

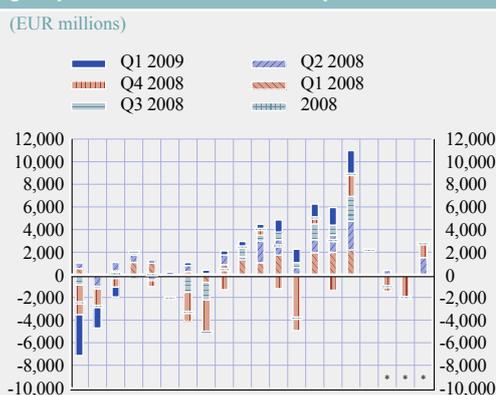
## 4 THE EURO AREA BANKING SECTOR

Euro area banks came under intense financial stress in the last quarter of 2008, and many large and complex banking groups (LCBGs) suffered substantial losses. While these losses were partly due to further write-downs on their structured product portfolios, the deterioration of the macroeconomic environment in the first quarter of 2009 had a more marked impact, triggering an increase in loan losses and a decline in non-interest revenue. Market participants also became increasingly attentive to the level of capital ratios, which held up well, thanks partly to government recapitalisations and especially to the quality and composition of capital. The overall outlook for LCBGs remains uncertain, with the prospective increase in loan losses affecting most of these institutions and funding costs remaining elevated beyond very short-term maturities. In this regard, and notwithstanding some improvement in financial positions in the first quarter of 2009, euro area LCBGs will have to take further steps to convince financial markets and authorities that they will be in a position to withstand the risks that lie ahead. More elaborate pricing of loans and hedging of securities, as well as further cost-cutting and rethinking of business models, might be necessary to restore stable earnings and organic capital growth.

### 4.1 FINANCIAL CONDITION OF LARGE AND COMPLEX BANKING GROUPS<sup>1</sup>

Stresses in the euro area banking system remained intense in the last quarter of 2008 and in the first quarter of 2009. Most banks reported either substantial profit declines or outright losses for 2008. Much of the profit compression was reported for the fourth quarter of 2008. The weighted average return on shareholder equity (ROE) for 2008 as a whole declined dramatically, to 1.9%, from 11.7% in 2007, for the full sample of 20 LCBGs.<sup>2</sup> In fact, the whole ROE distribution across LCBGs continued to shift downwards in 2008, as compared with 2007 and 2006 (see Chart S86). The erosion of bank profits is attributable to a number of factors.

Chart 4.1 Quarterly pattern of the net income of euro area large and complex banking groups in 2008 and the first quarter of 2009



Sources: Individual institutions' financial reports and ECB calculations.

Note: \*: A small number of LCBGs report only semi-annually.

Write-downs on structured products continued, and the deterioration of the macroeconomic environment triggered a rise in loan loss provisions. In the fourth quarter alone, write-downs on structured assets at euro area LCBGs amounted to €29.7 billion, the highest quarterly figure so far. For 2008 as a whole, the amount was €70.6 billion. The weighted average loan impairment charges of euro area LCBGs was 0.21% of total assets in 2008, compared with 0.08% in 2007 (see Table S5). At the same time, the unfavourable trading environment, especially in the last quarter of 2008, squeezed net non-interest revenues. As a percentage of total assets, these fell from 0.94% in 2007 to 0.48% in 2008 (see Table S5).

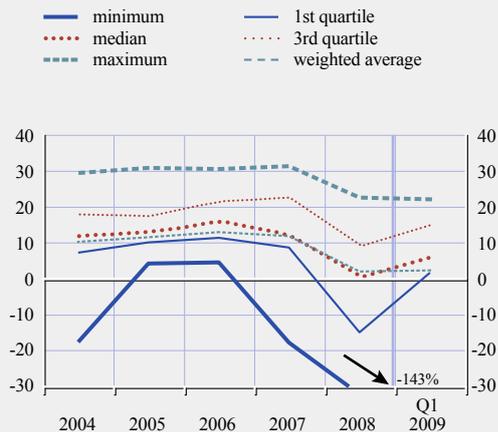
Over the course of 2008, the annualised quarterly ROE (using shareholders' equity as a measure of equity) of euro area LCBGs declined quarter after quarter, from 12.1% in the first quarter to 9.1% in the second, and to 1.6% and -18.7% in the third and fourth quarters respectively, but recovered in the first quarter of 2009, to 2.2%. Reported performance in the last quarter of the

<sup>1</sup> The analysis of developments in the first quarter of 2009 in this section is based on data for a sub-set of LCBGs that had reported at the time of finalisation of the Financial Stability Review (FSR).

<sup>2</sup> Two banks were dropped, owing to acquisition activity and a split of the company, from the sample of LCBGs which is the focus of this chapter. The identification of LCBGs is described in Box 10 in ECB, *Financial Stability Review*, December 2007.

**Chart 4.2 Return on equity of euro area large and complex banking groups**

(2004 – Q1 2009; percentage)

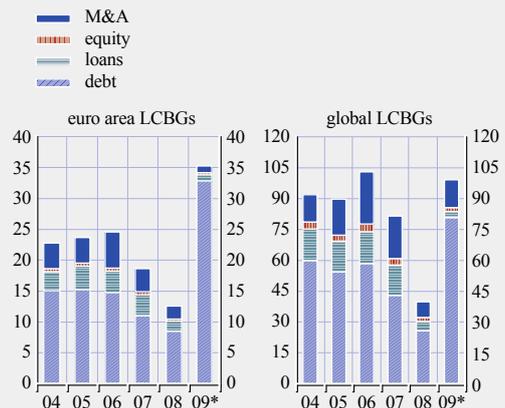


Sources: Individual institutions' financial reports and ECB calculations.

Note: The chart uses Tier 1 capital as a measure of equity capital. Data for Q1 2009 are for a subset of 16 LCBGs that reported quarterly results in the first quarter of 2009.

**Chart 4.3 Capital market underwriting volumes of euro area and global large and complex banking groups**

(2004 – Apr. 2009; percentage of assets)



Sources: Dealogic and ECB calculations.

Note: Figures for 2009 cover the period from January to May.

year was especially weak (see Chart 4.1). Part of the steady decline in the financial performance of LCBGs is probably due to the above-cited factors and the intensification of the market turmoil after the failure of Lehman Brothers. However, the fact that performance deteriorated so significantly during the last quarter, and by much more than analysts and market participants had expected, raises questions about the transparency of quarterly earnings reports, which are not audited. The pattern of reported profit erosion could, for instance, indicate that banks with outsized fourth-quarter losses had attempted to smooth earnings throughout the year, assuming that the worst of the crisis would be over by end-2008. This might also explain the further substantial declines in many bank stock prices and persistently elevated credit default swap (CDS) spreads in the last quarter of 2008 and early 2009 (see Section 4.3).

In the first quarter of 2009, the performance of euro area LCBGs improved somewhat in comparison with that in 2008 as a whole, although there were a few significant underperformers that pulled down the average performance ratios. For a subset of 16 LCBGs

that report on time and in sufficient detail, the weighted average ROE (using Tier 1 capital as a measure of equity) fell from 4.05% in 2008 to 2.13% in the first quarter of 2009 (see Chart 4.2). This figure was negatively influenced, however, by severe losses at very few LCBGs, reflecting a large increase in loan losses and writedowns on structured asset portfolios (and on exposures to monolines in particular cases), as well as exceptional losses. Excluding the most negative observation, the ROE in fact improved modestly to 6% in the first quarter of 2009.

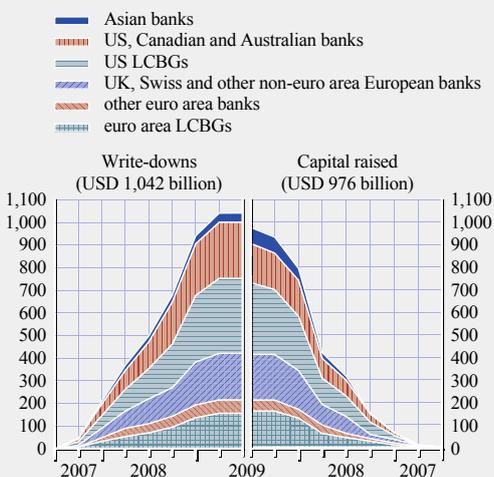
Underpinning the tentative recovery in financial performance by most LCBGs were strong revenues from retail lending (thanks to a steeper yield curve), fee income (from mergers and acquisitions, and capital market advisory business) and substantial cost cutting, all of which helped to underpin profitability. Notably strong capital market issuance volume (thanks to a low interest rate environment and issuance by investment-grade corporates) greatly supported both euro area and global LCBGs' non-interest income in the first quarter (see Chart 4.3). Whether this proves sustainable for the rest of 2009

will very much depend on banks' ability to keep up their performance and contain write-downs while, at the same time, achieving further progress in de-risking their balance sheets. For instance, interest revenue could well be boosted for banks in countries where "fixed-rate" lending is predominant (see Box 13). Similarly, issuance activity could remain high for some time to come as (mainly large) corporates continue to tap the capital markets.

According to estimates as at 28 May 2008, the total reduction in net income attributable to write-downs by global banks since the turmoil erupted has amounted to USD 1,042 billion (see Chart 4.4). US, Canadian and Australian banks reported the bulk of the income losses – about 56% of the overall figure. A further 20% was suffered by UK, Swiss and other non-euro area European banks, and another 20% by euro area banks.<sup>3</sup> For euro area LCBGs, write-downs amounted to USD 20 billion in the first quarter of 2009. For 2008 as a whole, write-downs for euro area LCBGs amounted to USD 105 billion. There is little evidence, therefore, to suggest that the pace of write-downs has abated.

**Chart 4.4 Turmoil-related bank write-downs and capital raised by region**

(as at 28 May 2009; USD billions)



Sources: Bloomberg and ECB calculations.  
Note: The data do not cover all banks in the euro area nor do they cover all banks across the globe.

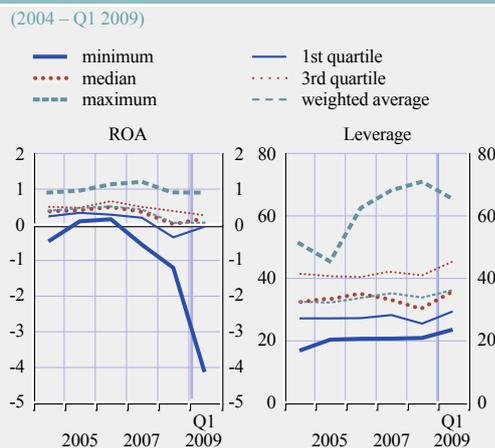
It is important to note that there were also factors which supported euro area banks' financial results in the second half of 2008. In particular, the reclassification of assets from trading and available-for-sale to hold-to-maturity in the third and fourth quarters of 2008, which was also done by Swiss and UK banks, delayed the negative impact of markdowns on profit and loss accounts. Without this, reported financial performances would have been considerably weaker in the last two quarters of 2008. An inspection of individual bank statements suggests that euro area LCBGs reclassified €375 billion of assets. The additional reduction in income before taxes without reclassification would have amounted to €11.2 billion (which compares with aggregate profits of €18.3 billion for 2008 as a whole). Euro area LCBGs also indicated that without reclassification, equity would have fallen by €14.1 billion (around 3% of their equity base).

This having been said, further strains on profits cannot be excluded, as pressures on income remain high and write-downs are not expected to abate soon (see also Section 4.2). This in turn is likely to put additional pressure on banks' capital buffers. Seeing the ROE profitability measure as the product of the return on assets (ROA) and the asset-to-equity ratio (a measure of leverage), it is possible to decompose patterns in the ROE of euro area LCBGs (see Chart 4.5). Underlying the declines of the ROE during 2008 was a significant drop in intrinsic profitability: the average ROA declined from 0.41% in 2007 to just 0.01% in 2008. At the same time, active attempts by banks to deleverage also placed downward pressure on the ROE, as the weighted average leverage multiple decreased from 37 in 2007 to 33 in 2008.<sup>4</sup> For the first quarter of 2009, the weighted

<sup>3</sup> Box 14 in Section 4.2 discusses the outlook for euro area LCBGs' future financial losses.

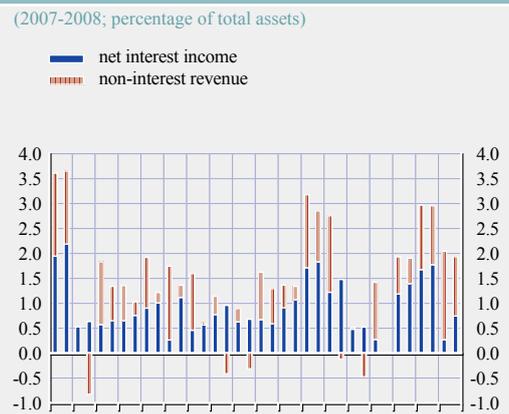
<sup>4</sup> For the six LCBGs where the leverage multiple effectively increased, this can be attributed to a combination of realised net losses and reductions in unrealised gains on available-for-sale securities (both reducing equity) and the increase in the replacement value of derivatives (increasing both assets and liabilities) following official interest rate cuts, stock index declines and credit spread widening in the last quarter of 2008.

**Chart 4.5 Return on assets and leverage of euro area large and complex banking groups**



Sources: Individual institutions' financial reports and ECB calculations.  
Notes: Leverage is defined as assets-to-Tier 1 capital. Data for Q1 2009 are for a subset of 16 LCBGs that reported quarterly results in the first quarter of 2009.

**Chart 4.6 Evolution of interest and non-interest revenue of individual euro area large and complex banking groups**



Sources: Individual institutions' financial reports and ECB calculations.

average ROA of the 16 LCBGs for which quarterly figures are available remained broadly unchanged at 0.07% compared with 0.06% in 2008. Again, when excluding the minimum observation, it actually improved to 0.18%. Leverage, on the other hand, seemed to have slightly increased from 34.2 to 35.4, suggesting that the process of deleveraging may have stalled or even reversed somewhat. In all likelihood, further strains on profits and pressures to deleverage and de-risk will remain in place for a prolonged period of time. This may mean that euro area LCBGs will experience a prolonged period of lower profitability.

