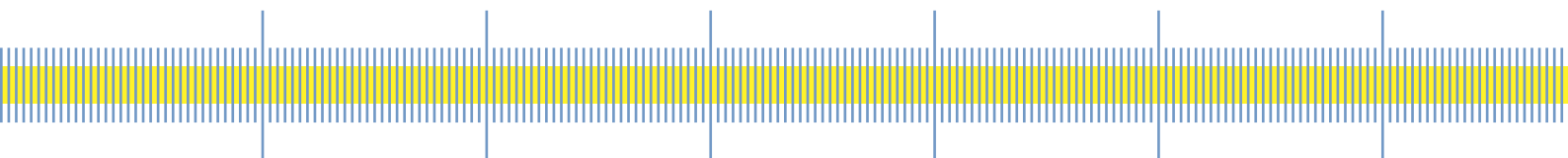


## FINANCIAL STABILITY REVIEW 2009



November 2009

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

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

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

Tel +49 69 9566-0  
Fax +49 69 9566-3077  
Telex 4 1 227 within Germany  
4 14 431 from abroad

<http://www.bundesbank.de>

Reproduction permitted only if source is stated.

ISSN 1861-8987 (print edition)

ISSN 1861-8995 (online edition)

The German original of this *Financial Stability Review* went to press on 19 November 2009.

# Financial Stability Review | November 2009

<b>ANALYSIS</b>	<b>7</b>
Overall assessment	8
Global risk factors affecting the German financial system	14
Macroeconomic risks	14
Risks in the international financial system and the financial markets	19
Stability in the German banking system	32
Current developments in the balance sheet structure	35
Profitability	38
Credit risk	41
Market risk	49
Liquidity risk	53
Loss estimates	56
Creditworthiness indicators	61
Stability in the German insurance industry	63
Learning from the crisis	69
<b>ARTICLE</b>	<b>85</b>
Interaction between the Eurosystem's non-standard monetary policy measures and activity in the interbank money market during the crisis	87
<b>CHRONOLOGY OF THE FINANCIAL CRISIS</b>	<b>101</b>
<b>GLOSSARY</b>	<b>107</b>
<b>BUNDESBANK PUBLICATIONS CONCERNING FINANCIAL STABILITY</b>	<b>119</b>



## LIST OF BOXES

### Analysis

1.1	The case of Hypo Real Estate Holding AG (HRE)	33
1.2	The relationship between leverage and the repo market	36
1.3	Evolution of the funding gap in Germany	39
1.4	Approaches to measuring bank's systemic risk	54
1.5	Development of loss estimates	57
1.6	Restructuring and winding up systematically relevant financial institutions	78
1.7	Financial crisis and information gaps	81

### Article

2.1	The Eurosystem's non-standard monetary policy response to the crisis	90
2.2	Money market – functions, segments and participants	92
2.3	The evolution of Euro GC Pooling during the crisis	94
2.4	Analysis of the relationship between non-standard monetary and liquidity policy measures and developments in the money market	96

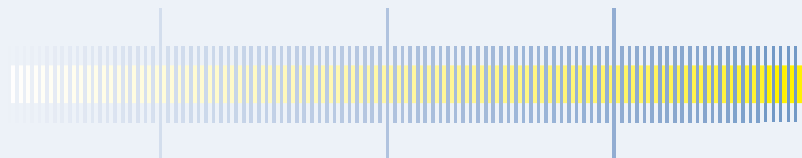
### Abbreviations and symbols

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

Teetering international financial system ...

As the summer of 2008 drew to a close, the international financial system was close to collapse. Given a growing number of existential problems at systemically relevant financial institutions and especially following the insolvency of US investment bank Lehman Brothers, the risks appeared literally incalculable from an individual investor's perspective. As confidence evaporated and uncertainty soared, market players were increasingly unwilling to assume risk. This caused an unprecedented increase in risk premiums. In addition, a broad range of financial instruments saw an exceptional widening of bid/offer spreads, which also affected plain vanilla products. In key refinancing segments, liquidity all but dried up. The spread between unsecured and secured short-term interbank loans tripled again after having already grown tenfold by mid-2008 vis-à-vis pre-turmoil levels. Indicators of risk perception in the equity markets derived from options prices were likewise four times higher than before the turmoil.

... necessitated stabilisation through extensive government measures

The financial market turmoil, the magnitude of which had not been seen in the western world in decades, had profound negative consequences for the real economy. There was a danger that the financial crisis, in conjunction with the severest slump in global growth in more than half a century, would result in a virtually uncontrollable downward spiral. The industrialised countries, in particular, were faced with an unprecedented drop in value added. Had the downturn been allowed to continue unchecked, there is no knowing how far it would have dragged down global

economic output in its wake. To stabilise the situation, it was imperative for the public sector to step in as the risk-taker of last resort. In this situation, far-reaching decisions frequently had to be taken amid extreme uncertainty and rapidly changing circumstances. Thanks to an array of fiscal and monetary policy measures, which were quite exceptional in terms of both their nature and their scale, and efforts to restructure balance sheets, the international and the German financial system alike were successfully stabilised in the first half of 2009.

Subsequently, a perceptible recovery got underway in the financial markets. Since the third quarter of 2009, growth expectations for some of the most important economies have also gradually been revised upwards, albeit from a sharply fallen overall level of activity. As a result, the outlook has improved markedly of late, not least for the heavily export-oriented German economy.

Of late, financial markets recovering and brighter growth outlook, ...

Nevertheless, the financial crisis and the economic crisis that is closely coupled to it are still far from being overcome. Financial institutions have not yet regained sufficient risk-bearing capacity, and markets are not yet fully functional. Although financing conditions in the money markets and the capital markets have improved significantly in recent months, substantial frictions remain in numerous market segments. Nor has the situation in the money markets returned to normal, as is evidenced by the intensity of central bank interventions. Moreover, it is already clear that

... but financial and economic crisis not yet overcome



the financial system will be severely tested going forward. Downside risks remain predominant.

Financial stability at risk from protracted economic stagnation ...

The most problematic scenario for financial stability would be a protracted phase of stagnation in the major economies. Faced with low growth and a sharp rise in unemployment, the process of restructuring the financial sector that has been set in motion could then falter amid spiralling loan losses in both industry and in the residential and commercial real estate markets. Such a cyclical pattern is by no means unusual, but is characteristic, in fact, of recessions in connection with financial crises. These have, in the past, often proved especially severe and persistent.

... and risk of negative feedback loop

In such an unfavourable scenario, negative feedback between the real economy and the financial system could, moreover, gain added momentum. The exit from the stabilisation strategy must therefore be predicated on and calibrated to an ongoing improvement in the market environment and financial sector resilience.

Rapid growth of government debt requires credible and transparent exit strategies

The non-standard measures taken to support and stimulate the economy will, as an unavoidable corollary, place future strains on the public purse. They therefore involve considerable medium and long-term risks. This applies primarily to government indebtedness – embracing both explicit budget debt and other implicit liabilities – which has risen rapidly in many industrialised countries. Transparent and credible strategies for unwinding the monetary and fiscal policy stimuli and the support measures in the banking sector are therefore crucial. It is vital to keep market participants' expectations

of a stability-oriented monetary policy and a sustainable fiscal policy firmly anchored. Failure to do so would have an adverse impact on interest rate levels and risk premiums on the capital markets. This would throttle investment and thus additionally stunt potential growth. Another non-negligible risk is that market players might factor into their behaviour the expectation that they will be able to offload losses onto the state. Supervisors and regulators will have to take this moral hazard into account in future.

Another negative factor is that the restructuring in the international financial system that was triggered by the crisis is still in full swing. It is being temporarily accompanied by limitations on intermediation. Moreover, only part of the write-downs expected in connection with the financial and economic crisis have been booked so far. Furthermore, the enduring change in the market environment requires a refocusing of business models. In addition, no new, sustainable structures have yet crystallised in the securitisation markets, which are important for the supply of credit in several economies. It is therefore vital that the rehabilitation of the financial sector and the necessary structural changes be implemented rapidly. Only then can the financial system support the global growth process. And only then can a supply-side shortage of credit be prevented.

Structural upheaval in the international financial system not yet overcome

Extensive government interventions have meanwhile also succeeded in stabilising the German banking system. Domestic credit institutions are increasingly benefiting from the brighter economic outlook. Favourable financial market developments are likewise having a

Interventions have stabilised the German banking system, too

beneficial effect. However, write-downs on loans to enterprises and households could squeeze earnings further. The positive developments therefore remain susceptible to setbacks in the recovery of the real economy. In a worst-case scenario, the trough in the credit cycle, with the concomitant large need for write-downs, would coincide with a renewed downturn in the market cycle and a slump in operating earnings. It is against this setting that the *Financial Stability Review* aims to assess the risks to and the resilience of the German financial system from a systemic perspective. The macroprudential analysis focuses not on the most likely scenario, but rather on potential worse-case developments.

benefiting from high issuance activity both by the government sector and the corporate sector. Banks should use the given leeway mainly to bolster their risk provisions and shore up their capital. Given a strong sustained upturn, German enterprises' currently weak credit demand is likely to pick up again. This will need to be matched by a credit supply that is priced according to risk and is not limited by insufficient capital cover.

The largest German banks have, on average, improved their capital situation. They have lowered their leverage perceptibly, which partly reflects balance sheet consolidation. This was partially achieved by reducing equity exposure. In addition, interbank lending contracted in the wake of perceived high counterparty risk. Finally, a significant drop in repo business has likewise helped to lower leverage noticeably. The whole process is evidently being accompanied by a refocusing on domestic markets. German banks' exposures to foreign institutions have registered a particularly large contraction. This relates mainly to exposures denominated in US dollars where there have been temporary refinancing problems. The German banking system's dependence on the short-term wholesale funding markets is relatively low. Nevertheless, the fact that institutional investors provide a large share of individual banks' funding may create systemic risk, particularly if a lot of refinancing is required.

Moreover, the global financial and economic crisis is still weighing on the credit quality of German enterprises, particularly those with a strong export focus. On the other hand, Germany's multifarious links with the global econ-

Situation in Germany comparatively favourable

By international standards, Germany's starting position for weathering the financial crisis is favourable. It is notably characterised by sustainable levels of debt on the part of domestic non-financial corporations and households. The percentage of non-performing loans is correspondingly low at present. Moreover, real estate prices in Germany provide no indication of a bubble, which limits credit risks in real estate financing. In addition, the fiscal stabilisation measures have supported the financial situation of households and non-financial corporations. Developments in these two sectors have therefore been less problematic than some had feared at the beginning of the year.

Window of opportunity to strengthen risk-bearing capacity and profitability

For the time being, credit institutions have gained time to steel themselves for the upcoming strains and tackle their accumulated problems. The steepening of the yield curve is currently boosting interest income from maturity transformation. Commission and fee income is

Balance sheet adjustment process

Loan losses likely to move centre-stage

omy and its wide range of export goods also represent an opportunity to participate in a potential recovery of the world economy earlier and more extensively than other countries. Overall, German banks' credit risk has increased significantly, and more so in the corporate sector than in the household sector.

Sharp rise in market risk

Market risk has risen sharply with the financial crisis, especially owing to the exceptional jump in price volatility. While for many banks share price risk has latterly shrunk slightly, interest rate risk is a greater concern again, especially for smaller institutions. Systemic risk has manifested itself, particularly during the extreme market phases. It is a consequence of contracting diversification effects among banks active in the market – in other words, the fact that they hold increasingly similar positions.

Estimating losses from securitisations ...

Losses from securitisation instruments have probably already peaked. The write-downs that German financial institutions are likely to make by end-2010 were estimated based on information on banks' individual loan portfolios and on system-wide securitisation exposure. To determine the market price loss arising from securitisations, the change in the ratio of the book value to the nominal value of securitisation positions was compared with the respective market price movements since the beginning of 2007. On balance, this reveals the need for further write-downs totalling some €10 billion to €15 billion. This can be attributed almost exclusively to positions in collateralised debt obligations (CDOs). The estimates naturally rely heavily on the assumed development of market prices. At the current end, however, these have, for some time, been pointing in a more positive direction.

By contrast, loan write-downs might become a more prominent issue given their cyclical lag. When estimating potential loan losses, macro-economic, ie systemic, factors were used as explanatory variables besides microeconomic measures. Based on this approach, the value of the loan portfolio will have to be adjusted by another €50 billion to €75 billion. However, the estimates are subject to particularly large forecast uncertainty. A general point to be noted is that, given the strong volatility of key variables such as market prices or economic forecasts, the results are more of a snapshot at a particular point in time. In view of the ongoing improvement in the real economy, actual losses could be lower.

... and loans

As its exposure to structured products was low, the German insurance industry came through the beginning of the crisis virtually unscathed. However, the mutation of the financial crisis into an economic crisis has affected insurers as well. Although this impact has been limited to date, the aftermath of the crisis could create a difficult constellation for insurers, too. In the unfavourable scenario of a protracted phase of stagnation, interest rates would remain low for a lengthy period. This would put earnings under pressure. As a consequence, it would be more difficult for life insurers to generate the guaranteed return, which can be lowered only gradually. Shifts into higher-yielding investments would entail greater credit risk, for instance with respect to corporate bonds. However, individual life insurers are affected to different degrees by this difficult conjuncture.

Insurers also feeling impact of financial and economic crisis

The turmoil which started in the summer of 2007 and its escalation in the fourth quarter of 2008 has complex causes. The evolution of the

Stronger macroprudential supervisory approach needed

crisis has demonstrated, in particular, that while a microprudential perspective is important, it is far from sufficient for effective crisis prevention. It is of paramount importance also to take the systemic dimension into account. In future, the macroprudential approach will therefore assume much greater importance in the field of regulation and supervision. Only if regulators and supervisors maintain a system-wide vision will endogenous risks appear on their radar screens. These aggregate risks result from dynamic interaction both within the financial system and between the financial system and the real economy. They are not visible in a microprudential approach focused on individual institutions. Moreover, moral hazard dictates that individual institutions must be allowed to fail without jeopardising the stability of the overall system.

Central banks have comparative advantages in terms of macroprudential stability analysis

Financial stability is a public good. Central banks have comparative advantages in terms of information and activity as they combine complementary elements such as co-responsibility for systemic stability, oversight of payment systems, their own refinancing operations, their activities in the financial markets and a presence on international committees. These are highly relevant both for systemic and macroprudential analysis as well as for ongoing banking supervision. A closer involvement of central banks in prudential supervision is therefore beneficial for ensuring the necessary holistic approach embracing microprudential and macroprudential tasks alike. Neither monetary policymakers, regulators nor prudential supervisors can, on their own, effectively counter negative developments on the financial markets. A monetary policy that is focused on price stability is therefore a necessary, but not a

sufficient condition for preventing financial market imbalances. However, the transfer of additional financial supervisory responsibilities to central banks must crucially neither dilute their monetary policy objective of ensuring price stability nor jeopardise their independence.

A focal point of the macroprudential approach is the procyclicality of the financial system. The crisis has revealed that mechanisms within the financial system and the framework in which it operates – to a certain degree even prudential rules – may favour the emergence of debt-financed imbalances in the run-up to a financial crisis. The same mechanisms also potentially amplify the feedback effects of negative market developments during a crisis. Above all, this suggests that much greater importance should be attached to ensuring sufficient risk buffers in future.

Focus on procyclicality ...

The multiple interlinkages within the financial system pose further challenges to macroprudential supervision. A macroprudential approach justifies treating intermediaries differently depending on their position within the system as a whole and also monitoring players outside of the traditionally defined banking system if they perform similar functions or roles. In relation to large or very interconnected institutions (“too big to fail” or “too connected to fail”) whose collapse would jeopardise the overall financial system, this means that such institutions, too, must therefore be regulated more stringently. There are, moreover, substantiated grounds for imposing higher capital and liquidity requirements on such institutions.

... and interconnectedness of the financial system

## Challenges from innovation

Financial innovations such as highly complex resecuritisations play an important role in connection with risks to financial system stability. The nature of these instruments was such that the onset of the crisis caused an immediate loss of market liquidity. For these reasons, macroprudential oversight must include closely scrutinising the complexity of such financial innovations and their concentration within particular financial intermediaries and acting to counter any negative developments at an early stage.

ing suitable measures to broaden their capital base. Another key requirement is better liquidity management by banks. This highlights the increased importance of monitoring refinancing risk at individual institutions. But controlling systemic liquidity risk is equally as crucial. This risk arises endogenously, for instance when solvent institutions are forced to liquidate assets. This, too, necessitates a larger capital buffer or a reduction of maturity transformation risks.

## Extensive reform agenda launched ...

An extensive reform agenda was launched at international level immediately after the onset of the crisis. It is being worked on as part of the G20 summit process, largely under the guidance of the Financial Stability Board and the Basel Committee on Banking Supervision. Intense debate has achieved concrete progress on numerous issues. Many aspects still require further analysis, however.

Necessary reform measures also include gearing incentive structures more towards a sustainable development and increasing the transparency of the financial system. This applies especially to the securitisation process. Improved standards of quality and integrity are vital to create new, more sustainable structures and prevent a (renewed) erosion of credit standards. Improvements in rating agencies' business practices and the monitoring of agencies likewise feature prominently on the agenda. It is, moreover, essential to strengthen the infrastructure, for example by establishing central counterparties. These should reduce the share of over-the-counter business. In addition, consistent pricing of risks would sharply reduce the systemic danger of such business.

... and improve incentive structures and transparency

## ... to strengthen financial institutions' resilience ...

A key lesson learned from the crisis is that financial institutions' resilience needs to be strengthened. Banks should therefore hold more and better-quality capital in future. Stricter capital requirements and more effective capturing of risk positions could help prevent excessive leverage and over-risky business models. At the same time, shortcomings identified in the Basel II framework need to be remedied. However, the framework's underlying principles, particularly its fundamental risk orientation, should not be called into question. In order to minimise the danger of a credit crunch, an appropriate transitional period should be envisaged prior to implementation of a revised capital framework. Independently of that, banks crucially need to act now by tak-

On balance, these reforms are likely to noticeably enhance the stability of the financial system, but are also likely to depress earnings prospects in the financial sector in the medium term. But in the light of the considerable negative externalities that may arise if financial institutions run into distress, this seems a price worth paying to safeguard financial stability. After all, in the long run banks themselves will also benefit from a more stable financial system.

More moderate earnings prospects in the financial sector likely in future

## Global risk factors affecting the German financial system

The global financial setting continues to present a difficult picture. Compared with the crisis at its height, the typical indicators of uncertainty are very much in decline. Yet on a number of markets, transaction volumes are still well below pre-crisis levels. This is particularly true of structured products, which are at the interface between the banking system and the financial market, and also applies to cross-border financing flows, the volume of which has fallen substantially. At the same time, bid-ask spreads, despite having narrowed, are still markedly wider than before the crisis. Without doubt, this is in part an expression of the adjustment to a risk situation that is deemed to have changed noticeably. In the end, it reflects the question as to the new, post-crisis normality. Above all, the looming write-downs and the impending, considerable credit defaults paired with an – in the medium term – slower macroeconomic development continue to make banks' financial situation look weak. This naturally also puts a strain on the risk-bearing capacity of the German financial system with its close-knit international connections. The private sector's financial vulnerability, exacerbated by the economic slump, could in turn hamper a recovery in the real economy. Moreover, there exists within the international financial system a substantial risk of ongoing frictions which might become accentuated again. This would not be untypical, particularly in the unfavourable scenario of a protracted phase of economic weakness. Nor, in such a case, could the possibility be ruled out that negative feed-

back loops between the real economy and the financial sector may again become a significant factor for the German financial system.

### Macroeconomic risks

#### Direct macroeconomic risks have receded somewhat

The economy has picked up appreciably in recent months thanks to wide-ranging monetary and fiscal policy stabilisation measures, a palpable easing in the financial markets and a turnaround in the inventory cycle. Against this backdrop, the IMF's latest global economic growth forecast for 2010 has been revised up to 3.1%. In the medium term, however, a fairly slow upward movement is expected. Worldwide economic output is likely to remain below pre-crisis levels in the longer run. In the past, too, recessions associated with financial crises were often deep and prolonged.<sup>1</sup> In particular, cyclical downturns that hit many countries simultaneously and were accompanied by extensive balance sheet restructuring in the non-financial sector were comparatively pronounced.<sup>2</sup>

Global economy  
back on growth  
track, ...

<sup>1</sup> In this context, real economic contractions lasting at least three years are not uncommon. See S G Cecchetti, M Kohler and C Upper (2009), Financial Crises and Economic Activity, NBER Working Paper No 15379, as well as C M Reinhart and K S Rogoff (2009), The Aftermath of Financial Crises, *The American Economic Review*, Vol 99, No 2, pp 466-472.

<sup>2</sup> See also IMF, From Recession to Recovery: How Soon and How Strong?, *World Economic Outlook*, April 2009, pp 97-132.

... but risks remain high

Although the downside risks to the global economic recovery have lessened considerably, they probably still outweigh the positive factors. The deflationary fears that arose intermittently have receded to the background. Yet the danger of a long drawn-out period of weak economic activity has by no means been banished, especially for the industrial countries. One major macroeconomic risk lies in the possibility that the rehabilitation of the financial sector now underway could suffer setbacks due to sharply rising unemployment and unexpectedly substantial credit defaults in industry and in the real estate sectors of a number of countries. If banks sustain further heavy losses in equity capital, this could lead to restrictive credit standards and a shortage of credit supply, and so hinder the global growth process.

US real estate market still a risk factor ...

The US economy, which is of particular importance to global economic development, has embarked on a recovery path – due, first and foremost, to the sweeping economic recovery package. According to the first estimate, in the third quarter of 2009 GDP in the United States was almost 1% up on the previous quarter. Marked growth is expected again for 2010 (IMF: 1.5%; European Commission: 2.2%). First signs that housing prices are bottoming out support the incipient optimism. The drop in prices is gradually petering out.<sup>3</sup> The continued rise in the number of foreclosure sales poses an obstacle to a recovery of this market segment, however. What is more, many residential real estate properties are today affected by negative equity.<sup>4</sup> This appreciably restricts the scope for borrowing by households whose consumption in the past was often considerably debt-financed (in particular through asset value growth).

The development of the US housing market hinges, not least, on that of the labour market. The unemployment rate (October 2009: 10.2%) has more than doubled over the last two years (see Chart 1.1.1). This is reflected in corresponding losses in income. Moreover, this situation is aggravated by the inevitable – because of lifecycle or solvency considerations – rise in the saving ratio of the, in some cases, heavily indebted households.<sup>5</sup> The balance sheet adjustments this involves are likely to put a strain on US growth, which in previous years was led by strong consumption, in the foreseeable future.

... affecting, not least, the recovery of private consumption

The immediate economic outlook for the euro area has also brightened, yet shapes up somewhat less favourably than for the United States. The European Commission is expecting GDP to fall by 4.0% in 2009, and to rise slightly – by 0.7% – in 2010. The slump in overall economic output has caused the number of unemployed, also in the euro area, to increase distinctly by 4 million since the cyclical turnaround in March 2008. Spain alone accounts for more than half of this rise. In September 2009, a 9.7% unem-

West European labour markets face negative developments

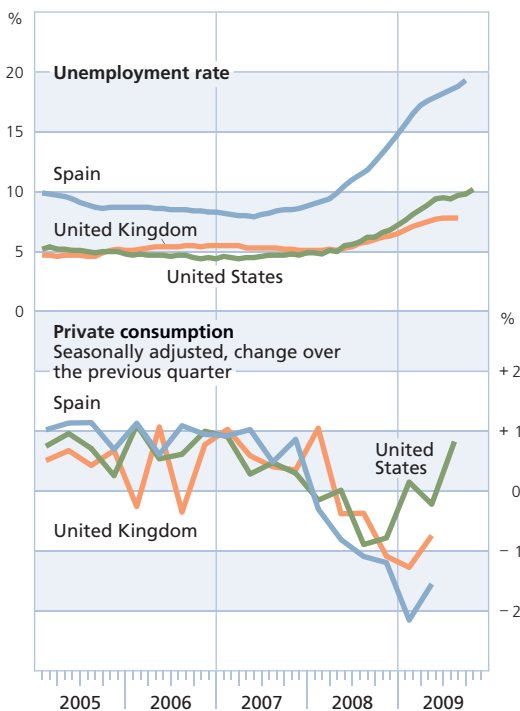
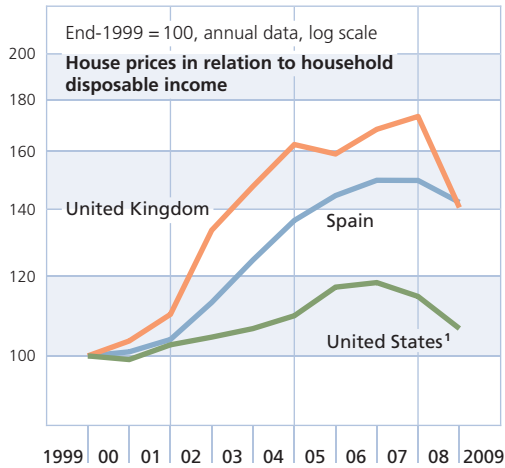
<sup>3</sup> The S&P Case/Shiller home price index for the 20 most important US metropolitan areas fell by only 1¾% in 2009 Q2 (in seasonally adjusted terms on the quarter), and the FHFA Purchase-Only Index, which has a broader regional basis and is geared more closely to the low and medium price segment, by 1%. Both rose as an average for July and August (over the average for the previous quarter). Moreover, more homes were sold in the summer months, while the ratio of supply to sales fell further.

<sup>4</sup> According to Moody's, already in Q2 of this year, 15.4 million mortgage debtors – roughly 19% of US single-family homeowners – were affected by negative equity. This poses a problem for banks providing real estate finance inasmuch as, in a number of states, real estate loans in the United States often do not feature recourse to the mortgage debtor's other assets. Structuring mortgages in this way allows the relinquishment of the mortgaged house to the bank (jingle mail) even when the borrower is not in financial distress or insolvent.

<sup>5</sup> After the saving ratio averaged 1¾% in the period 2005 to 2007, it temporarily climbed to just under 5% of disposable income in the second quarter of this year. However, this may be explained in part by special factors (tax refunds and higher transfers as part of the government fiscal stimulus package).

Chart 1.1.1

**HOUSEHOLDS' FINANCIAL SITUATION**



Sources: Eurostat, Bureau of Labour Statistics, Bureau of Economic Analysis (BEA), FHFA; Ministerio de Vivienda, OECD and Nationwide Building Society. — <sup>1</sup> House prices are based on the FHFA Purchase-Only Index, which has a broader regional base and focuses more strongly on the low and medium price segment.

DEUTSCHE BUNDESBANK

ployment rate was registered in the euro area – the highest in over ten years – and the tendency is rising. In Spain, Ireland and Slovakia, meanwhile, unemployment rates are in some cases well into double digits.

The reduction in employment of course amplifies the financial vulnerability of households. This creates a particular challenge for countries which – like the United States – in the past registered surging house prices and rising household indebtedness. Households in Spain in particular are burdened by debt well above the euro-area average and an appreciable drop in house prices (-8.0% in the third quarter of 2009, year-on-year). In non-euro area Europe, moreover, households in the United Kingdom are heavily indebted, and are affected by negative equity due to a pronounced decline in house prices.<sup>6</sup> The UK real estate market seems to be gradually stabilising.<sup>7</sup> However, unemployment climbed from 5.6% in 2008 to 7.8% in August 2009, reducing households' financial scope. Against this background, on the one hand continued decreases in consumer demand are to be expected in Europe. This is also likely to affect German exports. On the other hand, further payment defaults could put a strain on German financial institutions with extensive international operations, all the more as they also face considerable write-down risks on the securitisation products they hold.<sup>8</sup>

Households in a number of countries face financial vulnerabilities

<sup>6</sup> Between 7% and 11% of mortgage debtors in the United Kingdom are currently affected by negative equity. See Bank of England, Financial Stability Review, June 2009.

<sup>7</sup> In the third quarter of 2009, the Nationwide Index rose by a seasonally adjusted 3.7% on the quarter, following an increase of 1.4%.

<sup>8</sup> The United Kingdom dominates the European market for residential mortgage-backed securities (RMBS) with a market share of 39%. The share taken by Spanish securitisations is, at 15%, close behind that of the Netherlands (18%). See ESF Securitisation Data Report Q2:2009.



High foreign  
currency debt  
in parts  
of central and  
eastern Europe

Of the central and east European economies, the countries especially hard hit by the financial crisis are those which posted high current account and budget deficits prior to the crisis and whose private sector has a large proportion of foreign currency debt. This goes hand in hand with high interest rate and exchange rate risks. Moreover, given the close financial and trade relations which the new EU member states maintain with west European countries, a sustained recovery process will probably not take hold in the former until west Europe's real economic situation begins to stabilise. In this context, German banks could face direct risks – through economic relationships, credit exposure and their subsidiaries' activities in these markets – as well as (indirect) counterparty risks.

Above-average  
impact  
on German  
economy due  
to export  
dependence

The global economic crisis and the associated slump in world trade – the IMF is expecting a decline by 11.9% for 2009 – has had a particularly adverse effect on the German economy because of its strong focus on exports. It is generally thought that the decline of German GDP in 2009 will be heavier than the average for the euro area as a whole; both the European Commission and the German research institutions expect a decrease by 5%. Their growth forecasts for 2010 of 1.2% are more favourable than for Germany's neighbours; Germany could benefit to an especially large extent as the global economic situation continues to brighten. The German Council of Economic Experts is even more optimistic, predicting an increase of 1.6% in 2010. Nevertheless, the financial and economic crisis continues to harbour risks. To date, the effects on the German labour market have been relatively moderate due, *inter alia*, to short-time working schemes. However, the unemployment

rate – which according to Eurostat was 7.6% in September – looks set to rise further in the course of the next year. Cyclical setbacks, which cannot be ruled out, could place an additional burden on the solvency of German enterprises. If, in turn, the economy picks up further, the currently comparatively high level of credit standards could have an adverse impact on the – most recently – subdued investment activity. This constitutes a substantial risk factor for economic recovery in Germany, which is typically characterised by the self-reinforcing interaction between net exports and spending on new real capital, which needs financing.

The financial and economic crisis has brought discernible changes – also of a structural nature – to the underlying conditions that shape the German economy, with the result that a negative impact on potential output is to be expected.<sup>9</sup> Although especially large uncertainties surround all estimates at present, the currently low level of fixed capital formation in particular is likely to reduce potential growth discernibly in the years ahead.

Potential growth  
weaker

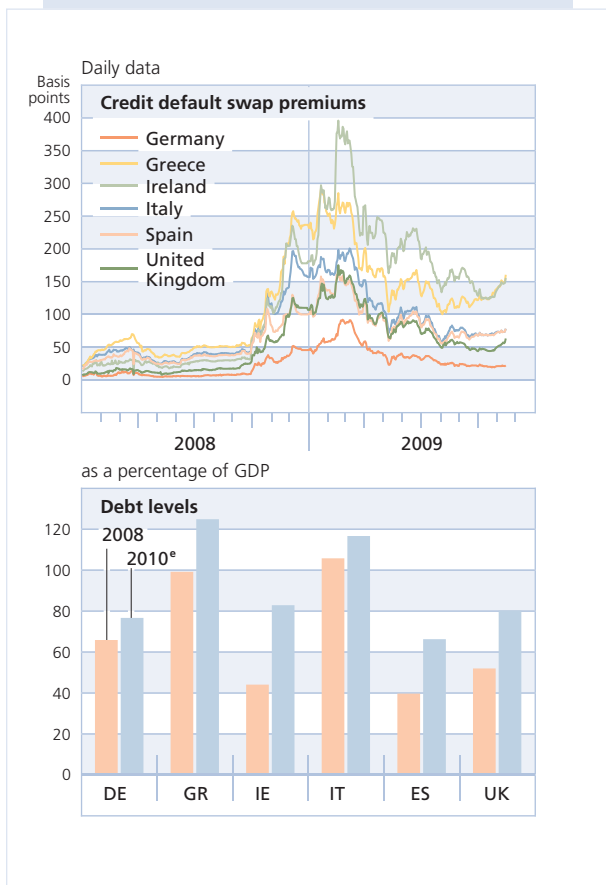
### Medium-term macroeconomic risks not inconsiderable

The unavoidable short-term policy interventions entail considerable medium-term risks from a financial stability perspective. In particu-

<sup>9</sup> First, potential output is likely to have dropped in the wake of the severe global recession. Second, the medium-term potential growth path now has to be rated less favourably. The latest OECD forecast of the German potential growth rate for the next two years averages 0.8% compared with 1.2% for 2006-2008. Additionally, a permanent increase in energy prices will put a strain on Germany's industrial output capacity in the medium term. See Deutsche Bundesbank, Growth effects of permanently high energy prices: recent evidence for Germany, Monthly Report, June 2009, pp 29-44.

Chart 1.1.2

**CREDIT DEFAULT SWAP PREMIUMS AND DEBT LEVELS OF SELECTED EU COUNTRIES**



Sources: Thomson Reuters and European Commission.  
DEUTSCHE BUNDESBANK

sible until the market environment has picked up on a sustained basis, it nevertheless then has to be made in a timely fashion. Furthermore, not only should extraordinary measures actually expire or be discontinued – the sustained consolidation of public finances, too, needs to be tackled. Otherwise, a possible erosion of investor confidence could put pressure on long-term capital market rates and trigger tensions in exchange rates.

Since the financial crisis began, some countries have recorded marked increases in risk premiums in the bond markets and for hedging instruments. Credit default swap premiums have, on the whole, fallen from their highs in the second quarter of this year. Nevertheless, the level that may be observed at the current end is noticeably higher than before the onset of the crisis (see Chart 1.1.2). The countries most strongly affected are those with a high debt ratio or a pronounced rise in this ratio. Yet not only the explicit, but also the implicit, debt – notably in connection with the transfer of risks from the banking sector to the public sector – is likely to play a role.

Risk premiums rise following marked deterioration of public finances

Large fiscal deficits tend to be accompanied by higher financing costs both for the public sector and for private issuers.<sup>10</sup> Consequently, large-scale issuance of government bonds<sup>11</sup> and government-guaranteed bank bonds could cause private-sector issues to be crowded out of the market. That there are no signs of

Potentially higher funding costs due to high fiscal deficits

Medium-term risk potential due to necessary short-term government support measures

lar, they give rise to questions with regard to the financing of the rising government debt and its long-term sustainability. In order to firmly anchor market participants' expectations with regard to a stability-oriented monetary policy and a sustainable fiscal policy, transparent and credible strategies are needed for scaling back monetary and fiscal policy stimuli as well as the government support measures to the banking sector. While an exit is not pos-

<sup>10</sup> Whereas the quantification of this effect is subject to considerable uncertainty, the direction of the impact is clear. A fiscal deficit increase by 1 percentage point in relation to GDP can cause long-term government bond yields to rise by 10 to 60 basis points. See IMF, Global Financial Stability Report, October 2009, pp 36-37.

<sup>11</sup> In 2010, the volume of government bonds maturing in some important industrialised countries will be relatively large.

this at present may be explained, not least, by the provision of large amounts of liquidity by the central banks.

Need for further structural adjustment to combat global imbalances

Moreover, from a macroprudential view, problematic developments are linked to the global imbalances that constituted the macroeconomic breeding ground for the crisis.<sup>12</sup> These imbalances have become considerably less pronounced since the global financial crisis began. The saving ratio of US households, for example, has risen appreciably. Furthermore, the current account balances of a number of major economies have contracted (see Chart 1.1.3). However, the reduction has so far not been sufficiently structurally founded or sustainable, having been to an extent only cyclically induced. This aspect could become especially virulent for countries burdened with sizeable current account deficits. In combination with the debate about credible exit strategies from an expansionary macroeconomic policy, confidence vulnerabilities exist which could also produce greater volatility on the foreign exchange markets.

## Risks in the international financial system and the financial markets

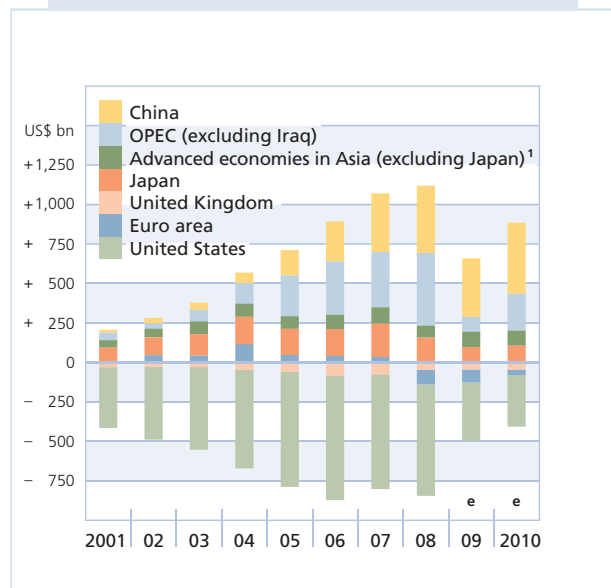
### Stabilisation of the global financial system

Stabilisation through government measures ...

Since the spring of 2009, there have been growing signs that the international financial system is stabilising after the collapse of US investment bank Lehman Brothers contributed to a sharp intensification of the crisis in the financial sector in the autumn of 2008. As global growth deteriorated dramatically, the interaction of the weakened financial system

Chart 1.1.3

### CURRENT ACCOUNT POSITIONS



Source: IMF. — <sup>1</sup> Hong Kong, Singapore, South Korea and Taiwan.

