative effects are generally much more significant than the risks posed by a fall in interest rates. This is due to the fact that, given a traditional balance sheet structure (liabilities are predominantly short-term, assets are predominantly long-term), rising interest rates result in losses, while falling interest rates imply gains.

Scenarios for equity price risk, exchange rate risk and volatility risk

With regard to the equity price risk, a global 30% slump in share prices is assumed. The equity price risk plays a major role especially for the larger banks owing to their heavy involvement in proprietary trading and their equity investments, although these have declined considerably in the past few years. For the exchange rate risk, the Bundesbank scenarios assume a 15% appreciation or depreciation of the euro against all other currencies. For the volatility risk, which plays a certain role, especially for the assessment of off-balance-sheet positions, a 50% increase in the interest rate, equity price and exchange rate volatilities is assumed.

Stress tests for credit spread risk

Since 2006, stress tests for the credit spreads have also been included in the analysis. Credit spreads denote the premium on interest rates for certain creditworthiness categories compared with the risk-free interest rate. The results of the studies show that the credit spread risk represents a non-negligible risk. The scenarios assumed by the Bundesbank take account of the fact that credit spreads for various credit ratings may develop in different ways. Depending on the creditworthiness category, the changes assumed in the analyses hitherto vary between 10 and 200 basis points.

Table 2.1

BUNDESBANK MARKET RISK SCENARIOS

Changes in basis points

Scenario	Short-term[1]	Medium-term[2]	Long-term[3]
Yield curve			
(1) Short-term interest rate +	110	60	40
(2) Parallel shift +	70	70	70
(3) Parallel shift ++	150	150	150
(4) Twist +	60	– 20	– 50
(5) Short-term interest rate –	– 110	– 60	– 40
(6) Parallel shift –	– 70	– 70	– 70
(7) Twist –	– 60	20	50
(8) Euro appreciation/ (9) Euro depreciation	15% appreciation/depreciation of the euro against all currencies		
(10) Fall in share prices	Simultaneous 30% fall in share prices across all markets		
(11) Rise in volatility	50% increase in volatility of interest rates, share prices and exchange rates		
(12) Credit spread expansion	Credit spread expansion in basis points: AAA + 10, AA/A + 20, BBB + 50, BB/B + 100, CCC and worse + 200		

1 No more than three months. — **2** More than three months but no more than five years. — **3** More than five years.

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The banks were allowed a relatively large amount of freedom in the specific design of the stress scenarios.

… in the form of scenario analyses …

One of the scenarios, for example, consists of an idiosyncratic two-notch rating downgrade. This implies higher funding costs in the interbank market, which is the most important element in short-term liquidity risk management, and a possible decrease in the committed facilities in the money markets. Further scenarios simulate market disruptions, which impair the market liquidity of certain assets, or operational problems in payments.

Liquidity risk

Introduction of liquidity risk stress tests …

In 2007, bank-specific stress tests on liquidity risk were conducted for the first time.[6] The participating – predominantly large – institutions were given framework scenarios, which they calculated using internal liquidity risk measurement and management techniques.

6 These supplement stress tests which are conducted centrally at the Bundesbank and are based on the monthly reporting data pursuant to the Liquidity Regulation (formerly Principle II).

… including current market developments

The stress scenarios also cover situations similar to recent developments in the financial markets in August 2007. Some banks, for example, take explicit account of potential drawdowns of liquidity facilities and restrictions in refinancing in the money and capital markets. The stress tests therefore provide important information on the participating banks' liquidity position under adverse market conditions and may be taken into account in the decision-making process concerning issues related to banking and financial supervision. Liquidity stress tests will be extended further in the future. In addition, the scenarios should be made more standardised and the number of surveyed institutions (2007: 12 institutions) enlarged.

Top-down approach in liquidity stress tests for smaller and medium-sized banks

For smaller and medium-sized institutions with less complex business structures, the Bundesbank calculates the effects of certain stress scenarios on the basis of the monthly data reports on liquidity risk (Liquidity Regulation). In the scenario on market liquidity risk, it is assumed that the market value of listed debt securities and other fixed-income securities falls by 10% and that the value of the shares, other variable-rate securities and other money market paper declines by 30%. In the scenario on funding liquidity risk, it is assumed that 40% of the overnight claims of banks and 10% of customer deposits are withdrawn unexpectedly. It is examined whether, in the specified scenarios, the available liquid assets exceed the expected payment obligations in a period of one month. Nevertheless, it should be noted that the available reporting data on the Liquidity Regulation do not provide a complete picture of the banks' liquidity profile, especially with regard to complex off-balance-sheet transactions.

Macro stress tests

General aim of macro stress tests

To examine the stability of the banking and financial system as a whole under stress conditions, central banks, supervisory authorities and international organisations conduct what are known as macro stress tests. Predefined macroeconomic stress scenarios, which describe extreme and unlikely, albeit plausible, macroeconomic situations, serve as a basis for testing the responses of all of the (mostly) national financial intermediaries or banks. Of particular interest in this context are the reactions of key balance sheet variables that function as financial stability indicators. This type of stress test has gained greater prominence in the past few years owing to studies conducted within the Financial Stability Assessment Program (FSAP), which has been conducted by the World Bank and the International Monetary Fund (IMF) since 1999 in connection with the Article IV consultations of the IMF.[7]

Model basis for approaches

In this area as well, two fundamentally different approaches are to be found: the bottom-up approach, which aggregates – nationally or for individual subsectors of the financial system – the results of the stress test analyses which are conducted by the banks or financial intermediaries themselves, and the top-down approach, in which an organisation itself performs the stress analyses centrally in the context of econometric approaches using microdata on the financial intermediaries. The centrally specified stress scenarios are common to both approaches. The models used to assess the stress effects are based on various

7 See W Blaschke, MT Jones, G Majnoni and SM Peria (2003), Stress Testing of Financial Systems: An Overview of Issues, Methodologies, and FSAP Experiences, IMF, Working Paper No 01/88.

forms of time series analysis which – provided the banks' microdata are available – are often enhanced by portfolio models and panel analyses in order to forecast the effects of macroeconomic developments on individual banks. In most cases, the macroeconomic, bank-specific and systemic aspects are studied separately in individual models and, increasingly, also within partially integrated approaches.

Sequence of model stress testing at the Bundesbank

The Bundesbank's macro stress testing is performed in a multi-stage procedure. This is divided into a macroeconomic part (macro module) and a microeconomic part (bank module). In the macro module, the macroeconomic stress scenarios are analysed in terms of their effects on a series of macroeconomic variables for a period of two years. Core variables resulting from this are then used in the next stage as simulation input for the microeconomic banking module. Finally, with the aid of the microeconomic banking simulations, the effects of the stress scenarios on the banks' key financial stability indicators can be analysed.

Macro module

Simulation of stress tests using two large Bundesbank structural macro models

The macroeconomic part (of the Bundesbank's stress testing) is based on the simulations of selected stress scenarios using two large structural macro models. The core of this is the Macroeconomic Model of the Deutsche Bundesbank (BbkM),[8] which the Bundesbank traditionally uses for macroeconomic forecasts and simulations. In a supporting role, the global model NiGEM[9] of the NIESR forms a preliminary stage of the simulations, in which the focus is on the international interactions and feedback mechanisms of macroeconomic shocks that operate via international financial and trade links.

Choice of scenario for macro stress tests

The choice of the stress scenarios is especially important as a starting point for macro stress testing. First, the scenarios have to represent an adequate level of "stress" to be actually able to test the stability of the banking system. In other words, they must be extreme events that clearly lie outside the baseline scenario of the projected course of the economy. Second, despite their extreme character and the low probability of their occurrence, they must be plausible and reflect a realistic assessment of risk from an expert point of view. Examples of such stress scenarios are oil price shocks, the abrupt adjustment of global imbalances, and short-term marked changes in the risk behaviour of investors in the international capital markets. The quantitative design of the shocks is, moreover, geared to the historical data and includes past outliers as a benchmark. Using the two macroeconomic models, global scenarios are then developed which take account of the macroeconomic interdependencies at the national and international levels. As a rule, it is not only individual macroeconomic variables that are "shocked". Rather, a single scenario mostly contains stress assumptions for more than one variable.

Simulation of global effects of stress scenarios using NiGEM global econometric model

Using the NiGEM global macroeconomic model, the global effects of such a stress scenario can be simulated as the first stage. NiGEM is a large structural macro model which not only accepts the economic agents' forward-looking

8 Deutsche Bundesbank (2000), Macro-Econometric Multi-Country Model: MEMMOD, June 2000.
9 National Institute Global Econometric Model – see R Barrell, K Dury, I Hurst and N Pain (2001), Modelling the World Economy: The NIESR Model NiGEM, NIESR manuscript.

expectations but also assumes nominal rigidities. This model framework ensures that nominal shocks, too, are reflected in time-lagged adjustment processes to a new equilibrium with real economic effects. It contains independent modellings for most OECD countries and some major emerging markets as well as regional blocs for the rest of the world. The countries or regions are linked by trade relations and the financial markets. As a result of simulations using this model, it is therefore possible to make a comparatively detailed assessment of the many different repercussions and second-round effects of a stress scenario through the global economic relations for Germany.

Simulation of stress test effects on German economy by means of Bundesbank macroeconomic models using NiGEM results

The results from NiGEM of the NIESR in the form of simulated macroeconomic variables, such as exchange rates, international interest rates and export demand, serve in the next stage as the basis for simulating the specific effects on the German economy within the framework of the BbkM. The BbkM is also a large structural macro model which is based on theoretically defined, econometrically assessed behavioural equations and a series of definitional equations. As a national macro model, the BbkM concentrates on in-depth modelling of the German economy. In more detailed and specific behavioural equations, it explains more precisely the individual components of macroeconomic demand and matching deflators and models, *inter alia*, the interdependencies in the labour market and the fiscal domain. By contrast, variables that are essentially determined externally, such as world trade and exchange rates, are entered exogenously into the model. For this purpose, the aforementioned values simulated in NiGEM are used. The simulated stress scenarios produce paths of key macroeconometric variables for Germany over a period of two years. These form the starting point for the simulations in the microeconomic banking model for assessing the impact on key financial stability indicators of the banking system.

Limitations of macro modelling for assessing financial stability

Traditional macro models offer the advantage of an integrated and consistent analytical framework for modelling direct and indirect effects of econometric shocks and their transmission process. Especially with regard to the analysis of financial stability, the limitations of such simulations should also be borne in mind, however. As a rule, the degree of detail in the modelling of the financial markets is not very high, for example. Furthermore, it is difficult to capture the transmission of shocks which operates through rationing and contains a marked confidence component.