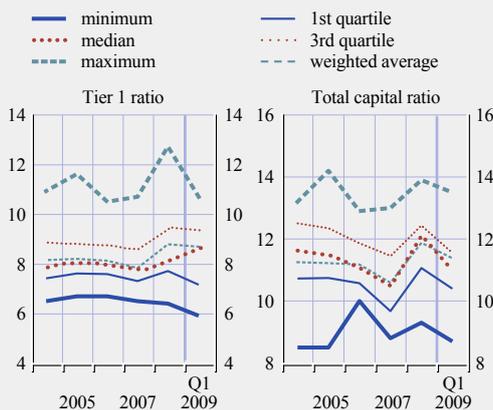
Price-to-book ratios also reflect the low profitability of banks (see also Section 4.3). Since the start of the financial crisis in 2007, price-to-book ratios in the US and euro area banking sectors have fallen continuously and are now significantly below one, implying that market participants consider banks to be worth less than their intrinsic values, arguably because markets discount further losses. It should also be noted that these implied losses have come down markedly since the beginning of March, thanks to an improvement in price-to-book ratios.

Looking at the composition of euro area LCBGs' revenue in more detail, it is clear that mainly non-interest revenue suffered in 2008 (see Chart 4.6). Net interest revenue stabilised at around €140 billion and, expressed as a percentage of total assets, it actually increased from 0.85% in 2007 to 1.02% in 2008 (see Table S5). Net non-interest revenue, on the other hand, fell sharply from around €170 billion in 2007 to €110 billion in 2008. Banks' trading income was the main item to suffer on account of adverse market conditions throughout the year and especially in the fourth quarter. As a percentage of total assets, income from trading declined from 0.30% in 2007 to -0.08% in 2008. Fee and commission income held up relatively well throughout 2008, declining modestly from 0.57% in 2007 to 0.48% of total assets in 2008, while other income also fell from 0.15% to 0.05% of total assets.

Turning to capital adequacy, euro area LCBGs' current regulatory capital ratios are in conformity with the regulatory minimum requirements. Moreover, both the median and weighted average Tier 1 ratios increased in 2008, as compared with 2007, from 7.76% to 8.15% and from 7.83% to 8.77% respectively (see Chart 4.7). In the first quarter of 2009, the Tier 1 capital ratio for the

**Chart 4.7 Tier I capital and overall solvency ratios of euro area large and complex banking groups**

(2004 – Q1 2009; percentage)



Sources: Individual institutions' financial reports and ECB calculations.

Note: Data for Q1 2009 are for a subset of 16 LCBGs that reported quarterly results in the first quarter of 2009.

subset of 16 LCBGs that reported quarterly figures remained unchanged from 2008 at 8.4%. The total capital ratio followed more or less the same pattern. Part of the recovery in regulatory capital is due to a reduction in risk-weighted assets and asset shedding at a majority of LCBGs. However, the increase also reflects the fact that euro area

LCBGs successfully raised capital in 2008 – both from private and from public sources – to cover the losses incurred. As shown in Chart 4.4, by the cut-off date of this FSR, euro area banks had received relatively more fresh capital than their US peers, as private and public capital injections were equivalent to 138.3% of write-downs in the euro area versus 89.2% in the United States.

By the cut-off date for this FSR, euro area LCBGs had announced €64 billion of capital injections from governments, in addition to €113 billion funding guarantees, following the intensification of the financial crisis in September-October 2008 (see Box 11 for details of the various support measures and their effectiveness as seen against the stated objectives). However, questions have been raised among market participants as to whether this additional capital raising represents true deleveraging. This is because capital injections by governments have taken place mainly through the issuance of preference shares, representing around 43% of their total capital increase for some euro area LCBGs. Although these efforts have helped the banks in question to improve their regulatory capital ratios, this form of capital does not have the same loss-absorbing features as common equity.

### Box 11

#### GOVERNMENT MEASURES TO SUPPORT BANKING SYSTEMS IN THE EURO AREA

This box summarises the measures taken by euro area governments to support the banking sector and discusses their implementation and effectiveness.

Following the bankruptcy of Lehman Brothers in September 2008, financial market stress intensified sharply. After the summit of the EU Heads of State or Government in Paris in October 2008, EU governments implemented support measures to alleviate strains on their banking systems. These measures complement the extensive liquidity support that has been provided by the ECB and have been implemented in accordance with specific guidance from ECB and the European Commission.<sup>1</sup>

<sup>1</sup> The recommendations can be downloaded from the following websites: [http://www.ecb.int/pub/pdf/other/recommendations\\_on\\_guaranteesen.pdf](http://www.ecb.int/pub/pdf/other/recommendations_on_guaranteesen.pdf) (Recommendations of the Governing Council of the European Central Bank on government guarantees for bank debt), [www.ecb.int/pub/pdf/other/recommendations\\_on\\_pricing\\_for\\_recapitalisationsen.pdf](http://www.ecb.int/pub/pdf/other/recommendations_on_pricing_for_recapitalisationsen.pdf) (Recommendations of the Governing Council of the European Central Bank on the pricing of recapitalisations), and <http://www.ecb.int/pub/pdf/other/guidingprinciplesbankassetsupportschemesen.pdf> (Eurosystem guiding principles for bank asset support schemes).

The main objectives of the public support schemes are to (i) safeguard financial stability; (ii) restore the provision of credit and lending to the economy; (iii) promote a timely return to normal market conditions; (iv) restore the long-term viability of the banking sector; and (v) contain the impact on public finances and preserve taxpayers' interests. In practice, the government support schemes introduced thus far fall into one of three main categories: (i) guarantees for bank liabilities; (ii) re-capitalisation measures; and (iii) measures to provide relief from legacy assets. The main characteristics of these schemes, most of which have been made available to banks on a voluntary basis, can be summarised as follows.<sup>2</sup>

- *Guarantees for bank liabilities.* In accordance with the agreement reached at the Paris summit, euro area governments raised the coverage of their deposit insurance schemes to the new maximum of €50,000 per deposit account, with some governments extending the guarantees even further. In addition, many countries started to extend government guarantees to cover newly issued bank debt securities. These guarantees were provided either on an ad hoc basis or within national schemes, with pre-announced commitments of the total amounts made available for banks.
- *Capital injections.* Several governments also provided Tier 1 capital to banks. Capital injections have mostly been made through the acquisition of preference shares or other hybrid instruments which fulfil the conditions for Tier 1 capital. Some countries have considered the provision of capital through the acquisition of ordinary shares.
- *Asset support schemes.* Some countries have set up asset support schemes. These can take the form of asset removal schemes (transferring the assets to a separate institution) or asset insurance schemes (keeping the assets on the banks' balance sheets). Some initiatives can be categorised as hybrid schemes, in that they involve asset transfers, financed through guaranteed public sector loans, and sophisticated risk-sharing arrangements between the governments and the participating banks.

A summary of the measures is given in the table below. The numbers outside parenthesis show the volume of the schemes as implemented by the cut-off date of this FSR, while the numbers in parenthesis show the full amounts to which governments have committed. Regarding the implementation of these measures, some conclusions can already be drawn. The take-up rate is generally low across

2 This is in contrast to some of the schemes announced in the United States where, for example, the recapitalisation measures have more often been compulsory.

### Summary of rescue measures in Europe

(EUR billions unless stated otherwise)

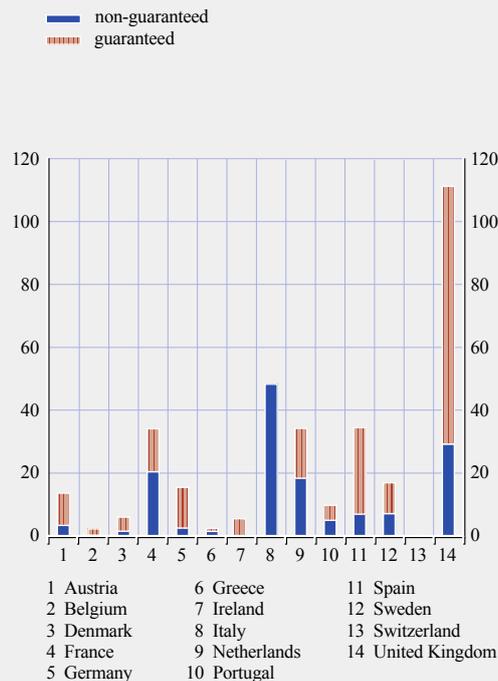
	Capital injections		Liability guarantees		Asset support		Total commitment as % GDP
	Within schemes	Outside schemes	Guaranteed issuance of bonds	Other guarantees, loans	Within schemes	Outside schemes	
Europe	103.4 (251)	56.6	543.7 (2,136)	236.8 (-)	585.4 (877)	26.2	27.3
EU	99.4 (247)	56.6	543.7 (2,096)	236.8 (-)	544.2 (836)	26.2	27.9
Euro area	59.1 (172)	54.1	396.8 (1,677)	235 (-)	23.7 (198)	26.2	23.7

Sources: National authorities, Bloomberg and ECB calculations.

Notes: Data are cumulative since October 2008. Numbers in brackets show total commitments for each measure. Some of the measures may not have been used despite having been announced. Usage of guarantees includes issued bonds but not guaranteed interbank loans. Capital injections outside schemes are support measures used without a scheme having been explicitly set up.

**Chart A Cumulative volume of gross issuance of bank bonds in Europe**

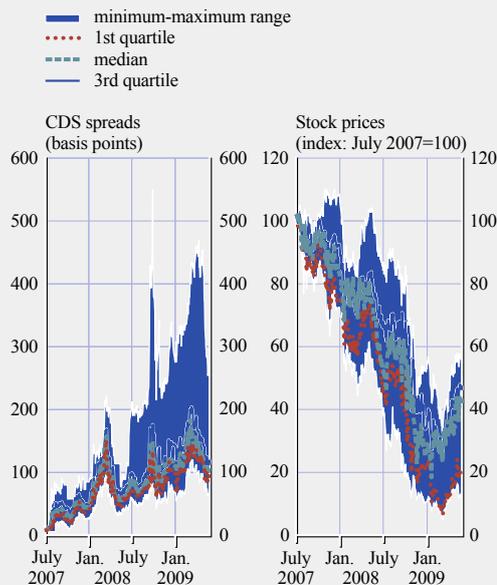
(Oct. 2008 – May 2009; EUR billions)



Sources: Dealogic and ECB calculations.

**Chart B Distribution of five-year senior CDS spreads and stock prices for euro area large and complex banking groups**

(July 2007 – May 2009)



Sources: Thomson Financial Datastream and ECB calculations.

all measures, but there are substantial variations: the use of recapitalisation measures has been relatively widespread, while the issuance of bank bonds with government guarantees has been considerably lower, albeit with an increasing take-up rate over the last few months.

However, as the issuance of non-guaranteed bank bonds remains limited in most countries, the use of guaranteed bonds is likely to have been indispensable in providing banks with access to medium-term funding when needed (Chart A). Reasons for the slow take-up rate include the occasionally relatively high liquidity premium on guaranteed bank debt over government debt, possible stigma effects (i.e. resorting to government assistance may be perceived as a signal of bank weakness), conditions that are sometimes attached to such guarantees (such as restrictions on remuneration), decreased medium-term funding needs owing to ongoing deleveraging by banks, and the general slowdown in demand for credit. Overall, while it is clear that the measures were successful in averting a further escalation of the crisis in late 2008, in spite of recent improvements, investor sentiment towards the banking sector remains rather negative, as evidenced by the still elevated levels of interbank money market spreads and banks' CDS spreads, as well as low (albeit rising recently) bank stock prices (Chart B).

The various measures to support the financial sector are expected to have only a small direct impact on government deficits in the short to medium term. The impact on government debt largely depends on the borrowing requirements of the government to finance the rescue operations. However, potential fiscal risks are sizeable for all countries that have established a guarantee scheme as it may negatively affect market perceptions' about the creditworthiness of the respective governments.

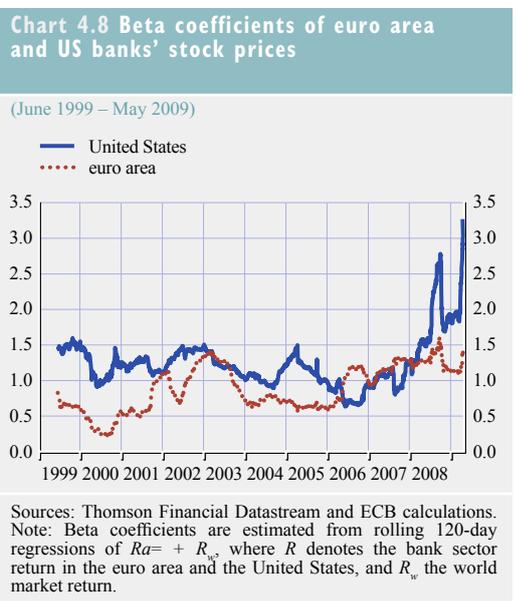
The impact of the measures on the provision of credit to the non-financial sector is more complex to assess, especially when it comes to separating possible credit supply restrictions from the observed decline in demand for loans. At the current juncture, credit to the private sector continues to be on a downward trend: year-on-year credit growth has decreased further, and monthly flows have even become negative in the first quarter of 2009. Banks that have tightened their lending standards have done so mostly in reaction to the deteriorating economic outlook, but also in response to continued funding pressures, notwithstanding the government support, hence indicating that some loan supply constraints cannot be ruled out at present.

In effect, banks have come under increased scrutiny by shareholders and market participants over capital adequacy and some face intense pressure to deleverage.<sup>5</sup> The increase in Tier 1 and total capital ratios suggests that such processes are indeed ongoing, and many banks have indicated that the trend is likely to continue throughout 2009.

Some additional indirect evidence on deleveraging can be gained by analysing how the stock prices of euro area banks have moved with the market. The beta coefficient – a measure of co-movement of an individual stock with the rest of the market and an indicator of the scale of systematic risk – has fallen since the demise of Lehman Brothers in September 2008.<sup>6</sup> More recently, however, the beta coefficients have again increased to historical highs, possibly reflecting positive

earnings revisions (see Chart 4.8). A similar pattern is visible for US banks, whose sensitivity to market-wide shocks has been higher and has risen by more than that of euro area banks since the start of the financial crisis in mid-2007.

In addition, an important consideration at present is the quality and composition of capital, with an increased emphasis on core Tier 1 capital – the most permanent and stable source of capital – and various leverage ratios, such as tangible equity to assets or gross leverage (as in Chart 4.5).<sup>7</sup> In this regard, a threshold figure for Tier 1 often quoted by market participants is 10%. The shift in bank capital structures can be attributed to the downgrading of the lesser forms of regulatory capital (in line with deliberations of the Basel Committee) and is already having a profound impact in both the cash and CDS markets.<sup>8</sup> Box 12 analyses the changes in the composition of banks' capital in more detail.