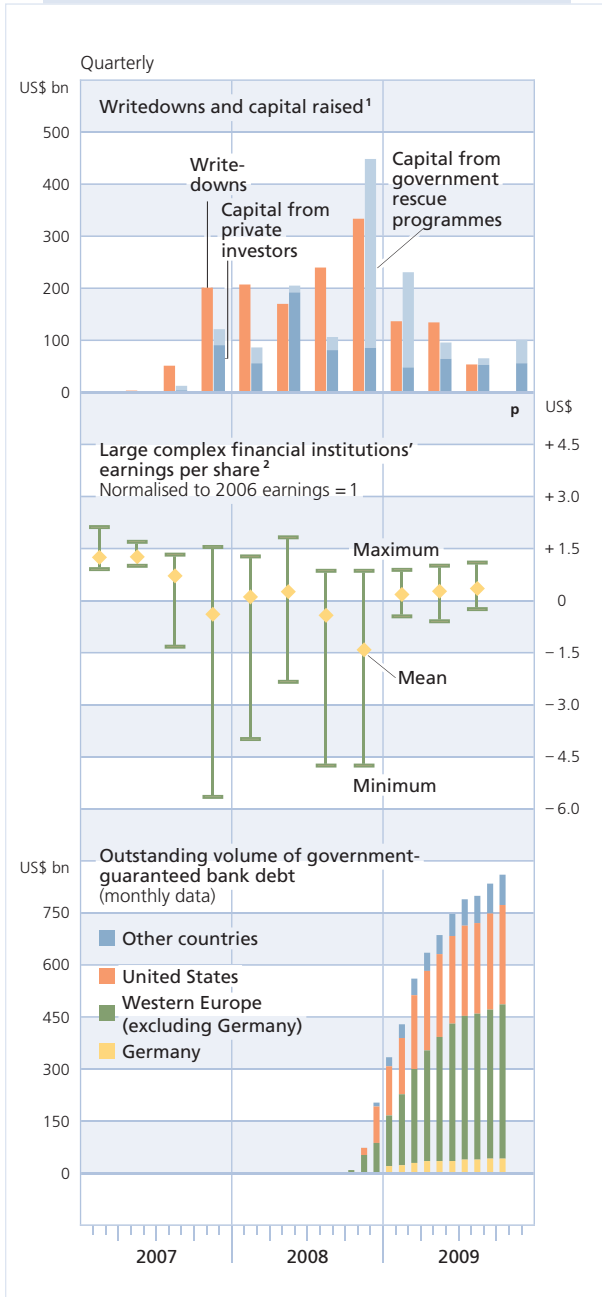
DEUTSCHE BUNDESBANK

and the real economy threatened to lead to a downward spiral. Governments and central banks around the world responded by taking exceptional stabilisation measures. To cushion further losses, numerous financial institutions received capital injections from the public sector (see Chart 1.1.4). In this situation, the vast majority of financial institutions were no longer able to raise capital on the markets. Besides guarantees and balance sheet relief, the financial system benefited from additional aid, including favourable refinancing conditions at central banks and the indirect impact of fiscal policy stimuli. These measures also succeeded in stabilising financial institutions' earnings.

<sup>12</sup> For more about the macroeconomic causes of the crisis, see BIS, 79th Annual Report, 2009, pp 5 ff.

Chart 1.1.4

FINANCIAL SECTOR INDICATORS



Sources: Bloomberg, Dealogic and Bundesbank calculations. — **1** Includes banks worldwide, GSEs and AIG. — **2** Includes the following institutions: Bank of America, Barclays, BNP Paribas, Citigroup, Crédit Agricole, Credit Suisse Group, Deutsche Bank, Goldman Sachs, HSBC, ING, JP Morgan Chase, Lehman Brothers, Merrill Lynch, Morgan Stanley, Royal Bank of Scotland, Société Générale, UBS, Unicredit.

DEUTSCHE BUNDESBANK

After the danger of a systemic collapse had been averted, a recovery got underway in the financial markets at the end of the first quarter of this year. Here, the decline in extreme risk aversion and in liquidity hoarding were key. Stress indicators such as the risk premiums on tradable credit products and expected price volatility declined in important market segments as compared to the extreme levels of the preceding months (see Chart 1.1.5). The equity markets also experienced a sharp recovery. In Europe, in particular, this has, since August, resulted in a remarkable decoupling of equity indices from the comparatively low level of government bond yields. This could reflect different appraisals of the economic prospects. The divergence could also be an indication of a potential decoupling from the underlying economic outlook. The expansionary bias of macroeconomic policy – which was, however, necessary in response to the crisis – may have been a contributory factor.

... results in recovery in the financial markets ...

The stabilisation of the financial markets was also considerably helped by the largely positive quarterly results published by leading financial institutions in the first half of 2009. Counterparty risk, which had previously almost brought activity in important market segments to a standstill, gradually receded. From the summer months onwards, growing signs of an economic upturn strengthened the financial market environment. This trend is naturally also strongly characterised by the considerable and frequently unconventional public-sector interventions.

... as well as positive quarterly reports and economic upturn

As concerns about counterparty risk died down, spreads in interbank money markets also narrowed again in recent months (see

Eurosystem supports money market ...

Chart 1.1.5). In Europe, this important market segment continued to receive significant support from the Eurosystem.<sup>13</sup> One such measure, taken in June, was to provide liquidity with a maturity of one year for the first time. In addition, the Eurosystem also met banks' substantial demand for US dollar liquidity by conducting regular tenders, as tension in this segment of the interbank market was comparatively slow to ease.

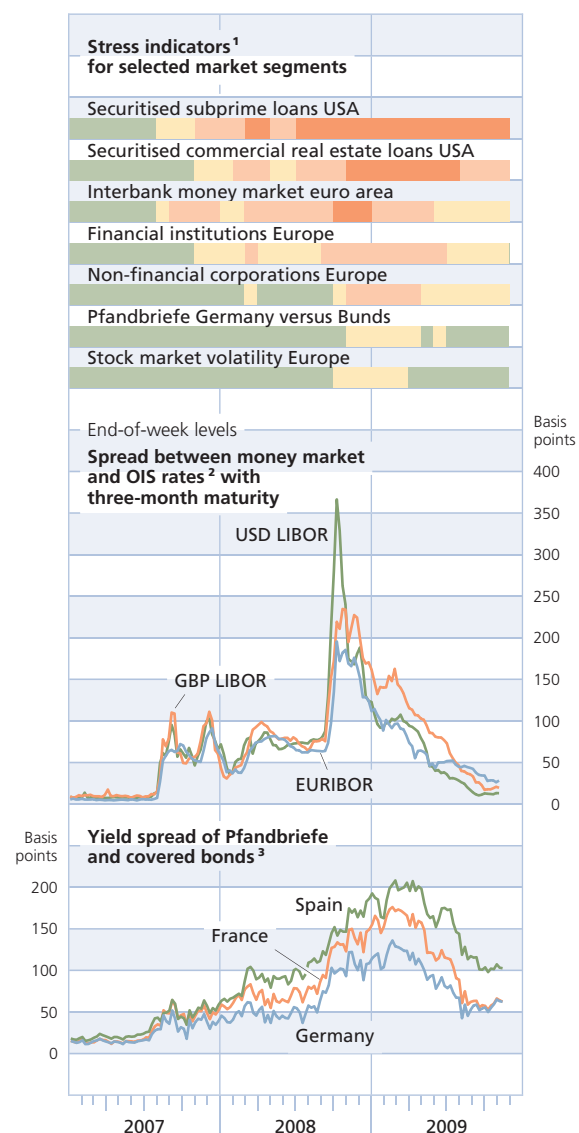
... and covered bond markets

Numerous European banks use covered bonds to refinance longer maturities, with the differentiation between spreads within this segment reflecting differences in perceived quality and liquidity. Stricter standards, especially in the Pfandbrief market, usually ensure broad, deep and robust markets, in which even large transactions can be settled without impacting prices. However, the crisis nevertheless spread to this refinancing instrument, too, and at times almost caused the market to dry up. One reason the disruption to the Pfandbrief market was no greater was that one major and, above all, systemically relevant German issuer received large amounts of state aid to avert insolvency (see Box 1.1 on page 33). The exceptionally difficult conditions prompted the Eurosystem to announce a special covered bond purchase programme with a total volume of €60 billion in May. Risk premiums consequently declined significantly, and primary market issuance picked up again noticeably.

Risk premiums for financial institutions' longer-term unsecured refinancing instruments also

Chart 1.1.5

### FRICTIONS IN THE INTERNATIONAL FINANCIAL SYSTEM



Sources: Bloomberg, MarkIT, Merrill Lynch, Morgan Stanley and Bundesbank calculations. — **1** The level of credit risk premiums against the long-term average is used as a stress indicator. Green indicates normal market conditions, yellow and light red raised and exceptionally high stress levels respectively; red signals extremely impaired markets. — **2** Overnight indexed swaps. — **3** Over Bunds of comparable maturity.

DEUTSCHE BUNDESBANK

<sup>13</sup> See also the article on the interaction between the Eurosystem's non-standard monetary policy measures and activity in the interbank money market during the crisis on pp 87-99.

Some normalisation also of longer-term refinancing ...

reflected a degree of normalisation. However, banks have not yet regained the advantage in terms of risk premiums which they usually enjoyed over good corporate borrowers before the crisis. This impairs their ability to act as an intermediary between savers and borrowers.

... but early repayment of aid not unproblematic

Major banks in the United States in particular made use of the better access to equity from private sources in the second quarter and, in some cases, started to repay government aid. European institutions later followed suit, although they focused on returning guarantees. Much of the financial aid was associated with user costs and had conditions attached, which became limiting and, in some cases, unattractive as the financial markets recovered. However, repaying government aid could prove premature if the institutions encounter financial difficulties again in an environment that remains fraught. This could reignite concerns about counterparty risk.

### Upheaval in the financial system not yet overcome

Remaining transitional period for adjustments limited

Despite the recovery of the financial markets, the global financial system currently still appears too susceptible to new problems to be able to do without extraordinary government aid. Against this backdrop, the Heads of State or Government of the G20 agreed at their meeting in Pittsburgh at the end of September of this year to avoid ending the stimulus measures early. Nevertheless, exit strategies are to be prepared. The reversal of the temporarily necessary large supply of liquidity must also be initiated in good time to prevent medium-term risks to price stability and mispricing in the

markets. For market participants, the remaining transitional period in which to repair their balance sheets and restructure business models is therefore limited.

In fact, the structural adjustment process in the international financial system has not yet been completed. Given that the financial systems in many countries are fragile, renewed setbacks could perceptibly impair the supply of credit to the economy. Financial institutions will therefore have to further improve their risk-bearing capacity if credit supply is to be maintained in the longer term. It would make sense primarily to use earnings for this purpose.

Improvement in risk-bearing capacity and profitability required

### Ongoing pressure on financial institutions to adjust

Before the onset of the crisis, the use of instruments designed to transfer credit risk had been increasing for some time. This was expected to improve investors' risk diversification. However, as credit defaults grew, it became evident that the products involved a high concentration of risk and had low liquidity – often because of their complexity. As a consequence, banks suffered heavy losses on trading book credit positions. The effectiveness of transferring risk through credit default swaps or credit insurance was limited as counterparties – particularly weakly regulated US insurers – encountered financial difficulties. In addition, numerous banks suffered in the first phase of the crisis as largely illiquid assets from special-purpose vehicles had to be taken back onto the balance sheets. Cleansing the balance sheets of assets that were previously considered liquid, but are now subject to large

Accumulated problems not yet fully dealt with

valuation uncertainty,<sup>14</sup> is an important step towards enabling new loans to be issued.<sup>15</sup> The write-down of, in the meantime, some US\$1,200 billion by international banks therefore partly reflects the substantial progress that has been made on expunging problem assets. Many countries, including Germany, further support this “detoxification” of banks’ balance sheets with targeted measures.<sup>16</sup> In the meantime, the fact that market conditions have stabilised increasingly allows complex credit products to be split up and liquidated separately. However, the accumulated problems have not yet been fully dealt with, making further work indispensable. This is necessary also because the cyclical lag alone means considerable additional write-downs are likely to be required.<sup>17</sup>

Business models likely to be subjected to critical scrutiny

Against this backdrop, establishing sufficiently large capital buffers as a precautionary measure is a high priority. Regulators are not alone in calling for better capital levels. Counterparties and rating agencies have also increased their requirements in terms of capital adequacy during the crisis. As the return on equity is falling owing to reduced leverage, some business models are likely to be subjected to critical scrutiny. Moreover, the range of services on offer is likely to be reviewed. For instance, a larger percentage of transactions will probably be settled via central counterparties in future, given that counterparty risk and the intransparency of existing structures emerged as particular weaknesses.

Greater restraint in credit supply a risk factor

Temporarily, the major banks with an international focus in particular are benefiting from the low central bank interest rates, high premiums for providing market liquidity, the exit of several

competitors from the market and the recovery in the financial markets, for instance in the bond and equity underwriting business. In the medium term, however, the challenge will be to get the balance between capital levels and profitability right. One example of the need to raise capital standards is that risk positions in the trading book were underestimated in the run-up to the crisis.<sup>18</sup> Overall, however, it is still unclear how the adjustment pressure resulting from the changed market environment will impact the profitability of particular business models and existing structures. A non-negligible risk is that the adjustments catapulted by the crisis could result in a number of financial institutions restricting their credit supply, which would also affect aggregate supply.

## Reduced activity in international credit markets

Within the international financial system, the flow of credit faltered considerably during the crisis. The drop in cross-border bank lending

Decline in cross-border bank lending

<sup>14</sup> At the six largest US financial institutions, holdings of what are known as level 3 assets, for which available market prices are insufficient and which are therefore valued using models, increased by some 125% to US\$545 billion between the first quarter of 2007 and the second quarter of 2009. Sources: Bloomberg and Bundesbank calculations.

<sup>15</sup> In addition, modified accounting rules, amongst other things, helped prevent automatic write-downs due to illiquidity and valuation uncertainty. The modifications were necessary because the mark-to-market approach could not be applied in the largely dysfunctional markets. Adhering to the fair value method would have fostered systemic instability.

<sup>16</sup> What form these measures take differs considerably from country to country, with the sharing of risk between private market participants and public bodies an important feature. If the government is generous in assuming risk, this would lead to a rapid cleansing of balance sheets in the short term. In the longer term, however, this would create problematic incentives for market participants’ behaviour.

<sup>17</sup> See section on loss estimates on pp 56-61.

<sup>18</sup> See Basel Committee on Banking Supervision, Analysis of the trading book quantitative impact study, October 2009.

Table 1.1

**CROSS-BORDER BANK CLAIMS ON A CONSOLIDATED BASIS**

Percentage change 2009 Q2 against 2008 Q1

Debtor	Creditor						
	United States <sup>1</sup>	United Kingdom	Germany	France	Switzerland	Japan	All reporting countries
United States	.	- 7	- 27	- 17	- 32	6	- 16
United Kingdom	.	.	- 42	- 28	- 24	- 2	- 19
Germany	.	- 23	.	- 9	- 35	- 13	- 18
France	.	- 20	- 24	.	- 28	- 8	- 24
Switzerland	.	- 30	- 18	- 34	.	- 17	- 20
Japan	.	- 21	- 46	- 10	- 45	.	- 7
Offshore financial centres	.	5	- 48	- 33	- 41	- 7	- 16
Developing countries	.	- 10	- 9	- 4	- 36	- 3	- 9
of which: Asia	.	- 16	- 12	- 17	- 35	- 8	- 12
Europe	.	- 20	- 5	- 5	- 41	- 17	- 15
Latin America	.	- 4	- 18	8	- 42	15	- 3
<b>All countries</b>	- 16	- 14	- 27	- 16	- 32	- 3	- 16

Source: BIS. – <sup>1</sup> As the reporting population has changed, comparable data are only available for the aggregate figure.

DEUTSCHE BUNDESBANK

between the first quarter of 2008 and the second quarter of 2009 by a total of 16% reflects significantly limited intermediation in the financial centres (see Table 1.1). The drop mainly related to lending among industrialised countries. This mirrors the reduction in risk exposure as well as financing problems in the international money markets. However, some emerging market economies also suffered a large-scale withdrawal of capital. Concerns that the branches of international banks would be particularly instrumental in this have proved unfounded, however. In fact, their local activities have developed fairly stably to date. Most banks in question regard these regional markets, to which they have a large exposure and in which they have built reputational capital, as part of their core business.

The issuance of syndicated loans is also severely impaired internationally (see Chart 1.1.6). For one thing, this development reflects higher average refinancing costs for financial institutions, which are generally passed on to clients. For another, credit standards for debtors with a generally poorer credit rating have been tightened, and credit demand from investors has weakened. The regular surveys conducted by central banks in the United States and Europe give an impression of the overall tighter credit standards of banks for clients in the corporate and household sectors. Borrowers and financial intermediaries alike are therefore under a lot of pressure to improve their credit standing. If they are successful, financing costs should come down. Increased transparency vis-à-vis lenders and a lower leverage ratio could help

Perceptible pressure on market participants to improve their creditworthiness



lower risk premiums and thus financing costs, as could refraining from particularly risky investments. Re-establishing higher levels of debt capacity is likely to be a lengthy process, especially for households, whose net asset and income position has, in many countries, suffered as a result of the crisis.

Corporate bond issuance contributing to stabilisation

The strong issuance of corporate bonds is remarkable in this environment. The main motive is likely to have been to secure timely follow-up financing. Enterprises with access to the bond market can circumvent the banking sector in this way and obtain funding directly from investors such as investment funds or insurers, whose balance sheets are generally less in need of de-leveraging. This is helping to stabilise the supply of credit. However, for the majority of small and medium-sized borrowers, cost considerations mean this is not a practical alternative.

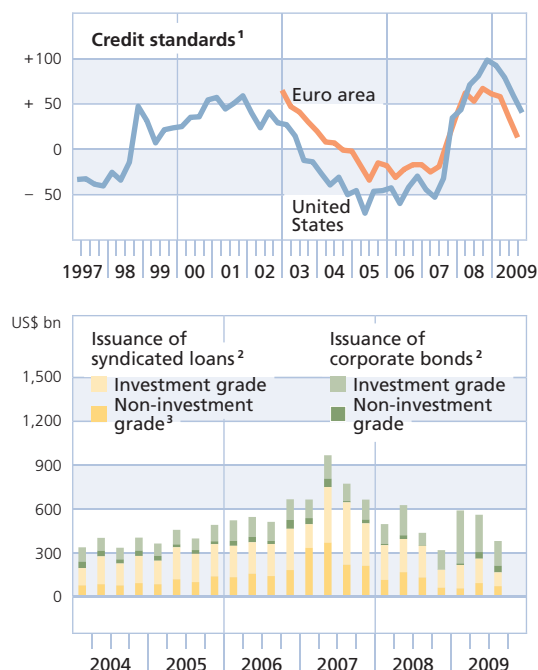
### Ongoing frictions in the securitisation market

Ongoing upheaval in the securitisation market

The smooth functioning of the financial system is still considerably impaired as a result of the continuing upheaval. In the securitisation market in particular, new, more sustainable structures have not yet emerged. In market-based financial systems such as the United States and the UK, securitisation of loans is more important for the domestic credit supply than in more bank-focused financial systems such as the euro area. However, their tradability means securitisations have an important role to play in diversifying risk at the international level, too. On the demand side, the crisis has eliminated important buyers of credit risk. These include off-balance-sheet special-purpose ve-

Chart 1.1.6

### CREDIT STANDARDS AND CREDIT MARKET ACTIVITY



Sources: Bloomberg, Dealogic, ECB and Fed. — **1** Balance of the percentage of those responding in bank lending surveys that standards had been "tightened" or "eased", respectively, in the segment loans to large and medium-sized enterprises. — **2** Western Europe and United States. Includes undrawn credit lines. — **3** Includes unrated loans with an issue premium of more than 150 basis points over LIBOR.

DEUTSCHE BUNDESBANK

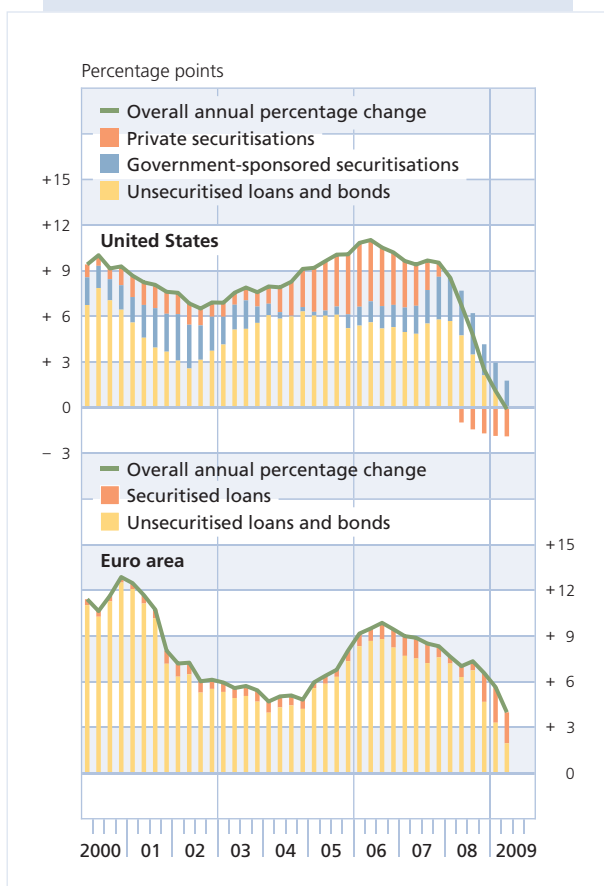
hicles as well as insurance companies in the United States. More stringent regulatory standards will apply to both going forward, as well as to securitisations that banks hold in their own trading book. In addition, investors are likely to have revised their opinion of the reliability of external ratings and the liquidity of securitisations.

In Europe, newly structured securitisations have been used in recent quarters almost ex-

Improvement in market conditions ...

Chart 1.1.7

**CONTRIBUTIONS TO THE GROWTH RATE OF HOUSEHOLDS' AND ENTERPRISES' LIABILITIES**



Sources: Fed, ESF, ECB and Bundesbank calculations.  
DEUTSCHE BUNDESBANK

clusively in refinancing operations with the Eurosystem. In the United States, the central bank and the government stabilised the securitisation market through large-scale purchase programmes, as this refinancing channel is believed to play a central role (see Chart 1.1.7). Since the middle of the year, market liquidity appears to have improved, however, not just in the segments receiving direct support. Nevertheless, even in the United States, the securitisation

market does not yet represent a functioning, solid pillar in the supply of credit. Despite substantial intermediation, it has stabilised at less than half its pre-crisis level.

A fundamental improvement in market and product structure is predicated on measures that set incentives in such a way as to prevent a renewed endogenous erosion of credit standards. Rating agencies' revised valuation models as well as the expansion of investors' internal valuation capacity are all steps in this direction. Issuers must provide more detailed information on securitised loans than before the crisis. Where this cannot be realised at reasonable cost, product complexity must be reduced. The adjustments initiated by rating agencies and other market players are not sufficient alone, however, as they still take insufficient account of the systemic risk when credit standards are too low. They therefore need to be accompanied by regulatory standards. Requiring issuers to retain a defined portion of their own securitisations could help further increase stability. These minimum retention requirements should set the right incentives. This would suggest that they should not relate only to the first-loss tranche.<sup>19</sup> The unexpected correlation of defaults of the underlying assets in the portfolio caused the greatest difficulties for structured securitisations. The supposedly especially secure senior tranches were hardest hit by the change in default risk. The proposal that originators of such products retain a verti-

... requires fundamental measures

<sup>19</sup> See proposal for a directive of the European Parliament and of the Council amending the Capital Requirement Directive (2008/0191 COD), especially Article 122a, October 2008; J P Krahen and G Franke, The Future of Securitisation, CFS Working Paper No 2008/31, and I Fender and J Mitchell, The future of securitisation: how to align incentives?, BIS Quarterly Review September 2009, pp 27-43.

cal cross-slice spanning all tranches therefore merits closer examination.

Adjustments are likely to take place in a very difficult environment

The issuance volumes possible in the boom years, not least due to wrong incentives, are unlikely to be repeated in the foreseeable future, however, given the trend towards simplified products and market structures. In the longer term, it is unclear whether the changed securitisation market will be able to compete successfully with Pfandbriefe and other refinancing instruments. It is nonetheless likely that adjustments in the securitisation market will take place in a very difficult environment. In particular, many segments could yet suffer considerable losses from credit defaults.

**Considerable risk of default ...**

Financial sector facing renewed tests

Given the current state of progress in the adjustment process in the international financial system and the considerable macroeconomic risk factors, the financial sector could face renewed tests. Counterparty risk and risks from purchased credit securitisations are especially relevant for German banks besides direct defaults in their own credit portfolios. Overall, continued high write-downs could make it substantially more difficult to restore sustainable balance sheet structures. They would, moreover, dampen credit supply.

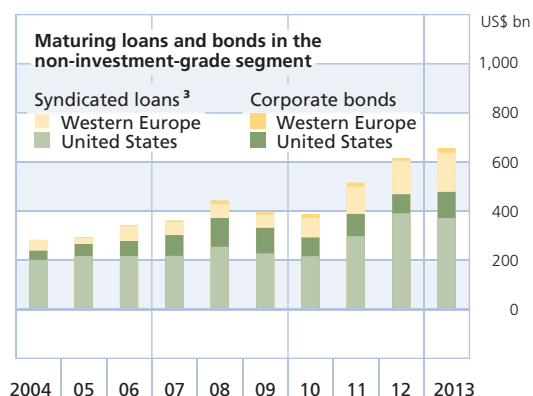
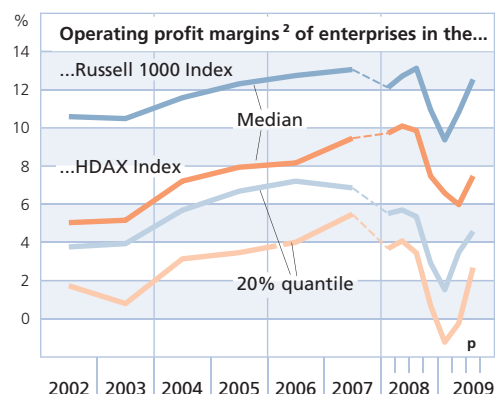
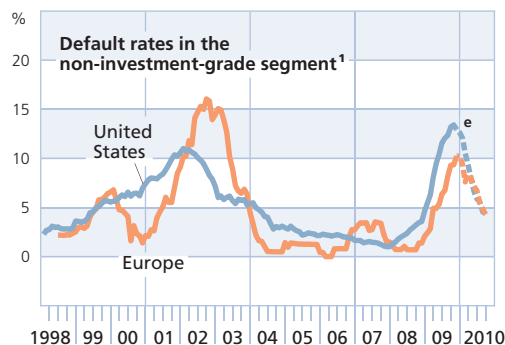
**... on corporate loans, ...**

Default rates expected to reach highs in 2009 Q4

Defaults in the global corporate sector will continue to weigh on banks' profits in the next few quarters. In October of this year, the default rate for non-investment-grade enterprises active in the capital markets already rose to

Chart 1.1.8

**RISK FACTORS FOR THE CORPORATE SECTOR**



Sources: Bloomberg, Dealogic, ECB, Moody's, Thomson Reuters and Bundesbank calculations. — **1** Moving average of the last 12 months in the non-investment-grade segment. — **2** Ratio of EBIT to sales. To end-2007, annual data, thereafter quarterly data. — **3** Also includes unrated loans with an issue premium of more than 150 basis points over LIBOR and undrawn credit lines.

13.4% in the United States and 9.4% in western Europe. Default rates are expected to peak in the fourth quarter (see Chart 1.1.8).<sup>20</sup> An unfavourable but not unrealistic scenario even sees default rates swelling to more than 14% in the United States and in excess of 12% in Europe in the coming months.<sup>21</sup>

Low cash flows from operations and poor credit quality

The poor fundamentals in parts of the corporate sector are a major reason for the high default rates. Profitability declined substantially in the fourth quarter of 2008 from a very solid base. It has, meanwhile, recovered substantially – albeit largely as a result of cost-cutting. The poor business environment means a lot of enterprises now generate only low operating cash flows with which to cover interest expenses and other current expenditure. At the same time, their debt burden is high. Low credit quality is also reflected in rating agencies' downgrades of corporate debt securities, which have reached record highs in recent quarters.

Debt financing difficult for enterprises with lowest credit ratings

Meanwhile, the fact that risk premiums have narrowed perceptibly as uncertainty has declined in recent months is a positive factor for those enterprises able to tap the capital markets. Yet enterprises with the lowest credit ratings were initially unable to benefit much as their access to bond markets was severely restricted. At the same time, they were harder hit by banks' increasingly tight credit standards. This reflects the typical phenomenon, which has, however, been accentuated by the intensity of the current recession, whereby the default risk of low-rated debtors increases owing to restricted access to credit. The situation of these enterprises, too, has improved in the second half of the year. However, in an unfavourable scenario of a renewed increase in

risk aversion and the concomitant immediate rise in financing costs, enterprises with the lowest credit standing will see their liquidity problems intensify.

The main reason why the limited access to debt financing is problematic for this group of debtors is that large volumes of bonds and syndicated loans will mature over the next few years (see Chart 1.1.8). One reason why refinancing risks for weaker borrowers are particularly pronounced is that, unlike today, large amounts of debt were issued at generous terms in the years before the crisis.<sup>22</sup> With corporate leveraged loans, there is also a considerable risk that enterprises will breach covenants as a result of poor earnings. If such clauses are breached, this usually equates to the exclusion from credit lines. Lenders are currently often willing to amend or waive such covenants, at least temporarily, particularly as recovery rates after defaults tend to be very low, therefore necessitating, partly very high, write-downs. However, this will probably only postpone borrower defaults in some cases. Following the peak they are expected to reach towards the end of this year, default rates are therefore likely to decline more slowly than in past cycles. This is borne out by the fact that a higher per-

Weaker debtors face refinancing risks and may breach covenants

<sup>20</sup> In the enterprise sector as a whole, the number of insolvencies rose significantly in the second quarter of 2009 on the year (USA +57%, Spain +129%, England/Wales +36%, Germany +12%). The most recent data available for Spain and England/Wales show that the increase in insolvencies slowed in the third quarter compared to the year-earlier period. The figures are not directly comparable, however, as insolvency legislation differs.

<sup>21</sup> For a discussion of how the current momentum of credit defaults compares to past credit cycles, see also E I Altman (2007), *Global Debt Markets in 2007: New Paradigm or the Great Credit Bubble?*, *Journal of Applied Corporate Finance*, Vol 19, No 3, pp 17-31.

<sup>22</sup> See Deutsche Bundesbank, *Financial Stability Review 2007*, pp 28-29. In the current year, more than half of all defaults related to private equity transactions.

centage of debtors than ever before has only a non-investment-grade rating.

### ... on non-German commercial real estate loans ...

Weakness of real economy is putting pressure on prices of commercial real estate ...

The poor fundamentals in the corporate sector and the weakness of the real economy overall are also reflected in the market for commercial real estate, albeit with a time lag. Job cuts, significantly lower production, cost cutting, reduced incomes and substantially lower retail sales are resulting in falling demand for commercial real estate, rising vacancy rates and strong pressure on prices and rents. In the third quarter of 2009, the price indices for commercial real estate in the United States and the UK plummeted by 36% and 43% respectively from the highs they had marked in mid-2007.<sup>23</sup>

... and increasing banks' risk of loan defaults

As a consequence, the risk of banks suffering losses on loans secured by commercial real estate has increased sharply. In the United States, small and regional banks are expected to suffer especially large losses, as their portfolios of commercial property in proportion to their equity capital are higher than for big banks. In the US banking sector as a whole, there has been a steep rise (from 1.6% to 7.9%) in non-performing loans as a percentage of commercial real estate mortgages held on the balance sheet in the period since mid-2007.<sup>24</sup> There is no indication yet of a trend reversal. This has the immediate consequence that financial institutions face a heightened risk of losses on investments in securitised commercial real estate loans. These quite frequently represent cross-border exposures, which have increased sharply in recent years.<sup>25</sup>

Another contributory factor in the high default risk is that, in countries such as the United States and the UK, large volumes of commercial real estate loans will mature over the next few years. A large volume of loans was issued during the property boom. Following the collapse in prices, it is likely to prove difficult to prolong them at sufficient levels. Moreover, banks have significantly tightened their credit standards in recent quarters, and the market for securitised commercial real estate loans still appears unreceptive for new issues. Many banks are apparently tending to prolong existing loans. The short-term relief this affords the financial system has to be rated as a positive. However, losses may only be postponed.

Refinancing risks for commercial real estate loans

### ... and on loans to households

Despite growing indications that house prices are stabilising, the situation on the US residential housing market remains difficult. The ongoing tensions in the property markets combined with the loss of jobs and income as a result of the sharp cyclical contraction are making it more difficult for households to service existing debt. Loan delinquencies and foreclosures continue to rise; at the current edge, this is mainly affecting prime segment borrowers. In addition, defaults on consumer loans are on

Households' susceptibility increased, both in the United States ...

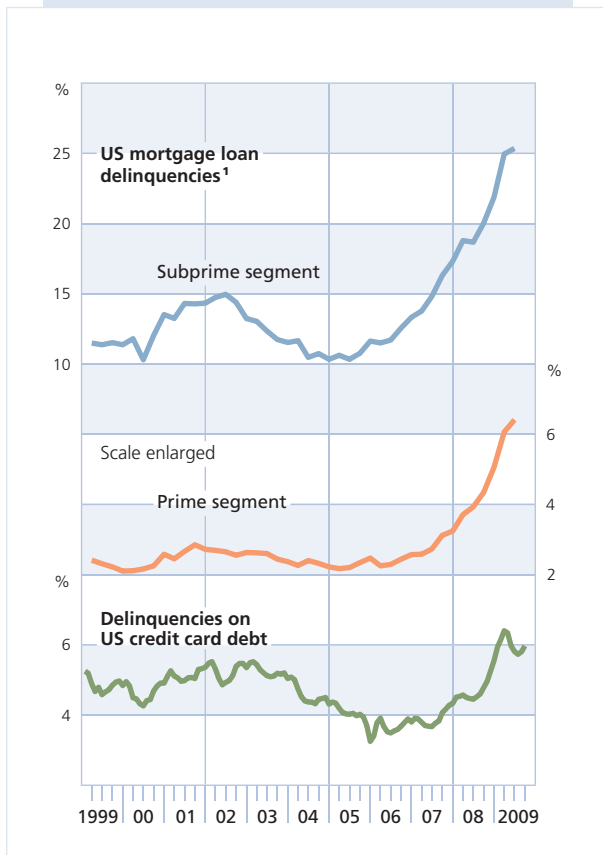
<sup>23</sup> With the slump in commercial real estate prices, the value of the collateral which enterprises have at their disposal to secure loans naturally declines. This has a negative impact particularly on small and medium-sized enterprises.

<sup>24</sup> See Federal Reserve Statistical Release, Q2:2009.

<sup>25</sup> In the United States, just under a quarter (US\$603 billion) of commercial real estate loans were securitised at the end of the first quarter of 2009. At this point in time, the securitisation volume in western Europe was some €148 billion according to the Securities Industry and Financial Markets Association (SIFMA). In its most recent Global Financial Stability Report, the IMF said that potential mark-to-market losses from securitised commercial real estate loans totalled some US\$137 billion.

Chart 1.1.9

**LOAN DELINQUENCIES FOR US HOUSEHOLDS**



Sources: Bloomberg and Moody's. — 1 Mortgage loans at least 30 days past due as a percentage of all residential mortgage loans outstanding (number) in the respective segment.

DEUTSCHE BUNDESBANK

the rise, especially credit card claims (see Chart 1.1.9). In view of the ongoing negative developments in the US labour market, this trend is likely to continue in the foreseeable future, especially given the difficult financial situation in which many US households find themselves. For instance, virtually no savings were made from current incomes in the preceding boom period. Debt had risen significantly both in absolute terms and as compared to disposable

income.<sup>26</sup> This leaves households very susceptible to drops in income and wealth.

Several European countries, too, have seen continued corrections in their residential housing markets, and households remain financially susceptible. Households' credit quality differs greatly from country to country, however. The situation is particularly unfavourable in the United Kingdom and in Spain (see also Chart 1.1.1), where, as in the United States, significant corrections in the real estate markets (in other words net wealth losses) hit an already highly indebted household sector.<sup>27</sup>

... and in several European countries

**Risks in credit risk transfer markets**

The negative development of credit quality since the onset of the financial crisis is particularly evident in the securitisation markets (see also Chart 1.1.10). In recent quarters, product classes based on commercial mortgages (Commercial Mortgage-Backed Securities: CMBS) and company loans (Collateralised Loan Obligations: CLOs) have been increasingly affected. Many CLOs come under pressure, especially if their portfolios contain a large percentage of credit tranches that proved particularly risky, such as those issued in the context of leveraged corporate takeovers, of which there were many in the years preceding the

Situation on the securitisation market remains difficult ...

<sup>26</sup> Between the end of 1999 and mid-2008, US households' (absolute levels of) debt had risen by 117%, while mortgage debt had increased as much as 139%. Since then, debt levels have declined slightly.

<sup>27</sup> The average rate of house price decline in the United Kingdom since the third quarter of 2007 (before a recovery in 2009) peaked at 19%. This is comparable with the correction witnessed in the early 1990s (-21%), which was preceded by a property boom of similar proportions. However, the UK household sector is now significantly more leveraged than in earlier cycles; financial debt has risen to 24% of net assets. Sources: Nationwide and Office for National Statistics.

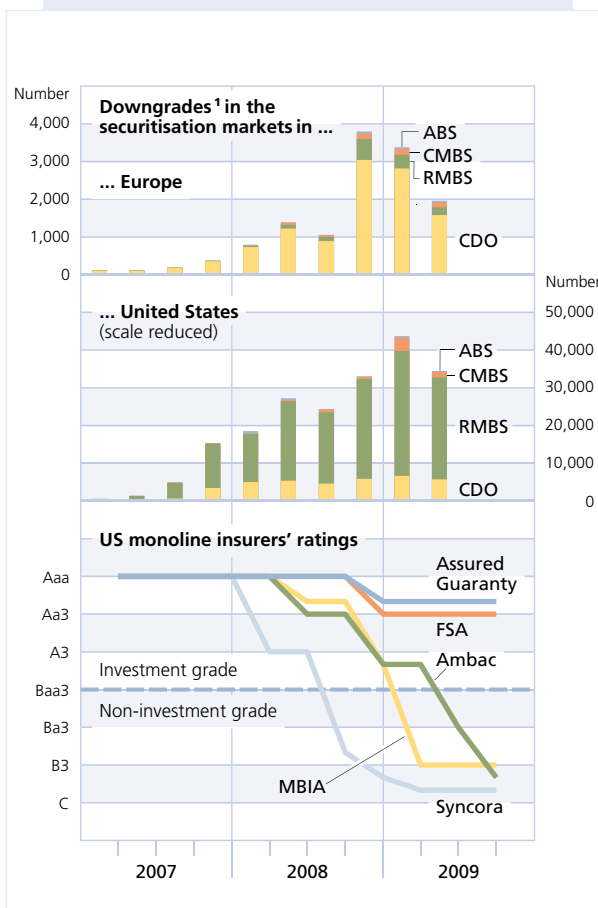
crisis. Besides the unfavourable fundamental dynamics, another reason for the extent of downgrades was that rating agencies adopted more cautious assumptions and estimation methods to determine probabilities of default and recovery rates during the crisis. With this in mind, the recent normalisation of the valuations of many securitised loans has yet to prove sustainable. It has, to some extent, also been supported by government aid programmes and is therefore not endogenous. An even greater increase in corporate default rates, defaults on commercial real estate loans and by households over the credit cycle, and the associated higher write-downs, remains a serious risk for the securitisation segment as a whole.