Banking module

Simulation of impact of macroeconomic shocks on German banks by linking micro and macro modules

The banking module investigates the effects of cyclical shocks on German banks. The link to the macro module functions via key macroeconomic variables, such as real GDP growth and short-term and long-term interest rates. In addition, bank-specific characteristics, such as the average maturity of loans, their average credit rating (measured by the percentage of non-performing loans) and their sectoral distribution, play a major part in the forecasting equations. In contrast to the macro module, the banking module is a microeconomic model which uses a panel regression approach to track the loan decisions of the individual banks. Since not only aggregated variables are incorporated, this approach can also be

Box 2.2

BANK RATING MODEL

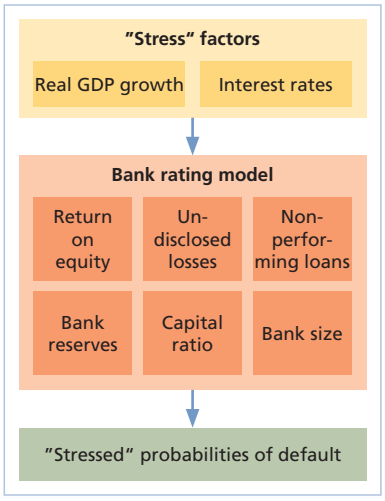
In specific stress scenarios, such as an interest rate or an oil price shock, predicted developments in key bank-specific variables, such as loan loss provisions, net interest received or non-performing loans, provide information on the German banking system's vulnerability to crises. Nevertheless, it is no easy matter to assess the changes in different variables simultaneously and to derive robust information on financial stability. Therefore, efforts were undertaken to condense all the variables into a single bank-specific soundness indicator.

A soundness indicator of this kind has already been used for several years to assess German savings banks and credit cooperatives.[1] The results are depicted regularly in the Financial Stability Review (Bundesbank Hazard Rate Model, see page 78). What is new is that, in future, this soundness indicator will likewise be incorporated into the Bundesbank's macro stress testing model. The bank rating model on which the soundness indicator is based calculates the probability of a credit institution's existence being endangered within a period of one year if no assistance measures are provided. Certain variables for capitalisation, profitability, credit and market risks as well as the development of the economy as a whole are entered as explanatory factors for the "failure" of an institution.

For stress testing purposes, the following three-stage procedure is now chosen. First of all, the paths for the relevant macroeconomic variables resulting from the framework scenarios are determined within the macro model. The variables "GDP growth" and "interest rates" calculated in this stage are then used in the second stage as "stress factors" for the variables "loan loss provisions", "net interest received" and "non-performing loans" at the institutional level, which are forecast using panel equations. In the third and final stage, these risk variables are condensed into "stressed ratings" in the bank rating model. The bank-individual risk factors of the preceding stage determine the changes in the components of the soundness indicator either directly (for example, in the case of the non-performing loans) or indirectly as a component of other variables (for example, net interest received is included in the return on equity).

Using the stress indicators produced in this way, it may be possible to gain a comprehensive picture of the risk situation of the banking system under stress. A risk situation would be emerging especially if the ratings overall or for a sizeable group of banks were to show a marked deterioration.

CALCULATION OF "STRESSED" PROBABILITIES OF DEFAULT IN THE BANK RATING MODEL



1 A soundness indicator for big banks, whose business differs markedly from that of the savings banks and credit cooperatives, is currently at an early stage of development.

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used to study, say, which categories of banks would be most affected by possible cyclical downturns. If information on the banks' capitalisation is also used, it is possible to forecast which banks might run into difficulties given an increase in write-downs or non-performing loans. This produces a more precise picture of the stability of the banking system as a whole than would be possible by analysing aggregate variables alone.

Operation of banking module and major findings

At the core of the banking module are forecasting equations for loss provisions in lending business and net interest received. Econometric estimations show that, given a decline in macroeconomic growth of 1 percentage point, the credit institutions' loss provisions increase, on average, by roughly 10%. The differential between long-term and short-term interest rates,[10] in turn, has a high degree of explanatory power for the amount of net interest received. This reflects the fact that most banks perform a maturity transformation, ie they make long-term investments and refinance themselves through short-term deposits. Besides provisions for loan losses and net interest received, which affect profit and, therefore, have a direct bearing on the banks' capital, the banking module forecasts the portfolio of non-performing loans, which does not have a direct effect on the level of the bank's capital but which is nevertheless a major criterion for assessing a bank's stability in the medium term.

Credit quality model for banks included for more precise results

Projected variables for loan loss provisions, net interest received and non-performing loans can provide information on the risk situation of the banking system. For example, it is possible to determine the number of banks whose capital – in a given scenario – might fall below the minimum capital requirement level of 8% of the risk-weighted assets. Focusing the analysis on banks that are directly at risk might be short-sighted, however, if risks which might lead to problems in the long term are also looming for the majority of the banks which are, in themselves, healthy. Therefore, as a third stage for the stress test studies, the determined variables are linked to a bank rating model which the Bundesbank has developed for its stability studies. On the basis of balance sheet figures and other available prudential information, this bank rating model measures the probability of the bank concerned running into difficulties within a period of one year (see Box 2.2).

Enhancements

Inclusion of feedback and second-round effects

The objective of most macro stress test models used in practice is to measure the direct impact of cyclical developments on the institutions' risk situation. This means that feedback and second-round effects are mostly not taken into account, however.[11] Yet, precisely in stress situations, these could be of greater macroeconomic significance than is usually assumed and modelled. One possibility of including these effects is a dynamic disaggregated macro model which, in its modelling, is geared to individual industrial sectors (see Box 2.3). In principle, this model makes it possible to capture the effect of declining lending on growth in the economy as a whole.

10 The differential between the ten-year and one-year risk-free interest rates was used in the estimations.
11 See M Sorge (2004), Stress-testing financial systems: an overview of current methodologies, BIS Working Papers No 165.

Challenges

The enhancement of stress testing methodology faces a whole number of challenges.

Taking account of interdependencies between risk categories

Above all, when looking back to the events of summer 2007, there arises the question of the interdependency of the risk categories. As has become apparent, increased market and credit risks in the event of heightened uncertainty about market players' ability to absorb these risks could quickly cause distortions in certain market segments and lead to shortages of liquidity. Taking due account of such interdependencies poses difficulties and requires further research.

Importance of banks' behavioural adjustments to crisis situations

Stress test models draw an incomplete picture of the risk situation if they are based on too mechanistic a view of the risks and do not take due account of the possibility of the players adjusting their behaviour.[12] This includes banks making portfolio adjustments with the aim of reducing risks or improving their own risk-bearing capacity. On the other hand, such adjustments do not necessarily have a stabilising effect; it might, in fact, be the case that the market players' symmetric behaviour makes a crisis worse, even though the individual responses may appear rational.

Indirect determinants of banks' stability

In this connection, it should be borne in mind that institutions can be influenced adversely through various channels even though they themselves are not primarily or directly affected by potential symptoms of crises. Crisis

12 See, for example, M Cihak (2007), Introduction to Applied Stress Testing, IMF Working Paper No 07/59, and C Upper (2007), Using Counterfactual Simulations to Assess the Danger of Contagion in Interbank Markets, BIS Working Paper, forthcoming.

Box 2.3

DYNAMIC DISAGGREGATED MACRO MODEL AS A POSSIBLE BASIS FOR MACRO STRESS TESTS

Owing to the high level of aggregation, the linkage between the macro model and the micro model in a two-stage procedure has usually involved major difficulties. Typically, only highly aggregated macroeconomic variables can be transferred to the micro model. Given the German banks' very heterogeneous business structures and, therefore, heterogeneous dependencies on developments in the economy as a whole, this may appear unsatisfactory, however. For this reason, a disaggregated macro model could serve as a possible alternative basis.[1]

This model analyses the linkages of German industries using time series econometric methods in the context of a Global VaR.[2] Industry-specific gross value added, prices, the volume of lending and insolvencies as well as macroeconomic developments in the money market interest rate, the stock market and the price of oil are incorporated. The analysis is based on the sector-specific firm defaults in response to macroeconomic or sector-specific shocks in the context of stress scenarios. The results from this, taking into account the industry-specific exposures of the individual institutions, allow the calculation of bank-specific risk indicators. In this model framework, potential financial system repercussions for the economy as a whole can be modelled by the industry-specific volumes of lending.

1 See J von Borstel (2007), A dynamic disaggregated model of the German economy – basis for stress tests, Deutsche Bundesbank, Discussion Paper, forthcoming. — **2** See M H Pesaran, T Schuermann and S M Weiner (2004), Modeling Regional Interdependencies Using a Global Error-Correcting Macroeconometric Model, in Journal of Business and Economic Statistics, Vol 22, pp 129-162.

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overspill occurs mainly through loans to banks at risk from default if the loans have to be provisioned or, indeed, written off; in the worst case, this can lead to the lending institution running into difficulties. Furthermore, investors' confidence can be so shaken that it impacts on the refinancing options of the banks which are not affected by the crisis. Such developments could be seen within the interbank market in the summer of 2007, when the credit institutions were very cautious with regard to lending within the banking system.

Balanced approach to stress testing …

Credit institutions, central banks and supervisory authorities generally possess a broad range of different stress testing methods that have to be adapted to the given circumstances. Stress tests should not, in turn, pose a dangerous temptation to believe implicitly in any particular model since, by definition, they can look only at one given segment of the overall risk situation.

… and enhancement of stress test methods

Further research efforts are needed for the ongoing development and enhancement of stress testing methods as part of a quantitative risk analysis. In this context, an in-depth exchange of ideas and findings among credit institutions, central banks and supervisory authorities is indispensable. With this in mind, the Bundesbank, in a joint project with the IMF, has established a web-based stress-testing platform which is addressed to all institutions dealing with stress tests and which is designed for exchanging research findings.

Bond markets in emerging market economies

In the past few years, the emerging market economies (EMEs) have made distinct progress in the field of stability and growth. This group of countries is proving more and more to be a stabilising factor for the global economy. The strong growth in the EMEs is contributing to a more broadly-based global economic upswing. Moreover, the efforts of the emerging economies to enhance the stability of their financial systems are bearing fruit. This view is supported by the fact that, for instance, although the financial markets in the EMEs have been affected in the past few months by tension in the international financial markets, the overall impact has been relatively limited so far. However, risks still persist, especially in those countries that are reliant on short-term capital inflows to finance their external deficits.

This progress, which is welcome in terms of financial stability, is due particularly to the fact that many EMEs have gone to considerable – and successful – effort in the past few years to eliminate the main factors which had made the financial crises so intense, widespread and persistent in the 1990s. At the time, macroeconomic instability, a relatively nascent banking system and largely underdeveloped local bond markets had forced many emerging market countries to rely on short-term external debt incurrence. The attendant currency and maturity mismatches had made this group of countries particularly vulnerable to exchange rate and interest rate fluctuations.