- 5 See, for example, Barclays Capital, "Tier 1/Upper Tier 2 into High Yield", March 2009.
- 6 There is a positive relationship between beta, as obtained from the Sharpe-Lintner capital asset pricing model (CAPM), and leverage:  $\beta_{CAPM} = \beta_U [1 + (1-t)D/E]$ , where  $\beta_{CAPM}$  denotes the CAPM beta,  $\beta_U$  the unlevered beta,  $t$  the corporate tax rate, and  $D/E$  the firm's leverage ratio.
- 7 The arguments in favour of targeting simple leverage ratios are two-fold. First, assets which are believed to be low risk (because highly liquid) can become highly illiquid and risky when systemic problems emerge. Second, calculating capital requirements on the basis of internal models entails judgement. See also the UK Financial Services Authority, "Turner Review: A Regulatory Response to the Global Financial Crisis", March 2009.
- 8 JPMorgan Chase & Co., "Thoughts on European Bank Capital", April 2009. It is now expected that there will be no new issuance of dated subordinated debt instruments (lower Tier 2), and the absence of deliverables is causing the longer end of the subordinated CDS curve to invert and converge toward senior CDS levels. In cash markets, the shift in bank capital explains why issuers face less resistance in redeeming callable structures.

## Box 12

**THE COMPOSITION AND QUALITY OF BANK CAPITAL**

Following the intensification of the financial crisis in late 2008, euro area banks have come under increased pressure to improve the size and quality of their capital buffers. This box examines the capital positions for a sub-sample of 15 euro area LCBGs that had reported in enough detail to provide figures for both 2007 and 2008.

The total amount of regulatory capital decreased slightly, by 4%, over the period 2007-08 for the sample of 15 euro area LCBGs (see the table below). However, more noteworthy are the important changes in the composition of capital. Tier 1 and core Tier 1 capital increased modestly, while supplementary capital fell by 28%. Especially upper Tier 2 and Tier 3 capital were reduced significantly. This may well reflect the fact that banks have made efforts to respond to the pressure from market participants to achieve a higher quality of capital, as well as to changing priorities (in the medium run) in terms of bank solvency metrics on the part of regulators.<sup>1</sup>

The sample of 15 LCBGs also reduced the size of their risk-weighted asset portfolio, by 13%, over the period 2007-08, while total assets remained virtually unchanged. The former may be largely due to the introduction of Basel 2 in 2008. In any case, the combined impact of asset rebalancing and a reshuffling in capital led to substantial improvements in regulatory capital ratios, with Tier 1 reaching almost double the regulatory minimum for these banks. On the other

<sup>1</sup> See, for example, UK Financial Services Authority, "The Turner Review", March 2009, which advocates that regulatory capital ratios be expressed entirely in terms of high-quality capital – broadly speaking the current core Tier 1 and Tier 1 definitions.

**The composition of euro area large and complex banking groups' capital**

(EUR millions; in percentages)

	2007	2008	Percentage change
<b>Volumes</b>			
Core Tier 1 capital	280,664	288,921	3.0
Total hybrid capital	59,078	77,912	32.0
<i>As a percentage of Tier 1</i>	17	22	
of which innovative hybrid capital	7,865	1,652	-79.0
<i>As a percentage of Tier 1</i>	2	0.5	
Tier 1 capital	340,611	360,757	6.0
Lower Tier 2 capital	154,532	124,685	-19.0
Upper Tier 2 capital	23,356	1,587	-93.0
Tier 3 capital	3,774	1,451	-62.0
Supplementary capital	189,412	136,278	-28.0
Total regulatory capital	479,897	461,898	-4.0
Total risk-weighted assets	4,643,836	4,039,954	-13.0
Consolidated total assets	13,096,303	13,064,708	-0.2
Tangible assets	12,953,667	12,928,106	-0.2
Consolidated equity (including minorities)	499,484	410,903	-18.0
<b>Ratios</b>			
Core Tier 1 capital ratio	6.04	7.2	18.0
Tier 1 capital ratio	7.33	8.9	22.0
Total capital ratio	10.33	11.4	11.0
Equity/assets	3.81	3.1	-18.0
Core Tier 1 capital/tangible assets	2.17	2.2	3.0

Sources: CreditSights and ECB calculations.

Note: The sample refers to 15 euro area LCBGs with comparable data for 2007 and 2008.

hand, the leverage ratio fell from 3.81% to 3.10%, owing to the sharp decline in consolidated equity as a result of the effect of negative earnings.

As equity capital has been depleted during the crisis, investors have been demanding a higher quality and quantity of bank capital. Though banks still have ample Tier 1 capital to meet regulatory requirements, they may need additional equity capital to satisfy the increasing capital requirements of investors. Market participants currently often refer to a threshold Tier 1 ratio of 10% and a leverage ratio of 4-5%.

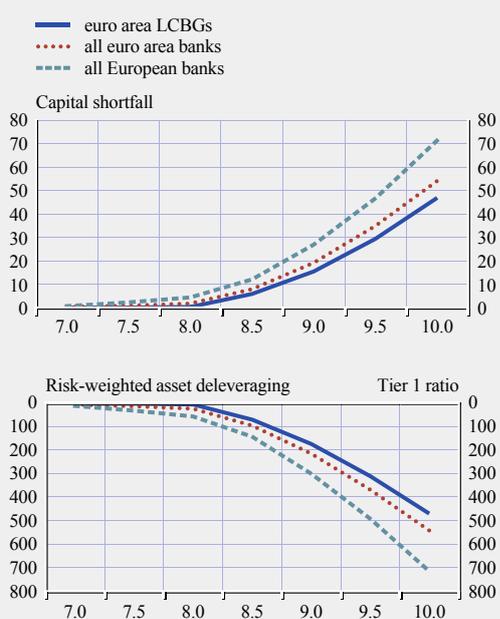
Simulations show that in order to meet a Tier 1 ratio of 10%, €47 billion in additional capital would be required for a group of 16 euro area LCBGs, and €71 billion for a larger sample of 35 European banks including smaller euro area as well as UK and Swiss banks (see Chart A).<sup>2</sup> Instead of raising new equity, banks could alternatively reduce risk-weighted assets to achieve the desired capital ratio. In the case of a targeted Tier 1 ratio of 10%, simulations show that risk-weighted assets would have to shrink by €469 billion for the group of euro area LCBGs and by €715 billion for the group of European banks.

Moreover, investors and regulators are increasingly focusing on high-quality capital such as core Tier 1 capital – which has the highest loss-absorbing characteristics – and on leverage ratios, instead of on the conventional Tier 1 capital ratios. Further simulations show that, on the basis of leverage ratios such as core Tier 1 to tangible assets (CT1), the capital shortfall is substantially

2 These computations are based on end-2008 figures, but also take into account the extra capital raised afterwards.

**Chart A European banks' Tier 1 capital ratios and capital shortfall**

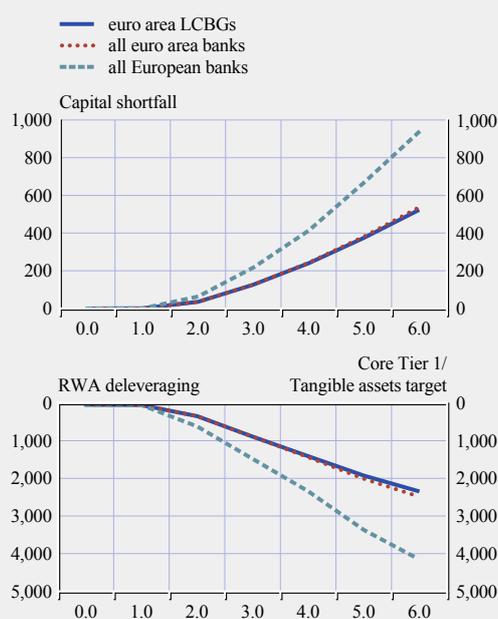
(EUR billions; percentages)



Sources: Individual financial institutions' balance sheet data and ECB calculations.  
Note: Calculations are based on data for 22 euro area banks (16 of which are LCBGs) and 13 other European banks.

**Chart B European banks' core Tier 1 leverage ratios and capital shortfall**

(EUR billions; percentages)



Sources: Individual financial institutions' balance sheet data and ECB calculations.  
Note: Calculations are based on data for 22 euro area banks (16 of which are LCBGs) and 13 other European banks.

higher (Chart B). The euro area banks would have to raise €240 billion in core Tier 1 capital to achieve a CT1 ratio of 4%, or would have to deleverage by €6 trillion, equivalent to a reduction of €1.3 trillion in risk-weighted assets. For the European banks, the capital shortfall would increase to €414 billion or require €10.3 trillion of (tangible) asset shedding, equivalent to a risk-weighted asset reduction of €2.3 trillion.

However, it should be stressed that a CT1 threshold of 4% or 5%, which market participants take as a norm, is inferred from US bank averages and is likely as such to be an unrealistic target for euro area banks owing to differences in the definition of assets under different accounting standards. Indeed, euro area banks follow the International Financial Reporting Standards (IFRSs), while US banks report under US Generally Accepted Accounting Principles (GAAP). The IFRSs are extremely restrictive as regards netting of derivatives on the balance sheet, while under US GAAP (or Swiss GAAP, which is similar), netting is much more widely permitted. This has as the effect that assets reported under the IFRSs may in some extreme cases appear almost twice as high as what they would be if reported under US GAAP.

Against this background, European banks are strengthening their capital bases in part by repaying junior bonds which are currently trading at large discounts to face value, mainly owing to concerns about the financial strength and viability of many institutions. The discounts can be booked as profits, which boosts core equity capital. However, repaying liabilities at discounts in combination with asset-shedding can only be one element of the efforts to strengthen banks' financial soundness in the short term and cannot be a substitute for capital that is generated from retained earnings.

## 4.2 BANKING SECTOR OUTLOOK AND RISKS

### EARNINGS RISKS

Despite the slightly improved first quarter 2009 financial results reported by many euro area LCBGs, the slowdown in global economic growth and the prospect of a further deterioration in macroeconomic conditions in most euro area countries implies significant challenges for LCBGs' earnings from core banking activities in the period ahead. In addition to cyclical pressures on banks' profitability, some LCBGs' business models, and thus their recurring earnings power, may be negatively affected by structural changes in their operating environment.

The persistent high funding costs, in particular, are likely to be one reason for a re-consideration of LCBGs' business models. In this vein, business lines that relied on high volumes of unsecured funding could see further a decline in activity. By contrast, other types of business which need less funding support, such as trading and underwriting activities in highly liquid markets, are likely to be emphasised in the future.

Looking at different components of LCBGs' income, growth in net interest income will be negatively affected by a lower volume of net new lending. Those LCBGs which reaped large shares of their past income from their operations in emerging market countries will probably experience a negative impact on their earnings prospects due to the slowdown in economic activity in these economic areas. Importantly, however, this could be partially offset by the steepening of the euro area yield curve (see also Box 13) and, to the extent that banks are pricing in higher credit risk, into their lending rates. In addition, there is anecdotal evidence that declining competition due to reduced cross-border activity by banks within the euro area is providing the remaining institutions with increased pricing power, especially in parts of the the corporate lending market. At the same time, competition has also intensified in the retail deposit markets, which would reduce the LCBGs' earnings potential by increasing their financing costs.

On the non-interest income side, as discussed in Section 4.1 above, LCBGs' earnings from

the trading and underwriting businesses have increased and, given the wide bid-ask spreads in most trading markets, it is to be expected that these income sources will continue to support the banks which are most active in these businesses in the period ahead. At the same time, several LCBGs could continue to see their earnings dented by marking-to-market write-downs on their holdings of legacy assets and securities. In addition, the ongoing deleveraging process, which has largely focused on more liquid trading book assets, will constrain these institutions' capacity to generate earnings for some time to come.

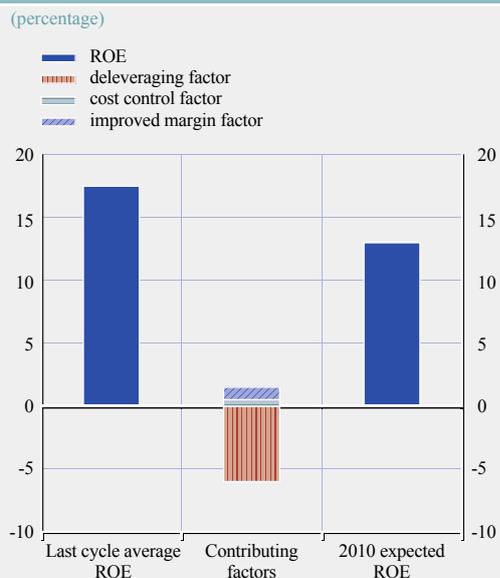
Growing pressure from LCBGs' shareholders to return to profitability will put the banks' cost structures under intense scrutiny. Despite the substantial cost-cutting that has been carried out by many of these institutions to date, costs will probably need to be reduced further. The expected intensification of consolidation in the euro area banking sector will probably

contribute to lower costs by reducing overcapacity in some markets.

Chart 4.9 shows some private sector baseline estimates of how large banks' average ROE is expected to evolve in the coming 18 months, compared with the average ROE of 17.5% over the previous industry cycle of 1987-99. The average ROE is expected to decline to 13%, with the negative impact of deleveraging being the most substantial drag on future earnings. This is expected to be offset somewhat by improvements in cost control and by improved margins in core businesses.

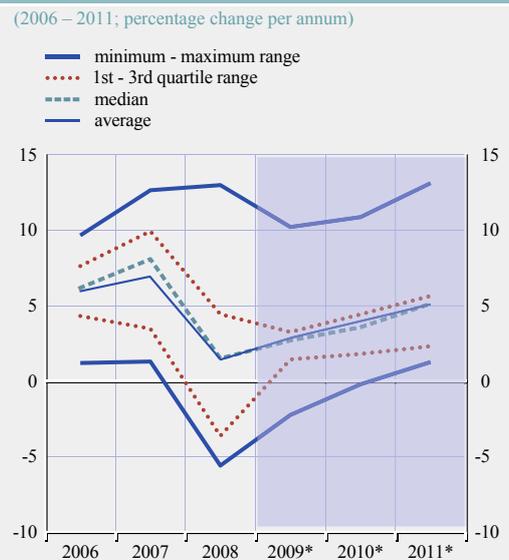
Reflecting the still sluggish overall outlook for earnings, analysts' forecasts of net income for the euro area LCBGs imply only a gradual recovery over the coming years, although all of these institutions are expected to return to positive net income by 2011, allowing them to start generating organic capital (see Chart 4.10).

**Chart 4.9 Expected evolution of average return on equity and contributing factors for euro area large and complex banking groups**



Sources: Morgan Stanley and Oliver Wyman.  
Note: The figures show average numbers for a group of global wholesale banks which includes a large share of euro area LCBGs.

**Chart 4.10 Euro area large and complex banking groups' net income and analysts' forecasts**



Source: Bloomberg.  
Note: The figure shows profits after all costs have been deducted.