... and continues to put major protection sellers under pressure

US monoline credit insurers, whose capitalisation proved too low during the financial crisis, remain under considerable pressure. For instance, as protection sellers, the two largest monolines by insured volume, Ambac Assurance Corp and MBIA Insurance Corp, face ongoing financial difficulties as a result of losses on securitised assets. Poorer ratings for monoline credit insurers, which are increasingly placing a question mark over the sector's business model, have already resulted in high write-downs, particularly for European credit institutions.<sup>28</sup> To reduce the risk of further mark-to-market write-downs, several credit institutions have paid a premium to unwind their hedge transactions with monolines or have outsourced the portfolio hedged by monolines to special-purpose entities. Overall, the precarious situation of the monoline credit insurers highlights the fact that the default of major protection sellers on the credit risk trans-

Chart 1.1.10

CREDIT RISK TRANSFER MARKETS



Sources: Bloomberg, ESF, Moody's and Bundesbank calculations. — 1 Sum of downgrades (number) by rating agencies Fitch, Moody's and S&P.

DEUTSCHE BUNDESBANK

fer markets continues to represent a distinct risk.<sup>29</sup>

<sup>28</sup> At the end of September, the rating agency Standard & Poor's (S&P) downgraded MBIA to non-investment-grade status with a negative outlook. The business model has therefore, de facto, been largely discredited. To date, financial institutions' global write-downs from risk exposures to monolines total around US\$65 billion. <sup>29</sup> For initiatives aimed at containing counterparty risk in OTC derivatives markets, see also the chapter Learning from the crisis, pp 69-83.

## Stability in the German banking system

As a result of changed conditions in the wake of the financial and economic crisis, the major German banks with an international focus found themselves collectively facing an enormous need for adjustment. They consolidated their balance sheets, lowered their leverage, increased their capital and reduced their dependence on funding through the wholesale markets. Leverage was reduced mainly by scaling back repo operations, which generate the greatest procyclical, endogenous momentum (ie generated within the banking system itself). Owing to a favourable interest rate configuration and developments in the financial markets that were fostered, not least, by government programmes, operating income recovered markedly in comparison with the second half of 2008.

Credit risks are of particular importance for future developments. The current situation in Germany is characterised by non-financial corporations' and households' sustainable level of debt as well as by what is still a low level of non-performing loans. Nevertheless, the global crisis has dragged the German economy very deeply into recession because of its reliance on exports. This is putting a strain on the credit quality of corporate borrowers. Furthermore, market risks have increased sharply in the wake of the financial crisis. German banks have to maintain considerably more capital for the event of unexpected losses resulting from market developments. Interest rate risks are of greater relevance again. Systemic risks were apparent especially during extreme market phases.

Estimates of the potential need for write-downs of asset-backed securities and loans show that the losses from securitisation instruments are likely to have already peaked. Because they lag the cycle, however, write-downs on loans might yet again impair profitability.

### Situation stabilised, challenges remain

Decisive intervention by central banks and fiscal policymakers has now stabilised the German financial system (see also Box 1.1). The foundation for a new start was laid initially by the direct effects of the measures taken in Germany – above all, extensive provision of liquidity, guarantees for private savings deposits by central government, and the injection of capital into credit institutions as well as guarantees for bank bonds by the Financial Market Stabilisation Fund (*Sonderfonds Finanzmarktstabilisierung* or SoFFin). The banks are now benefiting increasingly from the indirect effects of an improvement in the economic situation. For the time being, this has broken the feared vicious circle of a weakened financial system and a cooling of the real economy. The collective burdens of stabilisation are nonetheless apparent in central banks' bloated balance sheets and prolonged higher government debt. In addition, there is the risk of future negative incentives if the financing behaviour of market participants increasingly involves anticipating the possibility of shifting losses on to the state.

Stabilising effects of measures taken by monetary policymakers and government



Box 1.1

## THE CASE OF HYPO REAL ESTATE HOLDING AG (HRE)

Hypo Real Estate Holding AG (HRE) took over the Dublin-based public sector financing bank Depfa in the autumn of 2007. Depfa had become heavily involved in maturity transformation with a view to enhancing its low margins in the government financing business. Following the takeover, HRE sought to reduce these risks. While it managed to significantly lessen the market price risks through swap transactions, it was unable to secure adequate long-term refinancing owing to the tense situation on the financial markets.

After the situation on the money market grew acute in the wake of the insolvency of the US investment bank Lehman Brothers on 15 September 2008, HRE was no longer able to secure the necessary refinancing. As it became apparent that HRE was facing imminent insolvency, the Federal Financial Supervisory Authority (BaFin) and the Bundesbank entered into discussions with HRE and representatives of the financial industry between 26 September 2008 and 28 September 2008 (first weekend of negotiations) with the aim of putting together a rescue package. At the end of these discussions, the negotiating parties agreed on the first rescue package in the amount of €35 billion against the provision of collateral by HRE, €20 billion of which was to be provided by the Bundesbank and €15 billion by a syndicate from the financial sector, additionally secured in each case by a central government guarantee. In order to ensure that any potential burdens would be shared appropriately between central government and the financial sector, it was agreed that the syndicate from the financial sector should assume liability in the form of a counter-guarantee vis-à-vis central government for 60% of all possible defaults up to a maximum amount of €8½ billion.

The following week saw further considerable turmoil and functional disruptions on the markets. Thus risk premiums on the money markets widened dramatically. On the credit markets even euro-area government bonds came under considerable pressure. Higher yield spreads on certain government bonds, which Depfa had provided to counterparties as collateral, led to substantial margin calls. This, in turn, resulted in liquidity outflows. HRE's liquidity situation deteriorated further as a result of this unforeseeable worsening of the crisis, despite the measures that it had taken. The ten-

sion on the financial markets was compounded by the downgrading of the HRE group by Standard & Poor's and the non-coverage of Depfa in the Irish government's guarantee for deposit-taking institutions. In order to avert a moratorium being imposed, further negotiations were held between 2 October 2008 and 5 October 2008 between representatives of the German government, the Bundesbank, BaFin and the financial sector. They agreed to raise the liquidity facility to €50 billion. The additional €15 billion was made available by the syndicate from the German financial sector against the provision of collateral by HRE.

In the following weeks, HRE's liquidity requirements increased further, especially as – owing to the development of the US dollar exchange rate, interest rates and yield spreads for certain fixed-income bonds – HRE had to provide counterparties with additional collateral. The Financial Market Stabilisation Fund (SoFFin) therefore granted HRE a guarantee line totalling €52 billion in stages and has since taken over 100% of its shares. In this context, the bank was provided with just under €3 billion of equity capital. On 4 November 2009, a decision was taken to inject a further €3 billion of capital and to extend the guarantee line until 30 June 2010.

There was no viable alternative to intervention in support of HRE. The insolvency of a banking group of this size just two weeks after the collapse of Lehman Brothers would have triggered a chain reaction, the cost of which would have been several times higher than that which the German government might incur from its guarantees. Besides the direct consequences for HRE's creditors, there was also a danger that German banks' refinancing could have been severely impaired in the wake of the loss of confidence in the German banking system that might have resulted from an insolvency. Given the large volume of Pfandbrief securities issued by HRE, there was the added risk that the Pfandbrief market would also have been dragged down.

The takeover of the bank by SoFFin in the context of a squeeze-out was necessary in order to ensure HRE's long-term stability. This was the only way to achieve a sufficient level of legal certainty and flexibility for the further restructuring process.

DEUTSCHE BUNDESBANK

Table 1.2

## CHANGE IN THE BALANCE SHEET STRUCTURE\*

Item	June 2009	June 2007 – June 2009	Oct 2008 – June 2009	Share <sup>1</sup>
	€ bn	%	%	%
Claims on banks	807	– 29.4	– 27.8	25
Claims on non-banks	2,179	– 4.0	– 10.2	25
Debt securities	1,177	– 7.7	– 9.5	13
Shares	97	– 57.7	– 23.4	3
Stakes in affiliated enterprises	11	– 1.1	– 18.2	1
Other assets	1,045	47.7	– 25.8	30
Combined other assets	182	26.3	– 13.4	3
Liabilities to banks	1,110	– 29.6	– 29.4	36
Liabilities to non-banks	1,837	– 0.9	– 11.2	23
Securitised liabilities	1,121	– 9.4	– 3.4	5
Capital shown in the balance sheet	175	27.4	8.6	3
Other liabilities	1,055	42.8	– 25.9	31
Combined other liabilities	200	– 15.3	– 7.3	2
<b>Balance sheet total</b>	<b>5,498</b>	<b>– 4.9</b>	<b>– 16.7</b>	<b>.</b>

\* Comprises a sample of 14 major German banks with an international focus. — 1 Percentage balance sheet change, October 2008 to June 2009.

DEUTSCHE BUNDESBANK

#### Use the opportunity

Government assistance is helping the financial system to deal with incurred losses and to prepare for foreseeable financial strains. As a result of government intervention, an advantageous situation has arisen with regard to the outlook for operating earnings. A steeper yield curve is bolstering net interest income. The banks are benefiting through commission and fee income from buoyant issuing activity by enterprises and governments. Added to this are the positive developments in the stock and credit markets since the second quarter of 2009, which have enabled banks to improve their result in trading business. Nevertheless, this development is fragile. At all events, the banks would be well advised to use the opportunity to raise risk provisioning, strengthen their capital base, build up capital buffers and further enhance their cost efficiency.

#### Challenges for the German banking system

The German banking system is facing major challenges. Because they lag the cycle, write-downs on loans may not yet have peaked. At the same time – as is typical of a recovery in the real economy – a reignition of credit demand is likely. In the event of an upswing, banks should be in a position to grant loans on a scale that does not impede the upturn.<sup>1</sup> A recovery that is only weak and also vulnerable to disruptions and which disappoints the expectations of the financial markets would soon lead to a fading of earnings potential. However, even if this were to happen, buffers built up now would be an advantage.

<sup>1</sup> See Deutsche Bundesbank, On the danger of a credit crunch in the cyclical recovery phase, Monthly Report, September 2009, pp 26-31.

## Current developments in the balance sheet structure

Balance sheets consolidated ...

Since the beginning of the turbulence in the financial markets in mid-2007, the major German banks with an international focus have seen their combined balance sheet total fall by roughly 5% to €5½ trillion.<sup>2</sup> The collapse of Lehman Brothers marked a turning point in this respect. Up until then, the balance sheet total was still rising – in some cases unintentionally – as a result of taking off-balance-sheet transactions back on to the balance sheet. Since October 2008, however, there has been a very marked fall of roughly 17% (see Table 1.2).

... by scaling bank interbank transactions and equity positions

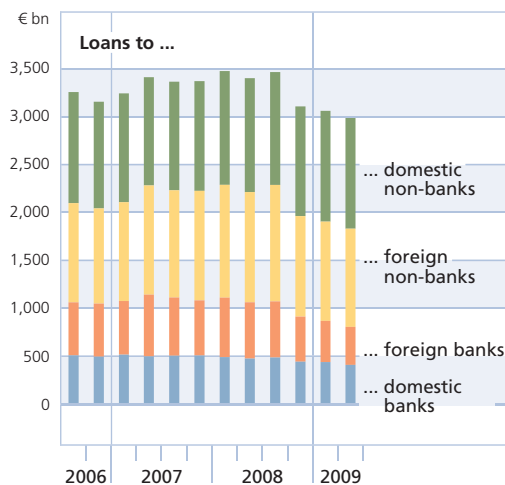
The structure of the cutback reflects the key characteristics of the financial crisis. In particular, claims on and liabilities to banks as well as equity holdings have been reduced. Since these items are highly liquid, they were the easiest for banks to scale back. The decline in interbank business stems from the increase in perceived interbank counterparty risks. To a large extent, the reduction – especially in the case of repo operations – is being made through highly leveraged positions (see Box 1.2). Efforts to reduce counterparty risks, which are assessed as being higher, are also revealed by the disproportionately large reduction in German banks' exposure to foreign banks, which shrank by 32% between September 2008 and the end of the first half of 2009. This played a key part in balance sheet contraction (see Chart 1.2.1).

Accounting rules may bloat balance sheet

Two special factors are crucial for interpreting balance sheet developments. These were, first, the sharp expansion of the items "Other balance sheet assets and liabilities" and, second, taking assets (back) on to the balance sheet or

Chart 1.2.1

### LOANS\*



\* Sample of 14 major German banks with an international focus.

DEUTSCHE BUNDESBANK

the provision of liquidity facilities in the follow-up financing of their own asset-backed commercial paper (ABCP) programmes.<sup>3</sup> The expansion of the items "Other balance sheet assets and liabilities" since mid-2007 can be explained by the fact that these items also comprise the market values of derivative financial instruments, depending on whether the bank is the seller or the buyer. Since the outbreak of the financial crisis, the rise in risk premiums has meant that market values have

<sup>2</sup> Unless stated otherwise, the analysis covers a sample comprising 14 major German banks with an international focus. The aggregate consolidated balance sheet total of these institutions as of June 2009 amounted to around €5.5 trillion and thus roughly 55% of the balance sheet total of the German banking system as a whole.

<sup>3</sup> Offloading toxic assets from the balance sheet on to a newly established "bad bank" has not been a major factor so far. Guarantees for such instruments totalling up to €32.5 billion have been received by some banks from their owners.

Box 1.2

**THE RELATIONSHIP BETWEEN LEVERAGE AND THE REPO MARKET**

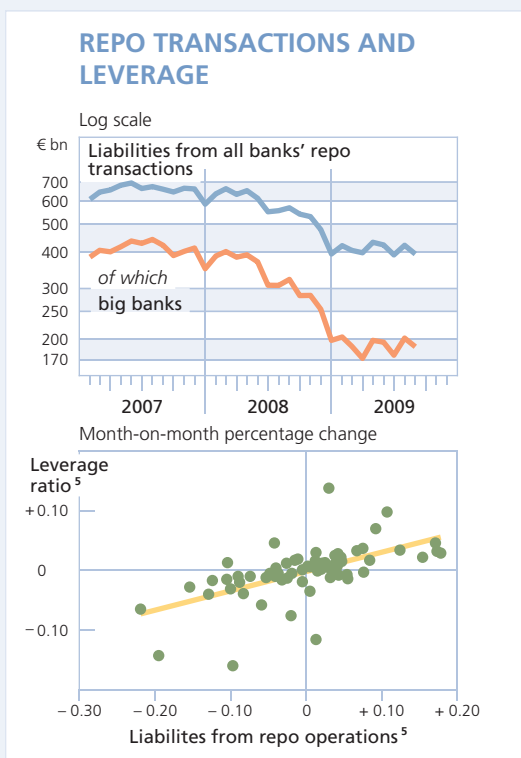
Studies of financial cycles have shown that repo transactions play an important role in the process by which financial intermediaries adjust to changes in the market value of their assets. Adrian and Shin (2009) show that there is a close link between increasing leverage and the growth of repo transactions.<sup>1</sup> This relationship can also be observed for German credit institutions that are active in the repo market.

Repo transactions reveal the systemic importance of the endogeneity of liquidity risks for the propagation of the financial crisis. Owing to higher haircuts on accepted collateral as a consequence of various financial market shocks, a mechanism evolved which played a key role in terms of the negative feedback between market liquidity and refinancing liquidity.<sup>2</sup> As prices on many markets fell, causing the value of the securities pledged as collateral to drop, investors that were financed through repo transactions received margin calls. Lack of alternative financing then forced many investors to sell positions into the falling market in order to fulfil their obligations (loss spiral). As the crisis progressed, rising haircuts again led to margin calls and thereby exacerbated the loss spiral as asset positions had to be reduced further (haircut spiral). The shocks in the financial markets therefore triggered a self-reinforcing mechanism, which rises in intensity with the leverage that investors were able to impose in their repo operations with banks.

German credit institutions' liabilities from repo transactions with customers and credit institutions fell sharply by over €270 billion by the end of 2008 – from their peak in mid-2007 – which represents a hefty decline of 43%. The group of big banks was hardest hit by the partial drying-up of this secured money market segment with a drop of just under 55%. Volumes have been at a relatively stable low level since the beginning of 2009.<sup>3</sup>

The marked declines in repo operations can be explained by the higher haircuts on accepted collateral or even the exclusion of whole securities categories. Established market practices in the repo markets have had a procyclical effect during the crisis. In addition, the central banks have, since the fourth quarter of 2008, been using repo operations to meet credit institutions' resulting additional liquidity requirements, and thereby had to substitute part of the private repo markets' business volume.

The co-movement of leverage ratios<sup>4</sup> and repo operations has diminished during the current phase of the crisis,



however. In the short-term view, this can be explained by the central bank intervention to secure the banking system's liquidity, which has supported balance sheets. In the longer term, ie after a gradual pullback by the central banks, it is entirely plausible that the correlation between leverage ratios and repo operations will become closer again. If repo activity does not return to the peaks seen in 2007, as market players expect, this will have a moderating influence on the financial system's leverage after the crisis. An example of this are changed market practices in big banks' securities trade with customers. In the past, it was usual practice for brokerage banks to re-use a certain percentage of securities from customers' margin accounts as collateral to raise funds in their own repo operations. Customers are increasingly prohibiting banks from applying this business practice, known as rehypothecation, thereby ending repo operations based on this procedure.

<sup>1</sup> See T Adrian and H S Shin (2009), Liquidity and Leverage, Journal of Financial Intermediation, forthcoming. — <sup>2</sup> See M K Brunnermeier (2009), Deciphering the Liquidity and Credit Crunch 2007-2008, Journal of Economic Perspectives, Vol 23, No 1, pp 77-100. — <sup>3</sup> Studies on the European repo

market show a similar development; see International Capital Market Association, European Repo Market Survey, September 2009. — <sup>4</sup> Leverage ratio is defined here as balance sheet total/equity capital. — <sup>5</sup> For big banks and Landesbanken in the period 2004 to 2009.

been subject to extraordinary changes. Unlike, say, US GAAP, the International Financial Reporting Standards (IFRS) allow the netting of asset and liability items on the balance sheet only to a very limited extent. As a result, the balance sheets of banks that are active in this line of business become considerably bloated, especially in times of violent market movements.<sup>4</sup> Between August 2007 and May 2009, the volume of outstanding ABCP programmes outside German banks' balance sheets fell from US\$74.1 billion to US\$23.2 billion. The two special factors mean that adjustments with regard to balance sheet and leverage ratios in the German banking system are significantly understated in comparison with banks using different accounting standards.

Improved capital adequacy

There has nevertheless been a marked improvement in capital adequacy (see Table 1.3) across all capital components with the exception of tier 2 capital. Assets contributed by silent partners have increased by 67% to around €40 billion since mid-2007. However, this contains roughly €21 billion in government assistance. Without this help, such assets would therefore have shown a decline.

Rise in tier 1 capital ratio, leverage reduced

The average tier 1 capital ratio is 10% and ranges between 5.7% and 15.1%. It is now near the overall capital ratio of 12.9%. This means that the two capital ratios are well above the statutory minimum figures of 4% and 8% respectively. The importance of the overall ratio, however, has diminished, as the banks are now evidently already anticipating narrower definitions of regulatory capital and

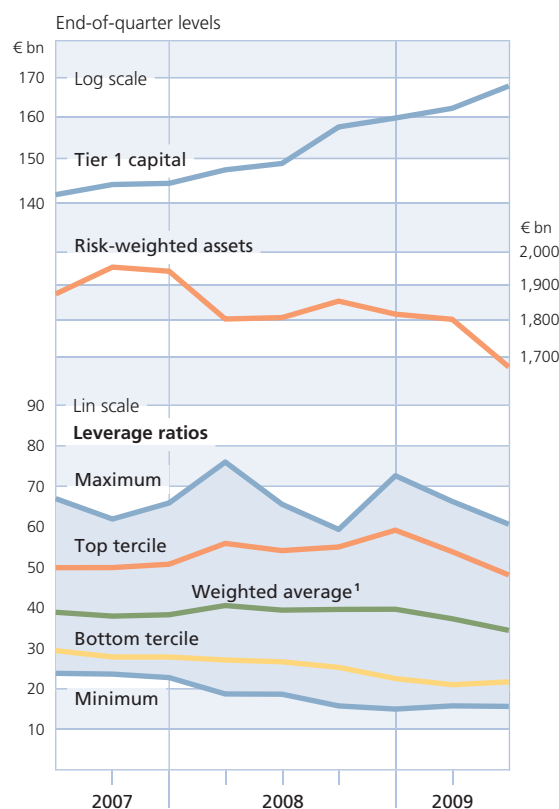
Table 1.3

**COMPOSITION AND QUALITY OF CAPITAL\***

Item	June 2009	June 2007 – June 2009
Capital ratio	12.9%	1.6 pp
Tier 1 capital ratio	10.0%	2.4 pp
Tier 1 capital	€167.8 bn	18.3%
Assets contributed by silent partners	€39.5 bn	67.1%
of which: government aid	€21.2 bn	.
Tier 2 capital	€52.5 bn	– 24.9%
Share of risk-weighted assets in total assets	30.5%	– 1.9 pp

Chart 1.2.2

**CAPITAL RATIOS\***



\* Sample of 14 major German banks with an international focus. — 1 Weighted by the balance sheet total.

DEUTSCHE BUNDESBANK

<sup>4</sup> This is the source of one of the problems that arise in international comparisons of leverage ratios.

Chart 1.2.3

**COMPONENTS OF OPERATING INCOME\***

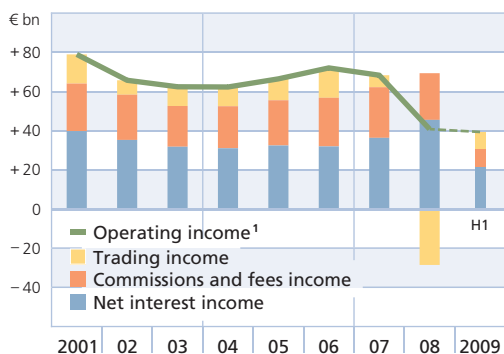
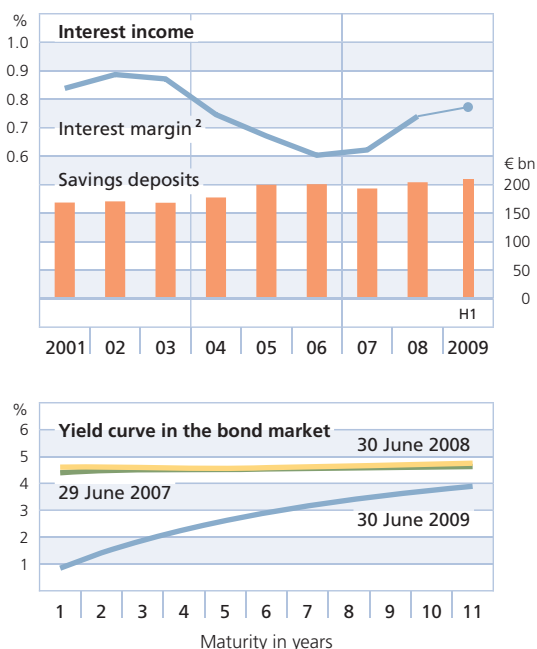


Chart 1.2.4

**INTEREST INCOME AND YIELD CURVE\***



\* Sample of 14 major German banks with an international focus. — 1 Sum of net interest income, commissions and fees income, and trading income. — 2 Net interest income in relation to the balance sheet total.

DEUTSCHE BUNDESBANK

higher capital requirements. The reduction of risk assets and the increase in tier 1 capital elements have both helped to improve the tier 1 capital ratio. As a result, there has been a perceptible fall in the leverage ratio, measured here as the ratio of the balance sheet total to tier 1 capital (see Chart 1.2.2).

**Profitability**

Besides capital adequacy, profitability is essential for the risk-bearing capacity of credit institutions. Following poor results posted by many banks in 2008, the performance of the monitored sample of German banks has shown an improvement over the last few months (see Chart 1.2.3).

Improved profitability

It should be noted in this context that both the year-on-year and half-year results for 2009 have been affected by the extended reclassification options for non-derivative financial assets which were adopted by the International Accounting Standards Board (IASB) and approved by the EU in October 2008. In the wake of the financial crisis, many markets whose efficiency is essential for fair value accounting were considerably dysfunctional, thus removing the basis for fair-value pricing. As a result, valuation was made easier for the financial institutions by allowing them the option of reassigning assets from “held for trading” and “available for sale” to “loans and receivables” or “held to maturity”. This also has implications for profitability and the revaluation reserve. By the first half of 2009, “available for sale” and “held for trading” financial instruments amounting to €250 billion and €59 billion, respectively, had been reclassified. Of these reclassification measures, 95% and 75%, respec-

Reclassification of financial assets

Box 1.3

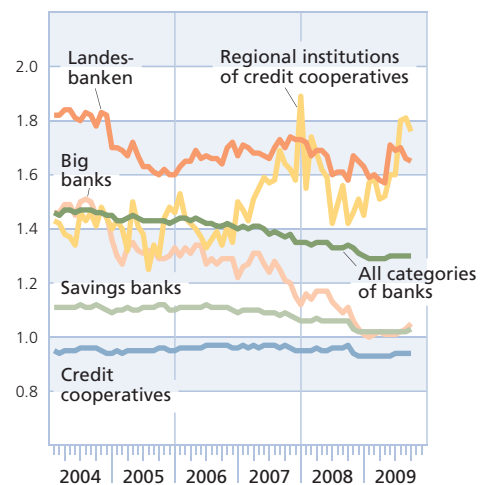
## EVOLUTION OF THE FUNDING GAP IN GERMANY

The term “funding gap” denotes the ratio of non-bank loans to non-bank deposits. A bank or banking system must plug this gap via refinancing in wholesale markets. This can cause problems in times of crisis if the wholesale markets suddenly dry up as a result of massive uncertainty regarding the credit-worthiness of counterparties.

Studies on banks’ funding show that the funding gap increased significantly in many countries prior to the outbreak of the financial crisis.<sup>1</sup> In many cases, banks have increasingly relied on alternative funding sources, in particular they have resorted more to tapping the capital markets. However, the internal transfer prices which liquidity managers set for individual business segments often did not contain adequate premiums for the higher liquidity risk. Reducing this funding gap is imperative. Banks are therefore likely to once again base their refinancing to a greater extent on deposit business with retail customers.

Studies carried out by the ECB and the Bank of England show an increase in big EU banks’ average funding gap up to the second half of 2008. The size of the funding gap of big (universal) banks in Germany (and of the German banking system as a whole) prior to the outbreak of the crisis amounted to 1.4, which was just over 6% lower than the average value for big EU banks. Furthermore, the evolution of the funding gap over time shows that it has been contracting for several years in Germany – from a record high of 1.56 (spring 2001) to approximately 1.3.

The sharp reduction in the funding gap of German big banks and savings banks in the second half of

FUNDING GAP<sup>2</sup>

2007 is due both to a stagnating loan portfolio and an increase in liabilities to non-banks. The escalation of the financial crisis in September 2008 accelerated the reduction in the funding gap. This can be attributed even more so than previously to a rise in liabilities to non-banks, whose demand for (government-guaranteed) bank deposits has grown during the crisis.

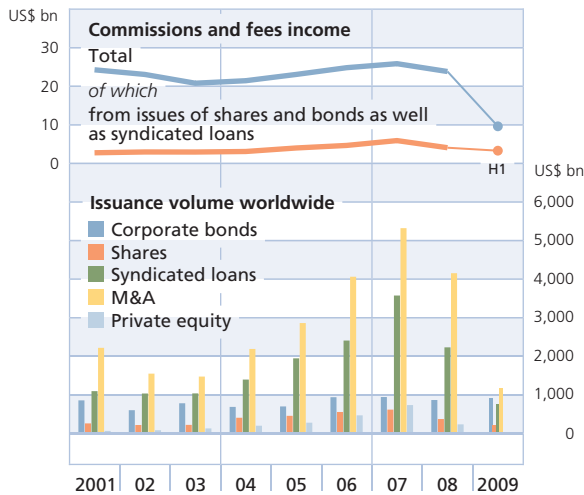
The German banking system thus differs significantly from the average development of EU banks both with regard to its pre-crisis level and the adjustment which is already apparent. In Germany, a heavy reliance on wholesale financing is characteristic less of the banking system as a whole than of individual institutions. Nevertheless, even a pronounced dependence of individual banks on capital market financing can create a systemic problem.

<sup>1</sup> See, for example, ECB, EU Banks’ Funding Structures and Policies, May 2009, and Bank of England, Financial Stability

Report, June 2009. — <sup>2</sup> The term “funding gap” denotes the ratio of non-bank loans to non-bank deposits.

Chart 1.2.5

**COMMISSIONS AND FEES\* AND CAPITAL MARKET ISSUES**



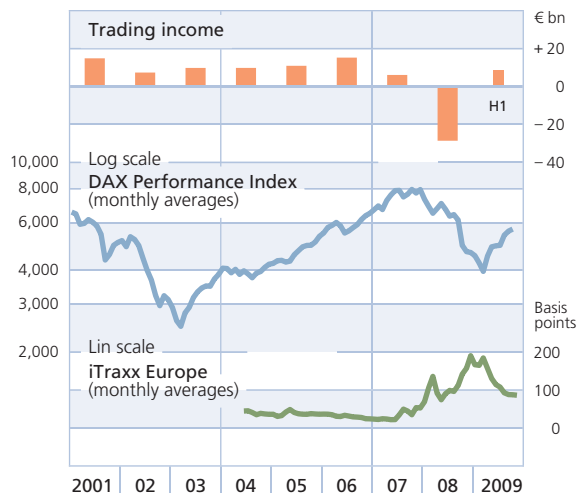
tively, had already been taken at the end of last year. Compared with year-end 2007, “available for sale” assets have shrunk by 48%.

Interest income made a major contribution to profits in the first half of 2009. Banks’ refinancing costs fell as a result of low central bank interest rates, more liquid money markets and growth in savings deposits – in which central government’s guarantee for private savings undoubtedly played a part, too (see also Box 1.3). A significantly steeper yield curve since the fourth quarter of 2008 led to improved earnings possibilities through maturity transformation. Overall, the interest margin for the analysed sample of major German banks with an international focus has increased by nearly 25% compared with the end of 2007 (see Chart 1.2.4).

Conditions favourable for interest income

Chart 1.2.6

**TRADING INCOME\* AND STOCK AND CREDIT MARKETS**



For a few of the monitored German banks, the comparatively high income from commission and fees has recently made a key contribution to consolidated operating profits (see Chart 1.2.5), which were boosted by the large number of capital increases and bond issues in the past half-year. These public offerings were mainly large-volume government issues of bonds to finance the fiscal stimulus packages. In addition, enterprises with very high credit ratings have recently been using the capital markets as an alternative source of financing in the expectation of a more difficult credit environment. In addition, German banks’ investment banking arms have also been benefiting in the past few months from the withdrawal of competitors and the gradual easing in the capital markets.

Comparatively high income from commission and fees

Following large trading losses in 2008, the monitored sample of banks again suffered

Recovery in trading income

Sources: Bloomberg, Dealogic and Bundesbank calculations. — \* Sample of 14 major German banks with an international focus.



marked losses in the first few months of the current year. Nevertheless, these losses were offset as early as mid-year owing to the recovery in the financial markets (see Chart 1.2.6).<sup>5</sup>

Sustainability  
of higher  
profitability  
questionable

Given the described advantageous set of conditions, profitability in the German banking system has generally stabilised. Nevertheless, the situation could deteriorate again for some income components. Interest rate risk has risen as the yield curve has steepened. For commissions and fee income, reduced earnings opportunities must be expected in future in some areas of investment banking. The volumes of investment banks' higher-margin operations, such as mergers and acquisitions, private equity and securitisations, are still well below their pre-crisis levels. Even under continued stable market conditions and given a sustained improvement in the general economic setting, these activities are highly unlikely to regain the importance they had before the crisis, especially as they were undoubtedly, to some extent, also an indication of past excesses. For underwriting business, it remains to be seen whether the current large volumes will persist in the future. The recent stock market recovery will not be able to maintain its current pace, either. Looking at the downswing in 2002-03, which was of shorter duration and considerably less pronounced than now, clearly shows that trading income stabilises very haltingly in times of recession and is very prone to setbacks (see Chart 1.2.6).

Use profitability  
for risk  
provisioning and  
strengthening  
the capital base

Seen in that light, it is important that German banks use the current improvement in profitability for risk provisioning and strengthening their capital base – as has already happened in some cases – in order to be prepared for im-

pending strains, especially from write-downs in the banking book.

## Credit risk

Against the backdrop of the economic crisis, credit risk is of particular importance at present. Among the positive aspects of the debt situation in Germany is that non-financial corporations and households entered the global financial and economic crisis in a relatively favourable position. Furthermore, developments in real estate prices in Germany do not show any signs of a bubble forming, which is limiting credit risk in real estate financing. Problems of credit risk are also being contained by measures to stabilise the economy. In Germany, such measures rest on a comparatively high degree of automatic stabilisation by the social security and tax systems. Developments in the financial situation of households and non-financial corporations have therefore been less dramatic than was feared at the beginning of the year.

Credit risk  
especially  
important

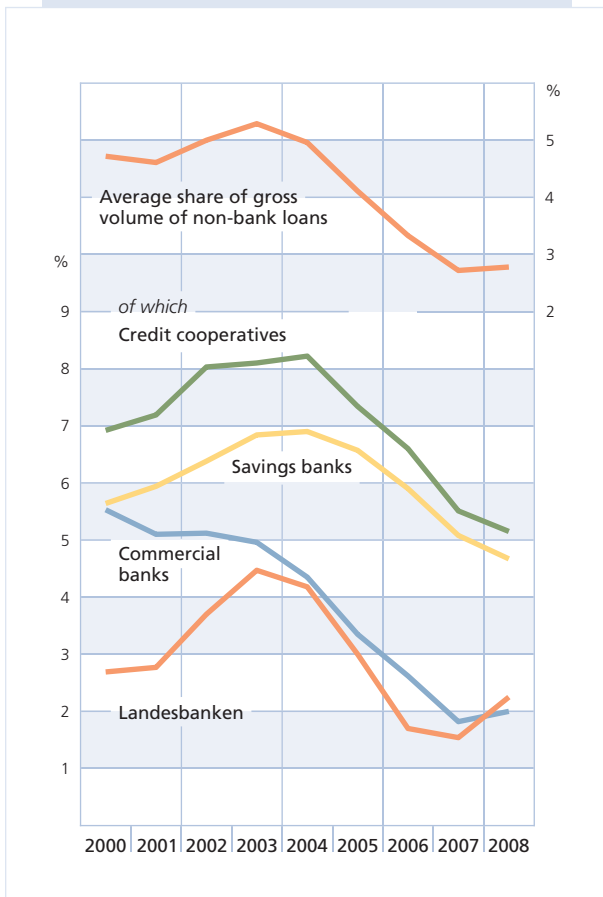
By contrast, the global financial and economic crisis has dragged the German economy deeply into recession owing to the latter's close integration into the world economy. This has placed a strain on the credit quality of German firms, especially those heavily reliant on exports. On the other hand, this also presents an opportunity to take part sooner, and on a

German  
economy  
severely affected  
by global slump

<sup>5</sup> The trading results present a more mixed picture when looking at the data of individual banks, however: while a small number of German banks have steadily built up their trading activities since the stock market low in early March 2009 and have benefited accordingly from the market recovery, other banks have conducted little trading since the start of the year or have even scaled back this line of business, resulting in low or even negative earnings. See also the comments on the change in the stock portfolio on p 35 and Table 1.2 on p 34.

Chart 1.2.7

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



\* Loans with a specific provision requirement as a percentage of the gross volume of non-bank loans.

DEUTSCHE BUNDESBANK

credit cooperatives, which predominantly lend to small and medium-sized enterprises (SMEs) and households, they even showed a further fall last year. By contrast, the portfolio of the Landesbanken reveals a sharp rise in non-performing loans. In the case of commercial banks, which includes big banks, the percentage of non-performing loans was only somewhat higher than in 2007. It should be noted, however, that loan defaults lag the economic and credit cycles. This is also indicated by a comparison with the downturn between 2001 and 2003, when the stock of non-performing loans peaked in 2003. The recent recession is therefore likely to be reflected in the data only in the near future. It remains to be seen whether the high 2003 level will be matched. This will depend crucially on whether the unfavourable scenario of a protracted downturn occurs. At the beginning of the last credit cycle, the level of non-performing loans was much higher than in 2008, however, which means that the current situation is more favourable.

**Increased credit risks in corporate lending**

At the end of September 2009, loans to enterprises accounted for more than 40% of German banks' total domestic lending (excluding government and interbank loans) (see Chart 1.2.8). Owing to the dynamic growth in investment activity during the last upswing, this share is significantly higher than in mid-2005, when the figure was just under 36%.

Increased importance of loans to enterprises

The single-borrower concentration of the ten largest German banks showed a deterioration on the year (see Chart 1.2.9). In 2008, for 25% of the banks, loans to their 50 largest borrow-

Higher concentration risks

larger scale, in a global recovery than other countries.

Cyclical lag of non-performing loans, but favourable starting position

The slump in economic activity is reflected only partly in the annual indicators of non-performing loans in the German banking system. On average, non-performing loans in 2008 were only slightly above their level in 2007, when they had reached a cyclical low (see Chart 1.2.7). Among savings banks and

ers accounted for more than 160% of their regulatory capital for solvency purposes. This corresponds to an increase of 33.5 percentage points compared with 2007. The 75% quantile rose further in the first quarter of 2009. Concentration risks have therefore increased for some big banks. This clearly indicates that the risks of a rating migration have increased.

Favourable starting position for firms

The crisis has not yet been reflected fully in the indicators of non-financial corporations' financial position. The reason for this is that corporate balance sheets were decidedly positive up to mid-2008. To that extent, the currently available data reflect their favourable starting position at the beginning of the recession but not developments since the turning point in the autumn of 2008 that was marked by the collapse of the US investment bank Lehman Brothers. Corporate debt rose in 2008 overall owing to the fact that investment was still strong (see Chart 1.2.10). It stood at 161% of gross value added, which means that it was still lower than at the last cyclical peak (166%). By contrast, the net interest burden as a percentage of the operating surplus remained more or less unchanged at 5.6%.

SMEs also affected by crisis

The financial and economic crisis is now also affecting many SMEs in Germany.<sup>6</sup> In the years before the crisis, however, SMEs were highly successful in using the positive business conditions to strengthen their financial resilience through cash flows from operations. With this solid basis to work from, they are better prepared to cope with the effects of the recession than they were during earlier downturns.

<sup>6</sup> Small and medium-sized industrial firms, in particular, recorded a slump in orders and sales during this crisis. See also KfW, Mittelstandsmonitor 2009, March 2009.