On the basis of that experience, the EMEs have taken measures to promote domestic bond markets in the past few years so that, by providing a broader spectrum of long-term financing opportunities on domestic bond markets, they can reduce their dependence on external borrowing, an endeavour in which they have made pleasing progress. Even so, further efforts in this direction are necessary. Especially against the background of the renewed occurrence of turbulence in the financial markets, the question arises as to the extent to which the EMEs have been able to eliminate balance sheet risks in the government and corporate sectors. In the light of the increasing international integration of financial markets, there is a broad interest in the further development and stabilisation of bond markets in the EMEs.

Priority measures include not only improving market infrastructure and the legal framework and broadening the investor base but also ensuring and maintaining macroeconomic stability. Monetary stability and financial stability go hand in hand. It is precisely a credible monetary policy strictly oriented towards price stability that is a key precondition for lasting success in developing stable and efficient bond markets.

In the years to come, the EMEs' financial markets will be increasingly incorporated into the financial globalisation process. The structure of these markets and the way they react will change in this process. Global factors – such

as international investors' portfolio behaviour and international market liquidity – are becoming increasingly important for the development and the volatility of local bond markets in EMEs. From a financial stability perspective, these aspects should therefore, in future, be given increased attention alongside analyses of traditional currency and maturity mismatches.

G7/G8 initiative to develop local bond markets in emerging market economies and developing countries

Individual EMEs have experienced different degrees of progress in their efforts to develop local bond markets. This was also clearly evidenced by a High Level Workshop hosted by the Deutsche Bundesbank and the Federal Ministry of Finance in Frankfurt am Main, Germany on 9-10 May 2007.[1]

The main objective of this workshop was, on the basis of each country's experience, to identify additional key reform steps and to develop concrete recommendations for best practices. These recommendations were incorporated into an action plan adopted by the G8 finance ministers at their meeting in Potsdam on 18-19 May 2007.

The recommendations listed in the action plan are particularly designed to increase the liquidity of emerging market economies' domestic bond markets and to promote the, in many cases, still largely underdeveloped corporate bond markets. Efforts to strengthen the legal and regulatory framework, along with measures to improve the market infrastructure and to broaden the investor base, are also intended to make EMEs' bond markets, on the whole, more resilient to exogenous shocks. It must be noted, however, that individual recommendations are not equally relevant for every EME, as there are distinct differences between individual countries with respect to the

1 This workshop was part of the initiative of the German G7/G8 presidency to develop local bond markets in emerging market economies and developing countries. The presentations can be found on the Deutsche Bundesbank's website at http://www.bundesbank.de/vfz/vfz_konferenzen_2007.en.php#high.

Box 2.4

G7/G8 INITIATIVE TO DEVELOP LOCAL BOND MARKETS IN EMERGING MARKET ECONOMIES AND DEVELOPING COUNTRIES

Statement of the G7 Finance Ministers and Central Bank Governors, Essen, 9-10 February 2007

– Excerpt –

"We also met with Ministers of Finance from a number of key emerging market economies to discuss the role of local bond markets in fostering growth and financial stability. In this context developing local currency bond markets deserves higher priority to reduce emerging countries' vulnerability to external shocks and financial crises and to promote growth. We look forward to the results of the high level conference on May 9-10 in Frankfurt on market experience, which help to identify concrete recommendations and sustain the momentum of reform."

Pre-Summit Statement by G8 Finance Ministers, Potsdam, 19 May 2007

– Excerpt –

"We endorsed the attached "G8 Action Plan for Developing Local Bond Markets in Emerging Market Economies and Developing Countries" which is aimed at fostering growth and financial stability. The plan identifies measures in several areas where further progress should be made. The plan for action acknowledges the key importance of macroeconomic stability and sound legal frameworks as necessary conditions for the development of local currency bond markets. We call for a strengthening of market infrastructure to broaden and diversify the investor base. We encourage the promotion and coordination of technical assistance and ask the International Financial Institutions to take stock of the available data in support of local currency bond markets, with a view to data consolidation. We also agree on the importance of promoting regional initiatives that should provide extra momentum for developing these markets. We ask the IFIs to report regularly on the progress made in implementing this plan and we agree to monitor the issue. In low-income countries, the development of local bond markets must take into account their potential impact on long-term debt sustainability."

G8 Summit 2007, Growth and responsibility in the world economy, Heiligendamm, 7 June 2007

– Excerpt –

"We support the initiative of G8 Finance Ministers to foster the development of deeper, more liquid local bond markets in emerging economies. This can make an important contribution to reducing the vulnerability of individual countries to crises and to enhancing the financial stability of emerging countries as a whole."

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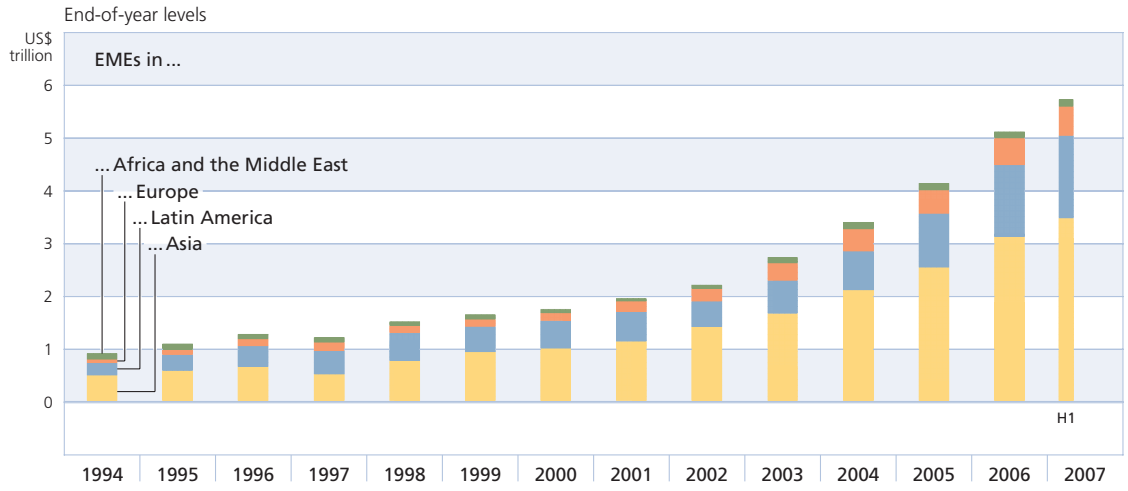
Chart 2.2.1

DOMESTIC DEBT SECURITIES OUTSTANDING IN EMERGING MARKET ECONOMIES (EMEs)



Source: BIS.

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structure of the economy, the financial system and their respective level of development.

Dynamic surge in EMEs' bond markets

Bond markets: dynamic growth ...

In the past few years, there has been a dynamic surge in the EMEs' bond markets. The volume of domestic debt instruments outstanding totalled at US$5.7 trillion as at the end of June 2007, or more than quadruple its 1997 figure.[2] Bond markets in Asian EMEs led the field, with a share of nearly two-thirds.

... and increased international significance

In the past few years, these countries' bond markets, moreover, have grown much faster than those of the G7 countries. Thus the ratio of the relevant market volumes in the emerging market economies to those of the G7 countries was as low as 6% at the end of December 1997 but rose to nearly 14% up to the second quarter of 2007. This reflects the growing significance of EMEs for global financial markets in the area of bond markets as well.

Dominant position of government bonds

From the end of 2003 to the second quarter of 2007 alone, the volume of domestic bonds outstanding doubled. This trend was fuelled particularly by the markets for government bonds, whereas corporate bonds have largely been of minor importance up to now. The vol-

2 This includes the bonds, notes und money market instruments of the following EMEs: China, Korea, Brazil, India, Mexico, Venezuela, Taiwan, Turkey, Malaysia, Poland, Thailand, South Africa, Indonesia, the Czech Republic, Hungary, Argentina, the Philippines, Colombia, Chile, Russia, Pakistan, Lebanon, Slovakia, Peru and Croatia.

ume of government bonds outstanding thus rose by 114% between the end of 2003 and June 2007, compared with a 36% rise in corporate bonds. The volume of debt securities outstanding issued by financial institutions has also risen distinctly; at 157%, they showed the strongest growth in this period and now make up around one-fifth of the total volume of bonds outstanding. However, government bonds still have the greatest weight, accounting for more than two-thirds of all bonds.

Potential to grow further

Despite this dynamic growth, EME local bond markets have considerable potential to grow further. The volume of domestic debt instruments outstanding is just over 40% of their nominal GDP, compared with around 140% in the G7 countries. Moreover, the general upward trend is still concentrated on a very few emerging market countries: the three largest emerging economies – China, Korea and Brazil – together account for around 58%.[3]

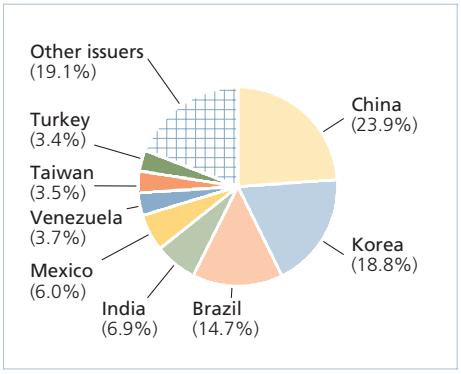
Issuing global bonds in the EMEs' local currencies …

In addition to the greater recourse to local bond markets, an increasing volume of bonds have been issued in the past few years on international financial markets in the currencies of emerging market economies (global bonds). The volume of such bonds outstanding rose from US$20 billion at the end of 2000 to US$102 billion at the end of 2006.[4] Resident issuers in the emerging market countries accounted for around US$34 billion worth of these bonds by June 2007. The growing issuance of global bonds denominated in local currency is a sign that, in particular, major emerging market economies have largely overcome the "original sin" of not being able to issue long-term local currency debt to residents or non-residents at fixed interest rates.[5]

Chart 2.2.2

CONCENTRATION OF THE VOLUME OF DOMESTIC DEBT SECURITIES OUTSTANDING IN EMERGING MARKET ECONOMIES

End-June 2007



Sources: BIS and Bundesbank calculations.

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… only a "second best solution"?