The overall impact of declining revenues and rising impairments is likely to depend on the severity of the credit cycle downturn. Expectations of a further deterioration in banks' earnings were already reflected in the rating downgrades for several LCBGs in December 2008 and in early 2009 (see also Section 4.3).

## Box 13

## ELASTICITY OF BANKS' INTEREST INCOME VIS-À-VIS RECENT CHANGES IN SHORT-TERM MARKET RATES

In the context of the current severe pressure on banks' earnings and solvency, a direct and immediate channel through which bank profitability may be strengthened is via the effect of recent changes in short-term money market rates on banks' net interest income. This box provides some estimates of the impact of recent declines in short-term money market interest rates (in part triggered by the monetary policy easing by the ECB) on banks' net interest income from loans and deposits.

The analysis is carried out in two steps. First, country-specific error-correction regressions of the change in the average interest rate paid on outstanding loans and deposits respectively, on changes in the three-month EURIBOR are conducted.<sup>1</sup> In particular, the following error correction model is estimated:

$$\Delta BR_t = \alpha + \sum_{i=0}^n \beta_i \Delta MR_{t-i} + \gamma(BR_{t-1} + \theta MR_{t-1})$$

where  $BR_t$  is the composite interest rate on either loans to or deposits from the non-financial private sector,  $MR_t$  is the three-month EURIBOR,  $\Delta$  indicates the first difference and the optimal lag length  $n$  is determined by a Bayesian information criterion.

Second, the multipliers on the changes in the money market rate,  $\beta_i$ , from these regressions are related to changes in the three-month EURIBOR, which declined by 1.61 percentage points between December 2008 and 28 May 2009. Using the amounts of loans and deposits outstanding as of end-December 2008, it is possible to calculate the effect on the interest receivables (i.e. on loans) and interest payments (i.e. on deposits) of the euro area monetary financial institution (MFI) sector arising from the recent decline in short-term rates.<sup>2</sup>

The results of the first step of this exercise are shown in Table A. Generally, the multiplier coefficients of short-term money market rates are higher for deposit rates than for lending rates in countries where banks operate predominantly with long-term fixed rate loans (e.g. Belgium, Germany and France). The opposite is generally the case for countries with predominantly floating rate and short-term lending (i.e. most of the other countries), where lending rates seem to react more strongly to changes in short-term market rates. However, when deriving the effect on banks' net interest income (from loans and deposits) account also needs to be taken of the amounts outstanding of loans and deposits. In other words, the overall effect on interest income hinges on the extent to which the country's banking sector operates with a "funding gap"

1 The MFI lending and deposit rates are applied to outstanding amounts as reported in the MFI interest rate statistics.

2 This analysis is partial as it obviously disregards any changes to the amounts outstanding since end-December 2008.

**Table A Interest rate multiplier, funding gap and interest rate payments of euro area banks**

(Dec. 2008; EUR billions)

	Immediate multiplier on three-month EURIBOR		Funding gap	Interest receipts	Interest payments	Net interest income
	Loan rate	Deposit rate				
Sum	n.a.	n.a.	1,146	584	256	328
Mean	0.25	0.18	104	53	23	30
Median	0.22	0.19	74	21	10	15
Maximum	0.60	0.42	429	138	77	72
Minimum	0.05	0.06	-293	8	3	5
Standard deviation	0.17	0.11	217	48	23	27
Floating rate countries <sup>1)</sup>						
- sum	n.a.	n.a.	956	282	104	178
- mean	0.29	0.18	137	40	15	25
Fixed rate countries <sup>2)</sup>						
- sum	n.a.	n.a.	190	302	152	150
- mean	0.17	0.19	47	76	38	37

Sources: ECB, Reuters and ECB calculations.

Note: The effect is derived using country-specific error-correction regressions of the change in the composite loan and deposit rates respectively, on the change in the three-month EURIBOR for the period from January 2003 to December 2008 (monthly data).

1) "Floating rate countries" include Ireland, Greece, Spain, Italy, Austria, Portugal and Finland. In this group of countries, the majority of new business loans are provided with floating rates and an initial rate fixation of up to one year.

2) "Fixed rate countries" include Belgium, Germany, France and the Netherlands. In this group of countries, a major proportion of new business loans (in particular to households for house purchase) are granted with initial rate fixation of over five years.

(in the sense of deposits being insufficient to finance lending). Indeed, the funding gap (as of end-December 2008) is sizeable in the majority of the euro area countries (see Table A).

All in all, focusing on the results regarding the decline in the three-month EURIBOR (the results for the EONIA, which are not reported, are similar), net interest income should generally be expected to fall in the euro area (see Table B). However, the total euro area effect is largely driven by countries where "floating rate" lending is predominant. Apart from the pure interest elasticity effect, this also reflects the comparatively large funding gap of the banking sector in most of these countries. For the group of countries where "fixed rate" lending is predominant, by

**Table B Estimated changes in euro area MFIs' interest income on outstanding loans and deposits between 31 December 2008 and 28 May 2009**

(EUR billions)

	Loans	Deposits	Net effect
Sum	-30.77	-22.18	-8.59
Mean	-2.80	-2.02	-0.78
Median	-1.64	-1.36	-0.39
Maximum	-0.42	-0.37	2.66
Minimum	-6.76	-8.43	-4.48
Standard deviation	2.25	2.29	1.97
Floating rate countries <sup>1)</sup>			
- sum	-18.41	-7.54	-10.87
- mean	-2.63	-1.08	-1.55
Fixed rate countries <sup>2)</sup>			
- sum	-12.36	-14.64	2.28
- mean	-3.09	-3.66	0.57

Sources: ECB, Reuters and ECB calculations.

Note: The effect is estimated using the country-specific multipliers reported in Table A. In a second step, the multiplier is combined with the aggregate amounts outstanding of loans and deposits in the country to derive the overall effect of the recent decline in the three-month EURIBOR on the interest received on loans and the interest paid on deposits.

1), 2) See Table A.

contrast, the net effect turns out to be slightly positive (importantly, the funding gap is also much smaller, on average, in this group of countries). However, despite the expected declines, the net interest income on loans and deposits of the banking sector remains significantly positive in all euro area countries, as a result of both the still positive loan-deposit margins and the substantial funding gap (in most countries). Moreover, it needs to be kept in mind that the overall effect on banks' net interest income also hinges on the interest elasticity of banks' holdings of debt securities and their non-deposit funding sources. It is not unlikely that especially the latter is highly correlated with short-term market rates, which should somewhat mitigate the generally negative net effect on net interest income found to stem from the recent rate decline. At the same time, to the extent that euro area banks are currently trying to reduce their funding gap, the validity of the reported results may become more pertinent in the future.

### CREDIT RISKS

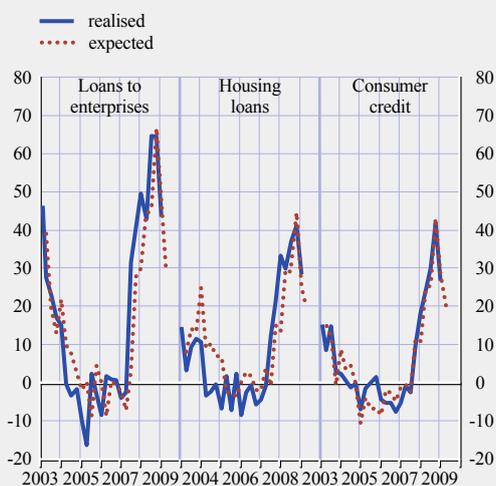
Against the background of a sharper than expected deterioration in macroeconomic conditions in many parts of the euro area, the credit quality of LCBGs' loan books has come under significant downward pressure. This may have increased the intensity of the adverse feedback loops in which credit market conditions restrain economic growth in the period ahead, leading to a further increase in credit risk and an additional reduction in credit availability.

Evidence from the January and April 2009 bank lending surveys for the euro area suggests that

banks have responded to the less favourable operating environment by continuing to tighten their credit standards for new loans both to households and to the non-financial corporate sector. In the first quarter of 2009, euro area banks reported a further tightening of credit standards for both borrower categories, although the degree of net tightening was somewhat smaller than in the previous quarter (see Chart 4.11). The main factors contributing to the net tightening of credit standards were reported to be an increase in risk as perceived by banks and, to a somewhat lesser extent, balance sheet constraints facing the banking sector. The same survey also revealed that banks expected the tightening of credit standards to continue in the second quarter of 2009.

Chart 4.11 Changes in credit standards of banks in the euro area

(Q1 2003 – Q2 2009; net percentage of banks tightening credit standards)



Source: ECB.

### Household sector credit risks

The outlook for the quality of LCBGs' loans to households has deteriorated significantly, although large differences still remain across euro area countries. As discussed in detail in Section 2.4, lending to households continued to decelerate in many parts of the euro area in the second half of 2008. Forward-looking information from the April 2009 bank lending survey suggests that the slowdown in household credit growth is likely to continue in the second quarter of 2009.

In some euro area countries, household sector credit risks may be further aggravated by the risk of property market corrections. In these countries, indications of a deterioration in banks' mortgage asset quality are evident in

their non-performing loan ratios or arrears in the first three quarters of 2008. Arrears are likely to increase further in many parts of the euro area, albeit from a historically low level. A number of government relief measures aimed at limiting the number of household foreclosures are being considered or introduced in a few euro area countries. These measures tend to entail, among other things, loan modifications, maturity extensions and adjustments of instalment payments. While the measures might prove to be effective in preventing foreclosures, they may – from the banks’ perspective – at the same time increase uncertainty as regards expected cash flows on residential mortgage-backed securities. All in all, the prospect of deteriorating household sector credit quality ranks among the key vulnerabilities facing banks in several countries in the period ahead.

#### Corporate sector credit risks

As discussed in detail in Section 2.2, since the third quarter of 2008, the prospect of a marked deterioration in the economic environment, together with the likelihood of financing conditions remaining tight, has pointed to increasing default risk among euro area non-financial firms. Weak aggregate demand is likely to weigh heavily on non-financial corporations’ earnings in 2009, while the rise in the cost and the reduction in the availability of credit, partially reflecting signs of decreasing competitive pressures in the euro area corporate loan market, point to increased refinancing costs, in particular for speculative-grade borrowers. Country-level information suggests that firms’ access to credit lines has been reduced and the renegotiation of credit lines and terms could prove challenging in the current environment. Furthermore, conditions for trade financing appear to have worsened significantly. This is apparent, in particular, in the reduction in the availability of international trade credit. A deterioration of credit conditions is also reflected in tightened collateral conditions.

Against this background, some LCBGs with significant leveraged loan portfolios face the risk of increasing loan losses, as slowing or

negative GDP growth and tight financing conditions are likely to have an adverse impact on the refinancing prospects of the more highly geared firms. Indeed, the level of distress in the European leveraged loan market increased substantially in the first few months of 2009, with the number of firms in distress (i.e. in default or entering restructuring) in the first quarter exceeding the number recorded in 2008 as a whole.<sup>9</sup> The volume of distressed leveraged loans (original-issue senior debt) was €15 billion, mostly held by banks. In the primary European leveraged loan market there was virtually no activity in the first quarter of 2009, with overall issuance of around €1 billion, more than 80% down from the same period in 2008.<sup>10</sup>

Finally, many LCBGs are significantly exposed to commercial property markets (see Section 2.3 for developments in this sector). Owing to a continued deterioration in these markets in most parts of the euro area, several banks face the prospect of loan losses on commercial mortgage portfolios and/or marking-to-market losses on commercial mortgage-backed securities (CMBSs). Indeed, some LCBGs face downward rating pressure, in part as a result of their exposures to commercial property.

#### Outlook for LCBGs’ credit portfolio risks under alternative scenarios

The outlook for LCBGs’ credit risk can be assessed using low-probability but plausible scenarios of future macro-financial developments.<sup>11</sup> In what follows, publicly available data on euro area LCBGs’ exposures to different types of loans, together with borrower-specific probability-of-default (PD) and loss-given-default (LGD) data, allow measures of

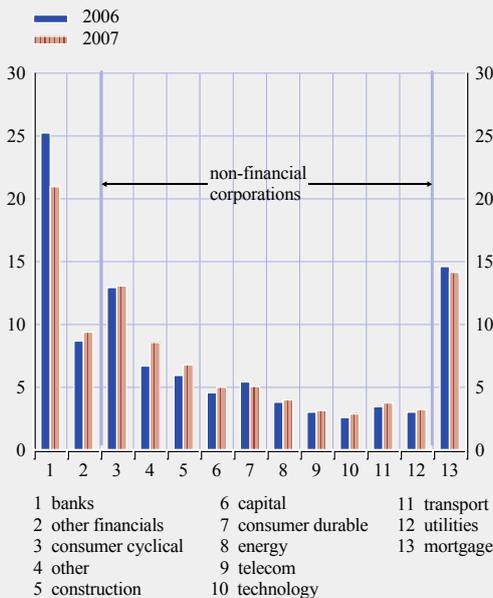
9 See Standard & Poor’s, “LCD Eurostats”, April, 2009.

10 As institutional investors (such as structured finance vehicles, mutual funds and insurance companies) have exited the primary market, the limited issuance volumes are almost entirely financed by banks. In the secondary loan market, activity has picked up for the highest quality borrowers. However, prices in the broader market have continued to decline, as market sentiment remains poor.

11 It should be stressed that this exercise is separate to the one announced by the Economic and Financial Committee (EFC) and coordinated by the Committee of European Banking Supervisors (CEBS). This latter exercise, where the ECB plays an important role, is expected to be finalised by September 2009.

**Chart 4.12 Sectoral distribution of euro area large and complex banking groups' loan exposures**

(percentage of total loans)



Sources: Individual institutions' financial reports and ECB calculations.

Note: Industry breakdowns are based on an internal aggregation method using the NACE industry classification as a basis.

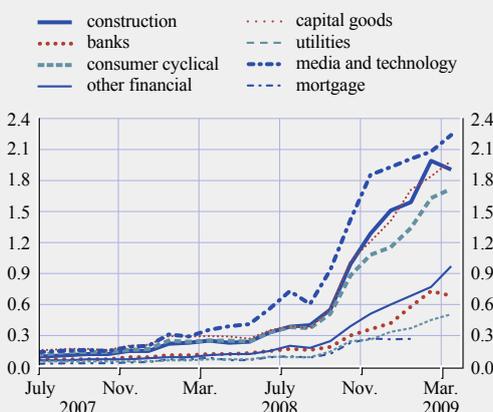
credit value at risk (VaR)<sup>12</sup> to be estimated for each LCBG's loan portfolio.<sup>13</sup> These credit VaR results (baseline scenario) are compared, in a second step, with stressed VaR measures that incorporate increased borrower-specific PDs for different macroeconomic shock scenarios.