Chart 1.2.8

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

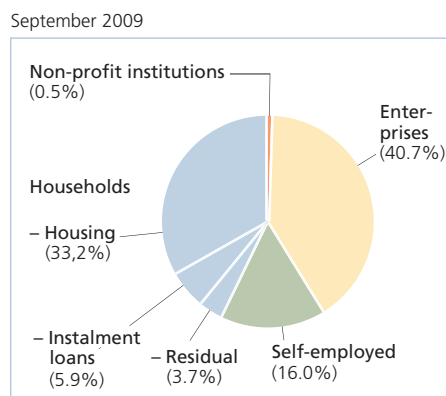
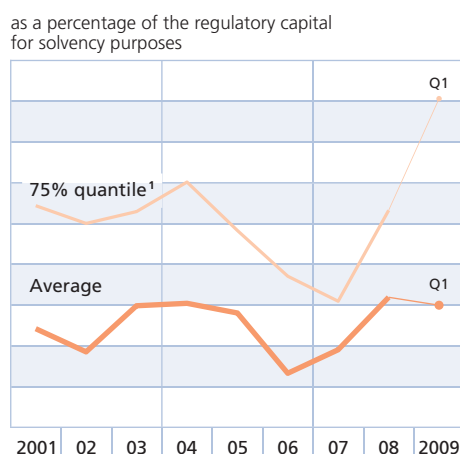


Chart 1.2.9

**LOANS BY THE TEN LARGEST GERMAN BANKS TO THEIR RESPECTIVE 50 LARGEST BORROWERS\*\***



\* 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 provisions and excluding collateral and other credit risk mitigation techniques. — 1 Threshold which 75% of the banks do not overshoot.

Chart 1.2.10

**FINANCIAL INDICATORS OF GERMAN ENTERPRISES**

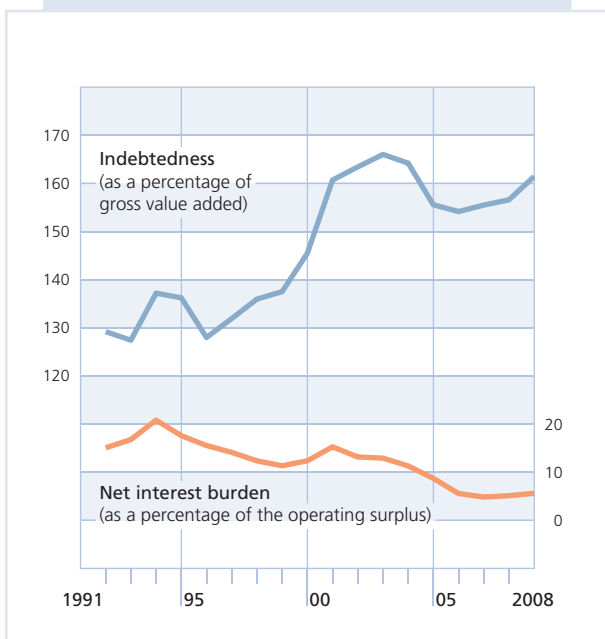
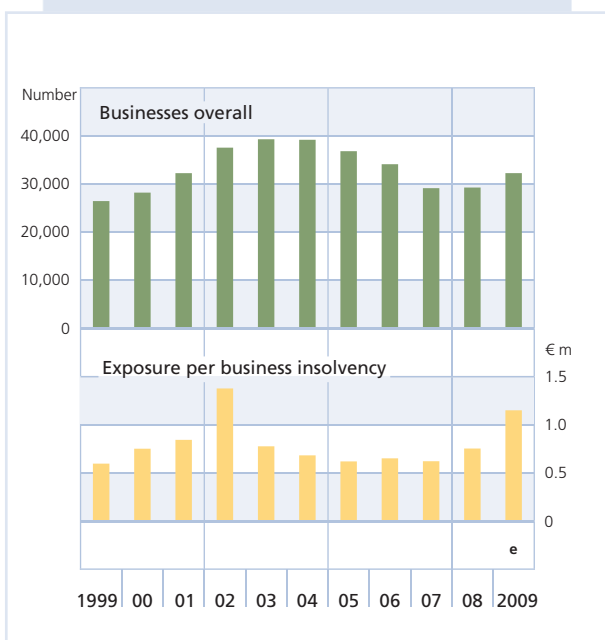


Chart 1.2.11

**BUSINESS INSOLVENCIES**



Source: Federal Statistical Office and Bundesbank calculations.

DEUTSCHE BUNDESBANK

Moreover, this strengthens their credit quality and, therefore, their access to external sources of funding, such as bank loans and borrower's notes. In the 2005-07 period, the share of own funds in the balance sheet total rose from just under 15% to more than 18%. In the case of non-corporations among the SMEs, it rose by 4 percentage points to roughly 12%, and in the case of incorporated enterprises it went up by 2.5 percentage points to more than 25%. In the period before the crisis, this reduced the disparity vis-à-vis large enterprises by 4 percentage points. Reflecting this improvement in SMEs' capital adequacy, their debt to banks fell by a further 3.5 percentage points to 26% of the balance sheet total.

Nevertheless, the financial and economic crisis has already left a clear mark on business insolvencies. Since the start of the year, insolvencies have increased noticeably, rising by 14.8% on the year in the first six months of 2009 (see Chart 1.2.11).<sup>7</sup> The average default loss was €1.15 million compared with €750,000 in 2008.

Other indicators of lending to enterprises, such as the Bank Lending Survey, show that banks perceive risk to have increased since the outbreak of the financial and economic crisis (see Chart 1.2.12). This applies to general economic risks as well as industry-specific and firm-specific risks. It is striking that risk assessments have been revised upwards more sharply for large enterprises than for SMEs. One reason for this could be that large enterprises have

Recent rise in business insolvencies

Perception of greater risk

<sup>7</sup> The year-on-year comparison is based on data from 15 federal states since, in the first quarter of 2008, insolvencies for 2007 were reported late by one large federal state. The inclusion of this state would understate the actual increase.

been drawn into the maelstrom of the recession more strongly than SMEs. It may also be the case that the surveyed banks doubt whether new or follow-up financing for syndicated loans to large enterprises will still be available against the backdrop of the financial crisis, and this is directly impairing large enterprises' credit quality.

### Steady development in real estate markets overall

Recession-induced turnaround in commercial real estate

The German real estate market still appears to be free of price exaggerations (see Chart 1.2.14). The credit risks in German commercial real estate and residential housing may therefore be assessed as commensurately low, even given a recession-induced turnaround in commercial real estate. While vacant properties were on a clear decline in the boom period of 2006-08 and peak rents were trending upwards, the first half of 2009 saw an increase in vacant properties. There was a concurrent decline in peak rents.

Stagnating house prices

According to the Bundesbank's figures, house prices stagnated in 2008 in year-on-year terms. Prices for newly constructed housing went up slightly. The number of foreclosure sales in 2008 fell by 3.7% on the year. The market value of housing sold in foreclosure sales was barely 7% lower than in 2007. The housing market in Germany is therefore decidedly stable.

### Households' credit risks still moderate

Further decline in debt

At just under 43%, loans to households account for the largest share of domestic lending

Chart 1.2.12

### PERCEPTION OF RISK\* FOR LOANS TO ENTERPRISES

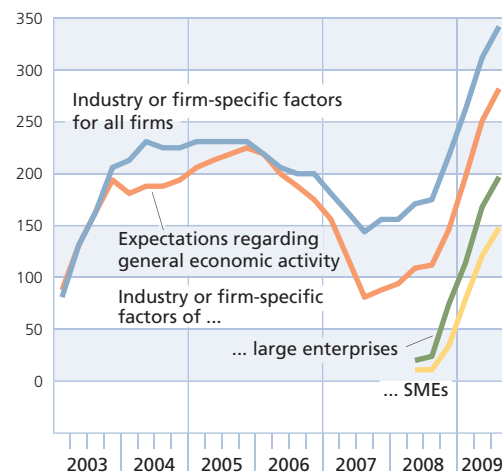
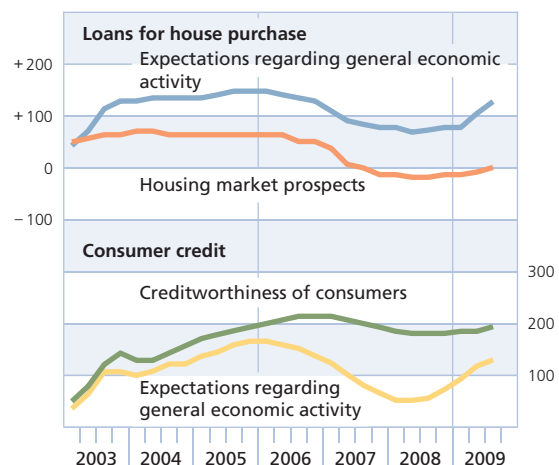


Chart 1.2.13

### PERCEPTION OF RISK\* FOR LOANS TO HOUSEHOLDS

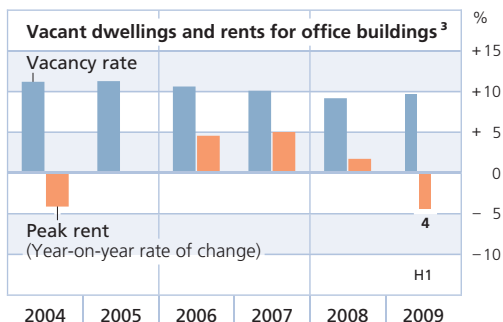
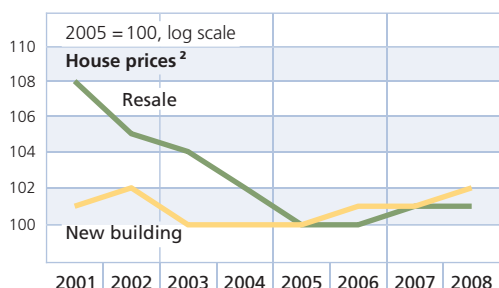
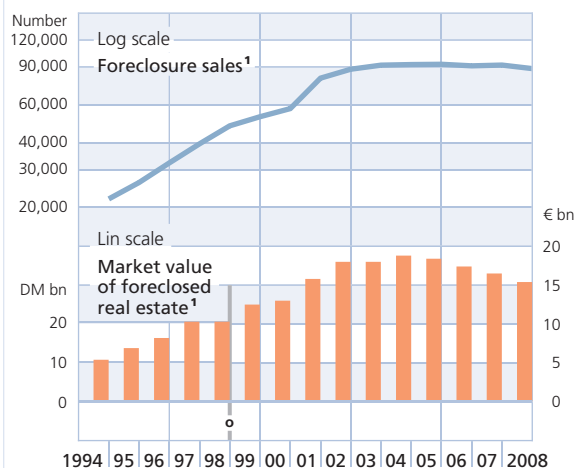


Source: Deutsche Bundesbank Bank Lending Survey. — \* Cumulative balances of the sum of the responses "tightened considerably" and "tightened somewhat" and the sum of the responses "eased somewhat" and "eased considerably" to the question "Over the past three months, how have the following factors affected your bank's credit standards?"

DEUTSCHE BUNDESBANK

Chart 1.2.14

**REAL ESTATE MARKET IN GERMANY**



**1** Source: Argetra GmbH, Ratingen. — **2** Source: Bundesbank calculations based on BulwienGesa AG data for owner-occupied apartments and terraced houses. — **3** Weighted office area average in Berlin, Düsseldorf, Frankfurt am Main, Hamburg, Munich, Wiesbaden. Source: Jones LangLasalle and Bundesbank calculations. — **4** First half of 2009 compared with 2008 as a whole. — **o** From 1999, figures in euro.

DEUTSCHE BUNDESBANK

(excluding loans to government and interbank loans). Of this figure, 33% is for housing construction. The rate fixation period for such loans is predominantly longer-term. Household debt has continued to decline and now stands at 98% of disposable income (see Chart 1.2.15). The interest payment burden remained virtually unchanged at 4.4%.

Households' financial assets as a percentage of their disposable income have shown a sharp fall in 2008, from 198% to just under 185%. This was due mainly to the sharp decline in equity prices. The loss in financial assets was, in fact, greater than that after the New Economy bubble burst at the beginning of the decade. A comparison of the levels shows, however, that households are now in a better position than they were then. Furthermore, a positive factor is that asset prices in the field of securities have been trending upwards since the second quarter of 2009.

Fall in households' financial assets

In 2008, there was a year-on-year fall in consumer insolvencies for the first time since the introduction of the consumer insolvency procedure in 1999 (see Chart 1.2.16). This could have something to do with a reduction of an overhang that accompanied the introduction of the consumer insolvency procedure. In the first half of 2009, consumer insolvencies were 0.4% down on the same period of 2008.

First-ever fall in consumer insolvencies

One of the questions asked in the Bank Lending Survey is how far banks' credit standards are affected by the perception of risk relating to expectations regarding general economic activity and housing market prospects. As might be expected, general economic risks have been contributing to a tightening of credit

Hardly any increase in perception of risk specific to housing market

standards since mid-2008 (see Chart 1.2.13). By contrast, there has been hardly any increase in the contribution to a tightening of credit standards made specifically by the outlook in the housing markets. This is consistent with the calm housing market situation mentioned above.

Creditworthiness for consumer loans virtually unchanged in the crisis

In the case of consumer credit, the perception of households' creditworthiness remained virtually unchanged despite the increase in risks regarding general economic activity. It has been noticeable in this context that the labour market has so far proved to be quite robust in the face of the sharp downturn, not least owing to the extension of the period for which short-time working benefits are paid. This has allowed households' financial situation and, hence, also their creditworthiness to stabilise.

Chart 1.2.15

**HOUSEHOLDS' FINANCIAL ASSETS AND INDEBTEDNESS**

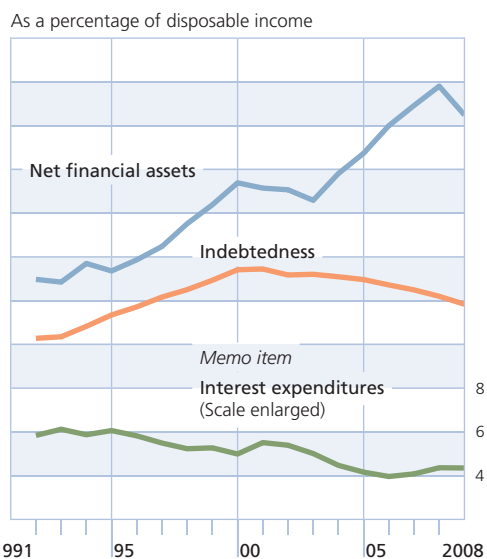
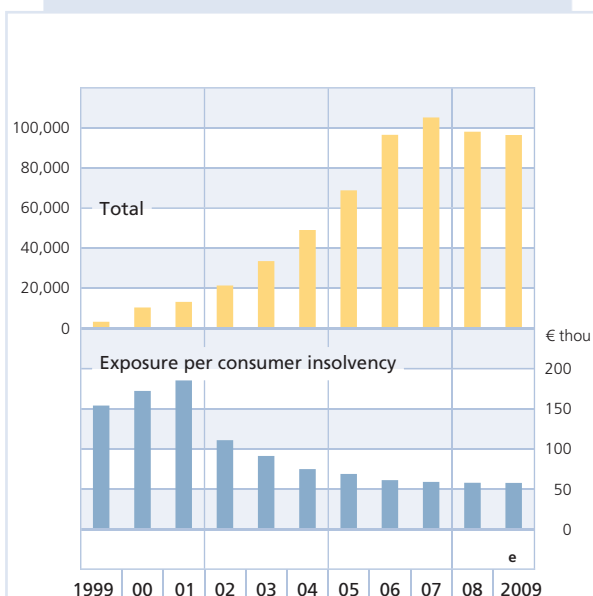


Chart 1.2.16

**CONSUMER INSOLVENCIES\***



Central banks' response to wholesale funding problems

**Country risks limited – exposure reduced**  
 German banks are major lenders to developing countries and emerging market economies. Some of the central and east European reform countries were hit very hard by the financial and economic crisis. Their default and refinancing risks are comparatively high. Looking at German banks' exposure to these countries is therefore relevant.

Lower exposure to central and east European countries

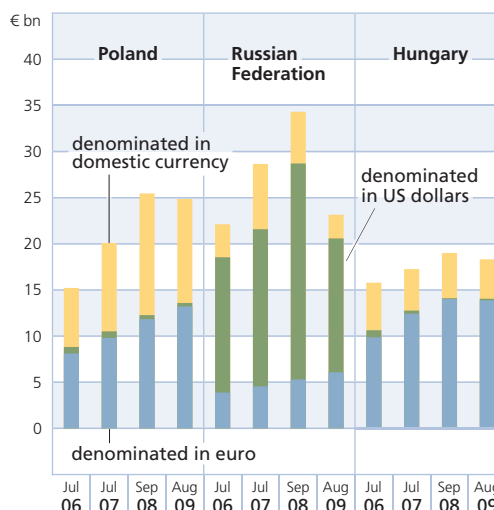
In August 2009, German banks' total exposure to these countries amounted to €129 billion, or 5.3% of the total exposure of all banks (see Table 1.4). Poland, the Russian Federation, Hungary and Croatia account for a considerable part of this. However, exposure to east European countries has declined by 10% compared with September 2008, the month of the

\* Source: Federal Statistical Office and Bundesbank calculations.

Lehman Brothers insolvency. Overall, the big banks and Landesbanken – the key lenders in this segment – reduced their exposure from 1.2 times their aggregate balance sheet capital to a figure slightly below it. The balance sheet data relating to selected central and east European reform countries (see Chart 1.2.17) show that German banks have reduced their exposure, especially to the Russian Federation, on a large scale of more than €11 billion (over 32%) since September of last year.<sup>8</sup> This mainly affected foreign assets denominated in US dollars, which fell by the equivalent of €8.9 billion, or just under 38%.<sup>9</sup> Assets denominated in domestic currency fell to €3.0 billion. By contrast, euro-denominated loans increased by nearly €800 million.

Chart 1.2.17

**GERMAN BANKS' EXPOSURES TO SELECTED COUNTRIES**



DEUTSCHE BUNDESBANK

Table 1.4

**GERMAN BANKS' EXPOSURE TO SELECTED CENTRAL AND EAST EUROPEAN COUNTRIES\***

Country	Sep 2008		Aug 2009	
	€ bn	% <sup>1</sup>	€ bn	% <sup>1</sup>
Poland	37.2	31.7	38.2	28.3
Russian Federation	34.5	29.4	23.3	17.3
Hungary	24.5	20.9	22.8	16.9
Croatia	12.1	10.3	11.9	8.9
Slovenia	9.7	8.2	8.7	6.5
Czech Republic	8.5	7.3	8.2	6.1
Latvia	3.5	3.0	2.7	2.0
Ukraine	3.3	2.8	3.1	2.3
Romania	2.9	2.5	2.9	2.1
Slovakia	2.7	2.3	2.6	2.0
Lithuania	2.4	2.1	2.2	1.7
Bulgaria	2.0	1.7	1.7	1.3
Estonia	0.7	0.6	0.7	0.5
<b>Total</b>	<b>144.0</b>	<b>122.8</b>	<b>129.2</b>	<b>95.9</b>

\* Including foreign branches and subsidiaries. — <sup>1</sup> Percentage share of the aggregate capital of big banks and Landesbanken.

DEUTSCHE BUNDESBANK

The smaller exposure to foreign banks and non-banks may have been due in part to a temporary wholesale funding problems in US dollars, which contributed to a balance sheet contraction through foreign assets. The central banks used forex swap lines to counter the reduced liquidity in the swap markets and the resultant wholesale funding risks in foreign currency for European banks. These lines were set up by the Federal Reserve with all the other major central banks in order to service non-US banks' demand for US dollars.<sup>10</sup>

Problems in wholesale funding in US dollars affecting exposure

<sup>8</sup> The relatively large percentage of German banks' foreign assets denominated in US dollars is due to the dollar's importance as an invoicing currency in the oil trade.

<sup>9</sup> The US dollar-denominated share was likewise 38%.

<sup>10</sup> See also the article "Interaction between the Eurosystem's non-standard monetary policy measures and activity in the interbank money market during the crisis" on page 87.



Limited vulnerability of German banks

German banks' vulnerability to this country risk exposure to developing countries and emerging economies is limited *per se*. Exposure to the central and east European reform countries amounts to no more than about 4% of the aggregate portfolio of the big banks and Landesbanken. As an additional contributory factor in a setting where greater loan loss provisioning is to be expected on the domestic side, however, major defaults arising from lending to foreign borrowers might still place a strain on the stability of the financial institutions concerned and thus impair financial stability as a whole.

### Market risk

Sharp expansion in market risks

Market risks expanded sharply as a consequence, in particular, of the exceptional rise in market volatility on the heels of the financial crisis. German banks thus have to maintain considerably more capital against unexpected losses resulting from market developments than they did before the financial crisis. Many banks' share price risks have slightly fallen recently. By contrast, interest rate risks are once again a major factor, especially for smaller banks. The sharp drop in diversification effects among banks active on the markets caused systemic risk to build up, principally during periods of market turbulence.

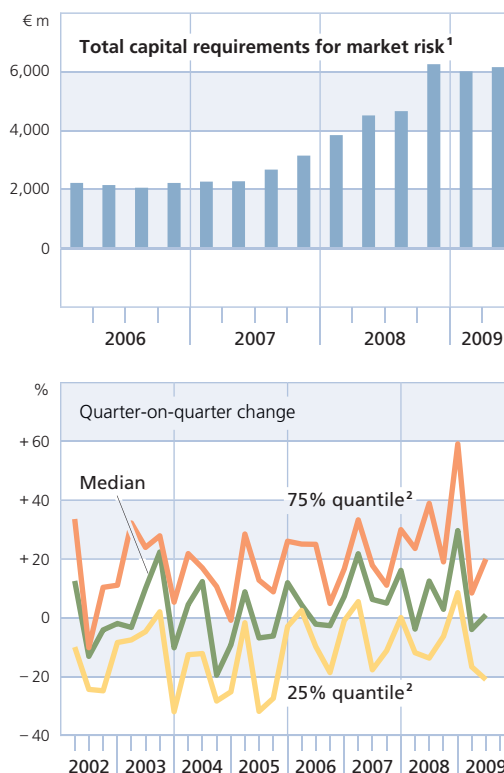
### Market risk in the trading book much higher

Volatility surges caused capital requirements to rise particularly for banks active in markets

The regulatory risk buffers held by banks active in the markets for market risks in their trading books were, in the past, relatively low, especially relative to the amount of capital neces-

Chart 1.2.18

### MARKET RISKS IN THE TRADING PORTFOLIOS



<sup>1</sup> Pursuant to Principle I/Solvency Regulation for banks with their own market risk model. — <sup>2</sup> Value undershot by 75% (25%) of institutions.

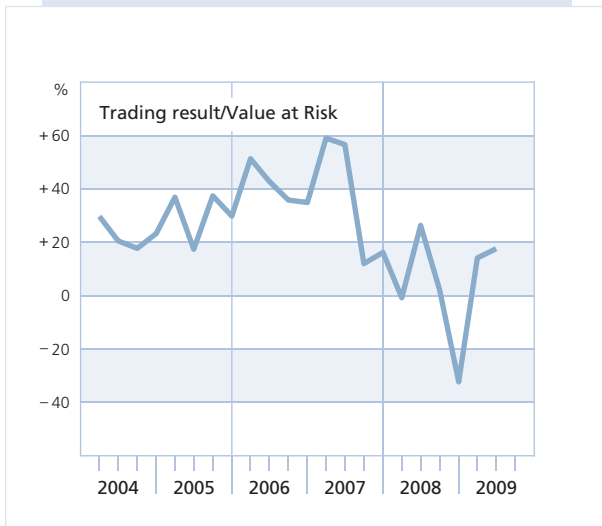
DEUTSCHE BUNDESBANK

sary to cover credit risk.<sup>11</sup> As the financial crisis unfolded, banks had to very substantially increase their required volume of own funds. On an average across all German banks using their own market risk models, the relevant capital

<sup>11</sup> In July 2009, the Basel Committee on Banking Supervision adopted changes to the rules for market risk in the trading book. The new rules include extended capital requirements for risk factors that had previously not been included (eg default risk, event risk and migration risk). Institutions have until the end of 2010 to implement the new rules.

Chart 1.2.19

**RISK-ADJUSTED TRADING RESULTS\***



\* Prudential information pursuant to Princi I/Solvency Regulation obtained from backtesting of the market risk models developed by the following banks: Commerzbank, Deutsche Bank, Dresdner Bank, DZ Bank, HVB and WestLB. Unweighted quarterly averages.

DEUTSCHE BUNDESBANK

requirements increased by around 170% between June 2007 and June 2009 (see Chart 1.2.18). In the fourth quarter of 2008 alone, quarter-on-quarter growth in banks' individual capital requirements reached a median value of just under 30%.

Risk reduction by curtailing proprietary trading identifiable only in some areas

The drivers of this development were surges of volatility in all asset classes, growing correlation between asset classes and an expansion of basis risk. During the financial crisis, banks' internal diversification effects between the various risk categories decreased. All in all, this substantial increase in market risk has made itself felt – with a certain time-lag – in a rise in the capital requirements based on value at risk (VaR). Nevertheless, some banks are exercising a mitigating influence on the overall evolution

of market risk by being active in redimensioning proprietary trading segments that are especially risky; in the area of non-customer-driven trade with credit risk products, risk mitigation has been initiated.

A further relevant factor is that, for some banks, explicit prudential supervisory add-ons to capital requirements took effect. Since, in many cases, the market turmoil showed the limits of market risk models' forecasting accuracy, a relatively high number of overshootings occurred.<sup>12</sup> The shortcomings of VaR-based market risk models are revealed most plainly by the fact that, in periods of calm on the markets, they encourage banks to take additional risks. In periods of crisis, however, they are highly error prone. In addition, if banks react collectively to changes in VaR-assisted risk assessments, they amplify the crisis.<sup>13</sup> The VaR modelling of market risk thus vividly illustrates the systemic dimension or, more precisely, the endogeneity of systemic risk. The Basel Committee on Banking Supervision addressed this issue in July 2009 by modifying the provisions governing the regulatory treatment of market risk in the trading book. In future, VaR additionally has to be calculated under stress. This leads to a capital add-on which is likely to fluctuate less strongly than when using the old procedure (see also pages 74-75).<sup>14</sup>

Market risk models at times inadequate

<sup>12</sup> Pursuant to section 318 of the Solvency Regulation (Solvabilitätsverordnung), an overshooting has occurred if the (hypothetical) loss on a one-day constant trading portfolio exceeds the VaR calculated one day earlier. At a prescribed 99% confidence level, an average of 2.5 overshootings may be expected within one year (250 trading days). Supervisory add-ons can be imposed if a bank has recorded more than four overshootings during this period.

<sup>13</sup> See also International Monetary Fund, Global Financial Stability Report, Do Market Risk Management Techniques Amplify Systemic Risks?, October 2007.

<sup>14</sup> This is intended to reduce the procyclicality of regulatory capital requirements. See Basel Committee on Banking Supervision, Revisions to the Basel II market risk framework, July 2009.

Not only market effects and portfolio shifts by banks but also prudential measures determine the increase in own funds requirements. The slight easing of pressure in the financial markets in the second quarter of 2009 led to a noticeable improvement again in the forecast accuracy of the market risk models.

Risk-adjusted returns in proprietary trading at multi-year lows

Even so, market risks remain high. This is also evidenced by an analysis of risk-adjusted returns in proprietary trading. Even though trading results in the first half of 2009 had returned, in absolute terms, to levels similar to those in the pre-crisis years, the risk-adjusted returns are at multi-year lows (see Chart 1.2.19). The tripling of the average risk-adjusted return between 2005 and 2007, moreover, shows particularly clearly that risks were being underestimated in the run-up to the crisis.

**Market risk stress tests show increase in interest rate risk and decrease in share price risk**

Market risk stress tests estimate ability to bear market value losses following financial market shocks

In the Bundesbank’s market risk stress tests, selected banks are annually prescribed extreme but not implausible risk scenarios for changes in interest rates, stock prices, risk premiums in the credit and bond markets, exchange rates and volatilities.<sup>15</sup> In order to assess the capacity to bear the resulting losses in market value of all balance-sheet and off-balance-sheet positions, liable capital at the time of the shock is used as the reference variable.

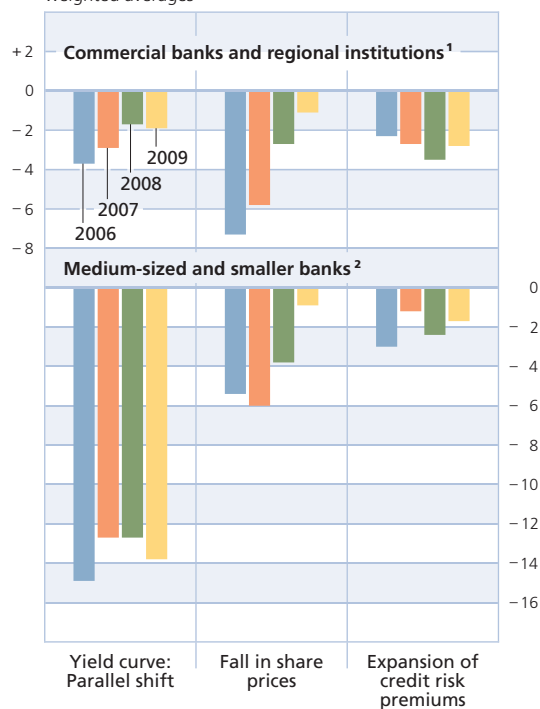
Interest rate risk up, particularly among smaller banks

The interest rate risk of medium-sized and smaller banks is traditionally the most important type of market risk owing to their business model, which is based heavily on deposit and

Chart 1.2.20

**CHANGES IN MARKET VALUES UNDER SELECTED SCENARIOS\* IN MARKET RISK STRESS TESTS**

As a percentage of liable capital, weighted averages



\* Each occurring intra-day; 31 March 2009, 31 March 2008, 31 May 2007, 31 March 2006. For a description of the risk scenarios, see Deutsche Bundesbank Financial Stability Review 2007, "Stress tests: methods and areas of application, pp 97 ff. — 1 15 institutions. — 2 Nine institutions.

DEUTSCHE BUNDESBANK

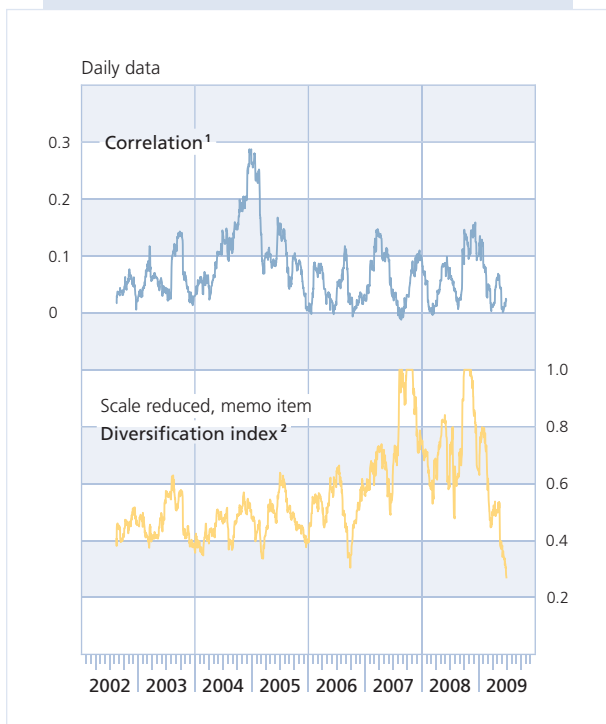
lending business. Unlike in the preceding two years, the interest rate risks among this group

<sup>15</sup> The Bundesbank is currently analysing 24 large and medium-sized institutions from the following categories of banks: commercial banks, Landesbanken, savings bank, Sparda banks and regional institutions of credit cooperatives. The banks were surveyed as at 31 March 2009.

<sup>16</sup> The Basel coefficient is a measure of interest rate risk in the banking book. It is calculated as the present-value loss in the banking book resulting from a standardised interest rate shock of (at present) 130 basis points upward (or 190 basis points downward), and all banks are regularly requested to provide information on this variable.

Chart 1.2.21

**RELATIONSHIPS BETWEEN THE TRADING RESULTS OF GERMAN BANKS\***



\* Each based on daily data from ten institutions that use their own market risk model. — **1** Calculated as an unweighted mean of the pairwise correlations of the daily returns from proprietary trading over a moving 50-day window. — **2** Indicator of the degree of diversification of market risk within the German banking system. The theoretical maximum value of the indicator is one. A value of one denotes the absence of diversification; a value of zero denotes complete diversification.

DEUTSCHE BUNDESBANK

of banks has increased perceptibly. In the extreme scenario of an upward parallel shift of the yield curve by 150 basis points at the end of March 2009, this group of banks suffered an average loss of just under 14% of its liable capital (see Chart 1.2.20). This development is affected mainly by the fact that maturity transformation is currently more profitable and is thus being used as a key source of income. Owing to the increasingly steeper yield curve,

banks are also assuming greater interest rate risk from maturity differentials between assets and liabilities. Since the yield curve has become around 50 basis points steeper since the survey date (end-March 2009), interest rate risk is likely to have risen further of late. This is confirmed by information provided by numerous smaller banks on their Basel coefficients.<sup>16</sup>

The effects of interest rate shocks on commercial banks and regional institutions of the savings bank and cooperative banking sectors are, by contrast, much less severe and have remained virtually unchanged on the year. A parallel shift in the yield curve of 150 basis points led, in past surveys, to a reduction in this group's liable capital of just under 2% on average.

Interest rate risk of commercial banks and regional institutions virtually unchanged

For most of the banks in the survey, share price risks were down considerably on the year. In the scenario of a global collapse in share prices of 30%, commercial banks and regional institutions are currently only expecting a 1.2% loss in the market value of liable capital, compared with 5.8% in 2007. One reason for this reduced loss lies in the smaller basis, because equity investments that remained on the books during the crisis are now valued lower. Another is that many banks have also actively reduced their equity positions.

Share price risks down

A sharp expansion of risk premiums in the credit and bond markets has had widely varying effects on the surveyed banks. Whereas

Risks from expansion of risk premiums in credit markets distributed heterogeneously

<sup>17</sup> The influence of similar risk management systems on market volatility is not a subject of analysis in this article.

<sup>18</sup> See C Memmel and C S Wehn (2006), 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, Vol 7, No 3-4, pp 310-325.

potential losses amounted in total to less than 3%, some banks' loss risk was up to three times that level. Exchange rate risk and volatility risk – expressed here as a 15% appreciation or depreciation of the euro against all other currencies and a 50% increase in the volatility of interest rates, stock prices and exchange rates – are still to be regarded as low, as in the past few years.

### Systemic risk more broadly diversified

Moderate increase in correlations of trading results in wake of tension

The correlation of the trading results of institutions using their own market risk models increased in the wake of the tension in the fourth quarters of 2007 and 2008.<sup>17</sup> Given the available data (since 2001), this development is relatively moderate, as the indicator value is within the usual corridor of the past years (see Chart 1.2.21).

System-wide risk diversification ground to a halt in periods of crisis

Conversely, the banking sector's aggregated market risk position indicates an intermittently strong decline in system-wide portfolio diversification. The diversification index used for this assessment shows that, in the past, a considerable diversification effect existed during normal market phases.<sup>18</sup> In situations of extreme market volatility, such as the fourth quarters of 2007 and 2008, however, these diversification effects vanished altogether. This is precisely the phenomenon of systemic risk (for more on this, see also Box 1.4). The consequent system-wide market risk of German banks active in the market was thus disproportionately higher during these periods. The normalisation of market conditions and the withdrawal of some banks from similarly constructed trading strate-

gies led in the first half of 2009 to a renewed broader diversification of risks.

### Liquidity risk

The liquidity situation of the German banking system is currently less tense than at the end of last year. This is evidenced by the data on the liquidity situation collected weekly from a number of banks, above and beyond the prudential supervisory reports filed pursuant to the Liquidity Regulation. According to these reports, the majority of reporting institutions have seen a significant improvement in their liquidity situation compared with the past year.<sup>19</sup> On aggregate across all participating institutions, liquidity reserves have risen by around 30% since December of last year, both according to a uniform supervisory definition<sup>20</sup> as well as in terms of net liquidity positions.<sup>21</sup>

Improved liquidity situation

However, this also reflects the still prevalent precautionary holding of cash balances by financial institutions which are making use of the temporary ample provision of liquidity by the ECB. In addition, individual institutions made productive use of the guarantees on debt securities issued by SoFFin in their refinancing policy.

Precautionary holding of cash balances ...

A sign that the interbank markets are gradually easing is that individual institutions have re-

... on a trend decline

<sup>19</sup> Reported data from early November 2009 compared with the previous year's data (owing to a changeover in the reporting format, this corresponds to early December 2008; using earlier points in time would render the comparison inconsistent).

<sup>20</sup> Cash, central bank balances (excluding minimum reserves) and free (ie not yet pledged) eligible securities (excluding the funds which are needed for payment settlement/Clearstream or otherwise tied up).

<sup>21</sup> Corresponds to the balance of inflows and outflows of liquidity as well as the liquidity reserve.

Box 1.4

## APPROACHES TO MEASURING BANKS' SYSTEMIC RISK

Contagion effects account for a significant percentage of systemic risks in the financial sector. This is due mainly to the strong linkages between financial intermediaries and to high information intensity in the financial markets. The common maturity mismatches between credit institutions' lending and deposit business also contribute to systemic risk. Problem segments can infect the whole financial sector via different transmission channels.<sup>1</sup>

Direct contagion effects arise as a result of contractual relationships with insolvent financial institutions. They lead to write-offs on loans to an insolvent bank or the loss of insurance protection from credit default swaps.

Fire sales lead to falling asset prices, which then cause contagion effects. The price collapse is disproportionate to the fundamental value, particularly among illiquid securities. As in the current crisis, this can lead to major mark-to-market write-downs.

Information-based contagion effects lead to a withdrawal of deposits if investors assume that certain banks have invested in similar assets to those invested in by the distressed institutions. Such a withdrawal can also be triggered by conjecture that institutions have lending relationships with the parts of the financial system that are fraught with problems.

This box outlines some new quantitative approaches to measuring the degree of integration within a financial system and the resulting contagion risks. In-

terdependencies and correlations are the key features of these new models and indicators. The models fall into two different categories.<sup>2</sup>

- Network models that simulate direct contagion effects resulting from contractual relationships. Most of these models are focused primarily on the interbank market.
- Statistical models that use correlations of banks' market indicators to calculate conditional or common probability distributions for stress events (losses or total default).