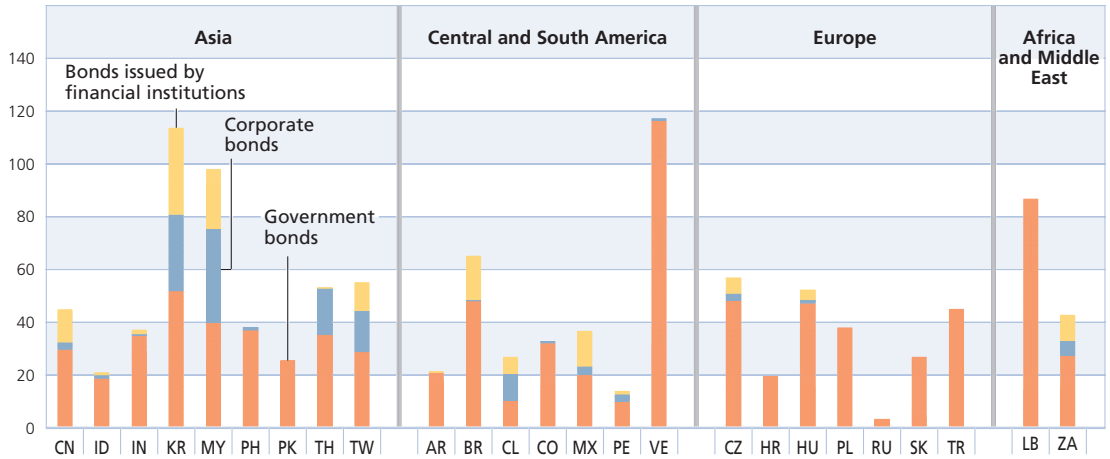
However, the issuance of global bonds can stunt the growth of domestic bond markets[6] by withdrawing funds from those markets.[7] Recourse to international financial markets is therefore occasionally also referred to as a "second best solution". Another way of looking at this, however, is that local currency bonds give issuers a broader scope for obtaining finance in international financial markets. This gives emerging market debtors

3 See T Mirow, High Level Workshop 2007 "Developing bond markets in emerging market economies", Frankfurt am Main, 9 May 2007.
4 As at the end of 2006, paper issued by non-residents amounted to around US$76.6 billion. See Committee on the Global Financial System, Financial stability and local currency bond markets, CGFS Paper No 28, June 2007, p 18.
5 See also G Häusler, High Level Workshop 2007, Frankfurt am Main, 9 May 2007.
6 See CGFS Paper No 28, loc cit, p 23.
7 See S Jeanneau and C E Tovar, Domestic bond markets in Latin America: achievements and challenges. In: BIS Quarterly Review, June 2006, pp 51-64.

Chart 2.2.3

COMPOSITION OF DOMESTIC DEBT SECURITIES OUTSTANDING IN EMERGING MARKET ECONOMIES

As a percentage of GDP, end-2006



Sources: BIS, IMF and Bundesbank calculations. IS02 country codes.

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the opportunity to find international investors who are subject to country-specific investment restrictions.

Old vulnerabilities overcome?

Currency and maturity mismatches as crisis-intensifying factors

A key issue from a financial stability perspective is the extent to which the aforementioned developments in EME local currency bond markets have brought about a reduction in currency and maturity mismatches, especially as the currently underdeveloped state of domestic bond markets is often seen today as a major factor behind these countries' financial imbalances.[8] In a currency mismatch, an enterprise's receivables are denominated in local currency while its payables have to be settled in foreign currency. If, for example, a reversal of sentiment in a country leads to a sudden outflow of capital along with a sharp depreciation of the local currency, a currency mismatch exacerbates and entrenches the crisis. The exchange rate-induced improvement in the price competitiveness of the domestic economy is offset by the increase in the debt burden of the corporate sector and a deterioration in the balance sheet ratios. Under these conditions, the depreciation can trigger recessionary tendencies that can lead to a further depreciation of the currency, with the two tendencies locked in a mutually reinforcing spiral.

8 See eg B Eichengreen, The development of Asian bond markets. In: BIS Papers, No 30, November 2006, pp 1-12.

Risk of depreciation and debt spiral

If the domestic corporate sector has a high percentage of long-term receivables at fixed interest rates whereas its payables are financed on a short-term basis (maturity mismatch), this can additionally exacerbate the crisis. In the case of sudden and strong capital outflows, the concomitant rise in interest rates would increase enterprises' debt service payments and thus reinforce the incipient downturn in the real economy. The simultaneous occurrence of both mismatches amplifies these problems; this situation is associated with the high risk of an escalating spiral of depreciation and debt.

Reduction or elimination of currency mismatches …

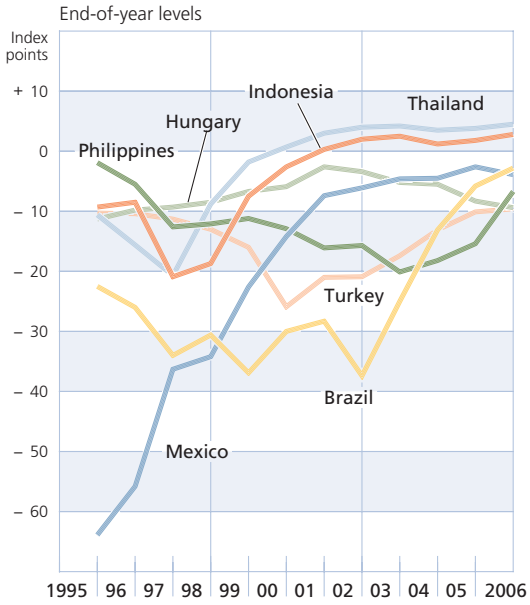
In the past few years, some EMEs have made distinct progress in reducing their currency mismatches or have even eliminated them altogether. Aggregate macroeconomic indicators suggest that, in many cases, this was primarily due to a reduction of external debt. This applies particularly to Indonesia, Brazil, Korea, Mexico, Thailand and Turkey. Hungary, by contrast, is showing a slight increase in currency mismatches.[9]

… yet information on sectoral distribution of currency mismatches required

Financial crises often begin in individual markets or sectors. The tension in the subprime segment of US mortgage markets in summer 2007 is but one example. In order to assess potential vulnerabilities, it makes sense, given the increasing complexity of financing instruments and structures, to look at the distribution of potential currency mismatches within individual sectors. From a financial stability perspective, current information on balance sheet ratios in the EMEs' household and corporate sectors would be desirable. However, because of the major effort required to collect it, such information is either not available or is only compiled on a case-by-case basis for individual countries or groups of countries based on individual analyses.[10]

Chart 2.2.4

AGGREGATE EFFECTIVE CURRENCY MISMATCH*



Source: BIS. — * The aggregate effective currency mismatch is the product of a country's net foreign currency assets (NFCA) and a simple currency mismatch (percentage of aggregate foreign currency debt in total debt related to the export share of gross domestic product); the nearer the value of the aggregate effective currency mismatch is to zero, the more closely aligned are foreign currency assets and liabilities. - See P Turner, Local currency bond markets in emerging market economies: trends, measurement and policy challanges, High Level Workshop 2007, Frankfurt am Main, 9-10 May 2007.

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9 See CGFS Paper No 28, loc cit, p 30 ff.
10 See also J A Mathisen and A J Pellechio (2007), Using the balance sheet approach in surveillance. Framework and Data Sources and Availability. IMF, 2007, especially p 28, and H Kamil (2004), A new database on the currency composition and maturity structure of firms' balance sheets in Latin America, 1990-2002, manuscript.

Vulnerability to interest rate hikes

Diagnosis of maturity mismatches less certain

It is difficult to assess the emerging market countries' success in reducing maturity mismatches owing to a lack of sufficient data.[11] Some EMEs appear to have made progress in extending the maturity of their debt. By contrast, others seem to be becoming, if anything, more vulnerable to a rise in interest rates.

In China and some Latin American countries, the ratio of short-term (up to one year) to longer-term instruments (maturity of over one year) has risen distinctly in the past few years. In China, large inflows of foreign currency and the attendant accumulation of currency reserves have been associated with comprehensive sterilisation measures. The sale of mainly short-term central bank instruments and bonds to the banking sector is intended to neutralise the liquidity effects of foreign exchange market intervention. However, these short-term debt instruments are also offset by short-term assets in the form of currency reserves, which means that the interest rate risk is, on the whole, limited. The fact that variable-rate bonds are still dominant in some Latin American emerging market economies is a sign that those countries are still relatively vulnerable to an interest rate hike.

Improvements in the macroeconomic framework

Progress towards greater stability in many EMEs

In the past few years, the emerging market economies have distinctly improved their stability policy environment. Relative to the 1990s, they have reduced their inflation rates visibly, cut their budget deficits and, in many cases, achieved current account surpluses. Moreover, following the financial crises, many emerging market economies moved to more flexible exchange rate regimes.

Stability promotes long-term financing ...

Falling inflation rates in the emerging market economies have helped to expand the supply of long-term funding for investment projects.[12] Those countries that have made the most progress in stabilising their macroeconomic environment and especially in achieving price stability have also made the greatest headway in establishing their bond markets.[13]

... and bond market structure

A rigorous stability policy, moreover, also positively impacts on the structure of bond markets. Macroeconomic stability is reflected in lower market volatility and improves the risk-return ratio, especially for investors with cross-border activities. Empirical studies show that foreign investors are particularly reluctant to invest in those emerging market economies in which markets are relatively volatile. A stable macro framework also promotes a broadening of the investor base and the liquidity of the bond markets.[14] Conversely, the development of local bond markets can favourably influence the macroeconomic environment and thus contribute to improved growth.

11 For instance, the statistics of the BIS only report money market instruments with a maturity of less than one year and domestic debt instruments with a residual maturity of more than one year.
12 See R S Kroszner, Globalization and capital markets implications for inflation and the yield curve. Remarks at the Center for Financial Stability (CEF), Buenos Aires, 16 May 2007. In: BIS Review 50/2007, pp 32-37, here p 36.
13 See also inter alia J D Burger and F E Warnock, Local Currency Bond Markets, NBER Working Paper 12552, September 2006, p 7.
14 See J D Burger and F E Warnock, Foreign participation in local currency bond markets. NBER Working Paper 12548, September 2006.

Measures to deepen bond markets

Strong legal framework: a condition for efficient bond markets

A credible stability policy is a necessary, but not a sufficient, condition for stable and efficient domestic bond markets. An additional decisive factor for realising potential efficiency gains is taking further steps towards reforms in order to strengthen the legal and regulatory framework.

Key goals for further reform steps …

At present, the EMEs' objectives for further key reforms are being focused specifically on measures to deepen the markets for government bonds and to further expand the largely underdeveloped markets for corporate bonds. Liquid markets make it easier to absorb external shocks without any major price fluctuations which, for their part, can exacerbate crises and can proliferate across other asset classes or countries.

… improved liquidity and extension of corporate bond markets

In the past few years, some emerging market economies have achieved perceptible improvements in the liquidity of their government bond markets. Measured by, for example, turnover ratios and bid-ask spreads, however, this does not apply throughout this group of countries or to corporate bond markets.