Chart 4.12 provides a breakdown of the lending exposures of euro area LCBGs at the end of 2006 and 2007, the last year for which full-year figures are available.<sup>14</sup> Among the largest were exposures to other banks and financial intermediaries (around 20%), mortgage loans (around 15%), the consumer goods sector (around 12%) and other financial institutions (around 7%).

The geographic distribution of loan exposures across LCBGs reveals that, on average, around 75% of the loans extended are to borrowers located in euro area countries. 7.5% of total lending is to borrowers in emerging market economies, 12.5% to borrowers residing in North America and 4% to borrowers in the rest of the world, which includes the non-euro area EU countries and countries in emerging Europe.

**Chart 4.13 Unconditional expected default frequencies for selected sectors in the euro area**

(July 2007 – Mar. 2009; percentage probability)



Sources: Moody's KMV and ECB calculations.

Note: The expected default frequencies (EDFs) provide an estimate of the probability of default over the following year. Owing to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%. The sector "capital goods" covers the production of industrial machinery and equipment.

Chart 4.13 plots the dynamics of sector-specific PDs, which increased sharply after the finalisation of the December 2008 FSR. The PDs for the construction, energy and capital

12 Credit VaRs are a standard tool applied by banks' risk managers, rating agencies and prudential supervisors. They typically indicate the amount of economic capital that is needed to cover 99.9% of unexpected losses in a scenario where the credit quality of the banks' existing borrowers might change. Expressed as a ratio to existing Tier 1 capital, the credit VaR can provide an indication of whether or not Tier 1 capital is sufficient to absorb the losses that would materialise in such a scenario.

13 For the methodology that is applied in this analysis, see ECB, "Global macro-financial shocks and corporate sector expected default frequencies in the euro area", *Financial Stability Review*, June 2007; ECB, "Assessing portfolio credit risk in a sample of euro area large and complex banking groups", *Financial Stability Review*, June 2007; ECB, "Assessing credit risk in the loan portfolios of euro area large and complex banking groups", *Financial Stability Review*, December 2007; and O. Castrén, T. Fitzpatrick and M. Sydow, "Assessing portfolio credit risk changes in a sample of EU large and complex banking groups in reaction to macroeconomic shocks", *ECB Working Paper*, No 1002, February 2009.

14 Since the composition of banks' loan books tends to change relatively slowly over time, assuming that the loan portfolio compositions remain constant over the scenario horizons is not unreasonable.

goods sectors, as well as for banks and other financial institutions, increased most (almost by 200%). The remaining sectors showed more moderate but still substantial increases. Comparing the recent rises with past episodes of financial distress shows that while these changes are large, they have not yet reached the peak levels in the historical series. For example, in the aftermath of the sharp correction in the euro area stock market in 2000-02, most sector-level PDs reached levels that were more than twice as high as the most recent values.

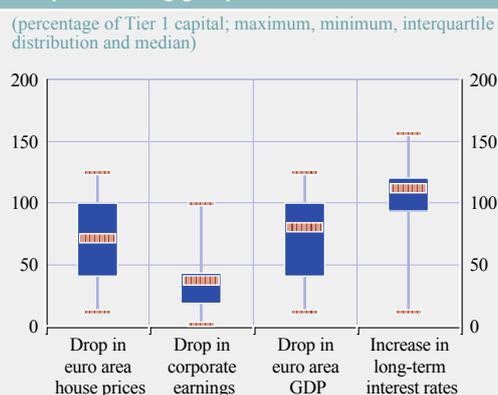
On the basis of these empirical PDs and data on the composition of LCBGs' loan portfolios, a baseline scenario and hypothetical adverse scenarios for credit VaRs can be calculated for euro area LCBGs. Importantly, these calculations do not take into account any mitigating impact on capital that would come from the banks' ability to generate new capital by retaining some of their future earnings. Bearing this caveat in mind, and taking into account the risks and vulnerabilities identified in other parts of this FSR, the following scenarios were applied:

- (i) a decrease in average euro area house prices (see Section 2.4);
- (ii) a decrease in corporate profits in the euro area (see Sections 2.2 and 2.3);
- (iii) a decrease in euro area GDP (see Sections 1.1 and 2.1); and
- (iv) an increase in long-term interest rates, reflecting the change in the outlook for public finances.

To quantify these scenarios, the lower confidence bounds of the simple univariate 95% interval forecasts for the relevant variables over the next 15 months were used. This means that the scenario has a 2.5%, i.e. very low, probability of materialising by May 2010.

In scenario (i), this translates into a decrease by 6% in average euro area house prices. Scenario (ii) entails a decline of 12.4% in euro area corporate sector profits (measured by the Purchasing Managers' Index (PMI)).

**Chart 4.14 Changes in credit VaRs relative to the baseline scenario across euro area large and complex banking groups under different scenarios**



Sources: Individual institutions' annual reports and ECB calculations.

Scenario (iii) uses a decrease of 2.7% in the year-on-year growth rate of euro area GDP. Finally, scenario (iv) incorporates an increase of 1.3% in euro area long-term interest rates.<sup>15</sup>

Mapping the effects of the four scenarios for borrower PDs to the individual LCBGs' credit VaRs shows that changes in credit VaRs relative to the baseline scenario are relatively heterogeneous across both scenarios and individual LCBGs.<sup>16</sup>

Chart 4.14 shows that an increase in long-term interest rates would have the largest impact on the LCBGs' median credit VaR, followed by a drop in euro area output and a rise in house prices. A drop in corporate earnings results in a change relative to the baseline that is just over half that in the previous two scenarios. Important to note in this context is that the median increase in credit VaRs corresponds to less than 60% of Tier 1 capital over all scenarios. Compared with the credit VaR estimates given in the December 2008 FSR, which covered all

<sup>15</sup> These figures refer to changes in the relevant variables between the start and the end point of the forecast horizon. This means that even if some of the variables, such as the euro area GDP growth, may currently be forecast to take more "severe" values before the chosen endpoint in May 2010, the figures in the text should be compared with other point forecasts referring to this date.

<sup>16</sup> The mapping process is based on a vector autoregressive estimation framework that incorporates PDs and macro-financial factors.

scenarios except for the increase in long-term interest rates, the median changes relative to the baseline scenario are significantly larger. This stems from the fact that sectoral PDs have increased as a result of the advancing of the credit-cycle downturn in the euro area (see Chart 4.13).

The severity of the scenarios that were applied, and the low probability of their materialising, means that the capital ratios of some institutions can be expected to be adversely affected. Indeed, the results show that for those LCBGs for which the baseline credit VaRs are the highest (corresponding to a higher risk profile in their loan books), some of these scenarios could, if they were to materialise, cause solvency ratio problems. Moreover, if more than one

scenario were to materialise at the same time, the outcomes would be more severe for most LCBGs in this sample. However, the additional capital buffers that are currently being raised by these institutions, together with the future earnings that they will be able to put aside as new capital, should safeguard them against such adverse events.

Finally, like all model-based estimates, these results can be sensitive to the specific confidence level chosen. In addition, they do not account for any hedging of credit risk exposures. Thus, and together with the assumption of no retained earnings, the reported changes in credit VaRs relative to the baseline should be seen as representing an upper bound to the credit VaRs to which these institutions could be exposed.

#### Box 14

##### ESTIMATING POTENTIAL WRITE-DOWNS CONFRONTING THE EURO AREA BANKING SECTOR AS A RESULT OF THE FINANCIAL MARKET TURMOIL

As the global financial turmoil has unfolded, several estimates have been made, both by public and private sector institutions, of the potential losses to be absorbed by financial systems. In order to assess the magnitude of probable losses the euro area banking sector faces, this box presents an estimate of total potential write-downs until the end of 2010. Combining these estimates with what is already known about banks' write-downs on credit-linked securities and losses on loans since the eruption of the market turmoil in August 2007, an estimate of total (past and expected) write-downs is also made.<sup>1</sup>

The first step in estimating potential losses is to gauge the size of exposures of euro area banks to various types of securities where losses could be faced. This was done following a bottom-up, bank-by-bank, approach. In particular, individual bank financial reports were investigated to assess the nature and scale of exposures of euro area banks to US-originated securities.<sup>2</sup> Loan exposures of euro area banks, as well as write-offs on these loans in 2007 and 2008, were taken from the ECB's MFI statistics and data on loan loss provisions were extracted from the ECB's consolidated banking data.<sup>3</sup>

1 The methodology adopted in this box broadly follows that used by the International Monetary Fund in the estimates published in the Global Financial Stability Report in April 2009, with an important difference that the euro area loan loss estimates presented here are based on empirical relationships estimated in euro area data.

2 This information was complemented with data published by the European Securitisation Forum on exposures across various types of securities.

3 It should be noted that there are differences in the consolidation approaches used in these two data sets. The consolidated banking data are consolidated both across borders and across sectors so that data on branches and subsidiaries located (from the reporting country's point of view) outside the domestic market are included in the data reported by the parent. In the ECB's MFI statistics, the data are not consolidated at the level of the banking group, with each institution reporting on a so-called solo basis. The consolidated banking data are only reported annually, while the ECB's MFI statistics are available at a monthly frequency. In addition, the consolidated banking data is less timely than the ECB's MFI statistics.

## Estimated potential write-downs for the euro area banking sector

(USD billions)

	Euro area banks securities	
	Outstanding	Cumulative implied write-downs
<b>US-originated securities</b>		
Sub-prime/Alt-A securities	106	59
Prime mortgages backed securities (MBSs)	94	2
<b>Total</b>		<b>61</b>
<b>European-originated securities</b>		
Residential mortgage-backed securities (RMBSs)	397	60
Collateralised debt obligations (CDOs) – non-sub-prime	158	32
Commercial mortgage-backed securities (CMBSs)	68	19
Consumer asset-backed securities (ABSs)	69	5
Other ABSs	15	1
Collateralised loan obligations (CLOs)	40	11
Corporate debt	553	29
	<b>1,500</b>	<b>157</b>
<b>Total for securities</b>		<b>218</b>
Sector	Euro area bank loan exposures	
	Outstanding	Realised and expected losses
<b>Households</b>	<b>6,520</b>	<b>200</b>
o/w mortgages	4649	44
o/w consumer	847	62
o/w other	1,024	95
<b>Corporates</b>	<b>6,489</b>	<b>230</b>
<b>Total for loans</b>	<b>13,009</b>	<b>431</b>
<b>Total for loans and securities</b>		<b>649</b>
Bloomberg estimate of write-downs as of 28 May 2009		215
Loan loss provisions and write-offs in 2007-08		150
<b>Potential further losses</b>		<b>283</b>

Sources: Individual banks' disclosures, European Securitisation Forum, IMF, ECB and ECB calculations.

Note: Euro values were converted to US dollar figures using the average exchange rate in the period from March to May 2009 (EUR 1 = USD 1.33).

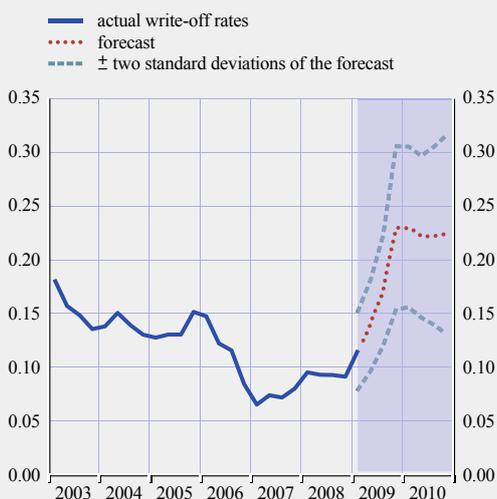
An estimate of the cumulative implied losses due to write-downs on securities – i.e. the mark-to-market of losses that banks have suffered as a result of falling securities values – was calculated by combining information on the magnitude of the exposures of euro area banks with information on default probabilities extracted from various CDS indices (or CDS spreads). The loss ratios from particular securities were derived from changes in securities prices and multiplied by the outstanding amounts held by euro area banks. The resulting figures represent the cumulative implied write-downs on securities exposures since the beginning of the turmoil. In principle, because such prices are forward-looking, they should embed expectations of future net losses on the assets that ultimately lie behind the securities. While this means that it is not necessary to compute a figure for expected losses on securities, it is important to bear in mind that this estimate will change as securities prices change.

Total losses on loans were calculated by adding up the net write-offs and provisions<sup>4</sup> reported by banks in 2007-2008 and expected future write-offs and provisions in 2009-2010. The expected write-offs and provisions were estimated by projecting a path for future write-off rates. These

<sup>4</sup> Provisions and write-offs take account of net value readjustments, such as net write-back and recovery following earlier value adjustments.

**Chart A Write-off rates on household mortgages extended by euro area banks**

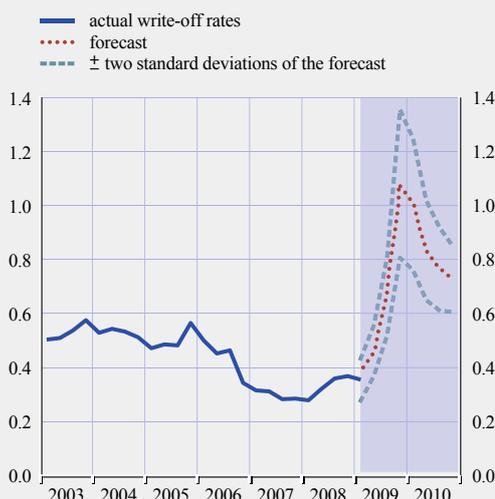
(Q1 2003 – Q4 2010; percentage)



Sources: ECB and ECB calculations.

**Chart B Write-off rates on loans to corporates extended by euro area banks**

(Q1 2003 – Q4 2010; percentage)



Sources: ECB and ECB calculations.

projections were based on empirical regressions which related household and corporate loan write-off rates to a set of macroeconomic variables, such as GDP growth, the unemployment rate, house price changes and expected default frequencies. The paths of exogenous variables for 2009 and 2010 were based on the macroeconomic forecasts for the euro area published by the European Commission in early May 2009. These forecasts see euro area GDP contracting by 4% in 2009 and by 0.5% in 2010. In the absence of quarterly data on loan loss provisions, these were assumed to be proportional to write-offs.<sup>5</sup>

The results show that euro area banks could face cumulative total losses of USD 218 billion on their exposures to securities, and an additional USD 431 billion of losses on their loan books (see Table A). This comes down to a total loss estimate of USD 649 billion over the period 2007-10. By the cut-off date of this FSR, the write-downs on securities by euro area banks had amounted to USD 215 billion.<sup>6</sup> At the same time, in 2007 and 2008 euro area banks provisioned and wrote-off USD 150 billion of their loan exposures. Looking ahead, therefore, there is potential for euro area banks to suffer a further USD 283 billion in losses, mainly originating from loan exposures. These losses would have to be buffered by additional provisioning and retained earnings over the next two years. There is however a high degree of uncertainty surrounding the outlook for banking sector profitability, which makes it very difficult to forecast banks' future retained earnings with a reasonable degree of accuracy.