The first step in developing network models for the interbank market is to outline its specific network structure as comprehensively as possible using a matrix of bilateral interbank linkages.<sup>3</sup> Ideally, micro data from central credit registers are used for this purpose;<sup>4</sup> missing information must be drawn from other data sources.<sup>5</sup> A sequential algorithm simulates the contagion mechanism in the event of credit defaults, thus determining the contagious defaults in the network.<sup>6</sup> This depiction of default chains constitutes a key methodological advantage over other contagion models, which cannot capture second-round effects. However, the fact that the transmission mechanisms depend heavily on assumptions regarding the size of the losses in the event of a default limits the usefulness of this approach. As there is generally no available information regarding the value of the assets or hedges, it is necessary to rely on estimates which are mostly imprecise. Moreover, many models are rather me-

<sup>1</sup> See M Hellwig, Systemic Risk in the Financial Sector: An Analysis of the Subprime-Mortgage Financial Crisis, preprints of the Max Planck Institute for Research on Collective Goods, No 2008/43. — <sup>2</sup> For a detailed overview of models of systemic risk, see IMF, Global Financial Stability Report, Responding to the Financial Crisis and Measuring Systemic Risks, April 2009. — <sup>3</sup> For a detailed overview of network models, see C Upper (2007), Using counterfactual simulations to assess

the danger of contagion in interbank markets, BIS Working Paper No 234. — <sup>4</sup> However, there are often certain reporting thresholds. Credit lines or off-balance-sheet transactions are not fully recorded. Data on foreign banks' exposures to domestic banks are almost always incomplete. — <sup>5</sup> If individual data on loans are not available, the balance sheet total of all exposures to banks is often distributed evenly across the banking system or categories of banks. — <sup>6</sup> For a suggestion on

chanical in the sense that they do not take account of any adjustment strategies, such as a reduction of credit lines.

Unlike network models, statistical models primarily use market data to measure potential contagion effects in the banking system. The advantage of this is that the information becomes available very quickly. In addition, these models can take account of transmission channels that do not function solely via lending relationships. Conversely, however, this means that no distinction can be made between the different transmission channels and that second-round effects are difficult to capture.

In recent years, two sub-categories of statistical model have emerged. One derives measures of contagion risk from conditional probabilities of default. The first step is to use financial mathematics to derive the usual (unconditional) probabilities of default from observed market data, such as credit default swap premiums, stock price returns and options prices. Then, the expected probabilities of default are made conditional on the occurrence of an external risk event. This would typically be the default, or a high realised probability of default, of a systemically relevant institution.<sup>7</sup> This requires advanced statistical methods such as quantile regression or extreme value theory. A more recent development in such approaches is to relate the conditional probabilities to the underlying distribution of the market value of banks' assets and to define a "stress event" as reaching a certain value at risk.<sup>8</sup>

To date, these approaches have not taken account of the fact that clusters of banks can also pose a contagion risk. A second type of model therefore attempts to estimate the multivariate distribution of individual probabilities of default for the banking system as a whole. As knowledge of the distribution provides the full picture regarding (direct) contagion risks, this kind of approach theoretically has a number of advantages. However, given the number of degrees of freedom that such approaches allow, they require data of a very high quality and quantity. In practice, as these conditions often go unmet, assumptions of varying degrees of restrictiveness are made in order to reach robust conclusions. Broadly speaking, two approaches are possible here. In one approach,<sup>9</sup> the individual unconditional probabilities of default are estimated on the basis of market data for a certain period of time. Then, these data points are used to calculate the multivariate density of the probabilities of default. As an alternative to direct estimation, the underlying market processes can be modelled more intensively, which has the advantage of reducing the number of degrees of freedom. One approach is to use structural default models, which assume that a bank will default precisely at the point when the market value of its assets falls below the balance sheet value of its liabilities. If the market values are understood to be intercorrelated stochastic processes, conclusions regarding contagion risks in the system as a whole can be drawn on the basis of the common distribution of market values.<sup>10</sup>

how to efficiently establish the equilibrium in financial networks, see L Eisenberg and T H Noe (2001), Systemic Risk in Financial Systems, *Management Science*, Vol 47, No 2, pp 236-249. — <sup>7</sup> "Co-movement" approaches that account for extreme events can also be found in the area of capital market research. See Y Malevergne and D Sornette (2004), How to account for extreme co-movements between individual stocks and the market, *Journal of Risk*, Vol 6, No 3,

pp 71-116. — <sup>8</sup> See T Adrian and M Brunnermeier, CoVaR, Federal Reserve Bank of New York, Staff Report No 348, August 2009. — <sup>9</sup> See also M A Segoviano and C Goodhart (2009), Banking Stability Measures, IMF Working Paper, No 09/4. — <sup>10</sup> See also H Elsinger, A Lehar and M Summer (2006), Using Market Information for Banking System Risk Assessment, *International Journal of Central Banking*, Vol 2, No 1, pp 137-165.

turned the guarantees. Since early 2009, institutions' liquidity hoarding has also been on a trend decline, which has manifested itself in a declining volume of all open market transactions outstanding and in the deposit facility (see Chart 2.1.6 in the article). Liquidity hoarding is likely to continue to decline once the situation in the financial markets has become sustainably stable and central banks have begun to exit from their extraordinary liquidity operations.

### Loss estimates

Unabated great interest in estimation of banks' losses

In the wake of the financial and economic crisis, financial institutions had to make extensive write-downs on their holdings of credit securitisation instruments. Increasingly, also loan books are suffering from impairments and need to be value-adjusted accordingly. The rising interest in the amount of further potential losses remaining on banks' balance sheets has prompted numerous estimates since the onset of the crisis (see Box 1.5). Based on information from surveys by the Deutsche Bundesbank and supplementary information published by the individual financial institutions, estimates for the German banking system are shown below.

### Market value losses from securitisation largely accounted for, ...

Losses in value of securitisation instruments driven by market price changes, ...

Current information on the nominal and book values of individual components of major German banks' securitisation portfolios has been used to determine mark-to-market losses for securitisation instruments.<sup>22</sup> By cross-

checking this information against market price movements since January 2007, it is possible to deduce the extent to which falls in market prices have already been taken into account on the balance sheet and what potential need for further write-downs still exists (see Chart 1.2.22).<sup>23</sup> As things now stand – and taking market price recoveries in some segments into account – German banks face further losses on their balance sheets of between roughly €10 billion and €15 billion. This would imply that the majority of market value losses on securitisations have already been realised.

It should be noted that this estimate represents a "snapshot" and is strongly contingent on the assumed market price developments.<sup>24</sup> To illustrate this, one instance of price recovery in the high-yield segment of the corporate credit market of about 10 percentage points against face value is by itself enough to reduce portfolio losses by around €4 billion. Assuming that the ongoing recovery in financial market prices since early 2009 continues, losses in the overall portfolio are likely to keep falling. However, the losses might also be overstated by the fact

... establishing market value losses therefore more of a snapshot view

<sup>22</sup> CMBS/RMBS, Consumer ABS, CDOs/CLOs and Other Securitisations have been included as individual components. Where possible, a distinction was made by origin of the assets in the collateral pool as well as by credit rating when weighting market prices.

<sup>23</sup> A problematic aspect here is that international accounting standards allow credit institutions to use their own valuation models in order to calculate securities prices in illiquid markets. These frequently vary widely in terms of assumptions and inputs and therefore also in terms of their results. The lack of sufficiently detailed information on asset class, credit ratings, vintages, geographical origin or denomination creates additional data problems.

<sup>24</sup> The use of market values is problematic, especially in illiquid market segments, because they may significantly understate the actual economic fair value. This problem is exacerbated by the fact that, in some asset classes, such as collateralised debt obligations (CDOs), no standardised instruments are traded and the valuation procedures depend on individual contractual circumstances. The segment mentioned here also comprises a variety of different CDO structures (CBOs/CLOs, synthetic CDOs, CDOs of ABS, CDOs squared, Other CDOs).



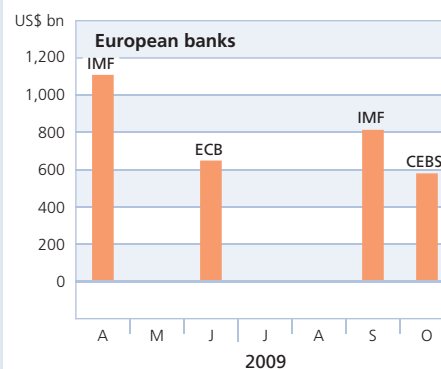
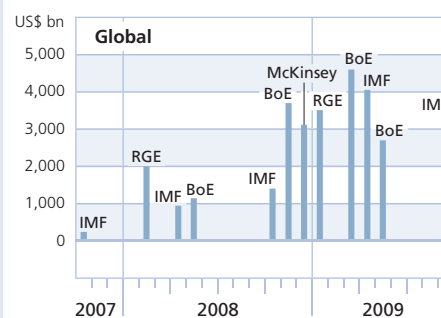
Box 1.5

## DEVELOPMENT OF LOSS ESTIMATES

In autumn 2007, the IMF published one of the first estimates of losses arising from the financial market crisis. As the adjacent, by no means complete, chart shows, a large variety of results have been produced over time. The mostly very different sample groups, inconsistent data sources for market prices and diverging forecasts for economic development make it difficult to compare the individual estimates. However, a common trend can be discerned: estimates initially rose dramatically but are now cautiously receding. This is due to the market prices of many asset classes recovering from their early-2009 lows, as well as the revisions that have been made to growth forecasts in recent months. The volatility of the individual estimates over time is also connected to the specific estimation approaches. Whereas the Bank of England (BoE) only takes into account the mark-to-market losses in securities, the other estimates also forecast and include write-downs on loans for 2009 and 2010. Furthermore, Roubini Global Economics (RGE) and McKinsey confine their approach to the evaluation of losses on US assets, whereas the approach applied by, among others, the ECB and CEBS, who use single-entity information, also takes into account losses from assets of other origin. With regard to the volatility of the key input factors for the estimates – market prices and GDP forecasts – it should be noted that the resulting estimates are to be interpreted more as point-in-time “snapshots”.

The ECB and CEBS base their calculations exclusively on euro-area banks. The global approach of the IMF also emphasises the specific losses of Eurosystem banks. In addition to economic developments and the movement of the market prices since the start of the year, in this respect too, the deviations in the results are due to significant differences in approaches.

## LOSS ESTIMATES

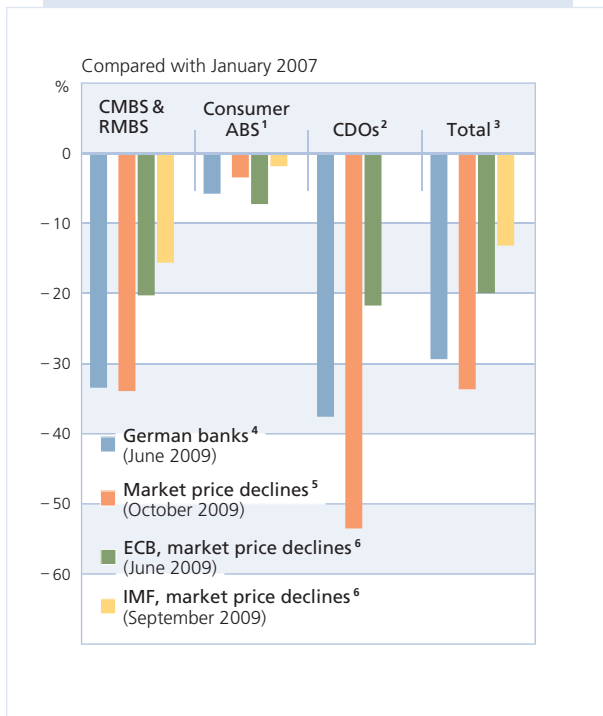


Sources: Bank of England (BoE), IMF, ECB, McKinsey, Roubini Global Economics (RGE), Committee of European Banking Supervisors (CEBS).

For example, in contrast to the preceding results, the IMF's lower estimate of September 2009 makes greater use of single-entity information. The changes in the results over time therefore reflect – alongside developments in the markets and in the real economy, which have to be tracked and understood – the learning effects and progress with respect to both the methodology and the data sources used. More and more improvements in the quality of the estimates have thus been made. However, it is difficult to make an intertemporal comparison of the results.

Chart 1.2.22

**A COMPARISON OF ESTIMATED CHANGES IN VALUE**



Sources: ECB, IMF, ESF, Markit, Bloomberg, Citigroup, RGE and Bundesbank calculations. — **1** Credit card and auto loan ABS. — **2** Contains pro rata synthetic and true-sale CDOs and CLOs. The IMF does not calculate loss ratios for CDOs separately. — **3** Calculation of "total" for pure market price declines weighted by relative portfolio shares of German banks. — **4** Derived from the ratio of book value to nominal value. As the nominal values are not necessarily the cost prices, the depreciation ratios given might overstate actual figures. — **5** Sample: German banks. — **6** Sample: euro-area banks.

DEUTSCHE BUNDESBANK

that nominal values may well diverge considerably from the cost price of acquiring the securities. On the whole, estimates of the decline in value for the various instruments diverge sharply, and are significantly lower in the ECB and IMF studies for the Eurosystem (see Chart 1.2.22).<sup>25</sup>

**... credit risks up**

Empirical observations show that macroeconomic developments as well as institution-specific risk factors are key determinants of credit risk. These insights permit a projection of future losses in loan books using a panel regression model which simultaneously incorporates historical data and information collected as a cross-section of the observed banks. Based on report data, the following empirical relation was estimated for the German banking system:

Econometric estimation of loan losses based on balance sheet data

$$\begin{aligned} \ln(\text{Losses}_{i,t+1}) = & 0.92 \times \ln(\text{BST}_{i,t}) - 0.18 \times \text{NPLR}_{i,t} + \\ & [0.89; 0.96] \quad [-0.26; -0.11] \\ & 2.54 \times \text{LR}_{i,t} - 10.03 \times \Delta \text{GDP}_{t+1} + 23.9 \times \Delta \text{GDP}_{t+1} \times \text{NPLR}_{i,t} \\ & [2.39; 2.68] \quad [-11.06; -9.00] \quad [18.6; 29.1] \\ & - 0.02 \times \text{Interest1}_{t+1} + 0.02 \times \text{Interest10}_{t+1} + u_i - 5.1 \\ & [-0.04; -0.01] \quad [0.01; 0.03] \quad [-6.00; -4.63]^{26} \end{aligned}$$

The losses in the loan book that are to be explained enter the forecast equation in logarithmic form (left-hand side of the equation). They consist of impairments and write-downs as well as allocations to loan loss provisions. Using a series of macroeconomic indicators and bank-specific figures (right-hand side of the equation), this loss variable is projected for 2009 and 2010. GDP growth ( $\Delta$  GDP) enters the forecast equation with a negative sign. Beneficial macroeconomic developments lower expected losses. Rising interest rates, especially long-run interest rates, increase the interest

Panel estimate takes account of institution-specific and macroeconomic explanatory variables

<sup>25</sup> In its calculations, the ECB takes much less account of securitised assets (for instance, no US CMBS, ABS or CDOs), which probably results in lower values. Above all, deviations in the assumed composition of portfolios may also have led to the differences. The total value for the ECB and IMF (see Chart 1.2.22) only includes the categories of instruments included in their own calculations and has been reweighted accordingly.

<sup>26</sup> Values in brackets reflect the 95% confidence intervals of the estimated variables.

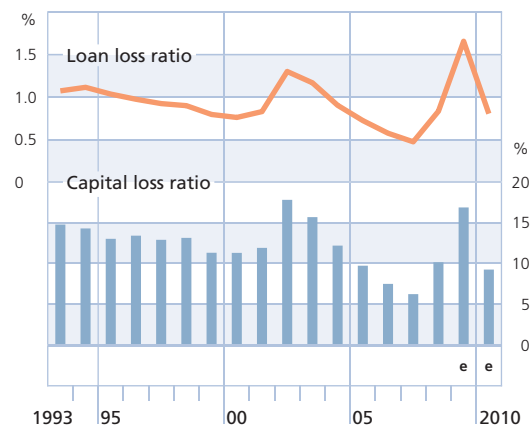
burden on firms and thus their risk of insolvency. The sign of the ten-year interest rate (Interest10) used in the equation is therefore positive. The one-year interest rate (Interest1), by contrast, reflects the economic setting, which is not completely modelled by GDP growth. Its sign is therefore negative. Not only macroeconomic factors but also the specific characteristics of the individual portfolios as well as the individual financial institutions' business strategies determine losses in credit business. Key factors include not only the size of the bank (expressed as a logarithmic balance sheet total, BST) and the share of customer loans in the overall loan book (lending ratio) but also the riskiness of the assets. In the forecast equation, this is approximated by the ratio of non-performing loans to all loans (NPLR). Their influence is non-linear in the equation and depends on the cyclical economic environment. However, under normal circumstances a higher riskiness of assets increases the risk of future losses.<sup>27</sup> Any remaining unobservable institution-specific factors are modelled with a cross-section-specific constant (u).<sup>28</sup>

Econometric  
forecast forms  
upper limit  
of losses

Owing to the strong cyclical collapse, the econometric model predicts an extraordinarily high rate of write-downs on customer loans in 2009.<sup>29</sup> However, a large percentage of the losses will show up only over the course of the fourth quarter. If the cyclical recovery continues in 2010 as assumed, the annual losses will revert to their long-term historical average (see Chart 1.2.23).<sup>30</sup> Since the econometric model was calibrated on annual data, and credit losses lag other cyclical developments, the forecast pattern of write-downs may be biased. The write-downs for 2009 might therefore potentially be overstated, and those for 2010

Chart 1.2.23

## LOSSES IN LENDING BUSINESS \*



\* Write-downs and impairments by German banks of loans and transfers to provisions in lending business as a percentage of the volume of customer loans and/or core capital. Figures for 2009 and 2010 are forecasted values.

DEUTSCHE BUNDESBANK

understated. On the whole, this results in a cumulative need for write-downs of just under €75 billion by the end of 2010. However, all estimations based on econometric models are currently fraught with a very high level of uncertainty. Owing to the unusual pattern of the crisis, the depth of the cyclical collapse, and also the exceptional monetary and economic policy responses, the established relationships may well be less stringent.

<sup>27</sup> Negative GDP growth is a special case.

<sup>28</sup> The institution-specific constant can be estimated using panel econometric methods.

<sup>29</sup> In line with the forecasts of the European Commission and German research institutions, GDP growth of -5.0% in 2009 and +1.2% in 2010 is assumed.

<sup>30</sup> Assuming economic stagnation in the coming quarters will increase the estimated loss by several billion euro.

Lower limit formed by adjusted forecast

On the basis of assessments provided by banking associations as well as information contained in banks' published quarterly reports in 2009, the picture that emerges is, at all events, clearly more positive: write-downs and impairments grew relatively moderately in the first half of 2009, and are only expected to peak in mid-2010. On the basis of this more favourable scenario, the purely econometric forecast was adjusted such that the annualised losses of the first half and the banking associations' estimates for the full year form the basis for the 2009 forecast. The model calculation continues to be the foundation for losses in 2010. These adjustments to the forecast indicate that the potentially outstanding overall loss amounts to around €50 billion.

Results influenced by high forecast uncertainty

The sizeable gap between the econometric forecast and the adjusted forecast can be explained, for one thing, by the above-described probable imprecision in the econometric model based on historical relationships. However, it is also possible that a currently positive trend in operations led to an overoptimistic market assessment of loss potential by associations and banks. Trends in the following quarters will therefore need to be observed precisely.

Write-downs may hamper lending activity

Write-downs in lending and securities business could in some cases lead to problems with regard to banks' capitalisation. Wherever realised losses lead to a reduction in capital, banks have two types of measure with which to respond in order to maintain their target capital ratio or to increase it to meet new requirements: they can either increase their capital or reduce their balance sheet total. However, since many banks cannot simply increase their capital at will, this could result in a shortage of credit that would

create problems from a macroeconomic point of view.<sup>31</sup> To date, however, there have been no signs of such a supply-side induced credit crunch. The recent slump in lending to non-financial corporations may be attributed largely to the flagging dynamism of credit demand.<sup>32</sup> It cannot be ruled out, however, that bank-specific factors, which have previously been of lesser significance, will acquire greater importance, particularly given the prospect of ever more accentuated rating migrations. Renewed supply constraints coinciding with a resurgent demand for loans would pose a particular risk, which would materialise especially if there is a need to correct the currently optimistic assessment that write-downs will remain moderate despite the ferocity of the recession and if financial institutions' capital needs were to be unexpectedly high next year.

It would not be appropriate, however, to conclude that there is a direct causal relationship between expected write-downs and current capital requirements since, initially, income from operations is drawn upon to cover losses incurred. The benign market conditions at present mean that the outlook for profits is appearing in a more favourable light than a short while ago. The high level of market uncertainty, however, makes it difficult to forecast future earnings.<sup>33</sup> In addition, it should be noted that the use of national accounting standards often permits banks to form forward-looking provisions for losses. These provisions

Loss estimates cannot be tied directly to need for capital

<sup>31</sup> See IfW, Szenarierechnung und Projektion Kreditvergabe Deutschland, Vorläufiger Zwischenbericht zur Kurzexpertise für das Forschungsvorhaben fe 28/09 des Bundesministeriums der Finanzen, 2009.

<sup>32</sup> See Deutsche Bundesbank, Developments in lending to the German private sector during the global financial crisis, Monthly Report, September 2009, pp 15-32.

<sup>33</sup> See also the section Profitability beginning on p 38.

can then initially be run down if banks realise losses. This would leave their capital base intact.<sup>34</sup>

### Creditworthiness indicators

German banks' credit default swap premiums recently lower

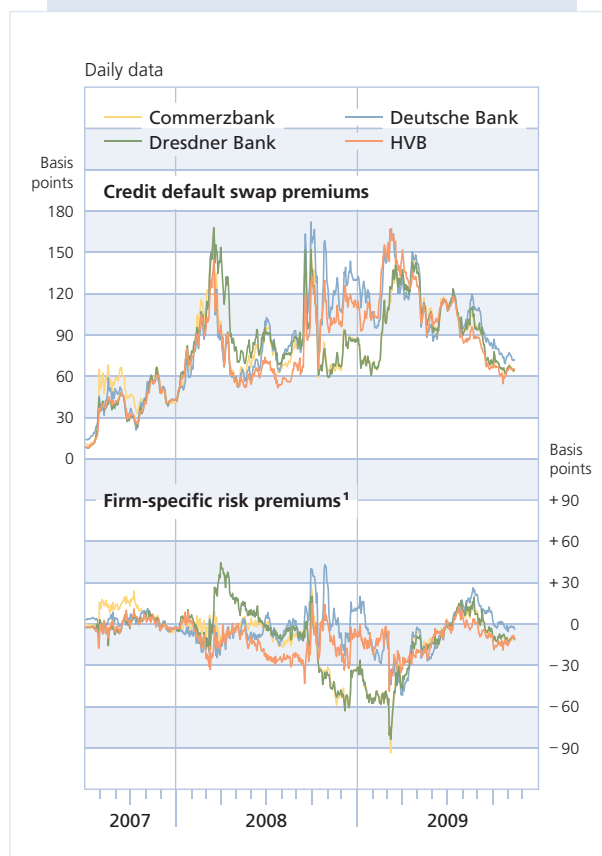
Market expectations about German banks' credit quality are reflected in their credit default swap premiums. In mid-November 2009, they were well below their peaks of early 2008 and early 2009. Despite extensive government assistance measures, however, the default risk is currently being assessed as much higher than prior to the financial crisis and also as a bit higher than during the first wave of the financial market turbulence in the fourth quarter of 2007 (see Chart 1.2.24).

During crisis, markets' assessments of German banks better than industry average

Compared with a group of 25 large European financial institutions, the credit default swap premiums of which are contained in the iTraxx Europe Senior Financials Index, the default risk of German credit institutions during the initial waves of the financial market turbulence in the third quarter of 2007 and partly also in the second quarter of 2008 was rated as higher than average. In the wake of the escalating crisis – the months following the Lehman insolvency and once again at the beginning of 2009 – German institutions, by contrast, were perceived as being more stable than other European institutions. As the current year has progressed, this relative advantage has been reversing – not because the markets perceive greater risks in the German banking system but because risks in other countries have subsided more strongly.

Chart 1.2.24

### RISK INDICATORS OF LARGE GERMAN BANKS



Sources: Bloomberg and Bundesbank calculations — <sup>1</sup> Difference between the credit default swap premiums of the big banks and the iTraxx Europe Senior Financials benchmark index.

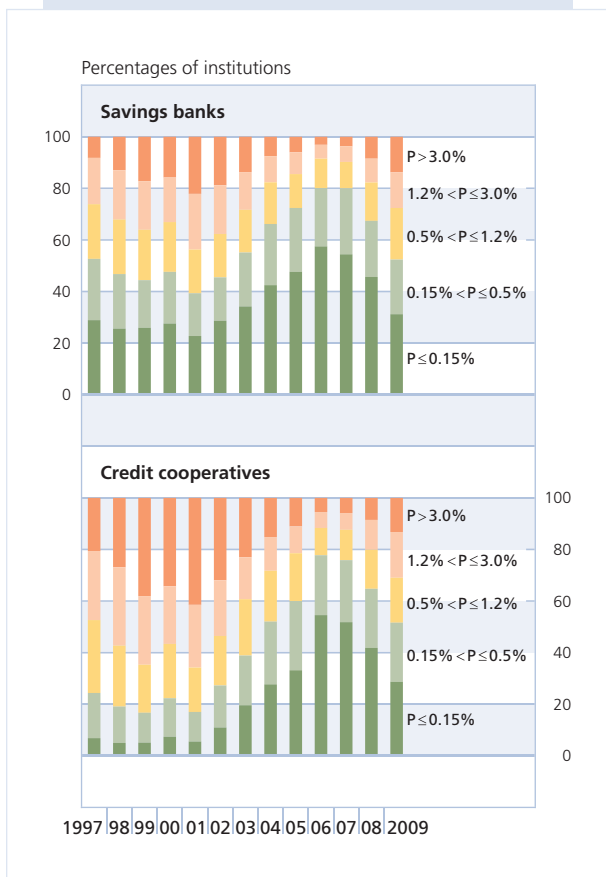
DEUTSCHE BUNDESBANK

Estimates of the savings banks' and credit co-operatives' probabilities of default also reflect the economic situation and the financial crisis – even though they were affected far less severely by falling securities values than were

<sup>34</sup> These include, in particular, the risk provisions pursuant to section 340f of the German Commercial Code (Handelsgesetzbuch, HGB), which do not have to be disclosed on the balance sheet and offer a cross-offsetting option. A large part of the German banking system still prepares balance sheets under the German Commercial Code.

Chart 1.2.25

**BUNDESBANK HAZARD RATE MODEL\***



\* Estimation of the probability (P) of an institution's survival being placed at risk in the given year without supporting measures.

DEUTSCHE BUNDESBANK

matting these probabilities of default uses, in a logit regression approach, a variety of bank-specific variables on profitability, solvency and the credit and market risks incurred, as well as macroeconomic factors. The networked institutions' default probability is given as one of five risk categories.<sup>35</sup>

At the current end, the worst risk categories are expanding considerably (see Chart 1.2.25). On an average of both categories of institutions (which currently make up just over one-quarter of the aggregate balance sheet total of the German banking system), the percentage of banks in the lowest two risk categories recently rose from 19.4% to just under 30%. One of the main drivers of this increase was the business climate, which remained extremely gloomy up until the second quarter of 2009. In a historical comparison, however, the worsened creditworthiness of the networked institutions appears relatively moderate. The rates of change indicate, firstly, that credit quality likewise fell at the beginning of this decade. Secondly, a comparison with 2001, which was a difficult year for the banking sector, shows that current levels of creditworthiness – especially among cooperative banks – are significantly better.

Credit ratings of savings banks and credit cooperatives down moderately

the more capital-market-oriented institutions. The Bundesbank's hazard rate model for esti-

<sup>35</sup> See also Deutsche Bundesbank, New specification of the Bundesbank's hazard rate model, Financial Stability Review 2007, Box 1.11, p 78.

## Stability in the German insurance industry

In principle, insurance companies are significant investors in the financial markets. Conversely, financial markets are strongly impacted by developments on the part of insurers. This was particularly apparent in the case of the US insurer American International Group (AIG). German insurance companies have been comparatively little affected by the financial crisis. In 2008, life insurers' net return on investment nevertheless fell below the level of current interest on policyholders' credit balances, thus leading to a reduction in the bonus and rebate provisions. A difficult set of circumstances is developing, especially looking ahead to the longer term. Earnings expectations are lower than before in view of poorer medium-term growth potential and a possibly protracted phase of low interest rates, while the guaranteed interest rate in insurers' portfolios is falling only gradually.

### Impact of the crisis has become noticeable for the insurance industry ...

Limited impact up to now

German insurance companies came through the early stage of the crisis virtually unscathed owing to their very low exposure to structured products. However, as the financial crisis evolved into an economic crisis, insurers began to feel the effects, albeit hitherto to a limited extent. To illustrate this: the volume of gross premiums written by life insurers has risen less markedly than in previous years. Although no German insurer has had to take recourse to government support, the industry

is nonetheless profiting indirectly from the assistance measures offered to credit institutions, in which parts of its capital investments are held.

For the longer term, however, a difficult set of circumstances is developing, intensified by the after-effects of the crisis. Firstly, in the medium term, growth potential in Germany is likely to be assessed as being lower than before the crisis.<sup>1</sup> This will lead to reduced earnings expectations, including for insurers. Secondly, in the unfavourable event of a lengthy period of stagnation, interest rates are likely to remain at a low level. The pressure that this will place on earnings will be set against the guaranteed interest rate in insurers' portfolios, which is declining only gradually. This will affect individual life insurers to varying degrees, however. If the insurance companies increasingly seek to ease the pressure on earnings by switching to higher-yielding investments, they will also expose themselves to higher credit risks, such as in the case of corporate bonds.

Difficult circumstances developing in the longer term

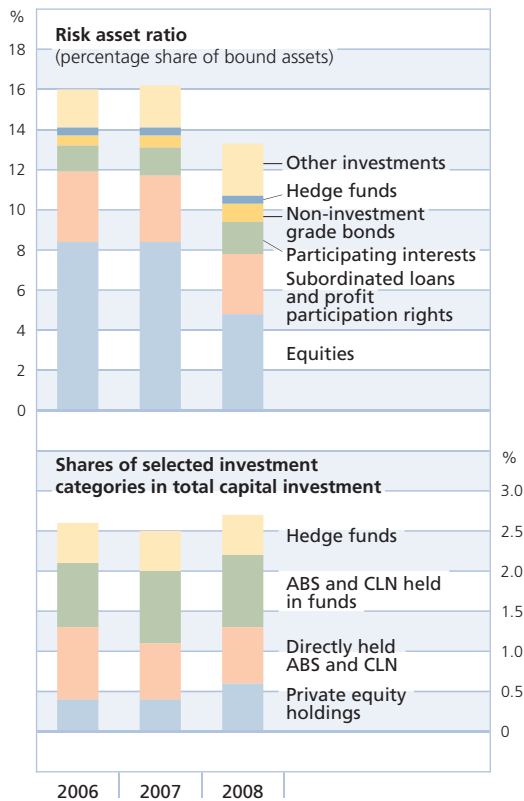
Insurance companies can be impacted by the crisis mainly through two channels: net investment income can be depressed by low interest rates and increased write-downs, while in current operations revenue may fall or claims may rise. In fact, both channels indicate that there are strains. For example, life insurers' net return on investment has fallen well below the level

Impact through net investment income and current operations

<sup>1</sup> See also "Macroeconomic risks" on pp 14 ff.

Chart 1.3.1

**LIFE INSURERS' CAPITAL INVESTMENTS**



Source: BaFin.  
DEUTSCHE BUNDESBANK

of current interest on policyholders' credit balances.<sup>2</sup> The current operations of the individual insurance sectors have been affected in different ways. For life insurers, for instance, the effects of the crisis last year meant, amongst other things, fewer new contracts. In the case of credit insurers, the economic crisis is making itself felt through a noticeable rise in claim expenditure.

**... through net investment income ...**

In the second quarter of 2009, life insurers' capital investment holdings amounted to around €700 billion, for the most part fixed-income securities and loans.<sup>3</sup> A significant portion of life insurers' investments are placed with credit institutions.<sup>4</sup>

High capital investments

Risks are limited by means of strict investment rules. Insurance companies may commit up to 35% of bound assets to more risky investments, particularly equities, profit participation rights, claims arising from subordinated liabilities and hedge funds. However, life insurers – similar to the other insurance sectors – make only very limited use of this scope for investment. The current risk asset ratio is 13.3% (2007: 16.2%).<sup>5</sup> Equities as well as subordinated loans and profit participation rights account for the largest shares (see Chart 1.3.1).

Low risk asset ratio

Therefore, during the crisis, life insurers benefited from having undertaken very few risky investments. In 2008, they placed 2.7% of their

Hardly any risky investments

**2** Net return on investment covers all income and expenses in relation to investment. Income and losses from the disposal of assets as well as write-downs on securities and shares in pooled investments are therefore also included in the calculation. Current interest on policyholders' credit balances comprises the guaranteed return as well as ongoing profit participation.

**3** In the second quarter of 2009, primary insurers' investment portfolios totalled approximately €1.1 trillion. See BaFin, Kapitalanlagen der Erstversicherer – 2. Quartal 2009.

**4** In the second quarter of 2009, for example, approximately €166 billion was invested in Pfandbriefe, municipal bonds and other debt securities issued by credit institutions (around 24% of all capital investments). A further €115 billion (about 16% of all capital investments) was invested in the form of loans against borrowers' notes, registered bonds and time deposits held with credit institutions. See BaFin, Kapitalanlagen der Erstversicherer – 2. Quartal 2009.

**5** Health insurers: 10.1%; non-life insurers: 15.9%; pension funds: 13.1%; all sectors together: 13.1%. See BaFin, Annual Report 2008, April 2009. All data for 2008.



total capital investments in private equity holdings, asset-backed securities (ABS), credit-linked notes (CLN) and hedge funds (see Chart 1.3.1).

Reduced equity exposure

In 2003, the equities ratio of German life insurers still averaged around 9.2%. In the ensuing years, the ratio was reduced for business strategy reasons based on the lessons learned from the bursting of the technology bubble. On 30 June 2009, only around 3.4% was still invested in equities.<sup>6</sup>

Net return of 3.55%

Although a conservative investment policy limits risks in capital investments, insurers – as large institutional investors – are nonetheless naturally not immune to developments in the international capital markets. In 2008, the net return on investment averaged 3.55% (2007: 4.65%).<sup>7</sup> It was thus only marginally higher than the average guaranteed interest rate and considerably lower than the current return. The net return was also boosted by balance sheet relief for write-downs on investments.

Guaranteed return of 3.40%

In 2008, the average guaranteed interest rate in life insurers' portfolios amounted to 3.40% (2007: 3.43%).<sup>8</sup> The maximum technical interest rate remains at 2.25%, although it applies only to new business. Current interest on policyholders' credit balances amounted to around 4.34% in 2008 and was thus distinctly higher than the net return on investment. It was therefore not possible to finance all current interest payments through capital investments, which inevitably led to a reduction in the bonus and rebate provisions. It is highly unlikely that this situation will be rectified in the near future as the current return for 2009 is of a similar magnitude.<sup>9</sup> It is therefore to be expected that the bonus and rebate provisions will also shrink

in this reporting period. It remains to be seen whether, in this situation, individual insurers will persistently pay out beyond their means and will thus live from their assets.

In addition, life insurance companies have avoided extraordinary write-downs by applying section 341b of the German Commercial Code (*Handelsgesetzbuch*) and valuing investments according to the moderate – rather than the otherwise usual strict – lower of cost or market principle. This is conditional on the investments being counted as fixed assets and able to be held until maturity.<sup>10</sup> It is estimated that a significant number of German life insurers have made use of this option and thus avoided on average about 1.4% of write-downs on investments.<sup>11</sup> Write-downs must be reinstated if the loss in value persists for more than 12 months. There is thus a risk that the future net interest return will be under strain.

Application of section 341b of the German Commercial Code

<sup>6</sup> 2004: 7.4%; 2005: 8.5%; 2006: 8.5%; 2007: 8.5%; 2008: 4.8%. Source: German Insurance Association (Gesamtverband der Deutschen Versicherungswirtschaft e.V. or GDV).

<sup>7</sup> See GDV, Statistical Yearbook of German Insurance 2009, September 2009.

<sup>8</sup> See Assekurata, Marktstudie 2009: Die Überschussbeteiligung in der Lebensversicherung, January 2009. The study covered 67 life insurers with a market share of around 73% (the 2007 study covered 71 life insurers with a market share of about 80%).

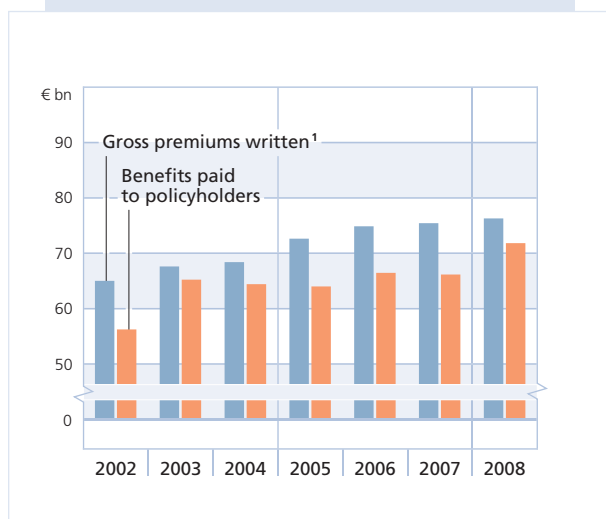
<sup>9</sup> On a market average, in 2009, the current return has fallen only moderately across all tariffs and generations by 0.08 percentage point to 4.26%. See Assekurata, Marktstudie 2009: Die Überschussbeteiligung in der Lebensversicherung, January 2009. The study covered 76 life insurers.

<sup>10</sup> Under the new provision, write-downs on securities can be avoided if the book value is no more than 20% higher than the fair market value at the end of the year. Until now, the threshold had been 10%.

<sup>11</sup> See Fitch Ratings, German Life Insurers – Sector Update, March 2009. An average of 70% of the life insurers rated by Fitch applied the provision to varying degrees. Some insurers did not apply the provision at all, while others avoided up to 3.8% of write-downs.

Chart 1.3.2

**GROSS PREMIUMS WRITTEN AND BENEFITS PAID BY LIFE INSURERS**



Source: German Insurance Association (Gesamtverband der Deutschen Versicherungswirtschaft e.V. or GDV). — **1** Not including premiums from bonus and rebate provisions.