Additional key reform steps

In the light of the differences in the level of development and of the reform measures taken in the individual countries to date, the aforementioned High Level Workshop identified the following core areas where further steps would promote the development of bond markets in the emerging market economies.[15] Besides steps to strengthen the legal framework, these notably included measures to further improve the market infrastructure, to broaden and diversify the investor base and to develop derivatives and swap markets.

Strengthening the legal framework and the market infrastructure

Strong legal framework promotes liquidity

A strong legal framework, effective banking and financial market supervision and an efficient market infrastructure are also major prerequisites for the development of bond markets. This is particularly true regarding the improvement of the liquidity of local bond markets. Empirical studies show that the legal framework is one of the key determinants for improving liquidity.[16]

Clearing and settlement systems still fragmented

The goal of deepening domestic bond markets also requires further progress in establishing an efficient market infrastructure. In keeping with the aim of increasing bond market liquidity also through boosting the presence of foreign investors, a key objective is to develop internationally competitive clearing and settlement systems. The relatively fragmented systems in many emerging market economies are posing a barrier to cross-border settlement. Further possibilities of increasing market efficiency and reducing transaction costs consist in extending system interoperability.[17]

15 See H Remsperger, Developing bond markets in emerging market economies: Conclusions and political recommendations. Speech at the High Level Workshop 2007 in Frankfurt, 10 May 2007.
16 See M Kawai, Bond Market Development in Emerging East Asia. Presentation at the High Level Workshop 2007, Frankfurt am Main, 9-10 May 2007.
17 See Group of Thirty, Global Clearing and Settlement Final Monitoring Report. Washington DC, 2006.

Need to broaden investor base in EMEs

Narrow investor base needs to be broadened …

In many cases, the local bond markets of emerging market economies have a narrow investor base. As much as 42% of the volume of domestic debt securities outstanding are held by banks, whereas the average figure for selected industrial countries is only 11%.[18] A narrow investor base contributes to risk concentration, limits the variety of investment strategies and tends to increase the danger of "herding" behaviour on the markets.

… by establishing domestic pension funds …

In the past few years, many countries have promoted the build-up of domestic pension funds by reforming their statutory pension systems. This applies particularly to the Latin American countries. While these reform measures have given a major boost to the development of local bond markets, this has been associated only to a limited extent with a deepening of the markets and an increase in liquidity, as domestic pension funds often hold bonds, once purchased, until maturity.

… and further opening markets to foreign investors

By contrast, experience has shown that foreign investors, even when pursuing longer-term investment strategies, rebalance their portfolios more frequently and thus tend to contribute to the development of secondary markets and the improvement of liquidity. Funds active across borders are, at the same time, proving to be a "transmission belt" for improving infrastructure and disseminating knowledge and experience in the area of portfolio and risk management. However, foreign investors are underrepresented in EME local bond markets. In 2005, this category of investors held only 2% of domestic debt instruments in emerging market economies, whereas the average for selected industrial countries stood at 26%.

Under the aspect of financial stability, emerging market economies are mainly interested in investors with a longer-term investment horizon. According to market assessments, however, around 45% of the trading volume in local bond markets in the emerging market economies is attributable to hedge funds.[19] These funds follow relatively short-term investment strategies and, through their activities, thus contribute to a distinct improvement in liquidity.

Growing significance of hedge funds

However, it is necessary to analyse the effects hedge funds have on relatively underdeveloped bond markets, especially in periods of high global liquidity and when risk premiums are at all-time lows. The extent to which hedge funds' market behaviour, given uncertain expectations, contributes to triggering a rapid and relatively sharp rise in risk premiums in emerging market economies, thereby increasing the sensitivity of the bond markets in this group of countries to exogenous disruptions, requires careful monitoring. Hedge funds could amplify market reactions, especially in tight markets, if they are forced into herding behaviour.[20]

Recommendations for broadening the investor base

In the interests of deepening the bond markets, the High Level Workshop came up with several measures to broaden the investor base

18 See CGFS Paper No 28, loc cit, p 68; group of countries: Australia, Belgium, Canada, Germany, Spain, United Kingdom and the United States.
19 See CGFS Paper No 28, loc cit, p 85.
20 See A Weber, Hedge Funds: a central bank perspective. In: Banque de France, Financial Stability Review, special issue on hedge funds. No 10, April 2007, pp 161-168.

which were also included in the action plan of the G8 finance ministers (see Box 2.5). One of the key recommendations is that investment restrictions to which institutional investors are subjected in some EMEs be reviewed in terms of financial stability and efficiency of allocation. In several EMEs, domestic pension funds are required to invest a large percentage of their assets in government bonds. Opening the markets more to foreign issuers, who would increase the supply of investment-grade assets, would also give domestic investors a broader spectrum of investment instruments denominated in local currency.

Further development of derivatives markets

Derivatives markets make it possible, especially for institutional investors, to manage risk more efficiently. Moreover, for risk reasons, some top-rated supranational issuers make their decision to invest in an EME dependent on the existence of derivatives markets.[21]

Derivatives markets have growth potential

Although derivatives markets are among the fastest growing financial markets in the world, they still have considerable growth potential in the EMEs. These countries make up around one-tenth of global derivatives markets. It is particularly the markets for interest rate derivatives that are lagging behind the international development curve.

The markets for interest rate derivatives contribute to improving liquidity on the bond markets, yet their growth is also dependent on the state of development of the underlying asset markets. Accordingly, in their financial action plan, the G8 finance ministers recommended that EMEs intensify their efforts to build up and evolve derivatives markets and, in particular, to strengthen the regulatory and legal framework in the light of potential barriers to the further expansion of derivatives markets.

Additional fundamental recommendations

In addition to these arguments, which are related to the framework and the efficiency of bond markets, the G8 finance ministers also recommended broadening the data base[22] and strengthening regional cooperation, such as is happening with the bond market initiative in Asia. They additionally called for greater coordination of technical support for the establishment and further development of bond markets, also with regard to the creation of bond markets in the developing world (see Box 2.5).

Orderly sequencing of the development and opening of financial markets

Free movement of capital and open financial markets are fundamentally conducive to the efficient allocation of credit, capital and risk. In addition, EMEs with developed financial markets are subject to less volatility in their international inflows and outflows of capital.[23]

Sequencing of reform steps requires country-specific structures to be taken into consideration

Achieving these efficiency gains is predicated on the orderly sequencing of reform measures. When prioritising reform steps in the individual EMEs, account needs to be taken of the inter-

21 See F Czichowski, KfW's Experience as an Issuer on Local Emerging Bond Markets, Speech at the High Level Workshop 2007, Frankfurt am Main, 9-10 May 2007.
22 See C Pazarbasioglu, Broadening the data base and technical assistance. Presentation at the High Level Workshop 2007, Frankfurt am Main, 10 May 2007.
23 See IMF, Global Financial Stability Report, Financial Market Turbulence: Causes, Consequences, and Policies, Chapter III, September 2007, p 77 ff.

Box 2.5

G8 ACTION PLAN FOR DEVELOPING LOCAL BOND MARKETS IN EMERGING MARKET ECONOMIES AND DEVELOPING COUNTRIES*

Modern and efficient domestic market structures make important contributions to financial intermediation, financial stability and sustained economic growth. Deep and well functioning local currency bond markets in Emerging Market Economies (EME) as well as in developing countries are key in this respect.

- Developed local currency bond markets reduce foreign exchange risks for local borrowers and the vulnerability to exogenous shocks, especially against the backdrop of risks of abrupt changes in the direction of global capital flows.
- Local currency bond markets reduce the local enterprises' dependency on loans and broaden the opportunities of investment financing.
- The liberalisation of capital accounts needs to be encouraged, with due attention to the appropriate pace and sequencing, to support the development of local currency bond markets.
- The development of local bond markets can improve financial intermediation.

Sound macroeconomic policies, robust market infrastructure and a strong transparent legal framework are key for a broader participation from long-term domestic and foreign investors and enhance the efficient international diversification of capital. In this respect, EME have undertaken a great deal of reforms to reduce their dependency on external finance. Further reforms are necessary to deepen their domestic bond markets, and given countries´ and regions' different stages of development and the different natures of their domestic financial systems, sequencing and prioritisation of reforms will be different in each country.

In consultation with other relevant international institutions and partners from emerging and developing countries, considering the results of the workshop on "Developing Bond Markets in Emerging Market Economies", held on 9-10 May 2007 in Frankfurt, we identified policy issues that contribute towards further progress aiming at enhancing long-term growth, financial stability and market efficiency in EME.

We ask our Deputies and the IMF and World Bank to report before our meeting in October 2007 on how to implement this action plan. We ask the IMF and World Bank, in cooperation with other relevant international institutions, to regularly report, on this basis, on the progress of the implementation of this action plan. These reports which we will discuss at our future meetings, when appropriate, should cover the following key policy issues:

1 Strengthening market infrastructure and public debt management

There is a need to enhance the regulatory framework and risk-based prudential regulation, removing non-prudential barriers to entry and investment, nurturing a vibrant credit culture, implementing international standards and practices (including documentation), improving the human capital of both local market participants and regulators and promoting efficient and transparent markets.

Clearing and settlement systems using international best practices enhance the integration of international financial markets, improve confi-

* Adopted at the meeting of finance ministers and central bank governors in Potsdam, Germany on 19 May 2007.

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dence in the EME markets themselves and reduce risks and transaction costs. We reaffirm the IOSCO (International Organization of Securities Commissions) principles for securities regulation and the CPSS (Committee on Payment and Settlement Systems)/IOSCO recommendations for securities settlement systems.

– We note the contribution of the G30 Action Plan towards enhancing the interoperability of settlement systems and call upon the private sector to consider developing a similar action plan for all markets, not just for advanced markets. We call upon CPSS and IOSCO to consider the advisability and applicability of a standard communication protocol, such as the Giovannini Protocol that was developed for the EU.

IMF and World Bank's diagnostic work identified common weaknesses in securities settlement systems. We believe that technical assistance (TA), provided bilaterally and multilaterally, should be targeted to meet common weaknesses and we support ongoing efforts in this respect. These weaknesses include: lack of independence of the regulator and of supervision by regulators; lack of enforcement of existing rules due to a shortage of resources and skills in the regulator; weak risk management practices in financial intermediaries and weaknesses in legal frameworks for mutual funds; weaknesses in governance of securities settlement systems.

– First, we encourage EME to develop and implement a sound regulatory and supervisory framework. We also call on EME, supported by bilateral and multilateral efforts, to consider benefits from Self-Regulatory Organisations development, by improving regulatory certainty and clarity, foreign investment promotion, removal of capital and exchange controls, elimination of transaction taxes, and reduction or elimination of withholding taxes on interest and capital gains earned by foreign investors.
– We support the efforts of the IMF and World Bank to provide TA in these areas.