Adequate interpretation of the loss figures requires that important caveats and limitations underlying these estimates are acknowledged. First, there is uncertainty about the scope and distribution of banks' exposures to securities, since some banks do not provide sufficiently detailed information on their exposures to various assets to make accurate calculations. Second, the confidence intervals surrounding the projections of write-off rates on mortgages and corporate

<sup>5</sup> The proportionality factor used was the average ratio of write-offs to provisions in 2006 and 2007.

<sup>6</sup> According to Bloomberg.

loans are rather wide (see Charts A and B), meaning that the estimates of total loan losses are likewise characterised by a high degree of uncertainty. This is especially the case for mortgage lending where write-off rates were unusually low over the last few years. Third, accounting rules in some euro area countries allow banks to delay reporting write-offs on loans to some extent. This may contribute to under-reporting of loan losses in good times and to substantial increases in provisioning during downturns. Against this background, write-off rates could increase by more than currently anticipated. Finally, a possible further deterioration in the economic environment would shift the projected path for write-off rates further upwards, thus increasing the loan loss estimates. Worsening macroeconomic conditions could also put pressure on securities prices and increase the likelihood of further losses on banks' securities exposures. That said, if macroeconomic conditions were to develop more favourably than currently forecast, loan losses might well turn out to be lower than indicated by these estimates.

All in all, there are many uncertainties surrounding estimates of the potential losses that euro area banks are likely to face over the next 18 months. These uncertainties reflect the availability and timeliness of data, the assumptions made in modelling and forecasting loan losses, as well as the macro-financial scenario envisaged. This means that differences in methodologies or assumptions can result in substantial differences in loss estimates. Against this background, and in the absence of detailed supervisory information about loan and securities exposures, no individual figure should be taken at face value. The wide range of estimates published by private and public sector institutions calls rather for constant monitoring and cross-checking of findings by central banks and supervisory authorities.

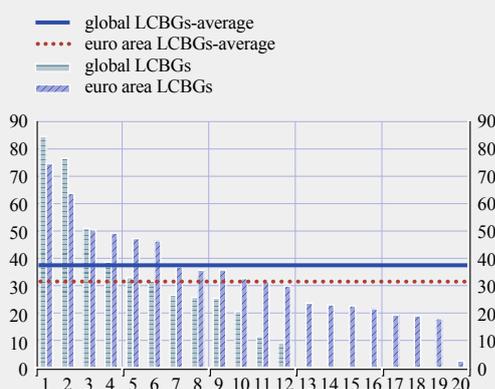
#### MARKET-RELATED RISKS

Since the finalisation of the December 2008 FSR, market-related risks for euro area LCBGs have remained elevated. This is mainly due to high volatility in several asset classes, linked primarily to continuing distress in various financial markets. Prospects for future stresses

in LCBGs' trading books remain significant. In particular, trading losses are likely to remain sizeable, while the possibility of adverse developments in the value of marked-to-market financial instruments cannot be excluded. This expected further distress may force LCBGs to allocate more capital for market risk and, at the same time, reduce their trading book exposures.

**Chart 4.15 Size of large and complex banking groups' trading books**

(2008; percentage of total assets)



Sources: Bloomberg and ECB calculations.

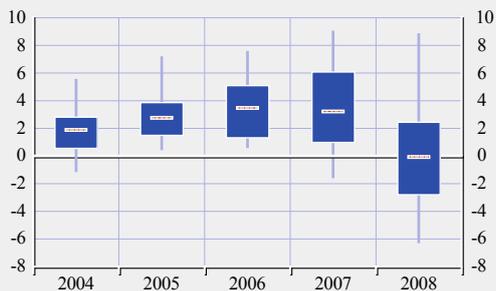
Balance sheet information on trading book exposures suggests that, on average, euro area LCBGs had slightly smaller trading book exposures in 2008 (35% of total assets) than their global peers (which had, on average, 40% of total assets classified in trading books, see Chart 4.15). This is an indication that global institutions may have been more exposed to increasing volatility and marking-to-market losses.

Earnings at risk related to trading activities of euro area LCBGs provides a measure of these institutions' market risk.<sup>17</sup> Earnings at risk can

<sup>17</sup> In the drafting process of this section, 2008 market VaR information was only available on a rather incomplete sample of euro area LCBGs.

**Chart 4.16 Trading income of euro area large and complex banking groups**

(2004 – 2008; EUR billions; maximum, minimum, interquartile distribution and mean)



Source: Bloomberg.

be captured by the share of trading income in total operating income, and its volatility. In 2008 trading income contributed negatively to euro area LCBGs' total operating revenues, which was mirrored in trading income losses for many LCBGs in 2008 (see Chart 4.16). This fall in trading income reflects both losses related to trading activities and marking-to-market write-downs on securities investments.

In addition, the volatility of trading income increased markedly across euro area LCBGs in the last few quarters of 2008 (see Chart 4.17).

**Chart 4.17 Contribution of euro area large and complex banking groups' trading income volatility to their total operating income volatility**

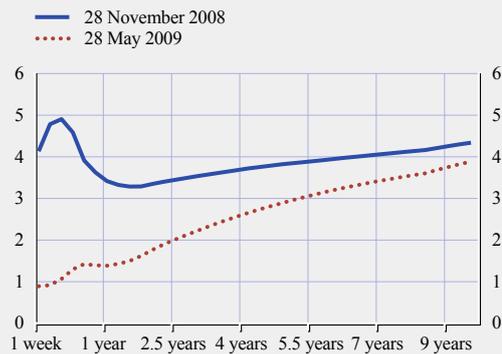
(Q1 2007 – Q1 2009; percentage of total income volatility)



Sources: Bloomberg and ECB calculations.

**Chart 4.18 Euro area yield curve developments (based on euro swap rates)**

(percentage)



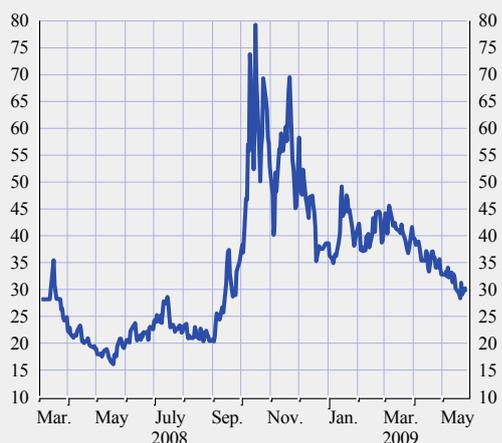
Sources: ECB, Reuters.

Equity risks and interest rate risks play the largest role in total market-related risks for euro area LCBGs. Interest rate risks declined somewhat after the publication of the December 2008 FSR, reflecting in part the recent partial easing of the stresses in the euro area interbank market (see Section 3.1). Moreover, the euro area yield curve (which can give some indication of the risks to income derived both from banking books and from fixed income assets held in trading books) steepened, as the interest rate decline has been more pronounced at the short end than at the long end of the curve. This suggests some scope for recovery in revenues from fixed rate loans and debt instruments (see Chart 4.18).

Like interest rate risks, equity risks in banks' trading books depend to a large extent on the volatility of the equity portfolio. For euro area LCBGs, this can be approximated by the implied volatility derived from options on the Dow Jones EUROSTOXX 50 equity index (see Chart 4.19). This measure of volatility remained at around 30-40% in the first few months of 2009. Assuming the same portfolio composition as in 2007, the VaR figures should have increased in 2008, which could indicate a need for higher levels of capital to cover the market risks in equity portfolios.

**Chart 4.19 Implied volatility for the Dow Jones EUROSTOXX 50 index**

(Jan. 2008 – May 2009; percentage)



Source: Bloomberg.

Additional risks to banks' trading books are related to the possibility of further write-downs in structured credit products. Current market estimates of future write-downs relative to total exposures to these securities suggest that further revaluations of trading book exposures cannot be ruled out (see also Box 14).

### Counterparty risks

Since the finalisation of the December 2008 FSR, owing to a high number of already experienced counterparty credit risk incidents and continuing signs of financial distress at various institutions, there has been an increased and widespread appreciation of counterparty credit risk issues among banks and other market participants alike. According to market intelligence, this has led to substantial changes in associated risk management practices.

In particular, there has been an increasing focus on margining terms,<sup>18</sup> loss tolerance levels and interdependence between institutions. In addition, more attention has been paid to potential early warning signals. In order to anticipate impending problems, some large banks, for example, have been monitoring margin disputes, as well as clearing and settlement flows, much more closely. Any

breaches of credit limits and other contractual agreements have been reportedly dealt with utmost care, which was not always the case before the eruption of the turmoil.

At the same time, it is notable that the interplay among banks and various other counterparties has become more intricate, in the sense that risk managers, through their credit decisions, might influence the viability of counterparties, thereby ultimately also becoming responsible for the overall functioning of the market.

On account of large numbers of incidents during the recent turmoil, many counterparty risk management practices have been tested in practice. This has provided risk managers with valuable experience and has allowed them to streamline various processes and procedures, including close-outs in the event of counterparty default.

In this context, it is noteworthy that recent multiple credit events in the CDS market, including some incidences of double default,<sup>19</sup> have not resulted in major dislocations or counterparty credit losses, and post-event settlements were handled successfully. Nevertheless, the centralised clearing of a majority of CDS contracts, especially plain-vanilla contracts, remains an immediate priority, as it should reduce counterparty credit risk and allay concerns about systemic risk.

By late May 2009, counterparty credit risk concerns, as judged by the CDS premia of major global dealers, including some euro area LCBGs, remained high. Moreover, aggregate and individual interbank limits for unsecured credit remained well below pre-crisis levels.

According to market intelligence, some larger non-bank counterparties, the most important of

<sup>18</sup> In a nutshell, the margining terms consist of an initial margin or haircut set at the outset of a transaction and the arrangements for adjusting the amounts of posted collateral throughout the life of the transaction.

<sup>19</sup> A double default refers to a situation when both the counterparty and the reference entity of a CDS transaction default simultaneously.

which are hedge funds, had managed to negotiate triggers and other credit terms that would offer them more protection in the event of a bank's default, despite banks' resistance to such terms. For example, some larger hedge funds had requested and obtained triggers which granted them the right to terminate transactions with the bank and seize the collateral if the bank's CDS premium were to rise above 1,000 basis points.

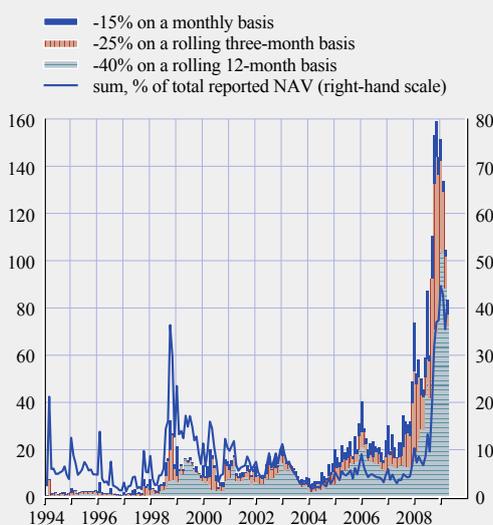
Nevertheless, many dealing terms still remained one-sided and far more favourable for the prime broker banks than for the hedge funds. Usually only larger hedge funds could expect to benefit from two-way margining, where both the hedge fund and the bank have to post/return collateral in line with changes in market prices. Furthermore, banks had been resistant and selective when granting margin lock-ups, which involve fixing haircuts and other margining terms for a specified period of time.

As a result of severe hardship in the hedge fund sector (see Section 1.3), banks have had manifold opportunities to renegotiate and render financing terms even more in their favour owing to numerous breaches of net asset value-based triggers (see Chart 4.20). Prime brokers had reportedly also been insisting on termination triggers based on a cumulative decline in total NAV, rather than in NAV per share, since the former incorporates the joint impact of both negative returns and investor redemptions.

In the aftermath of the failure of Lehman Brothers, many hedge funds, particularly the larger ones, had been asking for segregated accounts and restrictions on the re-hypothecation of their collateral in order to safeguard assets held with prime brokers. Concerns about prime brokers' credit standing and concentrations of counterparty risk had also led many hedge funds to establish multiple prime brokerage relationships and thereby contributed to substantial changes in prime brokerage market shares, of which some euro area LCBGs with large balance sheet capacity have been important beneficiaries.

**Chart 4.20 Estimated total net asset value (NAV) and proportion of hedge funds breaching triggers of cumulative total NAV decline**

(Jan. 1994 – Apr. 2009; USD billions and percentage of total reported NAV)



Sources: Lipper TASS database and ECB calculations.

Note: Excluding funds of hedge funds. Net asset value (NAV) is the total value of a fund's investments less liabilities; it is also referred to as capital under management. If several typical total NAV decline triggers were breached, then the fund in question was only included in the group with the longest rolling period. If, instead of one fund or sub-fund, several sub-fund structures were listed in the database, each of them was analysed independently. The most recent data are subject to incomplete reporting.

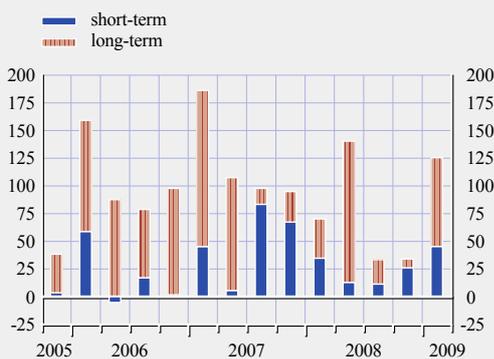
### FUNDING LIQUIDITY RISKS

Regarding banks' key funding markets, there have been some signs of improvement in euro area money market conditions since November 2008, as reflected in higher transaction volumes in unsecured interbank markets and a decline in recourse to the ECB deposit facility (see Section 3.1). Spreads between unsecured interbank deposit rates and overnight index swap rates have also declined markedly in major money markets since November.