DEUTSCHE BUNDESBANK

The first half of 2009 saw an easing of tensions in the premium revenue trend. German life insurers were thus able to expand their premium revenue by 6.6% year on year, profiting from a sharp rise in single premiums.<sup>13</sup> A year-on-year increase of 44% to around €8½ billion was recorded (first half of 2008: approximately €6 billion). With a share of about 60%, the majority of single premiums were in the area of annuities. In respect of periodic premiums under existing contracts, life insurers suffered a decline of 1% to €29½ billion. New business in contracts with periodic premiums was down on the year. This development was to be expected as the final stage of government assistance for “Riester” private pension plans was reached last year, thus resulting in a special effect in the first half of 2008. After adjustment for this “Riester” effect, new business periodic premiums declined by just under 10% in the first half of 2009.<sup>14</sup>

Marked increase in single premiums

**... as well as through current operations**

Fewer new contracts, only modest increase in gross premiums

Signs of the serious economic downturn also became apparent in the German life insurance companies’ current operations in 2008. The number of new contracts fell by around 12% to 6.7 million. The volume of gross premiums written increased only slightly by 1.1% to around €76½ billion. Growth in the preceding years had been considerably stronger in some cases.<sup>12</sup>

No liquidity problem

Life insurers have benefited from the fact that, as a rule, they do not have a liquidity problem. Premium income is normally higher than the payouts to policyholders (see Chart 1.3.2).

The sharp rise in single premiums and the simultaneous fall in periodic premiums show that the companies are operating in an increasing volatile line of business. Minor changes – for example, in the interest rate environment or profit participation – can lead to strong fluctuations in single premiums. Evidently, single premiums are taken out more for reasons of profit than protection.

Operation in a volatile line of business

**12** See GDV, Statistical Yearbook of German Insurance 2009, September 2009. Of the €76.3 billion in premium revenue generated in 2008, periodic premiums for primary insurance accounted for approximately €58.5 billion (+0.2%), single premiums for primary insurance accounted for €12.2 billion (+4.2%) and supplementary insurance premiums accounted for €5.5 billion (+4.6%). See GDV, Geschäftsentwicklung 2008, Die deutsche Lebensversicherung in Zahlen, July 2009.

**13** With a single premium, the policyholder pays a premium for the entire period of insurance cover when the contractual relationship commences.

**14** See GDV, press release of 18 August 2009.

Cancellation rate in life insurance still relatively stable

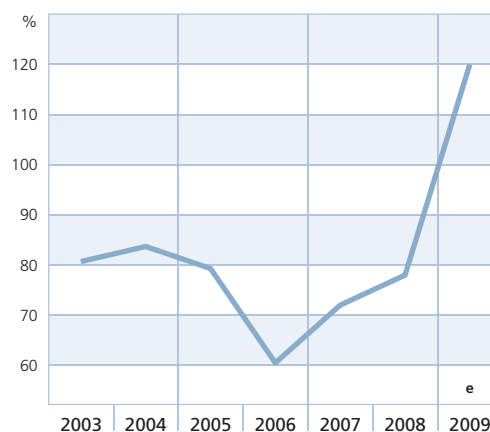
In the first half of 2009, the cancellation rate among life insurers – measured in terms of volume – amounted to around 4% (2008: 4%).<sup>15</sup> All in all, developments have been in line with expectations. The probably modest increase in the cancellation rate in 2009 shows that the general economic crisis has not yet induced households to terminate life insurance policies to a greater extent than normal. However, a rise in unemployment could alter this state of affairs. A significantly higher cancellation rate would also have a negative impact on the liquidity situation.

Credit insurers in the spotlight

As the general economic crisis has progressed, credit insurers have increasingly become the focus of public attention. In the first half of 2009, a slight decline in the insured sums in domestic trade credit insurance to around €263 billion was reported (end-2008: €285 billion; end-2007: €268 billion). The fall in the insured sums is currently in line with expectations. It can also be qualified by the fact that the volume of contracts in the entire industry is, in some instances, diminishing just as sharply. There is less demand for credit insurance, and so limits and insured sums are being reduced accordingly. Increases in prices and costs are, nonetheless, also in evidence, which means that it has no longer been possible to conclude some particularly risky contracts. As the number of insolvencies has increased, all classes of credit insurance business have seen a sharp rise in claim expenditure, while overall premium income has stagnated. This trend will continue in all probability. The combined ratio after settlement could be pushed up from 78% of late to around 120% (see Chart 1.3.3). It remains to be seen how long individual insurers will be able to cope with the strain of such a

Chart 1.3.3

### COMBINED RATIO IN CREDIT, SURETYSHIP AND FIDELITY INSURANCE



Source: GDV.

DEUTSCHE BUNDESBANK

high combined ratio. If the number of corporate insolvencies continues to grow, credit insurers are likely to scale down their range of credit insurance products.

In September 2009, the Steering Committee on Business Financing (*Lenkungsausschuss Unternehmensfinanzierung*) decided to implement a “top-up” model.<sup>16</sup> If private credit insurers are no longer able to cover a part of the risk of non-recovery owing to the crisis, the

Government's “top-up” model

<sup>15</sup> Source: GDV.

<sup>16</sup> The Steering Committee on Business Financing makes decisions within central government's loan and guarantee programme (“Business Fund Germany” (“*Wirtschaftsfonds Deutschland*”)) on loans and guarantees when certain thresholds are exceeded or which are of fundamental importance. It comprises members at state secretary level from the Federal Ministry of Economics (chair), the Federal Ministry of Finance and the Federal Ministry of Justice as well as a representative from the Federal Chancellery.

government will assume this function under this model. However, the additional coverage to be provided by the government shall, at most, be equal to that provided by the private insurer. €7½ billion has been earmarked for this purpose.

Impact of the crisis also noticeable for reinsurers

Reinsurers are also feeling the impact of the financial and economic crisis. In 2008, the reinsurance industry had to cope with, in some cases, substantial cuts in net investment income. 2009 has brought an easing of tensions here owing to the general recovery in the financial markets.

Effect on current operations

Two countervailing factors play a role for reinsurers with regard to current operations. On the one hand, a slowdown in economic activity

tends to lead to a smaller volume of primary insurance. This could likewise be mirrored in a lower demand for reinsurance. On the other hand, primary insurers particularly need to reduce their capital burden in times of crisis. Their demand for reinsurance could therefore be greater. With regard to premium income, 2009 has so far seen a year-on-year rise, on average. The reinsurance industry has, in recent years, already responded to more frequent and extensively insured catastrophe losses by adapting both its risk assessment and risk modelling methods with regard to natural catastrophes. It has, in part, thus been better able to cushion the impact of damage claims.<sup>17</sup>

<sup>17</sup> See BaFin, Statistik der BaFin 2007/08, Rückversicherungsunternehmen, September 2009.

## Learning from the crisis

The crisis has vividly demonstrated that, in order to safeguard financial stability, it is essential to supplement the microprudential supervision of individual institutions by a macroprudential approach that takes a system-wide view. The macroprudential approach primarily focuses on endogenous risks. These are caused, *inter alia*, by the procyclicality of the financial sector, the systemic relevance of large and widely interconnected institutions and the rapid evolution of financial innovations. On an international level, concrete progress has already been made in combating a number of weaknesses that emerged during the crisis. The primary objective of the reforms is to strengthen the resilience both of individual financial institutions and of the financial system as a whole. Moreover, there is a need to align incentive structures – particularly those for structured products – with the requirements of stability as well as to improve the robustness of the trading and settlement infrastructure and to identify potential systemic risks earlier. This should help to counter unwelcome developments more effectively in future and to minimise the risk of financial crises, which invariably entail a high cost to society.

### Paths towards macroprudential supervision and regulation

Macroprudential supervision supplements ...

One of the most important lessons of the crisis is that due account must be taken of the systemic dimension of financial stability by taking a macroprudential approach. However, discussions regarding the nature of macroprudential

regulation and supervision are still at an early stage. Such systemic regulation must address the following questions. What does a macroprudential approach entail and what are its aims? What specific form should macroprudential supervision take?

Many of the current regulatory approaches were forged by experience gained during previous crises. Until now, the predominant view has been that the financial system can be considered stable as long as the stability of all of the players is assured. Given the growing prevalence of market-based funding, which relates both to transactions and to the pricing of risks, this approach is no longer adequate. In addition, there is a danger that regulators and prudential supervisors may tend to neglect the big picture in seemingly stable times – particularly given that systemic crises are very rare. Nonetheless, they cause considerable damage to the economy, and this justifies investing in preventative measures. The crisis has shown that increased vigilance is warranted in apparently placid phases, too, especially when risk appetite is strong, volatilities are particularly low and asset values are rising sharply.

... traditional regulatory approaches

Therefore, the existing microprudential approach has to be complemented by a wider systemic vision in recognition of the fact that the main focus of traditional solvency supervision – safeguarding the stability of individual institutions – is not actually sufficient to ensure the stability of the overall system. Rational behaviour of financial intermediaries at the microeconomic level may – particularly when

Stability analysis at micro-prudential level insufficient

many adopt similar positions – cause feedback and contagion effects at a systemic level, leading to high macroeconomic costs. As the ultimate disciplining measure, a fully viable financial system must also allow individual institutions to go bankrupt. Where they impinge on one another, the microprudential and macroprudential supervisory approaches may occasionally lead to differing demands; in such cases the systemic perspective must ultimately take precedence.<sup>1</sup>

#### Vulnerability of individual institutions

Solvency supervision and macroprudential supervision follow different approaches. Solvency supervision considers the risk factors to be chiefly exogenous, ie originating outside the banking system. It aims to limit institutions' risk exposures through a set of common rules (a level playing field). The focus is thus on the vulnerability of individual institutions. Interlinkages with other parts of the financial system are taken into account only if they constitute direct risk exposures (in terms of market, credit and counterparty risk) owing to contractual relationships.

#### Systemic risk

By contrast, macroprudential supervision focuses on endogenous risks, ie risks arising from dynamic interactions both within the financial system itself and between the financial sector and the real economy. It analyses patterns of behaviour and structures within the financial system that can lead to malfunctions. However, the systemic perspective is also required to discover how exogenous shocks are transmitted and amplified. Systemic risks reflect disruptions and inefficiencies that occur when the conduct of market participants – which is rational at an individual level – leads to collectively undesirable dislocations as a result of

strategic interdependencies. Contagion risks among the intermediaries in the financial sector are one major source of systemic risk (see box 1.4 on pages 54-55). Another key source are multiplier mechanisms or spirals related, for example, to increases or reductions of leverage or access to liquidity.<sup>2</sup> A distinction must be drawn between systemic risk, which stems from the financial system and its way of functioning, and systematic risk, which originates externally and is caused by fundamental factors. Systematic risk generally affects all market participants and cannot be eliminated through diversification.<sup>3</sup>

The distinct microprudential and macroprudential viewpoints sometimes lead to differing evaluations. The term “diversification” is a case in point. At a bank level, the aim of broad diversification is to avoid concentration risk in a portfolio. At a systemic level, by contrast, diversification denotes the objective of banks being exposed to the various risk factors to different degrees. The occurrence of a risk event should not prompt a mass co-movement by the plurality of banks in response. From a macroprudential perspective, the homogeneity of portfolios or behavioural patterns therefore poses a significant risk to financial stability. In the event of a crisis, this is directly reflected in a drying up of liquidity, and this remains the case even if, from

#### Concepts of “diversification”

<sup>1</sup> Minimum capital requirements are a case in point. From a microprudential perspective, they should be risk-sensitive in order to increase the institutions' solvency. From a systemic point of view, however, a strong emphasis on risk orientation can lead to problems in the form of procyclical lending.

<sup>2</sup> For information on the liquidity spiral, see F Allen and E Carletti, *The Role of Liquidity in Financial Crises*, Jackson Hole Conference Proceedings, Federal Reserve Bank of Kansas City, August 2008, pp 379-412.

<sup>3</sup> In capital market theory, systematic risk is also defined as market risk that cannot be reduced even if a securities portfolio is optimally diversified.

a microeconomic perspective, each portfolio seems to be adequately diversified and the conduct of each institution is rational on an individual level. For this reason, the increased importance – owing to investment regulations, accounting practices and prudential requirements – of external ratings to the financial sector, for example, is to be viewed critically as it contributes to the homogeneity of risk assessments.

Systemic role and regulation

Risk diversification at the systemic level can therefore require intermediaries to be treated differently according to their role in the system as a whole or the externalities to which they give rise. If an institution is systemically relevant, whether because of its size or its degree of interconnectedness, this at least implies that it should be more stringently regulated and supervised. The extent to which discretionary or rule-based measures are required in such cases is currently the subject of intense debate.

Macroprudential regulation seeks to ensure smoothly functioning system

Compared with microprudential supervision – particularly solvency supervision – the tasks of macroprudential regulation are more difficult to clearly define; while an individual institution can be allowed to fail, public interest necessitates intervention to prevent a collapse of the financial system as a whole. Generally speaking, safeguarding financial stability focuses on the smooth functioning of the financial system. This relates not so much to the financial system's technical and operational functionality as to the goal of consistently ensuring an efficient allocation – in the sense of value added in the real economy – of aggregate capital and risks.<sup>4</sup> The overriding aim of macroprudential regulation is thus the timely identification of systemic risks to the financial system.

The need to strengthen the macroprudential perspective has given new impetus to international discussions regarding the role played by central banks in monitoring the financial system. Although many central banks have the sole mandate of ensuring price stability, the crisis has made it clear that this objective cannot be viewed in isolation from the stability of the financial system. Smoothly functioning financial markets are a prerequisite for effective monetary policy and, by extension, for achieving price stability.<sup>5</sup>

Role of central banks in macroprudential supervision

Central banks possess comparative advantages of information and action as they combine complementary elements such as responsibility for systemic stability, oversight of payment systems, their own refinancing operations, their activities in the financial markets and their presence in international committees. In addition, only central banks can perform the vital function of the lender of last resort during financial crises.<sup>6</sup> This in turn requires that central banks constantly keep abreast of all institutions' solvency situations and of liquidity conditions in the money market. They are therefore better able to assess possible domino effects than a separate supervisory authority.<sup>7</sup> Central banks' market proximity in the regulatory and supervisory process clearly enhances their ca-

Central banks' comparative advantages of information and action

<sup>4</sup> As in Tobin's concept of "functional efficiency" developed in J Tobin (1984), On the Efficiency of the Financial System, *Lloyds Bank Review* 153, pp 1-15.

<sup>5</sup> See J Peek, E Rosengren and G Tootell (1999), Is Bank Supervision Central to Central Banking, *Quarterly Journal of Economics*, Vol 114, No 2, pp 629-653, F Mishkin (ed), *Prudential Supervision: What Works and What Doesn't*, NBER Conference Report, January 2001 and P Sinclair, *Central Banks and Financial Stability*, Bank of England Quarterly Bulletin, November 2000 pp 377-391.

<sup>6</sup> See C Goodhart and D Schoenmaker (1995), *Should the Functions of Monetary Policy and Banking Supervision Be Separated?*, *Oxford Economic Papers* 47, pp 539-560.

<sup>7</sup> See German Council of Economic Experts, *Jahresgutachten 2007/08*, sections 216 ff.

pability to identify disequilibria and proactively counter potential pockets of instability.

Independence of central banks must be maintained

Monetary policy, regulation or supervision in isolation cannot effectively curb undesirable developments in the financial markets. However, advantage can be taken of the above-mentioned complementarities through greater central bank involvement in the supervisory process. Nonetheless, the transfer of additional financial supervisory responsibilities to central banks must crucially neither dilute their monetary policy objective of maintaining price stability nor jeopardise their independence.

### Complex problems to be solved

Procyclicality ...

Above and beyond the current crisis, macroprudential supervision will need to grapple with a range of problems in the coming years. One key issue is the procyclicality of the financial sector. In the past, herd behaviour combined with the prevalence of short-termism among investors has often led to debt-financed asset price bubbles and overinvestment in certain sectors. These dangers may actually be exacerbated by certain institutional frameworks and supervisory regulations.

... caused by accounting rules and high leverage

In this context, criticism has been levelled mainly at accounting standards geared to mark-to-market and fair value measurement and at the new Basel II minimum capital requirements. This is because institutions view equity capital as a comparatively expensive source of funding. An institution that wishes to maximise its return on equity will thus aim to jack up its leverage ratio. If assets are valued using mark-to-market or fair value measurement, an increase in asset

values will automatically expand the bank's equity cushion. The institution will attempt to offset this by raising its leverage ratio through additional lending or by purchasing assets. During a crisis, this process operates in reverse – and is generally far more intense. Illiquid markets can push market prices far below the asset's fundamental value (as measured by the present value of cash flows). As the bank's equity capital decreases, it may be forced to sell some of its assets and to cease lending. Regulations oriented to the microprudential level of individual institutions may reinforce this process. Risk-sensitive capital requirements can therefore mean that banks increase their operations when credit risks fall and reduce them as risks rise. In particular, the application of measurement methods under which the measured risks are closely correlated with the business cycle poses a problem for financial stability.

A macroprudential approach can address the problem of procyclicality in a number of ways. However, it should be borne in mind that financial cycles can only be smoothed effectively through interaction between prudential regulation, accounting rules and monetary policy ("leaning against the wind"). One approach to minimum capital requirements aims to induce institutions to build up larger capital buffers during upswings, eg through higher provisioning. In addition, risk-sensitive capital requirements can be supplemented by imposing countercyclical capital surcharges. However, the latter pose a supervisory problem; the principal shortcoming of rule-based capital surcharges is correctly gauging the current position in the business cycle. Business cycles vary both over time and from country to country.

Countercyclical regulation



For this reason, setting countercyclical capital surcharges for international institutions operating in different markets is particularly problematic. Furthermore, rule-based buffers have the disadvantage that they might no longer be perceived as such once they mutate into binding minimum capital requirements. Discretionary measures can help to mitigate these problems. However, it is difficult to garner political support for such measures in good times. Nevertheless, the move towards countercyclical capital surcharges is essentially appropriate.

#### Intersectoral interconnectedness

The interconnectedness of the financial system presents further challenges for macroprudential supervision. This is true of contagion effects both across and within financial sectors. Intersectoral interconnectedness poses the problem of a possible regulatory divide. The type and depth of regulation should essentially be determined not by the sector to which financial intermediaries formally belong but by their function within the financial system. Given the dynamic structural changes in the financial system, it must be ensured that all systemically relevant financial institutions, markets and instruments are adequately and continuously supervised or regulated.

#### Information gaps must be closed

In order to ensure timely detection of potential stability risks, any information gaps need to be closed by imposing transparency requirements on all parts of the financial system. This also applies to participants in the “shadow banking system” (eg off-balance-sheet investment and securitisation vehicles, including for CDOs, and non-bank financial institutions). Hedge funds throughout the world should therefore likewise be subject to appropriate reporting requirements. The fact that hedge funds primarily

have business relationships with large, regulated financial institutions is not a convincing argument for a low level of supervision. It is precisely these connections with systemically relevant banks that make such intermediaries a potential systemic risk factor.

A particularly important aspect of this interconnectedness is the “too big to fail” or “too connected to fail” problem. The collapse of large or widely connected institutions can have disastrous consequences for the financial system. Financial intermediaries could exploit this by intentionally gearing their business strategies to growth and interconnectedness, thus “banking” on a government intervention to rescue them if they run into distress. Macroprudential regulation and supervision can attempt either to directly prohibit institutions from growing too large or to neutralise the microeconomic advantages of reaching such a size, which are clearly outweighed by the macroeconomic disadvantages.<sup>8</sup> For example, large institutions could be barred from operating in certain sectors. A systemic change from the current universal bank model to a monoline model would take this idea to its logical conclusion. However, the case of Lehman Brothers, in particular, has shown how dramatic the consequences of a collapse even of a monoline investment bank can be. It would therefore seem more appropriate to make the institutions concerned pay for the negative externalities of their rampant growth themselves. This

Measures to combat “too big to fail” problem ...

<sup>8</sup> Empirical studies indicate that the motivation for consolidation among the larger banks is no longer rising returns to scale but an expansion of market power and the resulting margin increases. See D Focarelli, F Panetta and C Salleo (2002), Why Do Banks Merge?: Some Empirical Evidence from Italy, *Journal of Money, Credit and Banking*, Vol 34, No 4, pp 1047-1066.

could be achieved, for example, by imposing additional capital requirements, requiring contributions to a guarantee fund or levying a tax linked to holdings of certain liabilities (ie measuring stocks rather than flows).<sup>9</sup>

... and for possible insolvency

Another approach would be to mitigate in advance the potential impact of a collapse of systemically relevant institutions. To the extent that this lessens the likelihood that such banks would be bailed out in the event of a crisis, it could reduce the incentive for dangerously bloated growth. Such initiatives include efforts to rethink the restructuring and winding up of distressed large financial institutions in the event of insolvency (see box 1.6 on pages 78-79).

Financial innovations: problems ...

An additional problem is the issue of how to deal with the rapid pace of financial innovation and the explosive turnover growth in some market segments. While financial innovations are essentially to be welcomed, they also entail potential risks of both a microprudential and a macroprudential nature. New financial products are particularly prone to magnify information asymmetries; indeed, the products are often largely based on exploiting such asymmetries. Moreover, the potential returns from financial innovations often stem from regulatory or tax arbitrage rather than macroeconomic efficiency gains. Financial innovations can amplify endogenous systemic risk. The highly complex resecuritisations which played a key role in the global spread of the crisis that originated in the US real estate market are the most recent example of this. The tranching of asset-backed securities led to a situation in which it was actually the holders of senior tranches who faced the highest exposure to systematic risks. This made them particularly vulnerable to

rare but extremely damaging “black swan” events (tail risk). The massive uncertainty that has been the defining feature of the crisis meant that these complex and opaque instruments suddenly became illiquid and consequently were no longer accepted as collateral for repo transactions.

What fundamental lessons for future macroprudential regulation can be drawn from these considerations? First, the development of financial innovations – or, similarly, the emergence of new financial market players – must be monitored closely and undesirable developments must be nipped in the bud. An increase in the complexity of instruments and a high concentration of products among certain financial intermediaries could be taken as the first warning signs. Macroprudential supervision must seek to assess the potential implications for financial stability even though the market players themselves often believe that such developments will promote efficiency and stability. Regulations imposed in the first stage of an innovation cycle must be reviewed if regulatory arbitrage becomes a main driver of structural changes.

... and possible solutions

### Extensive reform agenda initiated

Further analysis and ongoing discussion are required before an adequate approach to macroprudential regulation can be agreed upon at international level. In some specific areas, however, measures to restore financial stability are already relatively well advanced. In

International reform agenda

<sup>9</sup> In terms of economic theory, this equates to imposing a “Pigovian tax”.

many respects, material progress has already been made and identified weaknesses have been overcome. International efforts are focused on the reform agenda which is being implemented through the G20 summit process, largely under the guidance of the Financial Stability Board (FSB). The primary objective of the reforms is to strengthen the resilience of individual financial institutions as well as the financial system as a whole. Moreover, it is important to make stability-oriented adjustments to incentive structures, and to improve the trading and settlement infrastructure as well as international cooperation. Any new measures must, where possible, be coordinated at international level. This is important both to ensure a level playing field and to avoid regulatory gaps and incentives for regulatory arbitrage.

### **Progress in strengthening the resilience of financial institutions, ...**

Increase in risk buffers essential

Increasing the risk buffers is pivotal for strengthening the resilience of the financial system. Tighter capital and liquidity requirements can counteract excessive leverage and risky business models. When adjusting capital requirements, identified shortcomings of Basel II must be eliminated. At the same time, however, the principles of the framework must not be called into question, particularly with regard to their risk orientation. A number of measures have already been initiated. The Basel Committee on Banking Supervision, for example, has already decided to increase the inadequate capital requirements for certain risk positions (risk coverage). For instance, the risk weights of (re-)securitisations in the trading book have been adjusted to those of the bank-

ing book in order to prevent risks being shifted to the trading book for arbitrage reasons.

The G20 summit in Pittsburgh, USA, in September 2009, reaffirmed the decision of the Steering Committee of the Basel Committee on Banking Supervision to develop internationally coordinated rules to increase and improve the quality of banks' capital by the end of 2010. This should be seen in a fundamentally positive light. When formulating the details, it must be ensured, however, that sufficient attention is paid to the specific features of national financial systems and that the principle of functional equivalence is applied. This, in turn, must go hand in hand with fair competition between jurisdictions and capital instruments. The crucial criterion for the definition of tier 1 capital should be the loss sustainability of the various capital instruments. Different legal forms which serve identical purposes should be treated equally.

Improvement in capital levels ...

The course the crisis has taken has also underlined the importance of adequate liquidity standards. The temporary loss of confidence in the solvency of key market players and thus in the functional capability of the financial system as a whole meant that liquidity, even more than capital, became the crucial restrictive factor. Financial institutions' resistance to liquidity shocks should therefore be considerably improved, which means that sufficient account has to be taken of both refinancing and market liquidity risks. International bodies tasked with supervisory issues have recognised the need for an appropriate liquidity cushion. For example, the Basel Committee on Banking Supervision will publish new global liquidity standards before the end of this year. The aim of these is

... and liquidity provisioning

to safeguard not only systemic liquidity but also the liquidity of individual institutions. Proposals based on the CoVaR approach,<sup>10</sup> in particular, are designed to achieve this goal.

Special requirements for systemically relevant institutions

The G20 have also agreed to monitor systemically important financial institutions more closely. The systemic relevance of a bank is not determined by its size alone. Its specific role within the system also has to be considered. The supervisory requirements for institutions ought to be based on the systemic risks they generate. The G20 have requested that the FSB present a plan of action detailing potential measures for ongoing supervision as well as specific capital, liquidity and other supervisory standards by the end of October 2010. This is likely to focus on additional capital adequacy requirements for institutions.

Capital base must be widened now

The options for strengthening the risk buffers should not be considered in isolation, but in terms of their cumulative effect. Moreover, stricter requirements should become effective only after a substantial economic recovery. A premature tightening could up the pressure to reduce risk positions and thus increase the danger of a credit crunch. Notwithstanding that, credit institutions should start making substantial efforts to improve their resilience now. One way of achieving this is to use current profits, first and foremost, to strengthen their capital base.

Improvement in risk management ...

Important lessons must also be learned with regard to the handling of banking risks.<sup>11</sup> The crisis has revealed serious shortcomings in many institutions' risk management. Not all major risks have been taken into sufficient account, especially those transferred to off-

balance-sheet special-purpose vehicles. Inadequate attention has likewise been paid to liquidity risks arising from maturity mismatches, as well as risk concentrations and interdependencies. The lack of risk awareness shown by many institutions was compounded by their excessive trust in external ratings and by risk measurement techniques which generally paid no attention to less probable risks. Besides eliminating the above-mentioned shortcomings, the necessary improvements also include allocating responsibility for risk management to the highest management level. Financial institutions should also perform more stress tests in order to identify their loss vulnerability, including for the case of extreme situations arising.

... and compensation practices

Furthermore, compensation regulations in the financial sector must be adjusted, especially with regard to the variable components of compensation. The most common remuneration practices have been characterised by asymmetries in the payment function and provided an incentive to take disproportionately high risks: short-term profit contributions have been rewarded, whereas long-term risk potential or losses have mostly incurred no negative consequences. The aim should therefore be to gear banks' compensation structures more closely to a sustainable development in a way that is compatible with incentives. In this re-

<sup>10</sup> See T Adrian and M Brunnermeier, CoVaR, Federal Reserve Bank of New York, Staff Report No 348, August 2009.

<sup>11</sup> The Minimum Requirements for Risk Management (MaRisk) have recently been amended in Germany to bring them into line with international standards. The new MaRisk are to be implemented by the end of 2009. See also Deutsche Bundesbank, Amendments to the new EU Capital Requirements Directive and the Minimum Requirements for Risk Management, Monthly Report, September 2009, pp 63-79.

spect, the decisions of the G20 summit in Pittsburgh are very welcome. Based on standards developed by the FSB,<sup>12</sup> they provide for the linking of variable compensation components to performance criteria and the staggering of payments. Guaranteed bonuses are ruled out. Compliance with compensation standards is to be monitored by supervisory bodies and, where necessary, enforced by capital surcharges.

### ... greater transparency and adjusted incentives, ...

Greater transparency needed to strengthen market discipline, ...

In order to restore financial stability, greater transparency is required in the international financial system. This would help to foster market discipline. Although market discipline alone cannot prevent the build-up of systemic risks, it can counteract excessively risky business models and the formation of excessive risk positions by individual market players. With this in mind, the enhanced disclosure requirements for financial institutions, which are to apply from the end of 2010 under Pillar 3 of the Basel capital adequacy standards, are a welcome development. This applies, in particular, to securitisation activities and risk exposures relating to off-balance-sheet special-purpose vehicles. The G20's decision to introduce Basel II in all key financial centres by the end of 2011 is therefore a step in the right direction not only from a risk perspective but also with regard to transparency. To create more transparency, the G20 have also increased the statistical requirements with a view to identifying and closing data gaps (see Box 1.7 on page 81).

Greater transparency is required at product level, too. Responsibility for improving market practices lies primarily with the market participants. Improved practices are needed to revive the securitisation market and thus counteract the persisting refinancing problems in the banking sector and reverse the decline in lending to enterprises. Quality standards and incentives in the securitisation process must be improved significantly.<sup>13</sup> Initial progress has already been made in this regard. For example, the EU Capital Requirements Directive was amended in such a way that the issuer of securitisations is now forced to retain at least 5% of the risk.<sup>14</sup> This retention should compel the issuer to conduct a thorough credit analysis before granting the loan and to monitor the loan consistently following its distribution. It is also worth considering whether this percentage risk retention should apply in vertical form, ie across all tranches, in order to bring it into line with the change in the correlation of default risks. Moreover, securitisations are to be made less complex and also structured with less leverage in future. More standardisation would facilitate risk assessment for investors and, at the same time, improve the tradability and, thus, market liquidity of securitised products.

... revive the securitisation markets ...

Greater transparency and compliance with appropriate quality and integrity standards are also on the agenda for rating agencies. Many

... and improve the rating process

<sup>12</sup> See FSB Principles for Sound Compensation Practices – Implementation Standards at [http://www.financialstabilityboard.org/publications/r\\_090925c.pdf](http://www.financialstabilityboard.org/publications/r_090925c.pdf).

<sup>13</sup> See also I Fender and J Mitchell, The future of securitisation: how to align incentives, BIS Quarterly Review, September 2009, and J P Krahen and G Franke, The Future of Securitisation, CFS Working Paper No 2008/31.

<sup>14</sup> The amendments must be transposed into national law by the end of October 2010. The new provisions do not apply until the end of 2010.

Box 1.6

## RESTRUCTURING AND WINDING UP SYSTEMICALLY RELEVANT FINANCIAL ENTERPRISES

**Requirements of a restructuring and winding-up regime**

Distressed systemically relevant financial enterprises pose a major challenge for legal systems across the globe. Mechanisms put in place to resolve such crises have to satisfy a number of sometimes conflicting requirements. The aim is to limit the overall negative effects on the financial system by managing circumstances where the existence of a systemically relevant institution is threatened without damaging the system. However, at the same time, the negative consequences for the general government budget should be kept to a minimum – *inter alia* by involving owners and creditors. In addition, care should be taken to avoid incentive distortions (such as moral hazard, weakening market discipline, competition distortions) that may arise from government assistance as far as possible. Furthermore, when designing the mechanisms, it is essential to ensure that these provide a large degree of transaction security by, for example, enabling rapid intervention while at the same time minimising legal risks.

**Situation in Germany**

At the latest, the current financial crisis has shown that the mechanisms in place in Germany to handle crisis situations, in particular banking supervision law (sections 45 *et seq* of the Banking Act) and general insolvency law, did not provide sufficient scope for an appropriate response to systemically relevant banks in distress.<sup>1</sup> The government thus initially had to respond with *ad hoc* measures (for example, the rescue packages for IKB and HRE) and then later issued the financial market stabilisation acts.<sup>2</sup> There is always a risk inherent in such measures that the aim of sparing government coffers to the greatest possible degree cannot

be achieved. Furthermore, it is extremely difficult to avoid incentive distortions as the “sanction mechanism” of insolvency for providers of debt and equity capital is suspended, at least temporarily. The financial market stabilisation acts also constitute an insufficient safeguard against future crises as, on the one hand, they apply for a limited term and, on the other hand, they satisfy the above-mentioned criteria only partially. For instance, the legal means of obtaining control that provide for certain waivers of general corporate and capital markets law entail actual and legal risks. It therefore appears appropriate to implement an entirely new restructuring and winding-up regime for systemically relevant financial market players in Germany. The responsible ministries presented draft laws to this effect in the third quarter of 2009.<sup>3</sup> However, these address credit institutions only. Suitable procedures should also be put in place for other systemically relevant financial enterprises.

**Central elements in international discussions**

The following (schematic) stabilisation options, which governments can implement against the will of providers of debt and equity capital, are currently being discussed at international level.<sup>4</sup>

- The option of transferring a financial enterprise either in whole or in part to another enterprise (purchase and assumption), using state funds (for example, guarantees) where necessary
- Transfer (in part) to a state bridge bank
- Good bank / bad bank models
- Temporary nationalisation.

These instruments can, for example, be found in the Banking Act 2009, which came into effect in February 2009 in

<sup>1</sup> However, the Act on the Strengthening of Financial Market and Insurance Supervision of 29 July 2009 has led to a number of improvements in the field of prudential measures. — <sup>2</sup> Financial Market Stabilisation Act of 17 October 2008, Financial Market Stabilisation Amendment Act of 7 April 2009 and Act to Develop Financial Market Stabilisation of 23 July 2009. — <sup>3</sup> Draft law by the Federal Ministry of Economics and Technology (law supplementing the Banking Act) of July 2009 and draft law by the Federal Ministry of Justice/Federal Ministry of Finance reorganising systemically relevant credit institutions of August 2009. — <sup>4</sup> See IMF and the World Bank, An Overview of the Legal, Institutional and Regulatory Framework for Bank Insolvency, April 2009, pp 35-43. — <sup>5</sup> Resolution Authority for Large, Interconnected Financial Companies Act of 2009. This draft law is based on and supplements existing mechanisms. — <sup>6</sup> The draft law by the Federal Ministry of Justice/

Federal Ministry of Finance envisages a good bank/bad bank model as well as the option of (partial) transfer to another enterprise. The central restructuring plan defined in the draft by the Federal Ministry of Economics and Technology is also designed to enable such a procedure. — <sup>7</sup> These clauses can be found in many international financing and derivative contracts. They give contractual parties the option, under certain conditions (such as the opening of insolvency proceedings over the counterparty's assets or a similar procedure), to withdraw from a contract or to provide for automatic termination. This problem cannot be resolved in full at national level. Thus sectoral federations, such as the International Swaps and Derivatives Association (ISDA), should be encouraged to make provisions for such changes in their standard contracts. — <sup>8</sup> In the USA, for example, quantitative thresholds have been defined as a prerequisite for intervention by the Federal Deposit

the United Kingdom. Current draft law in the USA<sup>5</sup> also contains similar powers of intervention. The draft laws existing in Germany at present also envisage using these instruments, at least in part.<sup>6</sup> As the measures may differ with regard to attaining the aims mentioned above, they should all be at the government's disposal. To be able to react flexibly and appropriately in each case, a fixed hierarchy among the various options should be avoided.

When specifying the details of the various solutions, the following issues in particular must be addressed.

- Division of tasks and cooperation between the state agencies (government, ministries, supervisory authority, central bank)
- Financing of measures (for example, public and private co-financing)
- Problem of events of default and termination clauses<sup>7</sup>
- Legal protection system against government measures (this is to be designed in such a way that legal certainty can be established as quickly as possible).

Whether the state intervenes should be dependent on two prerequisites; firstly, on the level of threat for the enterprise in question (pre-insolvency threshold) and, secondly, on its systemic relevance. With respect to the pre-insolvency threshold, state intervention could be made dependent on undershooting certain ratios (rules-based formulation).<sup>8</sup> The opposite of this would be a more general (principles-based) formulation.<sup>9</sup> As specific advantages and disadvantages are inherent in both approaches,<sup>10</sup> a hybrid form<sup>11</sup> would be advisable. By contrast, the definition of systemic relevance has to take into consideration the principle of constructive ambiguity. This principle specifies that, as far as possible, there should be no exact publicly accessible definition of systemically relevant enterprises from the outset, as this could trigger negative changes

in the behaviour of financial market players if government rescue measures seemed certain (moral hazard).

### Cross-border enterprises

Where cross-border financial enterprises run into difficulties, the situation becomes more complicated.

At European level, the European Commission is planning a fundamental reform of the current legal framework.<sup>12,13</sup> The debate is presently swinging between models that favour the cooperation of independent national procedures, in particular due to the budget sovereignty of member states and the differences in their respective legal systems (for example, with regard to general insolvency law as well as constitutional and administrative law), and models that promise more efficient procedures in Europe by increasing harmonisation and centralisation.<sup>14</sup>

A consensus has emerged at global level that the mechanisms which to date have existed only rudimentarily have to be fleshed out.<sup>15</sup> The recommendations by the Basel Committee on Banking Supervision presented recently, in particular, are a good starting point for further deliberations. One key element is to prevent too complex a group structure from arising and to have enterprises compile contingency plans or living wills up front.<sup>16</sup> These recommendations stipulate that an institution should draw up a crisis management and contingency plan, proportionate to its size and complexity, stating how it intends to safeguard its existence as an operating unit and, in particular, how it will continue performing systemically relevant functions in emergencies.<sup>17</sup> Consensus on this issue would also make it easier to stabilise and wind up systemically relevant financial market players at national and European level.

Insurance Corporation (prompt corrective action). — **9** As in the UK's Banking Act 2009, for instance. The draft law by the Federal Ministry of Economics and Technology also uses a principles-based definition of intervention prerequisites. — **10** A purely rules-based definition of intervention prerequisites runs the risk of neglecting a threat because this threat was not identified *ex ante* by legislators. However, a purely principles-based definition entails higher legal risks because it is often virtually impossible to foresee how courts will interpret general principles and whether they will recognise a government's scope of assessment. There is also a risk that the government agency may remain inactive for too long (forbearance). — **11** For instance, the level of danger (general clause) in the draft law by the Federal Ministry of Justice/Federal Ministry of Finance is defined rather broadly and is supplemented by concrete cases in which the existence of an enterprise may be considered en-

dangered (rules-based). — **12** In particular, Directive 2001/24/EC for cross-border bank insolvencies, Directive 2001/17/EC for insolvencies of insurance undertakings as well as a Memorandum of Understanding of June 2008. — **13** See European Commission, An EU Framework for Cross-Border Crisis Management in the Banking Sector, Communication COM 561/4, 20 October 2009. — **14** Including distributing financial burdens among the member states affected (burden sharing). — **15** See G 20, Leaders' Statement: The Pittsburgh Summit, No 13. — **16** See Basel Committee on Banking Supervision, Report and Recommendations of the Cross-border Bank Resolution Group, September 2009, recommendation 6 to the contingency plans, pp 31-33. — **17** For the European Commission's deliberations on living wills, see Commission Staff Working Document, SEC 1407 accompanying communication COM 561 of 20 October 2009, p 15f.

credit ratings, particularly those of multi-layered securitisations, have proven to be overly optimistic in retrospect. The valuation models used often underestimated riskiness, especially with regard to the rate and correlation of the probabilities of default. In future, agencies have to eliminate the weaknesses of their models and methods and exercise greater care when monitoring the quality of underlying collateral pools of securities. Greater transparency is also required with regard to the assumptions, criteria and methods used for preparing ratings. Stricter disclosure standards would facilitate the comparability of published credit ratings and pave the way for better opportunities for verification and competition.