The main direction of policy should be towards the creation of a liquid local currency government bonds market for benchmarking purposes.

– We encourage EME to improve institutional arrangements to increase liquidity, for instance by establishing a primary dealer system in those countries where it would be appropriate.
– We welcome the further issuance of local currency bonds by the International Finance Institutions (IFI) and other investment grade issuers as long as this does not crowd out private domestic issuers.
– We encourage the EME to pursue sound sovereign debt management including securitisation of receivables.

2 Broadening and diversifying the investor base

Broadening and diversifying the investor base is one of the most important steps towards deepening local bond markets in EME. The development of the domestic investor base is a priority that can be fostered by improving the regulatory environment and lowering barriers for foreign investors.

Box 2.5 (cont'd)

G8 ACTION PLAN FOR DEVELOPING LOCAL BOND MARKETS IN EMERGING MARKET ECONOMIES AND DEVELOPING COUNTRIES*

We call upon the IFI to support the expansion of the domestic institutional investor base by helping to design enabling reforms of private pension systems, mutual funds and insurance markets.

- We ask the IMF to examine best practice regarding the development of the domestic institutional investor base and to evaluate to what extent a further easing of the impediments for institutional investors in EME can contribute to more efficient diversification of funds and the development of local domestic bond markets.
- We invite EME to adopt measures designed to make local currency bond markets more attractive to long-term institutional investors particularly by establishing a level playing field for all investors.
- We encourage EME to establish enabling market access reforms, in particular by avoiding investment and other restrictions.

3 Developing of derivative and swap markets

Derivative and swap markets help to address exchange rate and interest rate risks. While in some EME derivative markets have significantly grown in recent years, in most EME these markets remain underdeveloped, particularly those for interest rate derivatives. The development of those markets needs to be underpinned by an appropriate infrastructure and regulatory framework, consistent with the conditions of the local financial system.

- We call on EME, aided by multilateral and bilateral efforts, to support derivative market development, once their markets have reached the appropriate stage of development and liquidity, by improving the regulatory, legal and market infrastructures.
- We encourage EME to upgrade their respective accounting standards.
- We support the joint IFC/World Bank Capital Markets Advisory Group, which is, together with the ongoing efforts, enhancing the IFI's capabilities to provide TA in this area.

4 Broadening the database

Limited aggregated data on EME bond markets, particularly on currency composition and maturity and coverage of corporate bond markets hampers the analysis of the local currency bond markets.

- We strongly support World Bank creation of indicators for bond market development.
- We support joint IFI initiatives to improve the quality, comparability, and consistency of local currency bond market data, especially on aggregate institutional investors' capital flows, and currency and maturity structures, including debt structures and composition of capital flows, to identify underlying weaknesses and risks in individual EME bond markets that need to be remedied.
- We ask IMF, World Bank, OECD and BIS to undertake a stocktake of currently available data on local debt markets and identify any gaps, with a view to consolidating the information. In addition, we call on the FSF for a progress report of the implementation of the recommendations for data requirements of the FSF Working Group Report on Capital Flows (April 2000) and comparable initiatives.

* Adopted at the meeting of finance ministers and central bank governors in Potsdam, Germany on 19 May 2007.

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5 Promoting regional initiatives

We noted with great interest that a regional bond market initiative by 10 ASEAN countries and China, Japan and Korea (Asian Bond Markets Initiative) is making progress in areas such as diversification of bond issuers and instruments. This initiative is based on a strong political commitment and appropriate involvement of the Asian Development Bank. Regional bond markets could also provide the critical mass necessary to justify costly investments in infrastructure such as trading platforms, valuation services, clearing, settlement and custody services, and accredited regional rating agencies for the smaller EME.

– We encourage the IMF and World Bank to enhance regional cooperation to develop local currency bond markets where that would be effective.

6 Developing bond markets in less developed countries, particular Sub-Saharan African countries

The specific challenges faced by developing countries, particularly Sub-Saharan African countries in developing local bond markets include the different debt structures and level of market infrastructure. Interested Sub-Saharan African countries are invited to adopt the guidelines and recommendations (best practices) outlined in this action plan. We encourage these countries to continue to implement the necessary macroeconomic and banking system reforms, which are preconditions for the sustainable development of capital markets and highlight the importance of sub-Saharan African countries taking full account of debt sustainability considerations when undertaking any new bond issuance, in particular ensuring consistency with the IMF/World Bank Debt Sustainability Framework.

– We ask the IMF and the World Bank to provide, in close cooperation with the multilateral development banks and major bilateral providers of TA, policy advice and TA to build and strengthen regional and/or local bond markets.

7 Technical assistance

Various IFI and multilateral and bilateral agencies provide TA to develop local currency bond markets in EME and developing countries. These institutions are invited to improve TA and its coordination to avoid duplication and overlap.

– We support internal reorganisations within the IFI – where necessary – to streamline TA on bond market development.
– We support an intensified and regular exchange of knowledge and experience between debt managers, regulators, investors, representatives of clearing and settlement systems and international market associations in G8 countries and EME (for instance support of regional cooperation by the World Association of Debt Management Offices and the Latin American Countries Debt Group), possibly by workshops or seminars of individual G8 countries in EME or developing countries.
– We are committed to continue bilateral TA by providing technical expertise (eg through our national agencies) and financial support.

dependencies between the economic structure and the financial system. In countries with, for instance, very decentralised economies, close interdependencies with an equally decentralised banking system often exist. In economies with a surfeit of small and medium-sized enterprises (SMEs), the relatively high transaction costs of issuing bonds may provide market-based incentives for bank-based refinancing, whereas corporate bond markets often develop only given a sufficient number of large, internationally well known enterprises.

Development of financial systems should fundamentally be market-led

While certain basic developmental patterns are common to all financial systems, it does not follow that the same rigid sequence to the process must ubiquitously be taken as a guide for economic policy measures. Rather, the key requirement is to take appropriate reform measures that strengthen the conditions for markets to function efficiently and remain stable, and otherwise to leave the development of the financial systems to the market.

Moreover, empirical studies show that those factors or measures which promote the development of a stable banking system are also those which promote the development of bond markets. This is true particularly of the existence of an effective legal system, efficient banking and financial supervision and a meaningful, transparent accounting system. To that extent, the development of bond markets also needs to be seen in the broader context of the development of a country's financial system.[24] Countries with broad and deep bond markets also tend to have larger banking systems.[25]

In their action plan, the G8 finance ministers asked their deputies, the International Monetary Fund and the World Bank to draft a report detailing ways of implementing the action plan's recommendations. This report was discussed and endorsed by G7 finance ministers and central bank governors at their meeting on 19 October 2007 in Washington, DC.

Stronger integration into the financial globalisation process

Increasing efficiency and stability requirements of EME bond markets

Reducing currency mismatches, shifting borrowing to local bond markets and opening these markets increasingly to international investors all serve to eliminate "old" risks and improve market liquidity. The stronger and faster integration of bond markets into the international financial system, however, also involves new or accentuated challenges for EMEs which cannot be ignored when assessing the implications for financial stability.[26]

… owing to institutionalisation of saving, …

One of these is the growing trend towards the institutionalisation of saving. More and more private savers in developed countries are placing the investment of their savings in the hands of professional fund managers, who make more intensive use of international financial markets. The bond markets of this group of countries offer institutional investors relatively attractive ways of spreading risk internationally owing to the low degree of

24 " …, the fact that bond markets grow in tandem with the rest of the financial system, which means in practice with the banking system, suggests that banks and bond markets are complements rather than substitutes." – E Borensztein, B Eichengreen and U Panizza, February 2006, manuscript, p 4.
25 See J D Burger and F E Warnock, Local currency bond markets. In: IMF Staff Papers. Vol 53, 2006, p 143 f.
26 See H Remsperger, Developing bond markets in emerging market economies: Conclusions and political recommendations. Speech at the High Level Workshop 2007 in Frankfurt am Main, 10 May 2007.

correlation.[27] In a trend that is likely to continue, over the past few years less developed bond markets in some developing countries have likewise begun to attract international portfolio investment. It still remains to be seen whether these markets will be able to meet investor demands in periods of greater volatility as well.

… financing of large global imbalances …

Similarly, the financing of the persistently large global imbalances is likely to be accompanied by increased recourse to financial markets in the EMEs. The bond markets in those countries must also be able to absorb the impact of sudden swings in global capital flows.

… and further capital account liberalisation

In addition, many EMEs will, as they integrate further into the world economy, continue to liberalise their capital accounts. This will not only mean growing challenges to bond markets in the affected countries; conversely, well developed bond markets can facilitate the "management" of capital account liberalisation.

Developments in EMEs more strongly affected by global factors

Greater integration into the financial globalisation process also alters the relative significance of those factors that determine the development of interest rates and prices on these markets and thus on the transmission channels through which exogenous shocks can be propagated.

Risk premiums increasingly determined by international factors …

For instance, the stronger integration of EMEs into the international financial market cycle also means that the risk premiums in this group of countries are increasingly determined by international factors. In the past few years, the risk premiums, measured in terms of the EMBI Global (relative to US Treasuries) have fallen distinctly; at the same time, the differentials between EMEs in Asia, Latin America and Europe have narrowed perceptibly. In June 2007, the risk premiums hit all-time lows. Against the background of the uncertainty associated with the tension in the subprime segment of US mortgage markets, they rose perceptibly in the summer months. Nonetheless, in a longer-term view they are at a low level.