Notwithstanding the signs of a slight improvement in euro area money market conditions, funding pressures for banks have remained intense. The maturity of interbank liabilities has shortened as a consequence of the limited availability of funds beyond one month in interbank markets and the reluctance of money market funds to invest in money market instruments with longer maturities. Furthermore, risk aversion and remaining concerns about counterparty risk have continued

**Chart 4.21 Net issuance of debt securities by euro area MFIs by maturity**

(Q4 2005 – Q1 2009; EUR billions)



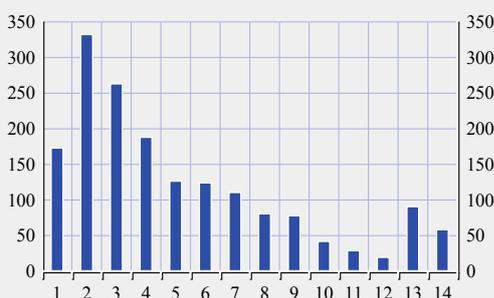
Source: ECB.

to impair access to interbank funding for some banks and, in turn, increased their dependence on central bank funding.

Looking at the other main components of banks' wholesale funding, the net issuance of debt securities by euro area MFIs has been reduced significantly in the aftermath of the default of Lehman Brothers. In the period between

**Chart 4.22 Long-term debt of euro area large and complex banking groups by maturity date**

(EUR billions)



1 2009	8 2016
2 2010	9 2017
3 2011	10 2018
4 2012	11 2019
5 2013	12 2020
6 2014	13 after 2020
7 2015	14 perpetual

Sources: Dealogic DCM Analytics and ECB calculations. Note: Banks' long-term debt includes bonds, medium-term notes, covered bonds and other debt securities with a minimum maturity of 12 months.

September 2008 and January 2009, net issuance of long-term debt securities by euro area MFIs was negative. Since February 2009 the issuance of long-term debt securities has recovered (see Chart 4.21), although this was predominantly due to issuance under government guarantee schemes. By late May 2009, euro area banks had issued €413 billion of bonds under government guarantees.

As regards other sources of medium and long-term funding such as covered bonds, the primary market for jumbo covered bonds had, encouragingly, begun to reopen in the first quarter of 2009. Furthermore, after the ECB announcement in early May 2009 on the programme to purchase euro-denominated covered bonds, primary issuance activity picked up markedly.<sup>20</sup> By late May 2009, according to data compiled by Dealogic, year-to-date issuance of covered bonds by euro area LCBGs was only 8% lower than in the corresponding period of last year.<sup>21</sup>

As regards euro area banks' refinancing needs in the period ahead, banks have large volumes of long-term debt that will need to be rolled over in the coming years. According to data compiled by Dealogic, in late May 2009 euro area LCBGs had more than €500 billion of existing long-term debt that will mature in the remainder of 2009 and in 2010 (see Chart 4.22).

Where other sources of wholesale funding are concerned, external liabilities of euro area MFIs, which to a large extent comprise deposits from foreign credit institutions, decreased sharply (by more than €500 billion) in the period from September 2008 to April 2009.

Banks' access to subordinated bond markets has remained hampered and the outlook for the issuance of subordinated debt has deteriorated even further in recent months, on account of

<sup>20</sup> In the three weeks between the ECB announcement and the cut-off date for the FSR, euro area LCBGs have issued €14 billion of covered bonds.

<sup>21</sup> These figures include both jumbo and non-jumbo covered bonds.

increased concerns about the nationalisation of banks. Reflecting these concerns, secondary market spreads on euro-denominated subordinated bonds have widened sharply, and peaked at around 950 basis points in late March 2009. Although spreads have gradually tightened since then, they remained at elevated levels in late May 2009.

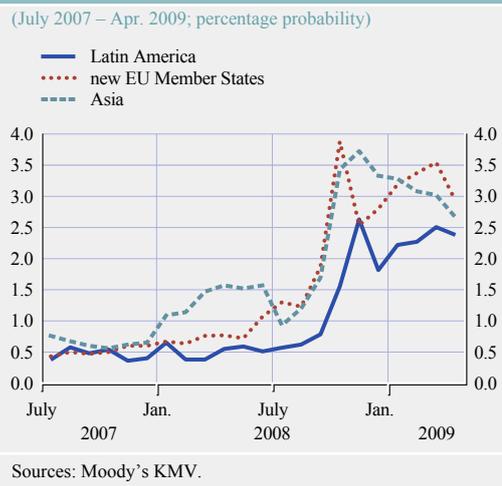
Against the background of continued stresses in wholesale funding markets, banks have focused their funding strategies on increasing retail deposits, thereby trying to reduce customer funding gaps. In the period from September 2008 to April 2009, customer deposits (i.e. deposits from non-MFIs excluding governments) increased by around 6%, owing to significant growth in deposits from households and other financial institutions. In the same period, the customer funding gap of euro area MFIs was reduced by more than €500 billion and the funding gap ratio (defined as the ratio of the customer funding gap to customer loans) dropped significantly, from 13.5% in September 2008 to 8.7% in April 2009.

Banks' efforts to strengthen or maintain their deposit bases are also reflected in the development of deposit margins, at least on time deposits. While banks passed through central bank rate cuts to deposit rates in early 2009, the latter have decreased to a lesser extent than money market rates. As a consequence, the deposit margin of euro area MFIs was negative or close to zero in the first quarter of 2009. This may in part be the result of intense competition for retail deposits (see Chart S98).

#### RISKS FROM EMERGING MARKETS AND THE NEW EU MEMBER STATES

Since the publication of the December 2008 FSR, macroeconomic conditions have worsened in Latin America, Asia and emerging Europe, as well as in several of the Member States that joined the EU in 2004 or later. GDP growth rates have slowed significantly and recent IMF estimates suggest that the annual output of

Chart 4.23 Expected corporate default rates for different emerging market areas



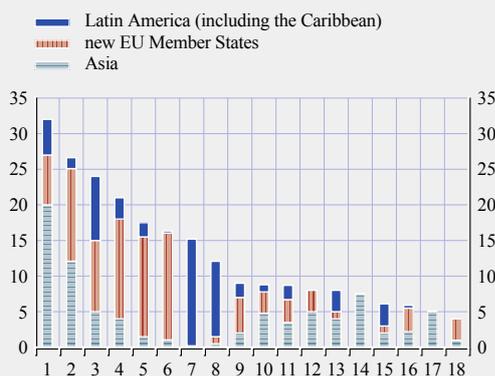
emerging market economies and the new EU Member States will contract by 0.4% in 2009.

At the same time, reliance by banks in these countries on external funding has increased further. Funding from abroad – either through markets or from parent banks – has become more scarce and more expensive in recent months. In some cases, banks have had to reduce their net foreign asset positions due to a lack of domestic funding. In addition, parent banks have come under increasing pressure from the global financial turmoil, as can be seen from, among other things, the development of their share prices.

Furthermore, many countries have seen their domestic currencies depreciate (for details, see Section 1.1). The banking sectors of some countries have also been affected by an erosion of domestic funding in the form of demand deposits. Although there is no evidence of a systematic deposit flight, many economies in central and eastern Europe (CEE) and in the Commonwealth of Independent States (CIS) have experienced deposit withdrawals since September 2008; there have, however, been some exceptions, with increases recorded. The widening gap between deposits and loans

**Chart 4.24 Loan exposures of euro area large and complex banking groups to emerging market economies and new EU Member States**

(2008; percentage of total assets)



Source: Individual institutions' financial reports.

**Table 4.1 Characteristics of euro area large and complex banking groups with large exposures to new EU Member States and emerging markets**

(Q4 2008; percentage)

2008 Q3	Loans/ total assets	Deposits/ total assets	Equity/ total assets	Tier 1 capital ratio
Median LCBG euro area banks with large EME and NMS exposures	33.8	24.7	2.8	9.4
	61.04	47.61	5.82	7.28

Sources: Individual institutions' financial reports and ECB calculations.

Note: The median LCBG excludes LCBGs with large exposures to emerging market and central, eastern and south-eastern European economies.

has forced banks to search for alternative and typically more expensive sources of funding.

These adverse conditions have been mirrored in considerably higher default expectations for firms (an increase from about 1% to above 2%), as well as for households in these regions (see Chart 4.23).

For some euro area LCBGs, a significant share of their assets (and their profits) is related to their activities in emerging market and CEE countries, exposing them to any further deterioration in the economic situation in those regions. Furthermore, given the higher profit margins that can be realised in the banking markets of new EU Member States, the contributions from subsidiaries in these countries to group profits can be substantial. Indeed, for the sample of

LCBGs which are most active in this region, emerging markets accounted for between 4.5% and 37% of total assets and between 6% and 45.1% of total profits in 2008 (see Chart 4.24). This suggests that some banks active in the region could be negatively affected by a scenario in which macroeconomic conditions deteriorate sharply in these countries, causing higher delinquency rates and defaults on corporate and household loans.

The LCBGs active in the emerging market and CEE regions generally have high ratios of loans to total assets, funded largely through deposits. They also typically have Tier 1 ratios that are lower than the LCBG median (see Table 4.1). This largely reflects the banks' business models, which focus on low-risk-weight retail banking activities and rely on relatively large deposit bases.

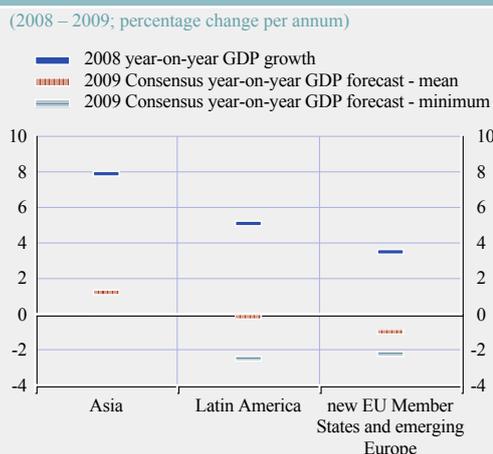
#### Box 15

#### ASSESSING THE RESILIENCE OF EURO AREA BANKS TO AN ADVERSE MACROECONOMIC SCENARIO IN THE NEW EU MEMBER STATES AND EMERGING MARKETS

Recent macro-financial developments in central and eastern Europe and emerging markets indicate that virtually all of them are being affected by the significant deterioration in global financial and economic conditions. Impacts on these countries have been heterogeneous, albeit severe in

some cases, reflecting significant differences in their domestic and external imbalances and therefore their vulnerability. The challenging macro-financial environment has meant that the banking sectors of new EU Member States and emerging market countries have come under increasing strain, predominantly as a result of a combination of two shocks.<sup>1</sup> First, external funding, on which many banking systems in these regions are reliant, became more scarce and expensive in 2008 and 2009; and second, the risk that non-performing loans will rise materially has increased on account of the economic slowdown and its repercussions for the debt servicing capacities of the corporate and household sectors. In some cases, this has already stretched balance sheets, not least owing to the balance-sheet effect of exchange rate depreciations. Against this background, this box analyses potential losses facing euro area banks should downside risks for the macroeconomic outlook of some new EU Member States and emerging market economies materialise.

Chart A Consensus Economics GDP growth forecasts for 2009



Source: Consensus Economics.

Potential losses facing euro area banks from lending activities in the new EU Member States and emerging market countries were estimated in three steps: first, by using the lower bound of Consensus Economics forecasts for GDP growth for these countries, as a proxy for the worst-case scenario; second, by empirically relating non-performing loans to GDP growth in the individual countries concerned, thereby allowing a projection of the potential increase in non-performing loans in 2009 to be computed on the basis of the worst-case macroeconomic scenario; and third, by combining these non-performing loan projections with information on what is known about the exposures of euro area large and complex banking groups (LCBGs) to these regions. Regarding the first step, contributors to Consensus Forecasts envisaged significant deterioration in major world regions in the first few months of 2009, with some expecting sizeable economic contractions (see Chart A).

Non-performing loans were empirically linked to GDP in a bivariate vector auto-regression (VAR) framework, whereby the elasticity of non-performing loans to a one percentage point decrease in annual GDP growth was estimated to range between 0.5 and 0.6 for all geographic regions.<sup>2</sup> For the new EU Member States, the estimates were based on consolidated banking data on non-performing loans, while for Asian and Latin American exposures, non-performing loans were approximated with Credit-Edge+ expected default frequencies for the whole corporate sector. These simple projections indicate that non-performing loans could increase by between 7.5 and 10 percentage points, on average, for the whole region under study. These aggregate figures,

1 The strains in the banking sectors of new EU Member States and emerging market countries have not emerged uniformly across the region. Moreover, the delayed onset of these strains in some countries after the eruption of the turmoil in mature economy financial systems gave banks time to prepare by accumulating additional capital buffers and loan-loss provisions to protect themselves from shocks.

2 This framework does not take into account the asymmetries which may exist between new EU Member States and emerging market countries.



**Chart B Change in four central and eastern European countries' currencies against the euro**

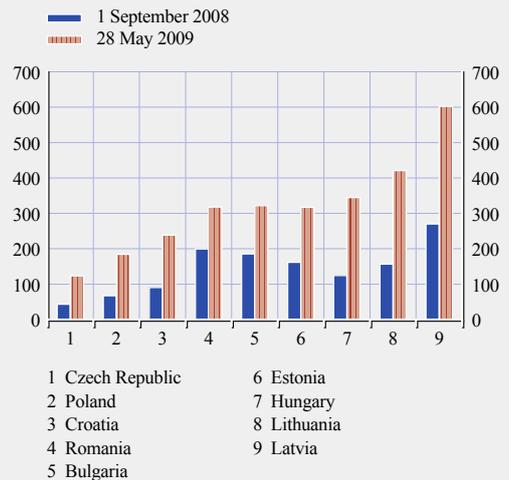
(July 2007 – May 2009; index: Sep. 2008 = 100)



Source: Bloomberg.

**Chart C Sovereign CDSs in central and eastern European countries**

(basis points)



Source: Bloomberg.

Note: The Estonian sovereign CDS is a purely synthetic instrument without any underlying asset.

however, mask important differences across countries, notably in the new EU Member States. Finally, loan losses were computed from the information given by LCBGs in their annual reports on exposures to the new EU Member States, Asia and Latin America.

The findings from this simple exercise, which has a number of caveats, shows that if the worst-case macroeconomic scenario were to materialise in 2009 in the new EU Member States, Asia and South America, the losses that euro area LCBGs would have to absorb collectively would amount to slightly more than 7% of their Tier 1 capital.<sup>3</sup> Although this finding suggests that the balance sheets of LCBGs, would not be unduly strained by such a scenario, there are important differences across LCBGs, and some of them could see their Tier 1 capital shrink by as much as a third under such a scenario. Moreover, for those institutions facing losses on other business lines, the combined effect could pose important challenges. That said, three mitigating risk factors have to be taken into account: first, most euro area LCBGs would be hardly affected by a more severe than currently expected economic downturn in all of these regions; second, as shown by the BIS banking statistics for the fourth quarter 2008, foreign banks remained committed to central and eastern European countries; and, third, public sector funding from the EU and the IMF had been seen by the markets as making an important contribution to lowering the risks in these regions.