Supervision of  
rating agencies

It is against this background that action has been taken by the responsible regulatory and supervisory bodies. In this context, a key role is being played by the International Organisation of Securities Commissions' (IOSCO) revised code of conduct for rating agencies of May 2008, which is being used as a basis for national and regional regulatory measures. The G20 have agreed to monitor those ratings agencies whose ratings are used for regulatory purposes. The EU has passed a regulation to guide and supervise ratings agencies which is to enter into force before the end of this year.<sup>15</sup> This stipulates that rating agencies active in the EU must undergo a certification procedure in future. The fact that this regulation provides for a separate ratings scale for structured products is especially important. This means that allowance is made for the fact that structured products generally have a liquidity and risk profile which is different from that of traditional corporate bonds. This is reflected, for instance, in a higher probability of extreme ratings

changes for structured products. Separate ratings scales mitigate a fundamental problem of institutional investment mandates, ie although scales for traditional bonds meet the minimum quality requirements of many investment mandates in structured securitisations in a formal sense, they harbour significantly higher material risks than originally assumed by most end investors.<sup>16</sup>

### ... strengthening the infrastructure ...

The financial crisis has shown that it was possible for individual market players to build up enormous risk concentrations with over-the-counter (OTC) derivatives. Given the systemic importance of this finding, the reforms adopted by the G20 to strengthen the trading and settlement infrastructure focus on three main issues:

Reform of the  
OTC derivatives  
market

- Trading in standardised OTC derivatives is, where possible, to be transferred to regulated markets (stock exchanges or other electronic trading platforms).
- By 2012 at the latest, standardised OTC derivatives will, where possible, be settled and cleared via central counterparties (CCPs).
- All OTC derivatives are to be recorded in a central database.

<sup>15</sup> See Regulation of the European Parliament and of the Council on Credit Rating Agencies (2008/0217 COD), September 2009.

<sup>16</sup> For the discussion of separate ratings scales, see also Committee on the Global Financial System, Ratings in structured finance: what went wrong and what can be done to address shortcomings?, CGFS Paper No 32, July 2008.



Box 1.7

## FINANCIAL CRISIS AND INFORMATION GAPS

### Mandate of the G20 countries

At international level, the crisis has revealed significant information gaps. For this reason, the G20 have attached great importance to enhancing transparency. The IMF and the FSB were asked to identify the most important deficits in terms of information and data availability and to formulate proposals aimed at closing these gaps. To this end, the IMF and the FSB have presented the finance ministers and central bank governors of the G20 countries with a joint report containing specific recommendations for an internationally coordinated broadening of the relevant database.<sup>1</sup>

### New statistical requirements

The emergence of new market participants, strategies and financial instruments has led to significant changes in the international financial market structures. This calls for new and stricter requirements for rapidly available and internationally comparable statistics. This is especially true with respect to a better information base on cross-border integration, the vulnerability of countries and groups of countries and the build-up of vulnerabilities in the financial sector.<sup>2</sup>

### IMF and FSB recommendations

The recommendations of the IMF and the FSB can be divided into four categories:

- Monitoring of risks in the financial sector: in order to prevent future financial crises wherever possible, it is necessary to identify financial vulnerabilities reliably at an early stage. In this regard, there is a need for action, for example, with respect to data on securities issuance<sup>3</sup> and credit risk transfers.

- International network ties: cross-border links have become considerably more complex. Moreover, in the wake of globalisation, a wide range of financial activities have been transferred to the “shadow banking system”. An expanded information base covering financial activities of this kind should enable more in-depth analyses of the vulnerabilities of individual countries and groups of countries and facilitate changing global transmission channels. This will lay the foundation for a sustained improvement in the monitoring of global macroprudential risks.
- Sectoral and other financial and economic statistics: better sector-related data coverage is essential, particularly since key financial risks have migrated to areas where data has thus far been in short supply and of limited reliability. Added to this are pronounced information gaps in many emerging market economies. Improving the data situation for non-bank financial institutions (such as insurance companies and pension, investment and hedge funds) deserves high priority.
- Communication of official statistics: the financial crisis has not only highlighted marked information deficits. It has also become obvious that there is a need to enhance the transparency of the many international statistical initiatives and programmes that already exist. Furthermore, it is incumbent on each and every G20 country to close the gaps that exist in the availability of national data.

The establishment of precautions in order to prevent financial crises along with the collection and provision of the data needed to achieve this goal is a long-term process that requires a corresponding degree of high-level political support. Hence, the commitment by the IMF and the FSB to present the G20 finance ministers and central bank governors by June 2010 with a progress report and a timetable for implementing the recommendations is to be welcomed.

<sup>1</sup> See FSB/IMF, The Financial Crisis and Information Gaps. Report to G20 Finance Ministers and Central Bank Governors, October 2009; available at [http://www.financialstabilityboard.org/publications/r\\_0911107e.pdf](http://www.financialstabilityboard.org/publications/r_0911107e.pdf). — <sup>2</sup> See B Braasch (2009),

Financial crisis and information gaps. Comments on a proposal by O Issing and J P Krahn. *Intereconomics*, Vol 44, No 4, pp 208-214. — <sup>3</sup> See Working Group on Securities Databases at [www.inf.org/extern/np/sta/wgsd/index.htm](http://www.inf.org/extern/np/sta/wgsd/index.htm).

## Strengthening of central counterparties

These steps are essential for creating transparency and form the basis for microprudential, macroprudential and market supervision. The introduction and increased use of, in particular, central counterparties will play a crucial role in reducing the systemic risks in OTC derivatives markets. By entering into transactions, CCPs lower the counterparty credit risk and reduce participants' open positions through netting. Moreover, they assess the riskiness of remaining net positions and require them to be backed by sufficient collateral.

## First instances of legislative and operational implementation

The US Department of the Treasury introduced legislative measures to this effect in the summer of this year. The European Commission is also reviewing concrete regulatory measures based on the EU consultation process concluded at the end of August this year and has announced (legislative) proposals for the beginning of 2010. Pursuant to an agreement with the European Commission, the major European derivative traders started transferring the clearing of credit derivatives to central counterparties at the end of July 2009.<sup>17</sup>

## Further standardisation necessary

The transactions currently settled via central counterparties represent only a fraction of the (credit) derivatives market. Efforts to standardise credit derivatives must therefore be consolidated and extended to other categories of derivatives. The standardisation of contracts is a major prerequisite for both CCP clearing and electronic trading. Since specialised derivatives can be extremely useful for the individual risk management of banks and enterprises, it is important that OTC trading or bilateral clearing remain possible. However, measures such as the collection in central databases and – where necessary – the strengthening of bilateral

clearing should be implemented to ensure stability in this non-standardised area, too. In addition to this, a number of issues are raised with regard to a definition of framework conditions for CCPs which is effective for systemic stability. Central banks are therefore currently looking into whether their services should also be offered uniformly to central counterparties.

**... and the intensification of international cooperation**

The crisis has also highlighted the importance of close international cooperation. As well as cross-border cooperation between public bodies, this affects international institutions, too. A number of reforms have already been initiated in this respect. The establishment of supervisory colleges for the most important internationally active financial institutions at global level under the guidance of the FSB was a major step towards improving systematic international cooperation. The aim of these supervisory colleges is to act as a platform for sharing information gathered by national authorities on international institutions, and making their cooperation in this field more effective. The revised EU Capital Requirements Directive and the EU Capital Adequacy Directive have enhanced the scope of cooperation between banking supervisory bodies. As a result of new ultimate rights of decision, the role of the

## Enhanced cross-border cooperation

<sup>17</sup> The ECB Governing Council has spoken strongly in favour of there being at least one clearing provider for credit derivatives in the euro area. This service is currently provided by two European CCPs. Eurex Clearing, which is part of the Deutsche Börse Group, is the only provider to offer the clearing of credit derivatives on individual reference enterprises in addition to the clearing of index credit derivatives.

home supervisor, as head of the supervisory college (consolidating supervisor), has been strengthened. This aims to tighten supervision and reduce the burden on institutions.<sup>18</sup>

Upholding the principle of subsidiarity

The FSB and IMF have further intensified their cooperation on macroprudential analyses and begun conducting regular joint early warning exercises to identify risks at an early stage. In the EU, cross-border cooperation is to be stepped up at microprudential level and three new supervisory authorities are to be set up for banks, insurance companies and securities markets. To strengthen macroprudential analysis, a European Systemic Risk Board (ESRB) will also be established, the secretariat of which is to be located at the ECB. These are welcome initiatives. However, it is important to draw a clear line between the individual areas of responsibility and to uphold the principle of subsidiarity. The latter is important on grounds of gains in efficiency and effectiveness, mainly more flexible information gathering and pro-

cessing. Therefore, European authorities should not be granted direct access to individual financial institutions. The authority to issue instructions to institutions must remain at national level, above all, on account of any budgetary issues which may arise.

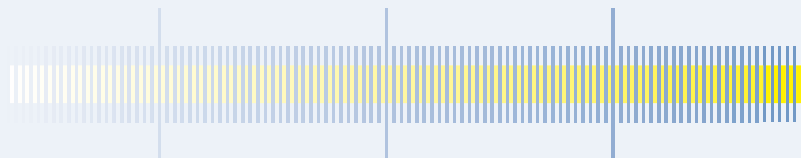
The primary objective of the above reforms is to strengthen the resilience of individual financial institutions as well as the financial system as a whole. In doing so, it is important not to further increase complexity by introducing a plethora of new regulations. Efforts should, instead, focus on ensuring that microeconomic incentives are structured in a stability-oriented manner. This, in turn, should help to minimise the risk of financial crises, which invariably entail high macroeconomic costs.

Essential to structure incentives in a stability-oriented manner

<sup>18</sup> See Deutsche Bundesbank, Amendments to the new EU Capital Requirements Directive and the Minimum Requirements for Risk Management, Monthly Report, September 2009, pp 63-79.



# Article





## Interaction between the Eurosystem's non-standard monetary policy measures and activity in the interbank money market during the crisis

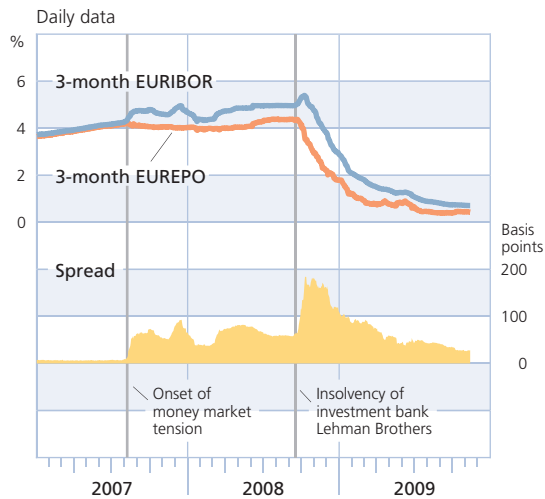
| The non-standard monetary policy measures taken by the Eurosystem – first and foremost the switch to fixed-rate tenders with full allotment for liquidity-providing monetary policy operations – have successfully stabilised the interbank money market, which had become severely impaired during the crisis.

Nevertheless, developments in the money market are far from uniform: on the one hand, unsecured trading, particularly in the longer maturity segments, has been severely curtailed as greater attention has been paid to counterparty credit risk. At the same time, the significance of secured money market trading, especially via central counterparties, has grown. On the other hand, a correlation is evident between the level of excess liquidity – defined as the funds that the Eurosystem provides over and above the liquidity the banking system strictly needs for the fulfilment of reserve requirements – and overnight money market volumes. The higher excess liquidity, the lower overnight volumes in the interbank money market. In order to strengthen market mechanisms, the Eurosystem must therefore, in the medium term, reduce the intermediation it had stepped up during the crisis.

An effective interplay of government aid measures and Eurosystem intermediation is essential for the process of normalising activity in the interbank money market. Once market players' mutual confidence has been fully restored and money markets function properly once more, a reduction in banks' demand will lower excess liquidity. The stabilising incentive mechanisms in place should then activate a convergence process in the market, ensuring that short-term interest rates will once again converge towards the main refinancing rate. In this environment, the Eurosystem will be able to exit from non-standard monetary policy measures – primarily by returning to variable-rate tenders for liquidity-providing operations – thereby supporting the smooth functioning of the money market and, in the medium term, strengthening them in a market setting which has undergone structural change. |

Chart 2.1.1

**SPREAD BETWEEN UNSECURED AND SECURED THREE-MONTH MONEY MARKET INTEREST RATES\***

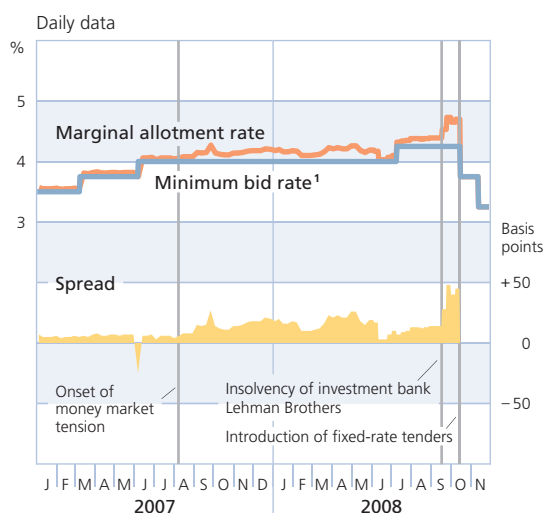


The insolvency of the US investment bank Lehman Brothers severely aggravated tensions in the money market in the autumn of 2008. Uncertainty about the extent of banks' liquidity and capital shortages led to significantly greater importance being attached to counterparty credit risk in the interbank market. Banks responded by clearly reducing, in particular, longer-term lending in the interbank market, and pronounced risk aversion meant new interest rate highs for unsecured longer-term money market transactions (see Chart 2.1.1). The interbank money market in its role as a central redistribution mechanism for central bank money was therefore severely impaired.

Interbank money market severely impaired by crisis

Chart 2.1.2

**SPREAD BETWEEN MARGINAL ALLOTMENT RATE AND MINIMUM BID RATE**



Ever since the onset of the turmoil in the third quarter of 2007, banks' uncertainty about their own liquidity requirements combined with concerns that they would not receive sufficient liquidity at Eurosystem variable-rate tenders – the primary market for central bank money – has caused the spread between the minimum bid rate on main refinancing operations and the marginal allotment rate to widen. This spread reached a historic high of just under 50 basis points at the end of September 2008 (see Chart 2.1.2).

Large spread between minimum bid rate and marginal allotment rate ...

In mid-October 2008, the Eurosystem changed its tender procedure for main refinancing operations in a bid to prevent central bank refinancing from effectively becoming too expensive for credit institutions. The variable-rate tenders previously in use, where the minimum bid rate as well as allotment volumes were fixed by the Eurosystem, were replaced by fixed-rate tenders with full allotment. At the end of October, longer-term refinancing transactions were also switched to fixed-rate tenders with full al-

... which the Eurosystem combated by introducing fixed-rate tenders with full allotment

\* Source: Bloomberg. — <sup>1</sup> Interest rate for ECB main refinancing operations. Since 15 October 2008, fixed-rate tender.



lotment. A host of other non-standard measures were also taken (see Box 2.1).

Below, the focus will be on the full allotment policy in main refinancing operations as these are the Eurosystem's most important monetary policy instrument and signal the monetary policy stance via the key interest rate.

Under full allotment policy, credit institutions ultimately determine aggregate liquidity supply themselves

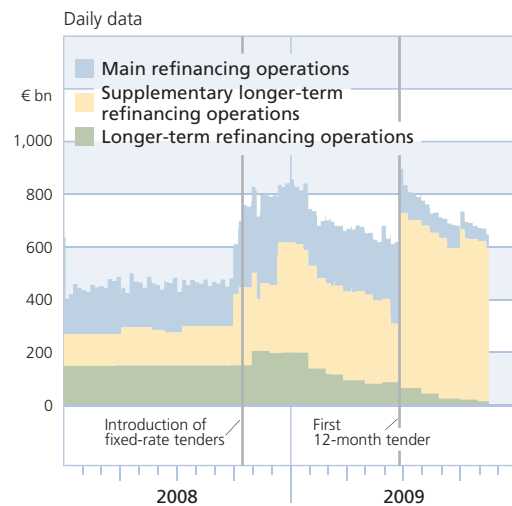
In the autumn of 2008, the Eurosystem was no longer able to forecast credit institutions' actual aggregate liquidity needs. As the redistribution of liquidity in the interbank market had dried up, these requirements were distinctly higher than benchmark liquidity, which can be calculated based on the so-called autonomous factors determining liquidity (mainly demand for banknotes) and minimum reserve requirements. The switch to the policy of full allotment in October 2008 means credit institutions ultimately determine aggregate liquidity supply in the market themselves. Each individual institution has complete certainty that its bid will be satisfied in full provided it has sufficient eligible collateral. The regime change has gone smoothly. At times, the total refinancing volume almost doubled (see Chart 2.1.3) as individual institutions that were suffering a pronounced liquidity shortage or whose need for liquidity buffers had risen significantly bid larger volumes. Furthermore, the initially much higher number of participants<sup>1</sup> – in particular in main refinancing operations – contributed to this development.

Switch to fixed-rate tender procedure leads to marked money market stabilisation

Overall, the switch to a fixed-rate tender procedure with full allotment in all liquidity-providing monetary policy operations in conjunction with the other non-standard monetary policy measures brought about a significant stabilisation of

Chart 2.1.3

### TENDER VOLUME BEFORE AND AFTER INTRODUCTION OF FIXED-RATE TENDERS



DEUTSCHE BUNDESBANK

the money market. Since then, credit institutions have had a stable and – with sufficient collateral – unlimited source from which to cover their short-term and longer-term liquidity shortages at the main refinancing rate as an alternative to the interbank market (see Box 2.2), which is fraught with uncertainty.

Given the sharp rise in refinancing volumes, the market has, since the implementation of the full allotment policy, witnessed large amounts of excess liquidity vis-à-vis the bench-

<sup>1</sup> While the number of participants in 2008 mostly ranged from 200 to 500 until the fixed-rate tender was introduced on 15 October 2008, the number of bidders in main refinancing operations rose to between 600 and 850 between mid-October and the end of 2008. This change was mainly due to the increased participation of German counterparties.

Box 2.1

## THE EUROSISTEM'S NON-STANDARD MONETARY POLICY RESPONSE TO THE CRISIS

When the financial market turmoil started in the summer of 2007, the Governing Council of the ECB responded immediately with a raft of measures designed to maintain control over short-term money market rates and support the smooth functioning of the interbank market. Measures included providing sufficient liquidity to allow credit institutions to fulfil their minimum reserve requirements to the Eurosystem early on in the reserve period, which is usually around a month long (frontloading), and extending the average maturity of monetary policy operations. When the crisis intensified following the insolvency of Lehman Brothers in September 2008 and spilled over from the financial sector to the real economy, the Governing Council initially responded with an internationally coordinated key interest rate cut, reducing euro-area rates by 50 basis points to 3.75%. Subsequent cuts brought interest rates down to 1% by May 2009. In addition, the Council implemented several non-standard monetary policy measures to support bank lending to the real economy as part of its new enhanced credit support policy. These measures were a continuation and enhancement of the stabilisation measures taken prior to September 2008.

In the Eurosystem's monetary policy refinancing operations, credit institutions have, since 15 October 2008, been able to obtain unlimited amounts of central bank liquidity at the key interest rate provided they have sufficient collateral. As an additional measure, the list of eligible collateral was extended, for the time being with effect to end-2010. This temporary move included reducing the credit threshold from A- to BBB- and accepting debt instruments that are denominated in US dollars, pound sterling and Japanese yen and issued in the euro area. The frequency of longer-term refinancing operations was also increased sharply from the third quarter of 2008. Large demand from credit institutions sent the volume of refinancing operations up from €467 billion at the beginning of September to €857 billion at the end of 2008. At the same time, credit institutions at times held several hundred

billion euro in the deposit facility. This balance-sheet extension demonstrates that the Eurosystem stepped up its role as an intermediary in response to the crisis in order to partially replace the interbank money market, which had virtually come to a standstill.

Since 21 October 2008, all credit institutions' bids in the Eurosystem's US dollar operations, which were introduced in December 2007, have also been satisfied in full, allowing banks within the euro area to fund US dollar positions via the Eurosystem, too. The same collateral framework applies to these transactions as to euro refinancing operations. Additionally, the ECB has, since 20 October 2008, conducted swap transactions to supply the Eurosystem's counterparties with Swiss francs in return for euro.

Finally, at the beginning of May 2009, the Governing Council agreed to conduct initially three refinancing operations with a maturity of 12 months and full allotment at the key interest rate (potentially with an interest rate premium for the second and third transactions). In the first of these operations, €442 billion was supplied on 25 June, while another €75 billion was distributed in the second 12 month tender on 1 October. On top of that, the decision was taken to launch a €60 billion purchase programme for highly rated euro-denominated covered bonds in July 2009, which is to be concluded by mid-2010. These measures brought down longer-term money market rates and revived the covered bond market segment, which is vital to credit institutions' refinancing activities. The announcement of the programme led to a marked decline in their interest rate premiums, while primary market issuance was stepped up.

As this publication went to press, the Eurosystem's non-standard monetary policy measures remained in place. The timing of a future exit and what shape it will take depends, first, on the sustainable functioning of the interbank money market and, second, on developments in the inflation outlook.

DEUTSCHE BUNDESBANK

mark.<sup>2</sup> This has also had some other consequences.

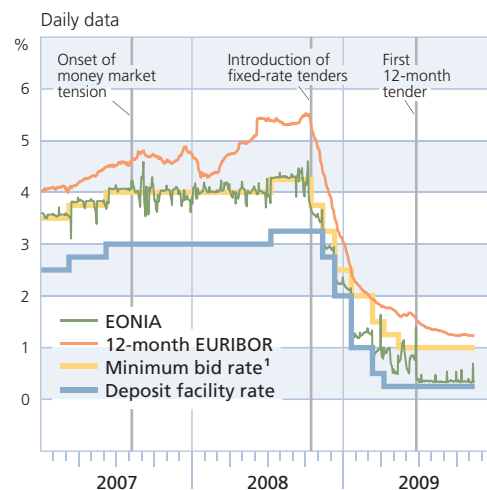
In response to the crisis, liquidity policy has accompanied monetary policy in achieving monetary easing

The very generous supply of liquidity has led to a dive in interest rates in the short-term segments of the money market, which means overnight rates are no longer guided by the main refinancing rate. The Eurosystem merely sets a lower bound through the rate of its deposit facility. As the overnight rate has fallen close to the deposit rate, medium-term money market rates have also been further depressed, providing additional support to the expansionary monetary policy stance (see Chart 2.1.4). Since October 2008, the provision of liquidity *per se* has therefore, for the first time ever, been involved in achieving the desired degree of monetary easing. The principle of separation between liquidity and monetary policy – which states that the liquidity supply must send no independent signals regarding interest rate policy – has therefore been of subordinate importance during the phase of monetary expansion. In fact, liquidity policy has, since October, been supporting monetary loosening and therefore has an important role to play in achieving monetary policy objectives.

From the very onset of the market turmoil in the summer of 2007, turnover in the unsecured interbank money market, in particular, fell substantially. The fact that credit institutions are very uncertain about their own liquidity requirements and are therefore establishing liquidity buffers to limit their liquidity risk is having a negative impact on trading. On top of that, the insolvency of Lehman Brothers and the liquidity and capital squeezes experienced by numerous European banks have been instrumental in largely destroying trust among

Chart 2.1.4

## MONEY MARKET RATES



Source: Bloomberg. — 1 Interest rate for ECB main refinancing operations. Since 15 October 2008, fixed-rate tender.

DEUTSCHE BUNDESBANK

banks. Decision-makers have since paid very close attention to counterparty risk in interbank trading, which means that supply, particularly in the unsecured interbank money market, has been severely limited. Interbank lending now only takes place among counterparties considered to be absolutely beyond doubt.

A closer look reveals significant differences between unsecured and secured trading. While transactions in the unsecured market segment have all but dried up, particularly in the longer maturity buckets, secured (electronic) trading

Significant differences between unsecured and secured trading

<sup>2</sup> Prior to that, frontloading had been used, albeit to a limited degree, to supply more liquidity than the theoretically required amount through above-benchmark allotment. However, excess liquidity was managed such that the EONIA rate was largely stable close to the minimum bid rate – where necessary through liquidity-absorbing fine-tuning operations.

Box 2.2

### MONEY MARKET – FUNCTIONS, SEGMENTS AND PARTICIPANTS

In the money market, credit institutions' short-term central bank balances are traded, generally with maturities of up to one year. Typical maturities besides the important overnight maturity – where the reference rate is the EONIA (Euro Overnight Index Average) – include one week and three months. The central bank acts as a monopoly supplier of central bank liquidity in the money market and therefore dominates the supply side. This allows it to steer short-term money market rates in line with its monetary policy objectives.

Besides direct refinancing with the central bank, credit institutions trade with one another (interbank market), amongst others, to finance longer-term positions with shorter-term contracts and to eliminate individual liquidity imbalances resulting from inflows and outflows of liquidity. The exchange of liquidity is therefore reflected on credit institutions' central bank accounts. Credit institutions require central bank funds, *inter alia*, to fund the public's cash requirements and the minimum reserves they have to maintain with the central bank. In addition, central bank balances are necessary to settle payments.

The money market comprises the unsecured and the secured segment as well as money market derivatives (eg EONIA swaps) and short-term money market paper (eg Bubills). The secured market segment, where liquidity is traded against securities held as collateral, represents the largest segment. The percentage of electronic trading systems is highest in the secured market. Participants in money market trading include not only credit institutions and Eurosystem central banks, but also insurers, fund operators and large enterprises.

EONIA volumes, ie overnight lending by 43 representative panel banks, have averaged €37½ billion a day in the year 2009 to date. In 2007/2008, this figure was €47½ billion after some €40 billion in the preceding years. There are currently no data on volumes in the other euro money market maturity buckets.

DEUTSCHE BUNDESBANK

via central counterparties has actually experienced a significant rise in turnover. Besides almost entirely eliminating counterparty credit risk, secured trading through a prudentially recognised central counterparty in combination with the deposited collateral has the advantage that the lending bank does not have to allocate any capital – which has mostly been a scarce resource since the crisis – to back the transaction.

This shift towards secured transactions reflects the greater weight attached to credit risk in trading decisions. Prior to the crisis, market players in the unsecured interbank market did not regard the possibility of a substantial change in credit risk as relevant given the transactions' relatively short duration. The efficiency and smooth functioning of the unsecured money market before the crisis were ultimately based on the limited availability or inadequate use of information on counterparty credit risk in interbank trading. Following the dramatic events of the last two years, the switch to secured trading could well prove permanent given greater risk awareness, particularly as improvements in the technical infrastructure mean that, compared with former times, conducting secured transactions is barely more complicated than unsecured trading.

Overnight trading in both the unsecured and the secured interbank money market has taken a hit as a result of the generous supply of liquidity in the market. This is evident, for example, from an analysis of the correlation between aggregate excess liquidity – as measured by the use made of the deposit facility in the euro area – and trading volumes in the overnight money segment of Euro GC Pooling (see

Shift towards the secured segment

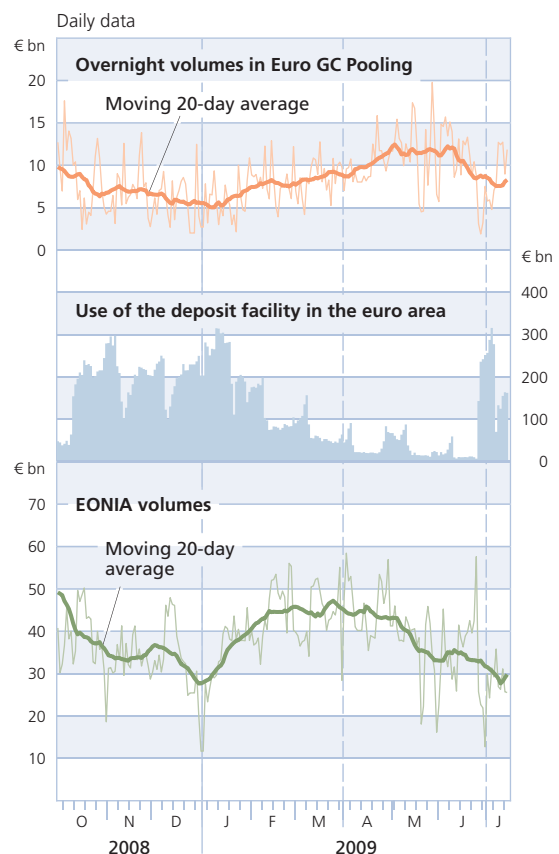
Volumes in overnight money down as a result of generous liquidity supply ...

Box 2.3) in the period from 1 October 2008 to 15 July 2009 (see Chart 2.1.5). These two variables are negatively correlated with a coefficient of -0.54.<sup>3</sup> This implies that an increase in excess liquidity tended to be associated with a reduction in the volume of overnight money traded in Euro GC Pooling, while a decline in excess liquidity was accompanied by an increase in Euro GC Pooling trading volumes. A comparable, though less pronounced, correlation can be observed between the use of the deposit facility in the euro area and the volume of unsecured EONIA transactions over the same period.

This is because the overnight segment ultimately has an important role to play in bridging very short-term liquidity shortages. Strong interaction can be expected: on the one hand, greater market liquidity and increased trading activity are likely to reduce demand at Eurosystem tenders as more banks will again be able to satisfy their liquidity requirements on the interbank market. On the other hand, a gradual drop in excess liquidity is also expected to result in greater volumes in the overnight segment, as rising interest rates make trading more attractive, particularly for those supplying liquidity.

Chart 2.1.5

### EXCESS LIQUIDITY AND OVERNIGHT VOLUMES



Source: Eurex Repo.

DEUTSCHE BUNDESBANK

up in response to the crisis – in order to strengthen market mechanisms.

<sup>3</sup> It should be noted that the use of the deposit facility follows a particular time pattern over the minimum reserve period, which could reduce the correlation. Towards the end of the reserve period, an increasing share of the liquidity supply is no longer required to meet minimum reserve requirements and is therefore placed in the deposit facility. Use of the deposit facility is therefore generally higher at the end of the reserve period than at the beginning.

... Eurosystem will therefore reduce intermediation once the markets are ready

The Eurosystem's decision to provide large amounts of liquidity through its policy of full allotment was necessary (see Box 2.4) as a lack of confidence among banks and the pronounced uncertainty as to how their own liquidity positions would develop meant the redistribution of liquidity among banks virtually dried up, especially in the autumn of last year. However, when the time is ripe, the Eurosystem will actively reduce its intermediation – stepped

Box 2.3

## THE EVOLUTION OF EURO GC POOLING DURING THE CRISIS

The crisis has seen the importance of Euro GC Pooling (EGCP), a cash-driven electronic market segment of Eurex Repo for money market transactions collateralised by securities of high quality and liquidity (general collateral or GC), grow significantly. EGCP offers access to reliable trading, clearing and settlement systems for the European repo

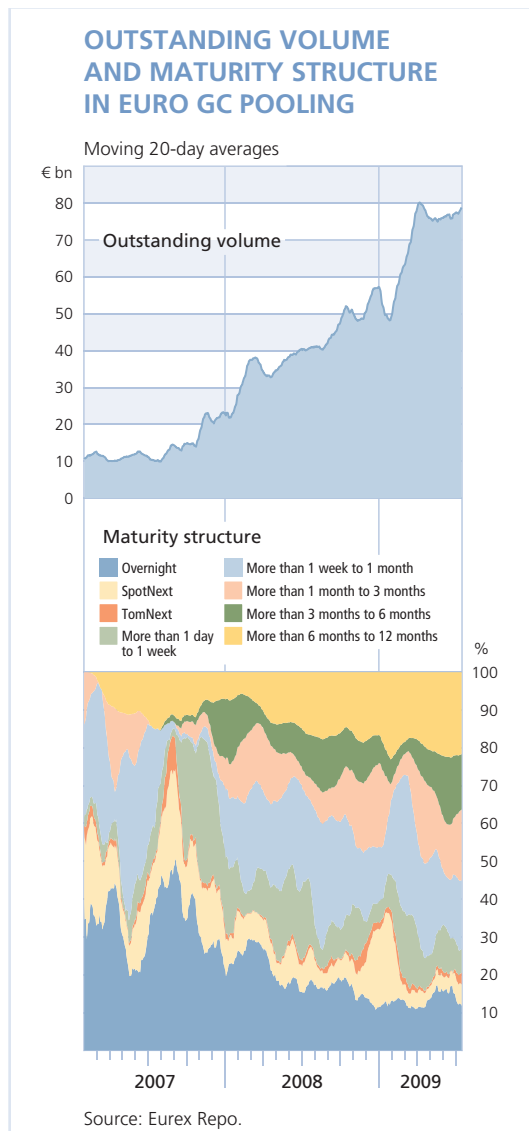
market with process automation and centralised collateral management using the collateral management system Xemac. It allows participants to trade anonymously. Eurex Clearing AG steps in as the central counterparty.

Since the onset of the crisis, the outstanding volume in EGCP has risen perceptibly, swelling from some €10 billion in January 2007 to €80 billion in July 2009. At the same time, the significance of longer-term transactions with maturities of between one month and a year has risen considerably. The higher volume is the result not of an increase in volumes per transaction but rather of a greater number of transactions, which can be attributed in part to a larger group of participants. The number of EGCP participants has risen by 16 since the beginning of 2007 and currently stands at 33. The number of participants based outside Germany has widened to six. Moreover, other international banks are currently in the admission process.

Counterparty credit risk is minimised in EGCP transactions as settlement is conducted via Eurex Clearing. Ultimately, a bank's only risk is a collapse of Eurex Clearing, which appears to be extremely unlikely as various safety mechanisms are in place. Settlement via the prudentially recognised central counterparty means that the transactions do not need to be backed by capital. As equity capital is a scarce resource, the 0% risk weight for EGCP transactions is an additional argument for using this segment.

Another argument in favour of EGCP transactions is that trading is anonymous. Where it is obvious that a bank requires large volumes of liquidity, it may be stigmatised in the market, making bilateral transactions more expensive or impossible. The anonymity of EGCP eliminates this risk.

Automated and smooth settlement has reduced the cost of secured trading and means that the collateralised overnight segment represents an alternative to the unsecured market. Noteworthy for Bundesbank counterparties in this context is the re-use functionality. The use of Xemac as a collateral management system ensures that collateral pledged in interbank transactions via EGCP can be re-used easily and quickly as collateral in refinancing operations with the Bundesbank.



DEUTSCHE BUNDESBANK

The big question is when the markets will be ready for such a step. When the time comes, this assessment will have to be based on a very broad set of information, mainly market indicators and data from monetary policy operations. It should be noted, however, that the extreme values which market-based indicators reached during the crisis have led to perceptible changes in empirical distributions. Thus, comparing, for example, current indicator figures with empirical averages and standard deviations might – depending on the reference period used – paint too rosy a picture. Moreover, the effects of the non-standard monetary policy measures, amongst others, could also impair the informational quality of market indicators, especially in the money market segment. It can be assumed that indicators' past performance and information content is of limited use when assessing future developments as the crisis will have longer-term structural effects on the money market. For many market indicators it is therefore not clear where the new and stable normal level will be following the crisis.

Between the beginning of 2009 and the first 12-month tender at the end of June, excess liquidity gradually declined, although the tender procedure remained unchanged and the number of tenders had actually increased (see Chart 2.1.6). This demonstrates that, even under fixed-rate tenders with full allotment, there is an incentive structure which prevents banks from, on aggregate, borrowing significantly too much liquidity from the central bank in the long run.

Impact of crisis on market access has differed from bank to bank

Banks can be divided into three categories. The first group is considered a good risk and still receives large amounts of money in the market at favourable terms. As a consequence, these

banks no longer need to participate in Eurosystem refinancing operations at all. They are supplying liquidity both in the unsecured and secured interbank market, provided the liquidity taker meets the distinctly higher credit standards or can provide adequate collateral. The second group of banks has some of the liquid collateral which is required in the interbank market, but cannot yet fully cover its increased – especially longer-term – liquidity requirements via the market, mainly as the market is uncertain about its credit outlook. It therefore takes part in the Eurosystem's refinancing operations. The third group is the problematic one as its liquidity situation is stretched but it is not perceived as having a sufficiently good credit standing and lacks adequate collateral for interbank transactions. Therefore it is virtually impossible for these banks to obtain money either in the unsecured or the secured interbank market. The banks in this group are therefore largely dependent on Eurosystem operations.

Where there is ample liquidity in the market – as has been the case following the switch to fixed-rate tenders with full allotment and again since the introduction of 12-month tenders<sup>4</sup> – interest rates, especially for secured money, have been below the fixed interest rate for main refinancing operations. This allows banks to obtain cheaper funding in the market provided they have the liquid collateral demanded by the market. Such interbank transactions are

Convergence process in the market may support exit from policy of generous liquidity supply

<sup>4</sup> The high demand for liquidity in the 12-month tenders is less the result of risk aspects; rather it is mainly based on banks' ability to conduct arbitrage business by financing higher-yielding bonds with similar maturities using the money obtained in the 12-month tenders. In addition, banks can borrow money for a year at favourable conditions, thereby eliminating uncertainty related to potential increases in key interest rates over the course of the year.

Box 2.4

### ANALYSIS OF THE RELATIONSHIP BETWEEN NON-STANDARD MONETARY AND LIQUIDITY POLICY MEASURES AND DEVELOPMENTS IN THE MONEY MARKET

The analysis carried out shows that the combination of the Eurosystem's non-standard monetary and liquidity policy measures and governments' measures to stabilise the banks has brought about a more stable situation in the euro money market again. However, it is methodically virtually impossible to distinguish between the effects of individual measures given the large number of actions carried out simultaneously.