… with high global market liquidity and investors' risk appetite the key determinants

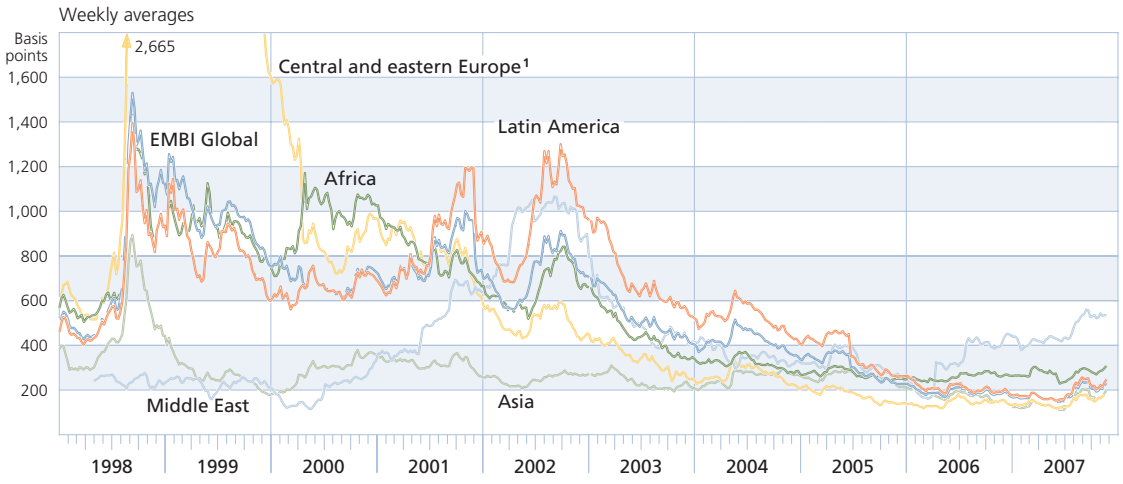
This development has been driven by high global market liquidity and international investors' pronounced risk appetite. In a longer-term, fundamental view, empirical studies have shown that these two factors are having a growing influence on the development of risk premiums in the EMEs and are therefore cyclical factors which do not indicate a sustained reduction in risk premiums.[28]

27 "Even more significant is the observation that covariances have remained comparatively low even in recent periods of market turbulences. The upshot is that local currency bonds from emerging markets seem to provide good diversification vehicles for international investors over a medium-term horizon. How well the markets for these bonds function is therefore of great interest to the international financial community." – P Turner, Local currency bond markets in emerging market economies: notes on trends, measurement and policy challenges. Presentation held at the High Level Workshop 2007 in Frankfurt am Main, 9-10 May 2007, p 4.

28 See M G Rozada and E L Yeyati, Global Factors and Emerging Market Spreads, Inter-American Development Bank, Research Department, Working Paper No 552. With regard to the development of spreads in the EMEs, the authors conclude that "Risk appetite, proxied by high-yield spreads in developed markets, is a key determinant of the (long- and short-run) evolution of emerging market spread" (p 4) – "International liquidity … exhibits a significant benign influence on the long-run levels of emerging market spread." (p 5) – "These two exogenous factors explain around 30 percent of the long-run (dynamic) variability of emerging market spreads (between 15 and 23 percent of the short run using weekly and monthly data, respectively)." (p 5) – "… in the later period [global factors] explain about 50% of the within variability" (p 12). See also C De Alessi Gracio, G Hoggarth and J Yang, Capital flows to emerging markets: recent trends and potential financial stability implications, Bank of England, Financial Stability Review, December 2005, p 100.

Chart 2.2.5

RISK PREMIUMS ON EMERGING MARKET ECONOMIES' SOVEREIGN DEBT INSTRUMENTS*



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

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Financial markets having increasing influence on real economy in EMEs, too

This development is of interest not only from a financial stability perspective but also in terms of its respective impact on the real economy. Owing to the increasing weight of EMEs in the world economy, any changes in risk premiums will have implications not only for growth in the EMEs in question but also in the industrial countries. Along those lines, the World Bank has calculated that a lasting increase of 200 basis points in bond spreads of EMEs will, in the following year, dampen world economic growth by 0.9% vis-à-vis the baseline scenario. These rough estimates show just how significant the financial markets of this group of countries have already become even today for global economic growth.[29]

International investors' portfolio strategies have stronger influence on EME bond markets

Broadening the investor base …

The broadening of the investor base is improving the liquidity of the markets. On the other hand, it must be noted that, in the course of this process, institutional investors' portfolio strategies are gaining increased significance for EME bond markets. This aspect is of importance especially for those bond markets which are at a relatively early stage of development, where, therefore, investment volumes make up a relatively large percentage of the overall market volume.

29 See World Bank, Global Development Finance. The Globalization of Corporate Finance in Developing Countries, 2007, p 28.

… amplifies the portfolio channel …

To what extent these contribute to stabilising or destabilising tendencies in the EME bond markets depends, *inter alia*, on the prevalence of strategies which are oriented to an assessment of the country's fundamentals.

… for the transmission for market volatility …

This cannot be simply assumed to be the case. Empirical studies on the investment behaviour of institutional investors active across borders show, for instance, that they often rebalance their international portfolios across all asset classes and several EMEs even in cases in which the risks have changed only in one asset class or only one country. The size of these effects increases with the degree of leverage of the assets in question.[30] Even countries with strong fundamentals will have to reckon with sudden inflows or outflows of capital if, in another region, the financial markets encounter turbulence or investors' assessment of the economic outlook changes. Analyses of this "portfolio channel" can, moreover, help to improve the quality of forecasts as to which countries will be hit hardest by the cross-border contagion of a financial crisis.[31]

… and is thus of growing significance for financial stability

The extent to which distortions in one country may spread to financial market developments in the other EMEs will depend to a great degree also on whether international investors look at the EMEs as a homogeneous asset class or whether they take an increasingly differentiated view in their evaluations of individual EMEs and their respective progress towards achieving macroeconomic stability. The varying reactions of bond markets in some EMEs following a rise in volatility over the last two years indicate that international investors are beginning to make a greater distinction between those countries' bond markets depending on how the fundamentals are assessed; yet it remains to be seen whether, and to what extent, this development is a lasting one.[32]

In terms of assessing financial stability in individual countries or regions, the investment behaviour of cross-border investors is acquiring an increasing explanatory value, and not only regarding the development of bond markets and the assessment of risks in the EMEs. While focusing on key data concerning the real economy and financing ratios in a country's banking, corporate and household sectors continues to provide essential information for assessing financial stability in the emerging market countries, it is no longer capable of providing the complete picture on its own.

30 See G J Schinasi and R T Smith, Portfolio Diversification, Leverage, and Financial Contagion. In: IMF Staff Papers, 2000, Vol 47, No 2, pp 159-176.
31 See inter alia F A Broner and R G Gelos, Testing the portfolio channel of contagion: the role of risk aversion. October 2003, manuscript.
32 See I Odonnat and I Rahmouni, Do emerging market economies still constitute a homogenous asset class? In: Banque de France, Financial Stability Review, No 9, December 2006, pp 39-48.

Overview | Glossary

ABCP (asset-backed commercial paper) Commercial paper which is backed by a pool of assets.

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 services the investors' claims 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.

Banking Act (*Gesetz über das Kreditwesen*).

Banking book Pursuant to the German Banking Act, a credit institution's banking book contains all items that are not contained in the trading book. See also trading book.

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 from 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 on Banking Supervision, which works towards the harmonisation of banking supervisory standards.

BSC (ESCB's Banking Supervision Committee) Committee comprised of representatives from the central banks and banking supervisory authorities of all 27 EU member states. The BSC's work focuses on the macroprudential analysis of the stability and structure of the European banking and financial systems. This involves assessing the effects of developments in the EU financial system as well as the impact of regulatory and prudential requirements on the stability of the financial system. In addition, the BSC facilitates cooperation and the exchange of information between members.

Capital charge Amount used to ensure that market risks according to Principle I are backed with adequate own funds.

Carry trade Borrowing of funds or taking of positions at a low interest rate and reinvestment of these funds at a higher interest rate. The two parts of the transaction are often effected in different currencies.

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 obligations, CLO), credit derivatives (collateralised synthetic obligations, CSO) or hybrid forms.

CLN (credit-linked note) A security whose redemption amount is dependent on contractually agreed credit events (ie the default of a reference asset). In contrast to a credit default swap (CDS), where the protection buyer receives a compensation payment if a specified credit event occurs, with a CLN the protection seller makes this payment in advance, which, in return, decreases the redemption if said credit event occurs.

CLO (collateralised loan obligation) See CDO.

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

CMBS (commercial mortgage-backed securities) MBS that are backed by mortgage loans which have been granted to finance commercial real estate.

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

Commercial paper (CP) Bearer debt securities that are used for short-term borrowing and are usually issued as revolving paper on tap with a maturity of between 1 and 360 days (up to 270 days for US CP).

Conduit Special-purpose vehicle that purchases receivables and refinances them by issuing commercial paper (ABCP conduit).

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-efficiency Effect of applying input factors while at the same time minimising costs in order to produce a given output. In this context it is assumed that the input prices are exogenous, ie set by the market.

Cost-to-income ratio (CIR) Simple indicator of a bank's efficiency which sets the general administrative spending in relation to the operating income (total of net interest received, net commissions received and net trading result). The CIR indicates how many units of spending are needed to yield one unit of income.

Counterparty risk Risk of default by the counterparty.

Credit default swap (CDS) Upon conclusion of a credit default swap agreement, the protection seller undertakes to pay the protection buyer a compensation payment if a specified credit event occurs (eg default or late payment). In return, the protection seller 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 Financial instrument which separates the credit risk from an underlying financial transaction, enabling the credit risk to be transferred to investors. The most frequently-used credit derivatives are credit default swaps.

Credit risk standardised approach (CRSA) Model to calculate credit risk pursuant to the Solvency Regulation that is based on external ratings.

Default risk 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 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 refers to banks and insurance companies.

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.

FVO (fair value option) In accounting: restricted option to designate financial instruments as at fair value through profit and loss.

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

Gross volume of non-bank loans Contains accounts receivable and bill-based loans pursuant to section 15 of the Regulation on the Accounting of Banks and Financial Services Institutions as well as liability loans pursuant to section 26 of the Regulation on the Accounting of Banks and Financial Services Institutions (no securities, derivatives or claims on credit institutions).

Hazard rate model Econometric model that establishes the probability that the existence of a credit institution will be endangered within a certain period of time (eg within the coming year) if no support is provided. The determinants in the Bundesbank's model are capitalisation, profitability, credit and market risk as well as regional and macroeconomic factors.

Hedge funds Investment fund subject to little regulation. Hedge fund managers are not subject to any restrictions in their choice of capital instruments and can therefore 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 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.

Internal ratings-based approach (IRBA) Model to calculate credit risk pursuant to the Solvency Regulation that is based on internal ratings.

Investment grade Rating grade of BBB- or higher (pursuant to the notation of the rating agencies S&P and Fitch) or Baa3 or higher (pursuant to Moody's); the credit quality of borrowers or securities with an investment-grade rating is deemed to be comparatively high. See also non-investment grade.

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

funds for the trading book positions of a trading book institution). Large exposures are limited to a maximum of 25% of the bank's liable capital/own funds (large exposure limit).

LBO (leveraged buy-out) The acquisition of established enterprises in whole or in part by private equity companies, using a large proportion of borrowed funds. Interest and redemption payments are generally financed from the future earnings of the acquired enterprise or by selling parts of the business.

Leverage Originally from corporate finance: the effect 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 on loan capital. The same effect can 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.

Leveraged loans Loans that either have a non-investment-grade rating from S&P or Moody's or that have an issue premium of at least 150 basis points over LIBOR.

Liable capital Pursuant to the German Banking Act, this comprises tier 1 capital and tier 2 capital, whereby certain equity exposures to other institutions are deducted. It is one of the key elements in calculating the large exposure limit in the banking book.