Potential losses for euro area banks from lending to emerging market countries and the new EU Member States could be aggravated further if financial market conditions in those countries were to continue to deteriorate. In particular, after the collapse of Lehman Brothers, a sharp rise in global risk aversion triggered significant outflows from some emerging economies, including new EU

<sup>3</sup> This figure takes full account of loan-loss reserves, but it is based on an assumption that there were no retained profits in 2008 to cover any losses that might be incurred on loans extended in 2009. The expected loss amounts were based on an assumption that the recovery rate would be 30%. This recovery rate is somewhat higher than the assumptions in private sector reports. For the latter, see Morgan Stanley, "Emerging Euro – Banks: Making the 97/98 Asian Crisis Our Base Case", March 2009 and JPMorgan Chase & Co., "European Banks: Absorbing CEE stress, crunching numbers", March 2009.

Member States. One consequence of this was large depreciations in the currencies of several of the new EU Member States (see Chart B) and a fall in market liquidity. However, in countries with currency board arrangements, which also had large foreign currency exposures, the foreign exchange market pressures were reflected in changes in foreign exchange reserves and domestic interest rates, rather than in the exchange rates. That said, since the beginning of 2009, there has been more differentiation in foreign exchange rate patterns, although global risk aversion remains a dominant factor. Generally, the countries perceived as being most vulnerable to the challenges of the macro-financial environment – i.e. those with banking systems that are strongly reliant on foreign funding and/or have a large share of foreign currency lending – have faced the greatest foreign exchange rate pressures, although there are some exceptions. In some countries, the high share of foreign currency-denominated loans exacerbated the risk to the real economy of sharp local currency movements, as borrowers face a relative increase in the amount of their debt.

This could, in turn, lead to an aggravation of the economic downturn in central and eastern Europe, as some western banks with local subsidiaries may endeavour to reduce their risk exposure to the region. Fears of such negative feedback loops between the financial and economic spheres in the new EU Members States and other emerging economies have contributed to a significant increase in perceived sovereign risk in the region (see Chart C).

#### 4.3 OUTLOOK FOR THE BANKING SECTOR ON THE BASIS OF MARKET INDICATORS

Since the finalisation of the December 2008 FSR, market-based indicators have continued to point to increasing risks for LCBGs. This can be attributed mainly to the uncertainty surrounding the depth and length of the global economic downturn, which could continue to negatively affect the credit quality of banks' borrowers. Adding to the uncertainty surrounding financial institutions has been some concern about the efficiency of government support programmes. Moreover, equity holders reacted negatively to the prospect of a dilution of their shares following public capital injections. A non-negligible possibility of some banks ultimately being nationalised forced banks' CDS spreads to increase further, reflecting the fact that nationalisation is considered a credit event in standard CDS contracts.<sup>22</sup> For these reasons, market-based indicators should be interpreted with particular caution at present. That said, LCBGs' equity prices have already decreased significantly, and in late 2008 they fell below the levels seen in 2003 (see Chart S110). Moreover, implied volatility on LCBGs' share prices has increased to historically high levels (see Chart S111).

As discussed in Section 4.1, uncertainties surrounding the future of euro area banks have also been reflected in price-to-book value ratios, which reached record low levels in the first quarter of 2009 and were three times lower than before the market turmoil erupted in 2007 (see Chart 4.25). As it measures the

22 According to the International Swaps and Derivatives Association master agreement, which serves as a standard for the majority of CDS transactions, nationalisation is a credit event.

Chart 4.25 Dispersion of price-to-book value ratios for euro area large and complex banking groups

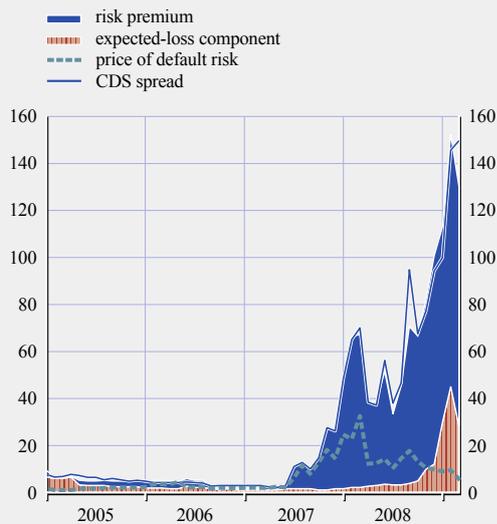
(July 2007 – May 2009)



Sources: Bloomberg and ECB calculations.

**Chart 4.26 Decomposition of the CDS spreads of euro area large and complex banking groups**

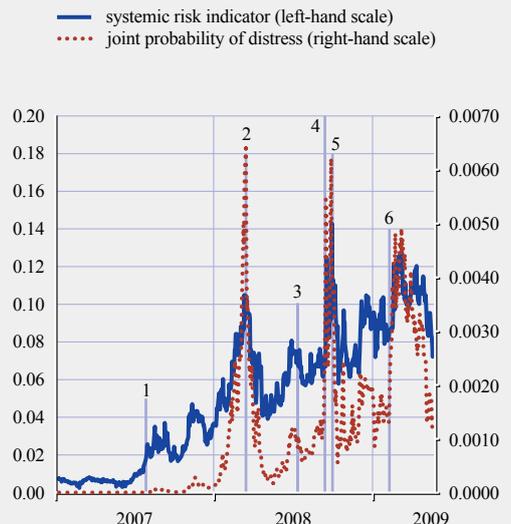
(Jan. 2005 – Mar. 2009; basis points)



Sources: Bloomberg, Moody's KMV and ECB calculations. Note: Since expected-loss components and risk premia were calculated for each LCBG individually, their medians do not necessarily sum up to the median CDS spread. See the box entitled "Price of default risk as a measure of aversion to credit risk", in ECB, *Financial Stability Review*, December 2008, for a description of how the price of default indicator was constructed.

**Chart 4.27 Systemic risk indicator and joint probability of distress for euro area large and complex banking groups**

(Jan. 2007 – May. 2009; probability)



- 1 Turmoil begins
- 2 Bear Stearns rescue takeover
- 3 Rescue plan for US Fannie Mae and Freddie Mac announced
- 4 Lehman Brothers default
- 5 US Senate approves Paulson plan
- 6 T. Geithner announces Financial Stability Plan

Sources: Bloomberg and ECB calculations. Note: See the box entitled "Measuring the time-varying risk to banking sector stability", in ECB, *Financial Stability Review*, December 2008, for a description of the joint probability of distress indicators and the box entitled "A market-based indicator of the probability of adverse systemic events involving large and complex banking groups", in ECB, *Financial Stability Review*, December 2007, for a description of the systemic risk indicator.

market value of equity capital relative to its book value, this ratio reflects a firm's solvency prospects. Additional capital injections and the fall in equity prices were seen as the main reasons behind the significant decrease in the market value of euro area banks' capital. Nevertheless, the median of this indicator seems to have stabilised at a low level in early 2009 and then picked up somewhat in April, which may be an indication that, following the gradual introduction of guarantee schemes, the prospects of the benefiting banks are no longer deteriorating in the view of market participants.

Uncertainty about the severity of the credit cycle downturn and its adverse impact on banks' shock-absorption capacities have also become apparent in the CDS spreads of euro

area LCBGs, which reached new record highs in March 2009, exceeding levels seen in the aftermath of the default by Lehman Brothers (see Chart S108). The cost of protection against banks defaulting continued to increase in spite of government support measures. It is important to note that this does not necessarily reflect a lack of trust among market participants in the effectiveness of government support; it could also mirror the fear that problems at some institutions may yet force governments to nationalise them.

A decomposition of CDS spreads tends to support this hypothesis, as it suggests that the expected-loss component, which represents the pure default risk, has more than doubled since the third quarter of 2008 (see Chart 4.26). By contrast, the

price of default risk, which is a measure of the compensation that protection sellers demand for bearing this risk, decreased after the Lehman default in September 2008. This means that by end-March 2009, the expected-loss component was a major contributor to the further increase in CDS spreads, whereas the relative importance of the default risk premium had decreased.

Against this background, the joint probability of distress and the systemic risk indicator for the euro area banking sector reached their local highs in early April 2009 (see Chart 4.27). Recent developments in these indicators have to be interpreted with caution, however. Since banks' CDS spreads are an important input in calculation of both indicators, the sharp increase in the indicators in mid-April may have been related to growing fears of bank nationalisations among market participants. Such perceptions, which may have been intensified by the above-mentioned terms of CDS contracts, can be considered somewhat irrational if the aim of a bank nationalisation is to protect bondholders and mitigate the risk of systemic failures. All in all, against the background of the substantial efforts made by public authorities to support the euro area banking sector, systemic risk can be considered to have decreased materially, although this might not be fully evident from the systemic risk indicators. Nevertheless, both indicators decreased significantly in May 2009.

Distance-to-default, an equity-based yardstick of credit risk, also signals increasing default risk among euro area LCBGs. This indicator has decreased substantially over the last six months, and has dropped below the levels seen in 2002-03, when the banking sector faced challenging conditions in the aftermath of the equity market correction (see Chart S107). Increasing default risk is also reflected in the surge in expected default frequencies (EDFs) for euro area LCBGs, which recently exceeded the peak levels seen during the last downturn (see Chart S106). All in all, both indicators suggest that market participants do not rule out further losses in the banking sector and have concerns about LCBGs' shock-absorption capacities in

**Chart 4.28 Option-implied risk-neutral density bands for the Dow Jones EURO STOXX bank index**

(Jan. 2005 – June 2009; index value; 10%, 30%, 50%, 70% and 90% confidence intervals of estimations on 11 May 2007, 8 Nov. 2007, 6 May 2008, 27 Nov. 2008 and 28 May 2009)



Sources: Bloomberg and ECB calculations.

spite of substantial support extended by the euro area governments.

In spite of growing risks as conveyed by default risk indicators, by end-May other indicators suggested that the short-term outlook for euro area LCBGs had slightly improved. Strong negative skewness in option-implied risk-neutral density functions, which had constantly been observed since the beginning of the financial market turmoil, has recently become much less profound. This suggests that options market participants may consider further losses on LCBGs' share prices to be less likely in the short run, possibly because many such institutions have seen their share prices decline below their intrinsic values (see Chart 4.28). Moreover, the confidence bands derived from options quotes narrowed slightly in May 2009, which suggests that large moves in the market prices had become less likely. The highest confidence intervals were even skewed upwards, which suggests that a higher probability to upward versus downward movements in euro area bank stock prices is assigned under the risk-neutral probability measure.

All in all, despite the tentative signs of near-term stabilisation indicated by the option-based indicators, other forward-looking indicators signal that the outlook for the euro area banking sector has worsened. In particular, despite the

public support measures implemented thus far, the outlook for euro area LCBGs remains uncertain and protracted challenging market conditions may exert further pressure on these institutions in the period ahead.

#### DEVELOPMENTS IN EURO AREA BANKS' CREDIT RATINGS

The, on average, still relatively high credit ratings reported for euro area LCBGs in the December 2008 FSR subsequently came under considerable downward pressure. This reflects the fact that LCBGs have continued to face an exceptionally difficult environment owing to the confluence of falling asset valuations, reduced market liquidity, varying levels of capital strains and extremely low investor and client confidence. The average rating for the group remained at the AA- level, but rounding effects mask the continuation of the deteriorating trend observed since the beginning of 2008. The downward trend in ratings is expected to continue, as rating outlooks – considered a medium-term indicator of the potential direction of longer-term credit ratings (beyond one to two years) – show a clear negative path for the future.

#### 4.4 OVERALL ASSESSMENT

The financial results reported for the last quarter of 2008 showed that for many LCBGs, financial conditions deteriorated sharply towards the end of the year. In 2009 support from the ECB and the euro area governments has continued to play an important role at a time when LCBGs' earnings have remained under intense pressure.

The outlook for the euro area LCBGs remains uncertain. There are indications that the actions taken by banks to reduce exposures, control costs and bolster solvency ratios – in many cases with government support – as well as the favourable trading environment in the first months of 2009 may have helped many of these institutions to stabilise their financial positions. At the same time, the deterioration in the euro area and global macroeconomic environment is exerting pressure on corporate and household finances

and insolvencies are expected to increase in the course of 2009. This will force many LCBGs to report growing impairment costs and loan losses, thus denting the earnings prospects of even those banks which have been less affected by securities write-downs.

Even if the more recent signs suggest a slowdown in the pace of deterioration in the economic environment, no substantial improvement in financial institutions' operating environment can be expected in the remainder of 2009. Against this background, financial institutions should intensify efforts to hedge their existing securities exposures and re-assess credit risks at a higher frequency than in "normal" times. Banks could also benefit from improving expertise in the area of debt restructuring processes and ensure that risks are priced appropriately but not excessively or prohibitively so.

The scarcity of medium and longer-term funding liquidity remains a key problem for the LCBGs. The decisions by the ECB and other major central banks to further increase the provision of liquidity have mitigated the problems at the short end of the money market maturity spectrum, but the cost of, and access to, longer-term financing remains problematic for many LCBGs. Since the beginning of the turmoil, LCBGs have been partially compensating for the low money market liquidity by actively increasing their deposit bases. While the efforts to this end should be continued, banks should also consider reallocating their business away from activities that are particularly dependent on the availability of unsecured funding.

An important contribution to the pursuit of stable or higher capital ratios among LCBGs is likely to come from the reduced growth rate of risk-weighted assets. There will probably also be further efforts to trim costs, and pressure for consolidation is likely to intensify. These developments, although necessary to bring the banking sector back to a state where stable earnings and organic capital growth are restored, might have substantial medium-term implications for the market structure

and competitive environment in the euro area banking sector. At the same time, public sector support measures will continue to provide relief to banks on stresses on both the asset and liability sides. Looking forward, to safeguard against further unexpected losses, governments and supervisors should encourage banks to take advantage of the existing public sector commitments for financial support. At the same time, the scale and scope of these support programmes should be assessed through system-wide stress testing, while supervisors should require full transparency regarding banks' exposures to hard-to-value securities.

The main risks currently faced by the euro area LCBGs can be summarised as follows.

- ↑ A slowdown in earnings and increase in credit costs as a result of the sharper than previously expected global economic downturn
  - ➔ Further write-downs on asset-backed securities, including those with European loans in collateral pools
  - ➔ Erosion of capital bases and a resulting loss of confidence in future solvency positions
  - ↓ Competitive pressures in the retail lending market and tight bid-ask spreads in the retail financial markets
- ↑ *Increased since the December 2008 FSR*  
 ➔ *Unchanged since the December 2008 FSR*  
 ↓ *Decreased since the December 2008 FSR*