Interest-rate spreads between transactions with matched maturity but different risks are frequently used as indicators in empirical analyses on the role of central bank measures in stabilising the money market and on the general assessment of the money market situation.<sup>1</sup> The regression analysis for the euro money market presented in the table on page 97 focuses on daily changes in the spread between the three-month EURIBOR and the three-month EONIA swap index (OIS) rates in the period from January 2007 to September 2009. As this interest-rate spread shows marked jumps during the crisis, the estimation allowed for the possibility of structural breaks in the coefficient of the constant on specific days during the crisis, including dates associated with certain measures, by means of suitably defined dummy variables. The results show that the coefficient of the constant rose significantly during the period following the collapse of Lehman Brothers. It is not until the period from 6 March 2009 onwards that a major correction of this increase can be seen. This demonstrates that the numerous stabilisation measures introduced in the fourth quarter of 2008 were already helping to effectively stabilise the money market in the first quarter of 2009.

The results of the analysis show, in particular, that significantly positive or negative changes in the

overall liquidity provided by the Eurosystem<sup>2</sup> go hand in hand with significant changes in the EURIBOR-OIS spread in certain phases of the estimation period. The patterns of correspondence were not stable, however. Yet it is evident that, in the estimation, noticeable changes in liquidity on the very day of allotment represent a kind of proxy variable for the current situation in the money market, which influences both banks' bidding behaviour in tenders and quotes for the EURIBOR fixing.

The interpretation of positive or negative changes in liquidity depends on the respective environment. During the critical phase shortly before the transition to fixed-rate tenders with full allotment, for instance, positive changes to liquidity were accompanied by a stronger rise in the EURIBOR-OIS spread. The Eurosystem's discretionary increase in the supply of liquidity was perceived as signalling a crisis. Following the necessary transition to the full allotment policy, however, positive changes in liquidity were associated with a less pronounced increase in the interest-rate spread. It is interesting to note that negative liquidity changes tended to have an even more pronounced dampening effect up to 6 March 2009. With the allotment of liquidity determined purely by demand in this period, these negative liquidity changes were interpreted as signs of easing tensions. The analysis therefore makes it clear that changes to the overall outstanding refinancing volume – in combination with the EURIBOR-OIS spread – also serve as an indicator of the degree of money market tension. The coefficients' significance in the regression analysis presented here underscores the robustness of this conclusion.

<sup>1</sup> See also J B Taylor and J C Williams (2009), A Black Swan in the Money Market, *American Economic Journal: Macroeconomics* 1, pp 58-83, and J McAndrews, A Sarkar and Z Wang, The Effect of the Term Auction Facility on the London Inter-Bank Offered Rate, Federal Reserve Bank of New York Staff Report No 335, July 2008, which use similar approaches to

analyse the impact of the Federal Reserve's Term Auction Facility measures on developments in the spread between the three-month USD LIBOR rate and the OIS rate – albeit in estimation periods ending before the crisis intensified in September 2008. — <sup>2</sup> The estimation takes into account dummy vari-



## DEPENDENT VARIABLE: CHANGE IN THE SPREAD BETWEEN THE EURIBOR AND THE RATE OF THE EONIA SWAP INDEX (FOR THREE MONTHS)

Least squares estimation for the period: 3 January 2007 to 29 September 2009

with the following explanatory variables:	Coefficient	t-statistic	p-value		
Dependent variable lagged one day	0.6437	6.5780	0.0000	<b>Evaluation:</b> Taking into account the structural breaks in the coefficients modelled with the dummy variables from specific dates onwards, accumulation yields the following coefficient estimates for the respective periods:	
Change in the rate of the EONIA swap index (for three months) lagged one day	0.6586	6.1159	0.0000		
Change in the spread of the Markit iTraxx Financial Senior Index lagged one day	0.0005	2.1440	0.0324		
Change in the rate for future main refinancing operations lagged one day	0.0948	1.7494	0.0807		
<b>Constant</b>					
Constant	-0.0028	-5.0787	0.0000	before 9/8/2007	-0.0028
Dummy (1 from 9/8/2007, 0 before that)	0.0036	2.6124	0.0092	9/8/2007 – 14/9/2008	0.0008
Dummy (1 from 15/9/2008, 0 before that)	0.0218	4.0765	0.0001	15/9/2008 – 5/3/2009	0.0226
Dummy (1 from 6/3/2009, 0 before that)	-0.0201	-4.1305	0.0000	from 6/3/2009 onwards	0.0025
<b>Dummy for negative liquidity effect</b>					
Dummy for negative liquidity effect	0.0020	1.5260	0.1275	before 9/8/2007	0.0020
Dummy for negative liquidity effect x Dummy (1 from 9/8/2007, 0 before that)	-0.0060	-2.0662	0.0392	9/8/2007 – 8/10/2008	-0.0040
Dummy for negative liquidity effect x Dummy (1 from 9/10/2008, 0 before that)	-0.0153	-2.1716	0.0302	9/10/2008 – 5/3/2009	-0.0193
Dummy for negative liquidity effect x Dummy (1 from 6/3/2009, 0 before that)	0.0191	2.7772	0.0056	from 6/3/2009 onwards	-0.0002
<b>Dummy for positive liquidity effect</b>					
Dummy for positive liquidity effect x Dummy (1 from 29/09/2008, 0 before that)	0.0836	8.4224	0.0000	29/9/2008 – 8/10/2008	0.0836
Dummy for positive liquidity effect x Dummy (1 from 9/10/2008, 0 before that)	-0.0952	-10.0581	0.0000	from 9/10/2008 onwards	-0.0116
R <sup>2</sup> (adjusted R <sup>2</sup> )	0.3654	(0.3537)			
Log likelihood	1716.38				

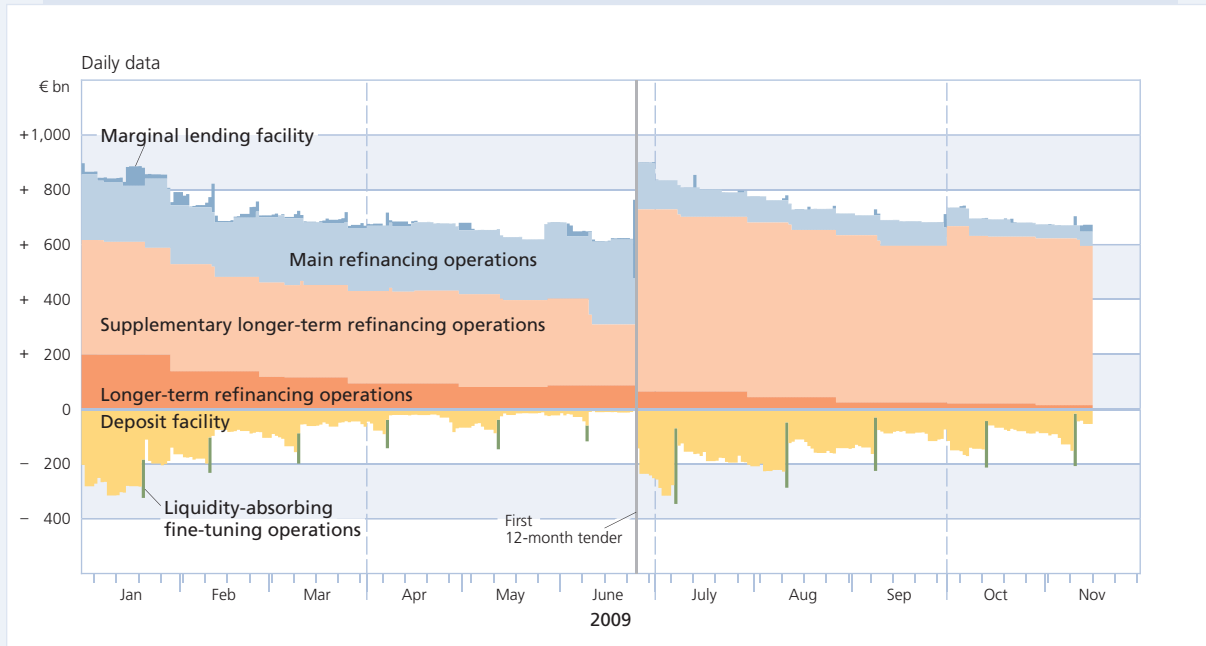
**Note:** The dummy for the negative liquidity effect equals 1 on the day before negative changes (below -€15 million) in outstanding liquidity from open market operations (excluding fine-tuning operations), which coincide with the settlement of new main refinancing and (non-standard) longer-term open market operations, and 0 on all other days. Correspondingly, the dummy for a positive liquidity effect assumes a value of 1 on the day preceding positive changes to liquidity of more than €15 million, and 0 otherwise. The other dummies used for modelling structural breaks assume a value of 1 from the indicated day onwards and 0 prior to that. For the spread of the Markit iTraxx Financial Senior Index (for five years), consolidated Bloomberg data for the latest applicable index series (between series 6 and 11) were used. Presented above are the results of a least squares regression with Newey-West heteroskedasticity and autocorrelation consistent (HAC) standard errors under Eviews. Sources: ECB, Bloomberg, EBF, Bundesbank estimates.

ables for the days preceding significantly positive or negative changes in the overall liquidity that the Eurosystem provides through refinancing operations. The decision to choose a one-day lead in the definition of the dummy variables is motivated by the time difference between the close of tender bidding

respectively allotment and tender settlement. The estimated coefficients for those (0,1) dummy variables then allow conclusions to be drawn as to how changes in the EURIBOR-OIS spread have, on average, developed on such allotment days relative to other days.

Chart 2.1.6

**OUTSTANDING MONETARY POLICY OPERATIONS IN 2009**



DEUTSCHE BUNDESBANK

advantageous for liquidity providers, as they earn more interest than they would on the deposit facility. The lower demand in Eurosystem refinancing operations which this entails reduces the volume of liquidity in the market and thus, in turn, causes market interest rates to rise. This convergence process can therefore support a gradual exit from the policy of generous liquidity supply and also ensures that short-term interest rates in the market will automatically converge towards the main refinancing rate.

gone some way to reducing uncertainty and stabilising the markets. Consequently, in the medium term, the government measures should support credit institutions which were previously only able to obtain refinancing from the Eurosystem as their credit standing was insufficient or they lacked adequate collateral for interbank trading to such a degree as to allow them to borrow money in the market again. At present, for example, some institutions are still almost exclusively using paper guaranteed by Germany's Financial Market Stabilisation Fund (SoFFin) as collateral for refinancing operations with the Bundesbank. However, such securities are also suitable as collateral for repo transactions in the secured money market. The institutions in question could therefore refinance in the interbank market, at least partially. This

Government measures should strengthen banks and allow them access to the money market

The measures taken by governments worldwide – such as guarantees for bonds, strengthening equity capital or assuming risk positions as well as (planned) adjustments to banking supervision and accounting rules – have already

would benefit both counterparties, as the lending bank achieves a higher rate of interest than on the deposit facility and the borrowing bank pays less than the allotment rate in Euro-system refinancing operations.

If the stabilising incentive mechanisms outlined above were to reduce excess liquidity in the market and the redistribution mechanism for central bank money were revived, a return to variable-rate tenders with a minimum bid rate would be possible. However, there is a risk that banks whose market access is still limited would bid very high interest rates to ensure that they obtain sufficient liquidity in refinancing operations. This would again result in a large spread between the marginal and the minimum bid rate and thus cause an unintended restrictive monetary policy. This problem, as well as any other initial uncertainty regarding liquidity buffers still required in the market could, for an interim period, be combated through a very generous supply of liquidity. Looking at individual banks which still have limited market access, however, targeted government measures offering sustainable solutions to the problems experienced by the institutions in question are ultimately required. As the Eurosystem's liquidity measures always target the money market as a whole, individual banks' problems normally cannot be taken into consideration when designing liquidity measures.

Return to variable-rate tenders with a minimum bid rate desirable

In principle, the reintroduction of variable-rate tenders for all refinancing operations is desirable as the Eurosystem should normally fix the allotment volume<sup>5</sup> in order to exploit its information advantage regarding credit institutions' aggregate liquidity requirements. This is because the Eurosystem has more precise infor-

mation than the market on certain autonomous factors that determine the banking system's liquidity requirements besides the minimum reserve requirements. These include, for instance, central bank transactions which have an effect on liquidity relating to foreign reserve assets and euro-denominated own funds portfolios as well as fluctuations in deposits held on Eurosystem accounts by governments and other institutions. Consequently, it must be assumed that in fixed-rate tenders with full allotment, where disaggregate bank bids determine the aggregate allotment volume in main refinancing operations, allotment is more frequently going to be fairly well above or below aggregate liquidity needs. As this is likely to result in greater EONIA volatility, the Eurosystem would have to up the frequency of its fine-tuning operations in order to ensure very short-term money market rates remained stable at the level of the main refinancing rate.

During the crisis, fixed-rate tenders with full allotment for all refinancing operations largely replaced the severely impaired interbank market. As the money market starts to recover, the non-standard monetary policy measures taken in response to the crisis can be phased out in order to stop substituting interbank activity in the money market. Instead, the aim would then be to foster and, in the medium term, strengthen the smooth functioning of the money market, in particular as the money market has undergone structural change during the crisis.

As the money market recovers, the smooth functioning of private market mechanisms is to be supported

<sup>5</sup> The option of fixed-rate tenders with fixed allotment has proved inadequate in the past as it resulted in severe overbidding and thus very low allotment ratios. See also European Central Bank, The switch to variable rate tenders in the main refinancing operations, Monthly Bulletin July 2000, pp 37-42.



# Overview | Chronology of the financial crisis

	Global	Europe	Germany
<b>Late 2006/early 2007</b>	US real estate market collapses; significant increase in default rates on subprime mortgages, falling securities prices (in particular asset-backed securities).		
<b>2007</b>			
<b>April</b>	US mortgage lender New Century Financial Corporation files for Chapter 11 bankruptcy protection.		
<b>June</b>	Two Bear Stearns hedge funds collapse.	ECB increases interest rate to 4%.	
<b>July</b>	Moody's downgrades several subprime bonds with a total value of US\$5 billion.		SME financier IKB announces significant risks from commitments to special-purpose vehicles which had invested significantly in the US real estate market.
	Issuers of asset-backed commercial paper (ABCP) suffer refinancing problems. Large investment funds halt redemptions of share certificates; problems spill over into the interbank market.		
<b>August</b>	The Fed injects US\$38 billion worth of liquidity into the market and extends the pool of eligible assets.	The ECB pumps €117 billion worth of additional liquidity into the euro area financial system using various measures.	Some German banks, in particular SachsenLB, encounter problems stemming from investment in the US real estate market.
	Another US mortgage lender (American Home Mortgage Investment Corporation) files for Chapter 11 bankruptcy protection.	BNP Paribas suspends three investment funds which had invested in the US real estate market.	In order to bridge short-term liquidity gaps, IKB receives funds totalling €3.5 billion from public and private banks.
		Barclays announces liquidity shortfalls.	The savings bank financial group ( <i>Sparkassen-Finanzgruppe</i> ) grants SachsenLB a credit line of €17.3 billion. The state of Saxony takes on a guarantee of €2.75 billion.
<b>September</b>	Fed reduces its target for the fed funds rate to 4.75%.	First UK mortgage lender (Victoria Mortgage Funding) collapses; after run on Northern Rock, the UK government guarantees deposits held at Northern Rock; HSBC closes US mortgage subsidiary and writes off US\$880 million.	
<b>October</b>		Royal Bank of Scotland assembles consortium and acquires ABN Amro for approximately €71 billion.	
	Numerous subprime bonds are downgraded. Several large financial institutions report write-downs. Large losses at US monoline insurers.		
<b>November</b>			In a second rescue package provided by a syndicate of banks, IKB is granted an additional risk guarantee of €350 million.
<b>December</b>	Fed announces second reduction in fed funds rate since September, to 4.25%, and establishes the Term Auction Facility (TAF).		Landesbank Baden-Württemberg takes over SachsenLB.
	BoE, ECB, SNB and BoC agree with the Federal Reserve to make US dollar swap lines available to banks in order to free up the money market.		
<b>2008</b>			
<b>January</b>	Bank of America purchases mortgage lender Countrywide Financial.	Société Générale announces trading losses of around US\$4.9 billion (Kerviel fraud case).	

	Global	Europe	Germany
<b>January (cont'd)</b>	Fed cuts its fed funds rate twice in January, ending up at 3.00%.		
<b>February</b>		Northern Rock is nationalised by the UK government.	IKB requires third rescue package totalling €1.5 billion.
<b>March</b>	Coordinated central bank measures (establishment of swap credit lines) in order to guarantee liquidity provision.		
	The Federal Reserve announces the creation of the Term Securities Lending Facility (TSLF) to support the securitisation market.		
	After liquidity problems, Bear Stearns is sold to JPMorgan Chase with guarantees by the US government.		
<b>April</b>	Citigroup announces write-downs of US\$50 billion.		
	Fed cuts its fed funds rate for the second time since January to 2.00%.		
<b>July</b>	Moody's and S&P downgrade monoline bond insurers Ambac and MBIA.	ECB renews supplementary longer-term refinancing operations totalling €100 billion.	Government-owned KfW sells its 90% share in IKB to Lone Star, a private equity firm.
	US mortgage lender IndyMac is taken over by the US Federal Deposit Insurance Corporation (FDIC).	Fed, ECB and SNB make US dollar liquidity available to European financial institutions under the TAF.	
	The Fed authorises credit lines to US mortgage lenders Fannie Mae and Freddie Mac owing to substantial write-downs.	ECB increases interest rate to 4.25%.	
	The Securities Exchange Commission (SEC) restricts naked short selling.		
<b>August</b>		Danish central bank purchases Roskilde Bank for approximately €603 million.	
<b>September</b>	US government places mortgage lenders Fannie Mae and Freddie Mac in government conservatorship.		
	Lehman Brothers Holdings Incorporated files for Chapter 11 bankruptcy protection. The collapse of Lehman Brothers causes a crisis in confidence in the international financial markets; interbank market collapses.		
	Bank of America announces its intent to purchase Merrill Lynch & Co for US\$50 billion.		
	Fed supports AIG with a loan of US\$85 billion and in return receives a 79.9% stake.	ECB makes unlimited liquidity available to banks via a quick tender operation.	BaFin prohibits naked short selling on selected financial instruments until the end of 2008. Later extended until the end of May 2009.
	Central banks across the world offer new or extended swap lines.	HBOS is taken over by Lloyds TSB.	Mortgage lender Hypo Real Estate (HRE) is threatened with insolvency. The central government and a banking syndicate make €35 billion rescue package available.
	UK, USA, France, Ireland and several other countries place temporary ban on short selling of financial securities.	UK government nationalises mortgage lender Bradford & Bingley.	

	Global	Europe	Germany
<b>September (cont'd)</b>	US Treasury Department announces guarantee programme to support money market funds.	Netherlands, Belgium and Luxembourg support the Fortis Group.	
	The US Treasury Department announces the US\$700 billion Troubled Asset Relief Program (TARP).	France, Belgium and the Netherlands support the Dexia Group.	
	US investment banks Goldman Sachs and Morgan Stanley become bank holding companies.	Ireland guarantees all savings deposits; Irish savings deposit guarantee increased to €100,000.	
	Washington Mutual collapses; its deposits and branches are taken over by JPMorgan Chase.		
<b>October</b>	Fed, ECB, BoE, BoC, Riksbank and SNB lower main policy rates by 50 basis points in a coordinated move.		
	The Fed announces the creation of the Commercial Paper Funding Facility (CPFF) and the Money Market Investor Funding Facility (MMIFF); US government announces Capital Purchase Program (CPP) worth US\$250 billion under the TARP.	Iceland nationalises its three largest banks, Icelandic deposits are guaranteed in full and all Icelandic stock trading is suspended.	The German government and the banking syndicate extend liquidity support for HRE to €50 billion.
	Acquisition of Wachovia by Wells Fargo.	ECB reduces interest rate corridor and extends pool of eligible assets.	The German government issues complete guarantee for all private savings deposits.
	Fed cuts fed funds rate to 1.00% and lends additional US\$38 billion to AIG.	Deposit guarantee limit increased from €20,000 to €50,000 across the EU.	German rescue package agreed - the Financial Market Stabilisation Act ( <i>Finanzmarktstabilisierungsgesetz</i> ). Provision of €500 billion for guarantees and participating interests; Financial Market Stabilisation Fund ( <i>Sonderfonds Finanzmarktstabilisierung</i> , SoFFin) established.
	US Congress passes TARP.	UK announces partial nationalisation of distressed banks (RBS, Lloyds) as well as a rescue package with a total value of £500 billion.	Deutsche Bundesbank makes special liquidity facility available to money market funds if required.
		France announces €320 billion rescue package for financial institutions; Switzerland also approves package of measures to stabilise the financial system.	
		The Dutch bank ING receives a capital injection from the state totalling €10 billion.	
<b>November</b>	American Express becomes bank holding company.		HRE receives guarantees totalling €20 billion from SoFFin.
	US Treasury Department, FDIC and the Fed grant Citigroup guarantees totalling US\$306 billion and a further US\$20 billion in capital is invested in Citigroup from the TARP.	Crisis reaches the Baltic states; Latvia nationalises its second largest credit institution (Parex-Bank).	Commerzbank receives €8.2 billion capital injection from SoFFin.
	Fed announces US\$800 billion programme to support the market for ABS/MBS.		Bayern LB receives €10 billion worth of equity capital from the federal state of Bavaria.

	Global	Europe	Germany
<b>December</b>	Fed cuts fed funds rate (corridor between 0.00% and 0.25%) and announces extension of its temporary liquidity facilities.	ECB extends interest corridor again.	SoFFin grants IKB and BayernLB guarantees totalling €5 billion and €15 billion respectively.
	US government purchases shares in GMAC, a financial subsidiary of GM.	UK credit guarantee scheme is extended to 5 years.	WestLB transfers risky assets totalling €23 billion to a special-purpose vehicle.
	BoJ cuts main policy rate to 0.10% and announces its intention to expand purchases of Japanese government bonds.	Irish government invests a total of €5.5 billion in the three largest Irish banks.	HRE receives €10 billion worth of additional guarantees from SoFFin.
<b>2009</b>			
<b>January</b>	BoJ announces the purchase of JPY 3 trillion worth of commercial paper and ABCP.	BoE cuts bank rate for third time since October 2008 to 1.50%, extends credit guarantee scheme until the end of 2009 and announces purchase of assets totalling £50 billion.	Commerzbank receives a further €10 billion (SoFFin silent participation totalling €8.2 billion. Federal government receives a 25% stake through purchase of ordinary shares worth €1.8 billion).
	US Treasury Department and FDIC support Bank of America with US\$20 billion worth of capital and US\$118 billion worth of guarantees.	UK government takes a 68% share in Royal Bank of Scotland.	HRE receives €12 billion worth of additional guarantees from SoFFin.
		Anglo Irish Bank is nationalised.	
		ECB cuts main policy rate for the third time since October 2008, dropping rate to 2.00%.	
		Risk premiums on euro-area government bonds increase markedly, in particular for Greece, Ireland, Italy and Spain.	
<b>February</b>	US government establishes Public-Private Investment Program (PPIP) to purchase distressed securities.	BoE reduces main policy rate to 1.00%.	HSH Nordbank receives €3 billion rescue package from federal states of Hamburg and Schleswig-Holstein.
	BoJ announces plan to purchase corporate bonds.	RBS receives £13 billion from the UK government (now 84% of RBS in public ownership).	HRE receives further €10 billion in guarantees from SoFFin. Total SoFFin guarantees granted to HRE now total €52 billion.
	US government announces US\$75 billion Homeowner Stability Initiative to stabilise housing markets.		
	US government takes a 36% share in Citigroup.		
<b>March</b>		ECB, BoE and SNB cut interest rates again.	SoFFin makes guarantees totalling €30 billion available to HSH Nordbank.
		BoE creates £75 billion Asset Purchase Facility.	SoFFin purchases shares in HRE totalling €60 million.
		Spain nationalises CCM savings bank (€9 billion in total guarantees).	
	First signs of easing in the financial markets: perceptible decline in risk premiums on the money markets and for credit default swaps (CDSs).		



	Global	Europe	Germany
<b>April</b>	Fed announces new reciprocal currency arrangements (swap lines) with BoE, ECB, SNB and BoJ.	ECB reduces lending rate to 1.25%.	Financial Market Stabilisation Amendment Act ( <i>Finanzmarktstabilisierungergänzungsgesetz</i> ) is approved (includes an option for banks to be nationalised as a last resort).
		Irish government announces National Asset Management Agency (bad bank) to take on risky real estate loans.	Extension of guarantees for HRE until 19 August 2009 and begin of the takeover offer by SoFFin.
<b>May</b>		BoE increases Asset Purchase Facility to £125 billion.	BaFin extends ban on naked short selling.
		ECB cuts interest rate to 1.00%, introduces longer-term refinancing operations and announces the purchase of €60 billion worth of covered bonds.	
<b>June</b>	US banks pay back US\$66 billion in government aid funds.		After capital increase, SoFFin holds a 90% stake in HRE.
<b>July</b>			German Bundestag adopts Bad Bank Act.
			IKB receives further government guarantees totalling €7 billion.
<b>August</b>		BoE increases Asset Purchase Facility to £175 billion.	
<b>September</b>	Bank of America terminates Asset Guarantee Term Sheet by paying US\$425 million.		
<b>October</b>			Complete nationalisation of HRE approved at its extraordinary general meeting. HRE also announces need for additional €7 billion in government assistance.
<b>November</b>	US SME financier CIT files for Chapter 11 bankruptcy protection.		SoFFin grants HRE a further capital injection of €3 billion and extends guarantees until 30 June 2010.



## Overview | Glossary

**ABCP (asset-backed commercial paper)** ABCP are senior debt instruments, usually with a maturity of three to nine months. They are issued by conduits to finance a portfolio of long-term receivables (eg mortgage loans).

**ABS (asset-backed securities)** Securities which are backed by a pool of homogeneous unsecured assets. The asset pool is assigned to a special-purpose vehicle, which services the investors' claims from the pool's payment streams.

**Arbitrage** Generally the exploitation of price differences for identical goods or financial products on different markets in order to make a profit. Pure price 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 price 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. Arbitrage can also refer to the exploitation of differences in the tax system (tax arbitrage) or the exploitation of differences in the regulatory system (regulatory arbitrage) of different jurisdictions.

**Available for sale** See Categorisation of financial instruments.

**Bad bank** Special-purpose vehicle for cleansing bank balance sheets. Against a compensatory payment, banks can offload financial assets with severe impairment risk to a bad bank for a limited period of time, thereby protecting themselves against additional write-downs and, thus, against any further deterioration in their solvency situation this could entail.

**Banking book** Pursuant to the German Banking Act, a credit institution's banking book contains all the items that are not contained in the trading book. See 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 and contains, above all, qualitative questions on developments in credit standards, terms and conditions of loans, and credit demand from enterprises and households.

**Basel III** 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.

**Brokerage** Services provided by financial institutions, usually for hedge funds. These services generally include trade settlement, the safe custody and administration of securities, securities lending, the granting of (collateralised) loans as well as reporting on trading positions and their performance.

**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.

**Categorisation of financial instruments** Enterprises applying international accounting standards are currently required by IAS 39 to assign financial instruments to one of the following four categories: (1) available for sale, (2) financial asset at fair value (held for trading or designated at fair value through profit or loss), (3) held to maturity, (4) loans and receivables. These categories are relevant for the recognition and measurement of financial instruments. It should be noted that the IASB is currently revising the provisions of IAS 39, which is likely to result in significant changes to the categorisation and measurement of financial instruments.

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

**CLN (credit-linked note)** A security whose redemption amount is dependent on contractually agreed credit events (eg 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 the credit event occurs.

**CLO (collateralised loan obligation)** See CDO.

**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 premium income 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 ABCP.

**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.

**Counterparty risk** Risk of default by a contractual counterparty.

**Covered bonds** The central feature of this form of investment is that the investor is protected on two accounts by (1) liability of the issuing financial institution, which in most cases is a bank, and (2) cover in the form of a special collateral pool consisting usually of first-class mortgages or public-sector bonds to which investors have preferential rights in the event of the issuer's insolvency. This distinguishes covered bonds from senior, but unsecured, bonds and asset-backed securities, for which the issuer cannot be held liable. Pfandbriefe are one important form of covered bonds.

**Credit crunch** A quantitative restriction on credit supply so great as to constitute a major economic risk.

**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 CDS 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 (other) investors. The most commonly used credit derivatives are credit default swaps.

**Default risk (counterparty credit risk)** Risk of economic losses 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 the price of which is directly or indirectly related to the development of the market price of other goods or financial instruments.

**EONIA (Euro Overnight Index Average)** A measure of the effective interest rate prevailing on the euro interbank overnight market. It is calculated as a weighted average of the interest rates on unsecured overnight lending transactions denominated in euro, as reported by a panel of contributing banks in the euro area.

**EONIA swap** See Swap.

**EONIA swap index** Index for financial operations whereby a variable overnight rate tied to the EONIA rate is exchanged for an agreed fixed rate for a fixed euro amount over a certain term (EONIA swap). The nominal amount on which the interest payments are based is not exchanged.

**EURIBOR (Euro Interbank Offered Rate)** The average interest rate at which a prime bank is willing to lend funds in euro to another prime bank. The EURIBOR is reported daily for interbank deposits with maturities of up to 12 months.

**Fair value** Refers to a valuation procedure for assets in international accounting practices (currently IAS 39.43 *et seq*). These assets comprise items of the categories “available for sale” and “at fair value through profit or loss”. Quoted prices on an active market offer the best guidance for determining fair value. Where no active market exists, the enterprise can itself use a valuation procedure to determine the value.

**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.

**Financial Stability Board (FSB)** Consists of representatives from central banks, finance ministries, supervisory authorities and international organisations. The FSB was set up by the G7 finance ministers and central bank governors in early 1999 as the Financial Stability Forum (FSF) with the objective of improving international cooperation and coordination in the supervision and oversight of the financial system. At the G20 summit in London in April 2009, it was agreed that the organisation be renamed FSB and given an extended mandate and membership.

**Fixed-rate tender** A tender procedure in which the interest rate is set in advance by the central bank and participating counterparties bid the amount of money they wish to transact at the fixed interest rate.

**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, 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).

**Haircut** Percentage discount that is applied to the value of an asset to provide the lender with a risk buffer in a collateralised lending transaction (eg repo transaction). The haircut is intended to absorb expected fluctuations in the value of the asset during the term of the loan and, in the event of the borrower becoming insolvent, to cover the outstanding debt.

**Hazard rate model** Econometric model for estimating the probability of an event occurring within a defined period. It is used here to establish the probability that the survival 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 Deutsche Bundesbank's model are an institution's capitalisation, profitability, credit and market risk as well as regional and macroeconomic factors.

**Hedge fund** 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.

**Held for trading** See Categorisation of financial instruments.

**Held to maturity** See Categorisation of financial instruments.

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

**IASB (International Accounting Standards Board)** An independent body of international accounting experts which developed the IFRS and amends them where necessary.

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

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

**Investment 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.

**LBO (leveraged buyout)** 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.

**Lender of last resort** Describes the function performed by the central bank of bridging a solvent bank's short-term liquidity shortages by providing central bank money. This can prevent a liquidity crisis from spilling over to other banks.

**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 risk** a) 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 drawdown of lending commitments (withdrawal risk).

b) 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 and receivables** See Categorisation of financial instruments.

**Loan to value (LTV)** Ratio of the loan amount to finance the purchase of a property to the mortgage lending value of that 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** Difference between the interest rates offered by a bank on loans or deposits and a reference rate.

**Market liquidity** Market participants' ability or possibility 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 that are backed by a pool of mortgage loans. They are divided into CMBS and RMBS depending on the type of loans by which they are backed.

**Median** Statistical measure which divides into two equal halves a series of observed values listed in order of size (a distribution) in such a way that 50% of the values are above the median and 50% are below it.

**Monolines (monoline insurers)** Insurance companies which specialise in hedging credit risk.

**Moral hazard** Refers to uncertainty over a counterparty's (positive/negative) behaviour owing to an asymmetric distribution of information. In this context, a problem arises where one party has behavioural scope and his actual behaviour cannot be monitored by the other.

**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 instruments.

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

**Operating income** Total of a bank's net interest received, net commissions received and net trading result.

**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 capital ratio** The ratio, expressed as a percentage, of the own funds eligible for German Banking Act purposes and the total capital charges for credit risks, market risk positions and operational risks, which are multiplied by a factor of 12.5.

**Panel regression model** Econometric method for estimating empirical relationships on the basis of large datasets with a time and a cross-section dimension (eg enterprises, individuals). A particular feature is that unobserved individual, ie cross-section-specific, effects can be considered.

**Potential output** In the sense of output that the economy as a whole could potentially produce with a given provision of natural resources; potential output is determined by the available production factors of labour and capital, the state of technology as well as policies governing the organisation of the economy and growth.

**Principle I (Own Funds Principle)** See Solvency Regulation.

**Private equity** Capital invested by private investment companies, generally in non-listed companies. The aim is often to restructure the enterprise and then sell it on for more than the acquisition price, 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.

**Quick tender** The tender procedure used by the Eurosystem for fine-tuning operations on the money market when it is deemed desirable to produce a rapid impact on the liquidity situation on the market. Quick tenders are normally executed within 90 minutes of the announcement of the tender and restricted to a limited number of counterparties.

**Rating** Scaled classification of the creditworthiness of borrowers (eg enterprises, banks or countries) or of the securities issued by them.

**Refinancing liquidity** Describes market participants' access to financing. See Liquidity risk.

**Regulatory capital for solvency purposes** Comprises regulatory tier 1 capital for solvency purposes, regulatory tier 2 capital for solvency purposes as well as 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.

**Repo transaction** Financial transaction, generally for temporary financing purposes, in which a counterparty sells securities (transferor) and at the same time agrees to repurchase them from the transferee at an agreed price on a set future date.

**Return on equity (RoE)** Measure of an enterprise's or a 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.

**Risk premium** Compensates the investor for taking on a risk; among other things, 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 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 their default risk. See Solvency Regulation.

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

**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 resulting separate tranches are awarded different ratings. See ABS.

**Short selling** The sale of borrowed assets that a seller does not own. A distinction is made between transactions covered by a securities lending agreement (short sale) and those without similar safeguards (naked or uncovered short sale).

**Solvency** Provision with own funds.

**SolvencyII** European Commission project, which – following a similar concept to BaselII – 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** Regulation governing the capital adequacy of institutions, groups of institutions and financial holding groups. Entered into force on 1 January 2007 and became mandatory for all institutions in Germany on 1 January 2008 after a one-year transitional period. It transposes the provisions of BaselII into German law and replaces Principle I.

**Special Fund Financial Market Stabilisation – Financial Market Stabilisation Agency (SoFFin)**

Fund set up by the German parliament in October 2008 to stabilise Germany's financial system. The Fund can draw on different instruments (granting of guarantees, recapitalisation and risk assumption) which allow financial institutions to strengthen their equity capital and remedy liquidity shortages for a limited period of time.

**Squeeze-out** Process by which minority shareholders are forced out of a public limited company against payment of an equitable compensation. A squeeze-out is permitted under the German Stock Corporation Act if a shareholder holds at least 95% of the public limited company's share capital either directly or through dependent enterprises.

**Stress test** Simulation of the effects of extreme, but not implausible, 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 stress 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 financial instruments (such as derivatives, securities or other claims) bundled in such a way that a new investment product is created. Main features are the formation of a pool of assets, the distribution of claims to payment inflows from this asset pool into separate tranches with different risk / return profiles and the separation of the asset pool credit risk from the arranger's risk – usually via a special-purpose vehicle.

**Swap** Contract whereby two parties agree to exchange different payment flows (eg foreign currency or interest payments) during a specific term on fixed dates in the future.

**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.

**Tier 1 capital / tier 1 capital ratio** Regulatory 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-weighted assets.

**Tier 2 capital** Together with tier 1 capital, an integral part of regulatory capital (normative anchor in section 10 (2b) of the German Banking Act). Tier 2 capital includes instruments with a lower quality of liability.

**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 defaults on claims from the security pool, the medium-priority mezzanine tranche and the senior tranche, which is the last tranche to bear losses.

**US GAAP** US accounting standards developed by the Financial Accounting Standards Board (FASB) with the aim of making information on an enterprise's economic situation and profit prospects available to external investors.

**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). The VaR also serves as a risk management tool in that VaR limits are set which may not be exceeded.

**Variable-rate tender** A tender procedure whereby the counterparties bid both the amount of money they wish to transact with the central bank and the interest rate at which they wish to enter into the transaction.

**Volatility** Measure of fluctuations, eg in the price of a financial instrument, within a certain period (often expressed on terms of standard deviations).

**Wholesale** Segment of short and long-term refinancing of credit institutions with institutional investors and on the capital market.

**Yield curve** Relationship between the interest rates and the maturities of an investment for issuers with the same credit rating. A yield curve is normal (inverse) 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 2007

*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 October 2007, see the index in the *Financial Stability Review*, November 2007.

- |                |  |
|----------------|--|
| September 2009 | Developments in lending to the German private sector during the global financial crisis   The performance of German credit institutions in 2008   Amendments to the new EU Capital Requirements Directive and the Minimum Requirements for Risk Management |
| March 2009     | Cashless payments in Germany and the role of the Deutsche Bundesbank   |
| January 2009   | Bank Lending Survey: an interim assessment and current developments   The Basel Framework in practice – implementing the Basel advanced approaches in Germany  |
| September 2008 | The performance of German credit institutions in 2007   Liquidity risk management at credit institutions   |
| July 2008      | Recent developments in the international financial system  |
| December 2007  | The current status of banks' internal risk management and the assessment of capital adequacy under the Supervisory Review Process  |

**DISCUSSION PAPERS, SERIES 2: BANKING AND FINANCIAL STUDIES**

- 15/2009 What macroeconomic shocks affect the German banking system? Analysis in an integrated micro-macro model
- 14/2009 The dependency of the banks' assets and liabilities: evidence from Germany
- 13/2009 Systematic risk of CDOs and CDO arbitrage
- 12/2009 Margins of international banking: Is there a productivity pecking order in banking, too?
- 11/2009 Determinants for using visible reserves in German banks – an empirical study
- 10/2009 The dark and the bright side of liquidity risks: evidence from open-end real estate funds
- 09/2009 Income diversification in the German banking industry
- 08/2009 Financial markets' appetite for risk – and the challenge of assessing its evolution by risk appetite indicators
- 07/2009 Time dynamic and hierarchical dependence modelling of an aggregated portfolio of trading books – a multivariate nonparametric approach
- 06/2009 Does banks' size distort market prices? Evidence for too-big-to-fail in the CDS market
- 05/2009 Why do saving banks transform sight deposits into illiquid assets less intensively than the regulation allows?
- 04/2009 Shocks at large banks and banking sector distress: the Banking Granular Residual
- 03/2009 The effects of privatization and consolidation on bank productivity: comparative evidence from Italy and Germany
- 02/2009 Stress testing German banks in a downturn in the automobile industry
- 01/2009 Dominating estimators for the global minimum variance portfolio