Liquidity facility Credit line generally granted by credit institutions that has not yet been used and which guarantees future provision of liquidity up to the amount of the liquidity facility.

Liquidity Regulation (*Liquiditätsverordnung*) Defines requirements of and principles for credit and financial services institutions to ensure solvency at all times. It is based on section 11 of the German Banking Act and on 1 January 2007 replaced Principle II (Liquidity Principle), which had been previously valid.

Liquidity risk
1) Risk that when refinancing long-term liabilities with short-term receivables the follow-up financing cannot be secured or can only be secured at a higher cost (refinancing risk). Further elements of refinancing risk are the risk of debtors not repaying receivables on time (forward gap risk) and unexpected withdrawals of deposits or the unexpected use of lending commitments (withdrawal risk).
2) Risk that transactions on the financial market cannot be concluded or can only be concluded at worse-than-expected conditions due to a lack of market liquidity (market liquidity risk).

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

Loss provisions Adjustment of the book value of an item on the asset side of the balance sheet to reflect the actual value situation.

Margin 1) Difference between the interest rates offered by a bank on loans or deposits and a reference rate.
2) Deposits required by a financial institution as collateral for typically leveraged trading positions, eg on the futures market.

Market liquidity Market participants' ability to carry out large-volume transactions at any time without causing a significant price effect.

Market risk Risk of financial losses as a result of unforeseen changes in interest rates, exchange rates or prices of financial instruments.

Maturity transformation Acceptance of short-term deposits and issue of long-term loans by banks. Maturity transformation enables banks to collect the term premium but exposes them to the risk of a change in the term spread.

MBS (mortgage-backed securities) Securities which are backed by a pool of mortgage loans. They are further divided into CMBS and RMBS depending on the type of loan on which they are based.

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.

Non-investment grade Rating grade below BBB- (pursuant to the notation of the rating agencies S&P 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.

NPL (non-performing loans) 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 general administrative spending.

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

Operational return on equity Product of revenue efficiency and operational efficiency. Captures the operating performance 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.

Originate-to-distribute business model Combines classic bank lending business with modern forms of asset and risk transfer. Granted loans are intended for bundling and distribution from the outset – for example as part of securitisations – and are held in the bank balance sheet for a transitional period only (warehouse holdings).

OTC (over the counter) Trading of financial instruments outside of established stock exchanges.

OTC derivatives market Market on which derivatives are traded directly between two parties, ie without the involvement of a stock exchange. Many derivative contracts are concluded almost exclusively in this way, eg swaps and exotic options.

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.

Principle I (Own Funds Principle) Gives concrete shape to the requirement pursuant to section 10 of the German Banking Act that supervised credit and financial services institutions back both their default and market price risks with adequate own funds. The institutions must comply with Principle I by close of business every day. Principle I will be replaced on 1 January 2008 when the rules from the Solvency Regulation, which transpose Basel II into national law, become mandatory.

Principle II (Liquidity Principle) Prescribes prudent liquidity management for supervised credit and financial services institutions pursuant to section 11 of the German Banking Act. An institution's liquidity is deemed adequate if – as from the respective reporting date – the means of payment available during the next calendar month equal at least the expected liquidity outflows during the same period. This is assessed by a liquidity ratio that has to be reported monthly. This ratio is the quotient of the available means of payment to the callable payment obligations and must equal at least 1.0.

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, granting of (collateralised) loans, reporting on trading positions and their performance.

Private equity Capital invested by private companies generally in non-listed companies. The aim is often to restructure the enterprise and then sell it, often 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 enterprises, banks or countries) or the securities issued by them.

Regulatory capital for solvency purposes Comprises regulatory tier 1 capital for solvency purposes, regulatory tier 2 capital for solvency purposes as well as the available tier 3 funds in use.

Regulatory tier 1 capital for solvency purposes Tier 1 capital pursuant to the German Banking Act after adjustment for prudential deductions.

Regulatory tier 2 capital for solvency purposes Tier 2 capital pursuant to the German Banking Act after adjustment for prudential deductions.

Retail Customer segment for private and small business customers. The opposite is wholesale, the segment for large customers. Retail banking supplies the broad range of private customers with standardised products on the basis of simplified processes.

Return on equity (RoE) Measure of an enterprise's or bank's profitability which sets the result from the profit and loss account in relation to the balance sheet, regulatory or economic capital deployed. In its usual form, the pre-tax result is set in relation to the balance sheet capital.

Revenue efficiency Product of asset productivity, risk profile and the leverage of debt financing.

Risk premium Compensates the investor for taking on a risk: equity risk premium on the equity market, term premium on the bond market, credit risk premium on the corporate bond market. The credit risk premium (also bond spread) recompenses the higher credit risk and, in some cases, lower liquidity of the securities vis-à-vis government bonds of the highest credit quality.

Risk profile Ratio of risk-weighted assets to total assets.

Risk provisioning Net expenditure on write-downs, 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. Under the Solvency Regulation, the current risk-weighted assets correspond to the risk-weighted CRSA or IRBA positions.

RMBS (residential mortgage-backed securities) MBS that are backed by mortgage loans which have been granted to finance residential real estate.

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 approximately 170 direct participants.

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.

Securitisation Bundling of assets into marketable securities and subsequent sale on the capital market. The portfolios are usually structured according to risk categories and the separate tranches are awarded different ratings. See ABS.

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 cheaper price in the future and reaping the difference between the sales and the repurchase price.

Solvency Provision with own funds.

Solvency II European Commission project, which – following a similar concept to 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 enterprise-specific risk management.

Solvency Regulation (*Solvabilitätsverordnung*) Transposes the provisions of Basel II into German law and replaces the previous Principle I. The Solvency Regulation will become mandatory for all institutions in Germany on 1 January 2008; during the transition in 2007 all credit institutions are generally permitted to continue using the previous Principle I whereby a "partial use" of the Solvency Regulation is also possible in this period.

Speculative grade See non-investment grade.

Stochastic frontier analysis Estimation method in econometrics used to determine production, cost and profit efficiency. Deviations from maximum output or profits or from minimum costs are explained by both random deviations and inefficiency.

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 developments in credit risk and net interest income for various scenarios with the aid of an econometric model. In micro stress tests, as in the market risk test, 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 instruments Basket of finance instruments (such as derivatives, securities or other 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 payment inflows from the asset pool into different tranches with various risk/return profiles and the separation of the asset pool credit risk from the arranger's risk – usually via a special-purpose vehicle.

Structured investment vehicle (SIV) Special-purpose vehicle similar to a conduit except that it also refinances by issuing longer-dated medium-term notes and capital notes.

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 – in particular, 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 as originator and/or lead manager 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.

Tier 1 capital/tier 1 capital ratio Supervisory tier 1 capital predominantly comprises paid-up capital, deposits by silent partners, disclosed reserves, special items for general banking risks pursuant to section 340g of the Commercial Code as well as a limited amount of innovative capital instruments such as hybrid capital. The tier 1 capital ratio sets the tier 1 capital in relation to a bank's risk exposures.

Trading book Pursuant to section 1a of the German Banking Act, a credit institution's trading book contains all items to be valued at market prices which the institution holds as proprietary positions with a view to reselling them in the short term or which are acquired by the institution with the intention of profiting for its own account.

Trading result Balance of gains and losses resulting from proprietary trading in securities, financial instruments, foreign exchange and raw materials shown in a bank's profit and loss account.

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.

Underwriter A party that assumes risks in exchange for a fee. On capital markets this might, for example, be a securities trader who makes a commitment to buy a securities issue wholly or partly at a certain price. In so doing, he assumes the risk that it may not be possible to place the securities in their entirety on the market.

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.

VaR (value at risk) Measure of risk which indicates the maximum expected loss that a portfolio may, with a specified probability (confidence level), incur in a specified period (holding period). VaR also serves as a risk management tool, in that VaR limits are set that may not be exceeded.

Volatility Measure of fluctuations, eg in the price of a financial instrument within a certain period (corresponds to the standard deviation).

Warehouse holdings Loans issued by a bank and intended for resale as part of the originate-to-distribute business model.

Wholesale See retail.

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 Deutsche Bundesbank publications on the subject of financial stability. Unless otherwise stated, the publications are available in printed form and on the Bundesbank's website in both German and English. The publications are available free of charge to interested parties and may be obtained from the Bundesbank's Communications Department. Additionally, a tape or CD-ROM containing roughly 40,000 published Bundesbank time series, which is updated monthly, may be obtained for a fee from the Bundesbank's Statistical Information Systems and Mathematical Methods Division. Orders should be sent in writing to the addresses given in the imprint. Selected time series may also be downloaded from the Bundesbank's website.

FINANCIAL STABILITY REPORTS

Financial Stability Review, November 2006
Financial Stability Review, November 2005
Report on the stability of the German financial system, October 2004
Report on the stability of the German financial system, December 2003

ARTICLES FROM MONTHLY REPORTS

For information on the articles published up to September 2006, see the index in the *Financial Stability Review*, November 2006.

October 2007	TARGET 2 – the new payment system for Europe
September 2007	The performance of German credit institutions in 2006
July 2007	The relationship between monetary developments and the real estate market | Primary and secondary markets for German public sector debt instruments: institutional framework, trading systems and their relevance for Germany as a financial centre
June 2007	Investment and financing in 2006
April 2007	Leveraged buyouts: the role of financial intermediaries and aspects of financial stability
December 2006	Transposing the new Basel capital rules into German law
October 2006	Current trends and structural changes in the public bond market

DISCUSSION PAPERS, SERIES 2: BANKING AND FINANCIAL STUDIES

For information on the discussion papers published up to October 2006, see the index in the *Financial Stability Review*, November 2006.

13/2007	Asset correlations and credit portfolio risk – an empirical analysis
12/2007	The marketability of bank assets and managerial rents: implications for financial stability
11/2007	Welfare effects of financial integration
10/2007	The quality of banking and regional growth
09/2007	Banking consolidation and small business finance – empirical evidence for Germany
08/2007	Time-varying contributions by the corporate bond and CDS markets to credit risk price discovery
07/2007	Modelling dynamic portfolio risk using risk drivers of elliptical processes
06/2007	How do banks adjust their capital ratios? Evidence from Germany
05/2007	Diversification and the banks' risk-return-characteristics – evidence from loan portfolios of German banks
04/2007	Open-end real estate funds in Germany – genesis and crisis
03/2007	Slippery slopes of stress: ordered failure events in German banking
02/2007	Efficient, profitable and safe banking: an oxymoron? Evidence from a panel VAR approach
01/2007	Granularity adjustment for Basel II
12/2006	Money market derivatives and the allocation of liquidity risk in the banking sector
11/2006	Limits to international banking consolidation